United States
Department of
Agriculture
Forest
Service

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TRIPOLI EAST VEGETATION MANAGEMENT PROJECT

Towns of Livermore and Thornton
Grafton County, New Hampshire

Environmental Assessment 2.0

Prepared By
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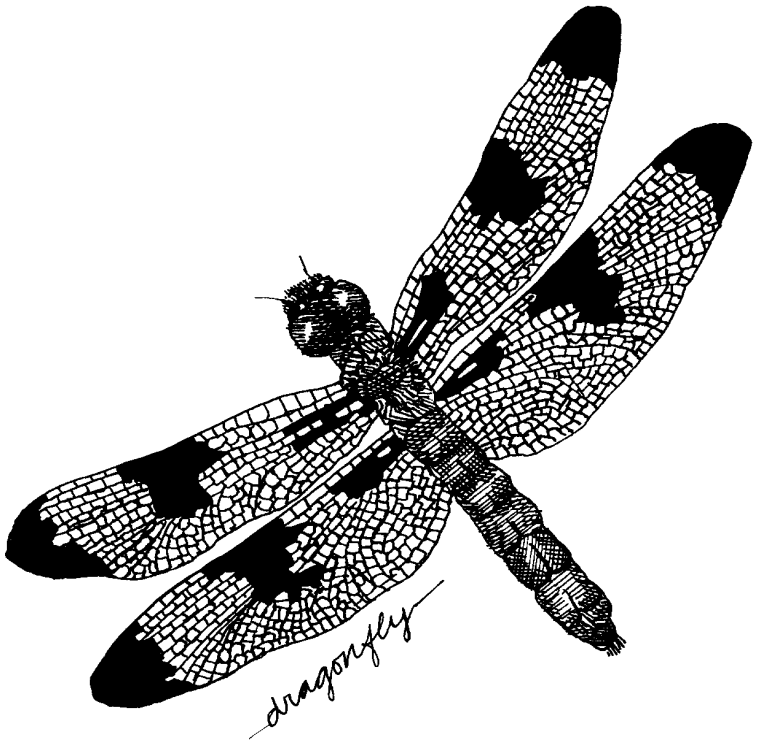

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TRIPOLI EAST VEGETATION MANAGEMENT EA 2.0 - DOCUMENT SUMMARY

The Ammonoosuc/Pemigewasset Ranger District of the White Mountain National Forest National Forest, New Hampshire is proposing the following management activities in the Tripoli East project area:

- Even- or uneven-aged timber management on 1087 stand acres, and
- Pre-haul road maintenance on 4.5 miles of road.

The project area is located in the towns of Thornton and Livermore, Grafton County, New Hampshire on the Pemigewasset Ranger District of the White Mountain National Forest. The Tripoli East project area consists of approximately 3,000 acres, all federal lands (Management 2.1 and 3.1 lands in Habitat Management Units 416 and 417 – Maps 1-3).

The following list describes the "needs for change" and opportunities identified for the Tripoli East project area that would meet the project's purpose of implementing the Forest Plan. Item 2 was identified following Scoping and is reflected in alternatives 3-6.

1. There is a need to increase the regenerating forest age class.
2. There is a need to relocate dispersed camping sites along the Tripoli Road out of the lower terraces adjacent to Eastman Brook onto upland sites to prevent possible future erosion and sedimentation during periods of out of bank flow.
3. There is a need to provide an adequate transportation system for both short- and long-term access to facilitate the management of National Forest Lands and to provide motorized recreation opportunities.
4. There is a need to provide wood to meet people's demand for wood products such as furniture, paper, fiber, and construction materials.

The proposed action may result in the following effects:

- Possible short-term, localized, soil compaction;
- Small watersheds may experience increased water yields;
- Short-term minor sedimentation may occur at temporary stream crossings if installed during summer or fall;
- Minor erosion and sedimentation may occur at times of out of bank flow where dispersed campsites are located on the lower terraces adjacent to Eastman Brook;
- Areas where clearcutting and group selection harvests occur would create temporary openings and allow new tree seedlings to become established, create a minor reduction in the mature forest community stage, and create an over-all increase in age-class diversity;
- Indirectly the increase in regenerating habitat would benefit the majority of management indicator species, and conversely where openings were created, the few management indicator species that favor closed canopy habitat would not benefit;
- There would be a very low potential for minor, localized, and short-term direct and indirect effects to amphibian, reptile, and fish habitat as related to sediment, turbidity, and/or travel impediments and displacement;
- There is a potential net return to the US Treasury of $436,775; a 10% timber tax return of $14,403 to the Town of Thornton and $65,612 to Grafton County (for the unincorporated Town of Livermore); and a return to the 25% Fund of approximately $200,000.

No adverse effects are anticipated to air quality, recreation, the transportation system, or heritage resources.

Table A displays the amounts of activities proposed by alternative in the Tripoli Project.

Table A: Amounts of Activities Proposed in the Tripoli Project by Alternative

Activity	Alt 1 No Action	Alt 2 Proposed Action	Alt 3	Alt`4	Alt 5	Alt 6
Timber Harvesting:						
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	0 Ac	141 Ac	0 Ac	111Ac	131 Ac	111Ac
Uneven-Aged Management -						
Single-Tree Selection	0 Ac	165 Ac	165 Ac	47 Ac	47 Ac	0 Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average	0 Ac	781 Ac	842 Ac	811 Ac	833 Ac	554 Ac
Group/Single-Tree Selection	0 Ac	0 Ac	0 Ac	118 Ac	118 Ac	0 Ac
Transportation						
Pre-haul Road Maintenance	0 Mi	4.5 Mi	4.5 Mi	4.5 Mi	4.5 Mi	3.7 Mi
Recreation:						
Opportunity to Create Upland Dispersed Campsites	0 Sites 0 Ac	0 Sites 0 Ac	23 Sites 6 Ac	25 Sites 7 Ac	225 Sites 7 Ac	10 Sites 3 Ac
Opportunity to Remove and Restore Riparian Dispersed Campsites	0 Sites 0 Ac	0 Sites 0 Ac	23 Sites 6 Ac	25 Sites 7 Ac	225 Sites 7 Ac	10 Sites 3 Ac

This environmental assessment will provide the deciding officer (Ammonoosuc/Pemigewasset Ranger District) with information to make informed decisions on the Tripoli East Vegetation Management Project and provides the basis for determining:

1. Which actions, if any, will be approved (which alternative to implement) that will move the Tripoli project area towards the desired condition per Forest Plan direction and addresses the needs and issues identified for this project?
2. Is the information in this analysis sufficient to implement the proposed activities?
3. Does the proposed project have a significant impact that would trigger a need to prepare an Environmental Impact Statement?
4. What mitigation measures and monitoring requirements should the Forest Service apply to these activities to meet Forest Plan standards and guidelines for all resources?
5. Will a Forest Plan amendment be required to accommodate this project?

If an action alternative is selected, project implementation could begin in 04/03 and last for several years.

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ACRONYMS & ABBREVIATION LIST

The following acronyms and abbreviations may be found in this document.

Ac	Acres
ADO	Appeal Deciding Officer
ALT	Alternative
AMC	Appalachian Mountain Club
AMS	Analysis of the Management Situation
AR	Administrative Record
ARO	Appeal Reviewing Officer
ARPA	Archaeological Resources Protection Act (1979)
ASQ	Allowable Sale Quantity
ATS	Atlantic Salmon
ATV	All Terrain Vehicle
BA	Biological Assessment
BBC	Breeding Bird Census
BBS	Breeding Bird Survey
BE	Biological Evaluation
BKT	Brook Trout
BMPs	Best Management Practices
BO	Biological Opinion
C	Centigrade
C	Compartment
CCC	Civilian Conservation Corps
CCF	Cubic Feet
CCRR	Cultural Resource Report
CDS	Combined Data Systems
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIP	Capitol Investment Plan
CMAI	Culmination of Mean Annual Increment
CO	Contracting Officer
CO	Carbon Monoxide Monitoring
CO2 (CO_2)	Carbon Dioxide Monitoring
CR	Cultural Resources
CT	Timber Sale Contract Special Provisions
CWD	Coarse Woody Debris
DAP	District Automation Program
dbh	Diameter Breast Height
DC	Desired Condition (Composition)
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
DFC	Desired Future Condition
DM	Decision Memo
DN	Decision Notice
DOJ	Department of Justice
EA	Environmental Assessment
EAM	Even-Aged Management
EC	Existing Condition (Composition)
EC & I	Ecological Classification & Inventory
ECS	Ecological Classification System
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELT	Ecological Land Type
ELTP	Ecological Land Type Phase
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EAWS	Ecosystem Analysis at Watershed Scale
FDR	Forest Development Road
FEIS	Final Environmental Impact Statement
FACA	Federal Advisory Committee Act
FH	Forest Highway
FIA	Forest Inventory & Analysis
FLPMA	Federal Land Policy and Management Act (1976)
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FORPLAN	Forest Planning Model
FP	Forest Plan
FR	Forest Road
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
FSR	Forest Service Representative
Ft	Feet
FY	Fiscal Year
GIS	Geographical Information System
GTR	General Technical Report
HMU	Habitat Management Unit
HR	Heritage Resources
HRV	Historical Range of Variability
ID	Interdisciplinary
IDT	Interdisciplinary Team
IN	Insufficient Data
IR	Implementation Record
IRM	Integrated Resource Management
K-V	Knutson-Vanderberg
LAC	Limits of Acceptable Change
LAU	Lynx Analysis Unit
LCAS	Lynx Conservation and Strategy
LSC	Land Suitability Class
LRMP	Land and Resource Management Plan
LTA	Land Type Association
M	Meter
M & E	Monitoring and Evaluation
MBTA	Migratory Bird Treaty Act
Mi	Miles
MIS	Management Indicator Species
MMBF	Million Board Feet
MMCF	Million Cubic Feet
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MT	Mountain
MUSYA	Multiple Use Sustained Yield Act
NAAQSs	National Ambient Air Quality Standards
NAGRPA	Native American Grave Protection

	and Repatriation Act (1990)
NATCRS	National Timber Cruising Program
ND	Data Not Available
NC (NCFES)	North Central Forest Experiment Station
NE (NEFE)	Northeast Forest Experiment Station
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NFSR	National Forest Service Road
NH	New Hampshire
NHFG	New Hampshire Fish & Game
NHNHI	New Hampshire Natural Heritage Inventory
NMFS	National Marine Fisheries Service
NO2 ($N O_2$)	Nitrogen Dioxide
NTMB	Neotropical Migratory Birds
NOI	Notice of Intent
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O3 (O_3)	Ozone
OA	Opportunity Area
OGC	Office of General Council
OHV	Off Highway Vehicle
ORV	Off Road Vehicle
OIG	Office of Inspector General
p.	Page
pp.	Pages
PAOT	People At One Time
Pb	Lead
PG	Page
pH	A chemical term for the hydrogen ion concentration of a solution
PILT	Payment in Lieu of Taxes
PM	Particulate Matter
PNV	Present Net Value
ppb	Parts per Billion
ppm	Parts per Million
PVA	Population Viability Assessment
R	Range
R9	Region Nine
RAP	Roads Analysis Process
RARE	Roadless Area Review and Evaluation
RD	Ranger District
REC	Recreation
RFSS	Regional Forester Sensitive Species
RMO	Riparian Management Objectives
RMO	Road Management Objectives
RO	Regional Office
ROC	Recreational Opportunity Class
ROD	Record of Decision
ROG	Recreational Opportunity Guide
ROS	Recreation Opportunity Spectrum
RPA	Forest and Rangeland Renewable Resources Planning Act
RVD	Recreation Visitor Days
Rx	Prescription
S & G	Standards & Guidelines
§	Section
SCL	Scenery Class/Condition Level
SDEIS	Supplemental Draft Environmental Impact Statement
SHPO	State Historic Preservation Office
SIR	Supplemental Information Report
SMS	Scenery Management System
SO	Supervisor' Office
SO2 (SO_2)	Sulphur Dioxide
SOPA	Schedule of Proposed Actions
SPM	Semi-primitive Motorized
SPMN	Semi-primitive Non-motorized
SS	Sensitive Species
T & E	Threatened and Endangered
T	Township
TESSC	Threatened, Endangered, & Species of Special Concern
TES	Threatened, Endangered, & Sensitive Species
TEPS	Threatened, Endangered, Proposed, & Sensitive Species
TMDLs	Total Maximum Daily Loads
TS	Timber Sale
TSPIRS	Timber Sale Program Information Reporting System
TTPP	Timber Theft Prevention Plan
TTY	Teletype
TTD	Telecommunication Devices for the Deaf
UEAM	Uneven-Aged Management
U.S.C.	United States Code
USDA	United Stated Department of Agriculture
USDI	United Stated Department of the Interior
USFWS (USFW&S)	United States Fish & Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VIS	Visitor
VMS	Visual Management System
VOL	Volume
VQO	Visual Quality Objectives
WMNF	White Mountain National Forest
WS&R	Wild & Scenic River
WLDLF (WL)	Wildlife
WSRA	Wild & Scenic River Act
WO	Washington Office

DOCUMENT STRUCTURE

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

Chapter – Purpose and Need: Chapter 1 includes information on the history of the project area, Forest Plan direction, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal (Scoping), how the public responded, and the unresolved (significant, 40CFR1501.7) issues that developed concerning the proposed action.

Chapter 2 - Alternatives: Chapter 2 details alternatives to the proposed action that were considered to meet the purpose and need for the project, both those alternatives eliminated from detailed consideration and those considered in detail. Alternatives were developed based on unresolved issues. Possible mitigation measures are included. The following tables are used to compare alternatives:

- Table 9, compares the individual stand treatments by alternative;
- Table 10, compares the alternatives to Forest Plan goals, identified needs, and by amounts of activity;
- Table 11, compares the alternatives by the responsiveness to unresolved issues; and
- Tables 12A-12C, compare alternatives by effects to resources.

Chapter 3 – Affected Environment, Environmental Consequences, and Cumulative Effects: This chapter describes the environmental effects of implementing the proposed action and other alternatives and is organized by resource area. Each section details:

The affected environment,

The possible direct and indirect effects of the no action alternative (provides a baseline for evaluation and comparison of the other alternatives that follow) and the action alternatives on the environment; and

The possible cumulative effects on the environment from all alternatives.

Additional information includes:

Preparers, Consultants, Personal Contacts: This section provides a list of people involved in the preparation of the environmental assessment and internal and external contacts.

Literature Cited and/or Reviewed For the Environmental Assessment

Glossary: Definition of terms used in the document.

Monitoring: A discussion of the monitoring associated with the project

Appendices: The appendices provide detailed information to support the analyses presented in the environmental assessment.

Additional documentation may be found in the project planning record located at the Pemigewasset Ranger District Office in Plymouth, NH.

CHAPTER 1 - PURPOSE AND NEED FOR ACTION

1.0 INTRODUCTION

The Tripoli East Vegetation Management project area is located in the towns of Thornton and Livermore, New Hampshire on the Pemigewasset Ranger District of the White Mountain National Forest (Map 1, Appendix A). The Tripoli East project area consists of approximately 3,000 acres, all federal lands (Management 2.1 and 3.1 lands of Compartments 112-117) in Habitat Management Units 416 and 417 – Maps 2 and 3). The Pemigewasset Ranger District proposed the following activities: timber management and road restoration.

The purpose of this Environmental Assessment (EA) is, after considering site-specific needs and opportunities for the Tripoli East project area, to implement management direction as outlined in the White Mountain National Forest Land and Resource Management Plan (Forest Plan), as amended (1986, USDA).

1.0.1 Tripoli East Vegetation Management Environmental Assessment 1.0

The original Tripoli East Project EA (version 1.0) was released for public comment on March 25, 2002. Comments were received from two individuals. These comments were considered in the preparation of this EA.

The Tripoli East Vegetation Management Project decision (based on the Tripoli EA 1.0) was signed by District Ranger John Serfass on May 15, 2002. An appeal was filed with the Regional Forester on June 12, 2002 by a third individual who did not respond during the 30-day comment period.

That decision was remanded by the Regional Forester on July 26, 2002 because of inadequate cumulative effects analyses.

The purpose and need for the Tripoli East Vegetation Management Project has not changed. Therefore, no additional Scoping was conducted. The issues identified in the Tripoli EA 1.0 remain the same, and the alternatives to the proposed action remain the same. This Tripoli East EA 2.0 includes a re-analysis of possible direct, indirect, and cumulative effects of the proposed action and alternatives on the various resources found in the Tripoli project area. The comments received during the review period for the Tripoli East EA 1.0 and the comments contained in the Tripoli East Decision appeal were taken into account for the re-analysis of possible direct, indirect, and cumulative effects for this Tripoli East EA 2.0.

1.1 BACKGROUND

The Tripoli area has been and continues to be heavily used for a variety of activities.

Developed campsites are located on both ends of the Tripoli Road, at Russell Pond and at Osceola Vista.

Camping at established sites is extremely popular along the Tripoli, Hix Mountain, and Mac Brook Roads. A parking pass system is in place that limits the number of overnight campers allowed at these established sites – 300 passes for midweek and non-holiday weekends and 500 passes for holiday weekends. Many of the established camping sites are located between the Tripoli Road and the lower terraces of Eastman Brook and its tributaries. These sites are cleared of vegetation, compacted, and some have the potential to contribute to stream sedimentation during periods of out of bank flows (see §**3.3.3 Recreation**).

Several hiking trails lead off the Tripoli Road including Mt. Osceola, Mt. Tecumseh, the East Ponds, Greely Ponds, and Livermore. There are also cross-country ski and snowmobile trails. Sightseeing is also a very popular activity in this area.

In addition to all of these recreational opportunities, the area has had a long history of vegetation and wildlife habitat management. Forest Service timber harvesting dates from the 1930s to the present day. Initial timber harvesting occurred well before this date, back to the late 1800s when railroad logging was operating in this area. Signs of this era still exist in the railroad grade that is now the Little East

Pond Trail and the mill site along the East Pond Trail. Before railroad-era logging, farmers and settlers populated much of the area. Cellar holes of old homesteads can be found throughout the Tripoli Road area as well as a graveyard and remnants of a waterwheel.

A number of National Environmental Policy Act (NEPA) decisions have been made since 1986, which affected all or part of the Tripoli East project area (§§**1.1.1** and **1.1.2**, below). Some documents provided broad programmatic direction, and some documents provided for site-specific implementation of the Forest Plan.

There are no active timber sales in the vicinity of the Tripoli project.

1.1.1 PROGRAMMATIC DOCUMENTS

WHITE MOUNTAIN LAND AND RESOURCE MANAGEMENT PLAN FINAL ENVIRONMENTAL IMPACT STATEMENT AND RECORD OF DECISION, AS AMENDED (USDA, 1986) (FEIS)

This analysis 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).

The Forest Plan is a programmatic document, which is required by the rules implementing the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). The purpose of the Forest Plan is to provide direction for the multiple use and sustained yield of goods and services from National Forest System lands in an environmentally sound manner.

The Forest Plan sets management direction for the White Mountain National Forest through the establishment of short term (10-15 years) and long-range goals and objectives throughout the year 2036. It prescribes the standards, practices, and the approximate timing and vicinity necessary to achieve goals and objectives. The Plan prescribes the monitoring and evaluation needs necessary to ensure that direction is carried out, measures quality and quantity of actual operations against predicted outputs and effects, and forms the basis for implementing revisions.

NFMA states that forest plans "shall be revised from time to time when the Secretary finds conditions in a unit have significantly changed, but at least every 15 years…. (16 U.S.C. 1604(f)(5)) ". However, Congress did not intend management to cease if the 15-year target date for plan revision was not met. NFMA, Section 1604 (c), illustrates this point. In the development of the original forest plans, Congress specifically allowed management of the forests to continue under existing resource plans pending approval of the first NFMA forest plan for each administrative unit.

A Notice of Intent to revise the Forest Plan was published February 14, 2000, and the revision process is underway. It is expected that the Final Environmental Impact Statement will be completed by December 2004.

1.1.2 SITE-SPECIFIC PROJECTS (PAST ACTIVITIES) IN THE AREA OF THE TRIPOLI PROJECT

Table 1, displays the previous NEPA decisions that have involved activities in the vicinity of the Tripoli East project area since 1986 (Map 4)

Table 1: Previous NEPA Decisions Affecting the Tripoli East Project Area since 1986

Decision Date	Project	Activities
1987	Russell Mountain Timber Sale	Harvest 119 acres Improve quality and productivity of timber and wildlife resources Provide for user safety at Russell Campground
1991	Russell Pond Campground Vegetative Management	Remove hazard trees Improve visuals Salvage wood products Establish screening between sites and provide vegetative diversity Release pole and small sawtimber to improve tree health Increase sunlight in the campground
1991	Tripoli Road Salvage	Harvest 84 acres Salvage commodity values Improve visuals Provide for public safety Reduce fire hazards Rehabilitate recreation and transportation facilities
1996	Eastman West Vegetative Management	Harvest 2.5 MMBF on 514 acres Construct 0.3 miles of

Decision Date	Project	Activities
		road, 1.5 miles of skid trails, and 3 landings Restore 1.5 miles of road

See **Appendix H, §B.3.** for a more in depth discussion of past actions on federal and private lands within several cumulative effects areas used in this analysis.

1.1.3 FORSEEABLE ACTIONS IN THE TRIPOLI PROJECT AREA

The Forest Service does not anticipate any additional vegetation management activities in the project area within this planning decade.

See **Appendix H, §B.3.** for a more in depth discussion of reasonably foreseeable actions on federal and private lands within several cumulative effects areas used in this analysis.

1.2 PURPOSE OF THE PROPOSAL

Tripoli East project area of approximately 3,000 acres (all federal land) is divided between MA 2.1 and 3.1 lands (Map 3) within HMUs 416 and 417 (Map 2 - approximately 18,000 acres of federal land and 2,000 acres of private land) and is managed using both even-aged and uneven-aged silvicultural systems.

The purpose of this proposed project is to implement Forest Plan direction (see Appendix H, §**A,** pp. H-1 – H-5) in the Tripoli East project area by addressing site-specific needs and opportunities (§**1.3**, below) to move the area from the existing condition (EC) towards the desired condition (DC) (see Appendix H, §**A.1.4**, pp. H-3 – H-5). This can be accomplished by implementing activities approved in the Forest Plan such as vegetation management, vegetation restoration, and the relocation of dispersed camping sites.

1.3 NEED FOR THE PROPOSED PROJECT

An interdisciplinary (ID) team (p. 110) surveyed and evaluated the Tripoli East project area. The team identified site-specific opportunities for natural resource management that would change or enhance the present conditions and move the area toward the desired condition described in the Forest Plan, as amended (pp. III-30 through III-41).

There are approximately 18,000 acres of federal land in HMUs 416 and 417. The proposed Tripoli East project area is located within management areas 2.1 and 3.1 lands of compartments 112-117, which comprise approximately 38 percent of HMUs 416 and 417. These HMUs also contain areas that are not subject to vegetation management including: 6.1, 6.2, 6.3, 7.1, and 9.1. See Tables 1, 2, and 3, Appendix D, for the desired composition of MA 2.1 and 3.1 lands in HMUs 416 and 417.

1.3.1 NEED FOR CHANGE

The need for change is determined by comparing desired conditions in the Forest Plan with the existing conditions (EC) in the project area. The Forest Plan provides desired conditions for even- and uneven-aged management systems for management areas 2.1 and 3.1 and for habitat management units by even- and uneven-aged management systems. The even- and uneven-aged desired conditions apply to the Forest as a whole and are not prorated for each project area (LRMP, Management Area Direction, pp. III-32 & III-38).

See Appendix D for a discussion of the existing/desired conditions for even/uneven-aged management in HMUs 416 and 417 and the Tripoli Project Area. For a discussion of the existing/desired composition objectives for management area 2.1 and 3.1 lands for HMUs 416 and 417, see Appendix D.

The following list describes the "needs for change" and opportunities identified for the Tripoli East project area that would meet the project's purpose of implementing the Forest Plan. It should be noted that protecting riparian values, maintaining and protecting habitat for proposed, threatened, endangered, and sensitive species, and maintaining healthy and resilient watershed into the future have been and will continue to be primary considerations in management of the Tripoli east project area. Item 2 was identified following scoping and is reflected in alternatives 3-6.

1. At the landscape level (MA 2.1 and 3.1 lands in HMUs 416 and 417) the

composition of habitat communities is weighted towards mature and over-mature forests (Appendix D), and there is little regenerating habitat (Table 2). Forest Plan direction is to provide a balanced mix of habitats for all wildlife species and to increase wildlife habitat diversity for the full range of wildlife species with emphasis on early-successional species.

Table 2: Percent Regeneration and Mature/Over-Mature Community Type in HMUs 416 and 417

	Age Class	
	Regeneration	Mature/ Over-Mature
Total % of MA 2.1 & 3.1 Lands within HMU 416	2%	80%
Total % of MA 2.1 & 3.1 Lands within HMU 417	0%	66%

2. Based on Forest Plan desired compositions (pp. III-13, VII-B-4, & VII-B-5), there is a need for increased regenerating forest age class. In addition, opportunities exist, through timber harvesting and reforestation treatments, to improve the growth, vigor, and health of forested stands. These improvements can be accomplished by harvesting mature or poor quality trees and regenerating new trees (Forest Plan, pp. III-3, III-30, III-36), and, thus, to provide a variety of wildlife habitat types and conditions. Stands would be harvested in accordance with the appropriate silvicultural guidelines and Forest Plan direction. Appendix E summarizes stand conditions. Activities could include clearcutting and group selection, single-tree selection, and group and single-tree selection.

   The stands where even-aged silvicultural activities fall into two categories. The most common category is stands that are dominated by paper birch trees. These trees are mature with many individuals becoming decadent or dying. The other situation is mature northern hardwood stands established, desirable regeneration in the understory.

   In both cases, even-aged management techniques are the most appropriate method of achieving the habitat objectives of HMUs and producing high quality forest products efficiently. In addition, it is the best way to insure that paper birch and other shade-intolerant species remain as a viable part of the species diversity objectives. Within this even-aged concept, clearcutting the proposed stands at this time is the optimal method of achieving habitat objectives and regenerating trees for a future timber supply.

2. Dispersed camping along the Tripoli Road is very popular. This creates some problems with parked cars, and some of the existing dispersed sites are located on the lower terraces adjacent to Eastman Brook. When harvesting units are located adjacent to the Tripoli Road, an opportunity is created to locate off-road dispersed campsites that do not have an impact on Eastman Brook. There is a need to relocate dispersed camping sites along the Tripoli Road out of the lower terraces adjacent to Eastman Brook onto upland sites to prevent possible future erosion and sedimentation during periods of out of bank flow.

   Creating upland dispersed sites would provide an opportunity to eliminate and revegetate sites currently located on the lower terraces adjacent to Eastman Brook where erosion and sedimentation could be a concern (Forest Plan, pp. III-2, III-3, III-31, III-35).

3. There is a need to maintain an adequate transportation system for both short- and long-term access to facilitate the management of National Forest Lands and to provide motorized recreation opportunities (Forest Plan, III-31 and III-35).

4. Congress annually funds the Forest Service to provide commercial timber within the capability of the lands and individual Forest Plans. The White Mountain National Forest Plan allocates land for sustainable wood production (MAs 2.1 and 3.1, Forest Plan, III-30 and III-35). People's demand for hardwood and other wood products continues to be high, which supports the need to supply this renewable resource.

   There is a need to provide wood to meet people's demand for wood products such as

furniture, paper, fiber, and construction materials. Projects such as Tripoli East, which supply wood products, provide a means to satisfy people's demand for wood and contribute to the economic vitality of local communities (Forest Plan, III-3, III-30, and III-35).

1.4 PROPOSED ACTION

Table 3 displays the actions proposed by the Forest Service to meet the needs for change identified for the Tripoli East project area.

Table 3: Alternative 2 – Proposed Activities/Amounts

Activity	Amount
Timber Harvesting:	
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	141 Stand Ac
Uneven-Aged Management -	
Single-Tree Selection (approximately 30% of the stand basal area)	165 Stand Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	781 Stand Ac
TRANSPORTATION	
Pre-haul Maintenance (Forest Roads 31A, 608, 609, 611, 612, & 613)	4.5 Mi

1.5 DECISION TO BE MADE

This environmental assessment (EA) will evaluate site-specific concerns (issues) and opportunities, consider alternatives, and analyze the effects of the activities proposed in these alternatives. This environmental assessment will provide the deciding officer (Ammonoosuc/ Pemigewasset District Ranger) with information to make informed decisions with regard to the Tripoli East Vegetation Management Project and provides the basis for determining:

1. Which actions, if any, will be approved (which alternative to implement) that will move the Tripoli project area towards the desired condition per Forest Plan direction and addresses the needs, opportunities, and issues identified for this project?
2. Is the information in this analysis sufficient to implement the proposed activities?
3. Does the proposed project have a significant impact that would trigger a need to prepare an Environmental Impact Statement?
4. What mitigation measures and monitoring requirements should the Forest Service apply to these activities to meet Forest Plan standards and guidelines for all resources?
5. Will a Forest Plan amendment be required to accommodate this project?

If an action alternative is selected, project implementation could begin in 07/03 and last for several years.

1.7 PUBLIC INVOLVEMENT

1.7.1 SCOPING

Scoping is the process of gathering comments about a site-specific proposed federal action to determine the scope of issues to be addressed and for identifying the unresolved issues that are related to a proposed action (40 CFR 1501.7).

The Tripoli interdisciplinary team (listed in the project file, Book 2) conducted an analysis (Appendix E – Veg. Report) of this project area to determine how best to implement the White Mountain Land and Resource Management Plan (Forest Plan). During this analysis process, resource specialists from various disciplines inventoried and analyzed information concerning the project area. Opportunities and needs that would move the area from the "existing condition" toward the "desired condition" described in the Forest Plan were identified through this analysis process.

Comments on the proposed action, potential concerns, and opportunities for management of the Tripoli East project area were solicited from Forest Service employees, members of the public, other public agencies, adjacent property owners, and organizations. A scoping letter was mailed to approximately 104 interested parties, including adjacent property owners, on September 22, 1998.

Seven letters commenting on the proposed action were received during the formal scoping process. Comments were used to define unresolved issues, to develop alternatives, and to analyze effects.

1.7.2 Tripoli East Vegetation Management Environmental Assessment 1.0 30-Day Comments and Appeal (6/12/02) (see § 1.0.1)

The comments received during the review period for the Tripoli East EA 1.0 and the comments contained in the Tripoli East Decision appeal were taken into account for the re-analysis of possible direct, indirect, and cumulative effects for this Tripoli East EA 2.0.

1.8 ISSUES USED TO FORMULATE ALTERNATIVES

The purpose of soliciting comments during the Scoping period is to determine whether there are any unresolved (significant, 40CFR1501.7(a)(3)) issues, which affect a proposed action. Issues and concerns, originating from public and agency comments, are identified for analysis. For a summary of the Scoping process and the disposition of comments received during the Scoping period, please see §§**1.7** and **1.8** and **Appendix B**. The comments that were received during Scoping were evaluated using the following criteria:

1. Was the comment one that should be addressed at a higher level (forest, regional, national) level?
2. Has the concern already been addressed at a higher level (e.g. Forest Plan)?
3. Can applying Forest Plan standards and guidelines or mitigation measures resolve the concern?
4. Could modifying the proposed action (alternatives to the proposed action) resolve the concern?

The four issues (listed below) that remained after applying the above criteria were considered "unresolved (significant issues)", were used to formulate alternatives to the proposed action, and are used in the analysis of alternatives. (For other issues brought forward during Scoping see Appendix B, §**B**.

1.8.1 Cumulative Effect of Creating Additional Early-Successional Habitat (Regeneration Age-Class) (Public)

The forest has already been extensively cut along the Tripoli Road, and timber harvesting proposed in the Tripoli East Project aimed at producing 4 million board feet represents approximately one fifth of the total annual harvest of the White Mountain National Forest. This concentration of timber harvesting, designed to create early-successional habitat, added to the early-successional habitat already created in the Tripoli area, will have negative effects on those species requiring mature and over-mature habitat.

The measure used to evaluate the effects of the alternatives will be how closely the predicted habitat community/age class for management area 2.1 and 3.1 lands within HMUs 416 and 417 compares to the desired composition for and "ideal" HMU.

1.8.2 Meeting Habitat Management unit Desired Composition as Directed By the Forest plan (agency)

Forest Plan direction is to provide a balanced mix of habitats for all wildlife species and to increase wildlife habitat diversity for the full range of wildlife species with emphasis on early-successional species. (See p. III-13 in the Forest Plan for the desired composition of HMUs). In the Tripoli East project area, the present mixture of age classes and forest types is not providing a balanced mix of wildlife habitats, especially early-successional habitat. Vegetative management needs to occur that will create a mix of habitats that more closely meet Forest Plan direction.

The measure used to evaluate the effects of the alternatives will be how closely the predicted habitat community/age class for management area 2.1 and 3.1 lands within HMUs 416 and 417 compares to the desired composition for and "ideal" HMU.

1.8.3 Timber Management Activities Adjacent to the East Pond and Little East Pond trails (public)

Logging adjacent to the East Pond and Little East Pond Trails and the Tripoli Road will negatively impact the recreation experience of users who enjoy viewing large trees and a naturally appearing forest.

Measures used to evaluate the effects of the alternatives will be the type of harvesting activity seen from the trails.

1.8.4 No Clearcutting (public)

Clearcutting can negatively impact the aesthetics of the Tripoli project area. Visual impacts of clearcut units may diminish recreational experiences.

Measures used to evaluate the effects of the alternatives will be the number of clearcut acres visible from identified viewpoints.

CHAPTER 2 – ALTERNATIVES

The ID team considered 12 alternatives for the Tripoli East Vegetative Management Project. See Appendix B for a discussion of the eight alternatives considered but eliminated from detailed study. Chapter 2 will: 1) describe how those alternatives were formulated, 2) provide a description of the alternatives considered in detail, and 3) present a comparison of the alternatives examined in detail (§**2.4 Comparison of Alternatives**). This section will provide the decision maker with a range of alternatives to consider for the Tripoli East Vegetation Management Project and will include a summary of the analysis of the proposed activities and their anticipated effects.

2.1 FORMULATION OF ALTERNATIVES

Public comments on the proposed action were received during October and November of 1998. After agency and public comments were analyzed, alternatives were developed by the ID team to respond to the unresolved issues raised concerning the activities proposed for the management of the Tripoli East project area. After gathering additional field information, the interdisciplinary team developed a modified proposed action alternative. The alternatives, both those eliminated from further study and those considered in detail, including no action, display a range of options that could be implemented to manage the Tripoli East project area. They represent different levels of management. The alternatives also provide a framework for analyzing the unresolved issues detailed in Chapter 1 (§**1.8 Issues used to Formulate Alternatives**). Alternatives were developed through consideration of management needs and opportunities as determined by on-the-ground investigations. Maps 5-9 (**Appendix A**) depict the activities proposed in each alternative.

Forest Plan standards and guidelines (pp. III-1 through III-29), the management area direction for management areas 2.1 and 3.1 (Forest Plan, pp. III-30 through III-35 and III-36 through III-41), and Habitat Management Units For Lands With Active Vegetation Management (Forest Plan, pp. III-13, VII-B3 through VII-B-9) guided the development of alternatives. General mitigation measures applicable to all activities and site-specific mitigations applicable to individual alternatives are listed in Appendix C.

2.3 ALTERNATIVES CONSIDERED IN DETAIL

If the project is implemented, actual amounts of activities accomplished on the ground (measured in acres or miles) may vary. All changes would be evaluated to ensure that any effects are within the parameters of the effects analyzed in this document and would be documented in the Tripoli East project file.

See Table 9 for a list of individual stand treatments and harvesting season.

2.3.1 ALTERNATIVE 1 – NO ACTION

Under Alternative 1, current and on-going management activities would continue (road maintenance and dispersed camping), but no new, federal 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 naturally or during routine operations. This alternative responds to those who want no vegetation or wildlife habitat management to take place.

Please refer to §**3.1.4** for a summary of the existing road system that would continue to be maintained in the Tripoli East project area under this alternative and to §**3.3.3** for ongoing recreation activities.

2.3.2 ALTERNATIVE 2 – PROPOSED ACTION

Alternative 2 is the proposed action that was scoped during October and November of 1998. Map 5 (Appendix A) displays the activities proposed under Alternative 2. Table 4 lists the activities proposed in Alternative 2.

Timber harvesting would produce approximately 5.1 MMBF.

Table 4: Alternative 2 – Proposed Activities/Amounts

Activity	Amount
Timber Harvesting:	
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	141 Stand Ac
Uneven-Aged Management -	
Single-Tree Selection (approximately 30% of the stand basal area)	165 Stand Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	781 Stand Ac
TRANSPORTATION	
Pre haul Maintenance (Forest Roads 31A, 608, 609, 611, 612, & 613)	4.5 Mi

Mitigation Measures

In addition to the generally applicable Forest and Management area-wide Standards and Guidelines listed in the Forest Plan in sections III and appendix VIIB, pp. 18-22 see individual resource sections in Chapter 3 and Appendix C – Mitigation Measures for a full list of mitigation measures that would be used in implementing Alternative 2.

2.3.3 ALTERNATIVE 3

Alternative 3 responds to the desire for no clearcutting in the project area. Map 6 (Appendix A) displays the activities proposed under Alternative 3. Table 5 lists the activities proposed in Alternative 3.

Timber harvesting would produce approximately 3.9 MMBF.

Table 5: Alternative 3 – Proposed Activities/Amounts

Activity	Amount
Timber Harvesting:	
Uneven-Aged Management -	
Single-Tree Selection (approximately 30% of the stand basal area)	165 Stand Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	842 Stand Ac
Transportation	
Pre-haul Maintenance (Forest Roads 31A, 607, 608, 609, 611, 612, & 613)	4.5 Mi
Recreation	
Create Opportunity to Relocate Dispersed Campsites to Upland Sites	Up to 27 Sites
Remove and Restore Riparian Dispersed Campsites	Approx. 25 Sites

Mitigation Measures

In addition to the generally applicable Forest and Management area-wide Standards and Guidelines listed in the Forest Plan in sections III and appendix VIIB, pp. 18-22 see Appendix C – Mitigation Measures and individual resource sections in Chapter 3 for a full list of mitigation measures that would be used in implementing Alternative 3.

2.3.4 ALTERNATIVE 4

Alternative 4 is a modification of the proposed action. This alternative was developed after additional fieldwork. Map 7 (Appendix A) displays Alternative 4. Table 6 lists the activities proposed in Alternative 4.

Timber harvesting would produce approximately 4.8 MMBF.

Table 6: Alternative 4 – Proposed Activities/Amounts

Activity	Amount
Timber Harvesting:	
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	111 Stand Ac
Uneven-Aged Management -	
Single-Tree Selection (approximately 30% of the stand basal area)	47 Stand Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	811 Stand Ac
Group/Single-Tree Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres; single-tree - approximately 30% of the stand basal area)	118 Stand Ac
Transportation	
Pre-haul Maintenance (Forest Roads 31A, 607, 608, 609, 611, 612, & 613)	4.5 Mi
Recreation	
Create Opportunity to Relocate Dispersed Campsites to Upland Sites	Up to 29 Sites/
Remove and Restore Riparian Dispersed Campsites	Approx. 25 Sites

Mitigation Measures

In addition to the generally applicable Forest and Management area-wide Standards and Guidelines listed in the Forest Plan in sections III and appendix VIIB, pp. 18-22 see individual resource sections in Chapter 3 and Appendix C – Mitigation Measures for a full list of mitigation measures that would be used in implementing Alternative 4.

2.3.5 ALTERNATIVE 5

Alternative 5 responds to the issue of meeting Forest Plan desired compositions for HMUs 416 and 417 by taking advantage of harvest activities that meet Forest Plan silvicultural guidelines. Map 8 displays Alternative 5. Table 7 lists the activities proposed in Alternative 5.

Timber harvesting would produce approximately 5.6 MMBF.

Table 7: Alternative 5 – Proposed Activities/Amounts

Activity	Amount
Timber Harvesting:	
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	131 Stand Ac
Uneven-Aged Management -	
Single-Tree Selection (approximately 30% of the stand basal area)	47 Stand Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	833 Stand Ac
Group/Single-Tree Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres; single-tree - approximately 30% of the stand basal area)	118 Stand Ac
Transportation	
Pre-haul Maintenance (Forest Roads 31A, 607, 608, 609, 611, 612, & 613)	4.5 Mi
Recreation	
Create Opportunity to Relocate Dispersed Campsites to Upland Sites	Jp to 29 Sites/
Remove and Restore Riparian Dispersed Campsites	Approx. 25 Sites

Mitigation Measures

In addition to the generally applicable Forest and Management area-wide Standards and Guidelines listed in the Forest Plan in sections III and appendix VIIB, pp. 18-22 see individual resource sections in Chapter 3 and Appendix C – Mitigation Measures for a full list of mitigation measures that would be used in implementing Alternative 5.

2.3.6 ALTERNATIVE 6

Alternative 6 responds to the issue of harvesting adjacent to the East Pond Trails and the Tripoli Road. Map 9 displays Alternative 6. Table 8 lists the activities proposed in Alternative 6.

Timber harvesting would produce approximately 3.4 MMBF.

Table 8: Alternative 6 – Proposed Activities/Amounts

Activity	Amount
Timber Harvesting:	
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	111 Stand Ac
Uneven-Aged Management -	
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	544 Stand Ac
Transportation	
Pre-haul Maintenance (Forest Roads 31A, 607, 609, 611, 612, & 613)	3.7 Mi
Recreation	
Create Opportunity to Relocate Dispersed Campsites to Upland Sites	Up to 10 Sites/
Remove and Restore Riparian Dispersed Campsites	Approx. 25 Sites

Mitigation Measures

In addition to the generally applicable Forest and Management area-wide Standards and Guidelines listed in the Forest Plan in sections III and appendix VIIB, pp. 18-22 see individual resource sections in Chapter 3 and Appendix C – Mitigation Measures for a full list of mitigation measures that would be used in implementing Alternative 6**.**

2.4 COMPARISON OF ALTERNATIVES

The allocation of lands within management areas 2.1 and 3.1 to even- and uneven-added management would not be affected by any activities proposed in this project. However, Alternative 3 proposes to treat 52 acres that are allocated to even-aged management in an uneven-aged manner using group selection.

This section displays the comparison of alternatives using several criteria:

- Table 9 compares the individual stand treatments by alternative;
- Table 10 compares the alternatives to Forest Plan goals, identified needs, and by amounts of activity;
- Table 11 compares the alternatives by the responsiveness to unresolved issues; and
- Tables 12A-12C compare alternatives by effects to resources.

