

**REVISED
ENVIRONMENTAL ASSESSMENT**

For the
Old Joe Project

May 2002



Forest Service
Eastern Region



United States
Department of
Agriculture

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List of Acronyms

BA/BE	Biological Assessment/Biological Evaluation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DEIS	Draft Environmental Impact Statement
DFC	Desired Future Condition
DN	Decision Notice
EA	Environmental Assessment
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
GMNF	Green Mountain National Forest
GMFLNF	Green Mountain & Finger Lakes National Forests
ID Team, IDT	Interdisciplinary Team
LWD	Large woody debris
MA	Management Area
MIS	Management Indicator Species
NEPA	National Environmental Policy Act
NFS lands	National Forest System lands
TES	Threatened, Endangered and Sensitive Species
VQO	Visual Quality Objective
VRMS	Visual Resources Management System
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
BBS	North American Breeding Bird Survey
PIF	Partners in Flight

TABLE OF CONTENTS

Preface	
Relationship Between the Forest Plan And Site Specific Analysis	vi
Document Structure	vi
I. Introduction	I-1
A. Background	I-1
B. Forest Service Authority, Policy and Management Direction	I-2
C. Old Joe Project Area	I-3
D. Purpose Of and Need For Action	I-3
E. The Proposed Action	I-8
F. Scoping and Identification of Issues	I-8
II. Description of Alternatives Including the Proposed Action.....	II-1
A. Process Used to Develop Alternatives	II-1
B. Alternatives Considered but Eliminated from Further Consideration	II-1
C. Alternatives Considered in Detail	II-2
The No Action Alternative	II-2
The Proposed Action	II-3
Alternative B – No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail	II-11
Alternative C – Increased Early Successional Habitat.....	II-15
D. Use of Mitigation Measures	II-20
E. Monitoring Plan	II-20
III. The Affected Environment and Environmental Effects	III-1
A. Introduction	III-1
B. Environmental Effects by Resource Area	III-1
Recreation	III-1
Visual Quality	III-7
Threatened, Endangered, and Sensitive Species	III-13
Wildlife	III-14
Vegetation Management	III-25
Management Indicator Species: MIS	III-26
Soil, Water, and Wetland Resources	III-35
Fisheries	III-43
Heritage Resources	III-48
Economic Analysis	III-50
Environmental Justice	III-53
C. Comparison of Impacts by Alternative	III-55
IV. Consultation and Coordination	IV-1
V. References	V-1

Appendix A: List of Public Comments from February, 1998 Initial Scoping	A-1
Appendix B: List of Comments from June, 1998 EA for Public Comment	B-1
Appendix C: Project Mitigation Measures	C-1
Appendix D: Monitoring Plan	D-1
Appendix E: Biological Evaluation.....	E-1
Appendix F: Management Indicator Species (MIS) Population and Habitat Community Trends	F-1

List of Tables

II-1A Summary of the Proposed Action: Vegetation Management Activities by Management Area:	II-8
II-1B Summary of the Proposed Action: Vegetation Management Activities by Treatment Method	II-9
II-2A Summary of Alternative B: Vegetation Management Activities by Management Area:	II-12
II-2B Summary of Alternative B: Vegetation Management Activities by Treatment Method	II-13
II-3A Summary of Alternative C: Vegetation Management Activities by Management Area:	II-17
II-3B Summary of Alternative C: Vegetation Management Activities by Treatment Method	II-18
III-1 Management Indicator Species And Associated Habitats	III-27
III-2 Trends In MIS Populations And Habitat Communities They Represent	III-28
III-3 Amount of Change in MIS Habitat Communities Expressed in Acres Affected and Percent of Analysis Area (16,899Acres) Affected As A Result of Implementation of the Proposed Action & Alternatives	III-31
III-4 Expected Impacts (Risk and Benefit) of the Proposed Action (PA) and Alternatives (Alt) On MIS Population Trends Within the 16,899 Analysis Area	III-33
III-5 Soils of the Old Joe Project	III-43
III-6 Economic Benefits and Costs	III-52
III-7 Ethnic Demographics for the Green Mountain National Forest Region.....	III-54
III-8 Income Demographics for the Green Mountain National Forest Region.....	III-54
III-9 Summary Comparison of Environmental Consequences by Alternative	III-55

List of Figures

I-1	Location Map	I-4
II-1	Map of the Proposed Action	II-10
II-2	Map of Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail	II-14
II-3	Map of Alternative C: Increased Early Successional Habitat	II-19

PREFACE

Relationship Between the Forest Plan And Site Specific Analysis

In January 1987, a comprehensive land management planning effort was concluded with the approval of the Green Mountain National Forest Land and Resource Management Plan. Most noteworthy in this effort was the high degree of public involvement used to identify issues and alternative management approaches. An environmental impact statement (EIS) was prepared in conjunction with the Forest Plan to document the analysis process. This document was completed in accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) implementing regulations for NEPA.

The signing of the Record of Decision for the Final EIS for the Forest Plan in 1987 represented the first level of decisionmaking related to land and resource management planning. This decision determined the desired future condition of the Green Mountain National Forest and established the standards and guidelines under which future projects would be implemented.

The second, and final, level of decisionmaking begins with the site-specific analysis of proposed management practices and projects designed to achieve the goals and objectives of the Forest Plan. The Old Joe Environmental Assessment (EA) documents the site-specific analysis of a proposal being considered at this level of decisionmaking. The environmental analysis was initiated when the proposed project, commonly referred to as the proposed action, was ready for detailed evaluation in accordance with NEPA procedures. These procedures afforded interested and affected publics the opportunity to participate through scoping. This EA outlines alternatives for implementing the project, notes any needed mitigation measures, and discloses the relevant environmental consequences. The EA will then be released to the public for a 30-day comment period. Consideration of these final comments, along with the results of the analysis, guide the decisionmaker in making an informed decision that will be documented in a Decision Notice (DN). Actual implementation of Forest Plan direction occurs when the selected actions described in the DN are carried out on the ground.

Document Structure

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

- *Introduction:* The section includes information on the history of the project proposal, 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 and how the public responded.

- *Description of Alternatives Including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed to address significant issues raised by the public and/or other agencies, and to provide the decision maker a range of choices based on issues and environmental effects. This discussion also includes possible mitigation measures.
- *The Affected Environment and Environmental Effects:* This section describes the affected environment and the environmental effects of implementing the proposed action and other alternatives. This section is organized by resource areas. The No Action Alternative is described and serves as a baseline for evaluation and comparison of the other alternatives that follow. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Consultation and Coordination:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *References:* This section lists the references consulted during the analysis.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the EA.

Additional documentation, including more detailed analyses of project area resources, may be found in the project planning record located at the Rochester Ranger District Office of the Green Mountain National Forest in Rochester, Vermont.

I. INTRODUCTION

A. BACKGROUND

This Revised Environmental Assessment documents the environmental analysis of the proposed federal action (Proposed Action) in the Old Joe Project Area of the Rochester Ranger District on the Green Mountain National Forest (GMNF). An EA for Public Comment on the Old Joe proposal was originally issued in June of 1998. Comments were gathered, incorporated into the analysis, and a Decision Notice (DN) and Finding of No Significant Impact (FONSI) were issued on September 18, 1998. However, new issues and information related to threatened, endangered, and sensitive species (TES), specifically the Indiana bat, prompted Forest Service to withdraw the Old Joe decision on November 13, 1998.

Since that time, the Green Mountain and Finger Lakes National Forests (GMFLNF) staff has completed an extensive analysis of its threatened and endangered species program. Documentation of this analysis was presented in the EA for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, January, 2001. This was followed by a DN and FONSI for that EA on September 11, 2001 that amended the GMNF Forest Plan to incorporate new information for not only Indiana bat but for all TES by way of updated standards and guidelines, resource protection objectives, and monitoring. An integral part of that study was a Biological Opinion (BO) issued by the U.S. Fish & Wildlife Service, which listed certain terms and conditions that need to be applied in regards to potential Indiana bat habitat. That analysis and decision also amended the Forest Plan to incorporate new information regarding the conservation of sensitive species based on a recent update of the Regional Forester's Sensitive Species list (RFSS) on February 29, 2000. The environmental documents for that Forest Plan amendment are hereby incorporated by reference into the Old Joe analysis.

Completion of the Forest Plan TES amendment allows the Forest Service to move forward with the Old Joe site-specific proposal (see the Preface for a brief description of the relationship between the programmatic Forest Plan and the implementation of its direction through site-specific proposals). The original proposed action remains essentially unchanged. All public input gathered through the scoping period and the comment period for the original EA for Public Comment continues to be considered in this analysis. The new information resulting from the TES amendment is incorporated and has resulted in modifications to various sections of the original EA. These modifications are presented here in this Revised EA for the Old Joe Project. Further public input will be gathered through the appropriate comment period for the revised EA and considered when a decision for implementation is ultimately prepared.

B. FOREST SERVICE AUTHORITY, POLICY, AND MANAGEMENT DIRECTION

The enabling authorities of the USDA-Forest Service are contained in many laws enacted by Congress and the regulations and administrative directives that implement these laws. The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA), provides the framework for land and resource management planning on national forest system lands, and ultimately requires the establishment and revision of national, regional, and local resource goals and objectives through development of land and resource management plans. The GMNF Land and Resource Management Plan (Forest Plan) describes the “local” resource goals and objectives for the GMNF. Achievement of these goals and objectives is the purpose of the planning process provided in these regulations (Federal Register, Sept. 30, 1982). Essentially, NFMA provides the process of going from the programmatic direction of the Forest Plan to a specific project proposed action. Agency policies and procedures for implementing the planning regulations (36 CFR 219) include Forest Service Manual (FSM) 1920 and Forest Service handbook (FSH) 1909.12.

The National Environmental Policy Act of 1969 (NEPA) establishes policy, goals, and means for protecting the environment (40 CFR 1500). NEPA essentially provides a process for starting with a specific proposed federal action, conducting an environmental analysis that includes public participation, and preparing the necessary documentation. Agency policies and procedures for implementing these regulations include FSM 1950 and FSH 1909.15.

There are many other laws and regulations that guide Forest Service analyses. Among these are the Multiple-Use Sustained Yield Act, the Endangered Species Act, the Clean Air Act, and the Clean Water Act. The laws and regulations noted in the above paragraphs, along with other appropriate laws not listed, are hereby incorporated into this analysis.

Authorization for the actions proposed in the Old Joe analysis is found in the Forest Plan (USDA-Forest Service 1987). Activities are proposed in four different Management Areas (MA), including MA 2.1A (Forest Plan pg. 4.93-4.97), MA 4.1 (Forest Plan pg. 4.107-4.114), MA 6.2A (Forest Plan pg. 4.129-4.133), and MA 9.4 (Forest Plan pg. 4.180-1 - 4.180-20, and Appendix J). The management strategies, or prescriptions, are stated for each MA on the pages noted above, along with standards and guidelines specific to each MA. General standards and guidelines are listed on Forest Plan pages 4.15-4.90, and usually apply to practices called for, or allowed, in more than one management prescription. This section, in particular pages 4.61-4.69, also describes how the various harvest practices can be applied.

C. OLD JOE PROJECT AREA

To provide some context, the GMNF encompasses approximately 384,000 acres in southern and central Vermont in the Counties of Addison, Bennington, Rutland, Washington, Windham, and Windsor. This is roughly 6 percent of the total land in Vermont and 50 percent of all public lands in the State. The northern part of the forest consists of the Rochester Ranger District and the Middlebury Ranger District, while the southern portion of the forest is covered by the Manchester Ranger District.

The Old Joe Project Area is located in the central part of the Rochester Ranger District, in the Towns of Rochester (Windsor County) and Chittenden (Rutland County). See Figure I-1 for location of the project area. Approximately 313 acres of Federal land, out of 610 acres of timber stands identified for management, would be directly affected by applying various timber harvest treatments such as selection cutting, thinning, clearcutting, and shelterwood harvests, both initial harvests and final harvests (overstory removals). The amount of affected land is only a very small percentage of the total national forest lands (roughly 75,000 acres in the Rochester Ranger District). In addition to the 313 acres affected, approximately 0.6 miles of cross-country ski trail would be temporarily relocated, and about one mile of brook aquatic and fish habitat would be improved.

The project area consists of two separate land areas that lie a couple miles apart. Adjacent and nearby lands, both federal and private ownership, will be considered when evaluating the cumulative effects of the Proposed Action and its alternatives. The vast majority of the lands surrounding the project sites are GMNF lands. Relatively little private land, mainly in small parcels, lies near the project sites. There are no industrial private timber lands within the project area. Given the size and scale of these parcels, they would not be expected to host projects that would contribute anything but minor adverse impacts to the overall project area lands.

D. PURPOSE OF AND NEED FOR ACTION

The proposed federal action, described below, is needed to implement the goals and objectives of the Green Mountain National Forest Land and Resource Management Plan (Forest Plan) by working toward the desired future condition (DFC) for the four management areas (MA) that comprise the project area. The proposed actions are designed to be consistent with overall Forest Plan direction and specific management direction established in the Plan for these MAs: 2.1A, 4.1, 6.2A and 9.4.

Management Area 2.1A

This MA encompasses 29 percent of the project area. The desired future condition for MA 2.1A is a forest with a closed canopy (continuous cover) which includes tree of many ages and sizes with opportunities for recreation in a roaded natural looking setting. (Forest Plan, pgs 4.93-4.97). Timber management is demonstrated primarily by using

unevenaged systems such as individual tree and group selection harvests. This type of harvest is

Figure I-1 Location Map.

needed in the MA 2.1A project lands to change the existing two-aged stands managed previously with evenaged methods to an all-aged management condition and perpetuate that condition as is emphasized for MA 2.1A lands. Much of the 2.1A project lands are currently in an evenaged, overstocked, dense condition. Selection cutting is needed to improve tree species composition, improve stand stocking levels, and treat areas damaged by insects, disease, ice, snow, and wind. This, in turn, will promote the growth of high quality sawtimber, and maintain a visually appealing, large tree dominated landscape while working toward the desired unevenaged stand conditions and providing wood products.

Management Area 4.1

This MA encompasses about 24 percent of the project area. The desired future condition is to provide long term suitable, stable deer wintering habitat (Forest Plan, pgs 4.107-4.114). Another purpose of MA 4.1 is to provide timber and recreational opportunities in a roaded natural environment. As stated in the Forest Plan (pg. 4.107), providing deer wintering

habitat is needed because of the importance of deer to Vermont's economy and lifestyle, the severity of Vermont's winter weather, and the increasing pressures for hunting and land development. These conditions still prevail today. Deer wintering habitat requires a mix of forest age classes and tree species that contain a variety of different sizes. The younger, smaller trees and brush growing in recently opened up areas provide browse (food). Multi-storied softwood stands (conifers) provide shelter from wind and extreme cold. The snow cover under these dense softwood stands tends to be less at times than in hardwood stands, and thus deer can move easier and expend much less energy, a key component to their overwinter survival.

Much of the MA 4.1 land in the Old Joe project area is in the older age classes with few open areas and little young-aged understory trees that are available for browse. Very similar conditions exist on adjacent private land. There are scattered clumps of conifers, both young, regenerating trees and older, larger trees, primarily spruce and hemlock. Different harvesting techniques are needed in selected areas to increase softwood thermal cover, encourage softwood regeneration, and create hardwood browse in a manner consistent with both the Forest Plan deer management objectives (pgs 4.107-4.114) and State management guidelines (Management Guide for Deer Wintering Areas In Vermont, 1990). Regeneration treatments such as initial shelterwood harvests and clearcutting are needed to create temporarily open areas that produce browse, and promote aspen and softwood regeneration (Forest Plan page 4.62-4.67 and Appendix A.03 - A.07). Group selection harvests are needed to temporarily open up existing pockets of young softwoods where microclimatic conditions favor these conifers. This would improve growing conditions for the existing trees and promote new softwood regeneration. Thinning harvests are needed to encourage the growth of existing softwood and hardwood forests, and provide short-term browse. Overstory removal harvests that remove most of the overstory of previously regenerated stands are needed to encourage the growth of the remaining younger trees that will become the overstory of the future. All harvests are needed to move the area toward the DFC while producing wood products.

Management Area 6.2A

This MA encompasses approximately 47 percent of the project area. The desired future condition emphasizes semi-primitive recreation and a generally remote, undeveloped condition that provides opportunities for solitude and a feeling of closeness to nature (Forest Plan pgs 4.129-4.133). It also emphasizes habitat for animals which are intolerant of people, and allows for production of forest products in harmony with this semi-primitive setting. Evenaged management (described on Forest Plan pgs 4.62-4.67) using extended rotation lengths is the preferred silvicultural system, however, unevenaged management systems (described on Forest Plan pgs 4.62, 4.68-4.69) are appropriate for producing timber in this MA as well.

Conditions of the MA 6.2A lands in the Old Joe Project area range from dense, mature northern hardwoods of varying quality to low quality, poorly stocked immature northern hardwoods. Very few young-aged (0-15 years) stands or open areas exist, and even fewer stands in the 10-59 year age class. Only scattered small pockets of conifers exist as small components of the hardwood stands. Harvesting is needed to improve wildlife habitat and species diversity, and to improve growing conditions for selected trees in low quality stands, while providing wood products. Regeneration cuts are needed to grow new, young, early successional stands and to increase diversity by creating open areas, both temporary and permanent. Individual tree selection harvesting is needed to improve growing conditions and promote the growth of select high-quality sawtimber. Group selection cuts, while achieving the same results in many cases, are also needed to create small holes (openings) that allows hardwood regeneration. These temporary holes can also be judiciously placed around and near softwood clumps to encourage the growth of new spruce and hemlock. The results in all cases would add to the species diversity, increase the amount of softwoods, improve age class composition, create needed wildlife habitat, and promote healthy, diverse, large tree dominated forests, all goals and objectives for MA 6.2A lands.

Management Area 9.4

This MA is intended to protect the characteristics of land and water resources which may make certain sections of streams on the forest eligible for inclusion in the National Wild and Scenic River System. Management prescription MA 9.4 (Forest Plan pgs 4.180-1 thru 4.180-20) is applied to stream corridors that overlay and run through a variety of lands with other management prescriptions. In other words, MA 9.4 overlays small portions of the other MAs in the Old Joe project area. Bingo Brook and Chittenden Brook are identified as Significant Streams (Forest Plan Appendix J pgs J.03). Any proposed activities within these stream corridors would need to be consistent with the standards and guidelines outlined for their protection, so as not to harm their eligibility for inclusion into the National River System. Other non-significant streams in the project area are Joe Smith Brook and Brandon Brook.

The desired future condition calls for stream habitat that increases the productivity of trout and Atlantic salmon and restores aquatic habitat on National Forest System Lands. Many sections of the streams in the project area lack ideal reproduction (spawning) sites

and habitat diversity such as pool habitat, and naturally occurring woody debris that provides cover and protection for fish and other aquatic organisms. Habitat improvements are needed to improve the quantity and quality of pool habitat, enhance spawning habitat, and increase the amount of large woody debris (LWD). LWD is an important structural element in streams that enhances habitat diversity.

Cross Country Skiing Use

There is a need to allow compatibility between logging access and existing cross-country skiing opportunities. Currently, Forest Road 45 (FR45) is used for cross-country skiing and snowshoeing, and for access to other Chittenden Brook ski trails. This road also serves as the main timber access road to this area and had been used for that purpose in the recent past. Plowing to keep the road open for logging access degraded the skiing experience and posed safety concerns. There is a need to construct a trail for skiing and snowshoeing use only in the winter, adjacent to the first 0.6 mile of the road corridor, that could be used when the road is plowed to provide a safer and more enjoyable skiing experience.

Forest Plan Objectives for Vegetative Composition

As has been shown through monitoring, each year the GMNF continues to fall behind in accomplishment of Forest Plan objectives for vegetative composition (U.S.D.A. Forest Service, 2001). Altering the vegetative composition improves species diversity and provides a variety of age classes needed for many wildlife species. Vegetative composition objectives are expected to be accomplished primarily through commercial timber sales (Ibid, p. 38), using regeneration harvests such as shelterwood cuts and clearcuts. The Monitoring and Evaluation Report for 2000 (U.S.D.A. Forest Service, 2001), on page 41, states that for the period from 1987 to 2000, regeneration cuts for hardwoods are being done at a rate of 37 percent of Plan direction, aspen management at only 14 percent, and conversion to softwoods at 74 percent. The report also states that other harvesting is considerably under accomplished. Selection harvest for the above period have been completed at only 52 percent of Plan level and thinning harvests at 23 percent of Plan level. These figures are most likely even lower due to a very reduced harvesting level in 2001 and up to the present time. The most pronounced impact of this reduction in harvesting is the inability to create early successional habitat. Approximately 65 percent of the GMNF's vertebrate species utilize this young, regenerating, open or partially open forest habitat. It is important to note that this habitat, as part of an overall mix of forest conditions, is in short supply regionally.

Timber harvesting is needed as a way to work toward accomplishing Forest Plan objectives for vegetative composition while providing wood products for public consumption, and in turn, meet Forest Plan direction to move the Old Joe project area closer to the desired future condition for three of the four management areas. Regeneration harvests are needed to improve species diversity and create the early successional habitat necessary to maintain viable populations of the vertebrate species that rely on this type of habitat niche.

E. THE PROPOSED ACTION

The Proposed Action included two separate and unrelated categories of activities. The first category is vegetation management. The outcomes produced by this category of actions would be improvements to wildlife habitat, forest stand (species) diversity and composition, and deer wintering habitat, and the commercial production of wood products for public consumption. The second category is stream and fish habitat management, with the outcome being increased fish habitat diversity. Since the original EA, it was determined that this second category of actions can indeed be implemented without reliance on conditions or attributes produced by, or connected to, the proposed vegetation management activities. As such, stream and fish habitat improvement activities can be analyzed and selected for implementation independently.

The vegetation management category consists of a number of different harvest treatments in three management areas (MAs) with the overall objective of producing the outcomes noted above while moving the project area toward the desired future condition for each of the MAs. Proposed treatments include single tree/group selection harvests on 167 acres, thinning harvests on 62 acres, clearcut harvests for aspen regeneration on 6 acres, final shelterwood overstory removals on 56 acres, and the first stage shelterwood regeneration harvests on 17 acres. Additionally, a five acre permanent wildlife opening would be created. A total of 313 acres would be affected. Stream habitat improvements would be implemented on approximately 3/4 miles of Chittenden Brook and 1/4 miles of Joe Smith Brook. An existing cross-country ski trail on FR45 would be relocated for a short stretch onto a trail to be constructed adjacent to the road.

A detailed description of the activities in the Proposed Action is found in Chapter II, section C, Alternatives Considered in Detail.

F. SCOPING AND IDENTIFICATION OF ISSUES

Public issues and management concerns related to the Proposed Action were identified by reviewing Forest Plan direction for the area and by contacting interested and affected publics and Forest Service employees. Issues and concerns that were considered in the original 1997-1998 analysis have been carried forward through this analysis.

Public comments for the Old Joe analysis were collected from a number of sources. The first source was response to a February, 1998 scoping letter mailed for the original analysis to about 700 individuals and organizations. These letters informed the recipients of the Proposed Action and requested their comments. Twelve responses were received in the form of written letters and telephone calls. From these responses, 28 specific comments, issues, and concerns were identified. Each comment was evaluated to determine how it should be addressed in the assessment. The results of the evaluation, carried forward from the original analysis, are displayed in Appendix A of this EA.

The second source of public input used for this analysis was responses to the mailing of the EA for Public Comment (original EA) in June, 1998. Only two responses were

received. From those responses, eight specific comments were identified and used to determine whether or not further analysis was needed before the decision (original) could be made. No changes were necessary, and the original Decision Notice was issued on September 18, 1998 based on the EA for Public Comment and the analysis. As noted in the Introduction, the original decision was withdrawn in November of that year. Those comments and the Forest Service's responses to them at that time are displayed in Appendix B of this EA.

From the original scoping's public comments, three major issues were identified and served as a basis for evaluating the Proposed Action and the alternatives, and assessing the environmental consequences for the original EA. These still-valid issues are being carried forward in this EA and will again be used, in part, for evaluating alternatives and effects. These issues are:

Issue 1. Visual quality

Some people are concerned that timber harvests are visually unattractive and "damaging". Specifically, there are concerns about adverse visual quality from critical viewing points along such places as the Long Trail; Route 73; Mt. Horrid; Forest Roads (FR) 42, 45, and 220, and from homes located on FR115.

Issue 2. Management Area 6.2A Concerns

Some people are concerned that the timber harvests would negatively impact some of the recreational opportunities that are to be provided by MA 6.2A, especially those of providing feelings of solitude. Also, some people believe that timber harvests adversely impact the habitat needs of, and create an unacceptable level of disturbance for wildlife species intolerant of humans (reclusive species), particularly black bear, martin, fisher, lynx, goshawk and some neotropical migratory birds.

Issue 3. Ski Trail Relocation

Some people are concerned with the proposal to create a 0.6 mile cross-country ski trail bypass adjacent to FR45 to be used when the road is plowed for logging operations. They are concerned that the construction would cause negative impacts to soil, water and the small wetland that occurs here. They don't believe that the proposal would eliminate the safety problem of skiers using the road along with log trucks, given that skiers would have to cross the road three times before reaching the trailhead.

One new issue has been added. That issue prompted the withdrawal of the original decision for the Old Joe project in November of 1998.

Issue 4. Indiana Bats

Some people are concerned that timber harvesting cannot be done in a way that protects, maintains, and provides opportunities to enhance habitat on the GMNF needed to ensure the continued existence of the federally endangered Indiana bat.

This issue is addressed through implementation of new or revised Forest Plan standards and guidelines identified in the Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, September 11, 2001. This requires adherence to the U.S. Fish & Wildlife Service's Biological Opinion issued in response to new information concerning Indiana bats. Discussion about, and determination of, impacts of the proposed activities are displayed in the Affected Environment and Environmental Effects section.

II. DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

Chapter II describes the alternatives evaluated in this environmental assessment as required by NEPA section 102(2)(E). Comparison of alternatives further defines the issues, and sets the for discussion of the differences in effects (Chapter III) that results from implementing the different alternatives, and in doing so, provides a clearer basis for choice for the Deciding Officer. All alternatives with the exception of the No Action Alternative, would move the area towards its desired future condition and produce the outcomes noted in the brief description of the Proposed Action in chapter I, section E. The difference between the alternatives lies in their environmental effects, how quickly the desired future condition would be achieved, and to what level the outcomes would be produced.

Where applicable, mitigation measures that are designed to lessen or avoid impacts resulting from implementation of proposed activities are also discussed. A complete list of the applicable mitigation measures may be found in Appendix C.

A. PROCESS USED TO DEVELOP ALTERNATIVES

The development of alternatives was influenced by the scoping process (described in Chapter I) from the original analysis and EA, in combination with input from the Forest Service ID Team. Accordingly, issues and concerns identified by the public, government agencies, and the ID Team were considered in developing a range of potential alternatives to evaluate in the EA. Also considered were comments to the original EA for Public Comment and new information that led to withdrawing the original decision.

Therefore, the ID Team has now identified four alternatives, including the Proposed Action and the No Action Alternative, for consideration in detail. This is a slightly expanded set of alternatives from those presented in the original EA. This section also presents alternatives that were identified but eliminated from further consideration.

B. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Only one alternative action suggested by the public was considered but eliminated from detailed discussion. This action pertains to only a part of the Proposed Action. Some users of the cross-country ski trail don't believe that having both the skiers and the logging trucks using the access road poses a safety problem. They suggested that a better solution to the problem would be to plow up to the summer trailhead (used in the non-snow months) that is about 0.6 further down the road from the winter parking lot that is proposed to be used in the Proposed Action. In other words, people could then drive the 0.6 mile further down the road and use the existing summer parking lot located at the trailhead for winter parking, and avoid having to relocate the trail. This has been discussed and dismissed because of the high costs of plowing and sanding.

The estimated cost to construct the bypass (alternative) trail and to sign and maintain it over the life of the timber sale is \$1400. The estimated cost of plowing and sanding the 0.6 mile of FR45 to the summer trailhead parking lot is \$2,000 per year. Over the period of logging operations (3 winters), this cost would total approximately \$6000. The plowing and sanding expense would be needed to keep the road in a condition that would allow all types of vehicles, including two wheel drive passenger vehicles, to drive safely on a relatively snow-free and ice-free surface. The plowing that the loggers would have to do for their use would not be to the standard required for general public use. In addition to the expense of this alternative, safety is also a factor. If this alternative was selected, vehicles driving the plowed road to get to the summer trailhead parking lot could stand a good chance of encountering logging trucks.

C. ALTERNATIVES CONSIDERED IN DETAIL

THE NO ACTION ALTERNATIVE

As required by NEPA, a No Action Alternative has been included for consideration. The No Action Alternative provides a baseline for estimating the effects of the action alternatives. Under this alternative, the Proposed Action would not be implemented. There would be no harvesting, stream improvements, or relocation of the cross-country ski trail. Other routine activities would continue to occur in the area. Examples of these include road maintenance, pruning apple trees, maintaining existing permanent opening, and other activities covered by other NEPA decisions. This may include the continued, previously approved work on stream habitat improvements in Bingo Brook.

The outcomes produced by the No Action Alternative would be limited to those improvements of wildlife habitat, forest stand diversity and composition, and deer wintering habitat that result from natural actions such as disturbances, annual growth, insect and disease infestations, and ecological succession. There would be no outcomes of wood products for public consumption or stream habitat improvements to Chittenden Brook and Joe Smith Brook. The No Action Alternative would not move the area toward its desired future condition. Trends toward loss of early successional habitat would continue.

This alternative responds to the visual quality issue by not proposing any activity that would potentially adversely affect visual quality. It responds to the issue regarding MA 6.2A concerns by not proposing any of the timber harvesting activities that could potentially adversely affect recreational opportunities available in the MA, the feelings of solitude, or the habitat and disturbance level of wildlife intolerant of humans (reclusive wildlife species). It responds to the ski trail relocation issue by not implementing the relocation, thereby relieving concerns regarding soils, wetlands, and safety.

THE PROPOSED ACTION

The outcomes produced by the Proposed Action would be improvements to wildlife habitat, forest stand (species) diversity and composition, and deer wintering habitat, the production of wood products for public consumption, and increased fish habitat diversity.

The prescriptions (stand harvest treatments) described below for the Proposed Action and alternatives to the proposed action follow the direction for selection and application of appropriate silvicultural systems (see Forest Plan pgs 4.62-4.69 and Appendix A.03-07).

Tables II-1A and II-1B, and Figure II-1 describe the Proposed Action. The following activities are proposed:

Vegetation Management along Forest Road 42 (MA 2.1A)

- * Please Note: The single tree/group selection harvest of stand 25 in compartment 158 has been dropped from the proposal. That is the only change in the Proposed Action from what was presented in the original EA of June, 1998.
- * To work toward developing an unevenaged stand structure, and encourage softwood and hardwood regeneration for species diversity, harvest 41 acres of the 120 acres making up stands 4 and 11 in compartment 158 by using the individual tree and group selection cutting methods. The holes, or temporary openings, created by harvesting in groups would be less than one-half acre in size.
- * Access to the harvest areas would be from Forest Road 42 (Bingo Road). No new road construction, no changes in road use, and no changes in road classification would be needed.

Deer Wintering Habitat Management (MA 4.1)

To improve deer wintering habitat both along the Bingo Road and in the Chittenden Brook portion of the project area, use evenaged and unevenaged cutting techniques to harvest 144 acres of the 209 acres of forest stands selected for treatment in compartments 118, 125, and 158:

- * Using individual tree and group selection cutting methods (unevenaged), harvest 25 acres of the 39 acres in stands 11 and 12 of compartment 118. The holes, or temporary openings, created by harvesting in groups would be less than one-half acre in size, and, whenever possible, would be grouped around existing softwood trees to further improve their growth by increasing light exposure and to encourage regeneration of new softwood trees. In addition, overall stand structure, composition, and species diversity would be improved.
- * Using the thinning method (evenaged), harvest 62 acres of the 75 acres of stands 1 and 9 of compartment 125 and stand 14 of compartment 158 to improve the growth and quality of residual crop trees and improve species composition.
- * Using the shelterwood method (evenaged), make the first cut of a two stage shelterwood harvest on 8 acres of the 22 acres in Stand 19, compartment 158 to

improve tree composition and remove pockets of trees experiencing high levels of mortality or lost productivity. The remaining overstory trees would likely be harvested in approximately 6 to 7 years. Approximately 40 percent of the existing overstory trees would be left to provide partial shade and act as a seed source.

- * Using the last stage of the shelterwood method (evenaged), harvest the remaining overstory trees from past shelterwood cuts on 29 of the 44 acres in Stands 18 and 19 of compartment 125 and on 14 acres of the 29 acres in stand 15 of compartment 158. These harvests would encourage the growth of the understory trees, in particular any small, suppressed conifer (softwood) trees, by releasing them from the shade of the existing overstory, and thus improve species composition and stand structure as called for in deer wintering areas.
- * Using the clearcutting method (evenaged), harvest 3 acres of the 22 acres in stand 1, compartment 125, and harvest 3 acres of the 43 acres in stand 9 of compartment 125 to regenerate aspen, recognized by the Forest Plan (pg. 4.30) as an uncommon and desirable species to be maintained or increased. These clearcuts would also produce early successional, young-aged stands that are missing from the area, would produce browse desired in deer wintering areas (Forest Plan pg. 4.109), and would improve species diversity.
- * Access for tree harvest in MA 4.1 would be from Forest Road 42, Forest Road 45 and Forest Road 220. No new road construction, no changes in road use, and no changes in road classification would be needed.

Wildlife Habitat Management (MA 6.2A)

To improve wildlife habitat and species diversity, and to improve overall forest stand health in low quality stands and promote the growth of high quality sawtimber, use evenaged and unevenaged cutting techniques to harvest 128 acres of the 281 acres of forest stands selected for treatment in compartments 118 and 125:

- * Using individual tree and group selection cutting methods (unevenaged), harvest 101 acres of the 247 acres in stand 14, compartment 118 and stand 7, compartment 125 to improve stand structure, composition, and species diversity. The holes, or temporary openings, created by harvesting in groups would be less than one-half acre in size.
- * Using the delayed shelterwood method (evenaged), harvest 9 acres of the 145 acres in stand 7, compartment 125 to regenerate a low quality stand. This would create a new, young-aged stand in an area lacking any young age classes, and also provide wildlife habitat and species diversity. No final removal of the overstory is planned (Forest Plan Appendix A.04) thus eliminating the need to re-enter the area in six to seven years.
- * Using the last stage of the shelterwood method (evenaged), harvest the remaining overstory trees from a past shelterwood cut on 13 of the 34 acres in stand 21,

compartment 118. This harvest would encourage the growth of the understory trees by releasing them from the shade of the existing overstory.

- * Create a wildlife opening in a 5 acre portion of stand 7 in compartment 125 that was knocked down in a windstorm in 1990. This would work toward keeping a portion of the area that has very few, if any openings in the forested stands, in an open condition, and provide habitat for the many wildlife species that depend on openings. Small trees 1-8 inches in diameter would be cut. Any remaining larger trees would be dropped and left. The area would be maintained in any open condition by hand cutting and/or prescribed fire.
- * Access for tree harvest in MA 6.2A would be from Forest Road 45 (Chittenden Brook Road). No new road construction, no changes in road use, and no changes in road classification would be needed.

Relocation of the Cross Country Ski Trail

- * To continue providing an enjoyable cross country skiing experience and address safety concerns resulting from concurrent use of the road/existing ski trail by logging trucks and skiers, construct an temporary alternate trail alongside FR45 for about 0.6 of a mile. The trail would cross FR45 at two bridge locations and include two short road walks where relocation is not suitable. The trail relocation would occur within 150 feet of the road. All trail work would be done using hand tools. A few trees would be removed along with some saplings and brush to create a four to six foot wide trail. Appropriate trail signs would be used to mark the trail and logging road. These signs would be removed during the non-winter months. After the close of the timber sale, this trail would no longer be maintained.

Construction of this alternate ski trail is contingent upon implementation of the timber sale.

Stream and Fish Habitat Improvement

- * To provide fish habitat diversity and reproduction areas, improve approximately 3/4 miles of Chittenden Brook and 1/4 miles of Joe Smith Brook (about 6,000 total linear feet) by adding large woody debris (LWD) to the stream channel in a way that would mimic natural conditions. Recent stream habitat surveys indicate Chittenden and Joe Smith Brooks contain about 10 percent pool habitat, have a pool every 40 feet and one piece of LWD per 400 feet of stream. This is below the desired levels outlined in the Forest Plan (pages 4.37 to 4.37.3). Desired habitat conditions would include 30 percent pool habitat, pool frequency ratio of one per 30 feet and one piece of LWD per 100 feet of stream.

In order to work toward these desired conditions, woody debris would be appropriately placed to use the natural stream flow to create pool habitat in sections where long runs or riffles currently exist. Increasing the frequency of pools would improve channel stability, and add to the diversity of the aquatic habitat. This would

add to, or improve, spawning habitat, as well as increase cover and water depth during critical low flow and winter periods.

Placement of the LWD would be accomplished using both heavy equipment (small tracked excavator) and hand labor. The excavator would operate from the stream channel and would enter and exit the stream from designated locations to minimize impacts to riparian vegetation and the stream channel. In order to achieve the desired pool habitat described above, a minimum of about 60 to 65 trees or large tree parts would be placed in appropriate locations along approximately 6,000 linear feet of stream. Most of these trees will come from upland sources away from the stream bank and riparian areas. Generally, the entire tree is utilized and placed in or near the stream channel. Fallen trees and culls of various sizes are used whenever available near project sites (further details may be found in the Affected Environment and Environmental Effects, Fisheries section). All work, including selection of LWD trees, would conform to Forest Plan standards and guidelines.

The proposed stream improvement activities are not contingent upon implementation of the timber sale and can be implemented independently of the harvest activities.

Connected Actions

Connected actions can be thought of as secondary activities that can be directly linked to other proposed actions described above. These include:

- * In connection with the timber harvests, existing roads, skid trails, and landings would be used where possible to avoid further disturbance, provided it can be done in an environmentally sound manner. A new landing would be located along FR42 in or adjacent to stand 14 in compartment 158. The landings and skid trails would be closed to access after use. Some new skid trails may be needed to provide complete access to stands.
- * Post-harvest treatments: In order to prepare the site for natural regeneration, the shelterwood, clearcut and group selection harvests would be followed by what is referred to as site preparation. This entails the removal of selected small, damaged, or non-merchantable trees (usually 1 to 6 inches in diameter) not needed to provide shade (shelter) for the regeneration. In all harvest units, sufficient numbers of various sizes of retention trees would be left to meet Forest Plan standards and guidelines for wildlife (Forest Plan pages 4.31 to 4.33), including the new standards and guides developed recently to address concerns for Indiana bats.
- * As has been noted above, no new road construction and no changes in system road use and classification would be needed. No existing roads would be decommissioned. No adverse impacts beyond those that can be mitigated through normal road maintenance will result from the proposed activities. Therefore, a detailed forest-scale roads analysis and a project level roads analysis are not required (FSM Interim Directive No. 7710-2001-3, 12/14/2001).