Table 9: Comparison of Alternatives by Individual Stand Treatments

Comp/ Stand	Stand Acres	Forest Type	Alt 2 Proposed Action	Alt 3	Alt 4	Alt 5	Alt 6	Season
112/5	9	Paper Birch	Clearcut	Group Selection♦	Clearcut	Clearcut	Clearcut	Dry Summer/Fall∗
112/7	18	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Dry Summer/Fall∗
112/8	28	Mixedwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Winter∗
112/15	49	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Dry Summer/Fall∗
112/18	23	Paper Birch	Clearcut	Defer	Clearcut	Clearcut	Clearcut	Winter∗
112/19	63	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗
112/26	55	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Winter∗
112/27	60	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Winter∗
112/36	7	Northern Hardwood	Clearcut	Defer	Clearcut	Clearcut	Clearcut	Dry Summer/Fall∗
112/38	15	Mixedwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Dry Summer/Fall∗
113/5	22	Northern Hardwood-PB	Clearcut	Group Selection♦	Clearcut	Clearcut	Clearcut	Winter∗
113/9	42	Paper Birch-S/F	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Winter∗
113/10	90	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Dry Summer/Fall∗
113/13	69	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗✚
114/1	47	Northern Hardwood	Single tree Selection	Single tree Selection	Single tree Selection	Single tree Selection	Defer	Winter∗✚
114/7	29	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗✚
114/9	78	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗✚
114/15	78	Northern Hardwood	Single tree Selection	Single tree Selection	Single tree/ Group Selection♦	Single tree/ Group Selection♦	Defer	Winter∗✚
114/27	23	Mixedwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗✚
114/29	47	Mixedwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗
114/30	31	Northern Hardwood-PB	Single tree Selection	Single tree Selection	Single tree/ Group Selection♦	Single tree/ Group Selection♦	Defer	Winter∗✚
115/1	19	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗✚
115/25	11	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Defer	Winter∗✚
116/2	30	Northern Hardwood	Clearcut	Group Selection♦	Clearcut	Clearcut	Clearcut	Winter∗
116/4	30	Northern Hardwood	Clearcut	Defer	Group Selection♦	Group Selection♦	Group Selection♦	Winter∗
116/18	24	Northern Hardwood	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection♦	Group Selection	Winter∗
116/27	22	Northern Hardwood	Defer	Defer	Defer	Group Selection♦	Defer	Winter∗
116/31	23	Northern Hardwood	Defer	Defer	Defer	Group Selection♦	Defer	Winter∗
	80		Group Selection♦	Group Selection♦	Group Selection♦		Group Selection♦	Winter∗
117/10	67	Northern Hardwood	---	---	---	Group Selection♦	---	Winter∗
	20		---	---	---	Clearcut	---	Winter∗
117/16	20	Northern Hardwood	Clearcut	Defer	Clearcut	Clearcut	Clearcut	Winter∗
Total Stand Acres♦			**1087**	**1007**	**1087**	**1158**	**665**	
Volume			**5.1 MMBF**	**3.9 MMBF**	**4.8 MMBF**	**5.6 MMBF**	**3.4 MMBF**	

♦ With a Group Selection treatment, approximately 26% of the stand is actually harvested

∗ Hauling is restricted to Monday-Friday, non-holiday as a mitigation for public safety

✚ Harvesting is restricted to Monday-Friday, non-holiday, winter only as a mitigation measure applied in stands adjacent to East Pond Trails

Table 10: Comparison of Alternatives to Forest Plan Goals, Identified Needs, and by Amounts of Activity

Activity	Forest Plan Goals[a]	Need/ Opportunity[b]	Alt 1 No Action	Alt 2 Proposed Action	Alt 3	Alt`4	Alt 5	Alt 6
Timber Harvesting:								
Even-Aged Management – Clearcutting (northern hardwood, paper birch)	a, b, c, f, g, h, i, k, l, m, n, o, q, r, s	1, 4	0 Ac	141 Ac	0 Ac	111Ac	131 Ac	111Ac
Uneven-Aged Management -								
Single-Tree Selection (approximately 30% of the stand basal area)	a, b, c, f, g, h, i, k, n,q	4	0 Ac	165 Ac	165 Ac	47 Ac	47 Ac	0 Ac
Group Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres)	a, b, c, f, g, h, i, k, n, o, q		0 Ac	781 Ac	842 Ac	811 Ac	833 Ac	554 Ac
Group/Single-Tree Selection (groups range in size from 1/10 to 2 acres in size; ½ acre average and represent approximately 26% of stand acres; single-tree - approximately 30% of the stand basal area)	a, b, c, f, g, h, i, k, n, o, q		0 Ac	0 Ac	0 Ac	118 Ac	118 Ac	0 Ac
Volume	g, k, n	4	0 MMBF	5.1 MMBF	3.9 MMBF	4.8 MMBF	5.6 MMBF	3.4 MMBF
Transportation								
Pre-haul Road Maintenance (Forest Roads 31A, 613, 609, 608, & 612)	a, b, c, d, h	3	0 Mi	4.5 Mi	4.5 Mi	4.5 Mi	4.5 Mi	3.7 Mi
RECREATION								
Create Opportunity to Relocate Dispersed Campsites to Upland Sites	a, b, c, e, i, j, o	2	0 Sites	0 Sites	Up to 27 Sites	Up to 29 Sites	Up to 29 Sites	Up to 10 Sites
Remove and Restore Riparian Dispersed Campsites	a, b, c, d, , e		0 Sites	0 Sites	Approx. 25 Sites	Approx. 25 Sites	Approx. 25 Sites	Up to 25 Sites

[a] – See Forest Plan Goals listed in Appendix H of this document, pp. H-1 through H-3

[b] – See Needs and Opportunities, §**1.3.1**, above

Table 11: Comparison of Alternatives by Responsiveness to Unresolved Issues

Issue	Alt 1 – No Action	Alt 2 – Proposed Action	Alt 3	Alt 4	Alt 5	Alt 6
1) **Cumulative Effect of Too Much Harvesting** The concentration of timber harvesting, designed to create early-successional wildlife habitat, added to the early successional habitat already created in the Tripoli area, will have negative effects on those wildlife species requiring mature and over-mature habitat. 2) **Meet Forest Plan DCs in HMUs** In the Tripoli East project area, the present mix of age classes and forest types is not providing a balanced mix of habitats, especially early-successional habitat. Vegetative management needs to occur that will create a mix of habitats that more closely meet Forest Plan direction.	Cumulative effects area = Management Area 2.1 and 3.1 Lands in Habitat Management Units 416 and 417 through the year 2012(EA, § **3.0.2.1**) and time through 2012 (see description §**3.0.2.1 Management Area 2.1 and 3.1 Lands in Habitat Management Units 416 and 417 Cumulative Effects Are**a, pp. 31-36, below and Figure 3: Existing Closed-Canopy Forest and Anticipate Closed Canopy Forest By Alternative, p.36)).					
	Forest Plan objectives for MA 2.1 and 3.1 (Appendix H, §§**A.1.2 Management Areas** & **A.1.3 Habitat Management Units for Lands with Active Vegetative Management**, pp, H-2 &3) lands include: 1) Providing a balanced mix of habitats for all wildlife species and 2) Increasing wildlife habitat diversity for the full range of wildlife species with emphasis on early successional species. Lands in uneven-aged management (39% of the cumulative effects area) will be mature/over-mature, closed-canopy forest. Small pockets of regenerating trees (regenerating community stage/early-successional habitat) will occur where natural disturbances or group selection management occur. Early–successional habitat is not static and does not accumulate over time. Within 10-20 years, regenerated forest no longer supplies early-successional habitat. These stands become saplings and then grow into pole-sized stands, which are more like forested habitat. No additional vegetative management is expected in the MA/HMU cumulative effects area through the year 2012. Therefore, any differences in community stage distribution (including creation of early-successional habitat) would result from proposals in the Tripoli project.					
	The existing regenerating community stage (1.2% of cumulative effects area) will become part of the young community stage by 2012. There will be no activities to create additional regenerating community stage. Unless natural causes create areas of new tree seedlings, there will be no early-successional habitat and even less of the paper birch /aspen community type in MA/HMU cumulative effects area at the end of the next decade. *This would not meet Forest Plan DCs* (Appendix H, §**A.1.4 Desired Conditions**, pp. H-3 - H-5, Tables 4 & 5, p. 5). 83% of the cumulative effects area at the end of the next decade will be in mature/over-mature, closed-canopy forest – up 13% from the existing condition.	At the end of the decade, there would be 3.4% of the cumulative effects area in early-successional habitat. This represents 3.2% of the even-aged management lands in the cumulative effects area, which is 6.8% *below Forest Plan DCs*. 77% of the cumulative effects area at the end of the next decade will be in mature/over-mature, closed canopy forest – up 6% from the existing condition. Regenerating decadent paper birch stands at this time would also help to maintain the limited diversity of forest types in the HMUs.	No even-aged management (clearcutting) Same cumulative effect for community stage distribution as with Alternative 1. Group Selection is an attempt to provide some of the early-successional habitat characteristics provided by even-aged management. Group selection would help to promote diversity in stand structure and species composition. Because of the smaller group size, early-successional habitat is not provided in large openings favored by several MIS. *This would not meet Forest Plan DCs.*	At the end of the decade, there would be 2.7% of the cumulative effects area in early successional habitat, This represents 2.3% of the even-aged management lands in the cumulative effects area, which is 7.7% *below Forest Plan DCs*. 80% of the cumulative effects area at the end of the next decade will be in mature/over-mature, closed canopy forest – up 9% from the existing condition. Regenerating decadent paper birch stands at this time would also help to maintain the limited diversity of forest types in the HMUs.	At the end of the decade, there would be 3.2% of the cumulative effects area in early successional habitat, This represents 2.8% of the even-aged management lands in the cumulative effects area, which is 7.2% *below Forest Plan DCs*. 77% of the cumulative effects area at the end of the next decade will be in mature/over-mature, closed canopy forest – up 6% from the existing condition. Regenerating decadent paper birch stands at this time would also help to maintain the limited diversity of forest types in the HMUs.	Same as Alternative 4

<table>
<tr><th>Issue</th><th>Alt 1 – No Action</th><th>Alt 2 – Proposed Action</th><th>Alt 3</th><th>Alt 4</th><th>Alt 5</th><th>Alt 6</th></tr>
<tr><td>3) Logging Adjacent to Trails
Logging adjacent to the East Pond and Little East Pond Trails and the Tripoli Road will negatively impact the recreation experience of users who enjoy viewing large trees and a natural forest.</td><td>No harvesting will occur within sight of the trails and Tripoli Road</td><td colspan="4">Single-tree and group selection harvesting would take place within sight of the trails and Tripoli Road; Does not change ROS Class for the Trails and meets Visual Quality Objectives for the trails.</td><td>Same as Alternative 1</td></tr>
<tr><td rowspan="4">4) No Clearcutting
Clearcutting can negatively impact the aesthetics of the Tripoli Road project. Visual impacts of clearcut units may diminish recreational experiences.</td><td>0 clearcuts proposed</td><td>7 clearcuts proposed</td><td>0 clearcuts proposed</td><td>6 clearcuts proposed</td><td>7 clearcuts proposed</td><td>6 clearcuts proposed</td></tr>
<tr><td colspan="6">Four viewpoints for project area: Mt. Moosilauke, background, modification; Russell Pond Overlook, middleground, partial retention; Tripoli Road, foreground, partial retention; Mt. Osceola, middleground, retention, partial retention, modification. (see also item #4 above)</td></tr>
<tr><td rowspan="2">Except for naturally occurring changes, existing visual diversity of forested landscape (older stands of trees interspersed with a few stands of young [15—25 years], new trees) maintained. Vegetation will not offer as much diversity as if openings were present</td><td rowspan="2">Minor changes in the landscape resulting from proposed clearcuts would be visible from Mt. Moosilauke; shapes and patterns of the proposed cuts blend well with existing terrain & vegetation. Visual quality objectives of Forest Plan would be met.
Visual diversity of forested landscape increases from even and uneven-aged management activities</td><td rowspan="2">Only group and single-tree selection is proposed. Group selection creates small openings in the tree canopy that result in less textural change. Visual quality objectives of Forest Plan would be met.</td><td colspan="3">Minor changes in the landscape resulting from proposed clearcuts would be visible from Mt. Moosilauke; shapes and patterns of the proposed cuts blend well with existing terrain & vegetation. Visual quality objectives of Forest Plan would be met.</td></tr>
<tr><td>Similar to Alt. 2 except stand 116/4 is proposed in this alternative for group selection treatment, which visually differs greatly from the clearcut treatment in Alternative 2. Stands 114/15 and 114/30 are proposed for a mixture of single-tree and group selection treatments. This alternative has the least visual impact while achieving wildlife habitat concerns and harvest volume.</td><td>Similar to Alternative 4, but introduces two additional treatment areas, one a clearcut and one a group selection. The addition substantially increases the area on the south side of Tripoli Road with a continuous area of treatment.</td><td>Under this alternative the units adjacent to the East Pond and Little East Pond Trails and two proposed units at the east end of the project area have been eliminated. This alternative and Alternative 3 would have the least impact on the visual resource in the project area than all other alternatives except the No Action alternative (665 stand acres treated).</td></tr>
</table>

Table 12A: Comparison of Alternatives By Effects to the Physical Environment

<table>
<tr><th>Resource</th><th>Alt 1 – No Action</th><th>Alt 2 – Proposed Action</th><th>Alt 3</th><th>Alt 4</th><th>Alt 5</th><th>Alt 6</th></tr>
<tr><td>Soils - §3.1.1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Soil Calcium</td><td colspan="6">No evidence indicates any alternative analyzed will lead to a cumulative loss in soil or forest productivity, or change in forest health or composition. Alternative 2, has the greatest estimated impact on soil calcium because it affects the most acres using clear-cut harvesting. Probably the least impact for action alternatives is Alternative 6 harvest because it treats the fewest acres, and those acres are treated by uneven-age methods. The other alternatives lie between these two. In all cases, there is a continuing effort to study the impacts of all the vectors (acid rain, timber harvest, nitrogen deposition) that may affect soil calcium. There is also a continuing effort to examine more closely the actual sources of supply of soil calcium, including minerals, mineral-weathering rates, and organic sources that may include calcium. These research efforts will continue to refine the magnitude and duration of estimates in this environmental document.</td></tr>
<tr><td rowspan="3">Soil Erosion</td><td colspan="6">Surface soil erosion will not change on the Tripoli and Russell Pond Roads. Permanent soil compaction will exist on these road locations, as anticipated in the 1986 Forest Plan FEIS.</td></tr>
<tr><td>Skid roads associated with previous timber sales in this watershed are generally overgrown and/or covered with leaf litter, thus minimizing the impact of raindrop splash, which can be a precursor to soil erosion.</td><td colspan="5">Soil erosion on major skid trails used in the winter will be limited to minor, site-specific effects. The five stands where timber harvesting could occur during dry summer or fall periods may experience soil erosion on the main skid trails as the surface soil organic matter is compacted or eroded during the operation. Overall, harvesting could lead to a marginal increase in soil erosion in the project area. Skid trails would be seeded, mulched and water-barred as soon as they are no longer in use to limit possible effects of erosion.</td></tr>
<tr><td colspan="2">In the short term, no change in soil erosion is anticipated from hiking trails or dispersed campsite use. These locations experience limited, site specific and short-term soil erosion. Compacted surfaces at these locations will remain in place. Continued use of the dispersed campsites and pathways located on the lower terraces of Eastman Brook and its tributaries may become an increased source of erosion.</td><td colspan="4">Skid roads associated with previous timber sales in this watershed are generally overgrown and/or covered with leaf litter, thus minimizing the impact of raindrop splash, which can be a precursor to soil erosion.</td></tr>
<tr><td>Water - §3.1.2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Water Quantity</td><td>No new effects</td><td colspan="5">Because the mitigations would be used regardless of the action alternative selected, long-term direct and indirect effects to streams and riparian are not expected to occur for any of the action alternatives.</td></tr>
<tr><td>Water Quality</td><td>No new effects</td><td colspan="5">Effects related to the reopening of roads, skid trails, landings, and creation of upland dispersed sites are unlikely to occur All alternatives had levels of 1.2% or less within the subwatershed, well below the 10% level where effects began to be evident in the referenced summary (May and others, 1997). In addition, many of the same mitigations outlined above will also work to reduce the effect of compacted impervious surfaces on the water balance. Overall, there would be little or no effects from water yield increases related to roads, skid trails, landings, and dispersed sites in any of the action alternatives. Effects of cutting on flows tend to be localized and are unlikely to extend beyond first or second order streams in well-managed forests, where relatively small portions of the watershed are being harvested at a given time.</td></tr>
<tr><td>Air Quality - §3.1.3</td><td>No new effects</td><td colspan="5">Because of the limited duration of operation of harvesting 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 harvest would minimize this effect so that ozone is unlikely to form at elevated levels as a result of the proposed activities.</td></tr>
<tr><td rowspan="2">Transportation - §3.1.4</td><td rowspan="2">No new effects</td><td>Pre-haul maintenance of 4.5 Mi</td><td>Pre-haul maintenance of 4.5 Mi</td><td>Pre-haul maintenance of 4.5 Mi</td><td>Pre-haul maintenance of 4.5 Mi</td><td>Pre-haul maintenance of 3.7 Mi</td></tr>
<tr><td colspan="4">Approximately 15 landings. Ten (10) of the landings are already in place. Some trees and saplings would need to be cleared before the existing landings can be used. The remaining five (5) landings would need to be constructed.</td><td>Up to 12 landings. Eight (8) of the landings are already in place. . The remaining four (4) landings would need to be constructed.</td></tr>
</table>

Table 15B: Comparison of Alternatives by Effects to the Biological Environment

Resource	Alt 1 – No Action	Alt 2 – Proposed Action	Alt 3	Alt 4	Alt 5	Alt 6
Vegetation - §3.2.1	Paper birch that is in the over-mature age class is becoming decadent and may convert to northern hardwoods. There would be no early-successional habitat. *Forest Plan DCs for diversity of habitat community and age/size class would not be met*. There would be less overall species diversity Most trees would grow to larger size. Many trees would decline, lose commercial value, and die. Coarse, woody material would increase on the forest floor. There would be no direct effect to herbaceous vegetation.	32 acres of paper birch that is in the over-mature community stage is becoming decadent will be regenerated. This would help existing, limited community type diversity. In addition, 109 acres of northern hardwood would be regenerated. *These activities will help meet Forest Plan DCs for diversity of habitat community and age/size class.* Declining trees would be salvaged and used for forest products. Uneven-aged management proposed on 946 acres. Regeneration from group selection would tend toward a broader mix of shade-intolerant, intermediate and shade tolerant species. Single-tree selection would eventually tend towards stands of beech, sugar maple, and hemlock. Clearcutting would have effects on herbaceous vegetation up to 100 feet into adjacent stands. Some species would increase following harvesting. Within 30-50 years, the understory environment would return to pre-harvest conditions. There would be less impact to herbaceous vegetation from uneven-aged mgnt.	Only uneven-aged management is proposed. Decadent paper birch may convert to northern hardwood. This would reduce community type diversity. There would be no regenerating age class. All other age class would increase. *Forest Plan DCs for diversity of habitat community and age/size class would not be met.* There would be less overall species diversity. Declining trees would be salvaged and used for forest products. The effects of uneven-aged management would be the same as Alternative 2, but across 1,007 acres.	The effects would be the same as Alternative 2, except that there would be 111 acres of clearcutting and 966 acres of uneven-aged management. *These activities would help meet Forest Plan DCs for diversity of habitat community and age/size class.*	The effects would be the same as Alternative 2, except that there would be 131 acres of clearcutting and 1,087 acres of uneven-aged management. *These activities would help meet Forest Plan DCs for diversity of habitat community and age/size class.*	The effects would be the same as Alternative 2, except that there would be 111 acres of clearcutting and 554 acres of uneven-aged management. *These activities would help meet Forest Plan DCs for diversity of habitat community and age/size class.*

Table 15B: Comparison of Alternatives by Effects to the Biological Environment Cont.

Resource	Alt 1 – No Action	Alt 2 – Proposed Action	Alt 3	Alt 4	Alt 5	Alt 6
Wildlife Resources - §3.2.2	A direct, adverse effect would be continued lack of habitat diversity in the early successional age class in northern hardwood forest type. Indirect adverse effects include a potential decline in MIS diversity that favor early successional habitat, and long-term loss of the paper birch and aspen community types.	A direct effect would be the creation of large openings and increased age class diversity, which is beneficial to the majority of MIS. Indirect effects would be a reduction in closed canopy conditions in harvest units, which would not benefit the lesser number of MIS that favor this condition.	Due to no clearcutting, Alternative 3 would not create large openings and would increase age class diversity to a lesser degree than Alternative 2. Alt 3 has a greater potential to maintain mature forest canopy conditions for the lesser number of MIS that favor this condition.	Similar direct and indirect effects described under Alternative 2 would occur. However, Alt 4 has less opportunity to increase early successional age class diversity and perpetuate paper birch and aspen community types due to less acres of clearcutting and less total stand acres treated.	Similar direct and indirect effects described under Alternative 2 would occur due to the similar amount of clearcutting proposed.	Similar direct and indirect effects described under Alternative 2 would occur. However, Alt. 6 has less opportunity to increase early successional age class diversity and perpetuate paper birch and aspen community types due to less acres of clearcutting and less total stand acres treated.
Biological Diversity - § 3.2.3	A direct, adverse effect would be a continued decline in horizontal, vertical, and vegetative species diversity in the early-successional regeneration age class. Indirect adverse effects overtime would be a potential decline in overall biodiversity at the stand scale due to the lack of regeneration age class and loss of paper birch / aspen types and the associated MIS and general wildlife species favoring this habitat within the project area. There would be no direct or indirect effects to aquatic biodiversity or recreational fishing opportunities within the Tripoli East project area.	None of the action alternatives would cause forest fragmentation, but would cause relatively minor, localized, and temporary effects of conversion of vegetation age class and species composition that would result in neutral shifts in biodiversity at the stand scale within the Tripoli East Project Area. However, there would be no overall loss in aquatic or terrestrial vegetation or wildlife species biodiversity within the Tripoli East Project Area.				

Table 15B: Comparison of Alternatives by Effects to the Biological Environment Cont.

Resource	Alt 1 – No Action	Alt 2 – Proposed Action	Alt 3	Alt 4	Alt 5	Alt 6
Aquatic Resources - §3.2.4	No direct or indirect effects to riparian, amphibian, reptile, and fish habitat. However, there would be adverse indirect and cumulative effects to amphibian and reptiles due to a lost opportunity to open the forest canopy to allow light and solar warmth to the forest floor and increase early successional habitat. These microhabitats support various invertebrate insects, which are prey base for amphibians and reptiles.	There would be a low potential for relatively minor, localized and short-term direct and indirect effects to amphibian, reptile and fish habitat as related to sediment, turbidity, and travel impediments and displacement.	There would be a very low potential for similar relatively minor, localized and short-term direct and indirect effects to amphibian, reptile, and fish habitat as described under Alt. 2 but to a lesser degree because of no clearcutting and overall less number of acres proposed for treatment.	There would be a low potential for similar minor, localized and short-term direct and indirect effects to amphibian, reptile, and fish habitat as described under Alt. 2 but to a lesser degree.	There would be low potential for similar minor, localized and short-term direct and indirect effects to amphibian, reptile, and fish habitat as described under Alt. 2 due to similar number of acres treated.	There would be very low potential for similar minor, localized and short-term direct and indirect effects to amphibian, reptile, and fish habitat as Alt. 2, but to a lesser degree because of an overall, less number of acres proposed for treatment.

<table>
<tr><th>Resource</th><th>Alt 1 – No Action</th><th>Alt 2 – Proposed Action</th><th>Alt 3</th><th>Alt 4</th><th>Alt 5</th><th>Alt 6</th></tr>
<tr><td>Cultural Resources - §3.3.1</td><td>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.</td><td colspan="5">White Mountain National Forest works in consultation with the NH 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. The Forest Service received a letter (9/13/02) from the Deputy State Historic Preservation Officer with a “no adverse effect” determination for the proposed Tripoli project with regard to cultural sites (EA, §3.3.2.3).
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.
Known sites within the project area will be avoided during layout, marking, and logging operations. Avoidance and site mitigation measures are designed to eliminate or lessen any impacts to heritage sites or site values from timber harvesting. The East Pond Trail will be crossed by a minimal number of skid trails that will be done over snow cover and/or frozen ground conditions. Sites will be protected and avoided during logging operations. Mitigation measures for over snow and/or frozen ground will stop or appropriately minimize impacts to the railroad grade that is now a recreation trail. If the mitigation measures are followed, no effects to cultural resource sites in the Tripoli project area are anticipated.
Short-term changes in the vegetation may draw the public's attention to certain sites. As the vegetation regenerates site locations should be less visible and less of a temptation to the public.
Mitigation will include the development of a cultural resource implementation plan.</td></tr>
<tr><td rowspan="3">Recreation - §3.3.2</td><td colspan="2" rowspan="2">Permittee continues to improve upland dispersed sites on Tripoli Road. Sites located on the lower terraces of Eastman Brook and its tributaries may cause water quality problems in the future.</td><td>The opportunity to relocate up to 27 new dispersed sites in log landings. Opportunity to relocate and rehabilitate up to 25 sites located on the lower terraces of Eastman Brook and its tributaries to prevent possible future water quality problems.</td><td>The opportunity to relocate up to 29 new dispersed sites in log landings. Opportunity to relocate and rehabilitate up to 25 sites located on the lower terraces of Eastman Brook and its tributaries to prevent possible future water quality problems</td><td>The opportunity to relocate up to 10 new dispersed sites in log landings. Opportunity to relocate and rehabilitate up to 25 sites located on the lower terraces of Eastman Brook and its tributaries to prevent possible future water quality problems.</td></tr>
<tr><td rowspan="2">Snowmobiling allowed all winter.</td><td colspan="4">Snowmobiling allowed holidays and weekends (SA & SU).
Summer/fall harvesting activities may be noticeable and log trucks may be encountered on non-holiday weekdays (M-TH); logging activities on the Mack Brook Road (NFSR 609) will be prohibited on July 4, Labor Day, & the day before each holiday.</td></tr>
<tr><td colspan="4">During winter harvesting of units adjacent to trails, Little East Pond Trail may be closed non-holiday weekdays (M-F) for public safety; during winter, evidence of harvesting will be noticeable.</td></tr>
</table>

Table 15C: Comparison of Alternatives by Effects to the Socio-Economic Environment Cont.

<table>
<tr><th>Resource</th><th>Alt 1 – No Action</th><th>Alt 2 – Proposed Action</th><th>Alt 3</th><th>Alt 4</th><th>Alt 5</th><th>Alt 6</th></tr>
<tr><td rowspan="4">Visual Quality - §3.3.3</td><td colspan="6">Four viewpoints for project area: Mt. Moosilauke, background, modification; Russell Pond Overlook, middleground, partial retention; Tripoli Road, foreground, partial retention; Mt. Oceola, middleground, retention, partial retention, modification.</td></tr>
<tr><td rowspan="3">Except for naturally occurring changes, existing visual diversity of forested landscape (older stands of trees interspersed with a few stands of young [15—25 years], new trees) maintained. Vegetation will not offer as much diversity as if openings were present</td><td rowspan="2">Minor changes on the landscape resulting from proposed clearcuts would be visible from Mt. Moosilauke; shapes and patterns of the proposed cuts blend well with existing terrain & vegetation. Visual quality objectives of Forest Plan will be met. Visual diversity of forested landscape increases from even and uneven-aged management activities</td><td rowspan="2">Only group and single-tree selection is proposed. Group selection creates small openings in the tree canopy that result in less textural change. However, recent research indicates that the close clustering of these smaller canopy openings may give the viewshed a moth-eaten appearance, which is an undesirable short-term visual effect. Visual quality objectives of Forest Plan will be met.</td><td colspan="3">Minor changes on the landscape resulting from proposed clearcuts would be visible from Mt. Moosilauke; shapes and patterns of the proposed cuts blend well with existing terrain & vegetation. Visual quality objectives of Forest Plan will be met.</td></tr>
<tr><td>Similar to Alt. 2 except stand 116/4 is proposed in this alternative for group selection treatment, which visually differs greatly from the clearcut treatment in Alternative 2. Stands 114/15 and 114/30 are proposed for a mixture of single-tree and group selection treatments. This alternative has the least visual impact while achieving wildlife habitat concerns and harvest volume.</td><td>Similar to Alternative 4, but introduces two additional treatment areas, one a clearcut and one a group selection. The addition substantially increases the area on the south side of Tripoli Road with a continuous area of treatment. The close clustering of these smaller canopy openings may give the viewshed a moth-eaten appearance, which is an undesirable visual effect, especially when added together with the larger openings of the 3 clearcut.</td><td>Under this alternative the units adjacent to the East Pond and Little East Pond Trails and two proposed units at the east end of the project area have been eliminated. This alternative and Alternative 3 would have the least impact on the visual resource in the project area than all other alternatives except the No Action alternative (665 stand acres treated).</td></tr>
<tr><td colspan="3">Stumps, slash, and skid trails may be visible in along trails and roads for several years.</td><td>Stumps, slash, and skid trails may be visible in along roads for several years.</td></tr>
</table>

Table 15C: Comparison of Alternatives by Effects to the Socio-Economic Environment Cont.

Resource	Alt 1 – No Action	Alt 2 – Proposed Action	Alt 3	Alt 4	Alt 5	Alt 6
Community, Environmental Justice, & Economics - -§3.3.4	Net Cash Flow – Return to Federal Treasury by Alternative for Tripoli Project					
	-$142,690	$436,775	$344,228	$411,139	$479,494	$291,537
	Anticipated Timber Tax Revenue Received by the Town of Thornton (T) and Grafton County (GC) by Alternative for Tripoli Project					
	$0.(T)	$14,403 (T)	$11,018 (T)	$13,556 (T)	$15,813 (T)	$$11,210(T)
	$0 (GC)	$65,612 (GC)	$50,129 (GC)	$61,757 (GC)	$72,036 (GC)	$42,169 (GC)
	Employment opportunities would be limited to those seasonal positions offered by the Tripoli Road Dispersed Camping Area permittee. Returns to the counties (25% fund) would be limited to revenue generated by the dispersed camping permit ($950/year).	The effect to the local communities, from implementation of Alternatives 2-6, with regard to the operation of the Tripoli Road Dispersed Camping Area permit, would be the same as Alternative 1. Timber harvesting would provide some job opportunities, and would contribute dollars to the 25% Fund. Although there would be some changes in the forested landscape, dramatic changes in social conditions are not expected (Forest Plan, IV-52 to IV-55, IV-65 to IV-66).				
	Potential Dollar Return to Counties Through the 25% Fund by Alternative for Tripoli Project					
	$238	$200,038	$152,526	$188,285	$219,494	$133,434

CHAPTER 3 - AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES

3.0 INTRODUCTION

The Tripoli East Vegetation Management project area is located in the towns of Thornton and Livermore, New Hampshire on the Ammonoosuc/Pemigewasset Ranger District of the White Mountain National Forest (see Map 1, Appendix A). The Tripoli East project area consists of approximately 3,000 acres, all federal lands. Chapter 3 displays the current condition of the resources within the project area and the analysis of direct, indirect and cumulative effects of alternative management activities for the Tripoli East Vegetation Management project.

3.0.1 FOREST PLAN REFERENCES TO CUMULATIVE EFFECTS

This environmental assessment is tiered to the Forest Plan FEIS, in which some of the cumulative effects have been previously discussed. These disclosures 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

3.0.2 GENERAL CUMULATIVE EFFECTS

The purpose of analyzing cumulative effects is to consider the impacts of proposed projects on a landscape**Error! Bookmark not defined.** scale across time and space (from 1986-2012). Cumulative effects analysis facilitates the evaluation of private land influences and other activities that may occur across the landscape and that may not readily be apparent at a smaller scale.

See §**1.1.2 Site-Specific Projects in the Tripoli Project Area** for a list of past projects in the Tripoli project area. No additional Forest Service activities are anticipated in the Tripoli project area in the next decade.

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

Unless otherwise noted, the timeframe for the cumulative effects analyses span 1986 (when the Forest Plan became effective) through 2012 (reasonably foreseeable future).

The following cumulative effects areas may be used and are discussed in detail in Appendix H:

- Management Area 2.1 and 3.1 Lands within Habitat Management Units 416 and 417 (§**B.3.1**), and
- The Eastman Brook subwatershed (§**B.3.2**).

3.1 PHYSICAL ENVIRONMENT

3.1.1 SOILS

3.1.1.1 Soil Calcium

For an in depth discussion of soil calcium on the White Mountain National Forest refer to Appendix H, §**B.2.1s**.

Clearcutting in the beginning of the 20th century (Goodale 1999) plus acidic deposition since the 1950s (Federer et al 1989) in the Tripoli project area are estimated to have led to an 8.6% depletion of total Ca^{++} since the early 1900s (Fay, Hornbeck 1992). This estimate is based on the approach devised by Federer (1989). This estimate is consistent with other findings (Likens et al 1996), even though it pre-dated them, and is not as sophisticated with respect to changes in depletion rates over time.

The importance of landscape position is affirmed by studies at Hubbard Brook Experimental Forest where foliar, soil and stream chemistry generally indicate more calcium at mid- and lower slope positions

(Johnson et al 1998). Harvesting at Tripoli East is on these slope positions.

Plot data and stand examination at Tripoli East did not indicate any unusual mortality in hardwoods, other than the natural aging of paper birch (Wingate 2002).

Since 1991, the National Acid Precipitation Assessment Program Report (1998) includes a continuing concern about base cation depletion, including calcium. It reports "mortality and decline of red spruce at high elevations in the Northeast are the only cases of significant forest damage in the United States for which there is strong evidence that acid deposition is a primary cause". This concern, of course, is related to calcium nutrition. There are no such sites proposed for harvesting in the Tripoli project area.

The Tripoli East project area is primarily northern hardwood forest on mid- and lower mountain slopes. It does not include soils shallow to ledge, or outwash sands, where research guidance indicates the need to avoid such sites if short rotation harvest is used (Pierce et al 1993). No short rotation forestry is proposed in the Tripoli East project area.

The Tripoli project is a combination of ecological land types 115c, 115g, and 105. All are deep, well- or moderately well-drained ablation and basal till soils commonly found on the White Mountain National Forest. There is also a small amount of northern hardwood-spruce-paper birch forest at the interface of the mountain slope and valley bottom ecological land types. This is on ecological land type 115a, which is mostly a moderately well-drained basal till soil common in major valleys and swales. All stands would be considered northern hardwood for the purposes of this analysis, because any differences in calcium cycling are too small to be measurable. In the general vicinity of the Tripoli project area, there was some heavy timber harvesting in the early 1900s (Goodale, 1999). For those locations where early land use is not well known, it is assumed, for the purposes of this analysis, that the area was clearcut. This was the most common method of harvesting at the time in this area (Goodale, 1999).

In summary, Tripoli East project area has deep, moderately well drained, fine sandy loam soils that, in all likelihood, have sustained calcium loss from timber harvesting in the early 1900s and atmospheric deposition starting in the 1950s. At the larger landscape levels (regionally, state wide, Forest wide), on the Bartlett Experimental Forest, and at the Tripoli East project area level there is no evidence to indicate unusual health or mortality effects or a decline in forest growth that can be linked to a loss of base cations.

Based on the till source model, the Tripoli East project area has initial (post glacier) calcium concentrations reasonably similar to Hubbard Brook. Mineral weathering rates are considered similar to Hubbard Brook Experimental Forest, as this is the best evidence available.

Short rotation (40-year re-entry clear-cut) forestry has not been practiced in the Tripoli East project area.

3.1.1.2 Soil Erosion Affected Environment

The Tripoli East project area is in the Eastman Brook subwatershed. This subwatershed is approximately 11,500 acres in size. Roads within the subwatershed include Tripoli, Hix Mountain, Mack Brook, Talford Brook, Russell Pond, and Old Gore (see §**3.1.1)**. Tripoli and Russell Pond Roads have gravel or paved surfaces and are open for public use during the snow-free season. The remaining roads are mainly seasonal roads used for vegetation management purposes, though there may also be seasonal use for non-motorized recreation purposes. There are dispersed campsites along Eastman Brook.

Although deep soil slumps are a potentially significant source of soil erosion, there are no soils susceptible to deep slumps in this subwatershed. Based on identification of such areas by the White Mountain Ecological Land Type Inventory, this includes the Tripoli project area. Such slumps are characteristically along major rivers and streams.

Dry debris slides can also be a significant source of soil erosion, and these areas exist substantially upslope of the project area. Debris slides, which occur on very steep slopes with shallow, gravelly soil, are initiated by intense rainfall events in the spring of the year. All elements of the proposed action, or its

alternatives, are substantially down-slope of these debris slide areas.

Soil slumps and debris slides are not sources of erosion in the Tripoli project area. A potential source of erosion in the project area is primarily from roads, skid trails, and recreational use.

The Russell Pond Road, used seasonally to access a campground, has a paved surface and permanent drainage structures. Soil erosion is not evident on the roadway, in the drainage ditches, or on the cut-banks.

Tripoli Road has both paved and gravel surfaces and permanent drainage structures. It is used only in the snow-free season for recreation access to campsites or hiking trails and as a through road between Thornton and Waterville Valley. Although some surface erosion occurs on this road, the culverts and ditch-lines are maintained and minimize soil erosion.

Neither the Russell Pond nor the Tripoli Roads are open during the spring "mud season" when surface water on a road may be a possible source of erosion. These two roads have permanently compacted surfaces.

Hix Mountain Road is a 1.4-mile, native-surfaced road, constructed for three-season use, as is the 1.5-mile Mack Brook Road, the 1.5-mile Talford Brook Road, and the 0.5-mile Old Gore Road. These roads were built to the standards outlined in the 1986 Forest Plan to meet standards for safe trucking and to minimize potential soil erosion. All these roads were previously used for timber hauling purposes. Side-slopes are seeded and grass covered. There is no evidence of accelerated surface soil erosion. Best management practices (BMPs) were applied to the use and closure of these roads. These roads are part of the permanent road system of the Forest, and, for the most part, they have a permanently compacted surface.

Dispersed recreation campsites are found along Eastman Brook and its tributaries (see §**3.1.2**). Approximately 25 of these sites are located on the lower terraces of Eastman Brook and its tributaries. While these sites are mostly devoid of understory vegetation, the root mat is generally intact and is helping to prevent major soil erosion (photos 1& 2).

Photo 1: Dispersed Campsite Along Eastman Brook

Photo 2: Dispersed Campsite Along Eastman Brook

All of these sites have experienced minimal soil erosion and compaction, over the years. The small size of these sites, the intact root mat, and the gentle grades, however, means these sites are not a possible major source of soil erosion. These sites are not used in the spring season when soil moisture and out of bank flows of the streams might make them most susceptible to surface erosion. Continued use of these sites may, in the future, become an increased source of erosion.

The soils in this watershed are shallow at the highest elevations outside the vicinity of any proposed activity in this project area and are mainly deep, moderately well-drained basal till soil within the project area. There is commonly a "hardpan" at a depth of 28-32 inches, and the soil is seasonally wet. The soil erosion potential is rated high relative to other soils on the White Mountain National Forest. Slopes are generally 5-20%, well within those anticipated by the soil conservation standards and guidelines in the 1986 Forest Plan. The remaining soils are well-drained ablation till soils with moderate surface soil erosion potential, also relative to other soils in the White Mountain National Forest.

3.1.1.3 Soil-related Mitigation Measures

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

3.1.1.4 Soil Calcium Direct and Indirect Effects

The general effects of timber harvesting activities on the soils can be found in the Forest Plan FEIS, pp. IV-30 through IV-32. Conventional harvesting means the bole of the tree is removed, but not the tops or limbs.

For this calcium loss analysis, the distinction between even-aged management (clear-cutting) and uneven-aged management (group and/or single-tree selection) is based on differences in the magnitude of effects. In general, conventional clearcutting has a greater short-term effect on soil calcium loss than uneven-aged management. In the short term, the amount of calcium loss on till soils is estimated to amount to 2% per acre for even-aged management and 1% per acre for uneven-aged management using conventional harvesting methods for northern hardwoods stands during one entry. These estimated calcium loss percentages are based on research by Fay and Hornbeck in 1993, which built on earlier work by Fedder, et. al. in 1989. In the very long term, uneven-aged management may actually affect greater soil calcium loss (Adams et al 2000), because more biomass may be removed from the forest.

Alternative 1 – No Action

Direct Effects

Harvesting is deferred on National Forest lands suitable for timber harvest (as described in the LRMP) within the project area until some later time. There would be no loss of soil calcium due to timber harvest, and this calcium would continue to be available to buffer possible future impacts of acid rain or timber harvesting.

Indirect Effects

Because no harvesting will occur during this entry under Alternative 1, the present buffering capacity of the soils would be maintained. Indirectly this can help to minimize possible impacts to forest productivity, species composition, or health that may result from acidic deposition or timber harvesting. The consequence, based on current research, is that these forest qualities will likely remain unchanged (Monitoring Report 2000, pp. 43-50).

Alternatives 2 – 6

Direct Effects

Environmental factors that influence soil acidity can include acidic deposition, nitrogen deposition, and timber harvesting. The overall consequence of harvesting activities in Alternatives 2-6 is to lower the acid buffering capacity of the soil.

The direct effects of timber harvesting proposed for each action alternative can be calculated by applying the percentages of calcium loss to the acres of treatment proposed by management system for each alternative. Table 13 displays, by action alternative and management system, the acres of northern hardwoods within the project area that have the potential for soil calcium loss as a result of proposed timber harvest.

Table 13: Acres of Northern Hardwoods with Potential Calcium Loss Resulting from Timber Harvest, Listed by Alternative for Even-Aged and Uneven-Aged Management, Within the Project Area

	Acres with Potential Calcium Loss due to Timber Harvest, by Management System	
Alternative	**Even-Aged Management (clearcutting) – 2%/ac**	**Uneven-Aged Management (selection) – 1%/ac**
Alternative 2	141 Ac	946 Ac
Alternative 3	0 Ac	1007 Ac
Alternative 4	111 Ac	858 Ac
Alternative 5	131 Ac	880 Ac
Alternative 6	111 Ac	554 Ac

Indirect Effects

The potential effect of timber harvesting on forest productivity is indirect. Measurement of northern hardwood forest plots since 1934 at the Bartlett Experimental Forest and other till soil sites across the White Mountain National Forest does not indicate a statistically distinguishable change in forest productivity due to human impacts, even including the impacts of acidic deposition (Nuegenkapian, 1998). The Bartlett Experimental Forest, relative to other locations on the Forest, would be considered a relatively poor calcium site based on the till source model (Bailey, 2001). However, even within the Bartlett Forest, the re-measurement of 455 plots over time indicates no estimated measurable change in forest productivity based on biomass accumulation. Indirect effects are not expected on forest productivity from harvesting activities proposed in the Tripoli project.

In addition, a review of biomass accumulation studies across the Forest, where conventional and whole tree clearcutting was practiced, does not indicate a change in biomass accumulation (Leak, Fay 1997). There is no evidence of changes in species composition on Bartlett Experimental Forest soils that are potentially calcium poor and that have a history of harvesting (Leak and Smith, 1996). No change in species composition is anticipated within the Tripoli project area. While sugar maple decline sites on the old soils of western N.Y and Pennsylvania demonstrate significant tree mortality that is related statistically to soil calcium (and magnesium), such significant evidence does not exist on the younger soils of New England (Hallett, 1999).

3.1.1.5 Soil Calcium Cumulative Effects

For this discussion of soil calcium cumulative effects, the analysis area is the location of the actual harvesting activities, because site-specific soil impacts related to soil or forest productivity are not likely to extend further. The time-span for this analysis is from early harvesting at the beginning of the 20th century to the reasonably near future, as estimated by others (Likens et al 1996). Early harvesting is considered because land use history affects soil nutrients, including calcium. Future harvesting and atmospheric deposition are considered because they affect calcium depletion. The project area is composed of second-growth forest, regenerated from harvesting around 1900. Conventional, bole-only harvesting, and even- and uneven-aged harvesting are analyzed to display the range of impacts.

Land use history affects soil calcium. It is reasonable to believe that the stands considered in the Tripoli project area were harvested prior to acquisition by the Forest Service. The exact treatments are unknown. However, historic records indicate some portions might have been heavily cut in the early 1900s (Goodale 1999). For this analysis, historic timber harvest will be considered analogous to conventional clearcutting on primarily northern hardwood sites, and will be assumed to have depleted approximately 2%/acre of the total calcium pool on till soils such as these (Fay and Hornbeck, 1993). Based on mass balance studies at Hubbard Brook Experimental Forest (Federer, 1989), acidic deposition also depletes soil calcium. It is estimated that, over a 120-year period, approximately 11% of the total soil calcium pool on till soil in northern hardwood forests could be lost due to the impacts of acidic deposition. Acidic deposition has been a measurable human-induced effect since about 1950 (Likens et al 1996), so it is possible that up to 5% of total soil calcium has been lost due to acidic deposition during that time. It is reasonable to expect that ten more years of acidic deposition is likely to occur within this cumulative effects analysis period, resulting in another 1% of estimated calcium loss. The total cumulative impact on all northern hardwoods stands, therefore, is estimated as a loss of 8% of the total soil calcium currently available, prior to any timber harvest that might take place:

2% (prior land use) + 5% (acidic deposition up to 2002) + 1% (future acidic deposition) = 8%

Research is proposed to study in more detail the total size of the soil calcium supply, because some

researchers believe there may be a larger original supply of calcium than was applied in earlier studies (Bailey, 2001). This would lead to a smaller estimated calcium loss. The potential Ca source is Calcium-oxalate.

Research findings indicate that the 1970 Clean Air Act and its 1990 Amendment are altering the impacts of acidic deposition (Likens et al 1996), as less acid anions are being deposited through atmospheric deposition. While the consequences of this are not appearing as an improvement in stream acid neutralizing capacity (ANC), it is still reported that a hysterises pattern in stream chemistry indicates recovery over time will probably occur (Likens et al 1996). Even with an uncertain timeline, logic dictates that the rates of depletion estimated by Federer (1989) are not likely in the long-term. A gradual improvement has to be expected.

Alternative 1

There would be no loss of soil calcium due to timber harvest, and this calcium would continue to be available to buffer possible future impacts of acid rain or timber harvesting.

Alternatives 2–6

The acres of proposed treatment would contribute to potential soil calcium loss within the cumulative effects area during the next decade.

Environmental factors affecting cumulative soil calcium loss include land use history (prior to acquisition by the Forest Service); proposed harvesting; and the past, present, and future effects of acidic deposition. Future harvesting is not included, because none is projected to occur within the cumulative effects area in the reasonably foreseeable future. The approximate cumulative effect on till soils in northern hardwoods forests can be calculated by adding the potential soil calcium loss resulting from proposed timber harvesting activities (2%/acre for even-aged systems, 1%/acre for uneven-aged systems) to the estimated soil calcium loss resulting from land use history (2%/acre as described above) and past, present and future acidic deposition (6%/acre, as described above). The result is a cumulative estimate of 10% per acre of soil calcium loss on those acres treated with even-aged management systems (clearcutting), 9% per acre on those acres treated with uneven-aged management systems, and 8% per acre for those acres receiving no timber harvest treatment.

Table 14 displays, by action alternative and management system, the acres of northern hardwoods within the cumulative effects area that have the potential for soil calcium loss as a result of proposed timber harvest. Alternative 2 has the potential for the greatest cumulative impact, since it has the highest number of acres proposed for even-aged management. Alternative 3 has the least cumulative impact of the action alternatives, since it proposes no even-aged management at all.

Table 14: Acres of Northern Hardwoods with Potential Calcium Loss Resulting from Timber Harvest, Listed by Alternative for Even-Aged and Uneven-Aged Management, Within the Cumulative Effects Area

	Acres with Potential Calcium Loss due to Timber Harvest, by Management System	
Alternative	**Even-Aged Management (clearcutting) – 10%**	**Uneven-Aged Management (selection) – 9%**
Alternative 2	141 Ac	946 Ac
Alternative 3	0 Ac	1007 Ac
Alternative 4	111 Ac	858 Ac
Alternative 5	131 Ac	880 Ac
Alternative 6	111 Ac	554 Ac

3.1.1.6 Soil Erosion Direct and Indirect Effects

There are no soils susceptible to deep slumps in the Eastman Brook subwatershed. While there may be dry debris slides at the highest elevations, these are uncommon, they are not generally affiliated with streams, and there is a significant buffer of forest between such a possible hazard and Eastman Brook. These avalanche paths are historic locations where slides have repeatedly occurred over many thousands of years. No roads exist, nor is timber harvesting planned near these old debris slides.

Alternative 1- No Action

Direct Effects

Harvesting is deferred on National Forest lands suitable for timber harvest (as described in the LRMP) within the project area until some later time. Dispersed campsites located on the lower terrace of Eastman Brook will continue to be used.

Surface soil erosion will not change on the Tripoli and Russell Pond Roads. It will be at a low rate, similar to that which already occurs. As has been the case in the past, it may be slightly greater immediately after annual road grading done for maintenance purposes. The Hix, Mack, Talford, and Old Gore roads will continue to experience minor, site-specific, localized, surface soil erosion.

Accelerated soil erosion is not likely to occur. These roads were built or 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. Skid roads associated with previous timber sales in this watershed are generally overgrown and/or

covered with leaf litter, thus minimizing the impact of raindrop splash, which can be a precursor to soil erosion.

In the short term, no change in soil erosion is anticipated from hiking trails or dispersed campsite use. These locations experience limited, site specific and short-term soil erosion. Compacted surfaces at these locations will remain in place. Continued use of the dispersed campsites and pathways located on the lower terraces of Eastman Brook and its tributaries may become an increased source of erosion.

Indirect Effects

Sedimentation of stream water resulting from soil erosion is the indirect effect of most concern. This is addressed in the sections on Water Quality and Water Quantity (see §**3.1.2.**).

Another possible indirect effect of soil erosion is a change in soil productivity. Forest roads, trails and campgrounds are not considered part of the suitable land base (as described in the LRMP), and their soils should not necessarily be expected to remain productive. It is the general forestland not assigned to such uses, therefore, where soil productivity needs to be maintained. On those lands that are part of the suitable land base, current evidence does not indicate a change in productivity. This is consistent with the fact that the generally deep, moderate and well-drained soils of New England are not highly erosive, so it is not a principle issue when Best Management Practices are applied. No indirect effect on soil productivity is expected resulting from soil erosion. While there may be soil compaction on skid trails that are not part of the permanent transportation system, research indicates oxygen content does not fall below that necessary to support plant growth, and the soil returns to pre-cutting bulk densities within 2-3 years of harvesting.

Alternatives 2–6

The effects of Alternatives 2-6 are considered together, because the primary potential sources of soil erosion or compaction (permanent roads, main skid trails, and campsites) are essentially the same for all action alternatives, with one exception. Alternative 2 does not propose the relocation and rehabilitation of the dispersed campsites located on the lower terrace of Eastman Brook. With regard to the timber, the season of harvest is the same for all stands proposed for management. Differences between methods of harvesting, even- vs. uneven-aged management, do not substantially alter the density of main skid roads. The location of roads and main skid trails does not vary among action alternatives. In short, the alternatives were not specifically formulated to resolve issues of soil erosion and compaction.

Direct Effects

The majority of timber stands proposed for harvesting are limited to winter or frozen ground conditions. Most road use for timber hauling will be limited to the same winter or frozen ground conditions. Based on previous experience at these locations, pre-haul maintenance of the roads will lead to some minor, site-specific soil erosion. Most erosion occurs within the first twelve months after a road is originally constructed, and these roads have been in place well over 20 years.

Soil erosion on major skid trails used in the winter will be limited to minor, site-specific effects. Winter skidding is routinely done on a snow-packed or frozen surface and can be done without direct soil erosion effects. The same is true for landings. Mineral soil may be exposed at some places along the main skid trails, dependent on surface conditions, but this is generally limited in scale. Skid trails used only a few times to access specific locations will experience little or no exposure of mineral soil, because use is so short term.

The five stands where timber harvesting could occur during dry summer or fall periods may experience soil erosion on the main skid trails as the surface soil organic matter is compacted or eroded during the operation. Overall, harvesting could lead to a marginal increase in soil erosion in the project area. Skid trails would be seeded, mulched and water-barred as soon as they are no longer in use to limit possible effects of erosion.

Long term, leaf litter fall would help to restore the humus layer where bare soil may have been exposed. This mitigates the impacts of raindrop splash that initiates soil erosion. The freezing and thawing cycle will also serve to mitigate areas where soil compaction has occurred.

For Alternative 2, no change in the soil erosion or compaction is anticipated at the dispersed recreation sites in the lower terrace of Eastman Brook. As with Alternative 1, these locations have compacted surfaces and user-developed pathways that experience short-term erosion. Continued use of these sites may become an increased source of erosion over time. For Alternatives 3-6, dispersed camping will be moved away from the lower terraces of Eastman Brook, and the sites would be rehabilitated to prevent any further compaction or the potential for erosion and to promote revegetation of the sites. The sites to which the camping would be moved are landings that would be developed in support of timber harvesting in these Alternatives. These new sites would be level and hardened (a gravel surface) and might experience short-term erosion, but the effect would most likely be limited to the sites themselves.

Soil erosion at hiking trails will remain small, and unchanged.

Indirect Effects

Sedimentation of stream water resulting from soil erosion is the indirect effect of most concern. This is addressed in the sections on Water Quality and Water Quantity (see §**3.1.2.3**).

No change in soil productivity is expected from these Alternatives, because soil losses are small, especially since areas of deep soil slumps or debris slides either do not occur or are not affected. Also, winter harvesting minimizes impacts to surface organic layers of the soil, thereby minimizing the erosion hazard at other seasons of the year. Compaction of soil along main skid trails will occur, but experience indicates these trails can revegetate over time if kept free of traffic. This is especially true for skid trails used only a few times.

3.1.1.7 Soil Erosion Cumulative Effects

For this discussion of soil erosion cumulative effects, the analysis area is the Eastman Brook subwatershed, because soil effects are site specific and limited to the area of direct impact or its immediate vicinity. The proposed project, and its alternatives, directly affect only a portion of the subwatershed. Previous land disturbing activities, as well as that which might occur in the foreseeable future, will be considered as part of cumulative effects analysis. Land disturbing activities include: timber harvest, road maintenance, road construction, dispersed camping sites, and hiking trail use.

Alternative 1- No Action

Timber harvest, and the land disturbing activity that might contribute to soil erosion and compaction, is deferred on the suitable land base in this Alternative. As such, this Alternative does not contribute any additional cumulative effects to those that might occur from past, present or future land disturbing activities. However, the dispersed campsites and pathways located on the lower terrace of Eastman Brook will continue to be used, and their use will continue to present a potentially increasing source of erosion over time.

Alternatives 2–6

Timber harvest proposed in these Alternatives may contribute to the cumulative effects of other past, present and future land disturbing activities. However, with the exception of Alternative 2, which does not relocate dispersed camping from the lower terrace of Eastman Brook, the remaining Alternatives may reduce the contribution to cumulative effects of the dispersed campsites by closing and rehabilitating the existing sites, and relocating campers to sites well removed from the stream.

Repeated formal and informal monitoring across the White Mountain National Forest has shown that careful road maintenance and harvesting practices do not lead to substantial soil erosion. In the absence of road construction and by restricting the majority of harvesting activities to winter or frozen ground conditions, the potential for soil erosion from the proposed activities is diminished from what it might have been. This is consistent with the effects analyzed in the 1986 Forest Plan FEIS.

Past road building activities, harvesting activities associated with four previous timber sales, trail, and dispersed campsite construction resulted in some short-term surface soil erosion. Soil and water standards and guidelines found in the 1986 LRMP and the Best Management Practices were applied to the road and timber harvest activities. Relocation of dispersed campsites on the lower terraces of Eastman Brook and its tributaries would eliminate this potential source of soil erosion.

Cumulative soil erosion effects from past, present and future actions in the Eastman Brook subwatershed are not expected to be substantial. Soil compaction will briefly be greater than the existing condition because of operations on the main skid trails; however, this impact is expected to be short-term, as the skid trails are intended to be temporary and should revegetate after the operations are complete (Donnelly et al 1991, Holman et al 1978).

3.1.2 WATERSHED

3.1.2.1 Watershed Affected Environment

For general discussions pertaining to Hydrology, see Appendix H, §**B.2**. See the Soil Erosion section (§**3.1.1.2**) for a discussion of the physical attributes of soil erosion as they relate to hydrology.

Tripoli East project area is located in Eastman Brook subwatershed, a tributary of the Pemigewasset River. The watershed of Eastman Brook above the confluence with Talford Brook contains approximately 7,400 acres. There are several named and unnamed perennial and intermittent streams within the project area. All of these are tributaries of Eastman Brook and have watershed areas of less than 1,000 acres. There are also small ephemeral drainages and swales throughout the project area.

This section will discuss important watershed features, water quality, and water quantity within the project area.

Watershed Features

Hydrologic features and the related components of water quality and water yield are discussed in this section. In addition, other water related resources are discussed elsewhere in the EA. Vernal pools and wetlands are discussed in the Terrestrial Resources, Biological Diversity, and Aquatic Resources sections (respectively, §§**3.2.2**, **3.2.3**:; and **3.2.4**). Riparian areas are present in the project area and are discussed in this section where relevant and also in the Aquatic Resources section (§**3.2.4**).

Hydrologic Features

Streams and Riparian Areas

The streams within the project areas have been classified using the WMNF Riparian Classification System. A more detailed description of these types can be found in the Aquatic Resources report. Types 10, 12, 13, 17, 20, and 21 are found within the project area. Riparian types 10, 12, 13, and 17 are characterized as steep, entrenched, and degrading stream channels. The difference between these types is the channel gradient and valley type. These differences in slope and valley form affect channel capacity, bedload transport and bank stability. Riparian types 20 and 21 are characterized as relatively flat (2 to 4 percent slope), aggrading stream channels which have a tendency to meander or divide.

Eastman Brook and its tributaries are headwaters incised streams (FISRWG, 1998). Sections of the stream are in the early, widening phase (Figure 4B), and, in other sections of the stream, the widening phase has been completed (Figure 4C). The lower terraces in Figure 4B may experience out of bank flows (flooding) intermittently, depending on the depth of the scarp in the channel. The lower terraces as in Figure 4C are prone to yearly out of bank flows, especially during the spring and possibly during heavy rain events.

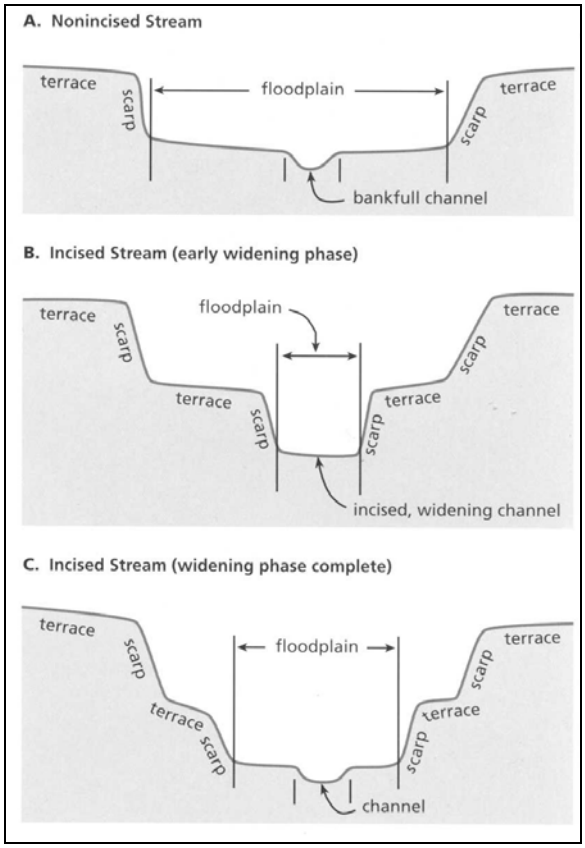
Dispersed camping occurs along the Tripoli Road and associated spurs in the Tripoli project area. Many of the campsites are located between the Tripoli Road and Eastman Brook or its tributaries. The dispersed campsites are located on the various terraces adjacent to the brook. Some sites are on the upper terraces as in Figures 4B and 4C, some sites are on the lower terraces as in Figures 4A-4C. The campsites in general are not hardened and have had their natural herbaceous and shrub cover removed through tenting and foot travel. Although these sites have become compacted through use, the root mat is usually intact, and, in general, no erosion is evident at these sites (See Photos 1 and 2, p. 27).

Over the past eight years work has been done in the area to relocate and rehabilitate dispersed campsites located on the lowest terraces that are prone to annual flooding. The intent has been to remove potential sources of erosion that might adversely affect water quality and to restore the streamside vegetation.

In the project area, there are approximately 25 dispersed camping sites located on the lower terraces of Eastman Brook and its tributaries along a four-mile stretch of Eastman Brook that are subject to intermittent out of bank flow. These sites represent less than 0.1% of the project area. These sites are considered priority areas for closure and restoration (Wingate and Williams, field visit, 9/9/2002). (For a more detailed discussion of these dispersed sites, see §**3.3.2.**

In the project area, the Eastman Brook watershed is defined as Class II Condition as (FSM 2521.1). This watershed class indicates that capital investments are <u>not</u> required to restore watershed conditions, and that the condition class can be restored to Class I through an integrated ecological approach to management. In this area, the relocation/closure/rehabilitation of dispersed camping sites on the lower terraces of Eastman Brook and its tributaries has contributed to moving the watershed towards a Class I watershed.

Figure 1: Terraces in (A) nonincised and (B and C) incised streams. Terraces are abandoned floodplains, formed through the interplay of incising and floodplain widening (FISWG, 1998)



The roads in the project area are already in place and stable. Following storm damage in 1995, ditches along Tripoli Road were reconstructed, and additional cross drains were installed to improve drainage and to reduce the potential for sediment delivery to Eastman Brook.

Water Quality

Water Chemistry and Temperature

Eastman Brook and tributaries were sampled at 10 locations on June 9, 1995 and analyzed for pH and major dissolved ions. The streams are chemically dilute with a mean pH for the 10 locations of 6.31 and mean specific conductance of 23.5 umhos. The dominant cation is calcium with a mean of 1.8 ppm. Dominant anions are sulfate with a mean of 4.1 ppm and nitrate with mean of 0.9 ppm. The chemistry data from Eastman Brook has been compared with those collected from 159 other sites within the same ecological province. In this regional comparison, Eastman Brook had higher than average pH and nitrate concentrations and below average sulfate and calcium concentrations. Temperatures were cold, within water quality standards. Overall, chemical quality is high and none of the measured parameters indicates concerns for human use or aquatic biota.

However, there is a concern that continued use of dispersed sites in close proximity to Eastman Brook and its tributaries (on the lower terraces) could result in a seasonal effect of bacterial contamination from human waste disposal at these sites. Future monitoring is planned for Eastman Brook that would provide information as to the validity of this concern. This monitoring would be planned and implemented as part of the forest monitoring that occurs each year on the White Mountain National Forest. Human waste disposal is currently managed at the dispersed sites at the Tripoli Road by the permittee who runs the site. The permittee sells bags for waste and explains the requirement for burial of waste if the bags are not used. Patrols and citations are used to enforce this. Visually, this generally appears to be an effective mitigation.

Sediment

Erosion and sediment transport in streams is a natural process, however, management activities such as timber harvest, and associated skidding and road use can potentially cause adverse direct, indirect, and cumulative effects on water quality by accelerating natural processes. Based on observations during a field visit in September 2002 by this hydrologist, sediment does not appear to be a concern for the health of the streams in the project area. Visual indicators for excessive sediment loading were not present in the streams observed. These include Eastman Brook in two locations, Mack Brook, and several unnamed tributaries above their intersections with the Tripoli Road. Two important indicators were 1) an assessment of fines in gravel deposits and bed material in the streams and 2) whether or not pools were filled or filling with sediment. None of

the sites observed showed evidence of excessive sediment. These observations agree with information discussed in the Aquatic Resources section.

Water Quantity

Based on the research described in Appendix H, §**B.2.2**, localized water yield increases may be currently present in localized areas in the within the Eastman Brook watershed as the result of another timber sale in the same watershed called Eastman West. The subwatershed called Middle is the only subwatershed that has both Eastman West units and proposed Tripoli treatment areas. In this watershed, based on information provided by C. Guenther from the project record, the Eastman West sale included 198 acres with treatments that remove greater than 25% of the basal area. This calculates to 15% of the Middle watershed acres with an overall basal area removal for the entire watershed of approximately 5%. Due to this, at the outlet of this watershed, water yield is unlikely to be measurable since less than 25% of basal area of the watershed is being treated. This agrees with field observations, where effects based on visual indicators of a water yield increase were not observed in the larger streams and tributaries during field observations 9-2002 by Crowley. The indicator that was used was bank instability since channels with increased discharge adjust by changing their bankful width and depth (Schumm, 1977). While there are areas with unstable banks, these locations appeared to be related to stream type characteristics, road and bridge effects, and dispersed camping sites.

3.1.2.2 Watershed-related Mitigation Measures

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

3.1.2.4 Water Quality and Quantity Direct and Indirect Effects

All of the known effects that have the potential to occur as a result of proposed activities in the Tripoli East project are mitigated using Soil and Water Conservation Practices (SWCPs), also known as Best Management Practices (BMPs), as well as the standards and guidelines of the 1986 LRMP. The discussion below explains how the effects will be mitigated and why the mitigations are expected to be effective at limiting effects to the short term without impacts to critical watershed features. The proposed activities involve reopening roads for timber access and hauling, skid trails, landings, removal of timber, and restoration of riparian sites. Each of these activities is related to direct effects, which, in turn, are related to indirect effects.

Direct and indirect effects to streams, riparian areas, and floodplains would be mitigated so that effects to these features would be short term and recoverable. The condition of streams and riparian areas is related to the amount of disturbance that occurs in these areas. Direct effects could include disturbance at stream crossings and removal of trees from the riparian area. Indirect effects could include sedimentation and channel adjustment due to increased water yield. These direct and indirect effects to streams, riparian areas, and floodplains are would be mitigated using the standards described above and would not be of consequence to the condition of these features. Streams, riparian areas, and floodplains would continue to function in much the same way as the current condition. Any potential harvest units are designed to maintain a buffer between the units and any perennial streams, so there would be no direct effect resulting from tree removal directly adjacent to these streams, except at stream crossings. At these sites, crossing would be removed and stabilized when harvesting operations are completed. And, in all cases, trees would be felled away from streams, riparian areas and floodplains to reduce effects that might result from the felling operation and skidding the downed tree. Logging debris will be kept out of riparian areas and streams with defined channels, and existing woody material will be left in place.

When trees are removed, water yield is increased. Depending on the magnitude of this effect, stream channels adjust to changes in discharge by altering their width and depth as well as bedload (Schumm, 1977). This alteration could result in erosion from the channel and subsequent contributions to sediment. However, research has shown that an average of 25% of the basal area must be cut to generate detectable increases in annual water yield (Hornbeck, Martin, and Eagar, 1997). As discussed in the water quantity section of this report, less than 25% of the basal area removed overall in the project area. Therefore, effects related to sediment from channel adjustment from increased flows from timber harvest are not likely to occur in these larger streams in Eastman Brook. Small first order watercourses with defined channels are more susceptible to this process since harvest can result in larger portions of their smaller watershed being treated. The use of these mitigations to protect these features is expected to be effective and will be monitored during harvest

(should an action alternative be selected) by the observation of the sale administrator.

Water Quality

There are three ways that timber harvest can alter water quality. The first way is related to the roads, skid trails, and other disturbed surfaces that cause erosion and subsequent transport of **sediment** into streams. The second way is from the **chemical changes** that occur in water after trees are cut. The third way is through **temperature** change.

Water quality can be affected by the change in water chemistry that occurs after timber harvesting. After timber harvest, changes in water chemistry have been observed in studies done in the White Mountains National Forest and elsewhere (Martin, Noel, and Federer, 1981, Davies, K., 1984, and Stafford, Leathers, and Briggs, 1996). The removal of trees increases soil and water temperature, reduces transpiration, increases soil moisture and streamflow, increases decomposition of organic matter, increases mineralization and nitrification, and increases in exchange of ions in the soil (Martin, et al 1986). The increases in water, nutrients, and temperature are reduced quickly within a few years, as vegetation regrows so that within a few years, these variables return to precutting levels (Martin, et al 1986). However, uptake by vegetative growth is, at first, less than nutrient release by accelerated mineralization, so nutrients are lost from some systems through the streamflow (Borman and Likens, 1979) for the first few years after harvest. More details on this are found in the soil report.

Of the various chemical changes, studies have shown that it is the changes to nitrate concentrations that have the potential to exceed water quality standards for short periods of time after the removal of trees. Nitrate concentrations that exceed water quality standards were associated with clearcutting entire watersheds (Pierce et al, 1971) where subsequent treatment with herbicide was used to keep vegetation from growing back. In contrast, watersheds that were treated with methods that are more conventional did not exceed water quality standards for nitrate (Hornbeck, et al, 1973). Stream water from watersheds with uncut portions tends to dilute this effect of increased nitrate concentrations from clearcut areas within a watershed. Martin and Pierce (1980) recommended use of buffer strips, less cutting in the upper portions of watersheds, and staggered harvest to reduce this effect. Treatment within the project area would utilize buffer strips, cut less in the upper portions, and leave large portions of uncut area. These practices all would work to reduce the possible elevated nitrate concentrations that could occur after timber harvest. In this way, effects are limited to the short term and unlikely to exceed water quality standards as a result of proposed project activities.

Another effect is the changed concentrations of nutrients and their depletion. Calcium losses have already been discussed in the soil report. In fact, it is soil characteristics that influence the chemistry of the nutrients. The type, size, density, and age of vegetation influence the rate of uptake by plants. Usual harvest practices such as those used on the White Mountain National Forest, including those proposed for the Tripoli East project, do not result in large nutrient losses and do not pose a risk to water quality (Brown, 1983). The practices proposed for the proposed Tripoli project are the normal harvest practices, including the mitigations. Because of this, water quality standards are unlikely to be exceeded and nutrients needed for vegetative growth would be maintained.

When forest harvest reduces canopy shading along streams, the potential exists to increase stream water temperatures. In one study, cutting all trees in a watershed at Hubbard Brook in the White Mountain National Forest resulted in a 6 degrees Celsius increase in stream temperature (Pierce, R.S., and J.W. Hornbeck, and G.E. Likens, and F.H. Bormann, 1970). Such large increases in stream temperature can be prevented or greatly reduced using buffers with uncut trees along the edges of streams (Davies, 1984 and Staffard, et al 1996). The mitigations for stream and perennial riparian areas provide for an uncut buffer on all perennial streams adjacent to the project area. No perennial riparian areas occur within the project area. Treatment is located in lower portions of the subwatershed, and is limited to only some portions of the subwatershed. All of these factors greatly reduce the potential for temperature increases in streams.

Another water quality parameter that has the potential to be of concern in the project area is sediment. Direct effects can occur where roads and skid trails go across stream channels because, at these locations, sediment can be delivered directly into the channel. Indirect effects can occur from sediment transport on skid trails, roads, landings, dispersed sites, and ground disturbed by the dragging of trees.

As stated in the soil report, it is anticipated that, after mitigation, small amounts of onsite soil erosion may occur from reopening roads to truck traffic. The FEIS for the 1986 LRMP further states that sediment production and its impacts can be reduced to a negligible amount with the use of mitigations such as careful layout and construction, caution in wet and muddy conditions, and road closure. Skid roads may also result in onsite soil erosion, but this impact is small when mitigations are used, particularly the use of winter operations. Minimizing the area of disturbed forest floor is a big step in controlling erosion and sediment movement into streams. This is accomplished by careful consideration of skid trail layout such as locating skid trails on the contour as much as possible, minimizing the number of skid trails, and avoiding steep slopes. Other mitigations include the use of water bars, avoiding operations during saturated and muddy periods, avoiding disturbance to stream channels, and winter harvest for many stands. Maintenance of BMPs during harvest activities is also expected to be effective at minimizing this effect.

Recent studies have shown that mitigations such as those utilized for the proposed harvest operations in the Tripoli East project area will keep suspended sediment levels under 2 NTU (nephlamine turbidity units) during non-storm flow periods on clearcut watersheds (Patric, 1980). The same study showed virtually no increase in average turbidity from lighter selection cuts that removed 25-30% of the basal area. However, regardless of cutting intensity, turbidities did increase during storms and were traced to muddy logging roads. Another well-known study at Hubbard Brook (Likens, et al 1970), found negligible increases in stream turbidity after vegetation in a watershed was felled and left in place with no roads or skid trails. However, at Hubbard Brook, in studies summarized by Hornbeck, et al (1987) of a strip cut watershed with roads and skid trails, increases in turbidity were observed. This points towards the roads and skid trails that are used to access and remove felled trees as the conduits for sediment movement and transport. This, in turn, indicates the importance of directing mitigations or BMPs towards roads and skid trails associated with the proposed activities. This is also true for the activities planned in associated with the action alternatives. Because of this, BMPs will be used to reduce these effects as described below.

Most effects related to reopening roads and reusing skid trails can be limited to the short term using the BMPs and the 1986 LRMP standards and guidelines. However, the effect of elevated turbidity during storm events would probably remain. Turbidity related to skid roads would decrease to near zero as the skid trails revegetated and stabilized after operations are completed. Turbidity related to permanent roads would probably continue to occur as long as the roads are in place. However, this effect would be mostly the same as what is occurring presently since no new roads are proposed for construction in any of the Alternatives. Maintenance and restoration of some roads could contribute to this effect since disturbance and use of the roadbed allows sediment to mobilize and be removed in subsequent rainfall events. However, since the increases in turbidity occur only during storm events when turbidities are naturally elevated, it is not likely these increases will have an effect on aquatic life, stream morphologies, or overall

water quality in the watershed. This effect of sediment transported from the forest road system is currently being monitored through the forest wide water quality monitoring plan that takes annual samples across the forest to track water quality, including turbidity.

Stream crossings are another location in a harvest area where sediment can be mobilized into a stream. Runoff that is allowed to channelize has a greater likelihood of reaching a stream (Farrish et al, 1993). Unlike skid trails that revegetate quickly, a stream crossing can be unstable for years after its use. Problems associated with stream crossings can be very persistent (Staffard, et al, 1996). Many of these stream crossings will occur in the winter season when the banks are frozen. Winter harvest is an effective mitigation to reduce disturbance at smaller stream crossings because disturbance occurs when the channel is mostly covered in snow and ice and is frozen. When combined with mitigations such as temporary stream structures to protect the channel, drainage structures, and sediment control where needed, the overall integrity of the stream is protected and the designated crossing is the only site which may require restoration after the proposed activities are done. Effective restoration, where needed, is often successful due to the quick revegetation ability of the region combined with the appropriate restoration methods. Designated crossings will have drainage control where needed to prevent runoff directly into the stream. Silt fence may be used to prevent sediment from running off disturbed sites into streams. All stream crossing sites will be reshaped if needed and stabilized after use. In this way, impacts related to stream crossing sites will be minimized and stabilized after use. Most studies show that best management practices (BMPs) are very effective at reducing or eliminating the transport of sediments into watercourses (as summarized by Stafford, et al, 1996).

Another activity proposed in this action is the restoration of camping sites in the riparian area on the lower terraces of Eastman Brook and establishment of new sites away from the riparian area. The sediment movement and transport expected from this type of activity is small. As sites are stabilized, current rates of sediment movement from the disturbed sites, and particularly from the user-developed pathways that access these sites, will be slowed to eventually natural levels and vegetation will reestablish thereby creating an effective buffer along the stream. New sites created in the uplands away from riparian areas will have increased potential for sediment movement. The new sites will be hardened to prevent erosion and sedimentation. In addition, the new sites will be removed from the riparian area on the lower terraces of Eastman Brook and would utilize best management practices to prevent the concentration of water, directing it away from any streams. Protection will also be provided through enforcement by the permittee and Forest Service law enforcement officers (LEOs) on the forest.

Further, as the sites adjacent to Eastman Brook are stabilized, any sediment movement from the disturbed sites, and particularly from the user-developed pathways that access these sites, will eventually be slowed to natural levels as vegetation becomes reestablished. New sites created in the uplands away from riparian areas would have increased potential for sediment movement; however, these new sites would be located away from any streams or riparian areas, would be hardened to prevent erosion and sedimentation, and would be developed using BMPs to prevent the concentration of water or channelizing of water to any streams.

Alternative 1- No Action

There would be no direct or indirect effects on water quality from implementation of Alternative 1 (No Action). The current condition would remain. Streams, riparian areas, and floodplain would continue to function much in the same way as present. Dispersed campsites located on the lower terrace of Eastman Brook and the pathways that access them will continue to be used, and the potentially increasing erosion associated with these sites may contribute sediment to the stream. Water quality concerns associated with pollutants generated by use of these sites would remain. Otherwise, direct or indirect effects on water chemistry, temperature or overall quality would remain unchanged from that which exists now.

Alternatives 2–6

Because the mitigations would be used regardless of the action alternative selected, long-term direct and indirect effects to streams and riparian are not expected to occur for any of the action alternatives. Many effects are avoided through the avoidance of activities such as buffers and treatment restrictions around streams and riparian areas and designated stream crossings. Buffers for perennial streams have been incorporated into the unit boundaries. Intermittent riparian areas are protected with a width determined by their riparian type where no more than 50% of the basal area would be removed. For riparian areas without a classification, 100 feet will be used as the buffer area. In addition, winter harvest has been shown to be a very effective mitigation for stream crossings based on previous experience on the White Mountain National Forest. Six (6) stream crossings are proposed for possible use during non-winter season for alternatives 2-6. A measure that could be used to compare alternatives is the total number of stream crossing since this is the direct effect that varies by alternative. More crossings mean more

locations where short term and minimal effects are occurring to streams and their associated riparian areas. Less crossings result in less locations where these short-term effects could occur. Alternatives 2-5 would have 32 stream crossings, and Alternative 6 would have 21 stream crossings. Of the action alternatives, Alternative 6 would result in the least amount of short-term effects to streams and riparian areas based on the measure of stream crossings.

Because the mitigations would be used regardless of the action alternative selected, the harvest of trees is not expected to deplete nutrient levels in the watershed or cause water quality standards to be exceeded for any of the action alternatives. Chemical quality would remain high, water quality standards will continue to be met, and temperatures would stay cold using mitigations.

Differences between even-aged and uneven-aged management do not substantially alter the density of main skid roads (see §**3.1.2**). In addition, the location of roads and main skid trails does not vary among alternatives. The disturbance related to skid roads does vary according on the season of harvest and the number of units proposed for harvest. Prior experience on the White Mountain National Forest indicates that a maximum of 10% of the area harvested is disturbed by skidding operations when harvest is in the summer or fall, and 1% of the area harvested is disturbed if the harvest is in the winter (C. Guenther, 2002). Disturbance in winter is lower because of frozen ground conditions and snow pack. The season of harvest is the same across the alternatives for all proposed harvest units, with most being harvested in the winter and some made available, under the appropriate conditions, for summer or fall harvest. Therefore, unless units are deferred, the skid road density is the same in each alternative for each proposed unit. Similarly, the location of roads, main skid trails, stream crossings, and landings does not vary among alternatives, unless units are deferred in a particular alternative. The amount of disturbance can be measured by two parameters for sediment portion of water quality. These are 1) the total acres of ground disturbance from landings, skid trails, and newly created dispersed sites minus the acres of riparian restoration and 2) the number of stream crossings.

Table 15 summarizes these measures for the sediment portion of the water quality discussion. Based on this table, Alternative 6 may be expected to disturb the fewest acres (43.5), while Alternatives 4 and 5 may be expected to disturb the most acres (55.5). Mitigations are expected to reduce any effects of this disturbance to the short term.

Table 15: Comparison of Water Quality Measures by Alternative

Alternative	Number of Temporary Strean Crossings	Acres of Landings*	Acres Disturbed b Skid Trails**	Acres of riparian dispersed sites restored	Acres of upland dispersed sites created	Total Acres Disturbed
1	0	0	0	0	0	0
2	32	24	27	0	0	51
3	32	24	25	- 2.5	6	52.5
4	32	24	27	- 2.5	7	55.5
5	32	24	27	- 2.5	7	55.5
6	21	21	22	- 2.5	3	43.5

* Estimated Acres of landings = 1.5 acres (C.Guenther, 2002).

** Estimated from 10% maximum for units harvested in the summer and 1% disturbance for the winter harvest units (C.Guenther, 2002).

For Alternatives 3-6, the dispersed campsites located on the lower terrace of Eastman Brook and the pathways that access them would be removed and rehabilitated, and any potential for erosion presented by these sites would be removed as the sites stabilize and revegetate. Water quality concerns related to potential pollutants generated by use of these sites would also be removed. Alternative 2 does not remove and rehabilitate these sites, so it will have effects related to these sites that are similar to those for Alternative 1.

The direct and indirect effects on water quality from the proposed action alternatives are anticipated to be small and temporary. The existing roads, landings and skid trails provide an example of the condition that these facilities will be in several years following the sale if all appropriate standards and guidelines are followed. Skid trails and landings are vegetated and stable, showing little evidence of sheet or rill erosion. Water quality remains high. The turbidity standard for Class B waters does "not exceed natural conditions by more than 10 NTUs". There would be no new or increased point or non-point discharges to, or hydrologic modifications of, Outstanding Resource Waters, so the antidegradation provisions would be met. The same Soil and Water Conservation Practices (SWCPs or mitigations) described for all action alternatives would be implemented should any action alternative be selected. The water quality measures above are solely used to show the differences between each alternative.

Use of these mitigations will reduce sediment effects to water quality of the activities proposed in all action alternatives to short term and minimal. This is because the mitigations

described above have been shown to be effective in reducing transport of sediment to stream courses from skid trails, roads, stream crossings, restoration of riparian areas, and establishment of new upland dispersed sites.

Water Quantity

Changes in water quantity related to timber harvest can occur in two ways. The first way is related to the roads, skid trails, landings, and dispersed sites that provide compacted surfaces where water readily runs off, thereby increasing the ability of that surface to directly transport water to a stream. This process can increase peak flows. The other way is from changes in evapotranspiration that would occur when trees are removed from the project area. Less use of water by trees changes the water balance in the project area. This process in the White Mountains (Hornbeck, et al 1997) can result in increased base flows during the summer depending on the amount of basal area removed. However, these increases become undetectable 7-9 years after timber harvest and decreased water yield was observed for years 8-25 after strip cutting. This is attributed to the species of tree regenerating the forest. The first trees to grow after harvest tend to be trees (cherry and birch) that use more water than the harvested trees (maple and beech) (Hornbeck, et al 1997).

The discussion on water quantity will reference the watershed of Eastman Brook above the confluence with Talford Brook. This scale watershed was chosen because all of the proposed units are within the boundaries. (This should not be confused with the cumulative effects area, which is the 6th code watershed (hydrologic unit code (HUC) = 01070001030040) Eastman Brook down to its confluence with the Pemigewasset River.)

There would be potential for localized indirect effects on water quantity from reopening roads, skid trails, landings, and dispersed recreation sites. The compacted, less permeable surfaces of these features can alter the hydrology of the land by increasing the amount and velocity of runoff. The skid trail system can have the greatest potential to impact peak flows when poorly designed and with no regard to consequences (Stone, et al, 1978). For example, in a watershed with a commercial clearcut with high road density and tractor skidding, mean peak flows increased by about 30% in the first two years after logging (Swank and Crossley, 1988). Such increases in peak flows are undesirable since they can produce additional sediment transport, channel scouring, or flooding. However, it has been shown that low density, well-designed skid trail systems, combined with relatively small disturbance to the forest floor during harvest, produce the smallest changes to the magnitude of storm flow (Richter, 2000).

May and others (1997) summarized several studies to suggest that impairment related to elevated peak flows begins when percent total impervious area (%TIA) in a watershed reaches 10%. The total impervious area in the subwatershed of Eastman Brook above Talford Brook confluence was calculated and is listed in the table above. Calculations of total impervious area used assumptions related to roads, landings, dispersed recreation sites, trails, and skid roads acres that would result in a maximum estimate. Units from the Eastman West project, also within the subwatershed, were also included. The assumptions used are listed in Table 16. Based on this information, it appears that, at the subwatershed level, %TIA and its possible impacts to peak flows, is not a concern for this project or watershed since the level is less than 10%. In addition, numerous mitigations will be used to reduce this effect as well as other watershed effects previously discussed.

Table 16: Total Estimate of Impervious Area (in acres) by Alternative

Alternative	Roads [a]	Landings [b]	Skid Trails c[3]	Upland Dispersed Campsites created	Trails [d]	Total Impervious Acres	Percentage of Subwatershed
1	24.3	4.5	7.9	0	8.8	45.5	.6
2	24.3	28.5	18.7	0	8.8	80.3	1.1
3	24.3	28.5	17.9	6	8.8	85.5	1.2
4	24.3	28.5	18.7	7	8.8	87.3	1.2
5	24.3	28.5	18.7	7	8.8	87.3	1.2
6	24.3	25.5	18.7	3	8.8	80.3	1.1

a) Road width estimated at 20 feet

b) Estimated Acres of landings = 1.5 acre/per landing, as per C. Guenther (forester and sale administrator), 2-8-2002.

c) Based on assumption of that the impervious surface under a skidder results from the impact of the tires on the ground and an average skid trail clearing width of 15 feet per message from C. Guenther (2-8-2002). The width of tire tread averages 3 feet for each tire. Two 3-foot widths equal 6 feet. 6 divided by 15 is .4 or 40%, therefore only 40% of the skid trail contributes to the impervious calculation.

d) Assuming a trail width of 5 feet.

The removal of trees alters the evapotranspiration process within a timber stand. This results in an increase in soil moisture and in the amount of water available for runoff. This increase is greatest in the first year after harvest and decreases in successive years. Hydrologic recovery to preharvest levels generally occurs within 7-9 years (Hornbeck, et al 1997). The magnitude of the increase is generally proportional to the percentage reduction in stand basal area. However, measurable responses in annual water yield are not realized until the reduction in basal area of the watershed of interest is greater than 25 percent (Hornbeck, et

al 1997). This increase in water yield is generally a result of increased low flow levels, or as augmented base flow or delayed flow, and not an increase in peak or flood flows (Hornbeck et al., 1993). This increase in water yield can be considered a benefit of timber harvest but can also result in channel adjustment, sedimentation, and increased flood risk and can be offset in later years by reductions in water yield as early successional trees revegetate the harvested area.

Alternative 1- No Action

There would be no direct or indirect effects on water quantity from implementation of Alternative 1 (No Action). The current condition would remain. Forest Plan direction, and Soil and Water Conservation Practices would continue throughout the project area. Current and on-going management activities would continue.

Alternatives 2–6

Effects related to the reopening of roads, skid trails, landings, and creation of upland dispersed sites are unlikely to occur. The percentage of total impervious surface was used as an indicator for impairment related to increased peak flows, which could be caused by these impervious surfaces. All alternatives had levels of 1.2% or less within the subwatershed, well below the 10% level where effects began to be evident in the referenced summary (May and others, 1997). In addition, many of the same mitigations outlined above will also work to reduce the effect of compacted impervious surfaces on the water balance. Therefore, overall, there would be little or no effects from water yield increases related to roads, skid trails, landings, and dispersed sites in any of the action alternatives.

Effects of cutting on flows tend to be localized and are unlikely to extend beyond first or second order streams in well-managed forests, where relatively small portions of the watershed are being harvested at a given time. This is because such increases lose their identity as they join storm flow from the larger surrounding rivers (Neary and Hornbeck 1994). As a result, where localized effects can occur, channel morphologies may adjust to a new higher low flow level for the duration of the increase based on the qualitative relationship proposed by Schumm (1977). The magnitude of the increase in discharge and type of channel would dictate the extent of the change in channel characteristics such as width and depth. Mitigations described above would combine to reduce this effect by maintaining a buffer or harvest restrictions along perennial and intermittent streams, minimizing stream crossings, utilizing existing corridors for skid trails, and locating new skid trails in appropriate locations.

Table 17:Comparison of Alternatives - Weighted Average % Basal Area Removed in Upper, Middle, and Lower Portions of the Subwatershed

Watershed	Percent of Subwatershed >25% Basal Area Removed (Existing + Proposed) By Alternative					
	1	2	3	4	5	6
Upper	0	2	1	2	2	<1
Middle - (Little East Pond)	0	7	5	7	8	5
Lower	0	4	2	4	4	3

The measure for changes in water quantity is the number of acres treated with prescriptions greater than a 25% removal of basal area within the last 10 years for each of the smaller watersheds forming the Eastman Brook subwatershed. Where less than a 25% reduction in basal area is proposed, no measurable increase in discharge is expected in the channels. Different treatment types may be expected to result in different levels of basal area reduction, with clearcutting expected to result in a 100% basal area reduction, group selection producing an estimated 26% basal area reduction, single tree selection reducing basal area by an estimated 33%, and a combination of single tree and group selection reducing basal area by an estimated 27% (S.Wingate, 2002). Using these basal area reduction estimates for the proposed treatments in each alternative, Table 32 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. Therefore, no measurable increases in water quantity are expected to occur at this level; and, therefore, no associated effects would occur.

3.1.2.5 Water Quality and Quantity Cumulative Effects

The cumulative effects area for water quality and quantity is the Eastman Brook watershed. The 6th code watershed boundary is used (hydrologic unit code (HUC) = 01070001030040), because any effects on water quality and quantity that might be caused by activities in the Tripoli project would be diluted below this watershed. The Eastman Brook watershed encompasses approximately 11,500 acres; with ninety percent (90%) in federal ownership. The non-federal land (10%, or approximately 1,170 acres) is located in the southwest portion of the watershed in an area known as Thornton Gore. This ownership includes some family residences and camps, and small amounts of past forest management.

The Eastman Brook 6th code watershed was selected because the effects of multiple uses within the watershed could become additive and result in cumulative effects. As water flows downstream, pollutants mobilized into the watershed and any changes in water yield and chemistry related to the project merge with other waters within the watershed, allowing for an analysis of the overall effect of changes in the watershed. The outlet of the watershed boundary is also the terminus of Eastman Brook, where it enters the larger Pemigewasset River. The larger flows of this river would make it difficult to discern any cumulative effects related to this project or within the Eastman Brook watershed at all. Therefore, the Eastman Brook watershed was used as the cumulative effects area for water resource effects.

Past and present activities that occur in the watershed include timber harvest, recreation, road maintenance and use, and activities on private land such as residential development and roads. Future activities include the proposed timber harvest, additional activity in the private lands, continued recreation use, and ongoing road maintenance and use.