**Table II-1A. Summary of the Proposed Action
Vegetation Management Activities by Management Area**

<u>Stand</u>	<u>Layout Unit</u>	<u>Stand Acres</u>	<u>Forest Type</u>	<u>Treatment Method</u>	<u>Harvest Acres *</u>
MANAGEMENT AREA 2.1A Compartment 158					
4	4	106	Hardwood	Single Tree/Group Selection	25
11	5	14	Mixedwood	Single Tree/Group Selection	16
Subtotal:		120 acres			Affected Acres: 41
MANAGEMENT AREA 4.1 Compartment 118					
11	9	11	Hardwood	Single Tree/Group Selection	11
12	9	28	Softwood	Single Tree/Group Selection	14
Compartment 125					
1	7	22	Hardwood	Thinning	19
1	7	--- **	Hardwood	Aspen Clearcut	3
9	12	43	Hardwood	Thinning	34
9	12	--- **	Hardwood	Aspen Clearcut	3
18	8	26	Hardwood	Overstory Removal	17
19	11	18	Hardwood	Overstory Removal	12
Compartment 158					
14	3	10	Hardwood	Thinning	9
15	6	29	Hardwood	Overstory Removal	14
19	2	22	Hardwood	Shelterwood	8
Subtotal:		209 Acres			Affected Acres: 144
MANAGEMENT AREA 6.2A Compartment 118					
14	10	102	Hardwood	Single Tree/Group Selection	43
14	16	--- **	Hardwood	Single Tree/Group Selection	34
Compartment 125					
7	14	145	Hardwood	Single Tree/Group Selection	24
7	-	--- **	Hardwood	Create Wildlife Opening	5
7	15	--- **	Hardwood	Delayed Shelterwood	9
21	13	34	Hardwood	Overstory Removal	13
Subtotal:		281 Acres			Affected Acres: 128

Total Acres of Stands Proposed for Harvest/Treatment: 610 Acres
 Total Acres That Will Be Affected by Harvest: 313 Acres
 Estimated volume of wood products produced: 904 MBF (0.9 MMBF rounded)

*** Harvest Acres totals are based on actual layout of the harvest unit on the ground and may differ from estimates in the original environmental assessment. This is a more accurate estimate of affected acres.**

**** Stand acres already accounted for elsewhere in this table.**

**Table II-1B. Summary of the Proposed Action
Vegetation Management Activities by Treatment Method**

<u>Compartment</u>	<u>Stand</u>	<u>Layout Unit</u>	<u>Stand Acres</u>	<u>Forest Type</u>	<u>Harvest Acres</u>
Single Tree/Group Selection Harvests					
158	4	4	106	Hardwood	25
158	11	5	14	Mixedwood	16
118	11	9	11	Hardwood	11
118	12	9	28	Softwood	14
118	14	10	102	Hardwood	43
118	14	16	---	Hardwood	34
125	7	14	145	Hardwood	24
Subtotal:			406	Affected Acres:	167
Thinning Harvests					
125	1	7	22	Hardwood	19
125	9	12	43	Hardwood	34
158	14	3	10	Hardwood	9
Subtotal:			75	Affected Acres:	62
Aspen Clearcut Harvests					
125	1	7	---	Hardwood	3
125	9	12	---	Hardwood	3
Subtotal:			---	Affected Acres:	6
Overstory Removals					
125	18	8	26	Hardwood	17
125	19	11	18	Hardwood	12
125	21	13	34	Hardwood	13
158	15	6	29	Hardwood	14
Subtotal:			107	Affected Acres:	56
Shelterwood Harvests (SW)					
158	19	2	22	Hardwood	8
125	7	15	---	Hardwood	9 (Delayed SW)
Subtotal:			22	Affected Acres:	17
Wildlife Openings					
125	7		---	Hardwood	5
Subtotal:			---	Affected Acres:	5
Total Acres of Stands Proposed for Harvest/Treatment:					610 Acres
Total Acres That Will Be Affected by Harvest:					313 Acres

* Stand acres already accounted for elsewhere in this table.

Figure II-1. Map of the Proposed Action.

ALTERNATIVE B: NO OVERSTORY REMOVALS, REDUCED MA6.2A ACTIVITIES, NO SKI TRAIL

Alternative B eliminates from consideration: (1) the last stage of the shelterwood harvests that would remove the overstory trees in stands 18 and 19 of compartment 125 and stand 15 of compartment 158 (all three in MA 4.1), and stand 21 of compartment 125 (MA 6.2A); (2) the single tree/group selection harvest and the delayed shelterwood harvest for stand 7 of compartment 125 (MA 6.2A); (3) the creation of the permanent opening in a portion of stand 7, compartment 125 (MA 6.2A); and (4) the construction/relocation of the ski trail. All other proposed actions are the same as described in Proposed Action. The connected actions for Alternative B will be similar to those described for the Proposed Action but to a lesser extent. Tables II-2A and II-2B, and figure II-2 describe the Alternative B.

In summary, Alternative B proposes seven less vegetation management actions from what is found in the Proposed Action: four less overstory removals (56 acres), one less single tree/group selection harvest (24 acres), one less delayed shelterwood harvest (9 acres), and one less non-commercial activity to create the wildlife opening (5 acres). That open area, which was partially opened as a result of a wind event, would be left in its natural state. Total acres affected would drop from 313 in the Proposed Action to 219 acres in this alternative. Also as noted, Alternative B would not relocate the ski trail.

The outcomes produced by Alternative B would be similar to, but less than, those produced by the Proposed Action. There would be less improvement of wildlife habitat and less forest stand species diversity produced due to the reduction in regeneration harvests and no wildlife opening work. Outcomes related to deer wintering habitat and fish habitat diversity would remain about the same. Outcomes related to the production of wood products for public consumption would be considerably less than those of the Proposed Action. Alternative B would move the area toward its desired future condition but at a slower pace than that of the Proposed Action.

Alternative B addresses the issue of visual quality by reducing some of the activities that could potentially contribute adverse visual impacts. It addresses concerns regarding MA 6.2A activities by proposing a reduced level of actions that could conflict with recreational opportunities, solitude, and the habitat needs and disturbance level of reclusive wildlife species. It responds to the ski trail relocation issue by not implementing the relocation, thereby relieving concerns regarding soils, wetlands, and safety.

**Table II-2A. Summary of Alternative B
Vegetation Management Activities by Management Area**

<u>Stand</u>	<u>Layout Unit</u>	<u>Stand Acres</u>	<u>Forest Type</u>	<u>Treatment Method</u>	<u>Harvest Acres *</u>
MANAGEMENT AREA 2.1A Compartment 158					
4	4	106	Hardwood	Single Tree/Group Selection	25
11	5	14	Mixedwood	Single Tree/Group Selection	16
Subtotal:		120 acres			Affected Acres: 41
MANAGEMENT AREA 4.1 Compartment 118					
11	9	11	Hardwood	Single Tree/Group Selection	11
12	9	28	Softwood	Single Tree/Group Selection	14
Compartment 125					
1	7	22	Hardwood	Thinning	19
1	7	--- **	Hardwood	Aspen Clearcut	3
9	12	43	Hardwood	Thinning	34
9	12	--- **	Hardwood	Aspen Clearcut	3
Compartment 158					
14	3	10	Hardwood	Thinning	9
19	2	22	Hardwood	Shelterwood	8
Subtotal:		136 Acres			Affected Acres: 101
MANAGEMENT AREA 6.2A Compartment 118					
14	10	102	Hardwood	Single Tree/Group Selection	43
14	16	--- **	Hardwood	Single Tree/Group Selection	34
Subtotal:		102 Acres			Affected Acres: 77

Total Acres of Stands Proposed for Harvest/Treatment: 358 Acres
 Total Acres That Will Be Affected by Harvest: 219 Acres
 Estimated volume of wood products produced: 596 MBF (0.6 MMBF rounded)

*** Harvest Acres totals are based on actual layout of the harvest unit on the ground and may differ from estimates in the original environmental assessment. This is a more accurate estimate of affected acres.**

**** Stand acres already accounted for elsewhere in this table.**

**Table II-2B. Summary of Alternative B
Vegetation Management Activities by Treatment Method**

<u>Compartment</u>	<u>Stand</u>	<u>Layout Unit</u>	<u>Stand Acres</u>	<u>Forest Type</u>	<u>Harvest Acres</u>
Single Tree/Group Selection Harvests					
158	4	4	106	Hardwood	25
158	11	5	14	Mixedwood	16
118	11	9	11	Hardwood	11
118	12	9	28	Softwood	14
118	14	10	102	Hardwood	43
118	14	16	--- *	Hardwood	34
Subtotal:			261	Affected Acres:	143
Thinning Harvests					
125	1	7	22	Hardwood	19
125	9	12	43	Hardwood	34
158	14	3	10	Hardwood	9
Subtotal:			75	Affected Acres:	62
Aspen Clearcut Harvests					
125	1	7	--- *	Hardwood	3
125	9	12	--- *	Hardwood	3
Subtotal:			---	Affected Acres:	6
Overstory Removals					
Subtotal:				Affected Acres:	0
Shelterwood Harvests (SW)					
158	19	2	22	Hardwood	8
Subtotal:			22	Affected Acres:	8
Wildlife Openings					
Subtotal:			---	Affected Acres:	0
Total Acres of Stands Proposed for Harvest/Treatment:					358 Acres
Total Acres That Will Be Affected by Harvest:					219 Acres

* Stand acres already accounted for elsewhere in this table.

Figure II-2. Map of Alternative B.

ALTERNATIVE C: INCREASED EARLY SUCCESSIONAL HABITAT

Alternative C considers all Proposed Action projects, including the overstory removals, all of the proposed MA 6.2A harvests, and the ski trail construction that were dropped from Alternative B. The difference between the Proposed Action and Alternative C is that this alternative proposes: (1) to increase the size of the groups, or holes, within the individual tree/group selection harvests in stands 4 and 11 of compartment 158 (MA 2.1A), and stand 7 in compartment 125 (MA 6.2A) from about 1/4 to 1/2 acre to about 3/4 to one acre. The size of each group will depend upon the terrain and the opportunity for regeneration that presents itself at each specific site. It is estimated that the increase in group sizes will result in about 20-25 percent additional trees cut in each of the three selection units that this is proposed to occur (this is not an increase of 20-25 percent over the entire estimated timber harvest output; just in those three units). Alternative C also proposes to: (2) increase the size of the clearcuts in stands 1 and 9 of compartment 125 (MA 4.1) from three acres each to about six acres each. The connected actions for Alternative C will be similar to those described for the Proposed Action but to a slightly greater extent. Tables II-3A and II-3B, and figure II-3 describe Alternative C.

Increasing the size of the groups cut (the holes, or temporary openings, that are made when the trees are removed) for the selection harvests and increasing the size of the clearcuts would produce more early successional habitat. The two stands in compartment 158 were selected because of their proximity to the riparian area surrounding Bingo Brook, down below these stands. Increasing the amount of temporary openings here would produce more lush forage and browse for wildlife that tend to make the most use of the nearby riparian areas.

Stand 7 of compartment 125 was selected for larger group sizes because it is a low quality stand in need of regeneration. Field surveys of this unit years ago identified this condition and prescribed large clearcuts to essentially create a new stand that could be nurtured for higher quality and improved forest health. This is a traditionally accepted silvicultural practice. However, in order to address public concerns over evenaged management, in particular, clearcutting, the prescription was modified for this analysis to treat a portion of the large stand using two harvest methods, a delayed shelterwood cut (evenaged) on 9 acres and a individual/group selection cut (unevenaged) on 24 acres. The Proposed Action has small group sizes, 1/4 to 1/2 acre. As stated above, Alternative C would increase the size of these groups to about 3/4 to 1 acre in an attempt to maximize to the extent feasible, the amount of regeneration. This, in turn, would improve upon the low quality condition in this stand more so than would the Proposed Action with its smaller group sizes, and also increase the amount of early successional habitat.

Increasing the size of the two small clearcuts would create more temporary openings and allow for more aspen regeneration than that proposed in the Proposed Action. As has been noted, aspen is an uncommon yet desirable species that is particularly important for browse in the deer wintering areas.

In summary, Alternative C proposes an increase in the vegetation management actions from what is found in the Proposed Action: increased group sizes in three of the total of seven units proposed for individual tree/group selection harvests, and increasing the amount of clearcutting from 6 acres to a total of 12 acres. Total acres affected would increase from 313 in the Proposed Action to 319 acres in this alternative. Increasing the group sizes does not increase the overall size of the stands/units being treated but does result in more trees being cut within each stand.

The outcomes produced by Alternative C would be very similar to, but slightly greater than, those produced by the Proposed Action. There would be more improvement of wildlife habitat and greater forest stand diversity, in particular, an increase in early successional habitat, due to the increase in regeneration harvests resulting from the larger group sizes and clearcut sizes. There would also be more improvements to deer wintering habitat due to an increase in early successional habitat and deer browse resulting from the larger clearcuts in MA 4.1. Outcomes related to fish habitat diversity would remain the same. Outcomes related to the production of wood products for public consumption would be higher than those of the Proposed Action. Alternative C would move the area toward its desired future condition at a slightly greater pace than that of the Proposed Action.

Alternative C addresses a concern of Forest Service managers regarding accomplishment of Forest Plan vegetation management goals, and in particular, goals related to early successional habitat. This concern has also been raised publicly in a number of different forums over the past three or four years. Directly related to this has been the inability to move project areas such as Old Joe toward their desired future condition (DFC). This situation, that of falling behind in achieving Forest Plan vegetation management goals and not moving toward the Plan's DFC, has been exacerbated by the lack of decisions that would allow timber harvests. Since 1998, all timber harvest analyses were put on hold as issues regarding threatened, endangered, and sensitive species were being addressed.

Alternative C was also developed by the project ID Team to bring forward for analysis an alternative that produces a different range of effects regarding early successional habitat that is lacking locally and regionally, and what those effects may mean to the many wildlife species that need this habitat. Included in this group is the Indiana bat, which is thought of as needing open and semi-open areas, particularly those close to riparian areas, for foraging.

**Table II-3A. Summary of Alternative C
Vegetation Management Activities by Management Area**

<u>Stand</u>	<u>Layout Unit</u>	<u>Stand Acres</u>	<u>Forest Type</u>	<u>Treatment Method</u>	<u>Harvest Acres *</u>	
MANAGEMENT AREA 2.1A Compartment 158						
4	4	106	Hardwood	Single Tree/Group Selection	25	***
11	5	14	Mixedwood	Single Tree/Group Selection	16	***
Subtotal:		120 acres			Affected Acres:	41
MANAGEMENT AREA 4.1 Compartment 118						
11	9	11	Hardwood	Single Tree/Group Selection	11	
12	9	28	Softwood	Single Tree/Group Selection	14	
Compartment 125						
1	7	22	Hardwood	Thinning	19	
1	7	--- **	Hardwood	Aspen Clearcut	6	
9	12	43	Hardwood	Thinning	34	
9	12	--- **	Hardwood	Aspen Clearcut	6	
18	8	26	Hardwood	Overstory Removal	17	
19	11	18	Hardwood	Overstory Removal	12	
Compartment 158						
14	3	10	Hardwood	Thinning	9	
15	6	29	Hardwood	Overstory Removal	14	
19	2	22	Hardwood	Shelterwood	8	
Subtotal:		209 Acres			Affected Acres:	150
MANAGEMENT AREA 6.2A Compartment 118						
14	10	102	Hardwood	Single Tree/Group Selection	43	
14	16	--- **	Hardwood	Single Tree/Group Selection	34	
Compartment 125						
7	14	145	Hardwood	Single Tree/Group Selection	24	***
7	-	--- **	Hardwood	Create Wildlife Opening	5	
7	15	--- **	Hardwood	Delayed Shelterwood	9	
21	13	34	Hardwood	Overstory Removal	13	
Subtotal:		281 Acres			Affected Acres:	128

Total Acres of Stands Proposed for Harvest/Treatment: 610 Acres
 Total Acres That Will Be Affected by Harvest: 319 Acres
 Estimated volume of wood products produced: 989 MBF (1.0 MMBF rounded)

*** Harvest Acres totals are based on actual layout of the harvest unit on the ground and may differ from estimates in the original environmental assessment. This is a more accurate estimate of affected acres.**

**** Stand acres already accounted for elsewhere in this table.**

***** Group (hole) sizes increased from Proposed Action to about 3/4 to 1 acre in size.**

**Table II-3B. Summary of the Alternative C
Vegetation Management Activities by Treatment Method**

<u>Compartment</u>	<u>Stand</u>	<u>Layout Unit</u>	<u>Stand Acres</u>	<u>Forest Type</u>	<u>Harvest Acres</u>	
Single Tree/Group Selection Harvests						
158	4	4	106	Hardwood	25	**
158	11	5	14	Mixedwood	16	**
118	11	9	11	Hardwood	11	
118	12	9	28	Softwood	14	
118	14	10	102	Hardwood	43	
118	14	16	---	Hardwood	34	*
125	7	14	145	Hardwood	24	**
Subtotal:			406	Affected Acres:		167
Thinning Harvests						
125	1	7	22	Hardwood	19	
125	9	12	43	Hardwood	34	
158	14	3	10	Hardwood	9	
Subtotal:			75	Affected Acres:		62
Aspen Clearcut Harvests						
125	1	7	---	Hardwood	6	*
125	9	12	---	Hardwood	6	*
Subtotal:			---	Affected Acres:		12
Overstory Removals						
125	18	8	26	Hardwood	17	
125	19	11	18	Hardwood	12	
125	21	13	34	Hardwood	13	
158	15	6	29	Hardwood	14	
Subtotal:			107	Affected Acres:		56
Shelterwood Harvests (SW)						
158	19	2	22	Hardwood	8	
125	7	15	---	Hardwood	9	(Delayed SW)
Subtotal:			22	Affected Acres:		17
Wildlife Openings						
125	7		---	Hardwood	5	*
Subtotal:			---	Affected Acres:		5

Total Acres of Stands Proposed for Harvest/Treatment: 610 Acres

Total Acres That Will Be Affected by Harvest: 319 Acres

* Stand acres already accounted for elsewhere in this table.

** Group (hole) sizes increased from Proposed Action to about 3/4 to 1 acre in size.

Figure II-3. Map of Alternative C.

D. USE OF MITIGATION MEASURES

NEPA and the Council on Environmental Quality (CEQ) regulations require identification of all relevant and reasonable mitigation measures that could reduce the impacts of the projects, even if those measures are outside the jurisdiction of the Forest Service. All ground disturbing activities would be required to comply with Forest Service standards and guidelines. Although the proposed actions are designed to avoid, minimize, and reduce or eliminate potential negative impacts associated with the project, additional mitigation measures are necessary to ensure that environmental impacts are within acceptable levels. Appendix C displays a complete list of the mitigation measures applicable to this project.

E. MONITORING PLAN

The Old Joe analysis has defined a monitoring plan for following up on the implementation of project activities. The plan has been developed by the resource specialists and is intended to focus primarily on those activities that cause the most concern. It also will contribute to the overall Forest-wide monitoring efforts. In this regard, the plan has been designed to look at key standards and guidelines, monitor the results of certain activities to see if the objectives were met, and look at the overall effectiveness of the critical mitigation measures. The monitoring plan may be found in Appendix D.

III. THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

A. INTRODUCTION

This chapter describes, for each resource area, the existing conditions, or affected environment, and then discloses the environmental consequences of implementing the Proposed Action and the alternatives to it as described in Chapter II. Resources that may be affected include recreation; visual quality; wildlife and vegetation; threatened, endangered and sensitive species; soil, water, and wetlands; fisheries; and heritage resources. Some resources (such as air quality, and noise, with respect to the human environment) are either not affected at all or those effects are so minor or unlikely that they are not discussed below.

This chapter compares the impacts of the action alternatives to those that would result from implementation of the No Action Alternative. An impact is described as any change in physical, biological, social or economic factors which results from direct or indirect effects of an action. In addition, cumulative effects are also discussed. Cumulative effects are aggregates of many direct and indirect effects and include actions that: have occurred in the relatively recent past; are anticipated to occur as a result of this project; and can reasonably be expected to occur in the future. These effects may be generated by actions originating from both within and outside of the project areas that would be potentially directly impacted by this project.

NEPA and NFMA encourage disclosure of site-specific effects, or in other words, disclosure of the impacts of the proposed activities on the ground at the specific project site. Programmatic direction provides the overall guidance for implementing the concepts and attributes of any particular program, and is much more generalized in scope. The Old Joe project, as evidenced by this document and the project file, primarily focuses on site-specific analysis and assuring that specific on-site concerns and impacts are appropriately addressed and disclosed in order to provide the Deciding Official with the most pertinent information to make a decision.

B. ENVIRONMENTAL EFFECTS BY RESOURCE AREA

RECREATION

Affected Environment

The primary recreation activities occurring in the project area are cross-country skiing, hiking, hunting, fishing, camping, and driving for pleasure. Forest Road 42 (FR42, the Bingo Road), and FR45 (Chittenden Brook Road), are important recreational travelways, providing access in the non-winter months for many recreational pursuits along Bingo and Chittenden Brooks, including Chittenden Brook Campground, located to the south of the project area. The only other developed recreation sites in the immediate project

area are the two Chittenden Brook trailhead parking areas: the winter parking lot located at the intersection of FR45 and Vermont Route 73, and the summer trailhead parking area located on FR45, 0.6 mile from Route 73. There are several improved and unimproved parking spots along FR42 providing access to Bingo Brook. In winter months, FR45 becomes part of the Chittenden Brook Cross-Country Ski Trail, and provides access to the rest of the cross-country trail system located just outside of the immediate project area. The Chittenden Brook Cross-Country Ski Trail is presently the only ski trail system that provides several loop opportunities on the Rochester Ranger District, and gets a moderate amount of use, mainly from local residents. FR42 is also used in the winter as a part of the Pine Brook Cross-Country Trail loop that gets low use.

The project area falls primarily within three management areas, MA 2.1A, MA 4.1, and MA 6.2A. MAs 2.1A and 4.1 are managed for roaded natural recreation opportunities. MA 6.2A is managed for semi-primitive recreation opportunities. Roded natural experiences occur in a setting that offers high levels of interaction with the natural environment, and an equal probability of seeing other people and for isolation from the sights and sounds of people. Within roaded natural areas, resource modification and utilization is evident but is harmonized with the natural appearing environment (ROS Users Guide). Semi-primitive recreation experiences occur in a setting that offers high levels of interaction with the natural environment, and a moderate to high probability of experiencing isolation from the sights and sounds of humans and human activities within a predominately natural appearing setting.

Besides the forest roads noted above (FR42 and FR45), the project area includes several other relatively low use forest roads, including FR62, FR142, and FR220. There are no roadless areas located in the project area.

Bingo Brook and Chittenden Brook are currently listed in the Forest Plan as Significant Streams. Significant streams have the ability to provide outstanding recreational values and characteristics. These streams are managed in accordance to the MA 9.4 Standards and Guidelines for potential Recreational Rivers. Management prescription MA 9.4 (Forest Plan pgs 4.180-1 thru 4.180-20) is applied to stream corridors that overlay and run through a variety of lands with other management prescriptions. In other words, MA 9.4 overlays small portions of the other MAs in the Old Joe project area. Any proposed activities within these stream corridors would need to be consistent with the standards and guidelines outlined for their protection, so as not to harm their eligibility for inclusion into the National River System. The width of this corridor will vary as necessary to meet visual quality objectives (Forest Plan 4.180-2). A wide range of silvicultural practices can occur provided water quality and visual quality are maintained (Forest Plan 4.180-16).

Environmental Effects

Relationship to Issues

Two of the issues that help drive the analysis are directly related to the recreation resource, and therefore, will be used to focus the discussion below. Those two issues are Issue 2, MA 6.2A Management Concerns, and Issue 3, Ski Trail Relocation.

Proposed Action

Issue 2: Some people are concerned that the timber harvests would negatively impact some of the recreational opportunities that are to be provided by MA 6.2A. The opportunity for solitude, as represented by the presence or absence of sights and sounds of timber harvesting activities, will be used to disclose effects.

The sights and sounds of timber harvesting would have a negative impact on some recreationists in the project area. However, these sights and sounds are consistent with, and should be expected in, the roaded natural areas portion of the project area in MAs 2.1A and 4.1, which makes up approximately 53 percent of the overall project area. Of the 313 acres impacted in total by the harvest activities in the Proposed Action, 185 acres is in MAs 2.1A and 4.1. This represents 59 percent of the total acres impacted. Most of the adverse impacts produced by the sights and sounds of timber harvesting would be experienced by recreationists using MA 2.1A and 4.1 lands, and these would be minor since harvesting would be occurring only in the winter months when use is low to moderate. Users of the cross-country ski trails, in particular the Chittenden Brook Trail, that lie within these MA lands would experience the most impact.

These impacts are less compatible with the semi-primitive setting (Issue 2) that is emphasized in MA 6.2A (1/2 mile east of FR45, 1/4 mile south of Route 73), which makes up about 44 percent of the overall project area. About 128 acres (41 percent of the total 313 acres) of MA 6.2A land would be directly impacted by harvest activities. Even though the Forest Plan emphasizes opportunities for solitude in a remote natural appearing setting, timber management can occur when not in conflict with recreation activities.

Recreation use in the portion of the project area made up of MA 6.2A lands is low. The Proposed Action would have only winter harvesting, when recreation use is even lower. As noted above, the impacts would be most noticeable to the cross-country skiers that use the trails, and most of the trails lie on other than MA 6.2A lands. Practically all MA 6.2A lands are well away from any of the forest roads that could provide easy vehicular access in any season. The only trail into the area is the discontinued portion of Forest Road 142, which is used mainly by hunters in the autumn. FR142 is currently maintained as a road for the first 0.15 mile. Beyond that, the road is not currently usable by motorized vehicles due to several earthen piles on the roadbed and a large stream crossing, where a culvert has been removed. It will not be used to access the project area for timber removal, and therefore, will not be improved. The winter only harvesting would produce no adverse impact (no sights or sounds from timber harvesting) on autumn hunters and other autumn and summer recreationists such as hikers and berry

pickers. Since the proposed harvesting is relatively short-term and the character of the MA 62.A lands would not permanently be changed by this proposal, it would have no permanent impact on the area's remoteness, measured as the distance from roads and trails with motorized use, and no permanent impact on the opportunity for solitude as measured by the amount of interaction with other recreationists. In summary, with winter only harvesting and low to moderate wintertime use, the sights and sounds of harvesting would actually affect few people, and therefore this negative effect is considered minimal.

Issue 3: Some people are concerned with the proposal to create a 0.6 of a mile cross-country ski trail bypass adjacent to FR45 to be used when the road is plowed for logging operations. They are concerned the construction would cause negative impacts to soil, water, and the small wetland. They don't believe the proposal would eliminate the safety problem of skiers using the road along with log trucks or be an improvement to the existing situation, given that skiers would have to cross the road three times before reaching the trail head.

The new cross-country ski trail construction, needed to relocate the trail off the road, would bypass 0.6 mile of FR45, which would be plowed to access the timber stands to be harvested in compartments 118 and 125. Snowplowing of FR45 would be an inconvenience to recreationists who would have to walk 0.6 mile along FR45, or ski on poor snow conditions on the plowed road for that distance to where the trail leaves the road. The Proposed Action would get skiers off the road for approximately 70 percent of the trail distance minimizing possible encounters with log trucks. The alternative trail would be a narrow path through the woods adjacent to Chittenden Brook. No mechanical earth disturbance is necessary to construct this trail. No disturbance is needed in the vicinity of the small wetland. Only trees less than 4 inches in diameter would need to be cut. Any stumps would be cut flush with the ground. Some rocks and woody debris may be moved with hand tools. Some brush and low limbs would be cut to create the trail opening. It would provide a variety of more desirable scenery, and have better snow conditions for skiing, which should enhance the recreation experience. The new trail would have to cross FR45 three times due to terrain limitations. Crossing over the snowplow berms and over the plowed road would be an inconvenience, but it would reduce the safety concern and would offset the inconvenience of walking the 0.6 mile, or skiing on poor snow conditions on the plowed road.

To further reduce safety concerns of skiers encountering log trucks, warning signs would be posted for the duration of the timber sale, at the parking area at the beginning of FR45, and along the trail just before it enters back onto the plowed road. Additional signs stating "Hauling Operations Under Way," would be posted each day operators are present, and then removed as the loggers leave for the day. To further reduce the potential for accidents, log trucks would be prohibited from operating on FR45 during weekends, holidays and after 5:00 pm. These are periods of highest recreation use. Weekend and night restrictions, speed limits, and warning signs have been successfully used as mitigation measures for other GMNF timber sales. There have been no reported accidents involving a skier and a logging truck.

No Action Alternative

There would be no impacts to recreation as a result of the No Action Alternative. There would be no harvesting and therefore, no impacts associated with the sights and sounds of harvesting activity. There would be no temporary change in the remoteness of the area for the three winters that the proposed harvesting would take place. The loss of wildlife habitat diversity by not harvesting the overstory removals and the clearcuts that would produce early successional habitat would have slight adverse impact on the quality of hunting opportunities in the area.

The No Action Alternative would improve the recreational experience for cross-country skiers compared to what has existed over the past several years. A previous timber sale located on FR45 kept Chittenden Brook Road plowed for four to five winters during the mid-1990's. That timber sale is finished and will not affect FR45 or the ski trail. Under this alternative, there would be no harvesting and the road would not be plowed. There would be no safety hazard due to encounters with log trucks, and the snow conditions on the road would be undisturbed from snowplowing.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail

Issue 2: This alternative was developed, in part, to address issue 2, that timber harvests would negatively impact some of the recreational opportunities that are to be provided by MA 6.2A. Alternative B drops a number of proposed harvesting activities in MA 6.2A, reducing the number of acres affected from 128 in the Proposed Action to 77. These 77 acres lie in some of the more remote sections of the project area. The sights and sounds of harvesting would affect even fewer people than would be affected by the Proposed Action. The adverse effects produced by Alternative B would be very minimal.

Issue 3: In this alternative, the cross-country ski trail would not be relocated. Like the Proposed Action, harvesting timber would still take place in Compartments 118 and 125 but at lower level (six less areas would be harvested, all in the general vicinity of the proposed trail relocation). Snowplowing of FR45 would occur. The snowplowing would have a negative effect on winter sports activities that use FR45, mainly cross-country skiing and snowshoeing. Skiers and log trucks would share the same travelway and pose a safety concern. The amount of logging resulting from Alternative B would be less than the Proposed Action, and therefore, less logging traffic would be expected. However, it would still take three to four winters to harvest this portion of the sale. Between two and eight trips could potentially be made by the sale operators each day depending on the amount of harvesting accomplished, with snowplow trucks following each snowstorm. Another two to three trips each week by the log trucks can be expected throughout the operating period of December 15 to March 15. Without relocating the trail, the possibility of encountering a log truck while skiing on the road would be greatly increased, therefore presenting a higher safety risk.

To reduce the possibility of an accident, the same mitigation measures noted in the Proposed Action for signing would be included in this alternative, including the prohibitions on use.

Alternative C: Increased Early Successional Habitat

Issue 2: This alternative would increase the acres affected by timber harvest from 313 in the Proposed Action to 319 acres. The increased harvesting would produce a slightly greater adverse effect in terms of sights and sounds of harvesting than would be produced by the Proposed Action. However, given the winter only harvest and the low to moderate use (primarily cross-country skiers) at that time of the year, this effect would remain minimal.

Issue 3: This alternative would include relocation of the ski trail. The effects would be similar to or the same as those disclosed in the Proposed Action. There would be slightly more harvesting done in this alternative but would make a negligible difference in the amount of logging traffic.

To reduce the possibility of an accident, the same mitigation measures noted in the Proposed Action for signing would be included in this alternative, including the prohibitions on use.

Cumulative Effects

The affected environment for assessing the cumulative effects of sights and sounds of timber harvesting on dispersed recreation is the project area. Past timber harvesting in the affected environment has produced the same short duration sights and sounds impacts on dispersed recreation as the Proposed Action. Recreational users are no longer impacted by these previous activities since the harvesting has been completed.

Beyond the Proposed Action, there are only two instances where future timber harvest activities could affect the project area. The first is the North Half Overstory Removal (N1/2 OSR) Sale. This project is currently undergoing NEPA analysis. One harvest activity from this project would be near the Old Joe Project area, that being an 18-acre harvest to remove the overstory trees for stand 11 in Compartment 98. This stand is about 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit. The second is a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158, which would impact only about 8 acres. These activities would produce only the same short duration, isolated impacts. There are no industrial private lands in the project area. Any impacts produced by actions on the small, private non-industrial lands would produce little, if any, adverse impact to the experience of recreationists in the project area. Therefore, the Proposed Action would have no overall significant cumulative impact on dispersed recreation in the project area, except to introduce another period of minor intermittent, short term (estimated at four to five years, winter only) sights and sounds impacts to dispersed recreationists, skiers, hunters and hikers.

The affected environment for assessing the cumulative effects of this project on cross-country skiing is all lands within the Rochester Ranger District. Because cross-country ski trails in many cases share the same roads used for timber access and because most logging is now restricted to winter months to protect resources and other recreation opportunities, harvesting operations have had an adverse cumulative effect on the quality of recreation experiences available to cross-country skiers. Future sales on the Rochester District would probably continue to require plowing on main sections of forest roads that are also used as cross-country ski trails.

Construction of the alternative trail in the Proposed Action and Alternative C would mitigate most of the negative effects of plowing the road for this sale by allowing skiers the opportunity to ski off the plowed road. The mitigations of signing and restricting hours of operation would also mitigate safety concerns. Alternative B (no ski trail relocation) would continue the trend of ski trails sharing timber access roads, and even with mitigation to reduce safety concerns, would further cumulatively reduce the quality of the cross-country skiing experience on the District.

In summary, with regards to issues related to the recreation experience, the Proposed Action and Alternative C would only add a minor amount of adverse impact when also considering past and reasonably foreseeable future actions, while Alternative B would add a greater incremental amount of impact. In neither case would this result in a significant overall cumulative impact to the recreation experience.

VISUAL QUALITY

Affected Environment

The Forest Plan establishes visual quality goals for the management prescriptions within the Old Joe project area. These goals are based on criteria defined in the National Forest Visual Management System Handbook (U.S.D.A. Forest Service 1974). The goals vary depending on whether activities can be seen from certain areas, viewer sensitivity, and the recreation opportunity spectrum (ROS).

The affected environment includes views seen from the Long Trail, Route 73, Mt. Horrid, and FR42, 45, 220 and from homes on FR115. From Route 73, offsite views (greater than 1/2 mile) can be seen in the portion of the project area located south of Route 73. While on Route 73, there are no offsite views into the portion of the project area north of Route 73. There are also no offsite views from Mt Horrid into any of the project area. From offsite views, the Retention visual quality objective (VQO) is the goal on the upper part of the more noticeable peaks and ridges in the semi primitive 6.2 M.A. In the Retention VQO, alterations made by people are not to be visually evident. On the lower slopes in MA 6.2A, a VQO of Partial Retention is the goal. Here, alterations made by people must appear subordinate with the surrounding natural appearing landscape. From offsite views, the Modification VQO is the goal on the lower slopes in the roaded natural MA 4.1 areas. Here, alterations may dominate the original surrounding landscape.

Recent ice storm damage along the Long Trail corridor, south of Route 73, has created a vista that looks east toward the Old Joe project area (compartment 118 and 125). From this vista (three miles from the project area), evidence of past clearcut harvest from the Joe Smith sale is apparent on the upper ridge. According to computer terrain model analysis, lands down slope from here, including portions of compartment 125, stands 18, and 19, and portions of compartment 118, stand 14, can also be viewed. From homes along FR115 the past clearcut harvest can also be seen. Portions of the compartment 118 stands as well as portions of compartment 125, stands 1, 9, 18, and 19 can also be seen. Due to terrain, offsite views from Route 73 into compartments 118 and 125 are limited to the west of the project area. Views into the area begin less than one mile from the Chittenden Brook Campground Access Road. Mature trees on the south side of Route 73 block views to past timber harvests of the shelterwood unit in Compartment 125, stand 18. Offsite views from the east on Route 73 do not look into areas of any recent timber harvest.

From onsite views (less than 1/2 mile), as seen from Route 73, FR45, and FR42, the roadside zones have high visual sensitivity and should meet the Retention VQO. Here, alterations made by people are not to be visually evident. Over three miles from the project area, the recent ice storm has created a zone of broken trees adjacent to Route 73, near the top of Brandon Gap. Brandon Brook parallels the highway, weaving back and forth across Route 73. Closer to the sale area is the Brandon Brook timber sale. Here, group selection units are located near the road on the far side of Brandon Brook.

Private home sites are interspersed among the otherwise forested landscape. FR42 (Bingo Road) has a forested canopy along most of the roadside. Bingo Brook parallels the road with the sites and sounds of the brook being a dominant part of the landscape. FR42 has had past timber harvest along the roadside as evidenced by numerous landings used as dispersed recreation sites. Also visible are some dense stands of young saplings. To the general forest visitor, the roadside zone in the project area appears natural and past timber harvest is not readily apparent. FR45 (Chittenden Brook Campground access road) has a forested canopy. There is some evidence of tree stumps from past timber harvest and fallen trees. Over one mile from the project area, a recent harvest unit (a thinning) from the Campground Sale is located along the roadside. Because the harvest was adjacent to the road, there is some evidence of harvest due to treetops lopped and scattered close to the road.

Onsite views from FR220 have a low visual sensitivity level and should meet the Modification VQO. Here, alterations may dominate the original surrounding landscape. The road has a low visual sensitivity level because the road was developed as a timber haul road, is not a designated trail, and does not lead to a recreation site.

Environmental Effects

Relationship to Issues

One of the issues that helps drive the analysis is directly related to the visual quality resource, and therefore, will be used to focus the discussion below. That is Issue 1, the effects of timber harvesting on visual quality.

Proposed Action

Issue 1: Some people are concerned that timber harvests are visually unattractive and “damaging”. Specifically, there are concerns about adverse visual quality from critical viewing points along such places as the Long Trail; Route 73; Mt. Horrid; Forest Roads (FR) 42, 45, and 220, and from homes located on FR115.

All proposed vegetative treatments have been reviewed by the Landscape Architect through field visits, consultation with Recreation Technicians, computer terrain model analysis, and/or map review.

Offsite views (greater than 1/2 mile) were analyzed from viewpoints surrounding the project area as discussed in the Affected Environment section of this document. Views from the Long Trail would be changed with the overstory removals of compartment 125, stands 18, and 19. According to computer terrain models, it appears that less than two acres of stand 18, and six acres of stand 19 would be visible from the Long Trail vista. However, because these stands are located down slope from the ridge, the seen area and location of the harvest units would meet the Modification VQO. However, to best blend the harvest treatments to the landscape, the following mitigation measure should be used (Forest Plan p. 4.51):

- Feather upper slope edges (seen area) of compartment 125, stands 18 and 19. This is accomplished by providing a gradual reduction in the amount of trees between the edges of the harvested and uncut stands. These specific locations are shown on the computer model titled oldjoe - oldview2 in the project file.

Although a portion of stand 14 in compartment 118 would be visible from the Long Trail, the single tree and group selection treatments proposed for the stand would not be evident. This is due to the three mile distance from the Long Trail, season of trail use, the small size of the groups (less than one acre), and the screening effect of surrounding vegetation.

There will be little change to offsite views from Route 73. Computer models and field visits showed that portions of compartment 118, stands 12 and 14 are visible from Route 73. However, as stated above, the small size of the group selection units will be screened by the surrounding vegetation and will make the harvest units go unnoticed in summer (leaf on) months. During winter (leaf off) months, a textural change may be visible as the snow on the ground would be more visible in the area of the harvest. However, this view along Route 73 would be of a short duration, primarily from vehicles traveling Route 73.

There will be little change to offsite views from homes at the end of FR115. Computer models and field visits showed that compartment 118, stand 14 is visible from this viewpoint. All other stands are screened by topography or hidden by foreground vegetation. The small size of the group selection units will be screened by the surrounding vegetation and will make the harvest units go unnoticed in summer (leaf on). During winter (leaf off), a textural change may be visible as the snow on the ground will be more visible in the area of harvest. During winter, with snow on the ground, it may also be possible to see pieces of the newly created skid trails crossing the slopes.

Onsite views (less than 1/2 mile) as discussed in the Affected Environment section of this document were analyzed. There will be no evidence of timber harvest from portions of Route 73 within 1/2 mile of the proposed actions. Views from FR45 will also remain unchanged, as dense evergreen and deciduous vegetation growing along the Chittenden Brook stream banks will screen any possible visual effects of the clearcut in compartment 125, stand 1. Views from FR220 may show evidence of timber harvest from the thinning treatment selected for compartment 125, stand 9. Tree tops and stumps may be apparent while walking along the road. However, as described in the Affected Environment section of this document, this stand has a low visual sensitivity and it is therefore appropriate to see some residues of timber harvest. In the short term, FR42 may have some visual effects from the landings created adjacent to compartment 158, stand 14 and the re-opening of the landing north of compartment 158, stand 4. The goal of the landing locations along FR42 is to allow for efficient logging operations and minimize soil disturbance. The closing and revegetation of the landing areas will be done to help meet these goals, and also the recreation management goals of preventing unauthorized vehicular use of the landing and skid trails. To assure the most visually pleasing closure of these landing areas, the following mitigation would be implemented:

- These closings would be designed to blend with the natural surroundings. The Forest Landscape Architect should be consulted to aid in that design.

To further minimize evidence of timber harvest on FR42, the following mitigation would be implemented:

- Include a no cut zone of at least 50 feet from the road along FR42 and require branches to be lopped and scattered in any roadside stands. Also, branches and tree tops would be lopped and scattered in compartment 158, stand 14 to lie within three feet of the ground for the next 150 feet, where visible from the road.
- Do not locate a group cut (as part of the individual tree/group selection unit) on the north end of Compartment 158, stand 4 where the landing and associated skid trail appear to run into the unit when viewed from FR42. The existing evergreen (conifer) stand, and the landing and skid trail to the north of stand 4, visually creates a dramatic cathedral effect. Placing a group cut in the center of this would focus attention on this cut area. Avoiding this area of the unit would provide a more natural appearing setting.

The above mitigation measures would allow all visual quality objectives to be met for the activities of the Proposed Action. Any adverse visual quality effects would be minor and within acceptable limits.

No Action Alternative

Under this alternative, without vegetative treatments, there would be no changes to the current visual condition, as described in the Affected Environment, Visual Quality section above. All VQOs would be met with this alternative, and no adverse effects would result.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail

With reduced timber harvest, this alternative differs from the Proposed Action in that the offsite view from the Long Trail would remain unchanged from its current condition. The view would appear as it would under the No Action Alternative.

Onsite, while walking through the “woods” off trail, there would be less evidence of timber harvest as the stumps and tree tops left after harvest would be less than in the Proposed Action since there would be 94 less acres treated. Overall, there would be less potential adverse visual quality effects than would be found in the Proposed Action and Alternative C.

Following the mitigation measures described in the Proposed Action for the stands in compartment 158 would assure that all VQOs would be met with this alternative, and therefore, any adverse effect would be within acceptable limits.

Alternative C: Increased Early Successional Habitat

The visual effects of this alternative would be similar to the Proposed Action. However, evidence of timber harvest would be greater onsite, while walking through the “woods” off trail, because of the increased harvest size of some group selection units and the aspen clearcut units (six additional acres of clearcutting).

Offsite views are not expected to change from the Proposed Action since the only stand prescribed for group selection treatment most visible from offsite views (compartment 118, stand 14) will not have the larger group (hole) sizes cut during harvest.

All the mitigation measures described for the Proposed Action would be applicable to Alternative C. Following these measures would allow all visual quality objectives to be met, and therefore, any adverse visual quality effects would be minor and within acceptable limits.

Cumulative Effects

Visual evidence from past harvests includes timber harvest areas from the Campground and Joe Smith Brook Sales. These sales used FR45, the Chittenden Brook Campground Road, for access. On-site views still show some minor evidence such as the location of the log landing and skid trails into some of the units. Group selection harvest units from

the Campground Sale are located along east side of FR45, south of FR142, but are set back at least 50 feet or more. Units from the Joe Smith Brook Sale are not visible from FR45. With the passage of time and revegetation, these features currently produce little or no adverse visual effects. All Forest Service timber sales met VQOs. Overall, the immediate project sites and surrounding areas are heavily forested.

As stated for this proposal, all harvest activities proposed in the Old Joe project would meet Forest Plan VQOs and result in minimal adverse effects within acceptable limits. This will add very little to the overall cumulative impact.

To date, there is one other Forest Service timber sale planned for the immediate future in the vicinity of the Old Joe project area. It is the North Half Overstory Removal (N1/2 OSR) Sale. This project is currently undergoing NEPA analysis. One harvest activity from this project would be near the Old Joe Project area, that being an 18-acre harvest to remove the overstory trees for stand 11 in Compartment 98. This stand would be at least 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit and because of the screening effect that the south ridge of Philadelphia Peak provides, stand 11 would not be within the same view shed as the Old Joe units. Therefore, this would not add to the cumulative effect of the Old Joe project. The harvest of stand 11 would meet Forest Plan VQOs.

Other than the N1/2 OSR Sale, the only other foreseeable future project would be a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158. This would imply an impact to only about eight acres, and would be designed to meet VQOs. The design and location of any other future projects will be consistent with Forest Plan direction and meet visual quality objectives. These future possible actions would add very little to the overall cumulative effects for the visuals resource.

We can also expect some small scale future harvesting to occur on private lands. Only a small amount of private land lies within or close to the Old Joe project area, and most of these holdings are homes and small woodlots. There is no large industrial private timber lands in the project area. A small thinning was done on a private parcel some years ago, and little or no visual evidence remains. We would expect that any private land harvest activities would be of a similar nature and add very little to the overall cumulative effect on visual quality.

Therefore, based on the projected minor amount of impact from past, present (including this proposal), and reasonably foreseeable future actions on these lands, public or private, there would be no significant overall cumulative visual quality impacts resulting from implementation of either the Proposed Action, the No Action Alternative, Alternative B, or Alternative C.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

A Biological Evaluation (BE) was prepared for Threatened, Endangered, and Sensitive (TES) Species for the Old Joe Project. This document can be found in Appendix E. The BE involved a pre-field analysis of available information, followed by field review of all stands proposed for any kind of activities, including timber harvest, stream habitat restoration and the relocation of a cross-country ski trail. The BE is the document wherein the likelihood of occurrence, habitat needs, disclosure of effects for all alternatives, and determination of findings regarding TES species is displayed. A summarization of this information is presented below.

Plants

No Threatened or Endangered plants are listed for the GMNF. All plants evaluated are on the list of Regional Forester's Sensitive Species (RFSS). The analysis and field surveys found that no plants on the RFSS list are known to have documented occurrences within the project area, either currently or historically. Thus, there are no direct effects on TES plants, and also, none of the proposed actions would likely contribute to a trend towards Federal listing or to a loss of population viability to any Sensitive plant species or population.

It has been determined that at least some marginally good potential habitat exists for eleven Sensitive plant species. Thus, there would be potential indirect effects to these species due to impacts to this marginal habitat. It has been concluded that any impacts to this habitat, if they were to occur, would be minimal since the habitat is only marginally suitable, and since the type of harvest proposed in all but 11 of the 313 acres proposed for treatment would either impact only very small patches or would have only a short-term, temporary effect. Treatments for these 11 acres - clearcutting two three-acre units and creating a five-acre wildlife opening - would tend to produce a longer term effect since these areas would essentially be converted to a different species composition (aspen in the clearcuts and a shrubby, brushy composition in the permanent opening). As such, they would no longer offer potential habitat for the eleven Sensitive species associated with rich hardwoods, since they would be converted to early successional habitat. However, the VNNHP botanist described the stands in this compartment as basic northern hardwoods, with moderate enrichment only in small, occasional seeps, and not considered to offer very good potential habitat for rare plants. Thus, indirect effects would be considered minimal.

See the Biological Evaluation (Appendix E) for details.

Animals

None of the TES species tracked for the GMNF are known to have documented occurrences within the project area, either currently or historically.

One federally listed species (Indiana bat) and one Regionally Sensitive species (Eastern small-footed bat) have been identified as having potential or suitable habitat in the project area. As stated in the Biological Evaluation (Appendix E), it has been determined that both these species are "unlikely to occur" in the project area, and that for the Regionally Sensitive species, implementation of the Proposed Action or any of the

alternatives will not likely contribute to a trend towards federal listing or a loss of viability to the population or species. However, analysis of effects for these two species was carried forward in order to comply with the U.S. Fish and Wildlife Service recommendations for mitigation. A detailed effects analysis, including the recommended mitigation, for these species may be found in the BE.

WILDLIFE

Affected Environment

The affected environment will be described in the context of the needs of a number of species to be used to address the major issues, and other concerns. In general, the project area is heavily forested, primarily in hardwoods with pockets of softwoods. Most of the forest consists of mature or nearly mature species with little young-aged, early successional habitat or open or semi-open, brushy areas. There are few homes, no large-scale development, and no large industrial timberlands in the immediate project area. Further detailed discussion on the habitat characteristics of the area may be found in Chapter I under the description of each of the management areas.

Environmental Effects

Relationship to Issues

One of the issues that help drive the analysis is directly related to the wildlife resource, and therefore, will be used to focus the discussion below. That is Issue 2, the effects of timber harvesting on reclusive wildlife species.

Proposed Action

Issue 2: Some people are concerned that the timber harvests would negatively impact some of the recreational opportunities that are to be provided by MA 6.2A, especially those of providing feelings of solitude. Also, some people believe that timber harvests adversely impact the habitat needs of, and create an unacceptable level of disturbance for wildlife species intolerant of humans (reclusive species), particularly black bear, marten, fisher, lynx, goshawk and some neotropical migratory birds. The disclosure of effects will focus on these species and the effects of the harvesting activities, beginning first with a brief description of the species.

Black Bear. The black bear in Vermont is a species sensitive to human disturbance and prefers remote habitats (D. Blodgett, personal communication). It is an omnivorous feeder relying heavily on soft mast such as fruits and berries; hard mast such as beechnuts and acorns; herbaceous matter such as grasses and sedges; and lesser amounts of meat from carrion, rodents, and insects.

Due to its varied feeding habits, the black bear is adapted to numerous types of habitats such as woodlands, wetlands, fields, and shrubby openings. However, the shyness of the Vermont black bear limits the availability of suitable habitat. A high degree of human presence such as that found around residential developments and high use roads (greater than 1,000 vehicles per day) can prevent bears from using or accessing high quality

habitat. Field surveys have shown the project area to be important to bear due to the low level of human intrusion.

Bears utilize several habitat components found in the project area, including wetlands, non-forested openings and beech stands. One limiting factor is the lack of early successional habitat. Early successional habitat is an excellent source of shrubs, soft mast, and grasses. Logging slash, produced by evenage regeneration cuts such as clearcuts and shelterwoods used in the creation of early successional habitats, provide a proliferation of den sites that are preferred sites in extensive managed forests (R. DeGraaf, personal communications). Because beechnuts are an important autumn food source, retention and accessibility (for bears) of mature beech trees is essential for continued bear use during the late summer and autumn.

Fisher. The fisher is the largest member of the weasel family known to exist in Vermont. It prefers mature coniferous and mixed hardwood-softwood forests. Fisher also inhabit cut over forested areas and old burns. The fisher's diet consists mainly of small mammals, birds, frogs, fish, carrion, and occasionally fruit and nuts. It is the primary predator of porcupines and one of the few predators capable of killing porcupines while escaping damage from the quills. This species, once extirpated in Vermont, was successfully re-introduced during the 1950's. Today, the species is trapped in Vermont for its fur. The fisher is known to exist in the project area.

Pine Marten. Martens prefer closed-canopy forests with large trees and large diameter dead and down woody material for feeding, breeding, and wintering cover. They do not seem to favor heavily logged areas or openings during the winter. The marten is generally associated with pole and mature sized coniferous and mixed stands (DiStefano et al. 1990), although some people feel that hardwood stands with scattered softwood pockets are adequate marten habitat (Elowe, personal communications). The project area is dominated by northern hardwood habitats; softwoods do frequently mix in with these hardwood stands, with occasional stands being dominated by conifers. Martens feed primarily on voles and other small rodents. During non-winter months, they will also feed on a wide variety of other foods such as amphibians, reptiles, insects, birds, eggs, and various fruits and berries associated with open areas and brushfields.

This species was extirpated from Vermont in the first half of the 20th century and is listed by the State as an endangered species (Vermont Fish and Wildlife Department, 1990). The Vermont Fish and Wildlife Department began re-introducing the marten in 1989 into areas that contained suitable habitat. Within the boundaries of the Green Mountain National Forest, 114 martens were released over a three-year period. No martens were released in this project area, the nearest releases occurring more than 30 miles south of the Old Joe project area. Surveys, including track counts, track plate and photographic "sets", and visitor interviews have been conducted to determine introduction success. To date, these surveys have been insufficient to determine success, population status or distribution.

Lynx. The lynx is a short-tailed cat (like the bobcat), which inhabits the boreal (coniferous forest) belt across Canada. Its primary prey species is the snowshoe hare. It also feeds on grouse, ptarmigan, porcupine, squirrels, deer, beaver, mice and small mammals. Lynx are considered endangered in Vermont, with no known occurrences within the project area, or GMNF. Since this species is not known to exist within, or nearby to, the project area, it will be dropped from further discussion in this assessment. See the Threatened, Endangered, and Sensitive Species effects section and the BE for further discussion.

Northern Goshawk. The northern goshawk was previously considered Sensitive throughout the Forest Service's Eastern Region (which includes the GMNF). A risk assessment was completed in 1999 and the northern goshawk has been removed from the RFSS list for the GMNF. Rationale supporting this determination includes local information that this species, (i) is widely distributed throughout Vermont, (ii) is known to successfully breed on NFS lands, (iii) distribution and population has grown, in Vermont, over past four decades, and (iv) is protected by an agreement with the U.S. Fish and Wildlife Service for management of raptor nests and nesting efforts. When goshawks are discovered in project areas on the Forest, the agreed upon recommendations call for a six hundred and sixty foot radius zone of unaltered habitat around the nest site with an additional six hundred and sixty foot buffer area. These measures have worked successfully within other project areas on the GMNF. During project layout and specialist visits to the Old Joe project area, no goshawk nests were discovered.

Northern goshawk is a woodland raptor that nests in softwood or mixedwood stands but also utilizes temporary or permanent openings for foraging (D.Hirth, personal communication, 4/00). Northern goshawks have been documented adjacent to the project area but have not been found in the project area. Most of the project area is not preferred goshawk nesting territory, with the lack of early successional habitat (which produce temporary shrubby openings) and permanent open areas again being a limiting factor. The regeneration cuts and permanent opening creation, proposed for the Old Joe Project, could make the project area more attractive to goshawks.

Since this species is not at risk on the GMNF, it will be dropped from further discussion in this assessment.

Neotropical Migratory Birds. The Green Mountain National Forest is concerned about the decline of numerous songbird populations in the eastern United States. In an effort to assess the implications of GMNF management for these birds, Clayton Grove of the GMNF researched and developed a document disclosing the positive and negative impacts associated with GMNF management direction (Assessment of Green Mountain National Forest Management for Neotropical Migratory Songbirds, C.Grove, 1992). This assessment indicates that nearly 60 different bird species are likely to be utilizing habitats within the Old Joe project area; of these 60 species, approximately 2/3 are neotropical migratory birds.

Effects on Reclusive Species

Proposed Action

Black bear, fisher, and pine marten are considered "reclusive" due to their tendency to avoid human contact, which is not surprising, given the history of hunting and trapping of these species in Vermont. By definition, these species seek habitats removed from human presence and affects associated with humans (particularly hunting and trapping). The amount of disturbance resulting from the proposed harvesting activities would be minor. All harvesting would occur in winter months only.

Fisher, which can be active during the day as well as at night, may come in contact with humans during project implementation. Since the marten population, if existing in Vermont, is most likely very low, and since no documented sightings have been made in the project area, the chance of contact between marten and humans during harvesting operations is extremely low.

Black bears would be in hibernation during project implementation. The timber sale is expected to last about five years, possibly more if weather conditions preclude normal winter operating. A potential bear denning site was discovered in October of 2000. Revisits to that site in February of 2001 found that it had not been used; subsequent field visits have not found any active bear dens in the project area. During project review, Forest Service and VT State Biologists discussed and adopted guidelines in the event that project implementation disturbed a hibernating black bear. As noted in the Stratton Bear Study, bears are not easily disturbed and were found hibernating near snowmobile trails and ski trails. Ski trail grooming, which is similar to log skidding was found not to disturb a hibernating bear (F. Thompson and F. Hammond, personal communications). Unseasonable weather pattern can allow bears to move in the winter. The same, unseasonable weather conditions, would create a situation not suitable for hauling or skidding and would temporarily close logging operations.

Given the vast amounts of habitat that would remain undisturbed during the winter months (i.e. few private homes, no large developments, large majority of the project area and surrounding area is national forest), the reclusive species would easily avoid the small amount of human intrusion by forest management activities.

The primary access to the harvest sites would be FR42 (Bingo Road) and FR45 (Chittenden Campground Road) via State Route 73. FR42 is currently plowed for access to private homes although it may need to be plowed for an additional 1/4 to 1/2 mile to reach the furthest most landing site. FR73 is plowed and has relatively low levels of winter use. FR45 is not generally plowed and would need to be plowed to allow access by logging trucks.

Cross-country skiers currently use FR42 and FR45, and in terms of human intrusion, that impact is relatively minor and restricted to the trails (see the Recreation effects section for further details on this, and on the plowing of FR45). The impacts resulting from the increased traffic due to the harvest operations would be minor. The amount of additional

traffic would be very small and these travelway intrusions can easily be avoided due to the abundance of forested, undisturbed habitat along and away from the roads. Illegal off-highway vehicles use (ATV's or 4X4 vehicles) has not been observed within the project area. Other than the routinely used public travelways, there are little, if any, older road systems in place that provide opportunities for use by off-highway vehicles. Skid trail and landing closures following project implementation will further impede access. As such, there would be no adverse impacts (intrusive disturbance) expected to reclusive species from unauthorized motor vehicle use in the project area.

Overall, impacts to reclusive wildlife species associated with human disturbance caused by the proposed harvesting would either likely remain unchanged from that currently occurring, or would be slightly more adverse due to (1) the small amount and scale of the additional disturbance, and (2) the opportunity for reclusive species to easily avoid any kind of disturbance.

The creation of 23 acres of temporary openings (17 acres of northern hardwood regeneration through shelterwood harvest, and six acres of aspen clearcutting) and the five acres of permanent opening creation will benefit black bear through the production of blackberry and other soft mast habitat, and herbaceous material which generally follows clearcut and shelterwood harvesting. Beech tree retention guidelines used in all cutting units would protect available hard mast.

Fisher and pine marten are likely to benefit from an increase of small mammal populations that generally result from creating early successional habitat. Any increase or improved stability in small mammal populations would improve the prey base for fisher and marten. The pine marten would potentially lose some available habitat from activities of the Proposed Action. Research indicates marten exhibit aversion to clearcut areas during the winter months. This action proposes to clearcut six acres of aspen. The creation of the five-acre permanent opening in the blowdown area would produce the same effect. Pine marten would be likely to avoid these areas during the winter months. This avoidance would be temporary for six of these acres, as the stands grow past the sapling stage and once again, offer cover and feeding opportunities during the winter months. These areas are expected to resume winter utility in 10 to 15 years after being clearcut. Also, stand shape, tops and logging slash, and the distribution of reserve trees can reduce the openness of an aspen or hardwood clearcut. This could effectively reduce the area that a pine marten would avoid to even less than the six acres proposed. Since pine marten, if present, would not be confined to the Old Joe area, temporary reductions to wintering habitat would be overcome through an expansion, or relocation, of their home range (i.e., they would readily occupy the abundance of other nearby, more suitable habitat during winter months).

The majority of the Proposed Action's selection, thinning, and overstory removal harvest treatments, and the cutting of small residual stems to create the permanent wildlife opening in stand 7, would have little impact on the quality of habitat for bear, fisher, and marten. For the most part, the habitats would be essentially the same for these species before and after the harvest. The 167 acres of selection harvesting would leave those

stands still dominated by mature trees, but with a reduced total stocking. The same effect would be produced by the 62 acres of thinning. The selection harvest areas would contain more small temporarily open areas (the group cuts) that provide more potential herbaceous material and soft mast feeding areas for bears. The cutting of overstory trees on 56 acres would remove the limited number of mature trees occurring in those stands, currently dominated by regenerating seedlings and saplings. This would create a new age class of trees currently lacking in the project area, thus adding to the overall diversity of the area and providing utility to a number of wildlife species. The application of Forest Plan standards and guidelines giving direction for the retention of mature beech trees that show evidence of bear feeding (see LRMP pages 4.31 through 4.33) would ensure that adequate hard mast remains after these harvests. The beech regeneration that usually proliferates whenever forested areas are opened up (i.e., the clearcut, shelterwood, and overstory removal harvests, and the small group cuts in the selection harvests) would provide future sources of hard mast.

No Action Alternative

Since there would be no harvesting under the No Action Alternative, there would be no human disturbance of the project area as a result of harvesting. The area is utilized by bear and fisher, and indications are that the current condition is acceptable to these species, and that they would continue to utilize the project area. The current level of human intrusion for travel and recreation would continue.

As discussed above, black bears, pine marten and fisher generally benefit from efforts that diversify habitat and increase feeding opportunities; the one exception being pine marten's reluctance to utilize open areas during the winter months. From a vegetative perspective, "no action" will leave the project area in its current condition, eliminating potential for both a temporary reduction of pine marten wintering habitat, and for a general habitat improvement (through diversification) for these species. These species would not have the same opportunities for foraging and feeding in the No Action Alternative as with the Proposed Action since temporary and permanent openings and early successional habitat would remain lacking. Opportunities for increasing the prey base for these species would also be decreased.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail

This alternative differs from the Proposed Action by eliminating the last stage of the shelterwood harvests on four units (overstory removals on 56 acres), one single tree/group selection (24 acres), one delayed shelterwood (nine acres), one permanent upland opening (five acres), and also no constructing or relocating the ski trail. Compared to the Proposed Action, this reduces the harvesting by 94 acres. By reducing the amount of harvesting, potential impacts to reclusive species caused by implementing Alternative B would be less than those expected by the Proposed Action, particularly in MA 6.2A. Impacts due to human intrusion in MA 6.2A areas are already minor since these areas are generally away from roads and tend to be more remote.

The effects of the reduction in harvesting as described above would only be slightly different from those of the Proposed Action. This is because the understories in those

four units proposed for overstory removals are well established, and also, the three selection units dropped from this alternative would only result in a small reduction in early successional habitat, that from the small group cuts. The primary loss of early successional habitat and open areas would come from foregoing the creation of the permanent opening (five acres) and from dropping the delayed shelterwood regeneration cut (nine acres). The loss of this habitat would yield a reduction in soft mast and herbaceous material. It may also limit the potential for increase in small mammal populations (prey) that can generally be attributed to early successional habitat

Alternative C: Increased Early Successional Habitat

In regards to disturbance from harvesting operations, the effects of Alternative C would be very similar to those described above for the Proposed Action. With a slight increase in harvest acres (313 acres to 319 acres) and more cutting in the selection harvests due to larger group sizes, this alternative may take slightly longer to implement than the Proposed Action. In any case, the impact would remain minor.

Alternative C would create 12 acres (versus six acres for the Proposed Action) of new aspen stands and increase group selection cuts from 3/4 acre up to 1 acre in size. Marten would temporarily lose about six additional acres during winter months due to their avoidance of clearcuts. As noted in the Proposed Action, marten would not be confined to the Old Joe area and temporary reductions to wintering habitat would be overcome through an expansion, or relocation, of their home range. It should also be noted that the six acres of clearcut harvests equals a habitat change of two tenths of one percent of the project area and would not exclude martens from the area. By creating more early successional habitat and small open areas than the Proposed Action, Alternative C would produce an increase in herbaceous material and soft mast that would provide more food for bears, and improve habitat for small mammals. Any increase or improved stability in small mammal populations would improve the prey base for fisher and marten.

Cumulative Effects for Reclusive Species

The area in general appears to have been attractive to reclusive species in the past. The characteristics of the area show no evidence to the contrary. This is most likely due to the area being fairly heavily forested, mostly in National Forest with little private lands, and having relatively low levels of human use. In turn, past harvests have been small and scattered, and have apparently had little or no impact on reclusive species in or near the project area.

The Old Joe Project, as stated above, would result in only minor effects to reclusive species. Some of these impacts would be positive by way of an increase in habitat diversity and early successional habitat, and others would be negative by way of potential human disturbance from harvesting activities (see the Recreation section for discussion of other human use effects of the area).

To date, there are only two instances where future timber harvest activities could affect the project area. The first is the North Half Overstory Removal (N1/2 OSR) Sale. This project is currently undergoing NEPA analysis. One harvest activity from this project

would be near the Old Joe Project area, that being an 18-acre harvest to remove the overstory trees for stand 11 in Compartment 98. This stand is about 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit. The second is a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158, which would impact only about 8 acres. There are no large industrial forests in the area. Any private land harvesting would be of small scale. The impacts of these activities to reclusive species would be minor.

Future vegetative treatments hold potential to improve the habitat suitability by increasing habitat diversity, and therefore potentially increasing foraging and feeding opportunities. This would help keep the area attractive to reclusive species. The habitat suitability for these species also depends heavily upon the level of human use of the area. Keeping intrusions such as that expected by the Old Joe timber sale small in scale and temporary over the course of the year (seasonally) and over time, would only result in acceptable minor adverse impacts and would not alter long-term use or desirability of the area.

In conclusion, considering past, present, and foreseeable future actions in and near the project area, there would be no significant cumulative impacts to reclusive species from the proposed harvesting activities.

Effects on Neotropical Migratory Birds

Proposed Action

The Proposed Action would impact neotropical migratory songbirds (NTMB) directly through the alteration in habitats brought about by several of the proposed treatments. These impacts are beneficial to some NTMB species, and detrimental to others. The silvicultural treatments having the greatest impact to NTMB are shelterwood regeneration cuts, overstory removal harvests, and clearcutting (for both aspen regeneration and permanent opening creation). The effects discussion that follows will focus on these most important proposed habitat changes. The relocation of the cross-country ski trail and the stream habitat improvements would have no effect on NTMB.

Shelterwood regeneration treatments effectively open the existing forest canopy, allowing more sunlight to reach the forest floor, which results in a growth of tree and shrub species underneath the remaining mature trees. Opening the canopy negatively impacts NTMB species that nest in canopies of mature forests (species like great crested flycatcher and blackburnian warbler). Some species, like the black-throated blue warbler and ovenbird are likely to have habitat conditions improve, as these treatments will encourage understory growth, habitat components these species rely upon.

Overstory removal essentially removes a majority of the mature trees growing in a seedling/sapling stand, simplifying the stand habitat diversity to one of strictly seedlings and saplings. Some species, like the black-throated blue warbler and ovenbird, are likely to lose suitable nesting habitat from the elimination of the overstory. Other species, like the chestnut-sided warblers and indigo buntings, are likely to find greater quantities of

suitable habitat after removal of the overstory because their preferred habitats are unshaded shrub and regeneration areas.

Clearcutting changes the habitat from a mature forest to either regenerating, or permanently, non-forested habitats. Clearcutting done to re-grow trees (i.e., regeneration cuts) results in a temporary alteration as the trees grow back into the site. Clearcutting done to create a permanent opening results in a more or less permanent alteration of the habitat as long as the open, brushy, shrubby condition can be maintained. Each of these two habitat conditions are needed by different NTMB species. Birds negatively impacted by clearcutting include many species seeking mature forest conditions such as the Blackburnian warbler, great crested flycatcher, scarlet tanager, and hermit thrush. NTMB species benefiting from regeneration cuts such as aspen regeneration include willow flycatcher, Philadelphia vireo, and chestnut-sided warbler. NTMB species benefiting from the creation, and maintenance, of a permanent non-forested opening include yellow warbler, gray catbird, and mourning warbler. See the Assessment of Green Mountain National Forest Management for Neotropical Migratory Songbirds, Appendix B, for further discussion of the habitat needs of NTMB.

The harvesting activities of the Proposed Action would take place over an area of about 610 acres, using the size of the timber stands as a basis. Of these 610 acres, about 313 acres would actually be directly affected by harvesting. Of these 313 acres, clearcutting would take place on six acres, overstory removals on 56 acres, and shelterwood harvests on 17 acres. An additional five acres of permanent opening would be created. This totals only about 84 acres impacted by those actions that produce the important habitat changes as previously noted.

Because of the relatively small amount and scale of the proposed harvesting, the impacts (either positive or negative) would be minor, and result in no detectable change to the population of any songbird species inhabiting the project area. The proposed activities would occur during the winter months and would not conflict with nesting efforts of NTMB species. The timing of the cutting of residual stems for the permanent opening would fall in a period of from April to mid May and as such, would have no significant impacts. Those species that prefer mature habitats would find those habitat conditions over much of the project area and adjacent forests even with the proposed 84 acres of harvests, and would be impacted the least. Those species seeking open or brushy areas, and areas of early successional habitat, would find only little benefit because of the small amount of harvesting that would create these conditions, and the fact that these conditions are also greatly lacking over the entire project area and surrounding forests. This lack of early successional habitat and its impacts to those NTMB species needing it, is a concern over the entire GMNF.

The remainder of the project's proposed timber harvesting (e.g., 167 acres of selection cutting and 62 acres of thinning) would produce little, if any, overall change to the habitat as described in the reclusive species discussion above. Given that, these activities would not alter habitat conditions sufficiently so as to affect the use of the area by NTMB.

No Action Alternative

The No Action Alternative would allow for the continued use of these stands by birds finding the current conditions of mature or near-mature, closed canopy forest desirable (e.g., black-throated blue warblers, ovenbirds, blackburnian warblers, hermit thrush, great crested flycatcher, and scarlet tanager). The NTMB preferring regenerating forest stands and permanent non-forested areas with full sunlight conditions would be impacted the most due to the overall lack of this habitat throughout the project and surrounding area (e.g., yellow warbler, gray catbird, chestnut-sided warbler indigo buntings, and mourning warblers). The area would remain unattractive to these species. As with the Proposed Action, this alternative would not result in impacts, either positive or negative, that would affect the population of any songbird species using these project areas.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail

Alternative B would directly affect 94 less acres overall than the Proposed Action. It would affect only 14 acres instead of 84 acres in the group of harvest activities having potentially the most effect on NTMB (clearcuts, overstory removals, shelterwoods, and opening creation). Therefore, the effects of this alternative would be very close to those of the No Action Alternative. Those NMTB needing open or semi-open areas would be impacted the most.

Alternative C: Increased Early Successional Habitat

Alternative C would directly affect six more acres overall than the Proposed Action (six additional acres of clearcuts and larger group cuts in the individual tree/group selection areas). It would affect 90 acres instead of 84 acres in the group of harvest activities having potentially the most effect on NTMB (clearcuts, overstory removals, shelterwoods, and opening creation). The effects of this alternative would be close to those of the Proposed Action but would offer a greater benefit to those species needing open or semi-open areas. NTMB species benefiting from regenerating aspen include willow flycatcher, Philadelphia vireo, and chestnut-sided warbler. The larger group size within the selection cuts could also benefit willow flycatcher, Philadelphia vireo, and chestnut-sided warbler.

Cumulative Effects for Neotropical Migratory Birds

In the Assessment of Green Mountain National Forest Management for Neotropical Migratory Songbirds, (C.Grove, 1992), impacts associated with long-term and continued forest management are discussed (see Assessment pages 12 through 20). As expected, some species are likely to find improved habitat conditions resulting from long-term, wide spread forest management implementation through regeneration of stands by evenaged harvesting methods, clearcuts and shelterwood cuts. Moderate scale implementation across a modest scale part of the National Forest, such as one quarter to one third of the GMNF landbase, would improve conditions for some migratory songbirds. The Green Mountain National Forest Land and Resource Management Plan, 1987, developed a habitat matrix that will improve habitat conditions for songbirds that need seedling and sapling stands. The long term goal of the Plan within certain parts of the Forest is to maintain seedling and sapling stands by cutting the overstory at a

recommended rotation age. By completing projects where evenaged regeneration cutting is used, a management objective that maintains ten percent of the area in a seedling or sapling condition can be met. An example of this management objective can be found in MA 3.1. Subsequently, other areas designated for continuous forest canopy are maintained for migratory songbirds that utilize forested areas. The management strategy for these parts of the Forest is to have a continuous forest canopy with trees of all age classes spread throughout the area. An example of this management objective is described in MA 6.2 areas. A third guild of migratory songbirds would be those associated with open habitats such as fields, meadows, or shrub openings. The lack of open habitats on GMNF lands, as well as the trends on private land, limit available open habitats. This trend is expected to continue into the future.

As discussed in the Assessment, habitats provided by the GMNF are potentially some of the "highest quality breeding habitats for Neotropical Migratory birds" in southern Vermont, recognizing that conservation efforts for these birds must go beyond the National Forest boundaries. The management of 5 percent of the land base in Vermont (the total extent of the GMNF), in and of itself, is unlikely to significantly impact populations of any of the songbirds utilizing the Green Mountain National Forest. It is, arguably, of greater importance for the GMNF to be positioned so as to provide habitats that are regionally lacking, or in decline, in particular, early successional habitat, thereby insuring the continued opportunity for birds needing these habitats in the changing conditions of the future.

This single project holds no significant long-term cumulative impacts to NTMB species currently utilizing the Old Joe area. The relatively small scale actions of the past have had little or no impacts on NTMB, other than perhaps a continued decline in early successional, open or semi-open habitats. The Old Joe project would result in only minor impacts, both positive and negative. Reasonably foreseeable actions are expected to remain small in size and scale in and near the project area, and therefore, would have little or no additive cumulative impact. As discussed above, the GMNF could contribute in the future to those habitats that are lacking regionally, such as early successional habitat interspersed among the forested conditions. It is this that may provide the most beneficial overall long-term cumulative impact.

VEGETATION MANAGEMENT

Much of the discussion above regarding threatened and endangered species, and wildlife talks about the effects of proposed activities on vegetation. This section is intended to briefly disclose the effects on the vegetation management program, in particular, efforts to achieve vegetative composition goals.

The Old Joe Proposed Action would contribute 84 acres of evenaged regeneration harvests and opening creation, 167 acres of unevenaged selection harvests, and 62 acres of evenaged thinning harvests, for a total of 313 acres treated. As discussed in the Purpose of and Need for Action section of Chapter I, monitoring through the year 2000 shows that hardwood regeneration cuts are being done at only a rate of 37 percent of

Forest Plan levels and aspen management (done primarily through clearcutting) at a rate of only 14 percent. Aspen is a desirable species on the forest and is in short supply, and benefits a number of wildlife species. These low harvest accomplishments inhibit creation of the early successional habitat types that are used by as many as 65 percent of the forest's vertebrate species. Thinning harvests, another evenaged practice, are only being accomplished at a rate of 23 percent of Forest Plan level. Other harvest goals and movement toward goals such as increasing softwood conversions are also well behind expected Forest Plan levels due to lack of timber harvesting.

Proposed Action, Alternative B, and Alternative C

The Proposed Action would make a relatively small but important movement toward Forest Plan goals for vegetative composition. The proposed harvests would increase species diversity, create needed early successional habitat, and increase the range of size classes and ages of trees in the Old Joe project area. Alternative B would harvest 219 acres, 94 acres less than the Proposed Action, and that would include only 17 acres in regeneration harvests. Therefore, this alternative provides considerable less toward accomplishing Forest Plan vegetative goals. Alternative C would harvest six more acres than the Proposed Action, that six acres being additional clearcuts, and also would create slightly more temporary open and semi-open areas due to the larger group sizes. This alternative would make the most progress toward the vegetative goals, and would create the most early successional habitat.

No Action Alternative

The No Action Alternative would make no progress toward Forest Plan goals for vegetative composition. The forest's age classes would continue to show a predominance of older classes. The trend of a lack of early successional habitat would continue. Those species needing this habitat would be adversely impacted, while those species needing older forests and closed canopy conditions would continue to thrive. Species diversity would continue to decline.

MANAGEMENT INDICATOR SPECIES: MIS

The Management Indicator Species (MIS) program is designed to assist with assessment of Land and Resource Management Plan (LRMP) implementation. MIS can be equated to a coarse screen monitor of Forest Service's requirement to provide for a diversity of plant and animal communities, the coarse screen being a wider, broader scale perspective of plant and animal diversity as measured by MIS. In conjunction with our Threatened, Endangered and Sensitive (TES) species program, which is thought of as the finer screen, or closer detailed look at certain key species (TES), we are able to assess how LRMP implementation may affect biodiversity at a variety of levels. Looking at forest-wide trends of MIS as a result of management actions and, more importantly, the habitat community they represent, also provides the resource manager with one means to help determine the status of the Forest's vertebrate community as a whole as well as the status of the various wildlife species that each MIS is a proxy for.