Small amounts of forest management and land clearing for home building may occur on the private land in the Thornton Gore area within the next ten years. However, these activities are expected to occur on only a portion of the private land, which is itself only a small portion (10%) of the cumulative effects area; and these activities are not expected to contribute appreciably to the potential cumulative effects from the Tripoli Vegetation Management project (see **§3.2.1.4**).

In the Eastman Brook watershed, approximately 400 acres in the Eastman West Timber Sale have been treated within the last few years. Treatment types vary from clearcuts to thinning. In general, due to the limited nature of timber harvesting practices and the use of BMPs, effects from timber harvest on the White Mountain National Forest are limited to the project subwatersheds and are diluted by incoming streamflows downstream of the treated area. In addition, to protect against cumulative effects on water quantity from generation of additional runoff by timber harvest, the Forest Plan includes a standard and guideline that limits the amount of clear cutting in a 1,000 acre or larger watershed to 25 percent within a ten year period (LRMP p. III-17). Any clearcuts in the watershed younger than 10 years of age would be part of the Eastman West Timber Sale, and these clearcuts comprise approximately 66 acres, which is less than 1 percent of the watershed area.

The roads within the Eastman Brook watershed are likely already contributing to some changes in the routing of water and sediment within the watershed. Past, present, and future road activities are expected to continue in much the same way as present. Road density in the watershed is 0.9 miles per square mile. No road construction is proposed in the Tripoli project and no road construction is anticipated on federal land within the next decade. Trails may also be contributing to this effect to a lesser extent. There is no documentation as to what extent this is occurring and what the impacts are. However, based on observation and knowledge of the watershed some generalizations can be made. Effects related to sediment do not appear to be occurring in the Eastman Brook watershed since pools are not filled with sediment and gravels are still loose and not filled with fine sediment as described earlier in this report. Increased NTU levels during peak flows may be occurring but it is unknown to what extent this is occurring. This is not much of a concern since increased NTUs during peak flows are a natural occurrence and return to normal levels shortly after the peak flows are over. This could become a concern if turbidity remained high for longer periods after the peak flows subside and higher levels of sediment during peak flows reach levels that become a concern to water supplies and bedload movement.

Cumulative effects related to past, present, and future recreational activities in the Eastman Brook watershed have not been observed or detected. Recreation use in this watershed is largely limited to dispersed campsites along the roads and near the trails and ponds, and to the roads, trails and ponds themselves. Localized effects do occur when use is repetitive, but these are mostly limited to short sections of stream banks. More widespread erosion of stream banks or sediment loading in the streambeds is not in evidence anywhere in the watershed, and these localized effects are unlikely to contribute to cumulative effects. Future activities are expected to continue in much the same way as the present with ongoing restoration of near-stream dispersed sites. In this way, cumulative effects in the future are also not expected to occur since restoration activities would continue to occur and the localized effects would decrease.

There is a low risk of cumulative effects on water quality, water quantity, or on the condition of streams, riparian areas, or floodplains within the Eastman Brook watershed as a result of any of the alternatives, particularly because the alternatives propose activities that would result in short term disturbance on a relatively small portion of the watershed, most of which would be mitigated using BMPs and standards and guidelines from the 1986 LRMP. In some alternatives, water quality may be improved as a result of the relocation and rehabilitation of dispersed campsites within the lower terrace of Eastman Brook.

3.1.3 AIR QUALITY

3.1.3.1 Air Quality Affected Environment

See Appendix H, §**B.2.3.1** for additional information on the airshed characteristics of the White Mountain National Forest.

The Tripoli project area, located in the White Mountains airshed, is about 12.5 miles from the Presidential Range-Dry River Wilderness and 23 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 and south slopes of the predominately east west trending valley of Eastman Brook. 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. It can be seen from the occurrence maps, 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 45 miles from the closet point of Merrimack County.

3.1.3.2 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.

3.1.3.3 Air Quality Direct and Indirect Effects

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 ($NO_{x)}$ and particulate matter, both of which contribute to public health problems in the United States. NO_x emissions from diesel vehicles play a major role in ground-level ozone formation that is most problematic in the summer months.

Rehabilitation of dispersed camping sites located on the lower terraces of Eastman Brook and its tributaries is all done by hand. Closure of old sites and opening new ones would not change the overall emissions related to recreational use along the Tripoli Road. Because of these factors, air quality changes related to the activity of restoration and creation of dispersed sites is not expected to occur for any of the proposed actions that include this activity. Therefore, this activity is not carried through into the discussion of alternatives.

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 Tripoli Road will continue to be used for dispersed recreation on a fee basis in the summer and fall, and as a snowmobile trail in the winter. Visitors camping at designated sites within the project area will continue to use campfires. These existing emissions are currently contributing to the air quality condition described in the affected environment as well as the larger scale air quality issues discussed in the cumulative effects section of this report.

Alternatives 2-6

The direct effect of timber harvest and road maintenance activities proposed in these action alternatives is the emission of NO_x and particulate matter resulting from the use of heavy equipment, diesel-operated motors, and 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 harvest would minimize this effect so that ozone is unlikely to form at elevated levels as a result of the proposed activities. For units harvested outside of winter, effects would depend on levels of emissions from the vehicles and the weather conditions, including amount of sunlight and temperature. 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.

The relocation of the dispersed campsites within the lower terrace of Eastman Brook is proposed in Alternatives 3-6. This includes the rehabilitation of the existing campsites, and development of replacement sites located well away from the stream. The rehabilitation of the old sites would be accomplished using hand tools, while the new sites would generally be located in areas that have already been cleared as landings for logging operations. The work associated with this trade-off of sites is not expected to contribute to emissions generated by the other work proposed in these Alternatives, nor will it contribute any additional emissions related to the recreational use along the Tripoli Road. This is because the net balance of dispersed campsites will not change

3.1.3.4 Air Quality Cumulative Effects

For a general discussion of the cumulative effects of air quality on the White Mountain National Forest, see Appendix H, §**B.2.3.1**.

The cumulative effects area for air quality is the Eastman Brook subwatershed, 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.

Alternative 1 - No Action

No local emissions related to the proposed action would occur. The existing condition and trends as described in the affected environment would remain much the same. The same activities that currently are occurring in the cumulative effects area would continue to occur. 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 is largely undeveloped. Cumulative effects, as described in Appendix H, §**B.2.3.1**, would continue to occur with the same trends.

Alternatives 2-6

All alternatives would result in the same activities that produce emissions, the use of heavy equipment and trucks. None of these emissions is expected to contribute to existing cumulative effects already present in the cumulative effects area. This conclusion is reached, because, as discussed in **Air Quality Direct and Indirect Effects**, above, the emissions related to the action alternatives are expected to be local to the project area and of limited extent. These limitations are due to the timing for most of the harvesting (winter season) and the limited duration of these emissions.

3.1.4 TRANSPORTATION FACILITIES

3.1.4.1 Transportation Affected Environment

The Tripoli East project area contains 11.3 miles of National Forest "Forest Development Roads". The project area is approximately 4.7 square miles (3,000 acres), so the density of Forest Development Roads is 2.4 miles per square mile of National Forest land. Table 18, below, displays the inventory numbers, names and lengths for the Forest Service classified roads within the Tripoli East project area. These Forest Development Roads fall into three general categories: 1) roads seasonally open to the public, 2) roads that are open to the public on a limited basis, and 3) roads that are not open to the public. All of these roads are in place and are suitable and adequate for the logging systems used in this National Forest. In some cases, roads in categories 2 and 3 have had drainage structures removed and waterbars installed since their last use, and they will need to be "restored" to their original operating condition. This may involve clearing brush that has grown in the roadway over the years, cleaning or reestablishing ditches, and spot surfacing or grading, as well as replacing the drainage structures and removing the waterbars. A fourth road category is temporary roads used to access landings. These roads may be newly constructed or they may reconstruction utilizing an old skid trail. In either case, temporary roads are intended to supplement the classified road network by providing one-time access to a specific project. Once the project is completed, the road is no longer needed, and it is decommissioned (obliterated or closed and allowed to

revegetate).

Table 18: National Forest System Roads (NFSR) within the Tripoli East Project Area (Map 1)

FS Road	Road Name	Total Length Within Project Area
NFSR 30	Tripoli [a]	5.6 Miles
NFSR 31	Hix Mountain Road [b]	1.4 Miles
NFSR 31A	Hix Mountain Spur [c]	1.0 Miles
NFSR 31B	Hix Mountain Spur [d]	0.3 Miles
NFSR 608	Seeger Spur [d]	0.2 Miles
NFSR 609	Mack Brook Road [b]	1.5 Miles
NFSR 611	Clear Brook Spur [e]	0.2 Miles
NFSR 612	Short Spur [e]	0.4 Miles
NFSR 613	East Pond [f]	0.4 Miles
NFSR 614	Eastman Road [b]	0.3 Miles
	Total	**11.3 Miles**

[a] The road is gated shut when ice and snow accumulate making travel unsafe in the fall. The western 6 miles are open to snowmobile traffic during the winter when there are no active timber sales and then on holidays and weekends. Open to vehicle travel in the late spring after mud season and usually before Memorial Day weekend.

[b] Gated shut year around. Used for dispersed camping during very busy periods.

[c] Road gated. Used for intermittent hauling.

[d] Gated shut year around. Used for dispersed camping during very busy periods. Winter hauling only

[e] Berm. Winter hauling only.

[f] Road leads to a trailhead parking lot for first 0.1 miles. For next 0.3 miles, the trail is on the road.

In 2000, the Forest Service issued new rules for managing the transportation facilities of the National Forest System. These rules define roads as classified (needed for long term use), unclassified (existing roads for which a determination of long term need has not yet been made), and temporary (roads not necessary for long term use). The process of developing an inventory and atlas of all roads within the White Mountain National Forest, and a Forest-wide roads analysis that will initiate the process for determining the long term need for each road on the Forest are both ongoing, and are intended to inform any changes in the management of the Forest road network that may result from the revision of the 1986 LRMP that is currently underway. For this environmental assessment, road definitions and management direction is that which is provided by the 1986 LRMP.

The 1986 LRMP defines Forest Development Roads as "those roads needed for White Mountain National Forest purposes" and describes three standards for these roads: Type I (intermittent - winter service), Type II (intermittent – seasonal service), and Type III (three season, constant service).

Within the Tripoli East project area, three roads meet the Type III standard – Tripoli Road (Forest Development Road (FDR) 30), Mack Brook Road (FDR 609), and Hix Mountain Road (FDR 31). The remaining roads are either Type I or Type II.

The Tripoli Road, Forest Development Road (FDR) 30, is the only one of the Type III roads that falls into the first category of "roads seasonally open to the public". Although only 5.3 miles of the Tripoli Road fall within the project area, the full length of the road is 11.8 miles, and it connects Interstate 93 to the west with Waterville Valley to the east. The Tripoli Road is not the primary access route to Waterville Valley (that would be State Highway 49, to the south); but, when it is open in the spring, summer and fall, it is used as a short cut, or route of convenience, for those traveling between the towns of Lincoln and Waterville Valley. This is a two-lane road that is paved from State Highway 175 (near the I-93 interchange) to the intersection with the Russell Pond Road and from the Waterville Valley town line to the intersection with State Highway 49. The section between the paved portions is surfaced with crushed aggregate and is well drained. Gates control road use. FDR 30 is closed in the late fall when the surface becomes slick due to ice and snow in the late fall. The section of the road that traverses the project area is used as a snowmobile trail in the winter. This road is in excellent condition and funds collected during any timber harvest operations that use the road can be used for work above and beyond the regular maintenance needs that may result from hauling. Within the project area, there are as many as 500 dispersed, primitive campsites spaced along the Tripoli Road (as well as the Mack Brook and Hix Mountain Roads). Access to these sites is controlled through a fee station

near the west gate of the Tripoli Road, and the sites receive regular use during the summer and intermittent use in the spring and fall. Use is particularly high during the weeks of the Memorial Day, Forth of July and Labor Day holidays. More detail on the management of these sites is included in the Recreation affected environment section (see §**3.3.2**).

Mack Brook Road (FDR 609) and Hix Mountain Road (FDR 31) are Type III roads that fall into the second category of "roads that are open to the public on a limited basis". These two roads provide access to a large portion of the project area. They are surfaced with aggregate, and are gated shut for much of the year. They have a number of the dispersed, primitive campsites located along their respective lengths, but vehicle access to these sites is typically limited to overflow periods, usually high use weekends and holidays. If these roads are used for access during timber harvest, the purchaser would be responsible for maintenance.

The remaining six Forest Development Roads within the project area are Type I or Type II Roads that fit the third category of "roads that are not open to the public" for motorized access. These roads tend to be short spurs, generally less than ½ mile in length (with some exceptions) that access landing sites. They may have either bankrun or aggregate surfacing over small stretches, but they generally tend to have a native soil surface and many are limited to vehicle use only during frozen soil conditions. These six roads account for 2.8 of the 11.3 miles of Forest Development Roads within the project area. If these roads are used for access during timber harvest, the purchaser would be responsible for maintenance. However, most of these roads had drainage structures removed and waterbars installed, and have received little if any use since they were closed to the public. These roads will need to be restored to their original operating condition before they can be used for vehicle access again.

In addition to the Forest Development Roads, there is a more extensive network of travelways within the project area. This includes old logging roads and skid trails, a number of which may predate the National Forest, and most of which might be called "unclassified roads" under the 2000 transportation rules. There are also a few hiking trails, including East Pond, Little East Pond, East Pond Loop and Mt. Tecumseh trails.

A number of steps would need to be taken to facilitate a timber harvest operation using the Forest Development Roads and other travelways within the project area. As much as 4.5 miles of Forest Development Roads (including some segments of the Hix Mountain and Mack Brook Roads) would need to be restored to the "standard to which they were originally constructed". A system of skid trails and landings would need to be identified and utilized to access individual stands and move trees to central loading sites. For the most part, this system would utilize the existing network of old logging roads, skid trails and landing sites. Although harvest operations could need as much as 29 miles of skid trails and 15 landings, few new skid trails would need to be cleared, and a maximum of 5 new landings would need to be constructed (landings are generally ¼ to ½-acre in size) to service all of the potential harvest units identified in the project area. Most of the landings are located adjacent to Forest Development Roads; but, in the case of some of the new landings, they may be in a location that requires construction of a temporary road to gain access. In these situations, the operator is often given the option of constructing temporary roads to move the landing closer to the stands being harvested, or keeping the landings closer to the Forest Development Road and using longer skid distances. For the Tripoli East project area, it is anticipated that as much as 0.5 miles of temporary roads could be constructed to facilitate access to the new landings. Any temporary roads would be constructed for winter access only. If some of these new landings are converted to dispersed campsites, then the temporary road would be closed and converted to a footpath. Otherwise, temporary roads would be obliterated upon completion of timber harvest operations.

3.1.4.2 Mitigation Measures

In addition to the generally applicable Forest-wide and Management Area Standards and

Guidelines listed in the Forest Plan (§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 East Pond and Little East Pond Trails and the Tripoli Road to recreation use during winter weekday sale operations if operations create a potential hazard to trail users. Signs warning of harvesting and trucking activities would be posted at all major entry points. Require in sale contract.
- Winter log hauling would be limited to non-holiday weekdays (Monday through Friday) on the Tripoli Road between the Hix Mountain Road #31A and East Pond Road #613. This section of the Tripoli Road would be closed to snowmobiles during weekdays to minimize conflicts with snowmobiles. The remaining southern portion of Tripoli Road would be closed to snowmobiles during sale operations. Signs would be posted at all entry points to the Tripoli Road. These would be required in sale contract. Coordination with snowmobile clubs will occur prior to sale activity. These would be required in sale contract.
- Summer/fall log hauling would be limited to non-holiday weekdays (Monday through Thursday) on the Tripoli Road and all tributary roads. All logging activities on the Mack Brook Road (NFSR 609) will be prohibited on the Fourth of July, Labor Day, and the day before each holiday. These would be required in sale contract.
- Slash disposal zones and treatment would be as follows:
- From the edge of the Tripoli Road (NFSR 30) and the East Pond Trail and the Little East Pond Trail (#'s 366 and 367) all slash from purchasers operations will be removed a distance of 50' and lopped to within 3' of the ground for another 50'.
- Roads will be closed from March 30–May 20 to reduce deterioration of roads during spring break-up.
- 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.
- Upon completion of harvesting operations, any temporary roads constructed to facilitate access will be closed and converted to footpaths, or obliterated.

3.1.4.3 Transportation Facilities Direct and Indirect Effects

No road construction – either permanent or temporary - is planned for any alternatives. The existing road density of 2.4 miles of road per square mile would not change.

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 (see Table 32, above). Regular planned road maintenance will occur on the Tripoli Road. Activities may include: smoothing, removing debris, cleaning ditches, and replacing culverts. With no activities taking place, there will be no direct effects.

Alternatives 2-6

Table 19 displays the roads that would be used to implement Alternatives 2-6 and the miles of the roads that would be used. See Table 18, above, for the status of the roads that will not change with implementation of Alternatives 2-6.

Table 19: Forest Service Roads and Miles Necessary to Implement Alternatives 2-6

		Road Miles Used to Implement Alternatives	
FS Road	Total length	Alts 2-5	Alt 6
NFSR 30	11.8 Miles	4.7 Miles	
NFSR 31	3.8 Miles	0.2 Miles	
NFSR 31A	1.0Miles	1.0 Miles	
NFSR 607	1.6 Miles	1.6 Miles	
NFSR 608	0.2 Miles	0.2 Miles	
NFSR 609	1.5 Miles	1.5 Miles	
NFSR 611	0.2Miles	0.2 Miles	0.0 Miles
NFSR 612	0.4 Miles	0.4 Miles	0.0 Miles
NFSR 613	0.4 Miles	0.4 Miles	0.0 Miles

Implementation of timber harvest in Alternatives 2-5 would require approximately 15 landings. Ten (10) of the landings are already in place. Some trees and saplings would need to be cleared before the existing landings can be used. The remaining five (5) landings would need to be constructed. Landing location and use are

agreed to between the purchaser and the Forest Service prior to implementation.

Implementation of timber harvest in Alternative 6 would require up to 12 landings. Eight (8) of the landings are already in place. Some trees and saplings would need to be cleared before the existing landings can be used. The remaining four (4) landings would need to be constructed.

A ground-based logging system would be used for harvesting timber. Trees would be felled either mechanically or by chainsaw. 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. T

The Little East Pond Trail crosses through proposed timber harvest units 4, 6, and 7. Many perennial and intermittent streams flow through these units, and the number of stream crossings is a direct result of the number of times that skid trails are allowed to cross the Little East Pond Trail. Stream crossings for skid trails here and elsewhere in the project area will be determined in advance by Forest Service personnel.

Skid trails would utilize existing corridors wherever possible, typically old temporary roads (including the Old Tripoli Road) and skid trails. In those situations where new corridors would be needed to skid wood, they would be constructed in accordance with the standards and guidelines established in the 1986 LRMP. Consideration was given to reconstructing some of the old temporary roads (including the Old Tripoli Road) to facilitate truck traffic; however, this was not necessary to provide access to landing sites and maintain adequate operational efficiency for the proposed timber harvest.

To implement Alternatives 2-6, road restoration will be required for between 3.7 and 4.5 miles of existing Forest Service roads. As defined by the 1986 LRMP, restoration 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 also mean removing brush from the travelway and ditches, cleaning and reestablishing ditch lines and drainage patterns, curve widening where necessary, placing spot surfacing, and grading.

During winter harvesting operations, the Tripoli Road would be managed to accommodate both timber harvesting and snowmobile use in a safe manner. The road would be plowed to facilitate log hauling. Harvesting and hauling would be permitted Monday through Friday, and on non-holiday weekdays. Snowmobiles would be permitted to operate on the road on Saturdays, Sundays and holidays. This schedule of use has proven an effective and safe means of managing logging and recreation activities during the adjacent Eastman West project.

If eligible units are harvested during the summer or fall, the Tripoli Road would be managed to accommodate both timber harvesting and the dispersed recreation use in a safe manner. In addition to the dispersed use that the Tripoli Road receives during the summer and fall, the road is also used as a short cut for those traveling between the towns of Lincoln and Waterville Valley and is used to access the East and Little East Pond Trails and the Russell Pond Campground (east of the project area). To minimize possible conflicts between potential summer and fall harvesting operations and recreational use of the Tripoli Road, timber harvest and hauling would be restricted in the summer and fall to non-holiday weekdays, Monday through Thursday. In the adjacent Eastman West project, this schedule of use provided a safe, effective means of managing logging and recreation activities on the Tripoli Road.

See sections **3.1.2.4**, **3.2.2**, and **3.3.2** for the indirect affects that roads, landings, and skid trails may have on these resources.

3.1.4.4 Transportation Facilities Cumulative Effects

For this discussion of the cumulative effects associated with transportation facilities, the analysis area is the Eastman Brook subwatershed, including both the Eastman West project and the Tripoli East project areas, because this area encompasses all of the Forest Service management activities that have taken place on the transportation facilities servicing the Tripoli East project area in the recent past, and that might take place in the reasonably foreseeable future.

The existing road density in the subwatershed is 0.9 miles per square mile. No road construction is proposed for the Tripoli East project and no road construction is anticipated on federal land within the cumulative effects area over the next decade.

For the Eastman West project, an existing skid trail system was used extensively to implement timber harvest operations. As a result, no new roads were constructed, and few additional travel corridors were developed for new skid trails.

The Eastman West project moved some dispersed camping sites along the Tripoli Road from the lower terraces of Eastman Brook and its tributaries and into log landings on the uphill side of the road. This relieved parking congestion along the road and prevented possible minor erosion and sedimentation of Eastman Brook.

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. Dispersed campsites in the lower terrace along Eastman Brook would not be relocated to upland sites on landings associated with timber harvest.

While there would be no cumulative effects to the overall transportation system, there could continue to be minor congestion problems from parking associated with dispersed camping.

The old skid trails in the subwatershed have been used as travelways for hunters and recreationists for many years. No new travelways would be developed, and there would be no cumulative effect.

Because none of the dispersed campsites in the lower terraces of Eastman Brook and its tributaries would be relocated or rehabilitated, there could be some minor erosion resulting from use of the dispersed campsites and pathways during periods of out of bank flows.

Alternatives 2-6

Cumulative effects to the overall transportation system will be the same as for Alternative 1.

The Eastman West project moved some dispersed camping sites along the Tripoli Road off the lower terraces of Eastman Brook and its tributaries and into log landings on the uphill side of the road. This offered some relief of parking congestion along the road, prevented some erosion resulting from vehicles parking on road shoulders and in ditch lines, and eased potential sedimentation in Eastman Brook. Alternative 2 does not move any dispersed campsites from lower terrace sites to upland sites, and the cumulative effects for this Alternative are similar to those for Alternative 1. Alternatives 3-6 do propose to relocate and rehabilitate dispersed campsites in a manner similar to that employed in the Eastman West project. The total number of dispersed camping sites along the road would not be increased; however, parking at these sites would be moved off the road and into designated areas. Cumulatively this would improve safety by decreasing congestion along the Tripoli Road; and it would decrease maintenance by preventing vehicles from parking on the shoulders and ditch lines of the road, particularly near stream locations that are susceptible to erosion from the road.

The old skid trails in the subwatershed have been used as travelways for hunters and recreationists for many years. While few additional skid trails were constructed to accommodate timber harvest operations for the Eastman West project, and few would have to be constructed for the Tripoli East project, any new skid trails would contribute to a minor increase in the travel corridors already in existence in the Eastman Brook subwatershed.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 VEGETATION

3.2.1.1 Vegetation Affected Environment

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).

Within the project area, there is a predominance of northern hardwood forest (75%). The aspen-birch, spruce-fir, hemlock, and pine-oak (no oak in the project area only pine) forest communities do not meet Forest Plan desired conditions for HMUs 416 and 417 (Appendix D, Tables 1-3). Although the species content of these stands may change due to the proposed activities, it unlikely that there would be an increase to some of these community types.

The project area was first settled and influenced by western culture in the late 1700s and early 1800s. New England pioneers cut roads and farmsteads out of the original vegetation in the lower elevations. Over time, these early families increased the area they farmed to include pastureland, and they harvested timber for subsistence or local sale. Eventually, transportation technology made it economical to ship agricultural products from the Midwest to the east coast. Subsistence farming in New England became uneconomical, and farms were abandoned.

As these farms were abandoned, the railroad-logging era began, and all of the project area was harvested. The phase out of farming and phase in of large-scale logging created a variety of ages for the stands of trees in the project area. Most stands originated between 1890 and 1930. Generally, the older stands

are in the lower elevations and reverted from farmland or farm wood lots and sugar bushes. , Some of these stands may have been first cut at the beginning of the railroad-logging era. Harvesting then progressed up the slopes. The higher elevations were cut last when there was nothing else left. There are exceptions where stands were not completely cut. The older, residual trees are now the dominant trees in the present stands. Many of the more mature stands were regenerated in previous decades.

Some succession of cover types has occurred as tree cover became established. When the current vegetation in the project area was young, there would have been a higher percentage of shade-intolerant, short-lived species such as aspen, pin cherry, and paper birch. Over time, and due to competition between trees, the composition has changed to favor more shade-tolerant and longer-lived species such as sugar maple, beech, and yellow birch.

Many of the stands are classed as low quality. This is largely due to beech content. American beech is highly susceptible to an introduced insect known as Beech Scale. This insect creates a feeding hole the bark. Later the hole provides an entryway for the naturally occurring *Necteria* fungus. Scale alone can kill larger trees. In combination with *Necteria*, it will often kill moderate-sized trees. The wood in most other trees is degraded by wounds and lesions in the bark created by *Necteria*. In addition, many of the paper birch trees are beginning to decline as a result of aging.

Most of the project area was acquired by the Forest Service in 1916. Composition and stand age have also been influenced by management activities in the recent past. In the 1930s and 40s, there were a number of small timber sales proposed to thin older stands along Eastman Brook. In the 1950s and 60s, 529 acres of the better-stocked, younger stands were thinned. Often these treatments featured the harvesting of faster growing, short-lived species and the salvage of the most severely affected beech. Reduced competition allowed better quality trees to grow faster. Then, in the 1970s, 100 acres of the most mature and lowest quality stands were regenerated. During the 80s, 649 acres were regenerated, 440 were thinned, and 122 acres were treated using uneven-aged management. The uneven-aged treatments included 23 acres of improvement cutting and 99 acres of group selection. Of the thinned acres, 170 were regenerated later. In some other cases these treatments have overlapped but in total, 1,141 acres, or 26% of the project area, has received one or more management treatments since the 1930s. Of those treated acres, 749 acres, or 16% of the project area, was successfully regenerated. Currently, 50 acres are in the regenerating age class (0-10 years).

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 (Appendix E, §**Silvicultural Determinations**). The results propose even-aged management on 70% of the project area and uneven-aged management on the remainder.

Appendix E contains a summary of the acreages and ages. For the stands being analyzed in the action alternatives, northern hardwoods predominate. All of the stands have reached a point where a treatment is recommended based upon the current stand condition, management objectives, Forest Plan standards and guidelines, and the respective Silvicultural Guides. The silvicultural prescriptions contained in the project file describe this in more detail. All of the stands being considered for even-aged regeneration are mature. Some of these stands are primarily stocked with poorly formed trees. These stands are classified as low quality, meaning they do not have adequate stocking of healthy trees or quality stems to fully utilize the site.

Herbaceous Vegetation: During site-specific ID-Team field reviews of the Tripoli East project area, District Biologist Weloth observed the following common herbaceous

plant species. These species are typically found in the northern hardwood forests of the White Mountain National Forest: Wood fern; star flower; sarsaparilla; clintonia; club moss; false solomon seal; Indian cucumber; wild oats; lady slipper; bracken fern; false lily of the valley; aster; partridgeberry; and sparse trillium.

During further site-specific surveys within portions of the Tripoli East Project Area, the New Hampshire Natural Heritage Inventory (NHNHI, Sperduto 1998) documented the occurrence of the following shrub and plant species. These species are not considered unique or rare but occur less frequently in the northern hardwood forest compared to those listed above: Alternate-leaved dogwood *(Cornus alternifolia)*; red-berried elder *(Sambucus pubens)*; Jack-in-the-pulpit *(Arisaema atrorubens)*; round-leaved violet *(Viola rotundifolia);* and sweet cicely *(Osmorhiza claytoni)*.

Federally-listed Threatened, Endangered, Proposed; Eastern Region 9 Sensitive; and State-listed Threatened, Endangered, Special Concern and Other Concern Plants

This section summarizes the probability of occurrence of federally-listed threatened, endangered, proposed and Forest Service Eastern Region 9-listed sensitive plant species (TEPS) for the Tripoli East project area that were addressed in detail in the Tripoli East BE/BA and Supplemental Information Reports (located in the project file). Probability of occurrence and analysis of effects to State-listed threatened, endangered, species-of-special concern (TESSC) and other species of concern are addressed in the Vegetation Report (Appendix E) and in Appendix G1 & G2. Many of the federal- and state-listed plant species are associated with alpine and sub alpine habitat, and these habitats do not occur within the Tripoli East project area (Sperduto and Cogbill 1999, Sperduto 1998). Therefore, there is no probability of plants associated with those alpine habitat types occurring in the Tripoli East project area.

The Tripoli East project area does not contain suitable alpine bog/meadow/ravine habitats for the recently federally de-listed endangered Robbins' cinquefoil *(Potentilla robbinsiana)*. The USFWS's maps highlighted potential suitable habitat for the federally-listed threatened small whorled pogonia *(Isotria medeoloides)* within a small portion of the project area. However, Forest Service and NHNHI directed searches found none (Sperduto 1998; Williams 1998). See the detailed NHNHI plant survey report and the Tripoli East BE/BA and Supplemental Information Reports in the project file.

The Forest Service checked the NHNHI database of rare plant occurrences throughout the state and there are no known documented occurrences of federally- or state-listed plants within the Tripoli East project area (Sperduto, 1998). NHNHI found no TEPS plants during site-specific botanical survey of portions of compartments and stands having greater probability of occurrence (Sperduto, 1998). However, additional Forest Service interdisciplinary team review documented the occurrence of R9-listed sensitive species butternut *(Juglans cinerea)*, American ginseng *(Panax quinquefolius,)* and squirrel corn *(Dicentra canadensis)* within localized portions of the Tripoli East project area. Based on suitable habitat present within the hardwood and spruce/fir community types within the project area, the Tripoli East BE/BA, as amended, and Supplemental Information Reports (in project file) disclosed there is a very low probability and/or documented occurrence of the federally-listed plant species in the Tripoli East project area shown in Table 20.

Table 20- TEPS Plants with Probability and/or Documented Occurrence Within The Tripoli East Area.

Federal Status	TEPS SPECIES		Probability Of Occurrence/Habitat type
R9-Sensitive	Bailey's sedge	*(Carex baileyi)*	Very low potential = forested wetlands
R9-Sensitive	Clustered sedge	*(Carex cumulata)*	Very low potential = open woods

Federal Status	TEPS SPECIES		Probability Of Occurrence/Habitat type
R9-Sensitive	Squirrel-corn	*(Dicentra canadensis)*	Documented occurrence = moist woods
R9-Sensitive	Goldie's woodfern	*(Dryopteris goldiana)*	Very low potential = rich mesic forest
R9-Sensitive	Butternut	(*Juglans cinerea*)	Documented occurrence = deciduous forest
R9-Sensitive	Broad-leaved twayblade	*(Listera convallarioides)*	Very low potential = wet shady woods
R9-Sensitive	Chilean sweet cicely	*(Osmorhiza berteroi)*	Very low potential = deciduous forest
R9-Sensitive	American ginseng	*(Panax quinquefolius)*	Documented occurrence= semi-mesic forest
R9-Sensitive	Nodding pogonia	*(Triphora trianthophora)*	Very low potential = beech hardwoods

3.2.1.2 Vegetation- related Mitigation Measures

- 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 leave trees.
- In clearcuts, 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 would be applied by removing some of the interfering woody vegetation.
- All documented locations of individual Eastern Region 9-listed sensitive species of butternut trees and ginseng and squirrel corn plants would be monitored. If additional listed plants are found during project implementation, the sale administrator would alert the district biologist, and protective measures would be taken.
- Vegetation planted as part of the dispersed camping site rehabilitation activities would comply with Executive Order 13112, 23/99

3.2.1.3 Vegetation Direct and Indirect Effects

The general effects of timber harvesting activities on vegetative diversity can be found in the Forest Plan FEIS, pp. IV-32 and IV-33. For a discussion of general effects of timber harvesting on vegetation see §**B.2.4.1** in Appendix H.

Alternative 1 – No Action

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. These trees would be replaced by other or more shade-tolerant individuals. Over time, the stand would begin to resemble the climax vegetation type. This means 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 encouraging the less shade tolerant species.

Natural forces such as wind, ice storms, or fire could set this process back and result in natural regeneration that is similar to even-aged management. These events would favor shade-intolerant species. These events occur at random and infrequently in natural settings. Any attempt to predict the timing or size of an occurrence in the project area within the foreseeable future would be unreliable.

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

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

Alternative 2 – Proposed Action

Mature and low quality stands planned for regeneration cuts (141 ac) would be replaced by young growth. Species content in these stands would to shift more towards shade intolerants such as aspen, paper birch, and white ash. The disturbance may encourage regeneration from red oak, white pine, yellow birch, or hemlock. A few species of woody or herbaceous vegetation, who's seeds have a long period of dormancy, such as raspberry and pin cherry, would have an opportunity to germinate and become part of the ecosystem for a period of time. This would increase species diversity.

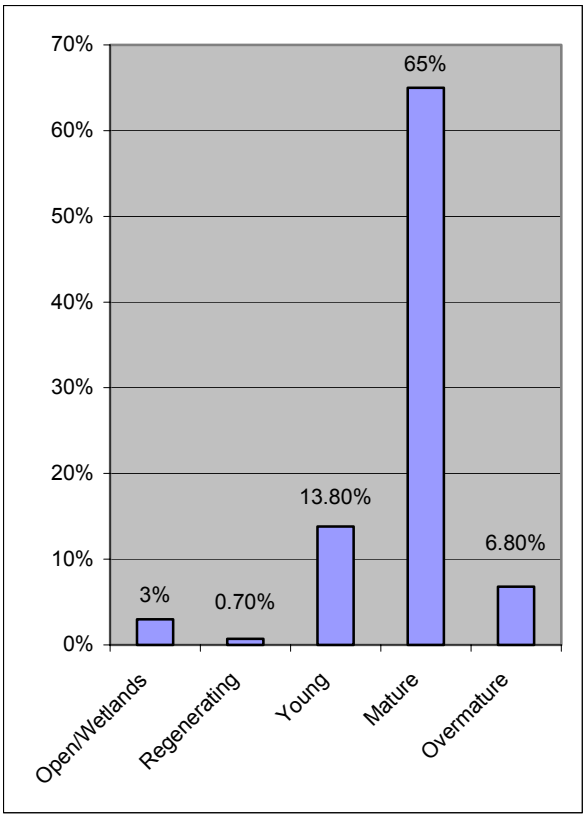
Stands planned for group selection (781 stand ac) would have regeneration cuts that are small in size, 1/10 to 2 acres, and are located throughout the stand. These groups would regenerate approximately ¼ of the stand area. Group selection would continue to be practiced in these stands in future management entries. Regeneration would tend toward a broader 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. 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. 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 cut 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 harvest units. Herbaceous plants in adjacent uncut stands would also be affected up to approximately 100 feet from the edge of the units proposed for clearcutting. The effects include changes in environmental gradients (i.e. heat, sunlight reaching the ground floor and moisture, and less competition from intolerant species) created by clearcutting, increased competition from intolerant species, or direct disturbance from harvesting activities. Negative effects tend to be greatest on plant species that are dispersed by animals and least on wind dispersed species. A few species of woody or herbaceous vegetation who's seeds have a long period of dormancy, such as raspberry and pin cherry, would have an opportunity to germinate and become part of the ecosystem for a period of time. These would increase species diversity. These effects are likely to last for 50 years for some species. Within 30-50 years, the understory environment would return to pre-harvest conditions.

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.

Figure 2: Existing Community Stage Distribution Across MA 2.1 and 3.1 Lands in HMUs 416 and 417



Alternative 3

This alternative emphasizes uneven-aged management. No clearcuts are proposed under Alternative 3. Two stands proposed for clearcutting in Alternative 2 meet the criteria for group selection. The remainder of the clearcuts proposed under Alternative 3 must be dropped from the project, because the species composition is not well suited for uneven-aged management.

The effects discussed for group selection in Alternative 2 would be the same for Alternative 3, but would occur on 842 stand acres. The effects for single-tree selection are the same as for Alternative 3 on the same number of acres.

The effects on the herbaceous plants would be the same as for uneven-aged management described under Alternative 2.

Alternative 4

Alternative 4 contains modifications of the proposed action. One clearcut (compartment 116, stand 4, 30 acres) is changed to group selection, to preserve a wildlife corridor. It would also add some group selection to single-tree selection (compartment 114, stands 15 & 30, 118 acres). The group cuts are located in pockets of declining trees and effect less than 10% of the stand area.

The effects of this alternative are nearly the same as Alt 2 with slightly more group selection and slightly less clearcutting.

Alternative 5

Alternative 5 proposes treatments that most closely meet Forest Plan desired conditions and objectives for habitat management units. The effects are similar to Alternative 2. Thirty (30) acres of clearcutting is changed to group selection to protect a wildlife corridor, and 20 acres of clearcutting and 67 stand acres of group selection are added in HMU 416 (compartment 117, stand 10). The effects are reduced by 10 acres for clear cutting, and group selection is increased by 52 acres. This alternative also includes the additional group cuts in compartment 114, stands 15 & 30.

Alternative 6

This alternative would eliminate all timber harvesting that could be visible from the Tripoli Road or the East Pond hiking trails. Clearcutting would be reduced to 111 acres, group selection to 554 stand acres, and single-tree selection would be eliminated. The effects are similar to Alternative 2 but in much less quantities.

3.2.1.4 Vegetation Cumulative Effects

The Management Area 2.1 and 3.1 Lands in Habitat Management Units 416 and 417 Cumulative Effects Area (Map 9, see Appendix H, §**B3.1** for a description of the area) is used for vegetative cumulative effects analysis through the end of the decade 2012). The Tripoli Project area is part of the 2.1 and 3.1 lands in HMUs 416 and 417. Within the 2.1 and 3.1 lands in HMUs 416 and 417 there is no private land.

This area is used because these are the lands that are allocated to vegetative management in the Forest Plan. General direction in the Forest Plan is to try to meet the desired composition for MA 2.1 and 3.1 lands in HMUs. The indirect effect of managing the diversity of habitat communities and age classes is to manage for diversity of wildlife species. Because these are the only areas within the HMUs that can be actively managed for vegetation, this is the area where the effect of meeting the desired composition can be calculated.

The time-period is 1986 (Forest Plan decision) through 2012. Other than the possible activities proposed in the Tripoli project, no other vegetation treatments are anticipated in the cumulative effects area through the end of the decade (2012).

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

There are approximately 6,800 acres, within the MA/HMU cumulative effects area. Of that approximately 3% is in open (herbaceous/ shrubby vegetation) or wetlands, 0.7% is in the regenerating age class, 13.8% in the young age class, and 74.8% in the mature and over-mature age classes (closed canopy forest) (see Figure 5).

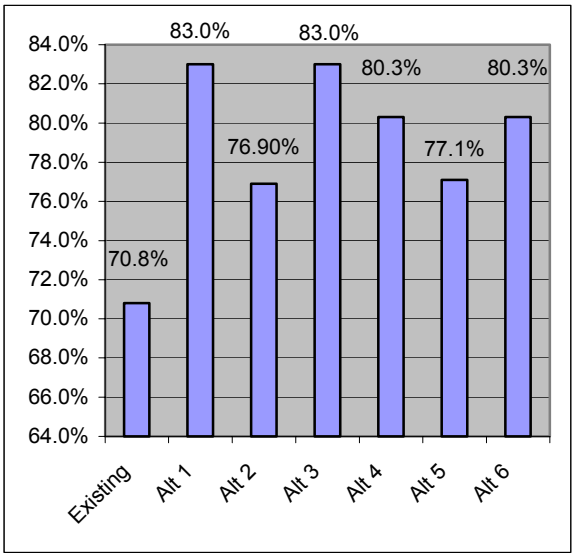
Alternatives 2- 6

For a discussion of general effects of timber harvesting on vegetation see §**B.2.4.** and §**B.2.4.1** in Appendix H.

A substantial portion of the Tripoli East 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.

Sixty-one percent (61%) of the cumulative effects area is managed using even-aged management. Thirty nine percent (39%) is under uneven-aged management.

Figure 3: Existing Closed-Canopy (Mature/0ver-Mature) Forest On Management Area 2.1 And 3.1 Lands in HMUs 416 and 417 Compared to the Closed-Canopy Forest Available by Alternative in the Year 2012



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 closed-canopy (mature/over-mature) forest exists on 74.8% of the MA/HMU cumulative effects area. Regeneration treatments would have the effect of reducing the closed-canopy forest in the cumulative effects area. No additional regeneration treatments are anticipated in the cumulative effects area beyond what is proposed in the Tripoli project. If no natural disturbances create regeneration, the maximum that closed-canopy forest could be reduced by is 3.4% under Alternative 2. Figure 6

displays the available closed-canopy forest under existing conditions on management area 2.1 and 3.1 lands in HMUs 416 and 417 compared to the closed-canopy forest available by alternative in the year 2012.

Table 21: Regenerating Habitat Desired, Existing, and Possible Future by Alternative) for Northern Hardwoods and Paper Birch.

Habitat Community	Desired Condition	Existing condition	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Northern Hardwood	10%	1.5%	0.0%	3.2%	0.0%	2.3%	2.8%	2.3%
Paper Birch	10%	0.0%	0.0%	8.0%	0.0%	8.0%		

In the cumulative effects area, the herbaceous species that could be impacted by proposed harvest activities could still be found on 83% of the MA/HMU cumulative effects area through the end of the decade (Alternative 1, no action).

The action alternatives propose varying amounts of clearcutting on lands allocated to even-aged management: Alternative 3 proposes no clearcutting, Alternatives 4 and 6 propose 111 acres, Alternative 5 proposes 131 area, and Alternative 2 proposes 141 acres. Table 36 displays, by alternative, the percentage of lands in even-aged management that would provide early-successional habitat (northern hardwood and paper birch habitat communities) for the HMU/MA cumulative effects area.

The Forest Plan desired condition is an "ideal" that assumes an even distribution of habitat communities in an HMU. The existing distribution of habitat communities in 2.1 and 3.1 lands in HMUs 416 and 417 is not ideal (Appendix D, Tables 1-3). The northern hardwood community dominates and the other communities are generally absent or less than half the desired composition. While none of the alternatives would meet ideal Forest Plan HMU desired conditions for regenerating age classes, Alternatives 2, 4, 5, and 6 move towards the "ideal" regeneration component given the existing vegetative conditions of these two HMUs.

Alternative 1 – No Action

With no action, all stands would continue to grow and or mature. Tree crowns would expand creating competition between trees. This would result in some decline and mortality, which would contribute to the numbers of snags and down woody material. Overall, stands would begin to show more old-growth characteristics. That is, more older, large trees with signs of decadence.

Species compositions would tend to shift toward more shade-tolerant species. Small, temporary openings associated with old landings and part-time roads would continue to close in with pioneer vegetation and expanding tree crowns.

There would be no early-successional habitat in the MA/HMU cumulative effects area at the end of the decade other than what might be created by natural disturbance.

Alternative 2 – Proposed Action

Clearcuts on 141 acres and group selection (approximately 25% of stand acres) on approximately 781 stand acres would regenerate approximately 300 acres of forest. No additional regeneration treatments are anticipated in the HMUs in the next ten years. With in-growth of the regenerating stands in the Eastman West Project, at the end of the decade, the only regenerating age class on 2.1 and 3.1 lands within HMUs 416 and 417 in areas allocated for even-aged management would be from regeneration treatments in the Tripoli East project area. On these even-aged management lands, there would be only 3.2% northern hardwoods and 8% paper birch in early-successional habitat. This is below the ideal Forest Plan HMU desired condition for these species (see Appendix D, Tables 4 and 5, p. D-4)

Single-tree selection on 165 acres would be in addition to 242 acres in the Eastman West sale. It is anticipated that this treatment would be repeated every 15 to 20 years and the minor effects of each entry, like bole injuries from skidding, could accumulate with each entry. The effects would be the same as those described above under Alternatives 2-6 above and in §**B.2.4.1** in Appendix H.