The Green Mountain National Forest (GMNF) MIS program identified 14 communities of importance for the animals of the Forest. For each of these communities, we have identified a vertebrate species that occupies and relies upon a respective community for its basic needs. We continue to monitor both the availability of each of these communities on the GMNF, and the population trends of the respective vertebrates that utilize the communities. Population trends of these 14 vertebrates are assessed at a variety of scales; Forest-wide, State-wide and region-wide (northern New England). The intent of the MIS program is to compare assessment at these differing scales to determine how LRMP implementation affects biodiversity within the Forest, State and northern New England region.

Looking at the direct effects of proposed management actions on all forest resources, including MIS, at the project level through the NEPA process can only answer localized concerns. What is most important, as noted above, is integrating this small piece of information into the broader scales. An assessment of how MIS populations are expected to respond to a range of LRMP alternatives can be found in the EIS for LRMP analysis [Draft EIS pages; 2.50-2.61, 3.14-3.15 and 4.60-4.63]. These population predictions are related directly to community availability of each alternative.

Because the ranges of MIS species extend well beyond the GMNF boundary, being found throughout Vermont and the northern New England region, any single project implemented on GMNF lands is not likely to cause a significant change in the availability of habitat for the species. Similarly, a single project is not likely to measurably alter Forest, State or regional MIS populations as all of the GMNF's MIS, except for peregrine falcon, are abundant.

It is a fact that the proposed Old Joe Project will alter acreage of some of these 14 communities. Although the habitat community alterations associated with the proposed project management activities will be detectable and measurable within the project area, and the analysis area scale defined for this project, this alteration, in and of itself, would not create a detectable change to community availability at the Forest, State or regional scales. Similarly, the number of MIS using those "altered" communities could grow, shrink, or remain essentially the same. This depends on the degree that the original habitat is altered and suitability of the new habitat created. Although there may be localized impacts on individual species, it is not anticipated that this project-scale change would measurably contribute to a population trend at the larger, landscape scales. It is also extremely difficult to show a direct cause and effect relationship between species abundance and specific management actions. For example, because most MIS are abundant and mobile, population changes within the Old Joe Project may be the result of simple migration from adjacent areas irrespective of management actions. As noted previously, meaningful discussion of community or population trends can only be made at Forest, State or regional scales representative of the respective community and vertebrate distribution, scales much larger than the Old Joe project or analysis area.

Management Indicator Species identified in the Forest Plan for the GMNF and their habitat community associations are described in Table III-1.

Table III-1. Management Indicator Species And Associated Habitats

Management Indicator Species	Habitat Community Represented
Chestnut-Sided Warbler	Hardwood Sapling
Barred Owl	Mature Hardwood
Snowshoe Hare**	Regenerating, Young Softwood
Blackpoll Warbler	High Elevation, Mature Softwood*
White-Tailed Deer**	Low Elevation, Mature Softwood
Ruffed Grouse**	Regenerating, Young Aspen And Birch
Beaver	Aspen And Birch
Yellow-Bellied Sapsucker	Mature Aspen And Birch
Gray Squirrel**	Mature Oak
American Woodcock**	Upland Opening
Brook Trout	Stream
American Bittern	Marsh
Peregrine Falcon	Cliff
Tree Swallow	Beaver Flowage

* Green Mountain National Forest is a population source or provides a unique habitat community

** Green Mountain National Forest is increasingly important for recreational hunting

Trends in Populations And Associated Habitat Communities

The GMNF is split between two physiographic areas, Northern New England (27) and Eastern Spruce-Hardwood Forest (28). The Northern New England area includes southern Maine, southern New Hampshire and Vermont, western Massachusetts, and New York’s Taconic Highlands. The Eastern Spruce-Hardwood Forest, the largest physiographic area in the Northeast, ranging from the coastal plains in Maine and the Maritime Provinces to the high Appalachian peaks in the White Mountains of New Hampshire and Green Mountains of Vermont.

MIS population and habitat community trends shown in Appendix F reflect both physiographic areas. These trends are summarized in Table III-2.

Table III-2. Trends In MIS Populations And Habitat Communities They Represent

MIS Species	Population /1 and Habitat Community Trends /2					
	New England		Vermont		GMNF	
	Population	Habitat	Population	Habitat	Population	Habitat
Chestnut-Sided Warbler	-* 27 & 28	↓	-*	↓**	?	↓**

Barred Owl	+27, +**28	↑	+	↑**	?	↑*
Snowshoe Hare	?	→	?	↓	?	↓
Blackpoll Warbler	?27, -**28	?	-*	→	***	→
White-Tailed Deer	?	?	↑	↑	↓	↓
Ruffed Grouse	-**27, **28	↓	?	↓	?	↓*
Beaver	+** 27 & 28	↑	***	↑	***	→
Yellow-Bellied Sapsucker	0	↑	***	↑	?	↑**
Gray Squirrel	0	↑	?	↑	?	↑*, ↑A
American Woodcock	-* 27 & 28	→	+	↓	?	↓
Brook Trout	- 27 & 28	→	0	→	0	↑
American Bittern	-	↓	+	↓	?	↑A
Peregrine Falcon	+	?	+	→	+	→
Tree Swallow	0	↑	+	↑	?	→

/1 -** = significant decrease; -* = moderate decrease; - = decrease; 0 = stable; + = increase; +* = moderate increase; *** = significant increase; ? = trend uncertain

/2 ↑ = habitat increasing; ↑A = habitat increasing through purchase; ↑* = moderate increase; ↑** = significant increase; → = stable habitat; ↓ = habitat decreasing; ↓* = moderate decrease; ↓** = significant decrease

27 = Northern New England; 28 = Eastern Spruce-Hardwood

Footnote: again, note that Vermont and the GMNF are split across both physiographic regions

Assessing Relative Risk or Benefit

Trends in MIS populations combined with trends in the quality and abundance of their associated habitat communities, indicate the “relative risk or benefit” a project, or combination of projects, has to the overall MIS population trend, as estimated at various scales. The magnitude of this risk or benefit decreases substantially at larger scales as the total amount of available habitat increases in proportion to the amount of habitat changed through management. This approach of measuring relative risk or benefit relies on a combination of quantitative and qualitative information to address a series of questions in a diagnostic fashion.

- What is the MIS population trend within Vermont or New England? To what degree?
- What is the trend in the amount and quality of associated habitat communities within Vermont or New England? To what degree?

- Is the GMNF of unique importance as a population source within Vermont or New England for the long-term survival of the MIS or the vertebrate community it represents?
- How will the project change either the quantity or quality of the habitat community represented by the MIS?
- Is this change important either by itself or combined with similar activities Forest-wide?
- Is this change likely to have a meaningful effect on population trends of the MIS or other wildlife and fish community associates within Vermont or New England?

Using both the information found in Appendix F and Table III-2, combined with the project-related habitat trends over a defined analysis area as shown in Table III-3, it is possible to determine the relative risk or benefit of the Proposed Action and its alternatives. For example, if a MIS species and the species assemblage it represents are in decline State-wide, then the Forest may be considered important as a population source for this habitat community. If the project (alone, or possibly combined with other projects) is likely to measurably (> 5 percent) increase the associated habitat, then the project has a high associated benefit to the MIS and those species it represents. If, on the other hand, the project were likely to measurably decrease habitat for this same species assemblage, the project would have a high associated risk.

The most meaningful way to evaluate trends of MIS populations and associated habitats, and how they are affected by proposed changes (risk or benefit), is to look at areas larger than the project level. With a project area of 610 acres, it is understandable that habitat communities continue beyond the area defined as the Old Joe Project. This continuity of communities plays an important role in the evaluation of MIS population trends and the relative risk or benefit of a proposed management action.

Analysis Area

For analysis of the effects of the Proposed Action and alternatives, an analysis area of 16,899 acres was chosen. It includes portion of four management areas associated with the Old Joe project area and the surrounding area in which MIS habitat communities lie: MA 2.1 (2,565 acres), MA 3.1 (1,536 acres), MA 4.1 (3,389 acres), MA 6.1 (1,590), and MA 6.2 (7,819 acres). Some management areas within the surrounding watershed were not included because no changes within those MAs are proposed (no project activities proposed). These include MA 2.2, MA 2.3, MA 6.3, and MA 8.1. The two management areas, MA 3.1 and MA 6.1 were included in the analysis area since they provide continuity for the area (i.e., lie among the other MAs). However, no activities are proposed in either of these two management areas. By looking at trends in habitat community distribution across management areas including and surrounding the Old Joe project area, it is possible to see how well represented the habitat communities are over this more meaningful, wider area.

Table III-3 displays the effective change in the habitat communities within the 16,899-acre analysis area that will result from implementing the Proposed Action or the Alternatives. Habitat communities either not affected by the Proposed Action or not present within the analysis area are indicated with an N/A. The No Action column shows the current condition. As an example, there is now 68 acres (about 0.4 percent of the 16,899 acres, i.e, 4/10th of 1 percent) of hardwood sapling habitat in the analysis area according to Forest Service data records. Implementing the Proposed Action (column 3 from the left) will create an additional 17 acres of hardwood saplings resulting in a 0.1 percent change in that habitat community within the analysis area (1/10th of 1 percent change from the existing community to the new, by 17 additional acres, habitat community).

The far right column displays the expected habitat trend that will develop over the next five years if the Old Joe proposal is not implemented. The only habitat changes expected to occur in or close to the analysis area in the near foreseeable future are possibly two overstory removal harvests. Removing the few remaining overstory trees from an existing habitat community would not change that community. No other habitat actions are expected to occur within the analysis area in the next five years. Any change that occurs will happen as a result of natural succession and events.

Table III-3. Amount of Change in MIS Habitat Communities Expressed in Acres Affected and Percent of Analysis Area (16,899Acres) Affected As A Result of Implementation of the Proposed Action & Alternatives

Habitat Community	Effective Change in Habitat Resulting from Implementation Of Proposed Action (PA) and Alternatives (Alt)				
	No Action or Current Condition	PA Effective Habitat Change	Alt B Habitat Change	Alt C Habitat Change	Habitat Trend W/O Old Joe Proposal
	Acres/Percent	Acres/Percent	Acres/Percent	Acres/Percent	Acres/Percent
Hardwood Sapling	68/0.4	17/+0.1	8/+0.05	30/+0.2	122/0.7
Mature Hardwood	10,927/64.6	-28/-0.2	-14/-0.08	-47/-0.3	11,059/65.4
Regen. Young Softwood	75/0.4	0/0.0	0/0.0	5/+0.03	75/0.4
High Elev. Mature Softwoods	N/A	N/A	N/A	N/A	N/A
Low Elev. Mature Softwoods	1,432/8.4	0/0.0	0/0.0	0/0.0	1,432/8.4
Regen. Young Aspen & Birch	10/0.06	6/+0.04	6/+0.04	12/+0.07	10/0.06
Aspen & Birch	1,040/6.2	6/+0.04	6/+0.04	12/+0.07	1,040/6.2
Mature Aspen & Birch	N/A	N/A	N/A	N/A	N/A
Mature Oak	N/A	N/A	N/A	N/A	N/A
Upland Opening	255/1.5	5/+0.03	0/0.0	5/+0.03	201/1.1
Stream /1	0 mi./0.0	1 mi./+4.5	1 mi./+4.5	1 mi./+4.5	3 mi./+14.0
Marsh	N/A	N/A	N/A	N/A	N/A
Cliff	N/A	N/A	N/A	N/A	N/A
Beaver Flowage	N/A	N/A	N/A	N/A	N/A

/1 Miles of habitat improvement and percentage of habitat improved as calculated according to total miles of habitat eligible for improvement. Habitat trends in far right column include other completed work in streams within the analysis area (i.e. Brandon Brook and Bingo Brook).

Results of the MIS Habitat Community Analysis

The information on MIS population trends and trends for the habitat communities they represent (described in narrative format in Appendix F and displayed in Tables III-2 and III-3) indicates that the Proposed Action and Alternative B and C will very slightly increase early successional habitats for hardwood saplings, young softwood, upland openings, and regenerating aspen at the project and analysis area level. Given the relative importance of the GMNF to this species assemblage and the degree of change projected, this benefit at the Old Joe project level would not have increased the early successional habitat enough to measure a benefit to the MIS or associated species assemblage at the Forest, State, or Regional level. This project, by itself or in combination with other similar projects, would need to collectively increase regenerating hardwood and softwood stands to at least five percent of the analysis area in order to reverse the current trend in early successional habitat loss. As shown in Table III-3, the

effective changes that would create early successional habitat in these communities are well below five percent, even well below one percent.

The hardwood sapling community is, likewise, under-represented in the project area and the analysis area. The hardwood sapling community is declining due to two reasons. First, the sapling communities present in 1987 (the first year of the Forest Plan) are growing and second, hardwood sapling communities are not being replaced by vegetation management activities on a large enough scale to show a positive overall benefit. In order to achieve Forest Plan composition objectives at the Forest level, as much as 130 acres of hardwood habitat would have to be regenerated each year for the next decade. The Old Joe project would make only a very small contribution toward increasing the amount of this community, with little or no benefit or risk to its MIS community associates.

Similarly, trends for softwood and aspen are below projected Forest Plan outcomes but to a much lesser degree since these communities are represented by smaller inclusions within the analysis area. Softwood regeneration has shown a slight increase through land acquisition but at the same time, Forest Plan guidelines that restrict softwood regeneration, conversion, or planting to only certain Management Areas limits where this habitat community can be improved.

MIS species associated with mature hardwood communities continue to benefit from proposals like Old Joe since there would not be a significant change in habitat. The Old Joe Proposed Action would change (decrease) $2/10^{\text{th}}$ of one percent of the mature hardwoods. Alternative C, which has group selection cuts between 1/2 and 1 acre, would cumulatively decrease the amount of mature hardwoods by approximately $3/10^{\text{th}}$ of one percent within this analysis area while at the same time, increasing the amount of hardwood sapling community. Even with this small reduction, the amount of mature habitat would continue to grow, both at the project level and at the analysis level. Because of the low level of harvest activity predicted across the Forest in the foreseeable future, mature habitat can be expected to continuing increasing at the Forest level as well.

Brook trout populations within this area are stable. However, stream habitat restoration projects that improve pool quality and quantity, replace large woody debris, and improve spawning habitat would increase the associated habitat. The Old Joe project, because of the amount of habitat change proposed and the timing of that change, would therefore have a high associated benefit to Brook trout and those species it represents.

Upland opening communities are decreasing as well. As explained for early successional habitat above, new permanent openings are not being created at a rate that will show a benefit. Also, remote small permanent openings (< 5 acres) are being lost as they become overgrown due to lack of maintenance. This is illustrated by the expected decrease in acreage of this community over the next five years as shown in the far right column of Table III-3.

Effects on MIS

Table III-4 displays the expected impacts on MIS in terms of associated risks and benefits to the species population trends within the analysis area resulting from the proposed changes to the habitat communities. As noted previously, obtaining accurate data on populations trends in the analysis area is extremely difficult, if not impossible, because of the migration of individuals in and out of the area, and the inability to separate this out from actual changes in population numbers. Therefore, estimating the level of risk or benefit, resulting from changes to the habitat community produced by the proposed activities, to the overall population trend provides a useful measure of the impacts on MIS.

Table III-4. Expected Impacts (Risk and Benefit) of the Proposed Action (PA) and Alternatives (Alt) On MIS Population Trends Within the 16,899 Analysis Area /1

MIS	Community	PA	No Action	Alt B	Alt C
Chestnut-Sided Warbler	Hardwood Sapling	0	0	0	0
Barred Owl	Mature Hardwood	+	+	+	+
Snowshoe Hare	Regenerating, Young Softwood	0	0	0	0
Blackpoll Warbler	High Elevation, Mature Softwood	0	0	0	0
White-Tailed Deer	Low Elevation, Mature Softwood	0	0	0	0
Ruffed Grouse	Regenerating, Young Aspen And Birch	+	0	0	+
Beaver	Aspen And Birch	0	0	0	0
Yellow-Bellied Sapsucker	Mature Aspen And Birch	0	0	0	0
Gray Squirrel	Mature Oak	0	0	0	0
American Woodcock	Upland Opening	+	0	0	+
Brook Trout	Stream	+	0	+	+
American Bittern	Marsh	0	0	0	0
Peregrine Falcon	Cliff	0	0	0	0
Tree Swallow	Beaver Flowage	0	0	0	0

- /1 -** = significant increase in risk to MIS or habitat community;
- * = moderate increase in risk; - slight increase in risk;
- 0 = no measurable impact;
- + = slight beneficial impact to MIS or habitat community;
- +* = moderate beneficial impact; +** = significant beneficial impact

As displayed in Table III-4, the analysis indicates that the Old Joe Proposed Action, the No Action Alternative, and Alternatives B and C will have no impact on the population

trends for chestnut-sided warbler, snowshoe hare, blackpoll warbler, white-tailed deer, beaver, yellow-bellied sapsucker, gray squirrel, peregrine falcon, American bittern, and tree swallow as there is either: no habitat available in the analysis area; no measurable change or impact; or little or no change to any existing habitat communities for these species within the analysis area. The chestnut-sided warbler, the snowshoe hare, and white-tailed deer would essentially be unaffected by the Old Joe proposal because of the very small amount of change expected to their respective communities. This is typical of most of the MIS communities, in that the small scale and amount of habitat affected directly by the Old Joe proposed activities would have perhaps some localized impact, but over the analysis area and particularly, over the larger scales, would have no measurable impacts to population trends.

The population trends for barred owl and other species associated with mature hardwood communities would show a slight beneficial impact from the proposed activities. The analysis area already favors these species groups because of the large amount of habitat available. The proposed actions would not reduce the amount of this habitat enough to affect population trends within the analysis area. In fact, because of the small scale of actions proposed, the amount of mature habitat and components of this habitat that favor this MIS and associated species would actually continue to increase, and thus show this beneficial impact.

Stream communities where fish habitat restoration has occurred, as well as stream habitats in general, would show a positive benefit as riparian corridors age over time. The stream habitat restoration work proposed in the Old Joe Project would achieve these conditions sooner, and therefore would show a slight beneficial impact.

Ruffed grouse would see a slight benefit at the localized level by implementing the regeneration harvests in the Proposed Action or Alternative C. There would be no measurable risk or benefit with the No Action Alternative or Alternative B since there would be no regeneration cuts in the aspen-birch community. The American woodcock, which represents fields and meadows, would see a slight localized beneficial impact at the project level with the Proposed Action or Alternative C through the creation of a five-acre permanent wildlife opening.

The small amount of habitat changed by the Old Joe proposal would produce, at best, minor localized risks or benefits to MIS population trends over the project level and the analysis area level. These changes (of local species abundance and local habitat availability) are of such limited risk/benefit as to hold no measurable impact, risk or benefit, at any scale beyond the analysis area level. The communities most at risk over the broader scales include any MIS community even remotely associated with early successional habitat. This habitat type is severely lacking, within forested areas, over at least the analysis area level, the Forest level, and perhaps the northern New England level. It is also predicted that this habitat will continue to be lost as harvesting to regenerate hardwoods and softwoods is reduced, and as forested areas continue to age. Species associated with softwood communities, such as white-tailed deer and snowshoe hare, are also somewhat at risk due to the lack of softwoods within the area as well as a

lack of young, regenerating softwoods for future use. For species representing mature communities, the Old Joe Project would have the highest associated benefit due to the large amount of mature habitat within the analysis area and surrounding forest lands.

Cumulatively over the foreseeable future, only two harvest actions are anticipated to occur in or near the analysis area. One is an 18-acre harvest to remove the overstory trees in stand 11 in Compartment 98. This stand is about 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit. The second is a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158, which would impact only about 8 acres. There are no large industrial forests in the area and any private land harvesting would be of small scale and would not affect population trends. These future overstory removals would not change any of the MIS communities. Any change to habitats will happen as a result of natural succession and events.

Therefore, regardless of which Old Joe alternative is implemented, the analysis area would continue to show a lack of early successional habitat, an abundance of mature habitat, and perhaps a slight, if any, increase in softwood habitat. As previously noted, MIS and their associates would either benefit slightly or be at a slight risk accordingly. In any case, there would be no significant cumulative impact to any MIS population trend. As previously stated and shown through this analysis, although there may be localized impacts on individual species, the Old Joe Project, due to its very small scale, would not measurably affect any MIS population trend at any of the larger landscape levels including the Forest, State, or northern New England scale.

SOIL, WATER, and WETLAND RESOURCES

Affected Environment

The soil types in the Old Joe project area are shown in Table III-5 displayed at the end of this section. Berkshire and Tunbridge soils dominate on side slope and ridgetop positions in the project area. These soils are well drained, two to four feet deep over bedrock, and have a loamy texture. They are acidic and formed from glacial till. On and near ridgetops, small areas of shallow soils (less than 20 inches deep) and occasional bedrock outcrops occur. Soils at the lower elevations in the Chittenden Brook portion of the project area are dominated by Peru soils. These soils formed from acid, dense till, and are moderately well drained, with two to four feet of soil over a hardpan (a dense soil layer). Soils throughout most of the project area have a moderate to high erosion hazard, due to the moderately steep to steep slopes (15-40 percent slopes, except as noted in Table III-5).

There are three perennial streams (Bingo, Chittenden, and Joe Smith Brooks) and five intermittent streams in the project area (see map in project file), along with numerous smaller streams and small wetlands. Streams in the project area have high water quality and the riparian areas are in good condition. Macroinvertebrate populations in Bingo Brook were monitored by the State of VT Water Quality Division, Biomonitoring and

Aquatic Studies Section in 1999 and 2000 (see letter from Steve Fiske, Aquatic Biologist, in project file). Their monitoring report stated:

“Bingo is of excellent ecological integrity, and monitoring should continue if any activities are planned or ongoing within the watershed.”

Further information on streams and aquatic habitat may be found in the Fisheries section that follows this section. It is important to note that standards, guidelines, and mitigation measures that would be implemented for the soil and water activities and the fisheries activities would be applicable and effective in addressing concerns to either resource area. The effects of proposed activities on soil and water resources, in particular those related to erosion and sedimentation, link closely to concerns for fisheries if the potential exists for these effects to reach stream courses and fisheries habitats.

Environmental Effects

Relationship to Issues

None of the issues that help drive the analysis are directly related to the soil and water resources, and therefore, will not be part of the discussion below. Issue 3 does cite concerns for soil, water, and wetlands potentially resulting from building the cross-country ski trail, the 0.6 mile relocation. However, since there would be no earth disturbance needed for the construction, there would be no adverse effects to these resources as described further on.

Proposed Action

If the Proposed Action were selected, the following mitigation measures associated with the timber harvest would be implemented to protect the soil, water, and wetland resources.

- 1) To best protect soils, all harvest areas would be logged only in winter. Skidding and landing operations would be limited to when the soils are frozen or have a thick cover of snow, so that compaction and rutting would be minimized.
- 2) Landing for Compartment 158, stand 4 – These actions would be implemented to minimize the risk of sediment from the landing getting into Bingo Brook:
 - a) Leave a 30 foot undisturbed buffer strip between the Bingo Brook Road and the landing, except at the short access road to the landing.
 - b) Maintain a snow or earthen berm between the landing and the small, ephemeral stream 30 to 50 feet east of the landing. This stream flows to the north but it never reaches Bingo Brook because it slows, then filters out into the soil before it reaches the Bingo Brook Road. Keeping runoff from the landing out of this small stream would eliminate the risk of additional runoff causing increased erosion in the stream channel. This is important even though the stream never flows into Bingo Brook.

- c) Hay bales would be placed, if needed, to prevent runoff from the landing from going into the Bingo Brook Road ditchline, which eventually empties into Bingo Brook.

3) Landing at Compartment 158, stand 14 – This landing is well drained but surrounded by poorly drained, wetland soils. The skidder would need to pass over 50 feet of the wetland to access the harvest units. To minimize adverse impacts to the wetland, the skidder would cross the wetland at only one location, in the driest part of the wetland, at the west edge of the landing. The wetland soils at the crossing would also be strengthened using corduroy (logs placed perpendicular to the road). An additional note about this landing – although it is just across the road from Bingo Brook, we expect no sediment from the landing to enter the brook. This is because there is no ditchline along the road, or streams near the landing by which to carry sediment from the landing to Bingo Brook on the other side of the road.

4) Skid trail in stand Compartment 158, stand 4 – The main skid trail climbs at a consistent grade of 20-25 percent throughout much of stand 4. This is in excess of the recommendations for skid trail grades (grades should not exceed 15 percent for extended distances). To address this concern, extra attention would be given to this skid trail to prevent erosion. Water bars on skid trails are normally spaced 100-200 feet apart; on this section of skid trail, water bars would be spaced 50-75 feet apart. Water bars would be installed before winter so they are better able to freeze up and maintain their shape during skidding. In addition, a water bar would be located just above each stream crossing, to divert water from the skid trail away from the stream. This will tend to mitigate concerns about these steeper grades and would result in effects within acceptable limits. We did not consider building a new skid trail on grades of less than 15 percent because this would carry a higher risk of erosion and sedimentation than using the existing, steep but vegetated trail. If we built a new skid trail, over 13,200 square feet of newly excavated, bare soils would be created (0.25 miles of new skid trail, 10 feet wide). On the other hand, the existing skid trail is revegetated, and much of it will stay vegetated since logging will be done only in winter.

5) Skid trail in stand Compartment 158, stand 4 – This skid trail would be relocated for approximately 150 feet, beginning right after the first stream crossing above the landing. The skid trail will be relocated further away from the stream to reduce the risk of sedimentation.

6) Compartment 125, landing at stand 1 – a 50 foot undisturbed buffer strip would be maintained between the small stream at the south edge of the landing and landing activities. A soil or snow berm in this location would be added to divert water away from the stream, if necessary, to prevent sedimentation. A box culvert would be used where this stream crosses the skid trail heading south of the landing. These measures would prevent sediment from getting into the stream, which drains into Chittenden Brook.

7) Compartment 125 skidder bridges – bridges will be installed at skid trail stream crossings at the very eastern end of stand 9 (to access stand 19); and in stand 21, in two locations.

8) Compartment 125, stand 21 skid trail grades - The main skid trail through this stand also has grades of 15-25 percent over varying distances. As noted above for compartment 158, stand 4, to prevent soil erosion and assure acceptable impacts, water bars would be spaced more closely, installed before the ground freezes, and installed above stream crossings so that water from the trail does not drain into streams.

9) Slopes of 40-50 percent grade – due to occasional areas of 40-50 percent slopes, a dozer would be used to bunch trees and construct skid trails (unless waived by the Sale Administrator) in Compartments 158 - stands 4, 11, 14, and 19; Compartment 125 - stand 19; and Compartment 118 – stand 12. Using a dozer on these slopes is safer for the operator. Constructing excavated skid trails results allows for more effective control of water on the hillside by using water bars.

10) Use of existing skid trails – existing skid trails would be used wherever possible, rather than building new ones. This will minimize the need for new trails, and thus reduce the amount of new ground disturbance that would be needed to open up new trails.

11) Whole tree harvest – to maintain long-term soil productivity, whole tree harvesting would not be allowed.

In addition to these mitigation measures, all standards and guidelines in the Forest Plan for protection of the soil and water resources would be implemented. The most important standards and guidelines for the Old Joe project would be:

- Stream filterstrip guidelines to keep harvest activities away from streams and prevent sedimentation.
- No logging on shallow soil areas (less than 20 inches deep to bedrock).
- Proper placement and spacing of skid trail water bars to control erosion and sedimentation.

A Timber Sale Administrator would visit the harvest area (when on-going) every one to two weeks to assure that standards and guidelines and mitigation measures are implemented and effective. This person would promptly initiate corrective measures to protect the resources, should unexpected problems arise.

The Forest Service monitored the effects of timber harvest on the Soil, Water and Fisheries Resources on the GMNF, and presented the results in a report entitled, “Soil, Water and Fish Monitoring on Timber Sales on the Green Mountain National Forest, 1992-1999”. This report is available in the project file, and can be obtained by calling

the Forest Supervisor's Office in Rutland. The monitoring consisted of visual observations to determine if standards and guidelines and special mitigation measures were implemented and effective in minimizing erosion and sedimentation; stream turbidity monitoring before, during and after logging; and surveys to detect changes in macroinvertebrate and fish populations, and stream habitat quality due to harvest. Macroinvertebrate and some water chemistry monitoring was completed by the State of VT Water Quality Division. The conclusion of the report states:

“Our monitoring showed most standards and guidelines (for soil, water and fisheries protection) were implemented most of the time; when implemented, standards and guidelines were effective in protecting the soil and water resources; and harvest activities had little or no effect on stream turbidity, macroinvertebrate and fish populations. In general, soil, water and fish resources are being protected during timber harvest.”

GMNF standards and guidelines are similar to Acceptable Management Practices (AMPs) put into practice by the State of Vermont. Our monitoring results are similar to past tests of AMPs (a.k.a Best Management Practices), with the results published by the State of Vermont and Forest Service Research (Martin and Hornbeck 1994; Brynn et al. 1990). Based on this information, the effects of the harvesting associated with this Proposed Action on the soil, water and wetlands resources would be minor because standards and guidelines and the mitigation measures would be effective in keeping erosion, sedimentation, compaction and rutting to a minimum, and within acceptable limits.

Other evidence that our harvesting activities have had minimal adverse impacts on water resources is water and macroinvertebrate monitoring completed on the Lookout III Timber Sale from 1997 - 2000. This sale was located three miles west of the proposed Old Joe project, on more erosive soils but with similar water quality features as those related to the Old Joe project. Water and macroinvertebrate monitoring in Smith Brook (which drains the sale area) by the State of Vermont Water Quality Division showed the macroinvertebrate community in an excellent condition (high level of biologic integrity) before, during and after the sale (see cited letter from Steve Fiske, Aquatic Biologist, in project file).

As part of the timber sale monitoring, the Soil Scientist has monitored the effects of skid trail grades exceeding 15 percent grade, on the soil and water resources (N. Burt, GMNF Soil Scientist, personal communication). This was important because the Forest Plan standards and guidelines call for skid trail grades not to exceed 15 percent except for short distances. The Soil Scientist has long observed that skid trail grades of 15-25 percent can be effectively used with minimal adverse soil and water impacts (see Project File: 2520/1920 memo dated 9/14/92 to Michael Schrotz, District Ranger, on the North French Hollow III Timber Sale; 2520/2431 memo dated 10/21/94 to Paul Lundberg, District Ranger, on the Voter Brook Sale Monitoring; and the Fish, Water and Soil Monitoring on Timber Sales form for the Lookout III Timber Sale dated 3/18/99 by Brad Bernardy). Past monitoring has shown that impacts can be kept to a minimum because

properly spaced water bars can effectively control erosion, and because of prohibitions on logging vehicles using the skid trails when ground conditions are wet. It was also found that erosion and sedimentation were more common on grades over 25 percent, and these grades should be avoided. Soil erosion and sedimentation for the proposed Old Joe harvest activities would be minor because skid trails have grades of less than 25 percent.

Some people are concerned the proposal to construct the 0.6 mile of cross-country ski trail adjacent to FR45 would have negative impacts to the soil, water and the small wetlands (see Issue 3). In fact, there would be no impacts to these resources. This is because no soil disturbance would take place (including in wetlands), so there would be no increased risk of erosion or stream sedimentation.

No Action Alternative

The No Action Alternative would have no adverse effects on the soil resource because there would be no soil disturbance, thus no increased risk of erosion and compaction. This alternative would have some beneficial effects because no biomass would be removed, so more plant material would be available for decomposition and incorporation into the soil. This would improve many soil conditions (including fertility, structure, moisture holding capacity) to varying degrees, depending on how long a period the project area remains unharvested.

This alternative would have minor adverse effects on the water resources because the stream habitat improvements would not be implemented. Not implementing the improvements would forego an opportunity to restore the stream ecosystem to a more natural state (based on historic data) by the addition of woody debris and pools (see Fisheries section for more detail discussion).

This alternative would have positive effects on the project area because there would be no increased risk of sedimentation (as compared to the Proposed Action), or potential changes in stream flow due to harvesting. These effects would be small because only minor sedimentation is expected with the Proposed Action, and the increases in stream flow due to harvesting would be less than 10 percent over a short period of 5-10 years (consultation with Pam Edwards, U.S. Forest Service, Northeastern Research Station, Parsons, WV).

The cross-country ski trail would not be built (relocated) under the No Action Alternative. As explained under the Proposed Action, there would be no ground disturbance needed to construct the trail and likewise, also no disturbance and no effect (negative or positive) from the No Action Alternative.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail

Alternative B would have greater adverse effects on the soil and water resources than the No Action Alternative, and less adverse effects than the Proposed Action. It would have less adverse effects than the Proposed Action because 94 fewer acres would be impacted by harvest in six less areas. Assuming the risk of erosion and sedimentation is

proportional to the acres undergoing harvest, the risk (in terms of magnitude and area impacted) of erosion and sedimentation would be approximately 30 percent less than for the Proposed Action. However this risk, even for the Proposed Action, would be minor. The same mitigation measures as described above for the Proposed Action would be applied for this alternative where applicable.

There would be no soil, water, or wetlands effect associated with the cross-country ski trail relocation since it would not be constructed under Alternative B (as similarly noted under the No Action Alternative).

Alternative C: Increased Early Successional Habitat

The adverse effects of implementing Alternative C would be greater than the other alternatives. As compared to the Proposed Action, six more acres (the increased size of clearcuts) would undergo harvest activities, as well as slight increases in the size of the group cuts in the single tree/group selection harvests. All harvests would make use of landing and skid trail systems similar in extent to the harvests of the Proposed Action. Assuming the risk of erosion and sedimentation is proportional to the acres undergoing harvest, the estimated risk of erosion and sedimentation would be 5-10 percent greater for Alternative C than for the Proposed Action. The same mitigation measures as described above for the Proposed Action would be applied for this alternative where applicable.

As stated for the Proposed Action, since there would be no earth disturbance for the ski trail relocation, there would be no adverse effects from this action to the soil, water, and wetland resources under Alternative C.

Cumulative Effects

The analysis area for the soil and water cumulative effects is the Chittenden Brook and Bingo Brook watersheds. Over the past 20 years, major factors affecting the soil and water components of the watershed ecosystems were timber harvest, road construction, recreational uses (camping, trail use), acid deposition, and heavy rainfalls. The latter two factors appear to have had only minor effects on the resources because streams are relatively stable with good water quality, and overall forest decline is not apparent in the middle and lower elevations of the watersheds (decline may indicate an adverse effect on the soil due to acid deposition). There are no known instances of excessive erosion, sedimentation, or destruction of wetlands associated with past harvesting or recreational use based on observations by the Soil Scientist and other specialists, on either public land or on the small non-industrial private lands in the immediate area. There are no industrial private timber lands in the project area.

The Proposed Action, including the ski trail relocation, the stream improvement projects, and the timber harvest, when implemented with Forest Plan standards and guidelines and mitigation measures, would result in only minor, acceptable adverse effects to the soil, water, and wetlands resources. There is no extraordinary action included with this proposal that would indicate otherwise, as shown through monitoring and extensive past experiences with similar actions. Thus, the Proposed Action would add little to the overall cumulative effects to the watersheds.

Since the adverse effects of the No Action Alternative and Alternative B are less than the Proposed Action, implementation of these Alternatives would also be minor. Impacts of Alternative C are slightly higher than the Proposed Action, but not high enough to result in an unacceptable adverse cumulative effect.

To date, there are only two instances where future timber harvest activities could affect the project area watersheds. The first is the North Half Overstory Removal (N1/2 OSR) Sale. This project is currently undergoing NEPA analysis. One harvest activity from this project would be near the Old Joe Project area, that being an 18-acre harvest to remove the overstory trees for stand 11 in Compartment 98. This stand is about 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit. The second is a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158, which would impact only about 8 acres. Based on monitoring and past experience, it is reasonable to believe that these similar future projects will likewise result in little adverse effects to soil, water, and wetland resources due to application of Forest Plan standards and guidelines and project mitigation measures and therefore add a negligible amount to the overall cumulative effect to the watersheds.

Therefore, based on the projected minor amount of impact from past, present (including this proposal), and reasonably foreseeable future actions on these lands, public or private, there would be no significant overall cumulative soil, water, and wetlands impact to the Chittenden Brook and Bingo Brook watersheds.

Table III-5: Soils of the Old Joe Project

Soils were identified based on field visit by the Soil Scientist to all proposed harvest units in the fall of 2001.

Compartment	Soil Type	Comments
Compartment 158 Stands 4, 14	Berkshire	Occasional rock outcrops and slopes of 40-50% in the higher elevations of both stands.
Stands 11, 15, 19	Berkshire, Tunbridge	Occasional rock outcrops in stand 11.
Compartment 118		
Stands 1, 18	Peru	
Stands 11, 12, 14	Berkshire, Tunbridge	Stand 12 has small areas with 40-50% slope, however most of these areas are to be excluded from the harvest unit. Stand 14 has occasional rock outcrops along its southern boundary (on a narrow ridge)
Compartment 125		
Stands 9, 19, 7 (western half)	Berkshire	Stand 19 had small areas of Tunbridge on slopes of 40-50%
Stands 21, 7 (eastern half)	Berkshire and Tunbridge	

FISHERIES

Affected Environment

The project area is drained by three perennial streams and is part of the White River watershed. The streams are characterized by having narrow, moderate to steep gradient channels containing boulders, rubble, gravel and fine sands. Many of these materials are also transported downstream to lower gradient or valley bottom stream sections. Riffles and cascades are the pre-dominant habitat types but are interspersed with pools and swift flowing runs as the streams descend in elevation.

Bingo Brook supports both resident and anadromous fish. Resident fish species include brook, brown, and rainbow trout, Longnose dace, Blacknose dace, and Slimy sculpin. Anadromous Atlantic salmon were reintroduced into the stream in the mid-1980. Salmon fry are stocked each year from the confluence with Falls Brook downstream to its junction with Brandon Brook. Population monitoring is conducted annually at specific

site(s) to determine juvenile salmon and trout abundance and to estimate the number of salmon smolts that will be expected to emigrate from the stream to the Atlantic Ocean the following spring. Over the past ten years, the abundance of juvenile salmon per mile of stream has ranged from a low of 146 in year 2000 to a high of 1452 in 1992.

Bingo Brook is also located along FR42 and is a locally popular trout stream. A natural reproducing population of brook and rainbow trout exists but in relatively low numbers. Occasionally, wild brown trout spawn in the stream. Water quality in Bingo Brook is good. Stream surveys conducted in the late 1980's and early 1990's indicated several habitat limitations including the lack of sufficient pool habitat and in-stream cover provided by woody debris and trees.

Observations in Joe Smith Brook indicate that brook trout are the only fish species found in this stream. Wild brook trout and a few rainbow trout were observed in Chittenden Brook. The low species diversity found in these streams is natural and typical for high elevation streams on the Forest and elsewhere in Vermont.

Environmental Effects

Relationship to Issues

None of the issues that help drive the analysis are directly related to the fisheries resource, and therefore, will not be part of the discussion below.

Proposed Action

It is important to note that the standards and guidelines and the mitigation measures identified in the soil, water, and wetland resources effects section of this document would be implemented and would work to protect fisheries resources as well. Those measures are not repeated here. In addition, all standards and guidelines in the Forest Plan for protection of fisheries and riparian resources would be implemented. The most important standards and guidelines for this sale are:

- Stream filterstrip guidelines to keep harvest activities away from streams, preventing sedimentation and degradation of fish spawning and rearing habitats.
- Protecting habitat quality by providing a vegetative canopy over the stream for maintaining desirable stream temperatures.
- Retaining large diameter trees in the riparian area for future recruitment of large woody debris to the stream channel for habitat diversity
- Maintaining fish passage in perennial streams where stream crossings are proposed.

A timber harvest Sale Administrator would also visit the sale periodically to assure that standards and guidelines are implemented and are working to keep erosion and sedimentation from adversely affecting stream habitat, and would apply immediate corrective measures if problems were identified.

Based on this information, the effects of the timber harvesting associated with the Proposed Action on the riparian and fisheries resources would be minor because application of the standards and guidelines and the project mitigation measures would be effective in keeping erosion and sedimentation of aquatic habitats to an acceptable minimum while maintaining stream shading, future LWD recruitment potential, and fish passage. This is further supported by the disclosure presented in the Soil, Water, and Wetland Resources Effects section preceding this discussion. Since there would be no earth disturbance for the ski trail construction (relocation), there would be no adverse effects from this activity to the riparian and fisheries resources.

Regarding the stream habitat improvement activities, the placement of logs, trees, root wads, and other woody material would increase pool quality and quantity. For example, the total measured pool area of Chittenden Brook is less than 15 percent during critical summer and winter periods. The desired condition is a minimum of 30 percent, which illustrates a need for 50 percent more pool area than the current condition. Where pools are lacking and appropriate hydrologic and geomorphic conditions exist, woody material would be placed in a manner such that natural flows would enhance habitat through increased water depth, slower velocities, and shelter associated with the woody debris. These features provide critical habitat and refuge during high flows and droughts as well as the harsh winter season.

The woody material placed in the streams would come from upland sources away from the stream bank and riparian areas so as not to degrade the riparian zone. Fallen trees, sound dead material, and culls of various sizes would be used if available near project sites. The cutting of any live trees for placement in the stream would follow all Forest Plan standards and guidelines, including the recently revised standards and guidelines identified in the Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, and would adhere to the U.S. Fish & Wildlife Service's Biological Opinion issued in response to new information concerning Indiana bats. Trees would be taken over a widely scattered area surrounding the stream courses. Other sources of trees would include any suitable woody material the logger could leave from nearby harvest operations. About 60 to 65 logs, trees, and tree pieces from any of the above sources would be needed to meet the minimum guidelines for improving the pool habitat over the course of the 6,000 linear feet of stream (includes both streams) proposed for habitat improvement. Generally, the entire tree is utilized and placed in or near the stream channel. This action mimics a natural tree fall, which fits the riparian forest character of our stream environments.

Stream habitat restoration and improvement work would have a positive impact on fish and macroinvertebrate (aquatic insect) populations and habitats in Chittenden and Joe Smith Brooks. Since 1989, the Forest Service management and research personnel have monitored stream habitat restoration projects in nine streams Forest-wide to evaluate their effects on habitat, fish, and aquatic insects. The results of this work were presented

in the year 2000 Forest Plan Monitoring and Evaluation Report (U.S.D.A. Forest Service, 2001). This report is available in the project file, and can be obtained by calling the Forest Supervisor's Office in Rutland. The conclusions of the report state:

“Increased LWD loading in stream channels has resulted in significant changes in habitat structure; habitat changes associated with the addition of LWD into the stream ecosystem have also resulted in increased aquatic insect diversity and community structure; Fish populations have also responded favorably to the stream restoration projects; Increases in pool area, quality and frequency combined with LWD cover appear to be effective in eliciting a positive population response by stream fishes. These findings indicate that habitat restoration can have a beneficial affect on aquatic insects and fish communities.”

The activities proposed for Chittenden and Joe Smith Brooks would yield the same or very similar positive results as described above.

To minimize the risk of sediment entering the streams from disturbed areas within the stream habitat project sites, the following mitigation measure would be implemented:

-All equipment access points (for stream access by equipment) will be obliterated and vegetated (seeding, mulching, shrub/tree planting) immediately after project completion unless pre-project access existed.

Also, project interpretation signs may be used at current access sites for fisheries and watershed protection and restoration purposes.

No Action Alternative

The No Action Alternative would have no adverse effects on fisheries resources because there would be no ground disturbing activities for vegetation management and ski trail construction, and thus no increased risk of erosion and stream sedimentation, no loss of stream shading and LWD recruitment potential.

This alternative would have minor adverse effects on fisheries habitat and channel stability because the stream restoration and improvements would not be implemented. Joe Smith and Chittenden Brooks would continue to remain in a condition below habitat capabilities. The opportunity to restore the streams to a more natural state through the addition of woody material and pool habitat would be missed. Enhanced educational opportunities and public enjoyment of this resource including recreational fishing would also be diminished.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail
Alternative B would have overall less potential adverse effects on fisheries resources than the Proposed Action because of the reduced amount of harvest activities. Fewer trees and acres would be harvested in six less project sites (stands). Additionally, there would be no effect associated with the ski trail relocation since it would not be constructed

under Alternative B. This would result in an even lower risk of erosion and degradation of stream habitat from sedimentation than would be seen from the Proposed Action.

Stream habitat would be improved as described in the Proposed Action. The effects of those improvements would be the same for Alternative B.

Alternative C: Increased Early Successional Habitat

Alternative C would result in potentially greater adverse effects on fisheries resources than the other alternatives. This is because six more acres, including increased clear-cut sizes, would be harvested, although the harvesting would make use of landing and skid trail system identified in the Proposed Action. As a result, there is a slightly increased risk of erosion and stream sedimentation from more acres affected by timber harvesting. As stated for the Proposed Action, since there would be no earth disturbance for the ski trail relocation, there would be no adverse effects from this action to the riparian and fisheries resources.

Stream habitat would be improved as described in the Proposed Action. The effects of those improvements would be the same for Alternative C.

Cumulative Effects

The analysis area for the fisheries effects is the Bingo, Chittenden and Joe Smith Brook drainages. Degradation and loss of fisheries (stream) habitat is the most substantial resource concern to be evaluated.

Bingo, Chittenden and Joe Smith Brooks and their tributaries are forested and have little development. Streamside riparian vegetation is recovering from early 1900's logging and agricultural practices that left many riparian areas devoid of vegetation up to stream edges. These past practices reduced water quality and eliminated the function of riparian areas to provide shade and LWD to streams. Resultant effects included warming of stream temperatures, habitat degradation, and loss of habitat diversity and channel structural integrity. Today, after many decades of re-forestation, water quality has been restored and woody debris from riparian stands is beginning to deposit and accumulate in headwater streams. However, scientific information suggests that the lag time between forest recovery and LWD recovery including stream habitat, is still several decades away for New England streams. In other words, it will be some time yet before conditions are right for natural tree fall to be fully capable of supplying the necessary LWD.

Recent past logging and recreational uses, both on public land and on the small amount of non-industrial private lands nearby, have had only minor effects on the fisheries resources because the streams in this area are relatively stable, support continuous stream-side vegetative buffers, and are not subject to excessive stream sedimentation or habitat degradation. However, there has likely been in the past, and will continue to be in the future, some erosion and stream sedimentation occurring where gravel roads closely parallel streams in or near riparian areas. This results from road maintenance activities, the addition of more gravel, and routine use of the road.

The Proposed Action would have only minor adverse effect on fisheries and riparian resources due, as has been previously stated, to the implementation of Forest Plan standards and guidelines and project mitigation measures that have been proven to be effective (see also the Soil, Water, and Wetland Resources section above for further discussion on effectiveness monitoring of activities affecting soil, water, and streams).

Since the direct adverse effects of the No Action Alternative and Alternative B would be less than those of the Proposed Action, implementation of these alternatives would also result in little or no overall cumulative impact. The effects of Alternative C would be slightly higher than the Proposed Action, but not high enough to result in an unacceptable adverse cumulative effect.

To date, there are only two instances where future timber harvest activities could affect the project area drainages. The first is the North Half Overstory Removal (N1/2 OSR) Sale. This project is currently undergoing NEPA analysis. One harvest activity from this project would be near the Old Joe Project area, that being an 18-acre harvest to remove the overstory trees for stand 11 in Compartment 98. This stand is about 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit. The second is a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158, which would impact only about 8 acres. Based on monitoring and past experience, it is reasonable to believe that these similar future projects will likewise result in little adverse effects due to application of Forest Plan standards and guidelines and project mitigation measures, and therefore add a negligible amount to the overall cumulative effect to the drainages.

Therefore, based on the minor amount of impact from past, present (including this proposal), and reasonably foreseeable future actions on all nearby lands, public or private, there would be no significant overall cumulative impact to the fisheries and stream habitat in the project area drainages for Chittenden, Joe Smith, and Bingo Brooks.

HERITAGE RESOURCES

Affected Environment

Little is known about the prehistoric significance of the area and no prehistoric sites have been located to date, although the Bingo drainage has several high potential areas outside the project boundaries. Specific activity areas within the proposed project do not have high potential for containing prehistoric sites. Portions of the Old Joe Project Area were extensively farmed and virtually all of it was logged during the late 18th, 19th and early 20th centuries. Archaeological evidence of this past land use (e.g., cellar holes, stone walls, mill sites, check/crib dams) occurs around and within the project area, with a greater density of sites in the northern (Bingo Brook) portion of the project area. The relatively young, re-growth forest cover testifies to the historically recent intensive use of this landscape.

Specifically, the archaeological remains of two historic farmsteads (Forest Service site numbers Rhr-027.01 and -027.02) are located in compartment 158, near but outside of

proposed activity areas. Evidence of a mill lies along Chittenden Brook, in or just adjacent to compartment 125, but outside the project area. The remains of a turn-of-the-century log/crib impoundment dam, used for winter stockpiling of logs in anticipation of spring-time log drives, lies in the bottom of Chittenden Brook, due west of compartment 125, stand 9, but north of the proposed stream/fish habitat work.

A Heritage Resource Reconnaissance Report (#05-93-02) was completed for the original project area in 1993. It was reviewed and updated to include the expanded project scope in 1997 and again in 1998. Field validation of these surveys/reviews was conducted in 2001. Reviews have been conducted for all portions of the proposed actions including the timber harvest activities, the cross-country ski trail relocation, and the fisheries/stream habitat improvement project. Project information was shared with the Abenaki Tribal Council's Forest Service liaisons, and the State Historic Preservation Office concurs with our findings.

Relationship to Issues

None of the issues that help drive the analysis are directly related to heritage resources, and therefore, will not be part of the discussion below.

Proposed Action

Three specific sites of concern have been identified for protection. The following mitigation would be applied to assure that no adverse effects result from implementation of the proposed activities:

- (1) The two historic sites in compartment 158 (one each in/near stands 4 and 14) will have well-marked buffer zones around them, be located on the Timber Sale map, and be brought to the attention of the contractor/operator. The nature of the site marking (e.g., flags, paint, snow fencing) will be determined by the Sale Administrator in consultation with the Forest Archaeologist prior to the beginning of the project. The method may vary depending on the season of operation, visual/aesthetic considerations, and the size of area.
- (2) The area for locating the new landing along Bingo Brook Road/FR42 has been reviewed and approved by the Forest Archaeologist. Should it be necessary to slightly relocate that landing or expand any of existing landings along FR42, these adjustments should be reviewed with the Forest Archaeologist prior to the start of the project to ensure that they are not encroaching on any heritage resource sites.

No Action Alternative

The No Action Alternative would have no effect on heritage resources.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail;

Alternative C: Increased Early Successional Habitat

Since the same areas of concern regarding heritage resources would be impacted by Alternatives B and C, as for the Proposed Action, the mitigation measures noted above would be applied for these alternatives, resulting in no adverse effects.

Cumulative Effect

Monitoring results from past timber sales on the GMNF indicate that the recommended mitigation measures are effective in providing protection to heritage sites. In 1998 we completed a monitoring study of 14 timber sales conducted on the north half of the Green Mountain National Forest. Each of the sample sales had at least one heritage site identified within the project's Area of Potential Effect. Direct site impacts were anticipated to occur primarily from logging machinery, and skid road and landing construction and use. Our conclusion was that of the 94 total sites identified in these projects, all but two were protected from impact, primarily through the implementation of "buffering" mitigation measures. Disturbance to the two other sites was due to a lack of communication – not a lack of effectiveness of the mitigation measures when implemented. There is no evidence of damage to heritage sites in or near the Old Joe project area as a result of past similar Forest Service actions, such as timber sales.

As stated above, neither the direct actions in the Old Joe proposal or indirect/secondary actions (e.g., use of the transportation system) will produce an adverse effect to heritage resources given implementation of the mitigation measures.

Based on monitoring and past experience, it is reasonable to believe similar projects in the future will have similar effects to heritage resources. To date, there are only two instances where future timber harvest activities could affect the project area. The first is the North Half Overstory Removal (N1/2 OSR) Sale. One harvest activity from this project would be near the Old Joe Project area, that being an 18-acre harvest to remove the overstory trees for stand 11 in Compartment 98. This stand is about 1/2 to 3/4 of a mile away from the closest Old Joe harvest unit. The N1/2 OSR project is currently undergoing NEPA analysis, and includes a detailed heritage resource review. The second is a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158, which would impact only about 8 acres. That re-entry would more than likely make use of the landing sites along FR42 and require the same or similar mitigation, resulting in no adverse effect.

Therefore, with consideration of past, present (this proposal), and reasonably foreseeable future actions, there will be no significant adverse cumulative effects to heritage resources.

ECONOMIC ANALYSIS

The Forest Service Manual (FSM 1970.6) provide non-binding guidance as to the scope of economic analysis required in project decision making: "the responsible line officer

determines the scope, appropriate level, and complexity of economic and social analysis needed.” If a unit prepares an economic analysis, then one must be prepared and displayed for all alternatives (40 CFR 1502.23). NEPA regulations do not require a quantitative, monetary benefit-cost analysis. The disclosure of economic effects under NEPA is limited (40 CFR 1508.14).

Economic Conditions

The analysis area is located primarily in Washington and Rutland Counties, Vermont. From an economic and social standpoint, the analysis area is closely connected to the White River Valley, including, Hancock, Granville, Pittsfield and Stockbridge. Other towns outside the White River Valley, like Brandon, are affected as well, especially regarding wood products. Local tourism is based around destination resorts, motels, hotels, restaurants, stores and access to National Forest.

National Forest lands are an integral part of the economic life of local communities, as a destination point for outdoor recreation, as a scenic backdrop for commercial and recreation activities on private lands, and as employment opportunities in forest management and the wood product industries. Local employment is largely centered on retail and service sectors, through there is lesser but substantial employment in light manufacturing, construction and forest products industries.

Forest Plan direction is to identify opportunities for local communities to enhance self-sufficiency and stability. Timber harvesting has been an established economic activity in the Green Mountains. Under Forest Service administration, modern timber sale programs and timber stand management began in the 1950’s with the emergence of second growth forests that were extensively cutover around the turn of the century. Timber harvesting remains today as an important contributor to local economies in communities of the Green Mountain National Forest.

The following economic analysis has been prepared to display a comparison of key costs and benefits. It does not include all costs but only considers those commonly established cost factors that the Deciding Officer has deemed as useful criteria to compare alternatives and aid in the decision making process. At the request of the Deciding Officer, cost calculations are estimated and displayed from the NEPA decision point forward (i.e., when the decision to implement some alternative of the Old Joe Project is made), rather than also including those costs incurred prior to actually making the decision. As an example, the rather substantial cost of preparing the analysis documentation (the EA and associated documents) is not included in this economic analysis. The Quick-Silver Investment Analysis software and procedure was used with a discount rate of 4 percent. Further explanation of key factors is found in the footnotes following the table below.

Table III-6. Economic Benefits and Costs

BENEFITS /1	Proposed Action	No Action	Alternative B	Alternative C
Total Est. Volume (MBF)	904	0	596	989
Jobs Provided (person years)	32	0	22	36
25% Fund to Towns /4	\$ 76,936	0	\$ 50,435	\$ 85,061
Total Stumpage Revenues	\$307,742	0	\$201,739	\$340,242
COSTS /2				
Sale Administration	\$20,100	0	\$12,800	\$21,630
Sale Preparation	\$33,580	0	\$21,390	\$36,130
Trail Relocation	\$ 1,460	0	\$ 1,460	\$ 1,460
Cost of KV Fund Projects /3				
Site Preparation	\$19,950	0	\$16,485	\$20,580
Stocking Surveys	\$ 1,425	0	\$ 1,178	\$ 1,470
Cut Stems in WL Opening	\$ 525	0	\$ 525	\$ 525
Add LWD to streams, 20	\$ 6,800	0	\$ 6,800	\$ 6,800
TOTAL BENEFITS, COSTS, AND PRESENT NET VALUE AFTER DISCOUNTING				
TOTAL Benefits	\$307,742	0	\$201,739	\$340,242
TOTAL Costs	\$ 80,654	0	\$ 57,864	\$ 85,334
PRESENT NET VALUE	\$227,088	0	\$143,875	\$254,908

/1 Benefits listed are not a complete list of priced and non-priced benefits that may result of implementation of the alternatives. An estimate of revenues that could occur from the sale of wood products to the highest bidder was made. Estimates of the hardwood and softwood sawtimber and pulpwood volumes for the Proposed Action was estimated from existing documents. The estimated volume for each species and product group was then multiplied by the average prices paid for GMNF sawtimber and pulpwood on the stump in 2000. The amount calculated for the 25 Percent Fund estimate was made simply by determining 25 percent of the estimated stumpage revenues for each alternative. Job calculation is based on estimates provided by the State of Vermont that a 1 million board feet timber sale will yield 36 Vermont jobs. Such jobs consist only of “tree to board” processing of products, and do not include the jobs created from the actual application of lumber into finished wood products such as furniture, flooring or other items commonly used in homes or in home building.

/2 Costs were estimated from the most recent fiscal year 1998 Timber Sale Program Data for the Green Mountain National Forest and were prorated on a MBF (thousand board foot) basis for analysis.

/3 Knudsen-Vandenberg Funds are used for implementing SAI (Sale Area Improvement) Plans. The funds come from revenues generated from selling National Forest timber and are used to pay for work such as stocking surveys, reforestation, and fish habitat improvements. This timber money is used annually to help supplement other National Forest Program work in the sale area to help achieve multiple use management.

/4 The 25 Percent Fund is created from all revenues raised from activities on the National Forest. Activities such as special use permit fees paid by ski areas, revenues from selling timber, Christmas trees and fuelwood, and campground fees go into this fund. Towns receive payments from the 25 Percent Fund along with payments in lieu of taxes (PILT) depending on the acres of National Forest land occurring in the town. Under the Secure Schools Act of 1999, towns could choose to receive an annual 25 Percent Fund payment based on an average of the highest three years paid or stay with a payment that could fluctuate depending on the amount of revenues raised by the Forest Service in the areas listed above.

ENVIRONMENTAL JUSTICE

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Population and Low-income Populations,” mandates that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, policies, and activities on minority populations and low-income populations,” (Federal Order 12898, 2/11/94). Evidence shows that areas of low income or minority populations suffer a disproportionate risk of succumbing to adverse environmental conditions in their community. Some examples of this problem include toxic waste facilities, garbage disposal areas, or unmonitored factory dumping in impoverished, ethnic areas. In order to protect the rights and health of these populations, this Executive Order establishes, within the NEPA framework, a system to analyze the demographics of a proposed location.

Before a policy or proposal is instated, the proposed area must be checked to see whether it will disproportionately affect minority or low-income populations. The standards used to analyze a given location are as follows: if the demographics of a proposed location show a minority or low-income population greater than two times that of the state average, then that area is considered one of potential environmental injustice. If the demographics of a proposed location show a minority or low-income population greater, but not two times greater, than the state average and there are community-identified environmental justice related issues, the case should be identified and addressed as a potential environmental justice case. If the demographics of a proposed location demonstrate minority or low-income populations is equal to or less than that of the state average, then the area is not considered a potential for environmental injustice and there is no reason to disregard the proposal due to ethnic or financial discrimination.

Green Mountain National Forest Counties

The following tables compare the ethnic and income demographics for the counties within the Green Mountain National Forest to the Vermont state averages.

Table III-7. Ethnic Demographics for the Green Mountain National Forest Region /1.

County	%Native American	% African American	% Asian	% Hispanic
Addison	0.2	0.7	1	1
Bennington	0.1	0.5	0.8	0.9
Essex	0.3	0.2	0.2	0.6
Rutland	0.1	0.4	0.6	0.6
Washington	0.2	0.5	0.7	1.6
Windham	0.1	0.8	1	1
Windsor	0.2	0.4	0.8	0.7
Vermont State Average	0.3	0.6	0.9	1

/1 U.S. Bureau of the Census. 1998. U.S. Counties 1998. Available at <http://govinfo.library.orst.edu>. October 30, 2000.

The above display shows that none of the counties analyzed demonstrate ethnic populations greater than two times that of the state average. The percent Native American population in Essex County is equal to the state average, as is the percent Hispanic in Addison and Windham counties. In Addison and Windham counties, the percent African American and the percent Asian American are greater (but not two times greater) than the state average.

Table III-8. Income Demographics for the Green Mountain National Forest Region. 1/

County	% Below Poverty Level
Addison	12.2
Bennington	12.7
Essex	15.1
Rutland	12.7
Washington	11.2
Windham	12.1
Windsor	11.3
Vermont State Average	12.2

1/ U.S. Bureau of the Census. 1998. U.S. Counties 1998. Available at <http://govinfo.library.orst.edu>. October 30, 2000.

The counties analyzed in Table III-8 above do not portray income percentages greater than two times the state average. In Bennington, Essex, and Rutland counties, the income percentages are greater, but not two times greater than the state average.

In conclusion, the counties within the Green Mountain National Forest do not demonstrate ethnic nor income demographics two times greater than that of the state average. Most importantly, the Proposed Action and alternatives do not pose a disproportionately high and adverse environmental, human health, or social effect on these counties, and there are no known community-identified environmental justice related issues. The above conclusions are based on the effects disclosed in other portions of this Affected Environment and Environmental Effects Section.

C. COMPARISON OF IMPACTS BY ALTERNATIVE

Table III-9 presents a summary of environmental consequences anticipated for each alternative.

**Table III-9
Summary Comparison of Environmental Consequences by Alternative**

Resource	Alternative			
	Proposed Action (PA)	No Action	B	C
Recreation				
	Slight adverse impact on x-country skiers & winter-time visitors	No impact	Less impact than PA, particularly in MA 6.2A	Slightly greater impact than PA
Visual Quality				
	Slight adverse impact; mitigation would meet VQOs	No impact	Less impact than PA, particularly in regards to Long Trail	Slightly greater impact than PA
TES Plants				
	No listed T&E plants; minimal impact to marginal potential habitat for 7 sensitive plants	No impact	Same as PA	
TES Animals				
	No impacts; no known occurrences or critical habitat; mitigation recommended by F&WS for protection of potential summer habitat.			
Wildlife				
	Slight adverse impact (disturbance) to reclusive species. Positive impact to species dependent on early successional habitat	No disturbance impact; slight adverse impact on species dependent on early successional habitat	Only slightly less impact, both positive and negative, than PA	Disturbance impacts similar to PA; greater positive impact to species dependent on early successional habitat.
Resource	Alternative			

Old Joe Project Revised Environmental Assessment

	Proposed Action (PA)	No Action	B	C
Vegetation Management				
	Positive impact in moving toward Forest vegetative composition goals; increase species diversity	Adverse impact No improvement in species composition or diversity	Less positive impact than PA	Greater positive impact than PA; more early successional habitat; more species diversity
MIS				
	For the majority of MIS, there are no impacts; some minor localized impacts (positive and negative) to certain individual species at the project and analysis area level; no measurable impact to long term population trends at the Forest, State, or northern New England regional level.			
Soil, Water, Wetlands				
	Minor adverse impacts with application of mitigation measures	No adverse impact; slight positive impact	Less adverse impacts than PA	Slightly greater adverse impacts than PA
Fisheries				
	Very minimal adverse impacts with application of mitigation measures; high beneficial impact to stream habitat	No adverse impact; negative impact to stream habitat	Same as PA	
Heritage Resources				
	No adverse impacts with application of mitigation measures	No impact	Same as PA	

IV. CONSULTATION AND COORDINATION

A. U.S. FOREST SERVICE PARTICIPATION

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

Steve Kimball	Deciding Officer
Bob Bayer	NEPA Coordinator and Project Leader
Diane Burbank	Forest Ecologist/Botanist
Mary Beth Deller	Botanist
Nancy Burt	Forest Soil and Air Scientist
Chris Casey	Silviculturist
Bill Culpepper	Forester
Clayton Grove	Forest Wildlife Biologist
Dave Lacy	Forest Archaeologist
Steve Roy	Fishery Biologist
Donna Marks	Landscape Architect
Frank Thompson	Forest Technician
Mike Burbank	Forest/Wildlife Technician
Dick Gaiotti	Forest Technician
Tom Paquette	Recreation Technician
J. Michael Vasievich	Natural Resource Information System, R9

B. OTHER GOVERNMENT AGENCIES AND NATIVE AMERICAN TRIBES CONTACTED

U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
Vermont Department of Fish and Wildlife, Wildlife Program
Vermont Department of Fish and Wildlife, Nongame and Natural Heritage Program
Vermont Institute of Natural Science
Abenaki Nation, Mississquoi Tribe
Vermont Department of Commerce and Community Development, Division for Historic Preservation, State Historic Preservation Office

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Appendix A

List of Public Comments from February, 1998 Initial Scoping

Each response received during the environmental analysis scoping process was reviewed to identify specific comments, issues and concerns. This appendix contains a listing of those comments in the respondent's own words. Following each comment is a response as to how the comment was addressed. Comments are grouped by subject matter.

Group 1: Vegetation Management

G1-1: Logging in this area will continue to destroy soil, water, wildlife, fish, plant, recreation, scenic and roadless areas....

There is no evidence to suggest that recent management and logging in this area has destroyed any of these resources. Indeed, there is evidence to the contrary. The area has recovered significantly since the days when the area was over cut and log drives occurred on the local streams. This occurred before the Forest Service managed the land. Under National Forest management, soils are stable and productivity is maintained, water quality is high, wildlife and fish populations are healthy and diverse, recreation use is high, timber quality and quantity has increased and the scenery has been enhanced and is more natural appearing. These resources would not be negatively impacted by the proposed action and alternatives. See the Affected Environment and Environmental Effects section and Appendix C, Mitigation Measures, which disclose the effects the proposed action and alternatives would have on these resources, as well the mitigation measures that would be applied to protect them.

G1-2: May I suggest that this project area be managed as a fish wildlife plant habitat sanctuary, and with no development activities.

This concept is considered under the No Action alternative, at least how this proposal would fit in with the suggested concept of no development or, as implied, no harvesting. If no vegetation or other resource management were to occur in this area, it would not meet the purpose and need (see Ch. 1, Purpose of and Need for Action), nor would it work toward the goals the public and the Forest Service set for management areas 2.1A, 4.1, and 6.2A as described in the Forest Plan. Further, it should be noted that approximately 62 percent of the Green Mountain National Forest already has been declared as not suitable for commercial timber harvesting activities, as some areas are congressionally declared wilderness areas, Forest Service designated special areas, or areas determined to be unsuitable for timber harvest due to erosive soils or steep slopes. Therefore, application of vegetation management activities for the purposes of improving wildlife habitat, recreation opportunities and producing high quality wood products can only occur on less than half of Green Mountain National Forest's total land base. The past investments made in this project area in forest management and road building, along with current Forest Plan direction, allow the area to be managed overall for timber production and recreational use.

G1-3: All old growth should be saved for an old growth preservation system.

There is no old growth being proposed to be cut nor is there any old growth in the area. See discussion above, G1-2. There are areas within this analysis area that are unsuitable for timber management. These areas are already on their way to become old growth areas.

G1-4: ...With the preservation of wetland and riparian areas, and to fully preserve all roadless areas.

Wetland and riparian areas would be protected (see the Affected Environment and Environmental Effects section and Appendix C, Mitigation Measures). Also, there are no roadless areas within the project area (see the Affected Environment and Environmental Effects section, under Recreation effects).

G1-5: I'm concerned about cumulative visual, recreational, soil, water and wetland impacts.

See the Affected Environment and Environmental Effects section and Appendix C, Mitigation Measures, of this EA for disclosure of impacts to visual, recreational, wetland, and soil and water resources, particularly the cumulative effects sections. The project file also contains data in regards to the impacts of the proposal on these and other resources.

G1-6: ...the project's overall shelterwood, clearcuts and openings would be visually and environmentally damaging and conflict with Ecosystem Management, goals and guidelines, public desires, and the FS's own early 90's declaration to reduce evenaged management.

Temporary (from shelterwood harvests and clearcuts) and permanent openings are part of Vermont's working landscape. In fact, they are an important part of our high quality scenery. The Forest Plan incorporated public concerns into the visual standards and guidelines, and these guidelines are followed for implementation of projects (see Forest Plan p. 4.47-4.53 for Visual Quality standards and guidelines). In addition, these openings are essential for the diversity of habitat needed by Vermont's plants and animals. Openings and early successional habitat are becoming known as the feature that our forested ecosystem is missing as Vermont becomes more forested.

G1-7: There is no need to remove storm damaged & unhealthy trees as they are an essential part of wildlife habitat.

Salvaging, or removing, some of these still-living but damaged trees is generally done to open up the canopy allowing more sunlight to reach the remaining desirable trees and provide them more growing space. These treatments also reduce the spread of insects and disease by removing trees that, due to the damage, are more susceptible to infestations, or are already infested. This results in improved stand composition and overall forest health. Salvaging such timber while it still has economic value allows that value to be captured and moved throughout the economy by providing jobs, income, and other economic values. In regards to the early 1998 ice storm, field checks have shown that little or no damage was done to the stands in the Old Joe project proposal. Therefore, while this proposal may take advantage of an opportunity to

remove some localized storm-damaged or unhealthy trees, there are many, many more in adjacent stands and nearby areas that will never be cut, and will provide essential wildlife values. Within the areas proposed for treatment, some dead, dying, unhealthy trees will be left according to Forest Plan wildlife habitat standards and guidelines to provide habitat values.

G1-8: I read the explanation of this project with its five components [as discussed in the original EA]. They all make sense except for "commercial management" as the National Forest is not a commercial entity.

Providing wood products and emphasizing production of high quality sawtimber are among the many goals stated in the Green Mountain National Forest Land Management Plan (pg. 4.08). One traditional method for meeting these goals is to offer timber for commercial sale (Forest Plan pg.4.59, A.3). This is consistent with the management direction for the MAs 2.1A, 4.1, and 6.2A.

G1-9: The deer winter habitat improvements on MA 4.1 look good but the clearcutting of six acres I would like to see in several small patches not one big clearcut...

Please note that clearcutting in MA 4.1 would occur on a total of 6 acres, in two patches, each 3 acres. This is done to space out the open areas and take advantage of opportunities to regenerate aspen.

G1-10: Your schedule for post harvest treatments I hope includes rehabilitating landings, logging roads, and trying to dispose of slash.

Our sale contracts require cleaning, grading and revegetating landings. Also, steep portions of skid trails and approaches to stream crossings are revegetated. Slash resulting from the harvest operations is usually left where it lies to provide important nutrient recycling and habitat to vertebrate and invertebrate species. In some instances to meet visual quality, slash is lopped and scattered to lie close to the ground so it decomposes faster and looks more natural.

G1-11: Green Mountain Forest Watch appreciates the project's extensive use of selective harvesting in place of a focus on evenaged management. Generally, the project seems to use appropriate management techniques for given management prescriptions. It also seems that the evenaged management is contained to smaller acreages, a positive feature from our perspective.

We appreciate Forest Watch's comments on the use of evenaged management. In our attempts to meet the desired future condition of the management areas and achieve desirable results in terms of species' response to harvest (silvicultural) treatments, we have tried to use appropriate methods and still address concerns over evenaged management. The two small clearcuts for example, are perhaps the only way to get adequate regeneration of aspen, a desirable yet uncommon species. Looking at enlarging those clearcuts in an alternative provides a way to contrast the results between the two different size harvests. The proposal takes advantage of the flexibility of using either evenaged or unevenaged treatments in the various management areas. In the case of one of the forest stands proposed for treatment (compartment 125, stand

7), earlier field prescriptions called for large clearcuts to regenerate the low quality stands. The Old Joe project proposes to use mainly unevenaged management (individual tree and group selection), along with a much reduced use of evenaged techniques (a small shelterwood), to treat that stand as a way to address concerns regarding clearcuts.

Group 2: Management Area 6.2A

G2-1: Why so much logging anyway in this recreation oriented, mainly 6.2 Chittenden Brook area? What sales occurred here and what were the results? Did they strictly adhere to 6.2 and other M.A. standards and guidelines?

See the Purpose Of and Need for Action, and the Proposed Action sections of this EA for a discussion on why this project is being proposed. The proposed timber harvest is intended to work toward Forest Plan vegetation goals for MA. 6.2A which emphasizes semi-primitive recreation while providing habitat for wildlife intolerant of people and wood products. The Campground I Timber Sale, located to the south of this project area, involved MAs 4.1 and 6.2. The purchaser defaulted on the sale and it was re-offered as the Campground II sale. The logging for this sale was completed in 1998. Mid point timber sale monitoring shows that standards and guidelines were followed, and no significant resource damage was noted during inspections. Additional post-sale monitoring is planned. All other sale work and post-sale work has been completed or will be completed by summer 1998 according to plans and guidelines.

G2-2: Green Mountain Forest Watch is troubled by one particular feature: the extensive use of lands in the 6.2A management area (129 of 247 acres, or slightly over 50%).

About 85,935 acres of the GMNF call for semi-primitive conditions, and of the various MAs that are in this category, MA 6.2A comprises 60,100 acres. Of all the acres that require semi-primitive conditions, approximately 64,657 are considered suitable for timber harvesting. From 1987, when the Forest Plan was approved, through September of 1997, the amount of commercial timber harvesting that has been done (i.e., timber already cut) or will (i.e., the amount of timber sold but not harvested yet) occur within semi-primitive areas only amounts to about 4,128 acres or 5 percent of these lands. Therefore, given that a purpose of MA 6.2A lands is to contribute habitat and wood products, the 128 acres of the Old Joe project proposed for harvest does not present an extensive use of MA 6.2A.

G2-3: The Green Mountain National Forest should be protected for the biological diversity it provides, including human intolerant animals.

The proposed activities meet Forest Plan direction for the management areas affected, including standards and guides related to biological diversity, species habitat, and ecological system integrity. The impacts of the proposal on human intolerant animals (reclusive species) were brought forward as an issue and are evaluated in the Affected Environment and Environmental Effects section of this EA.

G3: National Wild, Scenic and Recreational Rivers

G3-1: What's the hold up on designating these 9.4 areas into the National Rivers System? Please get on with it.

Data collection to determine potential eligibility began in 1996 but it is not yet complete for the project area. Eligibility studies on 38 significant streams identified in the Forest Plan are scheduled to be completed across the Forest over the next few years. Significant streams will be deemed "Eligible" if they are free flowing and have outstandingly remarkable characteristics.

Once eligibility studies are complete, suitability studies must be conducted on all eligible streams and rivers. Suitability studies consider public support, political sensitivity and other options for effectively protecting the outstandingly remarkable characteristics in determining if eligible streams should be designated. The Green Mountain National Forest has elected to do the suitability studies as part of Forest Plan revision because of the intensive public involvement process and land allocation (management area designation) issues that the studies could generate.

Group 4: Fisheries

G4-1: Be careful accessing the streams for fisheries projects so you don't create devegetated, compacted areas that invite inappropriate uses like parking and river bank camping.

Ongoing habitat restoration in Bingo and Brandon brooks over the past four years was conducted using heavy equipment to place large boulders and trees in the stream channel. All access points to the stream for those projects were obliterated and/or barricaded so that parking and camping would be discouraged in the riparian areas. Monitoring of those access points shows no new use occurring.

All stream restoration work proposed in this project would be conducted in Chittenden Brook and Joe Smith Brook using hand labor without heavy equipment. Therefore, no new stream access points will be created that would encourage inappropriate use of riparian areas.

G4-2: [Concern regarding] The activities for stream stabilization and fish habitat improvement.....

We have conducted extensive monitoring on the physical response to habitat restoration in several streams on the national Forest. We have on-going monitoring of trout population response in the West Branch of the White River, Bingo Brook and two areas in Brandon Brook. Our analysis, conducted in cooperation with Dartmouth College, showed a significant increase in adult trout populations in restored stream reaches. Although we do not plan to conduct pre- and post-restoration monitoring in Chittenden Brook, we do plan to continue the long-term monitoring in the West Branch, Bingo Brook and Brandon Brook.

Group 5: Visual Quality

G5-1: I'm concerned that the visual effects of harvesting along FR42 will be less than pleasing, especially the group selection areas and the new landings. ...The cutting would be disruptive, unsafe (especially hauling along FR42) and ugly. The landings are likely... to be used for parking, partying and trash dumping...

These concerns are addressed in the Affected Environment and Environmental Effects section. All operations would be kept safe, with particular attention paid to the interactions between cross-country skiers and loggers. Appropriate signing will be used to warn visitors of logging activity. Much previous experience has shown that measures taken to protect the public from logging operations does work. The nature of the logging is within the character of use for this MA and surrounding private lands. The landings would be blocked and revegetated to make them unusable for parking or camping. Follow-up monitoring will be designed to ensure that these measures succeed.

Group 6: Recreation

G6-1: Any illegal Mt. bike or ORV use in this area? I'm concerned they'll use the landings and new skid trails, ignoring signs and closures as they commonly do elsewhere. This could damage the area's natural and heritage resources.

Landings and skid trails would be closed to access after logging use with large earthen berms, boulders and/or logs and other debris, discouraging use by mountain bikes. ORV users, such as ATV riders and snowmobilers, look for long distance trails or loop opportunities. The several existing landings and skid trails near FR42 and FR45 have not seen ATV or snowmobile use in the past, as they are not connected with any ATV or snowmobile trail network. Mountain bikes are currently allowed on forest roads where and when vehicular traffic is allowed, such as FRs 42, 62, 45 and 142 in the sale area, as well as the Pine Brook Trail, known as Forest Trail 754, located near FR42. Illegal use would have to be dealt with by Forest Service law enforcement.