Alternative 3

Alternative 3 proposes only uneven-aged management. The cumulative effects for group and single-tree selection are the same as Alternative 2.

Alternative 4

Alternative 4 has nearly the same effects as Alternative 2 with minor changes in clear-cutting and group selection.

Alternative 5

Alternative 5 has nearly the same effects as Alternative 2 with minor changes in clear cutting and group selection.

Alternative 6

Cumulative effects for both clear cutting and selection cutting are reduced from those listed for Alternative 2.

3.2.1.5 Potential Effects to Federal and State-Listed & Other Plants Of Concern:

Table 22 summarizes the effects determinations rendered in the Tripoli East Biological Evaluation/Assessment (BE/BA) for Federally-listed threatened, endangered, proposed and sensitive (TEPS) plant species and their habitat (see the Tripoli East BE/BA as amended and the Supplemental Information Reports in the Project File). See Appendices E, F & G of this Environmental Assessment for a complete analysis of potential effects for State-listed threatened, endangered, special concern (TESSC) and other plants of concern.

There is documented occurrence within localized portions of the Tripoli East project area of the following Eastern Region 9-listed sensitive species: butternut *(Juglans cinerea)*, American ginseng *(Panax quinquefolius)* and squirrel corn *(Dicentra canadensis)*. The localized occurrence of the few, scattered individual butternut trees (associated with old farmsteads) and the few individual sensitive plants are within the BE/BA predictions of low probability of occurrence analysis. Furthermore, these sensitive species do not regularly occur elsewhere outside of the project area. There is no known or documented occurrence of TEPS plants associated with the existing campsites or the relocated campsites proposed in landing and group cut areas.

Table 22: BE/BA Effects Determinations for TEPS Plants for the Tripoli East Project Area

Federal Status	TEPS SPECIES		EFFECTS DETRMINATIONS
R9-Sensitive	Bailey's sedge	*(Carex baileyi)*	The proposed action and all action alternatives 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 and/or documented occurrence within the Tripoli East Project Area.
R9-Sensitive	Clustered sedge	*(Carex cumulata)*	
R9-Sensitive	Squirrel-corn	*(Dicentra canadensis)*	
R9-Sensitive	Goldie's woodfern	*(Dryopteris goldiana)*	
R9-Sensitive	Broad-leaved twayblade	*(Listera convallarioides)*	
R9-Sensitive	Chilean sweet cicely	*(Osmorhiza berteroi)*	
R9-Sensitive	American ginseng	*(Panax quinquefolius)*	
R9-Sensitive	Nodding pogonia	*(Triphora trianthophora)*	
R9 Sensitive	Butternut	*(Juglans cinerea)*	

Direct Effects:

The potential direct effects to TEPS and/or TESSC and other plants of concern from single-tree, uneven-age, or clearcut harvests within the Tripoli East project area are anticipated to be overall relatively minor to none respectively. Potential direct effects to understory ground flora include 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 17 of the 24 units are proposed for winter mitigation season of harvest when snow and frozen ground conditions would minimize potential effects to understory vegetation. In addition, some of the federally-listed plants having low probability of occurrence within the project area such as Bailey's sedge and broad-leaved twayblade favor wet areas, which are routinely excluded from harvest units and skid trail layout.

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.

Indirect Effects:

Potential indirect effects of the action alternatives include effects from increased sunlight reaching the forest floor from open canopy conditions, which could benefit intolerant plants such as R9-listed sensitive species clustered sedge that favors open woods and clearings, but would not benefit tolerant plants such as broad-leaved twayblade that favors deep shade.

Cumulative Effects:

The analysis area for past, present and reasonably foreseeable future effects to TEPS plants included the site-specific Tripoli East Project Area and the forest-wide planning area.

The No Action alternative would cause no known direct or indirect effects to the R9-listed sensitive plant species or their habitat. The Proposed Action and all action alternatives would cause relatively minor to no direct or indirect effects to the R9-listed sensitive species, therefore there would be no cumulative effects. Thus, the Proposed Action and all action alternatives may impact individuals located within the Tripoli East project area, 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 in the forest-wide planning area (Table 20).

3.2.2 TERRESTRIAL WILDLIFE RESOURCES

3.2.2.1 Analysis Framework

White Mountain National Forest Plan Wildlife Strategy and Management Area Direction

The National Forest Management Act established the requirement for National Forest Land and Resource Management Plans (LRMP) to manage fish and wildlife habitat to maintain viable populations of existing native and desired non-native vertebrate species in the Forest-wide planning area (36 CFR 219.19). The White Mountain National Forest Plan established Wildlife Habitat Management Units (HMU) as a strategy to ensure diverse habitats are well distributed over time and to guide management activity toward the desired future habitat conditions necessary to maintain wildlife populations in the Forest-wide planning area (USDA-LRMP 1986a, III-13, VII-B-1-28). WMNF HMUs are typically 4,000 acres and may contain Management Area (MA) 2.1 and 3.1 lands that allow vegetation management, and may contain areas excluded from vegetative management.

Wildlife resource objectives for MA 2.1 and 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 management area 3.1 (USDA-LRMP 1986a, III-30, 36). The lands within these management areas are divided into uneven-aged and even-aged management systems. The proposed Tripoli East Vegetation Management Project Area (Tripoli East Project Area) is located in HMUs 416 and 417 within management area 2.1 and 3.1 lands, which allow timber harvesting (see Appendix E). The Proposed Action and action alternatives of the Tripoli East Vegetation Management project (at various degrees) respond to the purpose and need for greater wildlife habitat diversity to maintain wildlife populations (USDA-FEIS 1986, I-9).

White Mountain National Forest Plan Management Indicator Species

In accordance with 36 CFR 219.19(a)(1-7), during the forest planning process the WMNF Forest Plan (USDA-LRMP 1986a, VII-B-5-9) identified wildlife Management Indicator Species (MIS) whose population changes are believed to indicate the effects of multi-use management activities established in the plan. The WMNF Forest Plan identified a desired future habitat condition or "ideal" HMU that includes a mix of community types and age classes to meet the needs of wildlife.

The Tripoli EA 2.0 Appendix F1 displays the Probability of Occurrence Analysis of WMNF management indicator species for the Tripoli East Project Area. The occurrence of MIS and/or suitable habitat was based on but not limited to the following sources of information:

- Known documented occurrence and/or extirpation (NH Natural Heritage Inventory database & USFWS list reviews).
- Literature reviews of MIS life history and suitable habitat requirements (DeGraaf et. al 1992; DeGraaf & Yamasaki 2001).
- Site-specific, multi-seasonal field surveys during snow / snow-free and leaf on / off conditions (NHNHI and FS).
- Analysis of data from forest-wide wildlife monitoring transects & monitoring reports (USDA-FS 1993,94,96,99,2000, 2001).
- Analysis of quality and quantity of existing community types, age classes, and MAs present in the Tripoli East Project Area suitable for MIS (Forest Service stand exam data, CDS database, HMU 416 & 417 analysis, & ID-team field reviews).

Nine WMNF MIS have no probability of occurrence within the Tripoli East Project Area (Table 23) due to species extirpation and/or non-suitable habitat present within the project area (see EA Appendix F1). Suitable habitat is defined as meeting a species' life history requirements such as food,

cover, shelter, breeding, nesting, and young rearing (see EA Literature Cited/ Reviewed reference list). The no occurrence determination takes into account the potential for incidental or occasional travel through or fly-over of the Tripoli East Project Area by wildlife species.

Table 24 discloses that 15 WMNF MIS have potential to occur within the Tripoli East 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 Canada lynx and R9-listed Sensitive Species peregrine falcon are WMNF MIS. The USFWS lists the Canada lynx as extirpated from NH (USDI Fed Reg1998 and BO 2000). Due to the Standards and Guidelines for the protection of suitable habitat per the National Canada Lynx Conservation Assessment and Strategy (CLCAS), the potential effects to MIS Canada lynx are disclosed in the TEPS section of this EA and the Tripoli East BE/BA as amended. The potential effects to the R9-listed SS 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 Tripoli East BE/BA, as amended. The MIS American black duck and Eastern brook trout are discussed in the Aquatic Section of this EA.

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Table 23: The following nine MIS species have no probability of occurrence within the Tripoli East Project Area.

WMNF MIS	RATIONALE FOR NO OCCURRENCE WITHIN THE TRIPOLI EAST PROJECT AREA
Eastern Towhee	Non-suitable habitat = no oak, or regen / young age class in pine community type.
Gray-checked (Bicknell's) Thrush	Non-suitable habitat = no high elevation spruce/ fir habitat or MAs 5, 6, 9.
Blackpoll Warbler	Non-suitable habitat = no high elevation spruce / fir or young habitat or MAs 5, 6, or 9.
Common Loon	Non-suitable habitat = no large bodies of water greater than 10 acres supporting fish.
Osprey	Non-suitable habitat = no large bodies of water greater than 10 acres supporting fish.
Gray Squirrel	Non-suitable habitat = no oak community type or MA 7.1 within the Project Area.
Canada Lynx	Extirpated (USDI 1998, 2000). Addressed CLCAS S&Gs as suitable habitat is present.
Sunapee Trout	Extirpated & non-suitable habitat = no deep coldwater bodies with shallow gravel bars.
Robbins' Cinquefoil	Non-suitable habitat = no alpine zone habitat within the Project Area.

Evaluation Monitoring Of The White Mountain National Forest Plan Wildlife Strategy

Following an appeal of the 1986 WMNF Forest Plan, the WMNF established a Committee of Wildlife Scientists (COS) involving several university researchers, Federal and State biologists, and the Wildlife Institute and Audubon Society. The COS designed peer reviewed survey protocols for systematic evaluation monitoring of wildlife responses from implementation of the wildlife habitat management strategy as described in the 1986 WMNF Forest Plan.

As a result, there are 360 permanent monitoring plots located on 45 miles of transect lines well distributed Forest-wide within managed, unmanaged adjacent managed, and remote unmanaged lands on the forest (COS terminology). Forest Service personnel conducted large mammal winter track and small mammal and amphibian trap monitoring surveys on the forest-wide transects during 1993-97 and directed searches for northern bog lemming during 1995-97 per COS and Forest Plan Management Indicator Species monitoring protocols (USDA-LRMP 1986a, VII-B-24).

Forest Service biologists routinely coordinate with New Hampshire Fish and Game, Loon Preservation Committee, and NH Audubon biologists in statewide monitoring of white-tailed deer, grouse, loon, falcon, and eagle populations respectively. FS biologists secure available occurrence or extirpation data from these sources and the USFWS. In addition, the Forest Service and Audubon monitor populations of Neotropical migratory songbirds, forest and wetland hawks, and

waterfowl on the permanent Forest-wide transect lines described above, as well as high elevation above 2,500 ft and 96 wetland areas across the Forest.

Information from wildlife monitoring transect lines located adjacent to the Eastman Brook sub-watershed and the larger HMUs 416 and 417, and site-specific Tripoli East Project Area reviews, and information sources listed above were used to infer the probability of occurrence of wildlife species for the Tripoli East Project Area (USDA-FS Monitoring Reports 1993, 1996, 1999, 2000).

White Mountain National Forest Plan MIS Population Trends and Viability Assessment

The White Mountain National Forest recently completed a comprehensive evaluation of several years of monitoring data gathered from the wildlife monitoring transect lines within the forest-wide planning area entitled, *"Evaluation of Wildlife Monitoring and Population Viability: WMNF MIS"* (USDA-FS 2001a), which is located in the Tripoli East project file.

In summary, forest-wide breeding bird monitoring (including MIS) on the White Mountain National Forest since early 1990s showed cyclic population dynamics through 1996. Forest-wide small mammal monitoring conducted through 1995 indicated some between-year population differences (may reflect differences in mobility and not population size). Small-sized herbivore (small mammal and squirrel) populations spiked in 1995 most likely due to high mast supplies in 1994. Forest-wide large mammal population monitoring via snow tracking surveys documented the presence of bobcat and MIS American marten during all survey years. MIS white-tailed deer and MIS snowshoe hare showed cyclic population dynamics. New Hampshire hunter mail-in survey results reinforced the finding that MIS deer populations are distributed statewide with the MIS deer population being relatively stable. MIS snowshoe hare were found to be more prevalent in areas with vegetation management than without. Other species did not show a measurable difference between managed and unmanaged areas of the White Mountain National Forest (USDA-FS 1996). Tracks or sign of Canada lynx, timber wolf, or cougar were not detected. Recent forest-wide Forest Service lynx surveys conducted during 1999 through 2002 detected none.

An analysis of the amount and quality of habitat available forest-wide for WMNF MIS was conducted (USDA-FS 2003). This analysis included a query of the WMNF Combined Database system of Forest Types by Age Class and review of WMNF Monitoring Reports and appropriate literature (see the project file).

Table 24: MIS With Potential to Occur Within the Tripoli East Project Area and Their Population Trends & Viability Within the Forest-Wide Planning Area Per 36 CFR 219.19 (USDA-FS 2001a).

Community */Community Type*	**MA**	**MIS**	**Forest-wide Planning Area Population Trends & Viability Determinations**
Northern Hardwood (includes spruce and swamp hardwoods) / *Regeneration*	3.1	Chestnut-sided warbler	Declining population trends at global level and in portions of Physiographic Area 28. The past 8 yrs of WMNF monitoring shows a decline, which may continue with declining early successional habitat. However, 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) / Mature and Over-mature	2.1	Northern goshawk	Goshawk populations in Physiographic Area 28 appear stable with no indication of population declines anywhere within their range. Goshawk population viability and distribution would be maintained under the current WMNF management practices.
Paper birch / Aspen *Mature and Over-mature*	2.1	Broad-winged hawk	The MIS broad-winged hawk population trend on the WMNF was relatively stable over the 8-year period 1992-1999, with a peak in 1994 and a low in 1998. The forest-wide population is considered viable and well distributed.
Paper birch = *Regen & Young* **Aspen** = *All Ages*	3.1	Ruffed grouse	MIS ruffed grouse population trends on the Forest fluctuated widely over an 8-year period from 1992-1999, but their populations are viable statewide & on the WMNF in the near term.
Spruce / Fir *Regen & Young*	3.1	Snowshoe hare	The local snowshoe hare population is viable & stable in the near term, with cyclic fluctuations.
Pine *Regen & Young*	3.1	Northern (Dark eyed) junco	The MIS Northern 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 *Mature & Over-mature*	2.1	Cape May warbler	Forest-wide WMNF monitoring data indicate a fluctuating population trend for Cape May warbler, and the population is considered viable within the forest planning area.
Pine *Mature & Over-mature*	3.1	Pine warbler (intermixed pine)	The MIS pine warbler population viability on the WMNF is currently viable and stable.
Hemlock / *All ages*	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 *Forest Ecotone - Grass, Forb, Apple*	3.1	Eastern kingbird	A declining population trend in Physiographic Area 28, yet ranked secure in NH and Maine. The population is considered viable, yet the White Mountain Subsection does not provide much land in openings suitable for kingbirds.
		Eastern bluebird	Overall, stable population trend for Physiographic Area 28 from 1980-1999. This species has never been 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.
Shrub - Forest Ecotone	3.1	Mourning warbler	A stable population trend in Physiographic Area 28 over the 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. The local population is considered viable.
Mixed Forest Type *Varying age classes*.	All	American marten	The State-listed threatened American marten population on the Forest is believed increasing and not yet considered viable. See Appendices F for complete analysis.
Wetlands and Water		American black duck	Could occur in Eastman Brook and is addressed in the Aquatics Section.
Permanent Waterbodies		Eastern brook trout	Could occur in Eastman Brook and is addressed in the Aquatics Section.

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, 9 WMNF MIS have no likelihood of occurrence within Tripoli East Project Area due to extirpation and / or no suitable habitat present. See Appendix F1 for Probability Of Occurrence Analysis of MIS for the Tripoli East Project Area. *Suitable habitat* = Meets life history requirements. *No occurrence* = includes occasional or incidental travel or fly-over of the Project Area by some species.

3.2.2.2 Terrestrial Wildlife Affected Environment

Existing Condition of Wildlife Habitat (see HMU 416 and 417 Analysis Appendix D):

- HMUs 416 & 417 total approximately 20,000 acres, of which 18,000 acres are National Forest lands.
- The Kancamagus Highway (State Route 112) bisects the northern section of HMU 416 where development is concentrated in a corridor consisting of approximately 2,000 acres of private land. The private land includes the town of Lincoln, which includes services, tourist related businesses, residential areas, and the Loon Mountain Ski Resort. The private lands do not contribute substantially to age class diversity or opening habitat objectives in HMU 416.

The state of New Hampshire is predominately forested, which is steadily maturing as described in the Forest Statistics For 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 habitat. However, based on current information regarding analysis of age class and community types (EA Appendix E, HMU 416/417, forest-wide CDS analysis of forest type and age class) there is a lack of regeneration-age habitat preferred by some species (USDA-LRMP 1986a, VII-B-2). 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.

Analysis of existing habitat conditions within HMUs 416 & 417 shows there is a lack of regeneration age class and general lack of oak/pine, spruce/fir, paper birch, and aspen community types within the Tripoli East project area compared to Forest Plan desired condition. The Tripoli East project area is dominated by middle to older aged closed canopy habitat.

Site-Specific Tripoli East Project Area Field Surveys and Reviews (FS ID-Team & NHNHI):

Forest Service and NH Natural Heritage Inventory field surveys and reviews documented that the Tripoli East 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 (USD-FS ID-Team notes, Sperduto 1998). None of the ecosystems or habitats affected by the no action or action alternatives are scarce, unique, or regionally at risk. East Pond, Little East Pond, and 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 Tripoli East Project Area.

Old Growth Habitat: The NHNHI survey or database reviews did not specifically identify any stands as old growth within the Tripoli East Project Area (NHNHI-dbase review & Sperduto 1998, FS-HMU Analysis Appendix D). Management Area 6.1 (located outside of and nearby the Tripoli East Project Area) provides a large, contiguous area of uneven-age, interior forest habitat. In addition, 10% of the management area 2.1 and 3.1 lands within HMUs 416 and 417 are managed as an extended over-mature rotation component.

Furthermore, approximately 435,000 acres (56% of the 780,000 acre WMNF) are designated in Management Areas 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 stand exam and interdisciplinary team field reviews during snow free and leaf off periods, confirmed that the Tripoli East Project Area contains predominately northern hardwood forest and is lacking aspen and paper birch, spruce-fir, hemlock, and pine-oak communities. The annual growth of common trees and woody plants and their buds, fruits, and flowers within the Tripoli East Project Area provides browse or mast at various times such as hobble bush in the spring, soft raspberry fruit in the summer, and hard beech nuts in the fall (Payne et al. 1994). The hardwood forest typically provides habitat for general wildlife including but not limited to the species shown in Table 25. The Aquatic Resources Section of this EA (§**3.2.3**) analyzed the potential direct, indirect, and cumulative effects to fish, amphibians, and reptiles.

Table 25: 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 Section)	Grasshopper Black fly Mosquito Deer tick Beetle sp. Butterfly & moth Earthworm Springtail

Site-specific Forest Service field reviews during various times of the year documented the occurrence of several MIS within the Tripoli East Project Area. The Forest Service also conducted winter track and small mammal trap monitoring during 1993-97 in hardwood and softwood community types on the following transect lines located on the District near HMUs 416 and 417 containing the Tripoli East Project Area. Winter track and small mammal trap monitoring along these transects (in similar habitat community types as found in the Tripoli East Project Area) also detected occurrence of several MIS located adjacent to the Tripoli East Project Area.

- Lost & Walker Brook Transects (managed land);
- North Fork & East Branch Transects (adjacent unmanaged land);
- Pemigewasset Wilderness Transect (remote land).

Large Mammals (MIS white-tailed deer and Canada lynx (see TEPS section)): Winter track monitoring along the above wildlife transects (in similar habitat community types as found in the Tripoli East Project Area) detected MIS white-tailed deer adjacent to the Project Area. Interdisciplinary team field reviews documented moderate levels of existing deer use, such as winter fecal pellets, browsing pressure, bark scarred trees, and scattered game trails throughout the Tripoli East Project Area. The MIS white-tailed deer and do occupy, use, and travel through the Tripoli East 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 Tripoli East 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 Tripoli East Project Area do not contain a concentrated, dense softwood component of spruce, fir, or hemlock. 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 Tripoli East Project Area (district records; personnel communication with Karen Bordeau, New Hampshire Fish and Game Regional Biologist). New Hampshire 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 2001, USDA-FS 2001a).

The proposed Tripoli East Project Area contains scattered 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 Tripoli East Project Area. Field reviews documented no large mammal denning sites such as bear dens within the units proposed for harvest. NH Fish and 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 2001).

Small Mammals (MIS snowshoe hare and American marten (see TEPS Section)): Forest Service field review of the Tripoli Project Area during winter documented the occurrence of MIS snowshoe hare and the red squirrel. 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 located on the District near HMUs 416 and 417 containing the Tripoli East Project Area.

Winter track monitoring along these transects (in similar habitat community types as found in the Tripoli East Project Area) detected MIS snowshoe hare, MIS ruffed grouse. Other species detected were fisher, fox, coyote, red squirrel, and common rodents mice, vole, and shrew (unpublished data). Based on observations of wildlife and their sign via site-specific field reviews of the Tripoli East Project Area, the same small mammal species documented on the wildlife monitoring transects are known (MIS snowshoe hare and red squirrel) or assumed to also occur in the Tripoli East Project Area. Although none were detected during the winter track surveys associated with the general project area, the state-listed threatened and MIS American marten could occur in the project area (see Appendix F). Pre-project level monitoring of the Tripoli East 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 interdisciplinary team field reviews documented the MIS ruffed grouse present in the Tripoli East Project Area. This analysis assumes wild turkey and American woodcock occur within the small forest openings and the mast producing areas of the project area. Pre-project level monitoring of the Tripoli East Project Area included site-specific field reviews of available habitat and review of the proposed prescriptions and standards and guidelines designed to create and/or perpetuate the community types necessary to support populations of MIS ruffed grouse. MIS ruffed grouse populations fluctuate widely over a period of several years, but their populations are viable statewide and on the WMNF (USDA-FS 2001a).

Neotropical Migratory Songbirds and Raptors (MIS Chestnut-sided, mourning, Cape May, and pine warblers; Northern junco; Eastern kingbird and bluebird; Northern goshawk and 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 Tripoli East 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 HMUs 416 and 417 shows a shortage in the early-successional (0-9 year old) regeneration age class. Ongoing since 1992, the White Mountain National Forest and New Hampshire 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 White Mountain National Forest over the past 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.

NH Audubon conducted directed searches across the forest for MIS Northern goshawk and found no nests or hawks near the Tripoli East Project Area (Audubon 1993-94). Also, there are no known historic documented occurrences of MIS northern goshawk, MIS broad-winged or State-listed Cooper's hawks or their nests in or near the Tripoli East Project Aarea (Foss 1994). Pre-project level monitoring of the Tripoli East Project Area included site-specific reviews of suitable raptor habitat. Reviewers ensured the WMNF Forest Plan Standards and Guidelines and proposed prescriptions were designed to provide the communities and habitat conditions necessary for maintaining MIS songbird and MIS hawk populations. As a result, Forest Service stand exam and interdisciplinary team field reviews did not find active nests in suitable raptor habitat of the Tripoli East Project Area (FS-ID-Team 1998 through 2002).

Invertebrates: The full suite of terrestrial and aquatic macroinvertebrates native to this region and elevation of the White Mountains are likely to occur in suitable habitats within the Tripoli East Project Area (NHFGD 1996). Invertebrates are important components of the both terrestrial and aquatic ecosystems and are prey base for various MIS small mammals, MIS upland game birds and MIS Neotropical migratory songbirds, fishes, amphibian, and reptiles (see Aquatics Section).

Federally-listed Threatened, Endangered, Proposed, and Eastern Region 9 Sensitive Species (TEPS)

Per Forest Service manual direction (USDA-FS Manual 2670), the Forest Service completed a site-specific project-level Biological Evaluation /Assessment (BE/BA) of the potential effects of the No Action and action alternatives on Federally-listed threatened and endangered and Eastern Region 9-listed Sensitive Species (TEPS) and their habitat. See the Tripoli East BE/BA as amended and Supplemental Information Reports in the project file. This EA summarizes the probability of occurrence of Federally-listed TEPS for the Tripoli East Project Area. The Tripoli East BE/BA based the probability of occurrence of Federally-listed TEPS for the Tripoli East Project Area on suitable habitat present and/or known documented occurrence and/or species extirpation. Table 26 discloses the TEPS wildlife species having a very low to a medium probability of occurrence within the Tripoli East 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 1999):

Table 26: TEPS Wildlife Species Having Probability of Occurrence Within The Tripoli East Project Area.

FEDERAL STATUS	TEPS SPECIES		PROBABILITY OF OCCURRENCE	
Threatened	Bald eagle	*(Haliaeetus leucocephalus)*	Very low	= migration flyover
Threatened	Canada lynx	*(Lynx canadensis)*	Extirpated	= suitable habitat adjacent
Endangered	Indiana bat	*(Myotis sodalis)*	Very low	= summer transient
R9-Sensitive	Peregrine falcon	*(Falco peregrinus anatum)*	Medium	= summer forage / flyover
R9-Sensitive	Eastern small-footed bat	*(Myotis leibii)*	Very low	= summer
R9-Sensitive	Northern bog lemming	*(Synaptomys borealis sp.)*	Very low	= potential in wet areas.
R9-Sensitive	Wood turtle	*(Clemmys insculpta)*	Very low	= potential in riparian areas.

In summary, site-specific Forest Service and NH Natural Heritage Inventory field reviews of suitable habitat of the project area during various times of the year documented no sightings of wildlife TEPS or their sign such as tracks, dens, nests, or scat (FS field reviews; Sperduto 1998). The White Mountain National Forest (including the Tripoli East Project Area) is not designated "critical habitat" by the US Fish and Wildlife Service in Canada lynx, Eastern timber wolf, Eastern cougar, or Indiana bat recovery plans. The Tripoli East BE/BA as amended determined that there are relatively medium to high amounts of human activity associated with the Tripoli East Project Area (i.e. the Russell Pond Campground; Tripoli Road with dispersed camp sites; nearby towns of Thornton and Waterville Valley; Interstate 93 and State Highway Routes 49 & 175). The Tripoli East 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 extirpated, the Tripoli East BE/BA addressed the Canada lynx due to the national level Canada Lynx Conservation Assessment and Strategy agreement. The bald eagle and peregrine falcon may flyover the general area, but do not nest within the Tripoli East Project Area (Foss 1994, Audubon 2003) and are not expected to establish nesting territories in the Tripoli East project area in the future.

Due to minimal amounts of potential suitable habitat within the Tripoli East Project Area, there is a very low probability of occurrence of the Eastern Region 9-listed sensitive species Northern bog lemming and wood turtle. Section **3.2.2.3** of this EA discloses a summary of the BE/BA and Supplemental Information report determinations of potential effects to Federally-listed TEPS for the Tripoli East Project Area. Table 27 discloses the analysis of the effects to TEPS from multi-use activities at the national and forest-wide levels.

State-listed Threatened, Endangered , Special Concern (TESSC) and Other Wildlife Species

The New Hampshire Fish and Game Department and NH Audubon Society or NHNHI did not express specific concerns for TESSC for the Tripoli East Project Area during public scoping. The northern hardwoods, mature trees with cavities, and riparian areas could provide potential suitable habitat for TESSC and other wildlife of concern. If suitable habitat was present within the project area for species documented or suspected as occurring on the White Mountain National Forest, analysis of potential effects was based on the assumption that suitable habitat could be occupied. Appendix F and G2 discloses the probability of occurrence of State-listed TESSC and other wildlife of concern within the Tripoli East Project Area.

3.2.2.3 Terrestrial Wildlife –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 in proposed harvest units on the forest floor 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 would comply 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.

3.2.2.4 Terrestrial Wildlife Environmental Consequences

White Mountain National Forest Plan Management Indicator Species

In accordance with 36 CFR 219.19, during the Forest planning process the White Mountain National Forest Land and Resource Management Plan (USDA-LRMP 1986a, VII-B 5-9) identified wildlife Management Indicator Species and the associated habitat types and age classes they represent. The wildlife management HMU strategy on the White Mountain National Forest is to distribute diverse habitats, over time, to establish and maintain viable wildlife populations in the forest-wide planning area. The MIS framework is useful for indicating the effects of Forest Plan implementation. Management indicator species may be affected by individual project actions or no actions. However, viable populations of MIS are to be maintained or monitored in the Forest-wide planning area (36 CFR 219.19). The White Mountain National Forest Final Environmental Impact Statement (USDA-FEIS 1986, IV-9, 11) and the Forest Plan Wildlife Management Strategy (USDA-LRMP 1986a, VII-B) outline the general effects of vegetation management on wildlife and conclude that timber management can have positive effects on wildlife habitat by providing vegetation type and age class diversity. Based on recent forest-wide monitoring reports and analysis of age class by forest type (USDA 1995-96, 2000, USDA-CDS 2002), the current condition of the forest is dominated by middle to older aged stands adversely affecting two thirds of the native birds and mammals (USDA-FEIS 1986, II-21).

Potential Direct and Indirect Effects on Wildlife Resources

Because the home range and habitat needs of wildlife varies by species, the analysis area for direct and indirect effects included the site-specific Tripoli East project area (i.e. small mammals) and MA 2.1 and 3.1 lands within the larger HMUs 416 and 417 (i.e. large mammals). Most of the wildlife species expected to occur within the Tripoli East project area are also found on other parts of the District, across the Forest, and fewwe species could occur on suitable portions of adjacent private land.

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 road, skid trail, and landings could be beneficial for some MIS species, yet neutral or negative for others based on their specific or generalist habitat needs.

This Environmental Consequences section summarizes the effects to Federally-listed TEPS taken from the Tripoli East Project BE/BA, as amended and Supplemental Information Reports. Appendix F discloses the potential effects to State-listed TESSC wildlife. Appendix F discloses a Probability of Occurrence Analysis that several MIS could occur within the Tripoli East project area. Table 27 discloses a summary comparison of the potential direct and indirect effects to the quality and quantity of MIS habitat by alternative. Table 28 discloses the cumulative effects on WMNF MIS population trends and viability within 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 associated with timber harvest activity would not occur within the proposed Tripoli East Project Area at this time. Routine maintenance of existing roads 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 Tripoli East 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). The No Action alternative 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, which was not detected during NHNHI plant surveys and multiple Forest Service field reviews of the project area (Sperduto 1998; FS ID-Team 1998-2002), and the MIS Cape May warbler (if

present) would benefit from no change in the existing condition of the mature and over-mature, even-aged class of northern hardwoods and spruce/fir respectively. Forest interior species such as the ovenbird and wood thrush would also benefit from the perpetuation of the mature northern hardwood community type. Species preferring mature closed-canopy and climax forest conditions, such as the MIS broad-winged hawk and the MIS ruffed grouse representative of the mature/over-mature paper birch and aspen community respectively would benefit from the No Action alternative in the short term.

However, analysis of the HMUs 416 and 417 (Appendix D) indicates a need for creating a mixture of multiple age and size classes of trees in northern hardwood community type to meet the Forest Plan desired condition (DC) for habitat diversity. There is a disproportionate amount of habitat available at the landscape level for species 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. The No Action would not: move the forest towards the DC for the regeneration age class in the northern hardwood, spruce/fir; nor paper birch community types; nor provide wildlife habitat diversity in managed lands identified in the Forest Plan (USDA-LRMP 1986a, III 30-35, III 35-41); nor meet the DC for HMUs 416 and 417. 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 alternative 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. Alternative 1 would not provide an opportunity via harvest treatments 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 songbirds (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 when compared to the harvest units proposed for treatment under the action alternatives. However, Alternative 1 would not provide an opportunity via harvest treatments to increase the paper birch and aspen component as well as 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 birds within 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, which is the primary prey base for MIS Canada lynx (see the BE/BA as amended for detailed analysis for potential effects to Canada lynx).

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

Alternative 2 - Proposed Action

Trees would be felled under this alternative using 781 acres of group-selection treatment ($1/10^{th}$ to 2 acre size), 165 acres of single tree selection, and 141 acres of clearcut harvesting, totaling approximately 1087 stand acres.

Direct Effects

Alternative 2 would cause the direct effect of displacing some wildlife species. 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.

Forest Plan Wildlife Standards and Guidelines would mitigate the direct effect of tree removal on wildlife species by maintaining 1.25 to 2.50 square feet per acre of trees with an 18-inch diameter at breast height as existing and future wildlife trees within the proposed harvest units

(USDA-LRMP 1986a, III-15, VII-B-21, S&G #28). Also, the USFWS BO Terms and Conditions for protection of Indiana bat would retain existing snag trees, which also benefit other wildlife species. 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 pre-haul road maintenance of the existing forest road system and old skid trails are proposed. Roads can cause direct effects to wildlife if they are barriers to travel routes for daily activities, dispersal, and migration. Forest roads and landings that remain open to the public can cause the direct effect of increased human access, which can cause the direct effect of wildlife mortality from road-kill, hunting, and trapping, and cause adverse indirect effects on species intolerant of human activity (Deming 1994). Forest Management Practices (NHDFL 1997) and road closure Standards & 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 reconstruction and skid trail reuse associated with the Proposed Action would not create habitat patches isolated from one another or restrict wildlife dispersal necessary for maintaining population viability. The White Mountain National Forest FEIS addressed the effects of road construction on wildlife, and the effects of Alternative 2 are within the range of effects analyzed (USDA-FEIS 1986, IV-27).

Large Mammals (MIS White-tailed deer & MIS Canada lynx (see TEPS section)): The white-tailed deer is one of the management indicator species for emphasis under the uneven-aged system in management area 3.1 (USDA-LRMP 1986a,VII-B-21, S&G #31). The availability of quality wintering areas for deer can be a limiting factor in their survival. Spruce-fir or hemlock stands are the basic cover component of most wintering areas. A management goal for most wintering areas, regardless of species composition, is to prolong the useful life of the area by perpetuating shelter, maintaining deer mobility and access throughout all non-regenerating segments of the wintering area, and providing preferred and accessible browse. As a minimum, at least 50% of the entire wintering area should be in "functional shelter" at all times. Functional shelter is defined as softwood cover at least 35 feet tall, with at least 70% crown closure (Reay et al. 1990). Site-specific field reviews determined the Tripoli East project area does not contain a known documented deeryard and the softwood areas within the stands proposed harvesting do not function as a core or primary yard habitat (Forest Service & NH Fish and Game ID-Team, and NHNHI-Sperduto 1998).

Alternative 2 would cause the direct effect of an increase in the amount of limbs and tops on the ground from harvested trees, which would provide a localized, short-term source of natural browse for MIS white-tailed deer when they need it most for overwinter survival. Mobility patterns of large mammals traveling to, from, or within the proposed Tripoli East project area after harvesting activity would not be adversely affected by the proposed clearcut 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 2000). Alternative 2 would meet the Purpose and Need and would help move the forest towards the desired condition for HMUs 416 and 417 and for managing the stands for hardwood regeneration for management indicator species white-tailed deer forage habitat (USDA-LRMP 1986a, VII-B-21, S&G #33).

Small Mammals (MIS Snowshoe hare and MIS American marten (see TEPS section)): 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 (Trousdell 1954 cited in Harlow et al. 1997).

The relatively moderate amount of ground disturbance in terms of magnitude and duration (partially during frozen ground mitigation measure conditions) associated with treating approximately 1,087 stand 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 would retain wildlife cavity trees, snags and existing large woody material already on the ground for habitat structure for MIS snowshoe hare and other small mammals.

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

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

The American woodcock population is in decline in the Eastern Region (NHFG 2000/2001). The woodcock requires three distinct habitat types: brushy reverting fields for roosting, actively managed grassy fields for singing and courtship activities, and early-successional hardwood stands for nesting and feeding requirements. Woodcock forage largely on invertebrates such as earthworms found in rich loamy soils and other larval stages of Diptera (true flies) and Coleoptera (beetles) often associated with riparian zones (VFWD 1986). Some insects feed only on the plants that grow in early successional habitats (such as wild lupine and blueberries). Alternative 2 would have the direct effect of creating early successional young age class in the northern hardwood type suitable for American woodcock needs.

Neotropical Migratory Songbirds and Raptors (MIS Chestnut-sided, mourning, Cape May, and pine warblers; Northern junco; Eastern kingbird and bluebird; Northern goshawk and broad-winged hawk): A direct effect of tree removal through clearcutting and group selection treatments may cause displacement from upper canopy habitat of various neotropical bird and hawk species. Alternative suitable upper canopy habitat would be available to these species in the large blocks of mature closed canopy forest within the HMUs 416 & 417 that are not subject to vegetation management. This mature habitat would remain long-term sources of closed-canopy habitat within the HMUs. Although all field reviews detected none, trees that are discovered to contain raptor nests 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, if present (USDA-LRMP 1986a S&G, III 18 & VII-B-20). The winter harvest mitigation measures proposed under Alternative 2 would avoid the direct effects of disturbance to songbird nests or eggs. The Proposed Action would not have a measurable negative effect on migratory bird populations hence the project complies with the Migratory Bird Treaty Act Executive Order 13186 and MOU. The 1918 MBTA was designed to forestall hunting of migratory birds and the sale of their parts, and was not intended to regulate timber harvesting.

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

Indirect Effects

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

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

Roads would remain closed to motorized use when harvesting is not occurring with exception of Mack Brook and Hix Mountain Roads, which are occasionally open to dispersed camping on weekends.

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

Alternative 2 would have the indirect effect of residual hardwood stumps sprouts providing browse for MIS white-tailed deer. Also, there would be an increase of herbaceous and berry producing shrubs in the open areas after harvest treatments beneficial to black bear as forage habitat. Analysis of bear food abundance in the Adirondack Mountains of New York indicated that even-aged, managed habitats provided the highest amounts of spring and summer foods (particularly raspberry and pin cherry), while non-managed and uneven-aged habitats provided the highest quantity of fall foods, particularly beechnuts. Habitat selection was greatly influenced by food abundance. The study found that almost all habitats were valuable during some time of the year, suggesting that a variety of habitats is beneficial to bears (Costello and Sage 1994 cited in Harlow et al. 1997). Under the Proposed Action, the group selection treatments would benefit black bear habitat. 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 over 40% of the stands within the HMUs 416 and 417 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 Tripoli East Project Area would produce suitable habitat for moose, bear, and MIS white-tailed deer.

Small Mammals (MIS Snowshoe hare and MIS American marten (see TEPS section)): Under Alternative 2, 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 HMUs 416 and 417 is managed under an extended rotation providing older trees as potential roosting and nesting habitat for forest bats, birds, and small mammals. Potential MIS snowshoe hare, MIS American marten, forest bat, bird, and small mammal habitat would also be available within the adjacent forest and at the landscape level in the designated Pemigewasset and Sandwich Range Wilderness, which is approximately 5 miles north. 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 from summer/fall harvest.

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

MIS and NH state-listed threatened American marten.

A study by Krusic et al. (1996) compared bat activity (primarily little brown bats) among four age classes of northern hardwood and spruce/fir forest stands on the White Mountain National Forest. Bat activity was highest in over-mature hardwood stands and in regenerating stands (0-9 yr old age class) of both forest types. The data indicated a mixture of forest types and age classes, including clearcut and group cut regeneration and over-mature hardwoods help fulfill the summer habitat requirements of forest bats (see Tripoli East BE/BA as amended and Supplemental Information Reports in the project file).

Winter harvesting mitigation measures are proposed for the majority of Stands, which would avoid disturbance to any potential summer bat roost habitat. Stands 5, 7, 15, 36, 38 (Compartment 112) & Stand 10 (Compartment 113) could be harvested during the Indiana bat summer non-hibernation season (May 15 through August 30), but only if conditions are dry. These six stands could also be harvested during dry fall months outside of the non-hibernation season. These six stands contain a total of 188 stand acres (0.02%) of potential suitable bat habitat on the White Mountain National Forest (see the BE/BA as amended and Supplemental Information Reports in the project file for detailed analysis of potential effects to Indiana and small-footed bats). The relevant and local studies cited above support the reasonable conclusion that the harvest treatments proposed for the Tripoli East Project Area would produce suitable habitat for small mammals including MIS and woodland bats.

Upland Game Birds (MIS ruffed grouse): Under Alternative 2, clearcut harvesting 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 and Fish Habitat Standards and Guidelines (USDA-LRMP 1986a, III 15-16) would protect and maintain habitat important to invertebrates as prey base for MIS grouse and the American woodcock. In eastern Maine, courting male woodcock habitat was improved by creating clearings five acres in size (Sepik et al. 1986 in Harlow et al. 1997). Habitat characteristics were measured near 89 nests of woodcock on Moosehorn National Wildlife Refuge, Calais, Maine. Forty-four of the 89 nests were in clearcuts less than or equal to 10 years old. Because nests often are associated with clearcutting and early successional stands of alders and shrub species, this study concluded that it is essential to provide these habitats for nesting birds (McAuley et al.1996 cited in Harlow et al. 1997). The relevant studies cited above support the reasonable conclusion that the harvest treatments proposed for the Tripoli East Project Area would produce suitable habitat for MIS ruffed grouse and American woodcock.

Neotropical Migratory Songbirds and Raptors (MIS Chestnut-sided, mourning, Cape May and pine warblers; Northern junco; Eastern kingbird and bluebird; Northern goshawk and broad-winged hawk): Alternative 2 would have the indirect effect of increasing open forage areas through the group selection and clearcutting treatments beneficial to MIS songbirds and hawks. Neotropical migratory bird research on the White Mountain National Forest (Costello 1995) indicated that clearcutting provides more opportunity than group selection for bird species that require early successional habitat to fulfill all or part of their breeding requirements. Clearcut openings were higher in bird species richness, abundance, and diversity than group selection openings. The management indicator species chestnut-sided and mourning warblers were found in clearcuts and were the most abundant species observed in the group selection openings. Veery and eastern wood pewee are typically associated with older forest age classes (DeGraaf and Rudis 1986), and, although not breeding within clearcuts, they flew in and out and appeared to forage on the abundant fruit crops present, suggesting these clearcuts provide valuable foraging areas (Costello 1995).

A study of breeding bird assemblages in managed northern hardwood forests in New England found that during the first growing season after winter harvest, birds that nested in the stand do not return, but other species move in. Two years after cutting, there may be twice as many species, but a few that were present in the first year may no longer inhabit the site. During the third growing season, the number may double again (DeGraaf 1991). As even-aged forests progress through clearcutting to a mature state, each type and age-class supports a unique assemblage of bird species. Neotropical migrant songbird numbers were censused in clearcut stands of a spruce-fir forest in northern Maine, in a northern hardwood forest in Vermont, and in aspen and mixed oak forests of Pennsylvania. All three studies found that each seral stage (clearcuts, pole, and mature stands) was dominated by a characteristic group of birds (Titterington 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 Tripoli East Project Area would produce suitable habitat for Neotropical migratory birds and raptors (including MIS).

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

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

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

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

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

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

Alternative 3:

This alternative would treat the same stands as Alternative 2, but would use group harvesting instead of clearcutting, and several stands would be deferred with less total stand acres are treated. Winter mitigation measures described under Alternative 2 would apply.

Direct and Indirect Effects

This alternative would have similar direct and indirect effects on wildlife or their habitat as described under Alternative 2. However, management indicator species that use the regeneration age class of the northern hardwood community type would benefit less. There would be some benefit to these management indicator species and to forest bats foraging in canopy gaps from the group selection treatments, but the small size of the groups (1/10th acre to 2 acre, ½ acre average) would not provide the larger opening habitat. Single-tree selection treatments would not initiate softwood regeneration or conversion to this habitat type, but would maintain more mature forest hardwood habitat for MIS broad-winged hawk and the ovenbird.

Alternatives 3 would provide less benefit to the majority of MIS compared to Alternative 2, because maintaining mature stands would provide habitat for fewer wildlife species that prefer mature forest habitat (USDA-FEIS 1986a, IV-43). Only 10% of native forest wildlife species use mature or over-mature forest stands (USDA-LRMP 1986a, VII-M-6).

This alternative would provide less opportunity for creating early successional habitat for MIS songbirds, MIS grouse, MIS white-tailed deer, moose, and bear. Species, such as the MIS chestnut-sided and mourning warblers that nest and feed in clearcuts may use larger group cuts. Some species would benefit from the combination of mature and regenerating forest conditions that would be created with group selection and single-tree. Except for the No Action, due to lack of clearcutting, Alternative 3 has the least potential to move the forest towards the desired condition for diverse early-successional habitat for wildlife needs compared to Alternative 2.

Alternatives 4 and 6:

Direct and Indirect Effects

These alternatives would treat similar stands and cause similar direct and indirect effects to wildlife resources as described under Alternative 2. However, effects would benefit the majority of MIS to a lesser degree than Alternative 2, because of the smaller amount of acres being proposed for clearcutting and because several stands are deferred. The least total stand acres are proposed for treatment in Alternative 6. Winter mitigation measures as described under Alternative 2 would apply.

Alternative 5:

Direct and Indirect Effects

This alternative would cause similar direct and indirect effects to wildlife species and their habitat as described under Alternative 2 since both would treat similar stands. Although Alternative 5 would treat more stand acres using single-tree and group selection, the smaller group size openings provide less regeneration age class in the Northern hardwood community type compared to the larger opening size of clearcuts proposed under Alterative 2 that the majority of MIS favor. Winter mitigation measures described under Alternative 2 would apply.

Summary of Potential Effects on the Amount and Quality of Habitat for Management Indicator Species

A recent query of the WMNF Combined Database System generated the approximate total acres of forest type by age class within the forest-wide planning area (USDA-FS 2003). The acres of appropriate 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) of potential suitable habitat available within the forest-wide planning area for each MIS (see CDS analysis in the project file). Table 26 discloses that the No Action and the action alternatives would affect the amount and quantity of habitat differently for management indicator species having probability of occurrence within the Tripoli East 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 or Alternative 3, which emphasis uneven-age management via group treatments. All of the other management indicator species are either negligibly affected by or derive benefit from the treatments which utilize even-age management, namely the Alternatives 2, 4, 5 and 6. The effects to

wildlife and habitat are within the range of those described in the FEIS (USDA 1986, IV-62).

The analysis of potential effects to the amount and quantity of habitat for WMNF MIS peregrine falcon and Canada lynx are taken from the Tripoli East BE/BA (as amended and Supplemental Information Reports) and disclosed in the TEPS Section of this EA. 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 of this EA. The following 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 27 due to no probability of occurrence within the Tripoli East Project Area based on extirpation and/or non-suitable habitat present (see EA Appendix F1).

Table 27: Effects on the Amount and Quality of Habitat by Alternative for MIS Having Probability of Occurrence in the Tripoli East Project Area (per 36 CFR 219.19).

MIS	MA	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Uneven Age)	Alternative 4 (Modified Proposed)	Alternative 5 (Forest Plan)	Alternative 6 (Visuals)
American Marten Mixed forest. *Varying age class.*	2.1	Perpetuates the lack of age class diversity. Long-term loss of paper birch. Increase in softwood forest type via long-term forest succession.	Increase in age class diversity via a total of 141 CC; 781 group; & 165 single-tree acres. Perpetuates paper birch & potential development of the softwood forest type within the groups.	Least increase in age class diversity due to no clearcuts; 842 group; & 165 single-tree acres, with similar potential for softwood development within the groups compared to Alternative 2.	Less increase in age class diversity via 111 CC; 811 group; 47 single-tree; & 118 group/single-tree acres with potential softwood development in groups compared to Alt. 2.	Similar increase in age class diversity via 131 CC; 833 group; 47 single-tree;118 group/single tree acres, with softwood development in groups as Alt. 2	Less increase in age class diversity via 111 CC and 554 group acres compared to Alternative 2.
Snowshoe Hare Spruce / fir *Regen / young.*	3.1	Perpetuates lack of regen / young age classes as forage. Potential increase in softwood type over the long-term.	Increase in regen / young age classes as forage with potential increase in spruce / fir regen via 141 CC & 781 group acres.	Least increase in regen / young age classes via no clearcuts with some increase in spruce / fir regen via 842 group acres compared to Alternative 2.	Less increase in regen / young age classes with potential spruce / fir regen via 111 CC; 811 group; 118 group/single tree acres compared to Alternative 2.	Similar increase in regen / young age classes with some spruce / fir regen via 131 CC; 833 group; 118 group/singletree acres as Alt. 2.	Less increase in regen / young age classes via 111 CC & 554 group acres compared to Alternative 2.
Cape May Warbler Spruce / fir. *Mature / over-mature.*	2.1	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 141 CC and 781 group acres, but very little is in the softwood type.	Least conversion of mature closed canopy forest into open canopy due to no clearcuts; 842 group; & 165 single-tree acres compared to Alternative 2.	Less conversion of mature closed canopy forest into open canopy via 111 CC; 811 groups: 118 group /single tree acres compared to Alt. 2.	Similar conversion of mature closed canopy forest into open canopy conditions as Alt. 2 via 131 CC; 833 group; & 118 group / single tree acres.	Less conversion of mature closed canopy forest into open canopy conditions compared to Alt. 2.
Chestnut-sided Warbler N. hardwood. *Regen / young*	3.1	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 141 ac of CC and 781 ac of groups.	Least increase in regen / young age classes in northern hardwood type in large openings due to no clearcuts; 842 group acres compared to Alternative 2.	Less increase in regen / young age classes in northern hardwood type via 111 CC & 811group acres compared to Alternative 2.	Similar increase in regen / young age classes in hardwood type via 131 CC & 833 group acres compared to Alt. 2.	Less increase regen / young age classes hardwood via 111 CC & 554 group acres compared to Alt. 2.

MIS	MA	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Uneven Age)	Alternative 4 (Modified Proposed)	Alternative 5 (Forest Plan)	Alternative 6 (Visuals)
Northern Goshawk N. hardwood. *Mature / over-mature.*	2.1	Maintains mature closed canopy forest for nest habitat. Lack of openings & long-term loss of paper birch suitable as songbird / grouse prey base habitat.	Conversion of mature forest with reduced potential nest habitat, via a total of 141 CC acres. Perpetuates paper birch & increased open forage habitat via the clearcuts & 781 ac of group treatments.	Least conversion of mature forest & long-term loss of paper birch as future nest & prey base habitat due to no clearcut acres compared to Alt. 2. Increased open forage habitat via 842 acres of group treatments.	Less conversion of mature forest via 111 ac of clearcuts compared to Alt. 2. Increase in forage habitat via 811 group acres and some perpetuation of paper birch component compared to Alt. 2.	Similar conversion of mature forest into increased open forage habitat via 131 CC; 833 groups; 118 group / single tree acres & perpetuation of paper birch compared to Alt. 2.	Less conversion of mature forest and less increase in open forage habitat via 111 CC and 554 group acres compared to Alternative 2.
Broad-winged Hawk Paper birch. *Mature / over-mature.*	2.1	Maintains mature closed canopy forest condition. Lack of openings for forage habitat & long-term loss of paper birch component.	Conversion of mature forest with reduced nest habitat via 141 CC & 781 group acres. Increased openings for foraging habitat and perpetuation of paper birch component.	Least conversion of mature closed canopy forest & less acres of opening habitat due to no clearcuts and 842 acres of groups with long-term loss of paper birch compared to Alternative 2.	Less acre conversion of mature forest and less acres of open foraging habitat via less CC acres with paper birch perpetuated compared to Alternative 2.	Similar conversions of mature forest and increase in opening habitat acres and perpetuation of paper birch compared to Alternative 2.	Less conversion of mature forest and less acres of opening habitat created compared to Alternative 2.
Ruffed Grouse Paper birch. *Regen / young*. Aspen. *Mature / over-mature.*	3.1	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 141 ac of CC and 781 ac of groups. Perpetuation of aspen & paper birch via larger CC openings.	Least increase in regen / young age class due to no clearcuts & 842 group acres, and long-term loss of aspen and paper birch components compared to Alternative 2.	Less increase in regen / young age class via 111 CC & 811 group acres with less perpetuation of aspen and paper birch components compared to Alternative 2.	Similar increase in regen / young age class via 131 CC & 833 group acres with less perpetuation of aspen & paper birch compared to Alt. 2.	Less increase in regen / young age class via 111 CC; 554 group acres & perpetuation of aspen /paper birch compared to Alt. 2.
White-tailed Deer Hemlock *All ages*	3.1	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 141 CC & 781 group acres. Maintains hemlock type.	Least increase in regen / young age classes due to no clearcuts & 842 group acres compared to Alt. 2. Maintains hemlock type.	Less increase in regen / young age classes via 111 CC acres & 811 group acres compared to Alternative 2. Maintains hemlock type.	Similar increase in regen / young age classes via 131CC & 833 group acres compared to Alt. 2. Maintains hemlock.	Less increase in regen / young age classes via 111 CC & 554 group acres compared to Alt. 2. Maintains hemlock type.
Eastern Kingbird Openings	3.1	Perpetuates existing lack of opening habitat.	Increase in larger openings via 141 CC & 781 group acres and landings.	Least increase in larger openings due to no clearcuts and 842 group acres compared to Alt. 2.	Less increase in larger opening habitat via 111 CC; 811 group; 118 group /singletree acres compared to Alternative 2.	Similar increase in opening habitat via 131 CC; 833 group; & 118 group/single tree acres compared to Alternative 2.	Less increase in opening habitat via 111 CC & 554 group acres compared to Alt. 2.
Eastern Bluebird Openings	3.1	Similar effects as Kingbird.	Similar effects as described for Kingbird.	Similar effects as described for Kingbird.	Similar effects as described for Kingbird.	Similar effects as Kingbird.	Similar effects as Kingbird.
Mourning Warbler Opening	3.1	Similar effects as described for Kingbird.	Similar effects as described for kingbird.	Similar effects as described for Kingbird.	Similar effects as described for Kingbird	Similar effects as described for Kingbird.	Similar effects as described for kingbird.

MIS	MA	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Uneven Age)	Alternative 4 (Modified Proposed)	Alternative 5 (Forest Plan)	Alternative 6 (Visuals)
Northern (dark eyed) Junco Pine *Regen / young*	3.1	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 141 CC acres and 781 group acres.	Least increase in regen / young age classes with potential for some pine regen via no CC and 842 group acres compared to Alternative 2.	Less increase in regen / young age classes with potential for some pine regen via 111 CC; 811 group; 118 group/single tree acres compared to Alternative 2.	Similar increase in regen / young age classes with some pine regen via 131 CC; 833 group; 118 group/single tree acres as to Alt. 2.	Less increase in regen / young age classes via 111 CC & 554 group acres compared to Alternative. 2.
Pine Warbler Pine *Mature / over-mature*	3.1	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 is present in the Tripoli East Project Area.	Similar effects as Cape May Warbler, but very little mature or over-mature pine type is present in the Tripoli East Project Area.	Similar effects as Cape May Warbler, but very little mature or over-mature pine type is present in the Tripoli East Project Area.	Similar effects as Cape May Warbler (very little mature or over-mature pine type is present in Tripoli East Project Area.

Summary of Alternatives for Meeting Forest Plan Desired Habitat Conditions For WMNF Management Indicator Species

Table 28 summarizes the relative qualitative ranking of the alternatives for meeting Forest Plan desired habitat conditions based on MIS habitat needs.

Table 28: Relative Ranking of Alternatives for Meeting Desired Habitat Conditions for WMNF MIS

Alternative 1: Would not meet the proposed project Purpose and Need: nor move the forest towards the desired condition for wildlife habitat in managed lands identified in the Forest Plan (USDA-LRMP 1986a, III 30-35, III 35-41), nor meet the desired vegetation condition for HMUs 416 and 417. This alternative would not provide an opportunity via harvest treatments to increase the amount of existing early successional (0 to 9 year old tree age-class) hardwood and paper birch types. The No Action would benefit several MIS utilizing mature and over-mature hardwood forest, yet would not benefit the majority of MIS due to no opportunity to increase early-successional nesting and foraging habitat via larger clearcut and group openings.
Alternatives 2 & 5: Have greater potential to move the project area towards the desired condition for regeneration age class in the northern hardwood, softwood, and paper birch components via clearcut and group treatments in HMUs 416 and 417. This habitat diversity would benefit several wildlife species during breeding and nesting and increase MIS white-tailed deer and MIS snowshoe hare foraging habitat (USDA-LRMP 1986a, VII-B-21, S&G #33). However, Alternative 2 better meets the Purpose and Need for the Tripoli East project area (USDA-LRMP 1986a, III 30-35, III 35-41, VII-B-1) creating larger openings of early successional habitat available for a greater number of management indicator species.
Alternatives 3, 4, and 6: Would also benefit species that use early successional habitat because of group and clearcut treatments respectively, but to a lesser degree than Alternatives 2 and 5, due to the smaller group size openings, and the fewer amounts of total stand acres treated respectfully. Alternative 6 would provide a lesser opportunity to maintain a mature forest condition due to the group treatments.

Alternatives 2 and 3: Maintain mature habitat conditions in HMUs 416 and 417 for management indicator species Northern goshawk, white-tailed deer, Cape May warbler, American marten and State-listed Coopers hawk, because a greater amount of stand acres are treated via single-tree selection. Species using mostly mature forest or have smaller localized home ranges (i.e. rodents, reptiles, amphibians) would benefit less from Alternatives 4, 5 and 6, which includes clearcutting. These species would be affected by the removal of trees, and minor localized soil and litter compaction and overall change in micro-site habitat condition. Most of these species would likely inhabit adjacent uncut or partially cut areas until the treated areas become more suitable. However, some of the species that utilize mature forest, such as woodland bats and raptors would find increased opportunities for foraging in the clearcut openings. Based on the potential effects to the species using mature habitat or with small home ranges, Alternative 5 would rank last because it would treat the most total stand acreage via group and clearcutting combined, followed by Alternatives 2, 3, 4, 6 respectively.

In summary: All of the action alternatives would meet the Purpose and Need for the proposed project and would move the forest towards the desired condition at various degrees for wildlife habitat identified in the Forest Plan (LRMP III 30-35, III 35-41). The management indicator species chestnut-sided and mourning warblers, Eastern bluebird and kingbird, Northern junco, and ruffed grouse would benefit from the forest openings created by group and clearcut treatments under the action alternatives. All the action alternatives would provide the opportunity to increase the amount of available browse via treetops and limbs on the ground short-term and via stump sprouting and regeneration of hardwoods for MIS white-tailed deer, moose, and small mammals within the Tripoli East project area. The amount of understory vegetation and reserve trees within the harvested stands after treatment (coupled with the surrounding forest at the landscape level), would provide food, shelter, and escape hiding cover for the large and small mammal species native to northern hardwood forests that use a wide range of forest types and age classes (Gore 1988, cited in Deming 1994).

None of the ecosystems or habitats affected by the action alternatives are scarce, unique, or regionally at risk. Large mammal species with larger home ranges such as MIS white-tailed deer, moose, and black bear or potential future dispersal of (now extirpated) transient MIS Canada lynx, wolf or cougar or other species of concern **would not be adversely affected by the action alternatives**. The Tripoli East Project Area is not a limiting factor in MIS, Federal TEPS, State TESSC or other species of concern life history requirements (see the BE/BA as amended in the project file and Appendices F3 & G2). The harvesting and relatively moderate amounts of pre-haul road maintenance of forest road proposed under the action alternatives would not isolate or prevent amphibians and reptiles (dormant during winter harvest activity) or large and small mammals or birds from traveling to, from or within the proposed Tripoli East project area during or after harvest activity. The action alternatives would not interrupt the processes necessary for genetic interaction for maintaining population viability within the forest-wide planning area.

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

The WMNF Forest Plan (USDA-FS 1986) incorporates all of the requirements of 36 CFR 219.9 (Federal Register 1998a). The CFR states population trends of the MIS will be monitored and relationships to habitat changes determined in the context of the Forest-wide planning area (36 CFR 219.9 a (6)).

Based on the potential direct, indirect, and cumulative effects addressed in the Tripoli East EA 2.0, Table 29 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 Tripoli East Project Area. However, the No Action alternative in the near term **would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area**. The Proposed Action and the 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 Proposed Action and 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 Tripoli East Project File).

Table 29: Population Trends & Viability Within The Forest-wide Planning Area For MIS Having Probability Of Occurrence Within The Tripoli East Project Area, Thornton & Livermore, NH.

MIS HAVING PROBABILITY OF OCCURRENCE IN THE PROJECT AREA	EFFECTS DETERMINATIONS FOR THE NO ACTION	EFFECTS DETERMINATIONS FOR THE ACTION ALTERNATIVES
Northern Junco *Junco hyemalis* **Cape May Warbler** *Dendroica tigrina* **Pine Warbler** *Dendroica pinus* **Mourning Warbler** *Oporornis philadelphia* **Chestnut-sided Warbler** *D. pensylvanica* **Eastern Kingbird** *Tyrannus tyrannus* **Eastern Bluebird** *Sialia sialis* **Ruffed Grouse** *Bonasa umbellus* **Northern Goshawk** *Accipiter gentilis* **Broad-winged Hawk** *Buteo platyperus* **White–tailed Deer** *Odocoileus virginianus* **Snowshoe Hare** *Lepus americanus* **American Marten** *Martes Americana* **Peregrine falcon** *Falco peregrinus anatum* **Canada lynx** *Lynx canadensis* (extirpated)	The No Action alternative would add to the declining amount of early-successional habitat within the Tripoli East Project Area. Over time, a declining trend of MIS that use this habitat type would occur within the Tripoli East Project Area. **However, the No Action in the near term would not adversely affect population trends and viability of WMNF MIS within the forest-wide planning area.**	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 Tripoli East Project Area (Tables 8A-C, Appendix H). **However, the action alternatives would not adversely affect the population trends and viability of WMNF MIS within the forest-wide planning area.**

See EA Aquatics Section for effects and viability determinations for MIS **American black duck and Eastern brook trout**.
See EA Appendix F3 for complete analysis of effects for MIS **American marten**.
See EA TEPS Section Table 24 & Tripoli East BE/BA for further analysis of MIS **Peregrine falcon** and MIS **Canada lynx**.
Although extirpated, Canada lynx is addressed due to potential suitable habitat present.

3.2.2.5 Cumulative Effects on Wildlife Resources

The home range and habitat needs of wildlife vary by species (DeGraaf et al. 1992). Therefore, the larger MAs 2.1 and 3.1 within HMUs 416 & 417 was used to facilitate evaluation of past, present, and reasonable foreseeable future effects on wildlife resources such as large mammal species with wide home ranges and evaluation of habitat distribution (Appendix H, **B.3.1**). This larger cumulative effects area includes the site-specific Tripoli East Project Area, which contains the smaller home range of smaller mammals, amphibians, and reptiles. The Tripoli East EA 2.0 also used the broader landscape and regional analysis scales to assess potential cumulative effects to wildlife habitat distribution and connectivity, and wildlife population trends and viability within the forest-wide planning area (36 CFR 219.19):

- Lynx Assessment Units 8 and 11 analyzed in the Tripoli East BE/BA (TES and landscape connectivity).
- The Partners In Flight Physiographic Area 28, included the WMNF (Neotropical migratory birds & hawks).
- The New England and White Mountain subsection regional landscape scales (large and small mammals).

Alternative 1 (No Action)

This alternative would add an adverse cumulative effect to the steadily declining trend in early-successional, regeneration-age class of northern hardwoods and aspen/birch community types within the Tripoli East Project Area and at the larger HMU, Forest-wide, and New England regional scales. Because of a decline in early-successional habitat, Neotropical migrant MIS chestnut-sided and mourning warblers and snowshoe hare, and upland opening MIS Eastern kingbird and MIS bluebird that rely on early-successional age class and/or aspen/birch community type would potentially decline within the Tripoli East Project Area. Overall, wildlife habitat and species biodiversity within the Tripoli East 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, 3, 4, 5, 6

Past NEPA decisions involving vegetation management near the Tripoli East Project Area since 1986 (see Table 1) have not contributed substantially to the age class diversity within the cumulative effects area due to relatively small amount of acres treated. Also, stands treated in the 1987 Russell Mountain Timber Sale and 1991 Tripoli Road Salvage have grown have grow out of the early successional stage into the next age class. These areas will no longer provide early successional habitat for wildlife species that use this habitat. The early successional age class habitat is declining in HMU 416 and 417 and on the White Mountain National Forest landscape and New England region over the past several decades (USDA-FS 1993).

The recent Eastman West Timber Sale EA determined little to no cumulative effects to wildlife resource from implementation of any of the action alternatives. Recent harvesting within the Eastman West Project Area showed no evidence of major erosion, insect infestation, or disease during sale administration monitoring reviews. The stands treated in the 1996 Eastman West Sale will soon grow out of the early successional stage too. The recent Loon Mountain Ski Resort Development and Expansion FEIS determined no significant cumulative effects on wildlife resources. Both projects contained a similar mix of wildlife standards and guidelines as described for the Tripoli East Vegetation Management Project.

Future non-Forest Service actions on private land adjacent to the forest and in the northwest corner of HMU 416 are not expected to create substantial amounts of large opening or early successional habitat suitable to wildlife species that use this habitat. No additional Forest Service vegetation management projects are expected within the Tripoli East Project Area or HMUs 416 and 417 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 or the Tripoli East Vegetation Management Project.

Based on relatively minor, localized, and short-term direct and indirect effects to wildlife and/or their habitat from past, recent, and foreseeable future actions, the action alternatives of the Tripoli East Vegetation Management Project **would not add adverse cumulative effects** to wildlife resources. 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 Tripoli East EA 2.0 are within the range of effects to wildlife resources analyzed in the FEIS for the White Mountain Forest Plan (USDA-FEIS 1986, IV-62).

3.2.2.6. Effects Determinations for Federal TEPS & State TESSC & Other Wildlife

Table 30 discloses the effects determinations for Federally-listed TEPS wildlife species and their habitat taken from the Tripoli East Project BE/BA, as amended with USFWS concurrence and Supplemental Information Reports (see the Project File). In summary, there are no known documented occurrences of TEPS wildlife species within the Tripoli East project area. There is documented

occurrence of individual scattered R9-listed sensitive species butternut, ginseng, and squirrel corn (see Vegetation Section of this EA). The potential effects to TEPS wildlife species include similar direct, indirect, cumulative effects previously described under the Terrestrial Wildlife and Aquatic Resources Sections.

The Tripoli East BE/BA compared the potential site-specific effects from the Tripoli East Vegetation Management Project to those disclosed in the WMNF Programmatic Biological Assessment (BA) (USDA-FS 1999) of continued implementation of the 1986 WMNF Forest Plan. The Tripoli East BE/BA as amended and Supplemental Information Reports determined there would be no additional effects outside those evaluated in the WMNF programmatic BA. The USFWS concurred that the Tripoli East Vegetation Management Project complies with the Reasonable and Prudent Measures and Terms and Conditions of the USFWS BO (USDI-FW, 2000). The Tripoli East BE/BA 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 Tripoli East Vegetation Management 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 Tripoli East BE/BA determination for Canada lynx is "no effect", the judge's ruling is this case does not apply. EA Appendix F & G discloses the probability of occurrence of State TESSC and other wildlife of concern. These analyses determined there would be no adverse effects to these species from either the No Action or action alternatives.

Cumulative Effects:

The analysis area for assessing potential cumulative effects to TEPS species taken from the Tripoli East BE/BA included site-specific Tripoli East Project Area (small mammal home range) and the broader WMNF landscape Lynx Assessment Units 8 and 11. 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 population viability.

The Tripoli East BE/BA considered the effects determinations from the BE/BA completed for the recent Eastman West Timber Sale (located adjacent to the Tripoli East Project Area) and the effects determinations rendered from the recent Loon Mountain Ski Resort Development and Expansion BE/BA (located in Lynx Assessment Unit 8). The USFWS concurred with the Tripoli East BE/BA findings of **no adverse cumulative effects from past, present, and reasonably foreseeable projects** (including the Tripoli East Vegetation Management Project).

Table 31 summarizes the effects analysis for Federally-listed TEPS wildlife species at the national and forest-wide levels.

Table 30: Effects Determinations Taken form the Tripoli East BE/BA with USFWS Concurrence.

FEDERAL STATUS	TEPS WITH POTENTIAL OCCURRENCE WITHIN THE PROJECT AREA	TRIPOLI BE/BA EFFECTS DETERMINATIONS
Threatened **Threatened**	Bald eagle *(Haliaeetus leucocephalus)* Canada lynx *(Lynx canadensis)* *	**no effect** to the Federally-listed threatened bald eagle or 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 *(Myotis sodalis)*	**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).
R9-SS **R9-SS** **R9-SS** **R9-SS**	Peregrine falcon *(Falco peregrinus anatum)* Eastern small-footed bat *(Myotis leibii)* N. bog lemming *(Synaptomys borealis sp.)* Wood turtle *(Clemmys insculpta)*	**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 Federally-listed R9 Sensitive Eastern small-footed myotis, Northern bog lemming, or wood turtle.

Table 31. Summary of National Level and WMNF Forest-wide Effects Analysis for Federally-listed Threatened, Endangered, Proposed and Eastern Region 9 Sensitive Wildlife Species.

Nation-wide BA and BO for Canada lynx: The Forest Service agency completed a nation-wide BA of the effects of the continued implementation of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada lynx *(Lynx canadensis)* in the contiguous United States (USDA-BLM 1999). Subsequently, the USFWS rendered a Biological Opinion (BO) at the national-level (USDI 2000b), which concurred with the Forest Service that continued implementation of current nation-wide Forest Plans as implemented in conjunction with the Conservation Agreements, are "**not likely to jeopardize the continued existence of the Canada lynx**". The multi-agency Canada Lynx Conservation Agreement and Strategy (CLCAS) outlined Standards and Guidelines for conservation of the Canada lynx habitat. In addition, the USFWS BO for the forest-wide BA for the WMNF rendered a "**not likely to jeopardize the continued existence of Canada lynx**" (USDI 2000). The forest wide BO stated lynx appears to be extirpated from the WMNF and it is very rare and possibly extirpated statewide.
CLCAS Standards and Guidelines: The USFS entered into a conservation agreement with the USFWS to implement the CLCAS to conserve all lynx habitat on National Forest lands within the range of lynx (Ruediger et al. 2000). The CLCAS describes a Lynx Assessment Unit (LAU) process to define suitable habitat for management of lynx habitat. Although Canada lynx are considered likely extirpated from NH forests, the Tripoli East Project Area is located within LAU 8 and 11. The project specific Tripoli East BE/BA addressed the Standards and Guidelines outlined in the CLCAS and the potential effects to LAU 8 and 11 are summarized in the effects section of this analysis. FS and NHNHI field reviews of portions of the proposed Project Area during various time of the year, and Forest-wide winter track monitoring surveys form 1992 through 1997 (including transects near the Eastman Brook sub-watershed) documented no sightings of TEPS such as lynx or tracks, excavations, and fecal pellets (USDA 1996, Sperduto 1998). The WMNF is participating in the Nationwide Lynx Detection Surveys, collecting hair samples for genetic DNA analysis. Several years of collecting samples in suitable lynx habitat Forest-wide detected no evidence of lynx on the WMNF to date.
WMNF Forest-wide Biological Assessment (BA): The WMNF completed a Forest-wide BA of the potential effects to TEPS from continued implementation of the 1986 Forest Plan (USDA 1999). The USFWS rendered a Biological Opinion (BO) with an Incidental Take Statement (USDI 2000). The USFWS concurred with the findings of WMNF BA that continued implementation of the Forest Plan would cause either: a beneficial effect; a no effect; and/or not likely to adversely affect the majority of TEPS species for the WMNF; and is not likely to jeopardize the continued existence of Canada lynx and Indiana bat.
Terms and Conditions (T&Cs): The USFWS BO outlined T&Cs for protection of the Indiana bat. A TES amendment to the WMNF Forest Plan (USDA-FS 2001) includes the T&Cs of the BO, which the project specific Tripoli East BE/BA addressed. The Tripoli East Project Area does not contain caves or mine tunnels often used as overwintering habitat (hibernacula) elsewhere by the Indiana bat *(Myotis sodalis)* or the small-footed bat *(Myotis leibbi)*. Depending on the treatment such as clearcut, existing cavity trees (potential summer roosting or nesting habitat) for bat, bird, and small mammal species would be available within and immediately adjacent to the proposed harvest units, and within the surrounding forest at the landscape level, such as the adjacent designated Pemigewasset and Sandwich Range Wilderness Area.

3.2.3 BIOLOGICAL DIVERSITY

Biological Diversity (biodiversity) is commonly defined as the variety of life and its processes occurring at various levels. The diversity of species, communities, and genetic variability is ensured by the presence of varying conditions within a region (NHFG 1996, CEQ 1993). The biodiversity concept embraces both the components of an ecosystem and the processes that bind the components together. Assessments of biodiversity can include multiple scales such as genetic, species, population, community, ecosystem, landscape or regional:

- *Alpha* diversity is the number of species at the habitat or community level.
- *Beta* diversity is change in species composition along environmental gradients (i.e. elevation, soil moisture & fertility).
- *Gamma* diversity is many habitats and environmental gradients in a geographic region.

3.2.3.1 Affected Environment

Gama diversity: At the New England geographic region level, the Tripoli East EA 2.0 used information on biological diversity from, "*New Hampshire's Living Legacy: The Biodiversity of the Granite State, (NHFG 1996)*", and "*New England Wildlife Habitat; Natural History, and Distribution (DeGraaf et al. 2001)* and "*Biodiversity in the Forests of Maine (UNH 1999)*. The distribution of vegetative community types and age classes, and the structure of vegetation determine the number of different wildlife species (species diversity) that occur on a landscape (DeGraaf et al. 1992). Special habitat features such as upland openings, wetlands, vernal pools, cavity trees, downed course woody material, and riparian zones add to habitat diversity. Upland opening habitat includes maintained fields, apple orchards, and old pastures. Clearcuts provide a shrubby-type opening that move through successive stages of growth and development. Table 32 displays the various levels of biodiversity and the approximate number of associated wildlife species.

Table 32: Levels of Biodiversity and the Approximate Number of Associated Wildlife Species.

Biodiversity Level	Approximate Number Of Wildlife Species	% Species Associated With Regeneration / Young Age Class	% Species Associated With Mature / Over mature Age Class
New England Geographic Region	Approximately 339 inland wildlife species inhabit New England [a].	257 species have a primary or secondary association with woody vegetation. Of the 257, approx. 233 (90%) have a primary or secondary association with regenerating or young age class among all of the forest types[a].	The remaining 10% have a primary or secondary association with mature, over-mature, or old growth forest habitat types [a].
White Mountain National Forest Landscape	31 species of reptiles and amphibians; 190 species of birds; and 56 species of mammals inhabit the White Mountain National Forest throughout all or part of the year [b].	These species use a variety of habitat types & age classes to meet their needs Approx 66% use early successional forest habitat for all or part of their life cycle. More than ½ of the birds on the White Mountain National Forest are Neotropical migratory songbirds (breed in US & winter south of US), and approx. 85% use early successional habitat for all or part of their life cycle [b].	On the White Mountain National Forest there is abundant available habitat for those species that use mature or over-mature habitats [a].

[a] USDA-FS. 1986a. White Mountain National Forest LRMP, VII-B-1. [b] DeGraaf and Rudis 1986; DeGraaf et al. 1992.

Existing Condition of Biological Diversity:

Habitat Diversity (Mature / Over-mature; Wetland; Upland Opening; and Early Successional)

At the White Mountain National Forest landscape level, there is more available habitat for species using mature and over-mature habitats, and a proportionally lesser amount of available habitat for species that use regenerating or young age class habitat (USDA-FS, LRMP 1986a, VII-B-2; USDA-FS CDS 2003). There is disproportionately a lower percentage of early-successional habitat compared to the mature-over-mature habitat within the Tripoli East Project Area.

Alpha diversity: At the stand level (Tripoli East Project Area) analysis of the HMUs 416 and 417 discloses that the age class compositions of the vegetation communities present are dominated by mature/over-mature northern hardwood forest. Table 27 shows the general wildlife species typically associated with the northern hardwood forest community type. There is approximately less than 2% non-forested habitat (upland opening and wetland) within the Tripoli East Project Area. Non-forested areas are important components of wildlife habitat in managed forests. Upland and wetland non-forest types provide basic habitats for distinct groups of species and seasonally important habitat elements for species that also use forest, such as MIS ruffed grouse and wild turkey, and early spring forage for MIS white-tailed deer. The presence of upland and wetland non-forested habitats is necessary for approximately 22 % of the wildlife species found in New England and seasonally important to another 70 % of the region's species (DeGraaf et al. 1992). Even-aged management of forested stands provides early-successional forested habitat. After clearcutting, woody regrowth usually occupies the site in 1 or 2 years. Old fields that contain a fair amount of shrubs and small trees have wildlife communities that are quite different from those communities found in regenerating stands. The difference is largely due to the amount of dense, continuous herbaceous cover, which lasts longer in old fields than in regenerating stands (DeGraaf et al. 1992).

Beta diversity: The White Mountain Subsection (includes the WMNF) is divided into 4 Land-type Associations (LTAs): Valley Bottom, Mountain Slope, Upper Mountain Slope, and Mountaintop. LTAs are broad categories of land capability that reflect differences in geomorphology, elevation gradients, and climax forest composition. The distribution of habitat communities on the WMNF is the result of land capabilities and past management practices and natural disturbances.

The Tripoli East Project Area contains primarily northern hardwood forest on lower Mountain Slopes LTA, which includes Ecological Land Types (ELT 115c, 115g, and 105) and a small amount of northern hardwood-spruce-paper birch forest at the interface of the Mountain Slope and Valley Bottom LTA (ELT 115a). See the EA Soils Section, **3.1.1.1**, for further description of the ELTs. The natural disturbance pattern for the Valley Bottom LTA is mainly caused by wind, which includes a combination of stand-damaging events (i.e. broken tops, small areas of blow-down), and stand-replacing events (all trees blown down in a large enough area recognized as a stand with a new regenerating forest). Based on data from the Northeast, it is estimated that stand-replacing natural disturbance might place 3% to 6% of the landscape in the Valley Bottom LTA in seedling or sapling conditions. The Mountain Slope LTA is least likely to endure large catastrophic natural disturbances, although such disturbances do occur. Estimates for the Northeast range 1% to 3% of the northern hardwood forest in the Mountain Slope LTA may be in the 0-15 year-old seedling or sapling states at any one time because of natural disturbance. There are approximately 155,000 acres of Valley Bottom LTA across all management areas on the WMNF. Of these, approximately 123,800 acres or 80% is in management areas with active vegetation management. Experience indicates the normal occurrence of natural disturbance in northern hardwood forests being small scale, frequent, and most common on shallow or poorly drained soils (i.e. individual or small groups of trees blowing down). There is minimal opportunity for the reproduction of shade intolerant tree species. Small-scale disturbances tend to perpetuate the normal sequence of succession, i.e. shade-tolerant species dominating and eventually replacing those that are shade-intolerant. The likelihood of paper birch / aspen stands being reproduced is minimal and reduces the diversity of habitats across the landscape.

Some mid- to large-size natural disturbances do occur in the Northeast, but they are much less infrequent, sporadic, and unpredictable. The ELTs that are wet or shallow to ledge indicate a risk to large-scale windthrow. These ELTs tend to be high elevation or lowland softwood areas. Current FS compartment records and site-specific field reviews indicate only scattered pockets of blow-down occur within the Tripoli East Project Area (LTA and ELT maps located at the district office). Most of these areas have regenerated to spruce and fir. Major hurricanes and windstorms occurred 4 to 5 times during the 20th century. The last severe fire period was during the late 1940s and early 50s. Although wind has a dramatic effect on forest overstories, it has little impact upon successional trends and overall species composition. Intense fires generally occur on dry sites, outwash sands and gravels, rock or shallow to bedrock. These types of sites are rare in the Tripoli East Project Area.

1998 Ice Storm Event: Field reviews and over-flights of the White Mountain National Forest documented that the ice storm affected mostly the hardwood forest type in other parts of the Forest (Kilkenny Range) located outside of the Tripoli East Project Area. Thus, the 1998 ice storm did not create any natural openings or early successional habitat within the project area (Forest Service field reviews), and wildlife habitat and populations within the Tripoli East Project Area were not affected by this natural storm event.

3.2.3.2 Biological Diversity Environmental Consequences

Potential Direct and Indirect Effects to Biological Diversity:

In general, vegetation management directly affects aquatic and terrestrial wildlife habitat which, depending on the prescription, scale, intensity, or duration, can have positive, negative, or neutral effects to biological diversity (biodiversity). Positive effects can result in protection, maintenance, or promotion of biodiversity, and negative effects can interrupt function or processes and reduce biodiversity. Neutral effects arise when an action affects some species positively yet affects others negatively, or tend to mimic natural events or processes characteristic of the region or area (i.e. drought, flood, wind-throw, hydrologic regimes, nutrient loading).

The Tripoli East EA 2.0 incorporates the following key principles in analyzing the potential effects to biodiversity as outlined in the document entitled, *"Incorporating Biodiversity Considerations into Environmental Impact Analyses under the National Environmental Policy Act"* (CEQ 1993):

Ecosystem Approach:

The Wildlife Section of the Tripoli East EA 2.0 (§**3.2.2**) incorporates by reference *"The Biodiversity of the Granite State (NHFG 1996)",* which examined biodiversity across the entire statewide landscape and ecological subsections. The Tripoli East EA 2.0 uses varying ecosystem scales appropriate for analyzing potential direct, indirect, and cumulative effects to each resource considered.

- The Soils Section of the Tripoli East EA 2.0 (§**3.1.1**) uses the forest-wide ecological land

type classification system (ELT) for managing the terrestrial landscape of the Forest as described in the 1986 WMNF Forest Plan. The Tripoli East Vegetation Management project incorporates the ELTs that describe geomorphic history, climax forest, parent material and vegetation associations based on land capability of forested ecosystems.

- The Cultural Resource and Vegetation Sections of the Tripoli East EA 2.0 (§§**3.3.2** and **3.2.1**) reviewed the influence of past European settlements and logging history on the current condition of the landscape and vegetation and wildlife resources on the forest (land clearing and over hunting).
- The Recreation and Community/ Economic Sections of the Tripoli East EA 2.0 (§§**3.3.3** and **3.2.5**) address current human factors as part of the ecosystem.
- The Vegetation and Wildlife Sections of the Tripoli East EA 2.0 (§§**3.2.1** and **3.2.2**) assessed the status and trends of vegetative communities (HMU 416 & 417 Analysis) and used the WMNF Forest Plan MIS framework to represent a diversity of habitats well distributed across the ecosystem landscape over time (per 36 CFR 219.19).

Protect Communities and Ecosystems:

The Tripoli East EA 2.0 incorporates by reference the appropriate WMNF LRMP Desired Future Conditions and Standards and Guidelines that protect natural communities, special terrestrial habitat features, aquatic ecosystems, and native species and cites Mitigation Measures to avoid introduction of invasive non-native species. All natural communities and ELTs currently present within the Tripoli East project area would continue to exist in approximately the same amounts and distribution.

Minimize Fragmentation and Promote Natural Pattern and Connectivity Of Habitats:

The Wildlife Section of the Tripoli East EA 2.0 cites the WMNF Monitoring Reports (that summarize the WMNF Wildlife Monitoring Data) and local research studies, which indicate fragmentation is not occurring based on few cowbirds present on the WMNF.

- The Tripoli East project area would maintain a forested landscape with no conversion of National Forest land into permanent agriculture or non-forest development (i.e. shopping mall). There is no private land within the immediate Tripoli East project area, however the northwestern most corner of HMU 416 contains a corridor of private land including the town of Lincoln where development is concentrated and contained.
- The Transportation Section of the Tripoli East EA 2.0 (§**3.3.1**) explains that the road system is in place, which includes an asphalt road (Tripoli Road), gravel and forest woods roads, and no new roads would be built. The Wildlife Section of the Tripoli East EA 2.0 (§**3.2.2**) determined road reconstruction within the Tripoli East project area would cause no adverse effects on fragmentation, natural patterns of wildlife mobility, or habitat connectivity.
- The TEPS section of the Tripoli East EA 2.0 of the EA (§**3.2.2.6**) uses the Lynx Assessment Units 8 and 11 to ensure thresholds for landscape linkages and connectivity of habitats are maintained. The clearcut units proposed for the Tripoli East project area would be separated by a managed stand of at least 10 acres (LRMP S&G, III-17).

The Biodiversity Section of the Loon Mountain Ski Resort Development and Expansion FEIS disclosed that past, present, and reasonable foreseeable future projects (including the Tripoli East Project) within the broad 138,000-acre landscape analysis area would not have significant cumulative impacts on biodiversity including fragmentation, natural pattern or connectivity of habitats.

Promote Native Species and Avoid Introducing Non-native Species:

The Vegetation and Wildlife Sections of the Tripoli East EA 2.0 (§§**3.2.1** and **3.2.2**) describe the native plant, tree, and wildlife communities within the Tripoli East Project Area. Despite the occurrence of invasive plants such as Japanese knotweed and purple loosestrife on portions of the forest, recent forest-wide surveys for noxious invasive plants documented that the WMNF as a whole does not have an invasive plant problem (NEWFS 2002). Non-native plant species are used on private lands and roadsides within the northwest corridor in HMU 416 located outside of the immediate Tripoli East Project Area. The Proposed Action and action alternatives do not include specific actions that would purposely introduce non-native plant or wildlife species within the Tripoli East Project Area. All actions would comply with the 1999 Invasive Species Executive Order 13112 and standards and guidelines in the *Weed Prevention Practices Guide* to prevent noxious weeds.

Protect Rare and Ecologically Important Species:

Site-specific field surveys documented the occurrence of individual R9-listed Sensitive species ginseng and squirrel corn plants and butternut trees scattered outside of proposed harvest units in localized portions of the Tripoli East project area. Buffers were added for protection measures with monitoring planned. The Tripoli East Project BE/BA as amended determined that the Proposed Action and all alternatives may impact individuals, but would not cause a trend toward federal listing for these R9-listed sensitive species within the Tripoli East Project Area. Also, State-listed and other species of concern would not be adversely affected by any of the action alternatives.

Maintain Unique or Sensitive Environments:

The NHNHI conducted a site-specific survey of the Tripoli East project area and documented no findings of unique, sensitive environments, or exemplary communities such as old growth stands, mapped alpine bogs, ravines, meadows, high cliffs, rock talus slopes, vernal pools or caves (Sperduto 1998). The action alternatives would implement Forest Plan Standards and Guidelines and Mitigation Measures that avoid and protect any such areas as a routine best management practice.

Maintain or Mimic Natural Ecosystem Processes and Naturally Occurring Structural Diversity:

The Proposed Action and all alternatives would not interrupt the natural processes (i.e. windthrow, ice storm, drought, disease, etc.) characteristic of the region. The Forest Plan Wildlife Standards and Guidelines and the USFWS BO Terms and Conditions for Indiana bat would maintain naturally occurring snag structural diversity. The Tripoli East mitigation measures would maintain large woody material as naturally occurring structural diversity on the forest floor.

Protect Genetic Diversity:

All alternatives would allow processes for genetic interaction (such as movement and seed dispersal) for animals and plants to occur. The action alternatives would provide a range of successional stages of vegetation, protect unique habitats, and discourage non-native species. By maintaining successional stages and unique habitats, genetic variations/ diversity and the ability to adapt are also maintained.

Alternative 1 - No Action

Potential Direct and Indirect Effects

Although no vegetation would be removed via human actions in the project area at this time, a direct, adverse effect of the No Action alternative would be a continued decline in horizontal, vertical, and vegetation species diversity represented by the early-successional regeneration age class (USDA-LRMP 1986a, VII-B-5-13).

An indirect, adverse effect over time would be a potential decline in the diversity of MIS and general wildlife species favoring early-successional habitat, such as some Neotropical migratory songbirds, ruffed grouse, snowshoe hare, and white-tailed deer within the Tripoli East project area. The No Action alternative would not benefit the MIS Eastern kingbird, Eastern bluebird, and mourning warbler representative of the upland opening community type. There would be a potential decline in overall biodiversity at the stand scale due to lack of vegetation in the regeneration age class and paper birch/aspen community types and the associated wildlife species within the project area (NHFG 1996). There would be no direct or indirect effects to aquatic biodiversity or recreational fishing opportunities within the Tripoli East project area.

Changes in the existing condition of vegetation type or age class composition would occur through the natural process of forest succession or natural disturbances. There would be no creation of regeneration habitat, or the conversion of mature forest via vegetation management. Most of the existing clearcuts within the affected environment have entered the young stage, 10 to 49 years old, and are no longer providing regeneration / shrub habitat conditions. The acres that currently fall within the 0 to 9 age class would move into the young stage in the next one to three years. The adjacent Eastman West Vegetation Management Project created 50 acres of early-successional habitat in HMU 416. By 2012, these acres would have grown into the young-age class and would no longer provide regeneration age class habitat.