Group 7: Ski Trail

G7-1: Here is an example of logging taking precedence over recreation...the opposite of what you're supposed to do according to the Forest Plan. The new ski trail would not be necessary if you quit logging here and stopped plowing the roads.

Logging does not take precedence over recreation but is an activity that can and does occur concurrently with recreation across a variety of MAs to help meet the Desired Future Condition of the Forest Plan. Just like recreation management, timber management plays an important role in providing crucial goods and services to our country. In fact, the roads created for and by logging activities have historically formed the basis for much of the roaded recreation and trail use on this forest. The main transportation system for the forest has primarily been built with timber sale dollars. As use has grown, other resource concerns like protection of wildlife, and soil and water resources have grown too. This has resulted in very limited summer logging opportunities. As winter logging becomes more widespread, the challenge is to coordinate winter road use for logging with winter trail uses.

The multiple use nature of the National Forest indeed requires resources to share facilities and coexist. Both cross country skiing and logging access can and do occur on FR45. We would have to plow FR45 for about three winters for this project. When completed, the road will not be impacted by plowing for about ten years or more. Logging and recreation use both meet the management area's emphasis and Forest Plan direction.

G7-2: The cross country ski trail improvements look to me to be temporary at best. I think it would be more cost effective to find a more permanent solution to the relocation of this trail.

Actually, the ski trail proposal is intended to serve as a solution to a temporary, reoccurring situation. The goal is to create an alternate trail route, to be used only when logging operations are in progress. When the logging activity ends, the road will not plowed. All signs on the temporary trail would be removed and the trail would not be maintained. In the current situation, skiers must ski on a section of road (which is also used by logging trucks during logging operations) until they get up to the trailhead. Other locations for a bypass ski trail were considered but dropped, due to topographical limitations, such as long steep climbs, steep sidehills and proximity to the stream.

Group 8: Heritage Resources

G8-1: As far as heritage resources are concerned opening up these sites that will be uncovered during this project for educational purposes are a good idea, but I would also like to see archeological studies done of these sites and interpretive programs provided by the forest service of these sites.

It is not our intent to "uncover" any sites -- at least not in a physical sense -- as a by-product of the Proposed Project. Rather, our intent is to protect them from disturbance. Nevertheless, evaluation and interpretation of some of the many heritage sites on the Forest is an on-going goal of the Forest. The Forest Archaeologist does public outreach programs in local communities and would accept an invitation from the Rochester Historical Society to do so. We are also interested in developing Partnerships with archaeologists, universities, historical societies or others who would like to initiate research and interpretive efforts about the history of people and land-use on the National Forest.

Group 9: Skid Trails:

G9-1: Please do not add new skid trails. If the stands are not accessible to existing roads, don't cut them. Skid trails are destructive to forest soil and habitat.

Existing skid trails are always used as much as possible on GMNF timber sales. However, some new skid trails would be needed to access parts of the sale. In addition, short segments of existing skid trails would be relocated because they carry a high risk of erosion or sedimentation (for example a skid trail located close to a stream). Though new skid trails do produce an adverse effect to forest soils, our objective is always to minimize the number of skid trails, and locate, construct and maintain them in such a way to minimize harm to the soil. This concern is further addressed in the Affected

Environment and Environmental Effects section, Soil, Water and Wetland Resources, and in Appendix C, Mitigation Measures.

Group 10: General Comments, Concerns

G10-1: ...we ask that the no action alternative be considered on its own merits, as well as its merits relative to the other alternatives. Often the no action alternative is not carefully examined because it inevitably does not achieve identical results to the proposed action, nor on the same time frame.

The No Action alternative provides a baseline for comparing effects of all alternatives. Even though the No Action alternative rarely meets the purpose and need of the proposal, it does produce effects, and as such, presents a viable alternative for selection by the Deciding Officer.

G10-2: The Forest Service needs to examine and consider whether these [positive outcomes of the no action alternative] might not in fact serve the roles and goals of the Forest Plan as well or better than the immediate outcomes of the proposed action.

See the discussion in G10-1 above. Reference the descriptions of each of the alternatives, and the Affected Environment and Environmental Effects section, for discussion on effects and outcomes potentially produced by all the alternatives.

G10-3: The EA should examine the cumulative impacts of this extraction on recreational resources, interior forest habitat, and on the existence of natural areas throughout the entire Forest.

See the Affected Environment and Environmental Effects section for discussion regarding cumulative effects.

G10-4: Green Mountain Forest Watch appreciates the overall design of the project, and the scale. We believe that projects of this nature are more appropriate for the land being managed and the local industry being served by the project than large timber sales with an emphasis on evenaged management, or timber sales in remote areas. We hope that the sale, if necessary, could be offered in parts so as to be available to small local producers who might not otherwise be able to benefit due to the high up front costs of winning the contract.

The Forest Service appreciates the Green Mountain Forest Watch's support for the design and scale of the project. The Forest Timber Sale program tries to address sale size and the needs of local industry by offering small sales (less than 500 MBF), medium sales (greater than 500 MBF) and large sales (greater than 1,000 MBF, same as 1.0 MMBF). At the same time the Forest Timber Program has been criticized for being below cost. Our goal has been to increase revenues and reduce costs. Selling The Old Joe sale in one package, to the highest bidder, will maximize our revenues, and cost less and be more efficient than laying out, marking, preparing two or more small sale contracts and administering them. The Old Joe sale, itself, is expected to be a small to medium sale.

G10-5: The Vermont Federation of Sportmen's Clubs, Inc. fully supports the Old Joe Project proposed for National Forest System lands...We believe proposed actions are sound and necessary to achieve the project's purpose to move toward the desired condition for deer habitat, managed forests, improved stream and fish habitat and recreational opportunities.

This comment is noted.

G10-6: Thanks for sending the Old Joe Project scoping letter. As always, this is a well thought out project that is well within the direction provided by the Forest Plan.

Comment is noted.

Appendix B

List of Comments from June, 1998 EA for Public Comment

Of the 600 or so Old Joe Environmental Assessments (original EA for Public Comment) sent to those on the mailing list for this project, two responses were received, one from an individual and one from an environmental organization.

Both responses were reviewed to identify specific comments, issues and concerns. The comments did not lead to additional analysis, and hence changes to the Old Joe EA were not made. However, these comments, like those from the scoping of the original EA, are being considered as part of the revised analysis and EA. We have included the key points of the recipient's comments here in their words, and our responses to them. The complete text of all comments can be found in the Old Joe Project File.

Comments from 1st recipient of the pre-decisional EA mailing:

"The logging program increases the cost of water purification and filtration, decreases the value of private timberlands, unfairly competes against alternative fiber and building material businesses, increases wildfire risk, increases repair and maintenance costs for highways and public roads, and decreases the number of jobs in recreation, tourism, fisheries and alternative forest products."

Our monitoring results show that sedimentation due to logging on the Green Mountain National Forest is minimal. This is further supported by the effects analysis in the Old Joe EA, which states that the effects to water quality will be minor or non-existent due to the size and scope of the project and the application of mitigation measures. Specific issues pertaining to increased costs of water purification and filtration related to any specific GMNF project have not been raised by any town or municipality. In addition, surface waters in the Old Joe project area are not a drinking water source for local communities, thus water purification and filtration of these waters is not done.

Based on feedback we've heard from the Extension Service at University of Vermont, bidders, and private timberland owners (who often bid on our sales), the Green Mountain National Forest provides high quality sawtimber (the trees are larger and of better quality than those found on private lands) and therefore is not in competition with private timberland owners. Rather, the Green Mountain National Forest is generally thought of as demonstrating good management practices and working with others to maintain our working landscape. Whether our timber sales result in unfair competition against alternative fiber and building material businesses is not known, and given that it is a programmatic issue national in scale, it is beyond the scope of this analysis.

In response to the concern about the timber sale increasing the risk of wildfire, this is not a great concern on the Green Mountain National Forest due to our climatic conditions.

Long-term records show almost all wild fires in Vermont are started by escaped debris fires people set on their own property.

The concern about increases in repair and maintenance costs for highways and public roads had been raised in the past. As the wood industry is one of the largest industries in Vermont, logging trucks from National Forest, State, and private timber sales contribute to the need to repair and maintain roads and bridges. Logging trucks along with other trucks like milk tankers and heating oil trucks are a reality in our rural communities where people work with natural resources. To help offset this impact, the Forest Service is in many cases, a partner in cooperative road maintenance for many towns in Vermont. These towns also rely on our engineering expertise and gravel sources located on National Forest lands for road maintenance, and in recent times, for assistance in the repair of flood damage to town and Forest roads. In addition, many of the roads used daily by the public in Rochester and elsewhere on the Forest were created by and maintained with dollars budgeted to the timber program.

In response to the concern about decreasing the number of jobs in recreation, tourism, fisheries and alternative forest products, our analysis has shown that "project area recreational opportunities and any indirect economic returns will remain unchanged over time, and that this conclusion is based on previous timber sale harvests in the area and resultant recreational use prior to, during, and after timber harvest activities." While this is true for the Old Joe area itself, the positive effects of the forest-wide timber program on recreation have been greater.

Road based recreation accounts for about 99 percent of recreation visits nationally. The road system infrastructure provided by the GMNF timber program not only forms the basis for most Roded Natural Recreation opportunities such as sight-seeing and driving for pleasure, but it is used for hiking, biking, cross-country skiing, and snowmobiling. Many of these old roads now used as trails, either maintained or not maintained, also provide access to Semi-Primitive and Wilderness areas.

Further, GMNF recreation based jobs increase periodically. For example, in 1997 the forest saw a 40 percent increase in recreation based outfitter/guide special use permits. In another example of how the timber program helps fisheries jobs, the proposal will actually increase jobs in fisheries in that it calls for improvements in aquatic and fish habitat by the placement of large woody debris and about 20 structures. Some of this work, like other recent projects, will be contracted to local businesses.

"In addition, the ecosystem values of standing forests, especially native forests, including their value in providing clean water, mitigating floods, supporting recreation, hunting, fishing, and wildlife viewing, enhancing long term forest productivity, supplying alternative forest products, mitigating global warming, controlling agricultural pests and providing amenity values are systematically undervalued or not valued at all. For example, the Forest Service typically assigns zero economic value to "no action" alternatives in timber E.A.s or E.I.S.s, or no value at all. "

Based on the site specific analysis described in the Old Joe EA, the Proposed Action and the other action alternatives, B and C, will not cause significant environmental impacts. Therefore, the ecosystem service values will remain unaltered under these alternatives, as well as the No Action alternative. See also the economics effects section of the EA, which states that wildlife viewing and hunting opportunities will most likely increase under the action alternatives. Recreational use of the local Old Joe area will at least remain unchanged and probably will increase over time as trends indicate. Recent evidence shows new, young trees are effective in mitigating global warming through carbon sequestration. In regards to long-term productivity, the forest lands of the GMNF, as well as the rest of Vermont, are increasing in age and in area, and therefore overall fiber growth and productivity is increasing. The GMNF does provide an extensive range of amenity values, many of which can be attributed to the Old Joe project.

"The federal governmental has, in its possession, tools of economic analysis that enable project planners to estimate both adverse economic impacts as well as ecosystem values, and incorporate these estimates into E.A.s or E.I.S. so that realistic comparison between costs and benefits essential to fulfill the Forest Service's primary duty in management of Forest Service lands, namely, to maximize net public benefits. ...the Forest Service must adopt analysis techniques, such as the Natural Resource Damage Assessment techniques the federal government already applies in the context of Oil Spill litigation."

The development of timber sale programs and individual timber sales is guided by the National Forest Management Act (NFMA) regulations (36 CFR219) and agency direction found in Forest Service Manual (FSM) 2400. The preparation of NEPA documents is guided by, among other things, the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508).

It appears to us you are requesting a comprehensive benefit - cost analysis for this project, one that incorporates a monetary expression of all known market and non-market benefits and costs. Such an analysis is generally used when economic efficiency is the sole or primary criterion upon which a decision is made. The Forest Service does not endorse this use of economic efficiency analysis at the project level. The agency recognizes that many of the values associated with natural resource management are best handled apart from, but in conjunction with, a more limited benefit - cost framework. This concept is expressed in NFMA regulations (36 CFR 219). When discussing the evaluation of programmatic Forest Plan alternatives, the regulations state that the evaluation " shall compare present net value, social and economic impacts, outputs of goods and services and overall protection and enhancement of environmental resources" (26 CFR 219.12(h)). It is this process that results in a Forest plan that "maximizes long term net public benefits in an environmentally sound manner" (36 CFR 219.1). This approach is reasonable given the vast array of environmental and socioeconomic considerations in establishing a the Forest Land and Resource Management Plan, (i.e., the Forest Plan).

Once the Forest Plan is established, the timber sale program and individual timber sales are designed to accomplish the Plan's goals and objectives at the site-specific level. Economic efficiency again plays a role in the design and implementation of the program and individual sales, but within a more limiting context. FSM 2430.3 states this: "Operate timber sale programs and projects in the most cost efficient manner practicable within applicable standards and guidelines to achieve the objectives outlined in the Forest Plans." FSM 2403.2 focuses on individual sales by stating "Select, design, and implement timber project- level activities in an economically efficient manner, consistent with the objectives and guidance of the Forest Plan". Many of the same environmental and social considerations not included in Forest Plan economic efficiency determinations are also excluded at the timber sale program and project level as well, for the same reasons cited above. Thus, the timber sale program and projects like Old Joe do not use a fully comprehensive benefit-cost analysis as primary criterion for alternative selection, but subject the economic analysis to limits established at the discretion of the Deciding Officer.

Finally, NEPA regulations do not require a quantitative, monetary benefit-cost analysis. The disclosure of economic effects under NEPA is limited (40 CFR 1508.14). If a unit prepares an economic efficiency analysis, then one must be prepared and displayed for all alternatives (40 CFR 1502.23). The Forest Service Manual (FSM 1970.6) provide non-binding guidance as to the scope of economic analysis required in project decision making: "the responsible line officer determines the scope, appropriate level, and complexity of economic and social analysis needed." The analysis for the Old Joe project NEPA document (FSM 2432.22c) is prepared and displayed for all alternatives. The analysis follows the same format used in recent and similar EAs and provides useful criteria for the decision making process used by the Deciding Officer.

"We specifically request that the adverse external economic costs of logging in Compartments 118, 125 & 158 of the Rochester Ranger District, as well as ecosystem service values of standing forests be estimated in the final EA of the Old Joe Project using the latest quantitative techniques available."

For the reasons cited above, a quantitative, monetary benefit-cost analysis was not required nor completed for the Old Joe project.

"...the benefits associated with alternative uses of timber sale funds have not been evaluated on a project basis for the logging program as whole."

This is a programmatic concern and therefore, beyond the scope of this project. Congress appropriates funds for timber sales for the purpose of vegetation management to meet Forest Plan direction, which includes providing wood products and maintaining forest health through commercial timber sales. Using these funds for other purposes would be construed as a misappropriation of funds.

"We specifically request consideration of an alternative that will utilize available funds for this project to support the ecological restoration component of this itself,

without completing the commercial sale component. Such an alternative will improve ecological conditions, and leave the economic values of unlogged forests in Compartments 118, 125, & 158 of the Rochester Range District intact. Such an alternative will most likely maximize net public benefits in the Old Joe project."

The Purpose of and Need for Action section in the EA discusses the need to move toward the DFC for MA 2.1A, 4.1, 6.2A, and 9.4, following Forest Plan direction. Other than for the fisheries component, a need for other wide-spread, specific ecological restoration, or as in the case of the fisheries work, proposed activities that mimic natural restoration, as a way to move toward the DFCs, was not found. Therefore, an alternative of this nature will not be considered.

Page 4.59 of the Forest Plan discusses how timber can be cut and sold commercially to achieve desired non-priced benefits, even if this results in financial revenues falling below the financial costs. Page 4.60 of Plan specifically lists the non-priced benefits associated with timber sales, many of which Old Joe will produce. From the context and scale of the Old Joe project, using commercial harvesting as a tool to move toward the DFC and produce these non-priced benefits will most likely maximize net public benefits for the area.

Comments from 2nd recipient of the pre-decisional EA mailing:

"Logging and roading in this area will damage soil, water, wildlife, fish, plant and recreation resources."

Please refer to the Affected Environment and Environmental Effects section of the EA for discussion of impacts to resources which were determined to be minor and non-significant. Appendix C lists Mitigation Measure that would be applied, along with Forest plan standards and guidelines, to reduce impacts to acceptable levels.

"May I suggest that the following species habitats be managed as Sanctuary Areas; northern goshawk, eastern small footed bat, auricled tway blades, fishers, martin, lynx and Neotropical migratory songbirds.".. and to designate a minimum, 39 streams as National Wild and Scenic Rivers in this project are".

Establishing sanctuaries for these species in this area is not consistent with Forest Plan direction for the management areas in the Old Joe proposal, nor would this meet the purpose and need for the project. In addition, several of these species are not known to frequent the Old Joe area. Please see the Affected Environment and Environmental Effects section and also reference the response to a similar request in Appendix A, item G1-2.

Appendix C

Project Mitigation Measures

This appendix is intended to be a “pull-out” section, for use by timber sale administrators and other site inspectors, to have at hand the mitigation measures required during project implementation.

The Green Mountain National Forest Land and Resource Management Plan (Forest Plan) established standards and guidelines to mitigate potential adverse effects of management activities. Forest-wide standards and guidelines by resource area are found in the Forest Plan on pages 4.15-4.90. Standards and guidelines specific to each Management Area are found as follows: standards and guidelines for MA 2.1A are noted on pages 4.95-4.97; standards and guidelines for MA 4.1 are noted on pages 4.109-4.114; standards and guidelines for MA 6.2 are noted on pages 4.131-4.133 of the Forest Plan; and standards and guidelines for MA 9.4 are noted on pages 4.180-5 - 4.180-20. These standards and guidelines would apply to all alternatives.

Listed below, by resource area, are the specific mitigation measures that were created in response to issues and concerns associated with the Proposed Action and alternatives to it. Along with all appropriate standards and guidelines noted above, these mitigation measures would also apply to project implementation.

Furthermore, the project team members will work with the Silviculturist, timber sale marking crew, and sale administrator in the field to ensure that the mitigation measures, designs, contracts, and sale area improvement plans are incorporated in an appropriate manner. The timber sale administration would insure that contract provisions are followed during project implementation.

HERITAGE RESOURCES

- (1) The two historic sites in compartment 158 (one each in/near stands 4 and 14) will have well-marked buffer zones around them, be located on the Timber Sale map, and be brought to the attention of the contractor/operator. The nature of the site marking (e.g., flags, paint, snow fencing) will be determined by the Sale Administrator in consultation with the Forest Archaeologist prior to the beginning of the project. The method may vary depending on the season of operation, visual/aesthetic considerations, and the size of area.
- (2) The area for locating the new landing along Bingo Brook Road/FR42 has been reviewed and approved by the Forest Archaeologist. Should it be necessary to slightly relocate that landing or expand any of existing landings along FR42, these adjustments should be reviewed with the Forest Archaeologist prior to the start of the project to ensure that they are not encroaching on any heritage resource sites.

RECREATION RESOURCES

- (1) To reduce safety concerns of cross-country skiers encountering log trucks, warning signs would be posted for the duration of the timber sale, at the parking area at the beginning of FR45, and along the relocated ski trail just before it enters back onto the plowed road. Additional signs stating “Hauling Operations Under Way,” would be posted each day operators are present, and then removed as the loggers leave for the day.
- (2) To further reduce the potential for accidents, log trucks would be prohibited from operating on FR45 during weekends, holidays and after 5:00 pm on weekdays.

SOIL AND WATER RESOURCES

- 1) All harvest areas would be logged only in winter. Skidding and landing operations would be limited to the generally accepted winter logging period running from approximately December 1 through March 31, and when the soils are frozen or have an adequate cover of snow, so that compaction and rutting would be minimized.
- 2) Landing for Compartment 158, stand 4 – These actions would be implemented to minimize the risk of sediment from the landing getting into Bingo Brook:
 - a) Leave a 30 foot undisturbed buffer strip between the Bingo Brook Road and the landing, except at the short access road to the landing.
 - b) Maintain a snow or earthen berm between the landing and the small, ephemeral stream 30 to 50 feet east of the landing.
 - c) Hay bales would be placed, if needed, to prevent runoff from the landing from going into the Bingo Brook Road ditchline, which eventually empties into Bingo Brook.
- 3) Landing at Compartment 158, stand 14 – This landing is well drained but surrounded by poorly drained, wetland soils. To minimize adverse impacts to the wet areas, the skidder would cross the wetland at only one location, in the driest part of the wetland, at the west edge of the landing. The wetland soils at the crossing would also be strengthened using corduroy (logs placed perpendicular to the road).
- 4) Skid trail in stand Compartment 158, stand 4 –In order to address the steep sections of some of the skid trails in this unit, water bars on these sections would be spaced 50-75 feet apart instead of being normally spaced about 100-200 feet apart. Water bars would be installed before winter so they are better able to freeze up and maintain their shape during skidding. In addition, a water bar would be located just above each stream crossing, to divert water from the skid trail away from the stream.

- 5) Skid trail in stand Compartment 158, stand 4 – This skid trail would be relocated for approximately 150 feet, beginning right after the first stream crossing above the landing. The skid trail will be relocated further away from the stream to reduce the risk of sedimentation.
- 6) Compartment 125, landing at stand 1 – a 50 foot undisturbed buffer strip would be maintained between the small stream at the south edge of the landing and landing activities. A soil or snow berm in this location would be added to divert water away from the stream, if necessary, to prevent sedimentation. A box culvert would be used where this stream crosses the skid trail heading south of the landing.
- 7) Compartment 125 skidder bridges – bridges will be installed at skid trail stream crossings at the very eastern end of stand 9 (to access stand 19); and in stand 21, in two locations.
- 8) Compartment 125, stand 21 skid trail grades - The main skid trail through this stand also has grades of 15-25 percent over varying distances. As noted above for compartment 158, stand 4, water bars on the steep sections would be spaced more closely, about 50-75 feet apart instead of the normal spacing of about 100-200 feet apart, installed before the ground freezes, and installed above stream crossings so that water from the trail does not drain into streams.
- 9) Compartments 158 - stands 4, 11, 14, and 19; Compartment 125 - stand 19; and Compartment 118 – stand 12. In the few areas where there are 40-50 percent slopes, a dozer would be used to bunch trees and construct skid trails (unless waived by the Sale Administrator). Constructing excavated skid trails results allows for more effective control of water on the hillside by using water bars.
- 10) Use of existing skid trails – existing skid trails would be used wherever possible, rather than building new ones. This will minimize the need for new trails, and thus reduce the amount of new ground disturbance that would be needed to open up new trails.
- 11) Whole tree harvest would not be allowed. Leaving the tops and branches will help maintain long-term soil productivity and prevent erosion on steep slopes in the Old Joe project area.

VISUAL RESOURCES

- 1) Comp 125, stands 18 and 19: to best blend the harvest treatments to the landscape (Forest Plan pg 4.51), feather the seen area of the upper slope edges of these stands. Use the computer model titled “oldjoe – oldview2” that shows the specific locations.
- 2) Comp 158, stand 14: To further minimize evidence of timber harvest on FR 42, the Proposed Action and Alternatives B and C should include establishment of a no cut zone of at least 50 feet back from the road and require branches to be lopped and

- scattered in this roadside stand. Tree tops should be lopped and scattered to lie within three feet of the ground for the next 150 feet in, where visible from the road.
- 3) Comp 158, stand 4: Do not locate a group cut (as part of the individual tree/group selection unit) on the north end of Compartment 158, stand 4 where the landing and associated skid trail appear to run into the unit when viewed from FR42. The existing evergreen (conifer) stand, and the landing and skid trail to the north of stand 4, visually creates a dramatic cathedral effect. Placing a group cut in the center of this would focus attention on this cut area. Avoiding this area of the unit would provide a more natural appearing setting.
 - 4) Landings and associated skid trails would be closed to access after use by a combination of earthen berms, boulders, logs, and vegetation designed to blend with the surroundings. The sale administrator should consult with the Forest Landscape Architect to aid in design prior to the closures.

THREATENED, ENDANGERED, SENSITIVE SPECIES

- (1) To mitigate the possible loss of potentially suitable roost trees for Indiana bats, the Reasonable and Prudent Measures and Terms and Conditions found in the *Biological Opinion of the Effect of the Land and Resource Forest Management Plan and Other Activities on Threatened and Endangered Species in the Green Mountain National Forest and Incidental Take Statement* issued by the U.S. Fish and Wildlife Service on February 16, 2000 are to be followed. This is in accordance with direction found in the recently approved Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, September 11, 2001 (TES Forest Plan Amendment). New and revised Forest Plan standards and guidelines resulting from this amendment are to be applied to ensure that adequate numbers of potentially suitable roost trees will be retained in the project area.

At least five trees per acre, applied on a stand basis, are to be retained within the project area. The “leave” trees may be found among the harvest sites and among the remainder of the unharvested stand areas. They may be scattered over the entire area of the stands, or clumped where desirable, to provide the greatest potential benefit for roosting.

- (2) In order to eliminate or minimize damage to potential roosting habitat for Eastern small-footed bat, the Reasonable and Prudent Measures and Terms and Conditions found in the Biological Opinion (2/00) and the new and revised Forest Plan standards and guidelines are to be applied as described above for the Indiana bat.
- (3) Some potential exists that northern goshawk could nest in the project area. Those sites that deemed suitable for nesting in the project area should be surveyed at the appropriate season for nesting goshawks. If an occupied nest is located, follow procedures developed cooperatively with the U.S. Fish and Wildlife Service calling

for a six hundred and sixty foot radius zone of unaltered habitat around the nest site with an additional six hundred and sixty foot buffer area.

WILDLIFE RESOURCES

- (1) In order to address concerns regarding denning female bears with cubs, the following mitigation will be applied to the Old Joe project: In the rare case that a sow with cubs is disturbed by harvest operations and leaves the den, timber sale activities will cease. Restrictions to avoid the area at risk (den site) will be put into place to allow re-entry by the disturbed sow. Forest Service and State of Vermont Wildlife Biologists will work together closely to determine the length of time and size of area for which to restrict operations. Minimum time before allowing timber sale operations to resume would be two or three days to see if the sow will return to the den and to allow Biologists time to make a determination of further restrictions, both time and area. The maximum time of restriction could be the remainder of the winter harvest season.

- (2) Follow Forest Plan standards and guides for retention of mature beech trees that show signs of habitual bear use.

Appendix D Monitoring Plan

A monitoring plan has been developed to track implementation of the Old Joe Project. The actions below will be supplemented by others that are part of the normal monitoring processes that contribute to the GMNF's annual monitoring report.

Monitoring Actions for All Resource Areas

1) Monitoring of Standards and Guidelines, and Mitigation Measures

What: Monitor whether project mitigation measures and Forest Plan standards and guidelines are being implemented, and are meeting intended objectives.

Purpose: To verify whether resources are receiving good protection.

Frequency: Every 1-2 weeks while timber harvest is on going; conduct specialists review at conclusion of harvest operations.

Responsible Person: Timber Sale Administrator; Specialists as necessary during harvest; All Specialists upon conclusion of harvest activities.

Monitoring Techniques:

Take a list of applicable Forest Plan standards and guidelines, and a copy of Appendix C, Mitigation Measures, from the Old Joe Decision Notice to the timber sale area. Visually check to see if all measures are being implemented and are effective. Document the results.

Other Monitoring Actions Specific for Recreation Resources:

(1) Monitoring of Signing and Restrictions

What: Monitor effectiveness of signing and operating restrictions in providing a safe environment for cross-country skiers as referenced in the Recreation Effects section. Assure that signing is being maintained.

Purpose: To verify that safe conditions are maintained.

Frequency: Periodically while timber harvest is on going.

Responsible Person: Timber Sale Administrator, Recreation Specialist

Monitoring Techniques:

Site visits to look at effectiveness of the operating restrictions and of the signing used to warn cross-country skiers about on-going logging and truck traffic, and to alert truck drivers for possible encounters with skiers. Gather opinions from skiers and loggers as to need and effectiveness.

Other Monitoring Actions Specific for Visual Resources

(1) Monitoring of Visual Quality Objectives (VQO's)

What: Monitor Visual Quality Objectives referenced in the Visual Quality Effects section.

Purpose: To verify if the lands meet the Visual Quality Objectives (VQO's) determined for the sites.

Frequency: Monitor during leaf on and leaf off seasons as needed.

Responsible Person: Forest Landscape Architect

Monitoring Techniques:

Monitor during leaf on and leaf off seasons to determine if visual mitigation measures are followed, and if the lands meet the VQOs determined for the sites. Monitor views from Route 73, FR 42, FR 45, FR 115 and the Long Trail.

Other Monitoring Actions Specific for Threatened, Endangered, and Sensitive Plants:

(1) Monitoring of Cross-country Ski Trail and Nearby Wetland

What: Monitor wetland area near cross-country ski trail.

Purpose: Monitoring to confirm that wetlands were avoided during relocation of the cross-country ski trail.

Frequency: This should be done during and after construction of the trail.

Responsible Person: Trails personnel; Forest Botanist as needed

Monitoring Techniques:

Site inspection.

Other Monitoring Actions Specific for Threatened, Endangered, and Sensitive Animals:

(1) Monitoring for Goshawk Use

What: Survey for nesting goshawks.

Purpose: Investigate use of the project area by goshawks; ensure that proper mitigation is applied.

Frequency: Annually during the appropriate season.

Responsible Person: Wildlife Biologists

Monitoring Techniques:

Visual inspection; call and response procedure.

(2) Monitoring for Bat Retention Trees

What: Survey the project area for number and quality of roost trees.

Purpose: Determine that standards and guidelines from the Forest Plan TES amendment regarding roost tree retention are being followed, and that adequate numbers of roost trees are being left.

Frequency: During/after the timber sale has been marked and before harvest operations begin; annually after the close of the timber sale operating season.

Responsible Person: Timber Sale Administrator; Wildlife Biologists

Monitoring Techniques:

Combination of visual direct counts and re-visitation of established variable plots. Survey units during or after marking (i.e., before harvest operations begin) to validate that an adequate number of potential roost trees are delineated to be left. At the end of the timber sale operating season (annually), survey the harvested areas to see if retention guidelines have been met.

Other Monitoring Actions Specific for Soil, Water, and Wetlands Resources

(1) Monitoring of Water Quality and Macroinvertebrates

What: Water chemistry (including turbidity) and macroinvertebrate monitoring in Bingo and Chittenden Brooks

Purpose: To continue assessing overall stream health, and to see if the harvesting affects water quality or macroinvertebrate populations.

Frequency: Macroinvertebrate monitoring once per year in the fall. Water chemistry following heavy rainfall events while logging is on going.

Responsible Person: Soil and Water personnel

Monitoring Techniques: State of Vermont Water Quality Division protocols.

Other Monitoring Actions Specific for Fisheries:

(1) Monitoring of Fish Populations

What: Fish population monitoring in Bingo and Chittenden brooks.

Purpose: To assess changes in population abundance and trends; assess survival and growth of juvenile Atlantic salmon in Bingo Brook.

Frequency: Fish population monitoring in Bingo Brook once per year in late summer/early fall; every other year in Chittenden Brook during the same time period.

Responsible Persons: Fisheries personnel

Monitoring Technique:

Standard electro-fishing protocols and use of a Modified Zippin Removal Method for determining fish population estimates.

Other Monitoring Actions Specific for Heritage Resources

(1) Monitoring of Certain Measures

What: Monitor closely the following Heritage measures.

Purpose: To verify whether resources are being protected.

Frequency: Every 1-2 weeks while timber harvest is on going.

Responsible Person: Timber Sale Administrator, Archeologist as needed

Monitoring Techniques:

Answer the following questions and provide documentation:

1. Were the two sites in compartment 158 marked/buffered? **Y/N**
2. Was the Archaeologist involved in locating/designing the landing along FR42? **Y/N**
3. Were the sites protected from direct impact (e.g., skidders)? **Y/N; if no, describe and document**
4. Were the sites protected from indirect impacts (e.g., vandalism, collecting, erosion)? **Y/N; if no, describe and document**
5. Were there unanticipated effects to the site(s) from the project? **Y/N; if yes, describe**

Appendix E Biological Evaluation

***** EXECUTIVE SUMMARY - BIOLOGICAL EVALUATION *****

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Old Joe Project March, 2002

A Biological Evaluation (BE) was prepared for Threatened, Endangered, and Sensitive (TES) Species for the Old Joe Project, which is located on the Rochester Ranger District in the towns of Rochester (Windsor County) and Chittenden (Rutland County), Vermont. The full text follows this Executive Summary. The BE conducted a prefield analysis of available information, and, for animals, identified one Federally listed species (Indiana bat) and one Regionally Sensitive species (Eastern small-footed bat) as having potential or suitable habitat in the project area. None of the TES animal species are known to have documented occurrences within the project area, either currently or historically, and no critical habitat has been identified in the project area for any of those species.

Based upon the BE's analysis of effects, determinations were made that none of the Federally listed animal species tracked for the GMNF would be directly affected by the Proposed Action or its alternatives, due to lack of occurrences or critical habitat in the project area. In accordance with the Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, September 11, 2001 (TES Forest Plan Amendment), and the U.S. Fish & Wildlife Service's Biological Opinion, mitigation was recommended for Indiana bat to protect potential roosting trees that may occur in the project area. The BE also determined that although the project or alternatives may impact a portion of the suitable habitat (i.e., summer roost trees and rock outcrops) habitat for the one Sensitive species noted above, it will not likely contribute to a trend towards Federal listing or a loss of viability to the population or species. The mitigation described above for the Indiana bat will function equally as well for the Eastern small-footed bat to protect potential roost trees and rock outcrops suitable for summer roosting.

No Threatened or Endangered plants are listed for the GMNF. All plants evaluated are on the list of Regional Forester's Sensitive Species (RFSS). The analysis and field surveys found that no plants on the RFSS list are known to have documented occurrences within the project area, either currently or historically. Thus, determinations were made that none of the Federally listed plant species or RFSS listed plants would be directly affected by the Proposed Action or its alternatives and none of the proposed actions would likely contribute to a trend towards Federal listing or to a loss of population viability to any TES population or species.

**Biological Evaluation
for Threatened, Endangered, and Sensitive Species**

**Old Joe Project
Green Mountain National Forest
Rochester Ranger District**

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Biological Evaluation for Threatened, Endangered, and Sensitive Species Old Joe Project, March, 2002

Introduction

Purpose

The purpose of this document is to determine the effects of proposed land management activities on Threatened, Endangered, and Sensitive (TES) species within the Old Joe project area. Detailed information on the Proposed Action and alternatives, along with documentation of the Old Joe Project analysis, may be found in the Revised Environmental Assessment for the Old Joe Project, March 2002.

Document Structure

This document is organized in the following manner: Introduction; discussion of the Likelihood of Occurrence (LOO) for T&E species, followed by Sensitive species; Analysis of Effects for T&E animals, followed by Sensitive animals, followed by T&E Plants (none) and Sensitive Plants; Determination of Findings for T&E Species; Determination of Findings for Sensitive Species; and finally, a list of References.

Background and Information

Location for the proposed activities includes the towns of Rochester in Windsor County, and Chittenden in Rutland County, Vermont. The proposed activities consist of single tree and group selection harvesting in four stands of northern hardwoods for a total of 137 affected acres; single tree and group selection harvesting in one stand of mixed hardwoods and softwoods for a total of 16 affected acres; single tree and group selection harvesting in one stand of softwoods for 14 affected acres; thinning harvests in three stands of northern hardwoods for 62 affected acres; overstory removal harvests in four stands of northern hardwoods for 56 affected acres; delayed shelterwood harvest in a stand of northern hardwoods for 9 affected acres; shelterwood harvest in a stand of northern hardwoods for 8 affected acres; aspen clearcutting in two stands for 6 affected acres; and creation of a five-acre wildlife opening. In addition, stream habitat restoration work would occur along 3/4 mile of Chittenden Brook and 1/4 mile of Joe Smith Brook through the placement of large woody debris in the streams (a total of about 6,000 linear feet of streams), and about 0.6 miles of an existing cross-country ski trail would be relocated to move the trail off of Forest Road 45. The proposed activities would occur in portions of four Management Areas (MA) 2.1A, 4.1, and 6.2A, and 9.4.

Three alternatives to the Proposed Action, including the No Action Alternative, were developed to address issues and provide a range of alternative from which to compare effects.

To determine which TES species could be affected by the activities in the Proposed Action and alternatives, "Likelihood of Occurrence" (LOO) narratives and tables were completed for animals (narrative format) and plants (table format for the Regional

Forester's Sensitive Species list). All TES species tracked by the Green Mountain National Forest (GMNF) are listed along with their status and a brief description of habitat requirements. Information describing ranking criteria may be found at http://www.fs.fed.us/r9/wildlife/tes/tes_lists.htm#. These requirements are compared to existing habitat within the project area and existing data on species from Forest files, various field surveys in the project area, records of the Vermont Nongame and Natural Heritage Program (VNNHP), available research literature, and personal communication with TES specialists. This comparison is then used to determine the likelihood of occurrence for each TES species in the project area.

Plant and animal field surveys were conducted in the project area numerous times between 1993 and 2002 by various Forest Service Old Joe interdisciplinary team members and personnel from the Vermont Nongame and Natural Heritage Program. Documentation of these surveys can be found in the Old Joe project file.

LIKELIHOOD OF OCCURRENCE (LOO)

THREATENED/ENDANGERED SPECIES

Format: Name/Status/
Habitat/Green Mountain NF Distribution
LOO

BIRDS

Bald Eagle (*Haliaeetus leucocephalus*) - T/G4/N4B/E

Nests in tall trees or on cliffs near large rivers or lakes. Not known to nest in Vermont or the GMNF. Known to migrate through the Forest.

LOO: Unlikely; no nesting habitat adjacent to large water bodies within the project area.

MAMMALS

Gray Wolf (*Canus lupus*) - E/G4/N4/SH

Requires large tracts of wild lands in coniferous and mixed northern hardwoods/coniferous forest that have suitable numbers of available wild prey and low human densities. Not known to be present on the GMNF or in Vermont.

LOO: Unlikely; extirpated in the Northeast.

Eastern Cougar (*Felis concolor cougar*) - E/G5TH/NH/E

Requires large, remote hardwood or mixed forests with an availability of wild prey. Recently documented in northern Vermont in Orleans County and other non-confirmed sightings in other parts of the State. Not known to be present on the GMNF.

LOO: Unlikely; endangered in Vermont with recent isolated reports of occurrence outside the Forest.