With long-term continuation of No Action, habitat conditions across the landscape would become uniform. The majority of the affected environment would be comprised of mature northern hardwood forest as the existing stands would mature. The few existing stands of paper birch would convert to softwoods or other hardwoods. Natural events such as wind-throw would create some existing small sized upland openings.

Alternatives 2, 3, 4, 5, 6

Potential Direct and Indirect Effects

None of the action alternatives would cause forest fragmentation, but would cause minor, localized, and temporary effects of conversion of vegetation age class and species composition at the stand scale within the Tripoli East Project Area. However, the conversion of mature forest to early-successional or regeneration age habitat would affect biodiversity neutrally at the stand scale. When forest cover is removed, there is likely a decrease in closed-canopy obligate bird species, like the ovenbird or wood thrush, or management indicator species broad-winged hawk and a subsequent replacement with early-successional forest species such as MIS chestnut-sided and mourning warblers. Therefore, due to the minor, localized, and short-term effects from conversion of vegetation age class and species composition, the Proposed Action and any of the action alternatives would cause neutral shifts in biodiversity at the stand scale. However, they would not cause an overall loss in aquatic or terrestrial vegetation or wildlife species biodiversity within the proposed Tripoli East Project Area; nor at the landscape level within New Hampshire; nor regionally within New England.

Structural diversity would be maintained through aging trees and through snag and course woody material recruitment outside of the harvest units within the proposed Tripoli East Project Area. Natural corridors along with natural barriers would remain intact so as not to interrupt the existing

ecological processes.

The potential direct and indirect effects on aquatic species and habitat analyzed in §**3.2.3** would be minor, localized, and short-term. Forest Plan Soil, Water, Wildlife, Riparian, and Fish Habitat Standards & Guidelines common to all action alternatives would protect, maintain, and promote the structure and function of riparian areas and for large woody material recruitment and stream and soil nutrient loading processes. The Proposed Action or any of the action alternatives would not interrupt the life history processes of aquatic or terrestrial wildlife or plant species or biodiversity processes such as genetic interaction to maintain viability. The ecosystems within the Tripoli East Project Area would continue to function.

3.2.3.3 Cumulative Effects on Biodiversity

The analysis area for assessing the past, present, and reasonable foreseeable future cumulative effects on biodiversity included:

- The site-specific Tripoli East Project Area and the larger Eastman Brook sub-watershed (aquatics).
- The MAs 2.1 and 3.1 within HMUs 416 & 417 (Chapter 3 – page 31).
- The HMUs 416 (including private land in the Towns of Lincoln, Thornton, and Gore) & 417.

The Tripoli East EA 2.0 also used the broader forest-wide landscape and regional analysis scales to assess potential cumulative effects to wildlife habitat distribution and connectivity, species diversity, and population trends and viability within the forest-wide planning area per 36 CFR 219.19 (USDA-FS 2001):

- Lynx Assessment Units 8 and 11 analyzed in the Tripoli East BE/BA, as amended.
- The Partners In Flight Physiographic Area 28, including the WMNF (Neotropical migratory birds/hawks).
- The New England and White Mountain subsection regional landscape scales (large mammals).

Alternative 1 (No Action)

The No Action alternative would add negative cumulative effects to the existing lack of early successional habitat at the local project area, the forest-wide landscape, and the New England regional levels. There would be no adverse cumulative effects to aquatic biodiversity or recreational fishing opportunities within the Tripoli East analysis area from the No Acton.

Alternatives 2, 3, 4, 5, 6

Inversely, due to maturing forest conditions over the past decade in the White Mountain National Forest and in the New England region, all of the action alternatives would add positive cumulative effects from creation of early-successional habitat and promote overall habitat and species biodiversity at the local stand and Forest-wide landscape and regional levels (NHFG 1996). The action alternatives would not reduce landscape linkages necessary for maintaining population viability of wildlife species including WMNF MIS. The action alternatives would not reduce the varying ecological conditions of the region in which the Tripoli East Project Area is located.

Implementation of the Proposed Action or any of the action alternatives of the Tripoli East Vegetation Management Project (coupled with the recently closed Eastman West Vegetation Management) would not cause an overall change in the land use pattern from a heavily forested a non-forested landscape. The current Loon Mountain Ski Resort Development and Expansion Project may result in relatively minor and localized changes in land use patterns on private land. Undisturbed forest blocks in the HMUs and forest-wide planning area would continue to add to the variety of life and its processes. There are no reasonably foreseeable future vegetation management projects planned for the Tripoli East Project Area.

Nearly all effects to biodiversity from the action alternatives described in this section and in other biological resource sections would be relatively minor, localized and short-term. It is important to note that short-term management decisions may have long-term implications for biodiversity (NHFG 1996). Implementation of any action alternative would have some long-term effects on biodiversity at the local stand scale and at the species composition level (alpha diversity), primarily through creation or maintenance of permanent forest clearings. In addition, local ecosystems form the matrix of species and genetic diversity, which can affect regional ecosystem health (CEQ 1993). However, elements of the Proposed Action and all action alternatives would not cumulatively alter regional ecosystem dynamics by suppressing natural processes, such a genetic exchange, predator-prey relationships, dispersal, or any other factor integral to maintaining biodiversity, or coarse a large-scale change in landscape context.

In summary, the action alternatives would cause neutral shifts in vegetation communities and/or wildlife species composition and forest stand age classes would occur at a local scale with no cumulative effect on overall biodiversity at the landscape or regional levels. There would be no adverse cumulative effects to aquatic biodiversity or recreational fishing opportunities within the Tripoli East analysis area from the Action Alternatives.

The Proposed Action or any action alternative **would not cause adverse cumulative effects on any MIS, rare, or ecologically important species or ecosystems**. The cumulative effects on wildlife, vegetation, aquatic, cultural resources are within the range of those described in the FEIS (USDA 1986, IV-62).

3.2.4 AQUATIC RESOURCES

Forest Plan Management Area Direction:

The Tripoli East project area is located within management areas 2.1 and 3.1 (USDA-LRMP 1986a, III-30-41) within HMUs 416 and 417. The desired conditions for aquatic resources in management areas 2.1 and 3.1 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) and allows stocking of indigenous fish species in management areas 2.1, and 3.1, and 6.1.

Riparian Management Direction:

Riparian and fish habitat management would provide for the protection and enhancement of water temperatures and quality, bank and channel stability, floodplain and wetland functioning, associated biotic communities, sediment trapping abilities of the riparian, and recruitment of large over-mature trees for large woody material (USDA-LRMP 1986a, III-15d, 19, as amended). The White Mountain National Forest Riparian Classification System (Table 33 designates the streams within the Tripoli East project area as types 10, 12, 13, 17, 20, and 21, which are characterized as steep gradient, and/or shallowly entrenched and degrading stream channels, which affect channel capacity, bedload transport, and stream bank stability.

Table 33: White Mountain National Forest Riparian Classification System

Type 10: Channels are steep streams (5 to 15 % slope) found in V-shaped valleys. These channels have a high capacity and don't often flood. Due to the steep gradient, the normal bedload is carried through the reach and the channel is rapidly degrading. This channel type is moderately stable and has a moderate hazard for crossings because changes in channel gradient can cause bank instability and failure.
Type 12: Channels are steep streams (4 to 10 % slope) found in narrow flat-floored valleys. Similar to type 10, 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.
Type 13: Channels are very steep (5 to 20 % slope) and frequently start in landslide areas and have shallow V-shaped valleys with many ledges and falls. These channels generally have excessive deposition of materials from upstream slide areas. These materials can block the channel and lower channel capacity until they are flushed through the system. The high sediment load makes these channels unstable and the highest hazard for road crossings.
Type 17: Channels are shallowly entrenched streams (2 to 4 % slope), found in flat-floored valleys. Due to gentle gradient and lack of confining valley slopes, this channel type is more susceptible to flooding and experiences moderate amounts of bedload deposition. This type is moderately stable but increases in sediment load will make this stream begin to aggrade and be like type 20. There is a low hazard for road crossings in this type.
Types 20 & 21: Characterized as relatively flat (2 to 4 % slope), aggrading stream channels which have a tendency to meander or divide. Type 20 is similar to type 17 except that this type is unable to carry the bedload through the reach and is aggrading. As a result, type 20 channels are slightly unstable and have a moderate risk for road crossings since deposition will increase the risk of flooding and washouts. Type 21 channels experience excessive deposition, which fills the channel and increases the susceptibility to flooding. As a result, these channels are highly unstable and have the highest hazard for road crossings.

The Forest Plan Riparian Standards and Guidelines (USDA-LRMP 1986a, VII-E-1) describe the width of the riparian area to be managed as a streamside buffer. Table 34 displays the minimum width of the riparian areas along the channel types associated with following units proposed for treatment

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Table 34 – Riparian Types by Minimum Buffer Width for Proposed Tripoli Harvest Units

Riparian Type	Minimum Riparian Buffer Width	Proposed Tripoli Harvest Units Affected
10, 13	Valley inner-gorge or 50 ft + (4 x % slope)	10
12, 17	50 feet + (2 x % slope)	3, 4, 6, 7, 8, 9
20, 21	50 feet or floodplain to top of 1st terrace	11, 12, 13
Riparian Areas (RA): RA width will be based on site conditions (channel stability, topography, flood potential) and/or the riparian type. Eastman Brook is RA types 10,12,13,20,21 and Talford and Mack Brook tributaries include riparian types 12,17,20. Specific protection measures will be prescribed on a site-by site basis for intermittent or ephemeral streams (LRMP 1986a, III-19, VII-E-1).		

Fisheries Resources Management Direction:

The general direction for anadromous Atlantic salmon is continued cooperation with restoration efforts through land acquisition, maintenance of spawning and rearing habitat, stocking and monitoring of fry and parr, and habitat restoration and enhancement. Streams identified as salmon habitat would be managed to provide diverse habitat for all life stages and fish passage would not be blocked or prevented (USDA 1986a III-15a, as amended). The general direction for the resident fisheries resources is continued coordination with state Fish and Game agencies. The quality of fish habitat that is capable of supporting trout populations would be maintained.

Table 35 displays the Forest Plan Standards and Guidelines for managing riparian and anadromous and resident fish habitat to meet the desired future conditions.

Table 35: Forest Plan Riparian and Fisheries Resources Standards and Guidelines

Species	Riparian Integrity (Woody Material Recruitment & Streambank Stability)	Water Quality (Instream Temp)	Substrate Quality (% Cobble Embeddedness)	Pool Habitat Quality / Cover
Atlantic salmon	Stable streambanks with<15% eroding banks.	Maintain summer water temperature regimes with average maximum temperatures <78°F.	<50% substrate embeddedness in riffle/run spawning/rearing areas. <20% fine sediments in potential spawning areas.	At least 15% pool areas with 1/3 holding / resting pools. At least 20% low flow cover in riffle-run rearing areas containing cobble-boulder substrate, depth at least .5 ft, & large woody material.
Resident fisheries	Stable streambanks with<15% eroding banks.	Maintain summer water temperature regimes with average maximum temperatures <72°F.	<50% substrate embeddedness in riffle/run areas. <20% fine sediments in potential spawning areas.	At least 20% pool areas. At least 20% of total stream area providing cover.

Management Indicator Species (MIS)

Sunapee trout *(Salvelinus alpinus)* does not represent a community type on the White Mountain National Forest, but is a management indicator species because it is state-listed endangered and their population changes are believed to indicate effects of management activities (USDA-LRMP 1986a, MIS VII-B-9). However, the Sunapee trout or its habitat does not occur within the proposed Tripoli project area and this species is addressed as a state-listed TESSC species (see EA Appendix F and Wildlife Specialist's Report in the project file).

American black duck *(Anas rubripes)* is a management indicator species for the wetland and water community type. Black duck inhabit a wide variety of coastal and freshwater habitats. The Eastman Brook located within the Tripoli East project area provides suitable aquatic habitat along the margins. Forest wide WMNF wildlife monitoring surveys detected black duck during all four years of wetland bird monitoring (1993-1996). Globally, the black duck population has declined steadily for decades; but is considered the most abundant breeder in the northeast and their population is considered viable on the forest. Habitat is considered available and well distributed in the White Mountain Subsection, although perhaps naturally more limited in mountainous terrain compared to the lowlands surrounding the WMNF (USDA-FS 2001).

Eastern brook trout *(Salvelinus fontinalis)* is a management indicator species for permanent lakes, ponds, and stream community types on the White Mountain National Forest (USDA-LRMP 1986a, MIS VII-B-9). Management

indicator species Eastern brook trout require 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). These habitat requirements for the Eastern brook trout exceed the requirements for all other species in the aquatic community on the White Mountain National Forest. Eastern brook trout normally prefer sheltered areas of streams, including the downstream sides of boulders or overhanging banks that are out of direct currents (Scarola 1987). In New Hampshire, Eastern brook trout typically spawn in streams during late October or early November and areas of groundwater upwelling are preferred. Spawning can occur at temperatures ranging from 40 to 50°F (Scarola 1987). Eggs are deposited in redds (fish nests) that have been excavated in gravel beds. Spawning success is reduced as the amount of fine sediments in the water increases. FS Technicians conducted fish passage and electrofishing surveys in the Eastman Brook watershed, including Talford and Mack Brooks (USDA-FS 2000b). The New Hampshire Fish and Game Department (NHFG) manage Eastern brook trout as a game species. This fish is distributed nationwide and statewide, and wild Eastern brook trout populations in all major watersheds of the White Mountain National Forest are considered viable (USDA FS 2001a).

Eastern Brook Trout Stocking: Based on site-specific ID-team field reviews, H&R stream / riparian surveys, fish passage and population surveys, fish habitat suitability index models and NH Fish and Game Fish Stocking Records, Eastman, Mack, Talford and East Pond Brooks contain suitable habitat and resident management indicator species Eastern brook trout (USDA-FS 1991-94, 2000; USDI 1982 & 97, NHFG 1991-2000). Due to the underlying granitic bedrock geology, the overall productivity of the aquatic habitat in the Eastman Brook sub-watershed is low, and self-sustaining Eastern brook trout populations are mostly small sized fish (<6"). Therefore, New Hampshire Fish and Game stocks Eastman Brook with fingerling and yearling Eastern brook trout to supplement the inherent low productivity of this stream and provide a recreational fishery (NHFG 1991-2000). East Pond Brook in Livermore was aerial stocked with fingerling Eastern brook trout in the past. Mack Brook, and other headwater streams within the proposed Tripoli East project area and Talford Brook (outside the project area) do not appear on New Hampshire Fish and Game stocking records as being stocked with hatchery-reared Eastern brook trout. Stocking regimes indicate these streams most likely would not be stocked in the future. The unnamed ephemeral and intermittent tributaries within the Tripoli East 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 management indicator species on the White Mountain National Forest, but there is an interagency effort to re-establish a self-sustaining population in the Merrimack River basin. In a final rule, the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service determined endangered species status, pursuant to the Endangered Species Act of 1973, as amended, 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).

Essential Fish Habitat

The 1996 Magnuson-Stevens Act protects essential fish habitat (EFH) for anadromous fishes, which is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". Essential fish habitat for Atlantic salmon is further defined as all waters currently or historically accessible to Atlantic salmon within the streams, rivers, lakes, ponds, wetlands, and other bodies of water in New Hampshire as described in the Final Amendments for Essential Fish Habitat (NEFMC 1998). The currently stocked or historically accessible waters associated with

the Tripoli East Vegetation Management project area include Eastman Brook and its perennial tributaries. Preparation of an essential fish habitat assessment and consultation with NMFS is required for any federal action that may adversely affect essential fish habitat (50 CFR 600.920 (a)). Analysis of Riparian and Aquatic Resources in the Tripoli East Vegetation Management Project Environmental Assessment serves as the essential fish habitat assessment for meeting the CFR requirement. Essential fish habitat for Atlantic salmon is divided into life history categories of eggs, larvae, juveniles, adults and spawning adults. Table 36 describes the habitat requirements for each life history stage (NEFMC 1998).

Table 36: Essential Fish Habitat Requirements for Atlantic Salmon.

Eggs: Bottom habitats with a redd (fish nest) upstream or downstream from a pool. Redds are generally located in areas with water temperatures below 10 degrees C and with a supply of clean, well-oxygenated fresh water. In general, salmon eggs are present in streams between October and April.
Larvae (alevins / fry): Same bottom habitat requirement described for eggs.
Juveniles: Shallow gravel / cobble riffles interspersed with deeper riffles and pools in rivers and estuaries with water temperatures below 25 degrees C; clean, well-oxygenated water; depths between 10 and 61 cm; and water velocities between 30 and 92 cms. Juveniles mature into smolts, requiring access downstream to the ocean.
Adults: EFH for adult salmon that returned to spawn includes resting and holding pools in rivers and estuaries. Spawning grounds to which salmon migrate generally have water temperatures below 23 degrees C and dissolved oxygen above 5 ppm.
Spawning adults: Same habitat requirement as eggs, larvae, and juveniles. Spawning generally occurs during October and November.

The US Fish and Wildlife Service listed the distinct population segment of Atlantic salmon as endangered, which included the Gulf of Maine and not New Hampshire (USDI 2000a). This EA describes if the proposed Tripoli East project area contains suitable habitat and whether it is occupied or unoccupied by salmon. Preparation of an essential fish habitat assessment and consultation with the National Marine Fisheries Service is required for any federal action that "may adversely affect EFH" (50 CFR 600.920 (a)). Analysis of essential fish habitat in the Tripoli EA 2.0 serves as the required assessment for the Proposed Action and alternatives.

After hatching, juvenile salmon remain in the fresh water for one or more years, progressing from alevins to fry to parr and then to smolts as they swim to the ocean. Juvenile salmon require a substrate of gravel and cobble for adequate nursery habitat. While in the ocean salmon feed and grow for at least a year before they return to fresh water to reproduce. In the northeastern United States, adult salmon enter their natal streams from May to October, with spawning occurring in late October through November. Atlantic salmon may return to sea after they have spawned, and return to their native stream to spawn in subsequent years.

Essential Fish Habitat Within the Tripoli Project Area:

Eastman Brook has suitable rearing habitat and has been stocked with Atlantic salmon (ATS) fry, thus is occupied by the larvae and juvenile life stages. The headwater tributaries to Eastman Brook within the project area contain marginal amounts of sub-optimal bottom habitat for salmon eggs but do not provide spawning or rearing habitat directly for Atlantic salmon. The headwater tributaries have not been stocked with salmon fry, thus are unoccupied by the egg, larvae/fry, juvenile, adult life stages. No natural spawning salmon occur in Eastman Brook. The main stem Pemigewasset River located down-stream and outside of the Tripoli East project area provides all of the salmon life history habitat requirements. Although natural spawning salmon do not occur in the main stem Pemigewasset, it has been stocked with fry and adult salmon and is considered occupied by all the salmon life history stages.

Merrimack River Anadromous Fish Restoration Program:

Two hundred years ago, salmon thrived in the Merrimack River, and the numbers of

individuals may have been as high as 30,000. The Pemigewasset River and its tributaries provided the principle spawning areas for the salmon in the Merrimack River Basin. After Europeans colonized New England, over fishing, expansion of industry along the lower Merrimack River Basin, and the installation of dams and water control facilities caused rapid declines in salmon populations.

Since 1976, the White Mountain National Forest participates in interagency efforts to restore self-sustaining populations of Atlantic salmon within the Merrimack River Basin. Annually since 1994, Atlantic salmon fry have been stocked in Eastman Brook tributary. Dams currently block upstream passage of adult spawning salmon to the main stem Pemigewasset River and subsequently the Eastman Brook tributary. However, the stocking of fry utilizes available nursery habitat and contributes to the overall salmon population, as downstream smolt passage is available (USDI 1997). ATS stocking regimes indicate Eastman Brook would most likely be stocked in the future according to stocking regimes and the strategic restoration plan (NHFG 1993-2000, TCAFMMRB 1997).

3.2.4.1 Aquatic Affected Environment

The proposed Tripoli East Vegetation Management project area (Tripoli East project area) is located on moderately sloped terrain ranging approximately 1,300 to 2,450 feet in elevation within the Eastman Brook sub-watershed. The Tripoli East project area is located upstream of the confluence with Talford Brook (where vegetation management is proposed) and includes the perennial streams Eastman, Mack, Little East Pond, Clear, and East Pond Brooks, and several unnamed intermittent and ephemeral tributaries and swales. These aquatic ecosystems eventually drain into and influence the water quality and quantity of downstream aquatic habitat within the main stem Pemigewasset River. Collectively, these headwaters are part of the Merrimack River basin.

Existing Condition of Aquatic Habitat Indicators for Meeting Standards & Guidelines for MIS:

Forest Service Biological Technicians surveyed Eastman and Mack Brooks, and Talford Brook (located outside of the project area) using a basin-wide survey method (Hankin and Reeves 1988, modified for the White Mountain National Forest streams). Surveys documented the existing condition of fish, amphibian, reptile habitat, and the adjacent riparian zones associated with the proposed Tripoli East project area (USDA-FS 1991 & 94). Technicians also conducted a fish passage assessment of stream crossings along the Tripoli Road, which parallels Eastman Brook and included Eastman Brook confluence with Talford, Mack, Little East Pond, Clear, East Pond Brooks, and an unnamed tributary and Technicians also conducted fish population assessments in the Eastman Brook sub-watershed (USDA-FS 2000b). Technicians also conducted a stream survey of Russell Pond Brook in 1993, and historic data exists for East Pond, both of which are located outside of the proposed Tripoli East project area. Also, Forest Service Interdisciplinary Team (Stand Exam and interdisciplinary team 1997-2001), and NHNHI botanists (Sperduto, 1998) conducted site-specific field surveys conducted during various times of the year which documented that the proposed Tripoli East 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 Tripoli East project area contains a northern hardwood and mixedwood forest type primarily of sugar maple and yellow birch. The spruce-fir softwood component of the riparian vegetation consists of scattered concentrations of white pine. The dominant understory vegetation is hardwood saplings and associated ground flora (see section **3.2.1** Vegetation). As related to fish, amphibian, and reptile habitat, 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 Eastman, Talford, Mack, Little East Pond, Clear, and East Pond Brooks. 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, which functions as an energy source (allochthonous) for the food chain in the aquatic ecosystems associated with the Tripoli project area. There are 25 existing campsites located in a portion of the riparian area of Eastman Brook. See the Water Quality and Recreation Sections of this EA for further details.

Amphibian and Reptile Habitat

The aquatic habitat associated with the proposed Tripoli East project area supports aquatic and semi-aquatic biota such as amphibians and reptiles and likely the full suit of cold water 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 section and the common musk turtle are mostly absent from that area which includes the Tripoli East project area. The Blanding's and spotted turtle are dependant on marshy wetlands and are found primarily in the Gulf of Maine Costal Plain. Therefore, the box, musk, Blanding's and spotted turtles are assumed absent from the proposed Tripoli East project area due to lack of suitable habitat and the project area being located outside of their known range.

Federally-listed Threatened, Endangered, Proposed; Eastern Region 9 Sensitive; State-listed & Other Aquatic Species Of Concern

Eastman, Talford, Mack, Little East Pond, Clear, and East Pond Brooks and their associated riparian zones provide suitable habitat for the Eastern Region 9-listed Sensitive reptile 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)*. See the Wildlife Resources Section and Appendix F3 for further analysis of potential effects. However, there are no known documented occurrences of Federal or State-listed amphibians or reptiles or other aquatic or semi aquatic species of concern (see Appendix G2) within the proposed Tripoli East project area (NHFG 1996, Taylor 1993). No aquatic species were detected during stream / riparian / fish passage and populations survey (USDA-FS 1991,94, 2000) or Forest Service interdisciplinary team field reviews. See the Wildlife Specialist's Report in project file for detailed analysis of state-listed TESSC amphibians and reptiles.

Table 37 summarizes the existing condition of riparian integrity, water quality, and substrate quality evaluated during the H&R surveys of Eastman, Talford, and Mack Brooks (USDA 1991 & 94, unpublished data). Although Talford Brook is located outside of the Tripoli East Project Area, data is displayed because this brook is part of the Eastman Brook sub-watershed cumulative effects analysis area. Russell Pond Brook was surveyed in 1993, however due to the pond's location in a separate sub-watershed (located upstream and outside of the proposed Tripoli East project area) Alternative 2 or any of the action alternatives would not affect this aquatic resource, thus survey data was not summarized in Table 37.

Table 37: Existing Condition of Habitat Indicators for S & Gs for Atlantic Salmon & MIS Eastern Brook Trout

Stream	Riparian Integrity [1] (Woody Material Recruitment and Streambank Stability)	Water Quality [2] (Turbidity/Temperature)	Substrate Quality [3] (%Cobble Embedded With Sediment)	Existing Habitat Condition Meet FP S & Gs?
Eastman Brook: 1994 = Technicians surveyed approx 6 miles from the FS boundary to the headwaters.	Northern hardwood buffer intact with 25% crown closure & woody material recruitment tallied by mile. Ample herbaceous cover except at dispersed campsites. Streambanks are stable. Average stream width 36ft & average water depth 2.5ft.	Water appeared non-turbid & summer time instream temperatures ranged 50 to 62°F.	Dominant cobble with large boulder. Rearing areas embedded 0 to <25% with sediment. Dominant riffle & pools had good fish hiding cover. Adult & young ATS & BKT & aquatic insects, red eft, & frogs & toads seen.	Yes = Within normal ranges or below thresholds.
Talford Brook: (outside project area) 1991 = Technicians surveyed approx 3 miles from the Eastman Brook confluence upstream to the headwaters.	Riparian buffer intact and woody material recruitment tallied by mile. Streambanks are stable & undercut banks providing instream fish hiding cover. Average stream width 10ft. & average water depth 1.5ft.	Water appeared non-turbid & summer time instream temperatures ranged 58 to 65°F.	Dominant cobble with boulders. Rearing areas embedded 0 to <25% with sediment. Dominant riffle at 67% with 10% pools. Average channel gradient was 9%.	Yes = Within normal ranges or below thresholds.
Mack Brook: 1991 = Technicians surveyed approx 1.5 miles from the Eastman Brook confluence upstream to the headwaters.	Riparian buffer intact and woody material recruitment tallied by mile. Streambanks are stable & undercut banks providing instream fish hiding cover. Average stream width 8 ft. & average water depth 1 ft.	Water appeared non-turbid & summer time instream temperatures ranged 60 to 66°F.	Dominant large cobble & boulder. Rearing areas embedded 0 to <25% with sediment. Dominant riffles with pools and cascades. Channel gradient ranged 1 to 48%.	Yes = Within normal ranges or below thresholds.

[1] = Woody material recruitment and stable streambanks with <15% eroding banks.

[2] = < 5 Nephelometic Turbidity Units (NH State Water Quality Standard).

Maintain summer water temperature regimes with average max temperatures <72° F for MIS BKT, and < 78° F for ATS.

[3] = <50% substrate embeddedness in riffle-run spawning & rearing areas. White Mountain National Forest Standards and Guidelines (USDA-LRMP 1986a, III-15 a, b amended 1989).

In summary, the existing condition of the riparian integrity, water quality, and substrate quality indicators, met the White Mountain National Forest Fish Habitat Standards and Guidelines for management indicator species Eastern brook trout and Atlantic salmon (USDA-LRMP 1986a, III-15a, b, as amended 11/06/89).

3.2.3.2 Aquatic-related Mitigation Measures

- Large coarse woody material that is on the ground in the riparian area at the time the sale is prepared shall not be harvested and shall be left in place.
- Minimize the number of stream crossings.
- Winter harvesting where feasible.

Forest Plan Analysis Framework

The Forest Plan states fish and wildlife habitat will be managed to maintain viable populations of existing native and desired non-native vertebrate species in the forest-wide planning area (36 CFR 219.19 (a)(10)). The Forest Plan identified management indicator species whose population changes are believed to indicate the effects of the proposed management activities (USDA-LRMP 1986a, VII-B-9). The management indicator species (MIS) framework is useful for estimating the potential effects of the proposed action and alternatives on fish and wildlife populations. However, MIS population trends are to be maintained and monitored within the forest-wide planning area.

The Tripoli East EA 2.0 used the habitat indicators of **riparian integrity, water quality** and **substrate quality** as shown in Table 37 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).

3.2.3.3 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, hence affecting fish and aquatic biota survivorship.

General effects of vegetation management on amphibian and reptile habitat can include similar effects to water quality and quantity and affects to 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 Eastman, Mack, Little East Pond, Clear, or East Pond Brooks within the Tripoli East project area (or Talford Brook located outside the project area). However, the existing 25 campsites would continue to affect the portion of the riparian area of Eastman Brook. See the Water Quality and Recreation Sections.

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. See the Water Quality and Recreation Sections for effects to water quality from the 25 campsites.

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). See the Water Quality and Recreation Sections for effects to substrate quality from the 25 campsites.

Essential Fish Habitat For Atlantic Salmon and Management Indicator Species 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 the Eastman Brook sub-watershed from the No Action. Therefore, Alternative 1 would not adversely affect existing larvae (fry) and juvenile rearing essential fish habitat for Atlantic salmon. Alternative 1 would not adversely affect MIS Eastern brook trout or American black duck population trends or viability within the Forest-wide planning area or other aquatic species.

Alternative 2 - Proposed Action

Direct and Indirect Effects

There would be a very low potential for minor, localized and short-term direct effects to Eastman, Mack, Little East Pond, Clear, and East Pond Brooks and the unnamed intermittent "feeder" tributaries within the Tripoli East 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 Eastman, Mack, Little East Pond, Clear, and East Pond Brooks. Alternative 2 proposes maintaining a 50-foot buffer adjacent to perennial streams. These riparian buffers would retard potential chemicals and sediment, help maintain existing instream water temperatures, protect stream banks, and allow for future terrestrial and instream woody material recruitment (nutrient loading) into Eastman, Mack, Little East Pond, Clear, and East Pond Brooks. The standards and guidelines would protect the integrity of the riparian area and stream bank stability within the Tripoli East Project Area for amphibians and reptiles and MIS American black duck.

Amphibian and Reptile Habitat: (see the Tripoli East BE/BA as amended in project file for detailed analysis of potential effects to the wood turtle and Appendix F for the Jefferson salamander). 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 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 salamanders and reptiles and the amount of habitat available to these species may decline 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 White Mountain National Forest, 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 potential 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). There would be no barriers for other facultative species, such as the American toad, dragon and caddis flies (all 3 documented), and snapping turtle, which often use wetland and vernal pools but are not dependent on these habitats for their survival and can successfully reproduce and live elsewhere. Because these species are not utterly dependent on traveling to or from wetland areas, potential travel impediments from vegetation management are less likely to affect these facultative species. Furthermore, no vernal pools were found during Forest Service interdisciplinary team and NHNHI site-specific field reviews, and wet areas are routinely avoided and excluded from proposed harvest units.

Water Quality: The activity of using log landings and skidding associated with harvesting has the potential to generate/deliver sediment into "feeder" tributaries at stream 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 on the "feeder" streams associated with the proposed Tripoli East 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 would protect the water quality for amphibian, reptile and MIS Eastern brook trout and American black duck habitat within the Eastman Brook aquatic ecosystems. See the Water Quality and Recreation Sections for effects to Water Quality form the 25 campsites located within a portion of the Eastman Brook riparian area.

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 sediment delivery into non-fish bearing "feeder" streams. The potential amount of sediment generated and delivered into the intermittent, headwater streams affecting substrate quality causing cobble embeddedness within the Tripoli East project area during harvesting would be minimal because State Best Management Practices (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 identified during site-specific stream surveys of Eastman and Mack Brooks (USDA 1994 & 91) within the downstream reaches of these aquatic ecosystems. 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 best management practices include designated skid trails with erosion control at landings, crossings and haul routes. Although young of the year management indicator species 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 Tripoli East project area do not provide suitable fish habitat directly. Fish passage through temporary pipe culverts on intermittent channels or under a skidder bridge located across Mack Brook would not pose a migration barrier to fishes including MIS Eastern brook trout documented in the perennial systems during the stream survey (USDA 1994 & 91).

Alternatives 3, 4, and 6

Direct and Indirect Effects:

Similar minor, localized, and short-term direct effects to amphibian, reptile, and fish habitat including MIS Eastern brook trout as related to riparian integrity (woody material recruitment/stream bank stability), water quality (turbidity and temperatures), and substrate quality (sedimentation), and travel impediments and displacement as described under Alternative 2 would occur. Similar effects would occur because similar stands, access roads, and similar amounts of skid trails and new log landings are proposed under these action alternatives. However, the magnitude of effects to amphibian, reptile, and fish habitat including MIS Eastern brook trout and American black duck from Alternative 3, 4, or 6 has the potential to be slightly less than the Proposed Action because less total stand acres are treated and/or less clearcutting is proposed. Because implementation of Best Management Practices, Fish Habitat and Riparian Standards and Guidelines, and winter logging mitigation measures as described under the Proposed Action would apply to these action alternatives, 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 American black duck would not be substantial in terms of duration and magnitude.

Alternative 5:

Direct and Indirect Effects:

The potential direct and indirect effects to amphibian, reptile and fish habitat indicators from implementation of Alternative 5 would be similar in magnitude and duration (minor, localized and short-term) to those described for Alternative 2. A difference is that slightly more timber volume would be skidded along the skid trails. Fish Habitat and Riparian Standards and Guidelines previously described would be implemented.

Alternative Summary

The potential effects to riparian, amphibian, reptile, and fish habitat described under the No Action, Proposed Action and all the action alternatives 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 Proposed Action or any one of the action alternatives would cause localized, minor to no adverse direct or indirect effects on the existing condition of the ephemeral or intermittent channels, the riparian areas, or perennial fish habitat within and downstream of the proposed Tripoli East project area. However, the Proposed Action or any one of the action alternatives **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 or American black duck population trends or viability or other aquatic or semi aquatic species of concern or their habitats within the Forest-wide planning area.**

These determinations are based on the rationale that 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 management indicator species Eastern brook trout and American black duck and their habitats. Fish Habitat and Riparian Standard and Guidelines call for maintaining 50% of the basal area along perennial brooks (USDA-LRMP 1986a, III-15-16). However, the action alternatives would maintain a 50 foot buffer area on perennial streams that 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 Tripoli East project area. Furthermore, the proposed Tripoli East project area is located on moderately sloped terrain with ample amounts of ground cover vegetation. Harvesting activity is proposed mostly during firm or frozen winter ground conditions, thereby limiting the potential for soil transport into the stream courses. Forest Management Practices (BMPs 1997) such as installation of erosion control water bars, ditching techniques on landings and skid trails, or temporary stream crossings would limit sediment delivery. Stream crossings would insure fish passage and 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 Tripoli East project area.

3.2.3.4 Cumulative Effects On Aquatic Resources

The analysis area for cumulative effects to aquatic resources included the Tripoli East Project area and the larger Eastman Brook sub-watershed, which includes Talford Brook.

Alternative 1 (No Action):

Because there would be minor to no direct or indirect effects from implementation of the No Action, the No Action would not add adverse cumulative effects to the existing condition of the ephemeral, intermittent, or perennial streams, or riparian and fish habitat for Atlantic salmon or MIS Eastern brook trout or American black duck. However, the No Action would add an adverse cumulative effect due to the lost opportunities to increase the amount of open forest canopy for light and solar warmth to reach the forest floor and to increase the 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. 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, 3, 4, 5, 6 - Aquatic Species and Riparian Habitat

Historical logging practices affected instream habitat conditions in New Hampshire (Taylor et al. 1996). The stream inventories conducted across the White Mountain National Forest indicate that most streams have suitable instream habitat needed by trout including cold water 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. This may increase the amount of pool habitat in these systems in the future since the presence of large woody material is one of the mechanisms for pool formation (Likens and Bilby 1982).

The cumulative effects on amphibian, reptile, and fish habitat from implementation of the Proposed Action or any of the action alternatives are expected to be none, since a relatively moderate percentage of the overall Eastman Brook sub-watershed in HMU 416 and 417 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. See the Water Quality and Resource Sections for effects from 25 existing campsites within a portion of the Eastman Brook riparian area.

The EA completed for the nearby Eastman West Vegetation Management determined low potential for minor direct and indirect, to no cumulative effects to aquatic species or their habitat. There are no foreseeable future vegetation management activities proposed within the Eastman Brook sub-watershed. Other management actions would adhere to similar Forest Plan Standards and Guidelines and best management practices for erosion control as planned for the proposed Tripoli East Vegetation Management project.

The Proposed Action and all action alternatives 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 Proposed Action and all action alternatives **would not cause adverse cumulative effects to MIS Eastern brook trout or American black duck trends or population viability within the forest-wide planning area**, or other resident aquatic species. 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 White Mountain National Forest 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.

3.3 SOCIO-ECONOMIC ENVIRONMENT

3.3.1 CULTURAL RESOURCES

3.3.1.1 Cultural Resources Affected Environment

A cultural resource survey has been conducted for the Tripoli East project area (CRRR# 98-4-2). No prehistoric sites were found. Historic sites recorded across the project area, but not necessarily near proposed activities, include:

- Cellar holes associated with abandoned hill farms of the 1800's era;
- Concrete bridge abutments where the old Tripoli Road crossed Talford Brook;
- A logging railroad grade (Woodstock and Thornton Gore Railroad 1909-1914, currently Little East Pond Trail);

- The old Tripoli Road;
- The Tripolite Refinery site from the Tripolite Mine in East Pond;
- A CCC camp (Tripoli site from 1934); and
- A horse barn site.

Most historic cultural sites in the project area are a result of past land use history associated with homesteading, logging, and dredge mining of East Pond. There may be additional sites in the project area that have not been discovered.

The Tripoli project area is a popular recreation destination. As with other areas of the White Mountain National Forest, artifact collecting has been ongoing in the area since before the area was acquired by the Forest Service.

3.3.1.2 Cultural Resource-related Mitigation Measures

- Project layout would ensure avoidance of known cultural sites with the exception of the Little East Pond Trail.
- The Little East Pond Trail (historic railroad grade) may be crossed by skid trails. However, this would be done over snow and frozen ground conditions to minimize impacts. It would also be done at right angles to the trail to minimize the chance of ground disturbance to the resource.
- If, in the course of any project activities, previously unknown sites or artifacts were to be located, activities would stop immediately in that location. The district heritage paraprofessional or Forest archaeologist would be called in to evaluate the finds and make recommendations on how to proceed.
- Units adjacent to known cultural sites would be logged in the winter, under snow and frozen ground conditions to help protect historic values associated with the sites.
- An implementation monitoring project would be designed to track certain cultural sites within the project area (see Appendix C)

3.3.1.3 Cultural Resources Direct and Indirect Effects

Alternative 1 – No Action

No activities are proposed for this entry under Alternative 1. Current level of public visitation can continue to result in artifact collecting or vandalism to sites that would be addressed by standard Forest Service cultural resource and law enforcement policy.

Alternative 2-6

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.

On September 13, 2002, the Forest Service received a letter from the Deputy State Historic Preservation Officer concerning the cultural sites in the Tripoli Project area. That letter stated, "Based on the project review documentation which you have submitted to the Division of Historical Resources and through our discussions pertaining to the protection of identified historic sites, it appears that the undertaking, as proposed, would have 'no adverse effect,' pursuant to 36 CFR Part 800.5, on any properties or districts that are listed in or may be eligible for the National Register, nor properties of known or potential architectural, historical, archaeological or cultural significance, if the work is done as discussed."

Current level of public visitation may result in some impacts (potting or alteration) to sites that would be addressed by standard Forest Service cultural resource and law enforcement policy.

Under Alternatives 2-6, known sites within the project area would be avoided during layout, marking, and logging operations. The following avoidance and site mitigation measures are designed to eliminate or lessen any impacts to heritage sites or site values from timber harvesting.

1. The Little East Pond Trail would be crossed by a minimal number of skid trails that would be done over snow cover and/or frozen ground conditions; and
2. Sites would be identified on the sale area map and included in the timber sale contract.

This would ensure that sites are protected and avoided during logging operations and would prevent heavy equipment and other sale activities from disturbing sites. Mitigation measures for over snow and/or frozen ground would stop or appropriately minimize impacts to the railroad grade that is now a recreation trail. By following these mitigations, no effects to cultural resource sites in the Tripoli project area are anticipated. Similar mitigations have been used successfully in other similar circumstances, and SHPO has provided the Forest Service with a 'no adverse effect' determination is the project is implemented as proposed.

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. As the vegetation regenerates site locations should be less visible and less of a temptation to the public.

3.3.1.4 Cultural Resources Cumulative Effects

The Eastman Brook Subwatershed Cumulative Effects Area as described in Appendix H, §**B.3.2**), which includes the Eastman West Project as well as the Tripoli East Project, would be used for cultural resource analysis purposes, because activities are confined to the watershed, there are similar cultural sites within the watershed, and similar activities have taken place in the watershed.

This subwatershed has been a popular recreation area for a long time, and many cultural sites in the area have already been visited by the public. Some disturbance has occurred as a result. There has been some timber harvesting in the area during the past 25 years, including the Eastman West Vegetative Management project. Similar mitigation measures were used to protect cultural sites in that project. As with the Eastman West project, steps have been taken in the Tripoli project area to avoid and protect known cultural sites. This has been accomplished during project layout and would continue throughout project implementation. No additional projects are anticipated in this area in the foreseeable future.

No cumulative effects are anticipated beyond the effects discussed in §**3.3.1.3 Direct and Indirect Effects,** above.

3.3.2 RECREATION

3.3.2.1 Recreation Affected Environment

Recreational settings for the Tripoli project area are Semi-Primitive Motorized and Roaded Natural ROS Classes (Forest Plan Recreation Opportunity Spectrum (ROS), Appendix H). Primary recreation in the area includes: hiking, hunting, cross-country skiing, snowmobiling, dispersed camping, fishing, driving for pleasure, and mountain biking.

There are four recreation trails within the project area, East Pond, Little East Pond, East Pond Loop, and Mt. Tecumseh (Map 1). Most hikers use the trails during the summer and fall. Table 38 displays the hiking trails within the project area.

Table 38: Miles of Hiking Trails Within the Tripoli Project Area

Hiking Trail	Miles
East Pond	2.1 Mi
Little East Pond	1.6 Mi
East Pond Loop	1.3 Mi
Mt Tecumseh	2.0 Mi
Total	7.0 Mi

Mountain bikers, pleasure drivers, and locals use the Tripoli Road in the summer. and fall. In the winter, snowmobilers use the Tripoli Road from the western gate, 0.3 mile from the junction with state route 175, to the height of land (approximately six miles).

Dispersed camping occurs along the Tripoli Road and associated spurs in the Tripoli project area. Many of the campsites are located between the Tripoli Road and Eastman Brook or its tributaries.

The dispersed campsites are located on the various terraces adjacent to the brook. See §**3.1.2.1** for a discussion of the relation ship of the dispersed sited to Eastman Brook. Although these sites have become compacted through use, the root mat is usually intact, and, in general, no erosion is evident at these sites (Photos 1-2, p. 27).

Approximately 25 dispersed campsites remain in the lower terraces of the brook or its tributaries that are subject to intermittent out of bank flow.

Overnight parking (associated with camping) along the roads in project area (Tripoli, Hix Mountain, and Mack Brook Roads) is managed through a permit system. The reason for placing the road under permit was to eliminate the costs the government was incurring to provide this dispersed recreation in the area and to reduce use on the road. The permittee is required to apply $3,700.00 per year of Granger-Thye offset funds toward rehabilitating and closing to public use, campsites that are located on the lower terraces of Eastman Brook and its tributaries that are subject to intermittent out of bank flow. Rehabilitation work along the Tripoli Road still needs to be done. The permit administrator (Forest Service representative) determines which sites would be rehabilitated each year. Determination is based on the severity of damage at a particular site or the

potential of a site to adversely affect water quality. The intent is to maintain enough campsites along the Tripoli Road to accommodate recreation pressure without increasing or decreasing overall use. In order to replace the overall opportunity for individuals to use sites along the Tripoli Road (People At One Time - PAOTs) lost to rehabilitation activity on the lower terraces, the permittee improves and hardens sites in cutting units from timber activity along the road. In years when there is no harvesting activity, the permittee hardens existing, underutilized sites that are not located in the lower terraces.

The total number of established sites on the Tripoli, Hix Mountain, and Mack Brook Roads is 500. The limit for Parking Pass sales on Holiday weekends is 500. Many visitors arrive in groups with two to three cars, and share a campsite. It is very rare that all campsites are occupied. The Parking Pass sales limit for non-holiday weekends and mid-week is 300.