Indiana Bat (*Myotis sodalis*) - E/G5/N2/E

For winter habitat, this bat hibernates in limestone caves or mines. For summer habitat, it roosts in trees with cavities or exfoliating bark. Riparian areas provide important foraging habitat and travel corridors. Surveys conducted in the spring and summer of 2001 found Indiana bats in the Champlain Valley and on the western edge of the GMNF. Previous surveys on the Forest between 660 feet and 2200 feet elevation did not find any Indiana bats. Radio telemetry work conducted in New York in 2001 revealed that some Indiana bats migrated to the Champlain Valley, Addison County, Vermont. Winter hibernacula surveys in 2002 found a number of Indiana bats in the Brandon Silver mine, approximately six miles from the project area. Further details on habitat needs and recent survey findings may be found under the Analysis of Effects section of this document.

LOO: Unlikely. This project is scheduled to be implemented during winter months (the hibernation period for Indiana bats); no winter habitat for Indiana bat is known within the project area. Possibility exists that Indiana bats could use the

project area during the non-hibernation period (summer); however, this possibility is limited by daytime temperatures that do not remain at 50 degrees or higher during the spring, high elevation, limited open lands within the project area, limited foraging areas, and high stand density.

Lynx (*Lynx canadensis*) - T/G4G5/N4?/E

Requires boreal (coniferous) forest and good snowshoe hare habitat. There are no known occurrences currently in Vermont or on the Forest, although known historically to have occurred on the Forest. Records indicate that historic occurrence was uncommon.

LOO: Unlikely; extensive boreal communities not present in the project area; abundant snowshoe hare population not known from project area.

PLANTS

No federally listed Threatened and Endangered plants are found on the GMNF.

SENSITIVE SPECIES

BIRDS

Peregrine Falcon (*Falco peregrinus*) - __/G4/N3/E

Requires high cliffs with clear views of surrounding areas for nesting. Can also be found nesting on buildings, bridges, or the ground. Known from cliff sites on the Forest in Addison and Rutland Counties. Historic occurrence on other cliff sites within the Forest are known.

LOO: Unlikely; no suitable nesting habitat within the project area.

Common Loon (*Gavia immer*) - __/G5/N4N5/

Large and small freshwater lakes both in open and densely forested areas for breeding. Wintering: coastal bays and inlets from Maritime Provinces south. Known in Rutland County on the Forest in 2001.

LOO: Unlikely; no suitable habitat within the project area.

Bicknell's Thrush (*Catharus bicknellii*) - __/G3G4/N3N4/S3B,SZN

Coniferous forests above 3000 feet; spruce-fir krummholtz. Known from Forest in Addison, Bennington, and Windham counties at high elevations.

LOO: Unlikely; project area not within high elevation/krummholtz zone.

MAMMALS

Eastern small-footed bat (*Myotis leibii*) - __/G3/N3/T

Requires caves, old buildings, mines, rock crevices, and hollow trees for roost sites. Will use aspen, conifers, upland openings, and wetlands, usually up to 2,000 feet elevation. Known from the only hibernaculum on the Forest in Windsor County in the town of Stockbridge. Summer habitat is poorly understood. Recent summer

surveys on the Forest and also adjacent to the Forest have not found any Eastern small-footed bats.

LOO: Unlikely; This project is scheduled to be implemented during winter months (the hibernation period for eastern small-footed bats); no winter habitat for eastern small-footed bat is known within the project area. Possibility exists that eastern small-footed bats could use rock crevices and hollow trees in the project area during the non-hibernation period (summer).

AMPHIBIANS

Jefferson Salamander (*Ambystoma jeffersonianum*) - __/G5/N5/S2

Requires undisturbed damp, shady deciduous or mixed woods, bottomlands, swamps, ravines, moist pastures, or lakeshores. Requires temporary pond for breeding period. Known in the Champlain Valley, western edge of the Forest in Bristol, VT.

LOO: Unlikely; not known to occur near the project area.

REPTILES

Wood Turtle (*Clemmys insculpta*) - __/G4/N4/S3

Requires slow moving meandering streams with sandy bottoms and overhanging alders. Moves from water sources during summer months to fields, woods, and roadsides. Not known in the project area.

LOO: Unlikely; not known to occur near the project area.

MOLLUSKS

Brook floater (*Alasmidonta varicosa*) - __/G3/N3/S1

Requires firmly-packed sand and gravel stream bottoms of small rivers and streams. Known from the West River in Windham County along the proclamation boundary of the Forest.

LOO: Unlikely; no streams with required substrates in the project area. Only occurrence far from project area.

Creek Heelsplitter (*Lasmigona compressa*) - __/G5/N5/

Known on Otter Creek headwaters in Mt. Tabor.

LOO: Unlikely; no sandy river banks in project area; only occurrence far from project area.

INVERTEBRATES

Black-tipped Darner (*Aeshna tuberculifera*) - __/G4/N4/S2/

Requires undisturbed damp, shady deciduous or mixed woods, bottomlands, swamps, ravines, moist pastures, or lakeshores. Requires temporary ponds for breeding period.

LOO: Unlikely; not known to occur near the project area.

Green-striped darner (*Aeshna verticalis*) - __/G5/N5/

Requires undisturbed damp, shady deciduous or mixed woods, bottomlands, swamps, ravines, moist pastures, or lakeshores. Requires temporary ponds for breeding period.

LOO: Unlikely; not known to occur near the project area.

Lilypad Clubtail (*Arigomphus furcifer*) - __/G5/N5/

Requires lily ponds for breeding.

LOO: Unlikely; no suitable habitat within the project area.

Superb Jewelwing (*Calopteryx amata*) - __/G5G4/N4

Requires cold clear streams.

LOO: Unlikely; not known to occur within or near the project area.

Cobblestone Tiger Beetle (*Cicindela marginipennis*) - __/G2/G3/N2/N3

Restricted to cobblestone islands and deltas in large rivers. In Vermont, known only from the Connecticut, Winooski and White rivers.

LOO: Unlikely; no suitable habitat within the project area.

Harpoon Clubtail (*Gomphus desertus*) - __/G4/N4

Requires streams and small rivers.

LOO: Unlikely; not known to occur within or near the project area.

Mustached Clubtail (*Gomphus adelphus*) __/G4/N4

Requires rocky streams.

LOO: Unlikely; known in the Deerfield River. Not known within the project area.

Southern Pygmy Clubtail (*Lanthus vernalis*) - __/G4/N4

Requires small cold brooks. Is also associated with brook trout streams.

LOO: Unlikely; known in Bourne Brook. Not known within the project area.

Amber-winged Spreadwing (*Lestes eurinus*) - __/G4/N4

Requires shrubby borders of bog ponds.

LOO: Unlikely; no suitable habitat within the project area.

Maine Snaketail (*Ophiogomphus mainensis*) - __/G5G4/N4

Needs small streams and sometimes will inhabit rivers.

LOO: Unlikely; Not known within the project area.

Ski-tailed Emerald Dragonfly (*Somatochlora elongata*) - __/G5/N5/S2

Requires marshy ponds.

LOO: Unlikely; not known within the project area.

Forcinate Emerald (*Somatochlora forcipata*) - __/G5/N4/S2

Requires small bog streams.

LOO: Unlikely; not known within the project area.

Ocellated Emerald (*Somatochlora minor*) - __/G5/N4/S2

Requires small slow flowing streams.

LOO: Unlikely; no suitable habitat within the project area.

Likelihood of Occurrence Table for Regional Forester’s Sensitive Plants

SPECIES	HABITAT REQUIREMENTS	EXTANT OR HISTORIC OCCURRENCES IN ANALYSIS AREA	HABITAT SUITABILITY OF ANALYSIS AREA	SURVEYS CONDUCTED IN ANALYSIS AREA	LIKELIHOOD OF OCCURRENCE DETERMINATION *
Agrostis mertensii Arctic bentgrass	Alpine meadows on mountaintops in northern Green Mountains; known on Forest only from Lincoln.	None	Not suitable; the project area is not this high in elevation	Not for this species	Unlikely
Aureolaria pedicularia Fernleaf yellow false-foxglove	Dry hills, woodland character – oaks in southern VT; known on Forest only from Salisbury.	None	Not suitable; the project area is neither in southern VT nor near Salisbury, and the forests are not oak woodlands – they are more basic northern hardwoods, quite moist in some places.	Not for this species	Unlikely
Blephilia hirsuta Hairy woodmint	Rich woodland seeps; the only two extant populations are associated with trailside seepy areas; often hidden under <i>Laportea</i> (nettles); associated with limy soils up to 2500' elevation; known in VT only from Forest, in Leicester and Chittenden.	None	Suitable habitat in some places	Yes	Possible, although none were found during field surveys
Calamagrostis stricta ssp. Inexpansa New England northern reed grass	Wet, seepy, limy cliffs, low elevation to subalpine in Green Mountains; possibly limy wetlands at base of limy cliff; known on Forest only from Salisbury.	None	Not suitable; there were no wet, seepy, limy cliffs found during field surveys.	Not for this species	Unlikely

Old Joe Project Revised Environmental Assessment

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Cardamine parviflora Small-flower bitter-cress	Dry, rocky, sometimes calcareous places at low-mid altitudes; known on Forest only from Rochester/Goshen.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely
Carex aestivalis Summer sedge	Rich-mesic rocky woods, mid-elevations in southern VT; known on Forest only from Woodford and Danby.	None	Suitable; there are somewhat rich-mesic rocky woods in the project area	Yes	Possible, although none were found during field surveys
Carex aquatilis Water sedge	Bogs, fens, wet meadows, pond margins throughout VT; known on Forest from Wallingford, Woodford, and Stamford.	None	Not suitable; we did not find these habitat types in the project area, and it is geographically distant from the known populations	Not for this species	Unlikely
Carex argyrantha Hay sedge	Limy cliffs and ledges in western VT; known on Forest only from Salisbury.	None	Not suitable; we did not find these habitat types in the project area, and this site is not in western Vermont	Not for this species	Unlikely
Carex atlantica Prickly bog sedge	Scattered bogs, wet meadows, pond margins of VT; known on Forest only from Sunderland.	None	Not suitable; we did not find these habitat types in the project area, and it is geographically distant from the known population on the Forest	Not for this species	Unlikely
Carex bigelowii Bigelow sedge	Alpine meadows of Green Mountains; known on Forest only from Lincoln.	None	Not suitable; the project area is not this high in elevation	Not for this species	Unlikely

Old Joe Project Revised Environmental Assessment

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Carex foenea (=aenea) Bronze sedge	Clearings, dry rocks of southern VT (<i>aenea</i>); open sands of western VT (<i>foenea</i>); known on Forest only from Salisbury.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely
Carex lenticularis Shore sedge	Wetlands, shallow marshes, pond margins; known on Forest from Danby, Wilmington, Stamford.	None	Not suitable; we did not find these habitat types in the project area, and it is geographically distant from the known populations on the Forest	Not for this species	Unlikely
Carex michauxiana Michaux sedge	Shallow and deep marshes associated with high elevation softwater ponds in southern Green Mountains; only known occurrences in VT on Forest, in Mount Tabor, Wallingford, Ripton.	None	Not suitable; we did not find these habitat types in the project area, and it is geographically distant from the known populations on the Forest	Not for this species	Unlikely
Carex schweinitzii Schweinitz's sedge	Calcareous swamps, wet meadows, low woods, wet ditches; Vermont Valley and Taconics – not known from Forest	None	Not suitable; we did not find these habitat types in the project area, and it is geographically distant from the known populations	Not for this species	Unlikely
Carex scirpoidea Bulrush sedge	High elevation calcareous cliffs scattered throughout VT; known on Forest only from Rochester/Goshen	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely

Old Joe Project Revised Environmental Assessment

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<p>Clematis occidentalis var. occidentalis (=verticillaris) Purple clematis</p>	<p>Dry limy woodlands with thin soil or exposed limestone ledges, generally in moderate or full sun, usually in oak woods, generally in western VT; known on Forest only from Hancock, historically from Salisbury/Ripton.</p>	<p>None</p>	<p>Not suitable; these woods are basic northern hardwoods, rather than oak, and the project is not in western VT</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Collinsonia canadensis Canadian horsebalm</p>	<p>Rich mesic woods, generally low elevation and southern VT; known on Forest only from Bristol.</p>	<p>None</p>	<p>Suitable</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>
<p>Conopholis americana Squaw-root</p>	<p>Dry open woods (dry oak-pine, and dry oak-red maple) in southern and western VT; known on Forest only from Salisbury and Leicester.</p>	<p>None</p>	<p>Not suitable; these woods are basic northern hardwoods, rather than oak, and the project is not in southern or western VT</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Cryptogramma stelleri Steller's cliffbrake</p>	<p>Shaded cold damp crevices of calcareous cliffs and rocks (limestone or limy schist), scattered throughout VT; known on Forest only from Hancock and Mt. Tabor; historic from Dover, Salisbury, Chittenden, and Granville.</p>	<p>None</p>	<p>Not suitable; these habitat types were not found in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>

Old Joe Project Revised Environmental Assessment

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<p>Cypripedium parviflorum var. parviflorum Small yellow ladyslipper</p>	<p>Limy swamps with conifers, mostly Champlain Valley and southwestern VT; known on Forest only from Goshen.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area, and project is not in the Champlain Valley or southwestern VT</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Cypripedium parviflorum var. pubescens Large yellow ladyslipper</p>	<p>Fertile, limy woods with rich, moist soil, under maples, mostly Champlain Valley and southwestern VT; known on Forest only from Salisbury</p>	<p>None</p>	<p>Marginally suitable in places</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>
<p>Cypripedium reginae Showy ladyslipper</p>	<p>Limy wetlands with conifers, including limy sphagnum bogs and fens, limy wooded conifer swamps, and limy shrub thickets adjacent to wooded swamps; low elevations, generally the big valleys (Champlain, Vermont, Connecticut) in VT; known on Forest only from Goshen, historic from Hancock.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area, and the project is not in these big valleys</p>	<p>Not for this species</p>	<p>Unlikely</p>

Old Joe Project Revised Environmental Assessment

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<p>Desmodium paniculatum Paniculate tick-trefoil</p>	<p>In VT, associated with dry, low altitude, open woods and woodlands, sometimes oakwoods, in VT on limestone or limy schists; generally Champlain Valley in VT; known on Forest only from Salisbury, historic also from Salisbury.</p>	<p>None</p>	<p>Not suitable; these woods are basic northern hardwoods, rather than oak, and the project is not in the Champlain Valley</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Draba arabisans Rock whitlow-grass</p>	<p>Cold limestone cliffs, often moist, in full sun or partial shade, in Vermont associated with Champlain Valley and other limestone areas; known on Forest only from Salisbury, also historic there.</p>	<p>None</p>	<p>Not suitable; we did not find this habitat type in the project area, and the project is not in the Champlain Valley</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Dryopteris filix-mas Male fern</p>	<p>Rich, cool woodlands over calcareous bedrock or other limy substrate, mostly between 1300-2300' elevation; in VT seemingly restricted to an area from Brandon to Woodstock; known on Forest only from Pomfret and Bridgewater.</p>	<p>None</p>	<p>Marginally suitable; there are somewhat rich, cool woods available, but the site location is not within the expected range of this species' distribution</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>

Old Joe Project Revised Environmental Assessment

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Eleocharis intermedia Matted spikerush	Muddy shores of ponds, scattered throughout VT, although only in circumneutral substrates on Forest; known on Forest only from Ripton and Wallingford.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely
Eupatorium purpureum Sweet joe-pye weed	Limy, moist woods in central and western VT; known on Forest only from Salisbury.	None	Marginally suitable; there are somewhat rich woods in places at this site	Yes	Possible, although none were found during field surveys
Geum laciniatum Rough avens	Rivershores, damp places, in western VT and tends to be in limy areas; known on Forest only from Ripton, associated with <i>Polemonium vanbruntiae</i> .	None	Not suitable; although the woods are moist in places, they are not good potential habitat for this species	Not for this species	Unlikely
Isoetes tuckermanii Tuckerman's quillwort	Shallow waters on sandy shores of softwater ponds, mostly southern Green Mountains; known on Forest only from Wallingford, historic from Stratton and Wilmington.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely
Isoetria verticillata Large whorled pogonia	Acidic, open woods at low elevation in western VT, generally in oak-hardwood forests on escarpment; known on Forest only from Salisbury and Leicester.	None	Not suitable; these woods are basic northern hardwoods, not oak, and are somewhat enriched; also, this site is not in western VT	Not for this species	Unlikely

Old Joe Project Revised Environmental Assessment

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Juglans cinerea Butternut	Well-drained, circumneutral, gravelly soils in coves, stream benches, terraces, and talus of rock ledges; sometimes dry soil of limestone origin; generally riparian and below 1500'; several sites on Forest.	None	Marginally suitable; the hardwoods are somewhat enriched in places	Yes	Possible, although none were found during field surveys
Juncus trifidus Highland rush	Alpine tundra and subalpine cliffs, limited to isolated sites in Green Mountains in VT; known on Forest only from Goshen/Rochester.	None	Not suitable; the project is not this high in elevation	Not for this species	Unlikely
Lespedeza hirta Hairy bush-clover	Dry open woodlands and openings, in southern and western VT; known on Forest only from Salisbury.	None	Not suitable; these woods are basic northern hardwoods, not dry woodlands, and the site is not in southern or western VT	Not for this species	Unlikely
Listera auriculata Auricled twayblade	Moist, sandy soils along streams with alder, or circumneutral mucky seeps; extant only from Warren off-Forest; historic from Hancock and Sunderland	None	Not suitable; the streams w/in the project area did not offer these specific microhabitats	Yes, to determine suitability of stream banks	Unlikely – not found during field surveys
Littorella uniflora American shore-grass	Shores or shallow water of ponds, both soft and moderately hard water, scattered in VT; known on Forest only from Wallingford and Mt. Tabor/Peru.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely

Old Joe Project Revised Environmental Assessment

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<p>Muhlenbergia uniflora Fall dropseed muhly</p>	<p>Wet meadows and shores; assumed to be more common, but undocumented, in VT; known on Forest only from Stratton, historic from Ripton.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Myriophyllum farwellii Farwell's water-milfoil</p>	<p>Softwater ponds, bog ponds, and slow streams, often at high elevations, southern and northern Green Mtns (not central); unconfirmed from Wallingford on Forest, and historic from Wallingford.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Myriophyllum humile Low water-milfoil</p>	<p>Mudflats of softwater ponds, bog ponds, southern Green Mountains; known on Forest only from Stratton, unconfirmed from Wallingford, on private within Forest in Woodford.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Panax quinquefolius Ginseng</p>	<p>Rich maple woods and coves, sheltered limestone soils with much humous, moist and in deep shade, scattered in VT; known on Forest from 9 stations.</p>	<p>None</p>	<p>Marginally suitable; the woods are somewhat enriched in places</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>

Old Joe Project Revised Environmental Assessment

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<p>Pellaea atropurpurea Purple-stemmed cliffbrake</p>	<p>Limestone outcrops (often sunny but occasionally in woodlands), generally west of Greens in VT; known on Forest only from Salisbury.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Peltandra virginica Green arrow-arum</p>	<p>Shallow water, mud in bogs or lakeshores, in southern and western VT; known from Forest only from Woodford/Stamford.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Phegopteris hexagonoptera Broad beech fern</p>	<p>Warm, rich maple or maple-oak woods, generally light, moist soils, on limestone, western VT and lower CT River Valley; known on Forest only from Leicester; historic from Salisbury.</p>	<p>None</p>	<p>Marginally suitable; the woods are somewhat enriched in places; however, this project site is not in western VT or the lower CT River Valley</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>
<p>Platanthera orbiculata Round-leaved orchis</p>	<p>Either fertile oak woods, usually limy, dry, and low elevation, OR boreal conifer woods, generally moist and mossy, up into subalpine, scattered in VT; known on Forest only in Granville and Leicester, with several Forest historic sites.</p>	<p>None</p>	<p>Marginally suitable; there are moist conifer woods available in some places</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>

Old Joe Project Revised Environmental Assessment

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<p>Polemonium vanbruntiae Eastern jacob's ladder</p>	<p>Wetlands and seeps, between 350'-1800' elevation; natural seeps circumneutral muck over sandy sediments; extant and extensive on Forest only in Ripton, Lincoln.</p>	<p>None</p>	<p>Not suitable; the moist woods at this site are not as open as this species apparently requires</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Potamogeton biculpatus Snail-seed pondweed</p>	<p>Acid waters, southern VT; known on Forest only from Stratton, also on private in proc. boundary in Jamaica.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Potamogeton confervoides Tuckerman's pondweed</p>	<p>Shallow water of isolated soft-water lakes, ponds, or shallow depressions; known from 7 ponds in Manchester District</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Potamogeton hillii Hill's pondweed</p>	<p>Small, cold, slow, highly alkaline streams and occasionally ponds; in association with limy bedrock, primarily Vermont Valley and Taconics; not known from Forest.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Prenanthes trifoliolata Three-leaved rattlesnake-root</p>	<p>Cliffs, open woods, only known on Forest and in VT from one site in Salisbury</p>	<p>None</p>	<p>Not suitable; the northern hardwoods at this site do not fit this description</p>	<p>Not for this species</p>	<p>Unlikely</p>

Old Joe Project Revised Environmental Assessment

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<p>Pyrola chlorantha (=virens) Green pyrola</p>	<p>Limy woods, moderate elevations, and limy swamps at lower elevations, scattered in VT; known on Forest only from Leicester.</p>	<p>None</p>	<p>Marginally suitable; the woods are somewhat enriched in places</p>	<p>Yes</p>	<p>Possible, although none were found during field surveys</p>
<p>Ribes triste Wild red currant</p>	<p>Limy softwood swamps, and subalpine woods and ravines, especially on lime, scattered in VT; known on Forest only from Goshen, historic from Wilmington, Mt. Tabor, and Stratton.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Saxifraga paniculata (=aizoon) White mountain saxifrage</p>	<p>Cold, high elevation limestone cliffs, only 5 isolated sites in VT; known on Forest only from Rochester/ Goshen.</p>	<p>None</p>	<p>Not suitable; the project is not high in elevation</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Scheuchzeria palustris <i>spp. americana</i> Pod-grass</p>	<p>Sphagnum bogs and boggy margins of ponds, often limy, primarily southern and western VT; known on Forest only from Winhall, several historic from Wallingford and Sunderland.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>

Old Joe Project Revised Environmental Assessment

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Scirpus subterminalis Incomplete bulrush	Softwater ponds and sphagnum bogs, to moderate elevations, scattered in VT; known on Forest only from Mt. Tabor/Peru, Jamaica on private within proc. bdry., and historic from Stratton.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely
Sedum rosea Roseroot stonecrop	Subalpine limestone cliffs and rocks, exposed or shaded, often wet, only known from two sites in VT, one on Forest in Rochester/ Goshen.	None	Not suitable; the project is not high in elevation	Not for this species	Unlikely
Selaginella rupestris Rock spikemoss	Dry, warm rocks, usually schist or quartzite, occasionally lime, in full sun or partial shade, generally low elevations in oak zone; mostly Champlain and lower CT River Valleys; known on Forest only from Wallingford, unconfirmed from Bristol, and historic from Salisbury.	None	Not suitable; we did not find these habitat types in the project area, and the site is not in these geographic regions	Not for this species	Unlikely
Sisyrinchium angustifolium Narrow blue-eyed grass	Wet meadows, low woods and thickets, damp shores, scattered in VT; known on Forest only from Lincoln.	None	Not suitable; we did not find these habitat types in the project area	Not for this species	Unlikely

Old Joe Project Revised Environmental Assessment

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<p>Sisyrinchium atlanticum Eastern blue-eyed grass</p>	<p>Meadows (damp or dry), swales, marshes, low woods, historic in southern VT; only extant station in VT is on Forest in Hancock, historic in Stratton.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Solidago squarrosa Stout goldenrod</p>	<p>Open to partial shade (e.g. woodlands), dry soil, convex landforms, or outcrops of weathered, disintegrating rocks (e.g. slates, sandstones, granites), scattered in VT; known on Forest only from Rochester/Goshen.</p>	<p>None</p>	<p>Not suitable; this site is not dry or convex</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Sorbus decora Northern mountain-ash</p>	<p>Subalpine woods, often with lime, generally in Green Mtns in VT; known on Forest from Rochester/Goshen Lincoln, Sherburne, and Mendon.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Sparganium fluctuans Floating bur-reed</p>	<p>Tannic water ponds scattered in VT; known on Forest from sites in Wallingford, Mt. Tabor, Weston, Peru, Sunderland, unconfirmed at Stamford and Woodford.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>

Old Joe Project Revised Environmental Assessment

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<p>Torreyochlo pallida (=Glyceria fernaldii) Fernald alkali grass</p>	<p>Pools, marshes bordering streams, floating bog mats on softwater ponds, scattered in VT; known on Forest only from Ripton and Sunderland.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Utricularia geminiscapa Hidden-fruited bladderwort</p>	<p>Softwater ponds, in Green Mountains; known on Forest from Sunderland, Winhall, on private within Proc. Bdry. in Woodford, Searsburg.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Utricularia resupinata Northeastern bladderwort</p>	<p>Sandy, muddy, or peaty shores of mountain softwater ponds, scattered in VT; known on Forest only from Stratton, historic from Jamaica.</p>	<p>None</p>	<p>Not suitable; we did not find these habitat types in the project area</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Uvularia perfoliata Perfoliate bellwort</p>	<p>Rich, dry, calcareous woodlands, generally in western VT; known on Forest only from Salisbury.</p>	<p>None</p>	<p>Not suitable; while the woods at this site do show some signs of enrichment, there are moist, not dry, and the site is not in western VT</p>	<p>Not for this species</p>	<p>Unlikely</p>
<p>Vaccinium uliginosum Alpine bilberry</p>	<p>Alpine and subalpine ledges, scattered on isolated mountain tops in northern VT; known on Forest only from Lincoln.</p>	<p>None</p>	<p>Unsuitable; the project area is not that high in elevation</p>	<p>Not for this species</p>	<p>Unlikely</p>

Old Joe Project Revised Environmental Assessment

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Woodsia glabella Smooth woodsia	Cold, limestone cliffs, partial sun or shade, often wet and sheltered; also in limy talus at top of ledges, scattered, isolated cliffs in VT; known on Forest only from Rochester/Goshen.	None	Unsuitable; we did not find these habitat types in the project area	Not for this species	Unlikely

*NOTE: Any species determined **unlikely** to occur in the analysis area is not carried forward into the effects analysis of the Biological Evaluation. The determination for these species is that the proposed action and alternatives **will not impact** these species, and therefore, will not threaten their viability on the GMNF, nor result in a trend towards Federal listing of these species.

Analysis of Effects Animals

Determinations made in the LOO table dictate the level of analysis for each of the animal TES species. Any species determined unlikely to occur in the project area was not carried forward into effects analysis, except the Indiana bat and the Eastern small-footed bat. The federally listed Indiana bat and the Regionally Sensitive species, the Eastern small-footed bat, have been identified as having potential or suitable habitat in the project area. The effects analysis will therefore focus on these species. Even though these two species were determined to be unlikely to occur, they were carried forward in the analysis so as to implement U.S. Fish and Wildlife Service recommendations for mitigation regarding protection of potential summer roost trees. An evaluation of direct, indirect, and cumulative effects for these species is documented below, with particular attention paid to the indirect impacts of proposed activities on habitat conditions, primarily foraging habitat and summer roost trees.

None of the TES species are known to have documented occurrences within the project area, either currently or historically.

Affected Environment

The affected environment for the analysis of effects, occurring in the Old Joe project area, includes riparian habitats and associated wetlands, coniferous and hardwood stands and large trees that are either hollow or have exfoliating bark.

Threatened and Endangered Species

*Indiana Bat (*Myotis sodalis*)*

Background, Habitat Needs

The Indiana bat is federally listed as endangered. Indiana bats are migratory and use considerably different winter and summer habitats. A detailed life history can be found in the U.S. Fish and Wildlife Recovery Plan (1999), Kiser et al. (2001), and LaVal and LaVal (1980). It is a winter hibernating mammal. Winter habitat includes limestone caves and mines with, preferably, forest habitat and riparian foraging habitat near cave entrances. In the summer, Indiana bats prefer woodlots, low woodlands, swamps, and field edges. In the central parts of summer range, Indiana and Ohio, a mix of woodlands and agricultural lands provides preferred foraging habitat. Central hardwoods, particularly shagbark hickory are preferred summer roost trees. Summer habitat includes trees with cavities or exfoliating bark used by the maternity colony, with riparian foraging areas nearby (Evans, 1988). Recent work in Vermont have found Indiana bats in habitats similar to those found in other parts of its range (Kiser et al. 2001). Solitary females or small maternity colonies bear young in hollow trees or under loose bark. Information about habitat utilization from 2001 in Vermont (17 samples) shows that the most frequently used species for roosting was shagbark hickory (41%), followed by red maple (17%), white pine (12%), white ash (12%), quaking aspen (6%), american elm (6%), white oak (6%). Of the seventeen roost trees listed above, 59% were dead and

41% were live. Indiana bats tend to forage in the foliage of crowns of trees, along the shores of rivers and lakes, along streams and other travel corridors, and over floodplains. Recent evidence indicates that reproductive females may also forage or roost outside the riparian areas (Tyrell and Brack, 1990).

There is one known bat hibernaculum occurring on the Green Mountain National Forest, the abandoned Greeley talc mine in the Town of Stockbridge, Vermont, seven miles southeast of the project location. Wintering populations of Indiana bats are not known to inhabit this mine.

Information about bat use of the Green Mountain National Forest during non-hibernation periods has shown that Indiana bats occupy small woodlots in the Champlain Valley (Kiser et al. 2001). One male Indiana bat occupied GMNF land on the western edge of the forest at 1,100 feet elevation. Other surveys conducted on the GMNF between 1998-2000 have not caught any Indiana bats.

As expected, increased woodland bat surveying and tracking during the past three years has started to uncover additional winter and summer areas. The Silver Mine in the town of Chittenden, Vermont (six miles west/southwest of the project location), was surveyed during fall swarming in September, 2001 and two male Indiana bats were caught during this survey. Winter hibernacula surveys in 2002 found 159 Indiana bats hibernating within this mine. Extensive wetlands, open agricultural lands, and some areas of oak-hickory-pine forests lie to the southwest, west, and northwest of this mine. The Old Joe project area, northeast of the mine, is outside the area of influence (five mile radius) of the Silver Mine. The Silver Mine and the project area are separated by a long continuous ridgeline that rises to over 3,000 feet elevation. It is unlikely that Indiana bats migrating from the Silver Mine would choose to navigate through the Green Mountains to the Old Joe project area, but instead would most likely settle in the much more suitable habitat of the Champlain Valley. As evidence of this, it was confirmed that one of the hibernating Indiana bats from the Silver Mine was caught and tagged in Salisbury, Vermont during the summer of 2001.

Environmental Effects

The Old Joe project area has no known mines or caves suitable for bat hibernation. The Proposed Action or any of the alternatives will therefore have no direct impact to hibernating Indiana bats. All timber harvesting activities will occur only in the winter, and therefore, would not directly impact Indiana bats in the summer months. The cutting of any trees for use in the stream habitat improvement project would follow the standards and guidelines of the TES Forest Plan Amendment decision and the Biological Opinion of the U.S. Fish and Wildlife Service, with appropriate consultation as needed, and therefore, would not directly impact Indiana bats. There would be no cutting of trees or ground disturbance for the proposed relocation of the cross-country ski trail, and thus, no impacts from that activity.

Indirect impacts to the species may result from timber harvesting activities affecting a portion of the summer habitat. The amount of available foraging habitat and the

availability of roost trees can be limiting factors in offering suitable summer habitat conditions for attracting Indiana bats.

One measureable habitat variable that can be used as an indicator of preferable foraging habitat is stand density as measured by the amount of crown closure. Romme et al. (1995) indicated that overstory canopy closure of 50 percent to 70 percent is optimum for Indiana bat foraging. Lower stand densities generally translates into greater open or semi-open conditions, which in turn means more ideal foraging conditions. Besides forested areas with these ideal canopy conditions, other areas that offer good foraging opportunities include early successional habitat, open and semi-open areas, travel corridors such as skid trails, riparian zones, and wetlands.

Proposed Action

There is considerable difference in the density of stands (canopy closure) that the Romme studies indicate as preferred foraging habitat, and the density of the stands within the Old Joe project area. With the exception of small areas such as existing roads and stream corridors, the vast majority of the forested habitat in the project area is estimated to be between 80 and 100 percent crown closure.

Of the 610 stand acres proposed for timber harvest treatments, 313 acres would be directly affected. The greatest changes in stand density would occur over approximately 62 acres of thinning and 17 acres of shelterwood harvests. Stand density changes to a lesser degree would occur over 167 acres of single tree and group selection harvests. Desirable open areas would be obtained by clearcutting six acres of aspen, creating a 5-acre wildlife opening, and completing the initial cut on 17 acres of shelterwood harvests. Fifty-six acres would have the overstory removed in the final stage of past shelterwood harvests, but the overstories of these stands are essentially mostly open already and little additional opening of the canopy would occur. A reduction of canopy closure to somewhere in the range of 50 to 70 percent would be more likely to occur in the thinning units and in sections of the selection units around the group cuts. Reductions in canopy closure to an open or semi-open condition would be obtained by the shelterwood harvests, the clearcuts, and the permanent opening creation. Open areas are important as travel corridors to facilitate movement and as sources of nocturnal insects that Indiana bats forage on. This is evidenced by the character of habitat where bats seemed to be found in the Champlain Valley region: wetlands and stream corridors, field edges, low woodlands, agricultural areas, and small woodlots bordered by fields and other open travelways.

The timber harvesting of the Proposed Action would open previously used, existing skid trails and landings, and may create new ones as needed. This would offer more opportunities for movement between roost sites, and for foraging. The infrequency of timber harvest entry on GMNF lands, including the Old Joe project area, has allowed skid trails to become overgrown over time, and thus not provide these opportunities. Some of the sites where known roosting has been observed frequently tend to be old roads and skid trails that are re-opened from the ground to the bottom of the surrounding canopy, or are opened from ground to sky.

To mitigate the possible loss of potentially suitable roost trees, the Reasonable and Prudent Measures and Terms and Conditions found in the *Biological Opinion of the Effect of the Land and Resource Forest Management Plan and Other Activities on Threatened and Endangered Species in the Green Mountain National Forest and Incidental Take Statement* issued by the U.S. Fish and Wildlife Service on February 16, 2000 would be followed. This is in accordance with direction found in the recently approved Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, September 11, 2001 (TES Forest Plan Amendment). New and revised Forest Plan standards and guidelines resulting from this amendment would be applied to ensure that adequate numbers of roost trees will be retained in the project area. This, in turn, would ensure that the availability of roost trees would not be a limiting factor in offering suitable habitat.

At least five trees per acre, applied on a stand basis, would be retained within the project area. The “leave” trees may be found among the harvest sites and among the remainder of the unharvested stand areas. They may be scattered over the entire area of the stands, or clumped where desirable, to provide the greatest potential benefit for roosting. Areas of the stands not affected by harvest provide an existing source of potentially suitable roost trees, and would also continue to age, thereby providing future potential roost trees.

From the summer of 2000 through January, 2002, surveys were conducted in the Old Joe project area in four overstory removal units (all of the proposed overstory removal units), three thinning units (all of the three proposed units), two individual tree and group selection units (two of the seven units proposed), and one shelterwood unit (one of the two shelterwood units proposed). Plots were taken within the cutting units (the affected acreage) to estimate the number of reserved trees, including those that would be suitable for roosting, that would be left after the harvesting is completed. The tallies ranged from 7 to 85 reserve trees per acre that would remain as potential roost trees. These estimates exceed the minimum number of reserve trees per acre (five) recommended by direction in the TES Forest Plan Amendment and the Biological Opinion (2/00) of the Fish and Wildlife Service. Visual observations made in the areas adjacent to the harvest units also showed a substantial number of potential roost trees. Roosting habitat would not be adversely impacted as a direct result of this project.

No Action Alternative

This alternative would maintain the area in its present condition. There would be no timber harvests. With the aging of the forested habitats, the occurrence of summer maternity roosts (large, hollow trees, snags; trees with exfoliating bark) would increase over time. This alternative would maintain all potential roost trees in their current condition and they would be available to bats until they become unsuitable (bark falls off), or the trees fall down. Although older trees in greater numbers would remain as potentially suitable roosting habitat in the No Action Alternative, other factors would continue to reduce the overall habitat suitable. Overstocked stands and overgrown skid

trails would restrict bat movement. Lack of openings in the crown canopy would not allow the sun to warm possible roost trees. The lack of open or semi-open areas, travel corridors, early successional habitat, and fields (edge habitat) would limit foraging opportunities. Feeding would have to occur above the canopy or be limited to Forest Roads 42 and 45 as well as the few wetland or open areas that exist. Stand density would increase throughout the project area, and would not achieve desirable crown closure.

As such, this alternative would not provide some of the conditions that have been observed at known Indiana bat roost sites, and the Old Joe project area may never fully attain the suitable habitat conditions for Indiana bats. Therefore, it is highly unlikely that Indiana bats would settle into the project area. The habitat needed to ensure the continued existence of the species would have to be found elsewhere.

Alternative B: No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail
Alternative B would affect 219 acres, about 94 acres less than the Proposed Action. This alternative would maintain more of the existing potential roost trees in their current condition, and they would be available to bats until they become unsuitable (bark falls off), or the trees fall down. With less acreage harvested than in the Proposed Action, more of the forested habitat would continue to age. This would most likely provide more potential roost trees in the future. At the same time, however, the forests would continue to have a more closed canopy condition than the Proposed Action, and less desirable open areas, including less re-opened and new skid trails. This would further inhibit movement by Indiana bats within the area, and provide less foraging areas. Overall stand densities would be greater under Alternative B, particularly in MA 6.2A. Under Alternative B, the project area would be less attractive to Indiana bats, and offer less suitable habitat than the Proposed Action.

The same mitigation measures and new and revised standards and guidelines for Indiana bats described in the Proposed Action, including measures to ensure that adequate numbers of potential roost trees would be reserved, would be applied for Alternative B.

Alternative C: Increased Early Successional Habitat

Alternative C would result in greater beneficial effects than either the Proposed Action, Alternative B, or the No Action Alternative. These benefits would be derived from having more and larger open areas, and less overall stand density. Six more acres would be affected on the stand basis, that being the larger clearcuts, but within stand attributes produced by this alternative would be different. Having larger group sizes from 3/4 to one acre in three of the individual tree/group selection harvests provides more open area and lower stand density, resulting in easier movement and more foraging opportunities. These three selection harvest sites were specifically picked for larger group sizes because of their proximity to existing foraging areas that lie close to stream riparian zones, and therefore, may provide even more foraging opportunities. Other effects such as those pertaining to roost trees, reserve trees, and re-opened skid trails and landings would be very similar to the effects produced by the Proposed Action.