Pro-Sport INC. has a ten-year special use permit for the operation of the Tripoli Road Dispersed Camping Area that expires in 2005. Their operating season generally runs from April 20 through November 15, depending on the weather and freeze/thaw conditions. Pro-Sport is responsible for the care and policing of the road corridor and campsites, enforcing Forest Service rules and regulations, Pro-Sport's own house rules, and solid waste disposal, and rest facilities at either end of the road. They charge a parking fee for visitors to park their vehicles along the road between the hours of 10 pm and 6 am. The visitors parking along the road generally purchase the parking pass so that they may camp in the established sites along the road.

Pro-Sport pays a flat percentage for each pass sold during their operating season. They also contribute to a collection account that supports White Mountain Forest Protection Officer salaries, overtime, training, uniforms, vehicle operating and fixed costs, equipment and backup. The permittee covers all of the costs and labor for solid waste disposal, care and police, signing, gate maintenance, poster maintenance, and most of the hazardous tree removal work.

In the winter, snowmobilers use the Tripoli Road from the western gate, 0.3 mile from the junction with state route 175, to the height of land (approximately six miles). In the past, hauling and harvesting operations have been restricted to non-holiday weekdays, Monday through Friday. Snowmobiles can be run on holidays, Saturdays, and Sundays. This mitigation was developed to address the need for public safety and the desire to accommodate both harvesting operations and snowmobiling on the Tripoli Road. It has proven effective in the adjacent Eastman West Project.

3.3.2.2 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 action, unless listed as optional:

- Minimize the number of skid trail crossings of the East Pond Trail to minimize the impact to the trail.
- For public safety, close the East Pond and Little East Pond Trails and the Tripoli Road to recreation use during winter weekday sale operations if operations create a potential hazard to trail users. Signs warning of harvest and truck activity would be posted at all major entry points. Require in sale contract.
- Keep trails free of slash during and after sale operations as a safety precaution.
- Winter log hauling would be limited to non-holiday weekdays (Monday through Friday) on the Tripoli Road between the Hix Mountain Road #31A and East Pond Road #613. This section of the Tripoli Road would be closed to snowmobiles during weekdays to minimize conflicts with snowmobiles. The remaining southern portion of Tripoli Road would be closed to snowmobiles during sale operations. Signs would be posted at all entry points to the Tripoli Road. These would be required in sale contract. Coordination with snowmobile clubs would occur prior to sale activity. These would be required in sale contract.

- Non-winter log hauling would be limited to non-holiday weekdays (Monday through Thursday) on the Tripoli Road and all tributary roads. All logging activities on the Mack Brook Road (NFSR 609) would be prohibited on the Fourth of July, Labor Day, and the day before each holiday. These would be required in sale contract.

3.3.2.3 Recreation Direct and Indirect Effects

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 anyone in this area for recreation purposes. This noise level would be acceptable for semi-primitive motorized and roaded natural recreation ROS classes.

Alternative 1 – No Action

No new activities would be implemented at this time under Alternative 1. In the short term, the camping sites in the lower terraces of Eastman Brook and its tributaries that are subject to intermittent out of bank flow would not be relocated or rehabilitated. The dispersed campsites and pathways located on the lower terrace of Eastman Brook will continue to be used, and their use will continue to present a potentially increasing source of erosion over time. If, in the future, these lower sites adversely affect water quality, they could be closed for resource protection reasons. This could reduce the total number of campsites available to the public in the area. The permittee would continue to harden existing dispersed sites.

Alternatives 2-6

Under Alternatives 2-6, there would be evidence of human activity - sounds of equipment, log trucks, and the change in vegetation resulting from timber harvesting. Timber harvesting would occur primarily during the winter. Most recreation in the project area occurs during the summer and fall. Therefore, noise from timber harvesting activities would impact as few people as possible. The change in vegetation would be least evident under Alternative 6 as there would be no management along the trails or the Tripoli Road.

There are dispersed camping sites along the Tripoli Road. Under alternative 2, no rehabilitation or relocation of dispersed sites is proposed. Effects would be as described for Alternative 1. Under Alternatives 3-6, new dispersed sites would be located in log landings on the uphill side of the road. These new sites would provide more privacy for campers, and would get parked cars off the Tripoli Road. There would be no increase in the overall number of sites available along the Eastman Brook or its tributaries. Getting parked cars off the Tripoli Road would relieve some of the congestion on the road, especially during times of peak use. The elimination of dispersed sites located in the lower terraces of Eastman Brook and its tributaries that are subject to intermittent out of bank flow and the rehabilitation of these sites would eliminate potential sources of erosion along Eastman Brook and would restore streamside vegetation.

During the summer and fall, the Tripoli Road is an extremely popular dispersed use area. The road is used as a short cut between the towns of Lincoln and Waterville Valley and is used to access the East Pond, Little East Pond, and Mt. Tecumseh Trails and the Russell Pond Campground. To minimize conflicts between possible summer and fall harvesting operations and the recreational use of the Tripoli Road, harvesting and hauling would be restricted to non-holiday weekdays, Monday through Thursday. In the adjacent Eastman West project, this schedule of use provided a safe, effective means of managing logging and recreation activities on the Tripoli Road.

In the winter, snowmobilers use the Tripoli Road from the western gate, 0.3 mile from the junction with state route 175, to the height of land (approximately six miles). During winter harvesting operations, the road would be plowed to facilitate harvesting operations. To minimize conflicts between winter harvesting operations and snowmobiling on the Tripoli Road, harvesting and hauling would be restricted to non-holiday weekdays, Monday through Friday, and snowmobiling would be restricted to holidays and Friday through Sunday. In the adjacent Eastman West project, this schedule of use is providing a safe, effective means of managing logging and snowmobiling on the Tripoli Road.

Under Alternatives 2-5, Little East Pond and East Pond Trails may be closed during harvesting operations if cutting, skidding, or trucking are occurring adjacent to or near the trail. These areas would be harvested in the winter and on non-holiday weekdays to limit the impact to trail. This would minimize safety risks by avoiding peak recreation use periods. Other mitigation such as placing warning signs at trail entrances and keeping trails free of slash would inform the public of the ongoing activities, minimize conflicts and keep trails open for weekend use. The sale administrator would determine the need to implement mitigation measures requiring additional signing, closure orders or law enforcement presence to enforce closures. Implementation of these measures would depend on the amount of recreation use and potential for conflicts. No harvesting is proposed along the trails in Alternative 6.

There is an existing system of old skid trails in the Tripoli project area. Alternatives 2-6 would

utilize as many of these existing travel corridors as possible during timber harvesting. The construction of any new skid trails would create new travel corridors. Once the timber harvesting is completed, any new corridors created would become travel ways for hunters, hikers, and occasional cyclists and cross-country skiers who are already using the area.

3.3.2.4 Recreation Cumulative Effects

For the recreation resource analysis purposes, the scope of the cumulative effects area is Eastman Brook Subwatershed Cumulative Effects Area as described in section **3.1.1.3**, which includes the Eastman West Project as well as the Tripoli East Project. This cumulative effects area was chosen, because all activities concerned with the recreation resource occur within its boundaries. The year 2012 represents the extent of the reasonably foreseeable future.

Alternative 1 – No Action

No activities are associated with the lower terrace dispersed campsites under Alternative 1. The effects are as discussed under **3.3.2.3 Direct and Indirect Effects**, above. Dispersed campsite improvements along Eastman Brook and its tributaries, which were begun in the adjacent Eastman West Project, would not continue in the Tripoli project. the dispersed campsites and pathways located on the lower terrace of Eastman Brook will continue to be used, and their use will continue to present a potentially increasing source of erosion over time. If this were to occur, it is possible that these lower terrace sites would need to be closed in the future to protect resources. This could result in an overall reduction of the total number of campsites available in the area

Alternatives 2-6

For Alternative 2, with regard to the dispersed campsites, the cumulative effects are the same as Alternative 1

Under Alternatives 3-6, the Tripoli Project would continue the dispersed campsite improvements along Eastman Brook and its tributaries that that were begun in the adjacent Eastman West Project. Opportunities to develop new sites would be created on the uphill side of the road where log landings would be located. Existing sites in the lower terraces of Eastman Brook and its tributaries that are subject to intermittent out of bank flow would be relocated and revegetated. Overnight parking at the new sites would be off the road at designated sites. The overall number of sites would be maintained. Cumulatively, along Eastman Brook and its tributaries, these activities would continue reduce potential erosion and sedimentation effects to the Eastman Brook subwatershed.

Timber harvesting in the watershed predates the designation of the White Mountain National Forest and has occurred off and on since designation. Since 1987, three timber sales have occurred in this area, most recently the Eastman West Project. Because of this historic and recent timber harvesting, a network of skid trails can be found in the watershed. The extent of this network is sufficient that few new skid trails were necessary for the Eastman West Project, and few additional skid trails would be necessary to implement Alternatives 2-6. The construction of any new skid trails would create new travel corridors. Once the timber harvesting is completed, any new corridors created would become travel ways for hunters, hikers, and occasional cyclists and cross-country skiers who are already using the area.

3.3.3 VISUAL QUALITY

3.3.3.1 Visual Affected Environment

The Tripoli project area is a forested landscape and is typical of management area 2.1 and 3.1 lands. It is a coming together of scattered evergreen and evergreen/hardwood stands in a landscape that is dominated by hardwood vegetation. The stands in the project area represent two age and size classes:

1. Stands of older, large mature trees from harvesting that occurred between 1880 and 1920 and fields abandoned by the 1920s that were reclaimed by the forest; and
2. Stands of younger (15-25 years old), regenerating trees resulting from recent harvesting.

There is some variety in the older, forested landscape. Some very large trees are residuals left from early harvesting, and large white pines that were growing in fields. Small areas of younger trees exist where patches of trees have blown down, or where individual large trees have died or been harvested in the last 30 years.

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

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

Most of the land within the project area is Variety Class B, Common. A small amount of Class C, Minimal, can also be found in the lower, flatter portions of the project area.

The project area spans lower to mid-mountain

slopes ranging in elevation from 1300 feet to 2350 feet. The landscape is characterized by a large expanse of hardwoods with lesser amounts of evergreens situated primarily along streams and at the higher elevations. There is a variety of textures visible on the hardwood-dominated slopes resulting largely from harvest activities that have taken place over the last twenty-five years.

Viewpoints

The East Pond and Little East Pond Trails are located in the northeast corner of the project area. Vegetation along these trails is mostly hardwood forest at the lower elevations and evergreen forests at the upper elevations. There are no vistas along these trails. Additional views into the project area are possible from Mt. Osceola. Mount Moosilauke (eleven miles northwest of the project area) may also have distant views of the project area. From viewpoints, the project area is in the Background Distance Zone and has a Visual Quality Objective (VQO) of Modification. With a Modification VQO, management activities may dominate the characteristic landscape. However, management activities must also use naturally established forms, lines, colors, and textures. The Russell Pond overlook (three miles northwest of the project area off the Tripoli Road) views the project area in the Middleground Distance Zone, and has a VQO of Partial Retention. Partial retention is also the VQO for the Foreground Distance Zone views from the Tripoli Road. Here management activities may be evident, but must remain subordinate to the characteristic landscape. Appendix C6 in the Forest Plan lists the acceptable amount and types of management activities to meet the Visual Quality Objectives.

Table 39 displays the viewpoints from which the visual quality of the Tripoli project would be assessed.

Table 39: Viewpoints, Distance Zone, and Visual Quality objectives for the Tripoli East Vegetation Management Project

Viewpoints	Distance Zone	Visual Quality Objective
Mt. Moosilauke	Background	Modification
Russell Pond	Middleground	Partial Retention
Overlook		
Mt. Osceola	Middleground	Partial Retention
Tripoli Road	Foreground	Partial Retention

The desired condition (DC) within the project area is to meet the Visual Quality Objective standards and guidelines outlined in the Forest Plan and to ensure that any management activities blend into the existing environment. Activities should add to the visual diversity without detracting from the natural beauty.

Forest management and timber harvesting have been common activities in this area since approximately 1870. In order to preserve the visual values associated with the recreation activities in this area, visual effects have been carefully managed, Forest Plan standards and guidelines have been followed during past project implementation. This has maintained the visual quality objectives and variety class objectives for the area.

Human activity within and around the project area is noticeable. This includes evidence of current and past timber harvesting activities, dispersed camping, old roads and railroad grades, historic cultural sites, and narrow roadways.

3.3.3.2 Visual-related Mitigation Measures

- Slash disposal zones and treatment would be as follows:

  From the edge of the Tripoli Road (NFSR 30) and the East Pond Trail and the Little East Pond Trail (#'s 366 and 367) all slash from purchasers operations would be removed a distance of 50' and lopped to within 3' of the ground for another 50'.

3.3.3.3 Visual Direct and Indirect Effects

The general effects of timber harvesting activities on the visual resource can be found in the Forest Plan FEIS, p. IV-33. A goal for management area 2.1 lands is to protect and enhance visual quality. For management area 2.1 and 3.1 lands, the desired condition is to have a mosaic of forested stands varying in size, shape, height and species. Some stands would consist of trees of about the same age and size, and some would consist of a mix of sizes and ages ranging from seedlings to very large, mature trees. Along major road corridors, numerous views of panoramic and ephemeral landscapes would be provided through moving and stationary vistas.

Under the White Mountain National Forest Visual Quality Guidelines (Forest Plan Appendix C-6) Foreground Distance Zone views of clearcutting treatments with a Partial Retention VQO can have a maximum of five acres of observed opening with a strong relationship to existing vegetative patterns and landforms. From a Middleground Distance Zone with a Partial Retention VQO, up to a maximum of 15 acres may be observed. A Background Zone view of the area with a Modification VQO allows up to 25 acres observed from a stationary point, and 30 acres visible from a vehicle.

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. The existing forest consists of older stands of trees interspersed with a few stands of young (15-25 years old) trees (see section 3.3.2.1 above). Any changes in the existing forested landscape would result from natural causes (individual tree mortality, wind events, fire, insect and disease manifestations). 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, as there would be if openings where present.

Alternative 1 would have no direct negative effects on visual quality.

Alternative 2 – Proposed Action:

This alternative proposes a variety of stand treatments affecting 1,087 stand acres and 24 units, with 3 single-tree treatment units, 13 group selection units, and 8 clearcut units. Group selection units in the Foreground Zone along Tripoli Road and the trails would reduce tree densities and allow additional sunlight to reach the forest floor. This would create views that would extend further into the forest. Groups range in size from 1/10 to 2 acres, with an average size of ½ acre. Evidence of harvest activity in these areas would be of irregular size and shape and would usually be in harmony with the naturally appearing landscape. Single-tree selection cuts can also affect the visual quality of the forest by allowing sunlight to penetrate the forest canopy, allowing more visibility below and improving the growth of the shrub layer. As listed above (3.3.3.2 Mitigation Measures), vegetative buffering and slash disposal methods would be applied. The proposed units have been designed to include feathered edges to soften the transition of and avoid abrupt changes in canopy height and density. In addition, clearcut units would retain selected residual trees in groups of five or more. These residual trees would also be incorporated with wildlife trees into leave-tree islands within openings to help prevent possible windthrow. Where possible, especially in larger clearcut openings, additional quarter-acre patches or individual trees would be left in place to add diversity to the regenerating stand.

The clearcut units, with the exception of compartment 116, stand 4, should be able to meet the Forest Plan Standards and Guidelines for maximum observable acres of openings. The shape and size of units, the remaining residual individual trees and tree islands, along with incorporating the feathered edges as listed in the Mitigation Measures, would allow clearcut units to blend well with the topography and not be visually apparent. The visual quality objectives will be maintained.

Alternative 3:

Alternative 3 proposes only uneven-aged management in 19 units (1,007 stand acres). This includes group selection harvesting and single-tree harvesting. Visual effects for group and selection cuts are described under Alternative 2. Alternatives 3 and 6 would have the least impact on the existing Visual Quality. Uneven-aged harvesting treatments generate small openings in the tree canopy that result in less textural change.

Alternative 4:

This alternative provides a variety of even- and uneven-aged treatments on 24 units affecting 1,087 stand acres. The visual effects are similar to Alternative 2, with the following differences. Stand 116/4 is proposed in this alternative for group selection treatment, which visually differs greatly from the clearcut treatment in Alternative 2. Stands 114/15 and 114/30 are proposed for a mixture of single-tree and group selection treatments. This alternative has the least visual impact while still achieving Forest Plan goals and objectives for wildlife habitat (early-successional habitat) and harvest volume.

Alternative 5:

Alternative 5 is similar to Alternative 4, but introduces two additional treatment areas, one a clearcut and one a group selection, resulting in the treatment of 1,158 stand acres. The addition substantially increases the area on the south side of Tripoli Road with a continuous area of treatment. As stated under Alternative 3, recent research indicates that the close clustering of these smaller canopy openings may give the viewshed a moth-eaten appearance, which is an undesirable visual effect, especially when added together with the larger openings of the three clearcut units.

Alternative 6:

Under Alternative 6, the units adjacent to the East Pond and Little East Pond Trails and two

proposed units at the east end of the project area have been eliminated. Alternatives 6 and 3 would have the least impact on the visual resource in the project area than all other alternatives except the No Action alternative (665 stand acres treated in Alternative 6).

3.3.3.4 Visual Cumulative Effects

The cumulative effects area for the visual analysis is the Eastman Brook subwatershed through the year 2012, because the only activities in the Tripoli project that affect the visual resource are confined to the watershed and includes the Eastman West project.

As noted in Chapter 1, Table 1there have been four previous timber projects within the vicinity of the Tripoli East project area affecting over 717 acres since 1986, and additional harvest activities over the past 70 years. Any visual effects from vegetation harvested more than fifteen years ago would be well recovered, although there would remain some visual evidence from certain viewpoints due to differences in the vegetation texture (older versus younger trees). However, due to the topography, existing vegetation densities in the Foreground Distance Zone, and low number of viewpoints, this area is well able to absorb the proposed treatments under all alternatives. The variety classes of B (common) and C (minimal) will be maintained.

Alternative 1 – No Action

No harvesting is proposed under Alternative 1. With this alternative, there would be little or no change in the visual resource from that which currently exists within the project area. Any changes in the forested landscape would occur due to natural causes. No additional harvesting is anticipated in the watershed through 2012. There would be no cumulative effects under Alternative 1.

Alternatives 2 - 6

With the exception of Alternative 3, all action alternatives propose some clearcutting. Only small portions of the proposed clearcuts would be visible from any viewpoint. The shapes and patterns of the proposed cuts would blend well with the existing terrain and vegetation, and only small portions of any proposed clearcut may be visible from any one viewpoint. The harvest prescriptions proposed would intensify the mosaic appearance of this area by adding numerous small openings and a few additional moderate sized openings in the canopy. However, the amount of area with visible impacts would remain within the White Mountain National Forest standards and guidelines for visual quality for all harvest prescriptions being proposed and for the established Visual Quality Objectives for those areas. No additional vegetation management is expected through 2012. There would be no adverse visual cumulative effects from Alternatives 2-6.

3.3.4 Community, Environmental Justice, & Economics

3.3.4.1 Community, Environmental Justice, & Economics Affected Environment

The Tripoli project area is located on federal lands in portions of the towns of Livermore and Thornton (Map 1).

The majority of the project area (98%) is in the Town of Livermore, an unincorporated township.

Two percent (2%) of the project area is in the Town of Thornton, which is a small residential/recreational-home community. The village of West Thornton is approximately seven (7) miles from the project area, and the village of Thornton is approximately 10 miles away. Thornton is a small community with no services. Many residents in the town of Thornton practice traditional land use activities such as logging, farming, and sugaring.

There are no private residences within a mile of the project area.

Pro-Sport Inc. has a special use permit for the operation of the Tripoli Road Dispersed Camping Area (§**3.3.3 n**). Pro-Sport pays a flat percentage for each pass sold during their operating season. They also contribute to a Forest Service collection account that supports Forest Protection Officer: salaries, overtime, training, uniforms, vehicle operation and fixed costs, equipment, and backup. The permittee covers all the costs and labor for solid waste disposal, care and police, signing, gate maintenance, poster maintenance, and most of the hazardous tree removal work. There is no cost to government for this program. The permittee pays a flat fee of $2.00/permit sold and six percent of their gross concession sales per annum (approximately $950 for 2001) to the White Mountain National Forest.

There are numerous costs associated with implementing a project on the National Forest. The 'up front' costs are the planning costs. Project planning involves a number of preliminary steps and associated costs. The environmental analysis required by NEPA is one component of the planning effort for project implementation. Other planning activities include: silvicultural and biological surveys; fieldwork, development of stand

prescriptions, and project layout; data collection and entry; planning meetings; public involvement; and preparation of an environmental assessment and decision documents. The average unit planning cost to the government for the Ammo/Pemi Ranger District for the fiscal year (FY) 2002 was approximately $31,500/million board feet (MMBF) of timber produced (Table 40). This is the cost of 'doing business' and is incurred even if the no action alternative is chosen.

Table 40: Ammo/Pemi District FY02 Project Costs/MMBF

ACTIVITY	ASSOCIATED COST/ MMBF
Costs:	
Planning (inventory, mapping, layout, prescribing, NEPA)	$31,500
Sale Preparation (marking, appraisal, advertising)	$28,000
Sale Administration (sale inspection, accounting, billing, administration)	$11,750
Total Costs to Produce and Administer a Timber Sale	$71,250

Implementation of a project that includes timber management has associated timber sale preparation (marking, appraisal, advertising) and timber sale administration costs (sale inspection, accounting, billing, administration). The average unit cost to the government for the Ammo/Pemi Ranger District for sale preparation was approximately $28,000/MMBF, and for sale administration was approximately $11,750/ MMBF of timber produced for FY02. These cost figures were derived from FY02 district work plans and adjusted for complexity (accessibility of the project area and the time necessary to complete field work). Table 40 displays the costs associated with producing an MMBF of timber.

The revenue figure for value of timber harvested is the average of the comparable (green, no salvage) timber sales sold on the White Mountain National Forest in FY02. There were other sales sold, but they were included salvage, and there is no salvage in the Tripoli project. Table 41 displays the year sold and the value per MMBF of the last comparable green timber sales sold on the Forest.

Table 41: Last Four Timber Sales Sold on the White Mountain National Forest by Date and Value

Sale Name	FY Sold	Total Value	Total Volume	Average Value/ MMBF
Bickford Timber Sale	2002	$389,218	2.1 MMBF	$185,342
Iron Maple Timber Sale	2002	$153,684	1.2 MMBF	$128,070
			Average Value/ MMBF	**$156,706**

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

There is no private land in the project area.

Many of the values generated by the various alternatives (both positive as well as negative) involve goods and services that are not priced in the market place and, therefore, 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. The effects each alternative has on these types of non-priced goods and services are found elsewhere within 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.

Recreation in the Tripoli project area is mainly short stay or weekend camping and day-use activities such as, hiking, hunting, biking, and snowmobiling. There are no direct economic benefits to either the Towns of Thornton or Livermore from the recreational activities that occur in the project area. This is true for all alternatives.

Alternative 1 – No Action

No timber is being harvested under Alternative 1, and there would be no timber tax (Appendix H, §**B.2.7.1**) returned either to the Town of Thornton or to Grafton County.

There would continue to limited seasonal employment and income opportunities generated by the dispersed camping permit, but no income and job opportunities would be produced through timber harvesting from the implementation of Alternative 1.

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).

The unit figure cost for Alternative 1 is the average MMBF value of the action alternatives (4.56 MMBF). There would be no monetary benefit to the federal treasury from timber harvesting this decade. The government would receive approximately $950 in revenue from the Tripoli Road Dispersed Camping Area permittee. Table ? displays the federal cost/benefit analysis for the implementation of Alternative 1.

Table 42: Federal Cost/Benefit Analysis for Implementation of Alternative 1

Activity	Associated Cost or Benefit/ 4.56 MMBF (av. of volume harvested for Alts 2-6)
Total Planning Costs to Produce and implement the no action alternative	$143,640
Annual Revenue from Dispersed Camping Permittee **Constant?**	$950
Total net value	**-$142,690**

Grafton County would eventually disburse a portion of the monies received from 25% Fund payments (Appendix H, § **B.2.7.2**) to the Town of Thornton. The Town of Livermore is unincorporated and would receive no disbursements from the 25% Fund. The only revenue received under Alternative 1 is $950 (average annual revenue from dispersed camping permit). This would contribute approximately $327 to the 25% Fund.

Alternative 2 – Proposed Action

There would continue to be limited seasonal employment and income opportunities generated by the dispersed camping permit, and limited job opportunities and income would be produced through timber harvesting from the implementation of Alternative 2.

Vegetative treatments prescribed under Alternative 2 are estimated to produce approximately 5.1 MMBF. Table 43 displays the Federal Cost Benefit analysis for implementation of Alternative 2.

Table 43: Federal Cost/Benefit Analysis for Implementation of Alternative 2

Activity	Associated Cost or Benefit/ 5.1 MMBF
Costs⁂:	
Planning (inventory, mapping, layout, prescribing, NEPA)	$160,650
Sale Preparation (marking, appraisal, advertising)	$142,800
Sale Administration (sale inspection, accounting, billing, administration)	$59,925
Total Costs to Produce and Administer a Timber Sale Under Alternative 2	**$363,375**
Revenue	
Sale of Timber★	$799,200
Annual Revenue from Dispersed Camping Permittee	$950
Total Revenue Produce by a Timber Sale Under Alternative 2	**$800,150**
Net Return to the Federal Treasury for a Activities Under Alternative 2	**$436,775**

⁂ Costs were derived from FY02 District work plans, adjusted for relative accessibility of the project area and the time necessary to complete fieldwork.

★ Revenues were derived from the most recent sales with typical products or treatments as proposed FY02 projects.

Approximately 18% of the volume proposed for harvesting is in the Town of Thornton, and the remaining 82% is in the Town of Livermore. The estimated value of the timber that could be harvested on the portion of the Tripoli project located in the Town of Thornton is approximately $143,856. This would yield a timber tax revenue (Appendix H, §**B.2.7.1**) to the Town of Thornton of approximately $14,256.

The estimated value of the timber that could be harvested on the portion of the Tripoli project located in the Town of Livermore is approximately $655,344. Because the Town of Livermore is unincorporated, this would yield a timber tax revenue (Appendix H, §**B.2.7.1**) to Grafton County of approximately $65,5344.

The anticipated revenue received under Alternative 2 is $800,150 (see Table 44). This would contribute approximately $238 to the 25% Fund.

Alternatives 3-6

The economic effects of Alternatives 3-6 are similar to those of Alternative 2, differing in the estimated amounts of timber to be harvested from vegetative management.

The government would receive approximately $950/year in revenue from the Tripoli Road Dispersed Camping Area permittee under all alternatives. Table 44 displays the net return to the Federal Treasury from Alternatives 3-6.

The anticipated revenue received under Alternative 3-6 and the contributions to the 25% funds is $800,150 (see Table 45, above). This would contribute approximately $238 to the 25% Fund.

There are differences in the units to be harvested under different alternatives. The anticipated volume to be harvested in the Town of Thornton is approximately 18% for Alternatives 3-5 and approximately 21% for Alternative 6. The figures for the Town of Livermore are 82% and 79% respectively. Table 46 displays the anticipated timber tax revenue that would result from the implementation of Alternatives 3-6.

Table 44: Net Return to the Federal Treasury from Implementation of Alternatives 3-6

Activity	Alt 3 Associated Cost or Benefit/ 3.9 MMBF	Alt 4 Associated Cost or Benefit/ 4.8 MMBF	Alt 5 Associated Cost or Benefit/ 5.6 MMBF	Alt 6 Associated Cost or Benefit/ 3.4 MMBF
Costs⁂:				
Planning (inventory, mapping, layout, prescribing, NEPA)	$122,850	$151,200	$176,400	$107,100
Sale Preparation (marking, appraisal, advertising)	$109,200	$134,400	$156,800	$95,200
Sale Administration (sale inspection, accounting, billing, administration)	$45,825	$56,400	$65,800	$39,950
Total Costs to Produce and Administer a Timber Sale Under Alternative 2	**$267,875**	**$342,000**	**$399,000**	**$242,250**
Revenue				
Sale of Timber★	$611,153	$752,189	$877,554	$532,787
Annual Revenue from Dispersed Camping Permittee	$950	$950	$950	$950
Total Revenue Produce by a Timber Sale Under Alternative 2	**$612,103**	**$753,139**	**$878,494**	**$533,787**
Net Return to the Federal Treasury for a Activities Under Alternative 2	**$344,228**	**$411,139**	**$479,494**	**$291,537**

⁂ Costs were derived from FY02 District work plans, adjusted for relative accessibility of the project area and the time necessary to complete fieldwork.

★ Revenues were derived from the most recent sales with typical products or treatments as proposed FY02 projects.

Table 45: Anticipated Timber Tax Revenue Received by the Town of Thornton and Grafton County for Alternatives 2-6

Timber Tax Recipient	Alt 2 Associated Cost or Benefit/ 5.1 MMBF	Alt 3 Associated Cost or Benefit/ 3.9 MMBF	Alt 4 Associated Cost or Benefit/ 4.8 MMBF	Alt 5 Associated Cost or Benefit/ 5.6 MMBF	Alt 6 Associated Cost or Benefit/ 3.4 MMBF
Town of Thornton	$14,403	$11,018	$13,556	$15,813	$11,210
Grafton County (for unincorporated Town of Livermore)	$65,612	$50,192	$61,757	$72,036	$42,169

Table 46: Anticipated Revenue Contributed to the 25% Fund From The Tripoli Project by Alternative

Activity	Alt 3	Alt 4	Alt 5	Alt 6
Total Gross Revenue (Tripoli, Dispersed Camping Permit)	**$612,103**	**$753,139**	**$878,494**	**$533,787**
25% Fund Contribution	**$153,025**	**$188,285**	**$219,624**	**$133,47**

3.3.4.3 Community, Environmental Justice, & Economics Cumulative Effects

In 1992, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This executive order "…provides that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies,

and activities on minority populations and low-income populations."

The closest private land to the Tripoli project area is more than one mile away. The interim guidelines for Environmental Justice suggest obtaining demographic information for the census block group in which the project is located and other adjacent block groups within a one-mile radius, including private and National Forest System Lands. Given these criteria, no census block groups fall within the prescribed radius. The activities proposed in the action alternatives pose no human health hazards or significant negative environmental effects regardless of socio-economic group.

The revenue generating activities associated with the Tripoli project (Table 46occur in the Eastman Brook subwatershed and extend to the nearest town (Woodstock) that provides public services associated with the activities in the Tripoli project area. The cumulative effects area for community/economics is the Eastman Brook subwatershed and the area surrounding the village of Woodstock (Map 11).

Table 47: Federal Revenue-Generating Activities and Gross Revenue Anticipated in the Eastman Brook Subwatershed through 2012 by Alternative

Activity	Gross Revenue					
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Timber Harvesting:						
Eastman West	$194,633	$194,633	$194,633	$194,633	$194,633	$194,633
Tripoli East	$0	$800,150	$612,103	$753,139	$878,494	$533,787
Recreation Permit	$17,100*	$17,100	$17,100	$17,100	$17,100	$17,100
Total Gross Revenue	**$211,733**	**$1,011,883**	**$823,836**	**964,872**	**$1,090,227**	**$745,520**

* Could be less if campsites in the lower terraces of Eastman Brook were closed in the future for environmental concerns.

There would be no change in current conditions in the subwatershed under Alternative 1 and therefore, no cumulative effects.

The effect to the local communities, from implementation of Alternatives 2-6, with regard to the operation of the Tripoli Road Dispersed Camping Area permit, would be the same as Alternative 1. Timber harvesting might provide some job opportunities, and would contribute dollars to the 25% fund. Although there would be some changes in the forested landscape, dramatic changes in social conditions are not expected (Forest Plan, IV-52 to IV-55, IV-65 to IV-66).

Recreation occurring in the Eastman Brook subwatershed includes overnight/weekend camping and day-use activities such as hiking, biking, hunting, snowmobiling. Most visitors participating in these activities would come prepared with the supplies necessary for their planned activities. If visitors or people working in the Eastman Brook subwatershed need to pick up some food, ice, or gas, the closest place is Woodstock, approximately four miles away, which has a gas station and a convenience store. The revenue generated from these activities would be similar for all alternatives. Workers operating timber sales might stop at the convenience store.

Federal revenue in the subwatershed through the year 2012 includes the sale of timber and dispersed recreation receipts. Timber harvesting revenue includes the Eastman West Timber sale, and the anticipated revenue from timber harvesting proposed in the Tripoli project. No additional timber is expected to be harvested in the next decade in the subwatershed. A permitting system has been in effect for the Tripoli road for the past eight years, and has recently been renewed through the year 2005. For analysis purposes, annual revenue for the year 2001 ($950) is being used to calculate cumulative revenue. displays the cumulative federal revenue anticipated through the year 2012 for the Eastman Brook subwatershed.

The Eastman West Timber sale occurred in the subwatershed in the Town of Thorton and generated timber revenues of $194,633 and timber tax (Appendix H, §**B.2.7.1**) receipts of $19,463 for the Town of Thornton. No additional timber management is expected to take place in the subwatershed within the next ten years. Table 46 displays the approximate cumulative timber tax revenues for the Town of Thornton and Grafton County from the Eastman West and Tripoli Projects by alternative.

Under all alternatives, Grafton County would eventually disburse a portion of the monies received from 25% Fund payments (Appendix H, § **B.2.7.2**) to the Town of Thornton. The Town of Livermore is unincorporated and would receive no disbursements from the 25% Fund. Table 49 displays the anticipated cumulative revenues contributed to the 25% Fund from the Eastman Brook subwatershed through 2012.

Table 48: Anticipated Timber Tax Revenue Received by the Town of Thornton and Grafton County through the year 2012 for Alternatives 3-6

Timber Tax Recipient	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
	Associated Cost or Benefit/ 0.0 MMBF	Associated Cost or Benefit/ 5.1MMBF	Associated Cost or Benefit/ 3.9 MMBF	Associated Cost or Benefit/ 4.8 MMBF	Associated Cost or Benefit/ 5.6 MMBF	Associated Cost or Benefit/ 3.4 MMBF
Town of Thornton (10% of the timber harvested in Eastman West and Tripoli Projects)						
Eastman West (100%harvested in Thornton)	$19,463	$19,463	$19,463	$19,463	$19,463	$19,463
Tripoli East (~18% in Alternatives 2-5, ~21% in Alternative 6 harvested in Thornton)	$0	$14,402	$11,018	$13,556	$15,813	$11,210
Total for Town of Thornton	**$19,463**	**$33,865**	**$30,481**	**$33,019**	**$35,276**	**$$30,673**
Grafton County (for unincorporated Town of Thornton) Thornton (?% of the timber harvested in Tripoli Project, (~22% in Alternatives 2-5, ~79% in Alternative 6)	$0	$65,612	$50,192	$61,757	$72,036	$42,169
Anticipated Cumulative Total Timber Tax Revenue	**$19,463**	**$99,477**	**$80,673**	**$94,776**	**$107,312**	**$72,842**

Table 49: Anticipated Cumulative Revenue Contributed to the 25% Fund Through the Year 2012 by Alternative

Activity	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Total Gross Revenue (Eastman West, Tripoli, Dispersed Camping Permit)	**$211,733**	**$1,011,883**	**$823,836**	**$964,872**	**$1,090,227**	**$745,520**
25% Fund Contribution	**$52,933**	**$252,970**	**$205,929**	**$241,218**	**$272,556**	**$186,380**

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GLOSSARY

Age Class – An aggregation of tree ages into various ranges.

Best Management Practices (BMPs) – Proper methods for the control and dispersal of water on truck roads, skid trails, and log landings to minimize erosion and reduce sediment and temperature changes in streams.

Capability – The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices at a given level of management intensity. Capability depends on current conditions, site conditions such as climate, slope, landforms, soils, and geology, as well as the application of management practices, such as silviculture or protection from fire, diseases, and insects.

Clearcutting – the removal in a single cut of the entire standing crop of trees. It prepares the area for rapid seed germination and growth of a new even-aged stand.

Cumulative Impact – The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

Dispersed Recreation – Recreational use outside of developed recreation areas. Includes such activities as hiking, fishing, snowmobiling, and driving for pleasure.

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

Environmental Analysis – An investigation of alternative actions and their predictable effects, including physical, biological, economic, and social consequences and their interactions; short- and long-term effects; and direct, indirect, and cumulative effects. The process provides the information needed for identifying actions that may be categorically excluded, for preparing environmental documents, and for determining whether an environmental impact statement is needed.

Environmental Assessment (EA) – A concise public document that serves to (1) provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact, and (2) aid an agency's compliance with the NEPA when no environmental impact statement is necessary.

Even-aged Management –A timber management system that results in the creation of stands in which trees of essentially the same age grow together. Cutting methods producing even-aged stands are clearcut, shelterwood or seed tree.

Finding of No Significant Impact (FONSI) – A document by a federal agency briefly presenting the reasons why an action, not otherwise excluded, will not have a significant effect on the human environment and for which an environmental impact statement will not therefore be prepared. It shall include the environmental assessment or a summary of it and shall note any other environmental documents related to it. If the assessment is included, the finding need not repeat but may incorporate it by reference.

Granger-Thye Offset Funds – Collection of monies authorized by the Granger–Thye Act (1978): 3.5% of the assessed real value of the sites are collected. Funds are used for maintenance.

Group Selection – The cutting method that describes the silvicultural system in which trees are removed periodically in small groups, resulting in openings that do not exceed an acre or two in size. This leads to the formation of an uneven-aged stand, in the form of a mosaic of age-class groups in the same forest.

Habitat Management Unit (HMU) – A unit of land approximately 4,000 acres in size, the boundaries of which fall on compartment boundaries, and which contain a mix of habitat types. At least on of these types must be a pond or stream with wetland potential.

Habitat Community (Community Type) – A grouping of forest and non-forest habitat types

Hardening – Adding gravel to a recreation site to prevent erosion.

Improvement Cutting – A treatment used in uneven-aged management. The cut is designed to change the distribution of tree species composition, size, and quality so that the trees can function better as an uneven-aged stand.

Interdisciplinary Team – A group of individuals with skills from different resources. An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems. Team member interaction provides necessary insight to all stages of the process. Their presence is sufficient indication that specific habitat conditions are also present. These species represent groups of other species with similar habitat requirements.

Management Area (MA) – The grouping of land areas allocated to similar management goals such as 2.1 and 3.1 that stress vegetation management.

Management Direction – Forest-wide management direction consists of: Forest management goals, Forest management objectives, Forest-wide standards and guidelines, specific management direction for each management area, the Forest Plan map, and implementation maps. Specific management direction for each management area (MA) consists of: a purpose statement for the MA, the desired condition for the MA, the management prescription for the MA, and the standards and guidelines for the MA.

Management Indicator Species (MIS) – A plant or animal adapted to a particular kind of environment. The arrangement of habitats (by tree species and age group) reflects requirements for selected wildlife species.

Mitigation – includes: 1) avoiding the impact altogether by nit taking a certain action or parts of an action; 20 minimizing impacts limiting the degree or magnitude of the action and its implementation; 3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; 5) compensating for the impact by replacing or providing substitute resources or environments.

MMBF – A symbol used to indicate 1,000 board feet of wood fiber volume, either in log form or after conversion to lumber.

Nephelometric Turbidity Units (NTUs) - Turbidity is measured using the nephelometric turbidity unit (NTU). Nephelometry has been adopted by *Standard Methods* as the preferred means for measuring turbidity because of the method's sensitivity, precision, and applicability over a wide range of particle size and concentration. The preferred expression of turbidity is NTU.

Payment in Lieu of Taxes (PILT) – The result of a federal law that provides funds to local units of government containing federally-owned lands. The amount of money paid is based on the number of acres of eligible federal land within the town subject to certain limitations.

Twenty0five Percent Fund – The requirement that 25 percent of Forest Service receipts (money from timber sales, campgrounds, and special use permits) be returned to the communities in which they were derived for the benefit of public schools and roads.

People At One Time (PAOT) – A unit to measure to indicate the capacity of developed recreation sites. Usually indicated as "5 PAOT" per individual camping or picnic site. The capacity would be five times the total number of sites.

Recreation Opportunity Spectrum (ROS) – A means of expressing a range of recreation experience opportunities. Each part of the spectrum represents a particular kind of experience opportunity.

Primitive – Recreation opportunities characterized by natural appearing environment and high probability of isolation from others. Offers a high degree of challenge and risk.

Semi-primitive Non-motorized – Recreation opportunities characterized by a predominantly natural appearing environment and low degree of interactions between users. Evidence of other users is present. Managed to minimize on-site controls and restrictions. Motorized use is not permitted.

Semi-primitive Motorized - Same as above but motorized.

Roaded Natural – Recreation opportunities characterized by predominantly natural appearing environment but with moderate evidence of human activity. Resource utilization practices are evident.

Road Reconstruction – An activity that results in improvement or realignment of an existing classified road as defined: 1) *Road Improvement* – Activity that results in an increase of an existing road's traffic service level, expands it's capacity, or changes it's original design function; 2) *Road Realignment* – Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway.

Roaded Natural – Recreation opportunities characterized by a predominantly naturally appearing environment but with moderate evidence of human activity.

Semi-primitive Motorized – Recreation opportunities characterized by a predominantly naturally appearing environment and a low degree of interactions between users. Evidence of other users is present. Managed to minimize on-site controls and restrictions. Motorized use is permitted.

Shade Intolerant – Those tree species that need full or near full sunlight to regenerate and grow.

Shade Tolerant – Those tree species that can regenerate and grow in shade or varying degrees of sunlight.

Single-tree Selection – A method where individual trees are selected and cut in a stand while maintaining a prescribed number of trees in each diameter class.

Slash – Debris left after pruning, logging, thinning, or brush cutting, and large accumulation of debris after wind or fire. It includes logs, branches, and stumps.

Turbidity: A principal physical characteristic of water and is an expression of the optical property that causes light to be scattered and absorbed by particles and molecules rather than transmitted in straight lines through a water sample. It is a measure of the clarity of a water sample.

Uneven-aged Management – The application of a combination of actions needed to maintain continuous high forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter and or age classes to provide a sustained yield of forest products. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group.

µmhos - The unit of measure for specific conductance is siemens (formerly called mhos) per centimeter which is 1.0 divided by specific resistance. When the numbers get too small, the microsiemens (S) is used.

MONITORING

Implementation monitoring assesses whether the project was implemented as designed and whether or not it meets Forest Plan standards and guidelines. The project will be reviewed prior to implementation to insure that it is laid out and prescribed as described in this document. Actual amounts of activities accomplished on the ground (measured in acres or miles) may vary slightly. All changes would be evaluated to ensure that any effects are within the parameters of the effects analyzed in this document and would be documented in the Tripoli East project file. Project implementation is to be inspected at regular intervals to insure that Forest Plan Standard and Guides are being met.

Two specific monitoring projects are proposed as part of the Tripoli Project. For specifics, see Appendix C – Mitigation Measures.

1. **Butternut Monitoring:** Butternut trees that have been identified in the project area will be monitored to determine the progression and the effects of the canker disease.
2. **Cultural Sites Monitoring:** Specified cultural sites will be monitored before, during, and after project implementation to ensure that mitigation measures are properly adhered to.

APPENDICES

APPENDIX A - MAPS

APPENDIX B - SCOPING

APPENDIX C - MITIGATION MEASURES

APPENDIX D – HABITAT MANAGEMENT UNITS (HMUs) 416 AND 417 DATA

APPENDIX E - VEGETATION REPORT

APPENDIX F1- PROBABILITY OF OCCURRENCE ANALYSIS OF MANAGEMENT IINDICATOR SPECIES FOR THE TRIPOLI EAST PROJECT AREA, LIVERMORE & THORNTON, NH

APPENDIX F2- PROBABILITY OF OCCURRENCE ANALYSIS OF STATE-LISTED TESSC

APPENDIX F3- ANALYSIS OF POTENTIAL EFFECTS OF THE PROPOSED TRIPOLI EAST TIMBER SALE ON STATE TESSC AND OTHER WILDLIFE SPECIES

APPENDIX G1 - PROBABILITY OF OCCURRENCE ANALYSIS OF NH STATE-LISTED THREATENED (T), ENDANGERED (E), & SPECIES-OF-SPECIAL-CONCERN (SSC) PLANTS FOR THE TRIPOLI EAST VEGETATION MANAGEMENT PROJECT AREA, GRAFTON COUNTY, NH

APPENDIX G2 - PROBABILITY OF OCCURRENCE AND EFFECTS ANALYSIS OF SPECIES OF CONCERN ON THE WMNF

APPENDIX H - FOREST PLAN DIRECTION/DESIRED CONDITION AND GENERAL BACKGROUND AND RESOURCE INFORMATION