Despite the greater beneficial effects produced by Alternative C, the overall impacts would not be substantial enough to create ideally suitable Indiana bat habitat, and therefore, would only be slightly more attractive to roaming bats.

The same mitigation measures and new and revised standards and guidelines for Indiana bats described in the Proposed Action, including measures to ensure that adequate numbers of potential roost trees would be reserved, would be applied for Alternative C.

Cumulative Effects

Past timber harvesting activities in or adjacent to the Old Joe project area, including those areas in the vicinity of the Silver Mine, have been very small in scale and have done little to increase suitable habitat for Indiana bats. The forest has been growing, stand densities have been increasing, and little early successional habitat or open areas have been created.

As has been described above, the proposed harvesting for the Old Joe Project would only slightly increase the amount of suitable habitat. None of the action alternatives would provide the habitat necessary to attract Indiana bats on a permanent basis.

Future harvests can be expected to be similar in size and scale to the Old Joe project. Other than the North Half Overstory Removal Sale (N1/2 OSR) on national forest land, the only other foreseeable future project would be a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158. This would impact only about eight acres, and since it would provide little or no additional open area, would have no impact. The N1/2 OSR sale is a proposed series of final harvests of past shelterwood sites and likewise, would result in no impact, positive or negative.

We can also expect some small scale future harvesting to occur on private lands. Only a small amount of private land lies within or close to the Old Joe project area, and most of these holdings are homes and small woodlots. There is no large industrial private timber lands in the project area. Any timber harvesting done on these small private lots would most likely be much less in size and scale than the Old Joe proposal, and therefore result in little or no measureable impact.

In conclusion, the overall cumulative effects on habitat conditions would show a continued decline in foraging habitat as the project area and nearby areas grow more forested with higher stand densities. The continued lack of, and further decrease, in early successional habitat and open areas would limit feeding and movement. As the GMNF habitat conditions continues to move further away from the known preferred Indiana bat habitat such as that found in the Champlain Valley region (open stand conditions where sunlight reaches roost trees; forest edges; early successional habitat and forest openings; mixture of forested areas and open or semi-open areas interspersed with past or present agricultural areas), it is highly unlikely that the population will expand into the project area.

Sensitive Species

Eastern Small-footed Bat (*Myotis leibii*)

Background, Habitat Needs

The Eastern small-footed bat is listed as a USFS Eastern Region sensitive species. Small-footed bats occur in or near woodlands in caves, mines, tunnels, buildings, and rock crevices up to 2,000 feet elevation (DeGraaf et. al., 1986 and Godin, 1977). They have been recently documented in the only known hibernaculum on the Green Mountain National Forest, the abandoned Greeley talc mine in the Town of Stockbridge, Windsor County, Vermont. Summer habitat is poorly understood. Recent summer surveys on the Forest and also adjacent to the Forest have not found any Eastern small-footed bats.

Effects

The effects of the Old Joe proposed activities on Eastern small-footed bats and their habitat are the same or very similar to the effects described for Indiana bats. The project area has no known mines or caves, nor any documented history of subterranean "hollows" suitable for bat hibernation. This proposal would therefore have no impact to hibernating Eastern small-footed bats. All timber harvesting activities would occur only in the winter, and therefore, would not directly impact Eastern small-footed bats in the summer months. Indirect impacts to the species may result from timber harvesting activities affecting a portion of the summer habitat. While summer habitat utilization is poorly understood, some potential exists that this species will utilize rock crevices or large hollow trees for roosting, in much the same manner as the Indiana bat.

Proposed Action, Alternative B, Alternative C

As is the case for Indiana bats, a limiting factor in offering suitable habitat for Eastern small-footed bats can be the amount of foraging areas. The effects pertaining to foraging habitat produced by the activities of the action alternatives as described for the Indiana bat would be the same for the Eastern small-footed bat. See the discussion above.

The same mitigation as that described in the Proposed Action for Indiana bats would be applied to all action alternatives to ensure that adequate numbers of potential roost trees for use by Eastern small-footed bats would remain after harvest. Therefore, the availability of roost trees would not be a limiting factor in offering suitable habitat. See the discussion above on the results of the reserve tree surveys conducted in the proposed cutting units.

As has been described above for Indiana bats, the proposed harvesting for the Old Joe Project would only slightly increase the amount of suitable habitat. None of the action alternatives would provide the habitat necessary to attract Eastern small-footed bats on a permanent basis.

No Action Alternative

As described for the Indiana bat above, this alternative would provide the greatest amount of potential roost trees while also offering the least amount of improvement to

foraging conditions. The effects to Eastern small-footed bats would be the same or very similar to those described above for the No Action Alternative's effects on Indiana bats.

Cumulative Effects

See the discussion above under Cumulative Effects for the Indiana bat. The same conclusion can be drawn for Eastern small-footed bats. As the GMNF habitat conditions continues to move further away from desirable Eastern small-footed bat habitat such as that found in the Champlain Valley region (open stand conditions where sunlight reaches roost trees; forest edges; early successional habitat and forest openings; mixture of forested areas and open or semi-open areas interspersed with past or present agricultural areas), it is highly unlikely that the population will expand into the project area.

Analysis of Effects Plants

Threaten and Endangered Species

There are no federally listed threatened and endangered plants species on the GMNF. All plants evaluated are on the list of Regional Forester's Sensitive Species (RFSS).

Sensitive Species

Affected Environment

The affected environment for the effects analysis in the BE includes riparian habitats and associated wetlands, and coniferous and hardwood stands. Abundant tree species are yellow birch (*Betula alleghaniensis*), sugar maple (*Acer saccharum*), and American beech (*Fagus grandifolia*); smaller amounts of white ash (*Fraxinus americana*), hemlock (*Tsuga canadensis*), black cherry (*Prunus serotina*), and red spruce (*Picea rubens*) are also present. Some small, seepy areas show slight signs of soil enrichment, as indicated by the presence of wood nettle (*Laportea canadensis*), silvery spleenwort (*Athyrium thelypteroides*), and yellow jewelweed (*Impatiens pallida*) in the ground flora. Northern hardwoods bordered stream banks in most areas where restoration would occur, with little to no riparian transition zone between the woods and the stream. Wetlands near the proposed relocation of the cross-country ski trail were very small, and were avoided during project design.

How Effects Will Be Presented

The analysis of effects for Sensitive plants was based on the potential for two different types of effects as defined here. The first was the direct effect on the species itself resulting from implementation of the proposed activities and how that may contribute to a trend towards Federal listing or to a loss of population viability to any Sensitive population or species. The second was the potential effect (impact) to the habitat that may support Sensitive plants. For this analysis, the effect on habitat was considered an indirect effect to the plant species.

Direct effects

The analysis and field surveys found that no plants on the RFSS list are known to have documented occurrences within the project area, either currently or historically. Thus, there are no direct effects on Sensitive plants, and therefore, none of the proposed actions would likely contribute to a trend towards federal listing or to a loss of population viability to any Sensitive plant population. As such, no further discussion of direct effects will be shown.

Indirect effects

It has been determined that at least some marginally good potential habitat exists for eleven Sensitive plant species or population. Thus, there are possible indirect effects to these species due to impacts to this potential habitat. The following effects disclosure

will therefore only include those effects to this potential habitat resulting from proposed activities that may indirectly affect the species.

Sensitive species with potential habitat in the project area:

Hairy Wood Mint (*Blephilia hirsuta*)
Summer Sedge (*Carex aestivalis*)
Canadian Horse Balm (*Collinsonia canadensis*)
Large Yellow Lady's Slipper (*Cypripedium parviflorum* var. *pubescens*)
Male Fern (*Dryopteris filix-mas*)
Sweet Joe-pye Weed (*Eupatorium purpureum*)
Butternut (*Juglans cinera*)
Ginseng (*Panax quinquefolius*)
Broad Beech Fern (*Phegopteris hexagonoptera*)
Green Pyrola (*Pyrola chlorantha*)
Round-leaved Orchis (*Platanthera orbiculata*)

Each of the above species occurs in some variant of northern hardwoods or moist conifers. The first ten are associated more specifically with enriched or limy northern hardwoods, of varied types. Hairy wood mint is associated with rich woodland seeps, often hidden under nettles. Summer sedge is found in rich, mesic, rocky woods at mid-elevation. Canadian horse balm grows in rich, mesic woods, but at lower elevations. Large yellow lady's slipper grows in rich moist soil under maples. Male fern is known from rich, cool woodlands, mostly over limy or calcareous substrates, at mid elevations. Sweet joe-pye weed grows in limy moist soil. Butternut occurs in well-drained, circumneutral, gravelly soils, generally riparian and below 1500'. Broad beech fern grows in warm, rich maple or maple-oak woods. Green Pyrola is known from limy woods at moderate elevations (in addition to other habitat types not found in the project area). Round-leaved orchis grows in fertile oak woods – usually dry, limy, and low elevation. The last species, round-leaved orchis, can grow in boreal, moist conifer woods, in addition to other habitat types not found in the project area. To at least some degree, each of these variants of forested habitats can be found within the project area.

Indirect Effects: Proposed Action

The Proposed Action would impact a total of about 313 acres through timber harvest, and would impact the riparian zone to varying degrees (depending upon access to the stream) along about 6,000 linear feet of stream (total for both streams proposed for improvements). One management concern raised was the possibility of impact to habitat for the auricled twayblade (*Listera auriculata*). Surveys of riparian areas revealed that the available habitat was not suitable for this species.

Another concern was raised that decisions would be made without site-specific surveys. All sites where actions are proposed have had botanical surveys using the most current information as dictated in the recently approved Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for

Threatened, Endangered, and Sensitive Species, September 11, 2001 (see also Chapter I of the EA, section A., Background). Field surveys specifically for TES plants were completed by Chris Fichtel of the Vermont Nongame and Natural Heritage Program (VNNHP) (8/12/93; southern portion) and Diane Burbank of the GMNF (10/21/97, 11/6/97, and 9/12/01; northern portion). Documentation of these surveys can be found in the Old Joe project file.

A third concern was that relocation of the cross-country ski trail would impact wetlands. Wetlands were avoided during the design stage of this project proposal. Also, since there is no earth disturbance needed to construct the ski trail, there would be no effects to wetlands (see also, in Chapter III of the EA, the Soil, Water, and Wetland Resources effects section). Post-project monitoring is planned to confirm that wetlands were avoided during relocation of this trail.

For the Proposed Action, impacts to the habitat for the eleven Sensitive species listed above, if they occur, are expected to be minimal, since the habitat is only marginally suitable, and since the type of harvest proposed in all but 11 of the 313 acres proposed for treatment will either impact only very small patches or will have only a short-term, temporary effect. Treatments for these 11 acres - clearcutting two three-acre units and creating a five-acre wildlife opening - would tend to produce a longer term effect since these areas would essentially be converted to a different species composition (aspen in the clearcuts and a shrubby, brushy composition in the permanent opening). As such, they would no longer offer potential habitat for the eleven Sensitive species associated with rich hardwoods, since they would be converted to early successional habitat. However, the VNNHP botanist described the stands in this compartment as basic northern hardwoods, with moderate enrichment only in small, occasional seeps, and not considered to offer very good potential habitat for rare plants. Thus, indirect effects would be considered minimal.

The treatments proposed for the remaining 302 acres consist of single tree/group selection, thinning, overstory removal, shelterwood, and delayed shelterwood harvests. For these types of treatments, the soil at different microsites will continue to offer potential habitat for these species, and the trees that remain will continue to offer some shade. These sites would remain, or eventually return to mature woods of varying types, and would continue to offer marginally good potential habitat for rare species associated with different woodland types (in other words, no effects to this habitat and its capability to support TES populations). In addition, winter harvest will help to protect the soil and existing herbaceous layer. No specific mitigation measures, beyond application of the appropriate Forest Plan standards and guidelines, for TES plants would be needed for activities in the Proposed Action.

Indirect Effects: No Action Alternative

In the No Action Alternative, there would be no timber harvest, no stream habitat restoration, and no need to relocate the cross-country ski trail. Therefore, there would no impact to any of the potential habitat found for the eleven Sensitive plant species

associated with this habitat. As such, this habitat will neither benefit from nor be negatively impacted by the No Action Alternative.

Indirect Effects: Alternative B - No Overstory Removals, Reduced MA 6.2A Activities, No Ski Trail

Alternative B would impact approximately 94 less acres, in six less project sites, through timber harvest than the Proposed Action, and therefore, a lesser amount of potential habitat may be impacted. There would be no impact to the habitat available in the unit where the five-acre opening is proposed since this alternative would not create that opening. As for the Proposed Action, any impact would be minor due to the small amount of potential habitat and the short-term nature of the actions. The same concerns described for the Proposed Action would be applicable for this alternative and have been addressed as noted above. No additional mitigation measures for TES plants would be needed this alternative.

Indirect Effects: Alternative C - Increased Early Successional Habitat

Alternative C would impact approximately six more acres through timber harvest than the Proposed Action, along with slightly larger group size cuts in three of the individual tree/group selection harvests. These six additional acres would be clearcut harvests (increasing the size of the two three-acre clearcuts in the Proposed Action to six acres each), and thus, increase the overall area of potential longer-term impacts from 11 to 17 acres. As such, a slightly greater amount of potential habitat could be impacted through conversion to a different species composition, but this impact would again be minor as this compartment has been identified as basic northern hardwoods, with moderate enrichment only in small, occasional seeps, and not considered to offer very good potential habitat for rare plants. The same concerns described for the Proposed Action would be applicable for this alternative and have been addressed as noted above. As for the Proposed Action, no additional mitigation measures for TES plants would be needed this alternative.

Cumulative Effects

No significant cumulative effects are expected to these species as a result of any of these alternatives, since there are no direct effects, and the indirect effects (effects to habitat) are expected to be minimal. Since there are no known extant occurrences of these species at this site, adverse effects to their marginally good potential habitat are not likely to jeopardize the viability of any of the species on the GMNF, nor lead to the species listing and protection under the Endangered Species Act.

Future harvests can be expected to be similar in size and scale to the Old Joe project. The North Half Overstory Removal Sale (N1/2 OSR), currently undergoing NEPA analysis, is the only other known proposed timber sale that will occur on national forest land in the Rochester District in the near future. This sale is a proposed series of final harvests of past shelterwood sites and because of the nature of the treatments, would likely result in little or no additional impact to any potential habitat. A Biological Evaluation similar to this one would be completed for the N1/2 OSR proposal as part of that NEPA analysis. The only other foreseeable future project in the Old Joe area would

be a possible return entry to the Old Joe Sale in about seven years to remove the overstory from the proposed shelterwood harvest in stand 19 of compartment 158. This would impact only about eight acres, and would likewise have little or no impact to any potential habitat.

Only a small amount of private land lies within or close to the Old Joe project area, and most of these holdings are homes and small woodlots. There is no large industrial private timber lands in the project area. The forested habitat on these private lands is very similar in nature to that in the Old Joe project area. Any harvest treatments would most likely be smaller in size and scale than the Old Joe proposal, and result in even less impact to any existing marginally good potential habitat.

Determination for T&E Species

After reviewing the Proposed Action and alternatives, the project area, the literature, and consulting individuals, it is my determination that the proposed project or its alternatives will have no effect on the following threatened and endangered species:

- Bald Eagle or their critical habitat.
- Gray Wolf or their critical habitat.
- Eastern Cougar or their critical habitat.
- Canada Lynx or their critical habitat.
- Indiana bat or their critical habitat

There are no threatened and endangered plants on the GMNF.

Rationale

None of these species are known to occur within the project area, or have critical habitat within the project area. See the discussion of Analysis of Effects above for further details.

Mitigation

It is possible that potentially suitable roosting habitat for Indiana bat could be damaged or removed by timber harvesting in the project area. Considering the likelihood of occurrence, location of the project, recent survey work completed in the Champlain Valley, and the physical characteristics of the project area, the risk to these “potential” roost trees is very low. To mitigate the possible loss of potentially suitable roost trees, the Reasonable and Prudent Measures and Terms and Conditions found in the *Biological Opinion of the Effect of the Land and Resource Forest Management Plan and Other Activities on Threatened and Endangered Species in the Green Mountain National Forest and Incidental Take Statement* issued by the U.S. Fish and Wildlife Service on February 16, 2000 would be followed. This is in accordance with direction found in the recently approved Decision Notice and Finding of No Significant Impact for the Environmental Assessment for the Proposed Amendment of the Green Mountain National Forest Land and Resource Management Plan for Threatened, Endangered, and Sensitive Species, September 11, 2001 (TES Forest Plan Amendment). New and revised Forest Plan standards and guidelines resulting from this amendment would be applied to ensure that adequate numbers of roost trees will be retained in the project area. This, in turn, will ensure that the availability of roost trees would not be a limiting factor in offering suitable habitat. Whenever possible, desirable reserve trees should be large trees such as red or sugar maple with existing, or the potential to have, exfoliating bark.

For further details, see the discussion in the Analysis of Effects section above.

Determination for Sensitive Species

Determination for Species with Unsuitable Habitat

Based upon the prefield analysis documented in the LOO table, it is my determination that the Proposed Action and alternatives will not adversely affect the viability, nor result in a trend toward Federal listing, for any of the species identified as "unlikely to occur" within the project area. This applies to both animal and plant species.

Determination for Species with Occurrences or Suitable or Potentially Suitable Habitat

Plants

Eleven Sensitive plant species have been identified as having at least some marginally good potential habitat. None of these plant species are known to have documented occurrences within the project area, either currently or historically. Therefore, it is my determination that the Proposed Action and alternatives will not adversely affect the viability, nor result in a trend toward Federal listing, for any of these species.

Animals

Eastern small-footed bat

After reviewing the effects of the Proposed Action and alternatives (including the No Action Alternative), the project area, the literature and records, and consulting individuals, it is my determination that the Proposed Action and other alternatives are not likely to impact individuals or habitat of Eastern small-footed bat and will not likely contribute to a trend towards Federal listing or a loss of viability to the population or species.

Rationale

Eastern small-footed bats are not known historically in the project area, and therefore will not be directly impacted by the proposed activities (no effect). The species is only suspected to have marginally suitable or potentially suitable habitat in the project area. Only minor positive effects to foraging habitat would result from any proposed harvesting, thereby increasing the potential for suitable habitat. Even with this increase in potential, it has been concluded that Eastern small-footed bats would most likely not settle into the project area but would prefer the much more suitable habitat available in the Champlain Valley or similar areas.

With implementation of the recommended mitigation, the potentially suitable habitat component of summer roosting trees would be maintained or increased after implementation of any of the proposed harvesting activities. Continued closure of the Greeley Talc Mine to human intrusive will ensure protection of known eastern small-footed bat winter habitat.

Mitigation

The Reasonable and Prudent Measures and Terms and Conditions found in the Biological Opinion (2/00) will protect possible roost sites for Eastern small-footed bats in the same manner as for Indiana bats. See the discussion above for Mitigation under Determination for T& E Species.

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Personal Communications With:

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Clayton Grove, Wildlife Biologist, GMNF

Frank Thompson, Wildlife Technician, GMNF

Appendix A. Summary of Advice and Communication

Susi von Oettingen, Biologist, U.S. Fish and Wildlife Service, Concord, NH 2/11/02. Discussion of the Area of Influence around Brandon Silver Mine and the Silver Mine Hibernaculum Management plan effort, as it related to the Old Joe project.

Clayton Grove, Forest Biologist, Green Mountain National Forest. 1/17/97, 2/12/02. Effects to summer foraging and roosting habitat for Indiana bat and eastern small-footed bat and the impact to individuals of these species of winter logging activities. Discussion of the Area of Influence around Brandon Silver Mine and the Silver Mine Hibernaculum Management plan effort, as it related to the Old Joe project.

Michael Amaral, Biologist, U.S. Fish & Wildlife Service, Concord, NH. 1/13/97. On potential and existing summer foraging and roosting habitat for Indiana bat and eastern small-footed bat.

Christopher Fichtel, Zoologist/Biologist, The Nature Conservancy, Montpelier, VT. 1/13/97. On potential and existing summer foraging and roosting habitat for Indiana bat.

Frank Thompson, Forestry Technician, GMNF, Manchester Center, VT. 2/12/02. Discussion on tally of reserve trees and potential summer Indiana bat roost trees.

Mike Burbank, Biological Technician, GMNF, Middlebury, VT. 2/4/02. Roost tree data from spring and summer radio telemetry, unpublished, 2001.

Appendix F

Management Indicator Species (MIS) Population and Habitat Community Trends

Chestnut-sided Warbler (hardwood saplings)

The chestnut-sided warbler was selected as a MIS for the regenerating northern hardwood community. The chestnut-sided warbler's dependence on shrubby and dense sprout, vegetative structure makes it an ideal indicator for regenerating deciduous vegetation. This bird will be well distributed throughout regenerating woodland clearings and will often be associated with shrubby edges. Chestnut-sided warblers breed and feed in shrubby vegetation. They utilize brushy stream banks, roadside thickets, old fields, woodland clearings, and burns. The early second growth sprouts of regenerating hardwoods, from 0-9 years of age, duplicate this vegetative condition. Current Forest Plan direction provides for this habitat primarily through evenaged forest management prescriptions.

Population Trends: The global population of chestnut-sided warblers is declining (NatureServe 2001) with moderately declining populations in Physiographic Areas 27 & 28 (Partners In Flight Database). The Audubon Society Watch List lists the chestnut-sided warbler as high priority in Physiographic Area 27. The North American Breeding Bird Survey (BBS) for Vermont indicates a non-statistically significant population decline for the 1960-2000 and 1987-2000 trend periods but a statistically significant decline for the 1980-98 period. The population is considered secure (S5) in Vermont (NatureServe 2001) and has no specific status in the Vermont Nongame and Natural Heritage Program.

Habitat Community Trends: Habitat in Physiographic Areas 27 & 28, including Vermont, peaked following the widespread logging and agricultural abandonment that occurred in the last century. As New England and Vermont mature, suitable hardwood sapling habitat continues to decline. Currently, approximately 7 percent of Vermont's land area is in this habitat type (Trani et al. 2001). Partners In Flight (PIF) list early successional forest/edge habitat, represented by the chestnut-sided warbler, as a priority habitat-species suite with the objective being "management to reverse or stabilize populations."

On the GMNF, the acreage of evenaged management has declined in recent years. As a result, less than 5 percent of the Forest is in early successional habitat (USDA 1996). Assuming evenaged timber harvest and natural disturbance events continue to occur, it is unlikely that the chestnut-sided warbler or the habitat it represents will be lost from the suite of wildlife species or habitat communities present on the GMNF. However, numbers may continue to fall.

Relative Importance Of The GMNF To This Species/Habitat Community:

Population viability will likely be maintained even though numbers may continue to fall. The GMNF is, however, in a position to contribute towards PIF's objective to

“management to reverse or stabilize populations” of early successional forest/edge habitat through evenaged forest management, including clearcuts. This is particularly important given the general absence of evenaged forest management on Vermont’s private lands. Capen, Germaine, and Town (1991) found the Chestnut-sided warbler would also readily pioneer even small areas of early successional habitat.

Barred Owl (mature hardwood)

The barred owl was selected as a MIS for the mature and old growth northern hardwood communities on the GMNF. Due to their dependence upon suitable cavity trees for nesting, they are good indicators of the quality and availability of the communities that include these habitat components. They exhibit a limited tolerance to human activity – selecting the more interior hardwood habitats for their nesting territories.

Recent changes in Forest Plan direction for Indiana bat likely benefits the barred owl as additional trees that may also be suitable for barred owl nesting are retained. However, there is no indication that barred owl populations are being adversely effected due to a lack of suitable nesting sites.

Population Trends: The barred owl population is considered viable and well distributed. BBS data show increasing to significantly increasing populations in Physiographic Areas 27 & 28. The BBS for Vermont indicates a non-statistically significant population increase for the 1960-2000 and 1987-2000 trend periods. The barred owl is not considered vulnerable in the Northeast (Hunter et al. 2001), is considered secure (S5) in Vermont (NatureServe 2001), and has no specific status with the Vermont Nongame and Natural Heritage Program. GMNF surveys over a 6-year period did not indicate discernable population trends on the Forest.

Habitat Community Trends: Mature forests currently dominate the northeastern and Vermont forests (Trani et al. 2001). This trend is expected to continue into the foreseeable future. Therefore, the amount of suitable habitat for the barred owl can be expected to increase. Likewise, the amount of mature and old growth northern hardwood communities on the GMNF has increased over the last decade (USDA 1996) now comprising approximately 75 percent of the Forest. This trend is expected to continue with the decreased emphasis on evenaged management.

Relative Importance Of The GMNF To This Species/Habitat Community: All indications are that barred owl populations and its mature and old growth northern hardwood habitat community will increase in Physiographic Areas 27 and 28 as well as on the GMNF. Therefore, although a contributor to this habitat community, the GMNF does not play a unique role in its long-term maintenance.

Snowshoe Hare (regenerating, young softwood)

Snowshoe hare are similar to white-tailed deer, in that they are both relatively common, hunted species that rely on the Forest’s softwood community. They differ a bit from deer, in that hare prefer the greater tree density and lower cover characteristic of regenerating and younger conifer.

Population Trends: The snowshoe hare population is considered viable and well distributed. Snowshoe hare populations are considered secure (S5) in all Northeast states except Connecticut and Rhode Island (NatureServe 2001). The local population is considered stable and viable, albeit with cyclic fluctuations. No discernable trends have been identified on the GMNF. Litvaitis (2001) expressed concerns over long-term population declines throughout New England due to the loss and fragmentation of young forest and shrub dominated communities.

Habitat Community Trends: Early successional vertebrate populations reached unprecedented levels in the Northeast during the late 19th and early 20th centuries following the extensive land clearing for agriculture and subsequent farm abandonment (Litvaitis 1993). Since then, habitat has declined as young forests matured. Population declines likely followed. The 10-year decline in the amount of early-aged conifer forest on the GMNF (USDA 1996) may indicate a reduced amount of available high-quality hare habitat with a corresponding decrease in hare abundance and/or distribution.

Relative Importance Of The GMNF To This Species/Habitat Community: Though not a population viability issue, the GMNF is in the position to provide increased levels of early successional habitat, supporting higher snowshoe hare populations, through vegetation treatments. This is particularly important as recreational hunting is becoming more dependent on public lands due to the posting of private lands.

Blackpoll Warbler (high elevation, mature softwood)

The blackpoll warbler was selected as a MIS for the high elevation red spruce and balsam fir community on the GMNF. Blackpoll warblers breed in the mountains of New York, Vermont, and New Hampshire and winter in Guiana and Venezuela to Brazil. Nests are usually built in conifers within 2 meters of the ground.

Population Trends: The blackpoll warbler population is considered viable and well distributed. The population is considered secure (S5) in Vermont (NatureServe 2001). Overall, the trend is considered to be somewhat in a decline in Physiographic Area 28, but not significantly different from a stable population (Sauer et al. 2000). Population trends in Physiographic Area 27 are uncertain. The BBS for Vermont indicates a statistically significant population decline for the 1960-2000 trend period but no data is available for the 1987-2000 period. It has no specific status in the Vermont Nongame and Natural Heritage Program. Populations fluctuate considerably as a result of spruce budworm outbreaks, hurricanes, forest fires, and extensive logging (Richards 1994).

Ortega and Capen (1998) provided a preliminary analysis of blackpoll warbler population trends on the GMNF. They concluded that the blackpoll warbler showed statistically significant increases in mean relative abundance.

Habitat Community Trends: Habitat has been reduced from historic times through ski area development, trail construction, and historic logging. However, in recent times these activities have not expanded significantly. Therefore, the habitat is considered stable.

Partners In Flight lists the mountaintop/conifer woodland community represented by both the blackpoll warbler and Bicknell's Thrush, as a priority habitat-species suite with the objective being "immediate management or policy needed range wide."

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF provides a large portion of this high elevation community in Vermont. Therefore, it is in a unique position for both habitat management and wildlife community-level research.

White-tailed Deer (low elevation, mature softwood)

The white-tailed deer was selected as a MIS for the mature and old growth red spruce, balsam fir, and hemlock components of the GMNF. It is recognized that deer utilize other components of the Forest as well, however the spruce-fir and hemlock communities used by deer in winter were selected as the habitat upon which deer are most dependent.

Population Trends: The white-tailed deer population is considered viable and well distributed. Nationally and statewide the white-tailed deer population is widespread and secure (N5, S5) (NatureServe 2001) and is a game species in Vermont. Populations fluctuate considerably as a result of winter weather conditions. The state data indicates that Wildlife Management Units containing the GMNF have buck harvests below both: (1) the individual WMU state objectives and, (2) the statewide average expressed as a percent of the total state harvest objective. The cause for this shortfall can be any of several factors including a decline in the quantity or quality of winter deer habitat, reduced hunting pressure, poor weather conditions during the hunting season, the increase in housing as well as winter recreation in traditional deer wintering areas, or a combination of all these factors.

Habitat Community Trends: Softwood forest age class distribution statewide (USDA 2001) and for GMNF (USDA 1996) shows a general shift to a more mature forest. This indicates deer winter thermal cover is being maintained and its quality improved. It also indicates that mature conifer forest wildlife associates, such as the Blackburnian warbler, have also benefited. Conversely, there has been a decline in the amount of early-age forest in both the softwood and northern hardwood forest types. This may indicate a general decline in the amount and quality of browse available for wintering deer.

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF is not in a unique position to influence population or habitat community trends statewide. On a local level, it is in the position to increase conifer composition and browse in deer wintering areas through the use of evenaged and unevenaged management. This is particularly important as recreational hunting becomes more dependent on public lands due to the posting of private lands.

Ruffed Grouse (regenerating, young aspen and birch)

The ruffed grouse was selected as a MIS for regenerating and young aspen/birch community. The GMNF naturally does not contain large tracts of pure aspen; however, small pockets and inclusions are distributed throughout the lower elevations. A majority

of the GMNF's birch community occurs at higher elevations. These stands tend to be of greater purity and size than the aspen occurrences. Current Forest Plan direction provides for this habitat primarily through evenaged forest management prescriptions.

Population Trends: The ruffed grouse population is considered viable, although it may fluctuate widely over a period of several years. Nationally and statewide the ruffed grouse population is widespread and secure (N5, S5) (NatureServe 2001). PIF indicates that populations of this species are significantly increasing in Physiographic Area 27 but significantly decreasing in Physiographic Area 28. The ruffed grouse is ranked in Pool II of the PIF Species ranking system, meaning it is a high priority species for Physiographic Area 28. Ranking criteria define this as a species of moderately high global vulnerability, and with relatively high abundance and/or declining or uncertain population. The BBS for Vermont indicates a non-statistically significant population decline for the 1960-2000 trend period but a statistically significant increase for the 1987-2000 period. Ruffed grouse is a game species in Vermont. However, the state does not have systematic population or harvest data. The GMFL has periodically carried out drumming surveys along pre-designated routes for the last decade. The survey results do not indicate any clear population trends.

Habitat Community Trends: Habitat availability has also changed over time, but is currently also considered stable and distributed throughout Physiographic Area 28. The aspen stands on the GMNF (USDA 1996) are mature and becoming increasingly more susceptible to mortality. This, combined with the fact that the GMNF has only reached 25 percent of its Forest Plan habitat composition goals for regenerating evenaged acres of aspen and paper birch (USDA 1996), means suitable grouse habitat on the Forest is, or will shortly be, in decline.

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF is not in a unique position to influence population or habitat community trends statewide. On a local level, the Forest can improve aspen and paper birch habitat through evenaged management. This is particularly important as recreational hunting becomes more dependent on public lands due to the posting of private lands.

American Beaver (regenerating and young, birch and aspen)

The beaver was selected as a MIS for the regenerating and young birch and aspen communities on the GMNF. They are generalized herbivores, specialized for aquatic life, and are therefore associated with these communities in association with drainages. Although they are generalists and can adapt their foraging habits to a variety of environments, beavers have been shown to prefer quaking aspen and the more tender parts of other woody plants such as leaves, twigs and bark.

Population Trends: Nationally and statewide the beaver population is widespread, expanding, and secure (N5, S5) (NatureServe 2001). The beaver population is considered viable in Vermont. It is classified as a fur-bearing animal. The GMNF surveys both beaver populations and the quantity of regenerating birch and aspen at 5-year intervals. A 1994 GMNF report entitled *Beaver: Management Indicator Species*

Monitoring Results, Discussion, and Assessment compared 1983 and 1993 aerial surveys of active and inactive ponds as well as the total acres of occupied habitat. The report concluded that there had been a significant increase in beaver occupation, and presumably population, in this time interval.

Habitat Community Trends: It is possible that the natural cycle of wetland creation, abandonment, and re-colonization by beavers will maintain their distribution. The 10-year decline in the amount of early-aged forest both statewide and on the GMNF, combined with the maturing of aspen and paper birch stands could mean a decrease in beaver abundance and/or distribution.

Relative Importance Of The GMNF To This Species: The GMNF is not in a unique position to influence population or habitat community trends statewide. It is likely that the current distribution of both beaver and the wetland communities on the GMNF will be maintained. On a local level, the Forest could provide early successional food sources through evenaged management.

Yellow-bellied Sapsucker (mature aspen and birch)

The yellow-bellied sapsucker was selected as a MIS for the mature and old growth aspen and birch communities. Sapsuckers are primary cavity nesters, excavating their own cavities. Runde (1981) found that the majority of sapsucker nests he studied were in quaking aspen, although they utilized red maples, birch and beech. Regardless of tree species, the trees were associated with the following characteristics: wood decay conks *Fomes fomentarius* and *Phellinus tremulae*, branch stubs, broken tops, bark cover of at least 50 percent and previously excavated cavities.

The recent Forest Plan amendment for the Indiana bat may increase potentially suitable nesting sites in stands receiving timber treatments as additional trees that may be suitable for yellow-bellied sapsucker nesting are retained. However, there is no indication that yellow-bellied sapsucker populations are being adversely effected through lack of suitable nesting sites.

Population Trends: The population is considered secure nationally (N5) and in Vermont (S5) (NatureServe 2001). No population trend data is available at either the PIF or the Physiographic Area level. The BBS for Vermont indicates a non-statistically significant population increase for the 1960-2000 trend period but a statistically significant increase for the 1987-2000 period. DeGraaf and Yamasaki (2001) consider them to be common to Vermont.

Habitat Community Trends: With the general maturing of Vermont's forests (USDA 2001) and the relatively short-lived nature of aspen and birch, it is likely that the amount and distribution of suitable large diameter cavity trees will increase statewide. The aspen stands on the GMNF (USDA 1996) are also rapidly maturing and becoming increasingly more susceptible to mortality. Therefore, the amount of mature aspen and birch on the Forest is likely increasing as well.

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF is not in a unique position to influence population or habitat community trends statewide. Retention of suitable habitat on both managed and unmanaged lands will maintain or increase suitable habitat Forest-wide.

Gray Squirrel (mature oak)

The gray squirrel was selected as a MIS for the mature and old growth oak communities on the GMNF. Due to the squirrel's preference for acorns, squirrel relationships to the oak communities of the Forest make it a good indicator of management effects. Gray squirrels occur in hardwood as well as mixed hardwood-coniferous forests, and concentrate in areas of mast producing trees such as red oak, beech, hickory and butternut. The LRMP standards and guidelines provide direction for the retention of hard mast trees (including hickories) during timber harvest treatments. The recent amendment regarding the Indiana bat increases focus on shagbark hickory retention. However, due to the small acreage of naturally occurring shagbark hickory and the limited acreage receiving timber treatment, it is unlikely that this amendment will result in a detectable change to the population of gray squirrel on the GMNF.

Population Trends: Nationally and statewide the gray squirrel population is secure (N5, S5) (NatureServe 2001). The gray squirrel population is viable and considered a game species in Vermont. There is no population trend data available at the state level. DeGraaf and Yamasaki (2001) consider them to be common to uncommon in Vermont. GMNF monitoring efforts have not indicated any clear population trends.

Habitat Community Trends: Suitable gray squirrel habitat is distributed more extensively in the valleys, the Taconic range, and other lower elevation hickory forests. The USDA (2001) indicates that oak forests are maturing statewide. The GMNF has limited acreage of oak forests. These forests are maturing as well (USDA 1996). Therefore, available data indicates mature oak habitat is increasing both statewide and on the GMNF.

Relative Importance Of The GMNF To This Species/Habitat Community: Given the limited amount of oak forests on the GMNF, the Forest is not in a unique position to have a significant influence on either gray squirrel populations or the mature oak habitat community it represents. However, recent land purchases in the Taconic range have increased the Forest's ability to provide suitable habitat on a relatively local level.

American Woodcock (upland opening)

The American woodcock was selected as a MIS for the permanent openings on the GMNF. Because woodcock have highly specific diurnal and nocturnal ecological requirements, including the necessity of upland openings for the males' courtship display, their population levels are susceptible to change resulting from habitat alteration. These display grounds are usually abandoned fields, forest cuttings or other openings, and range from less than one acre to greater than 100 acres.

Population Trends: Population viability will likely be maintained even though numbers may continue to fall. Nationally and statewide the woodcock population is widespread and secure (N5, S5). PIF considers the woodcock to be in Tier IA (High Continental Priority-High Regional Responsibility) of the priority species pool for Physiographic Area 27. The U.S. Fish and Wildlife Service Singing-ground Survey data for 2000 indicates the number of displaying woodcock in the Eastern Region, which includes Vermont, decreased 10.4 percent from 1999 levels with a long-term (1968-00) Eastern Region decline ($P < 0.01$) of 2.3 percent. The BBS for Vermont indicates a non-statistically significant population increase for the 1960-2000 trend period. Roy (1996) analyzed seven years of North American woodcock data collected on the GMNF as part of the MIS monitoring program. He concluded that the index used showed no statistically significant change in woodcock populations within the study sites.

Habitat Community Trends: Habitat in Physiographic Areas 27 and 28, including Vermont, peaked following the widespread logging and agricultural abandonment that occurred in the last century. As New England and Vermont mature, suitable upland opening and hardwood sapling habitat continues to decline. Currently, approximately 7 percent of Vermont's land area is in this habitat type (Trani et al. 2001). In the northeastern U.S., habitat has declined with increasing urban/suburban/industrial development and concurrent decrease in field and shrubland habitat (Dwyer et al. 1983, Kelley 2001). Partners In Flight list early successional forest/edge habitat, represented by the American woodcock, as a priority habitat-species suite with the objective being "management to reverse or stabilize populations."

Relative Importance Of The GMNF To This Species: The GMNF is in the position to contribute towards PIF's objective of "management to reverse or stabilize populations" of early successional forest/edge inhabitants through active forest management. This is particularly important given the general absence of evenaged forest management on Vermont's private lands and the fact that recreational hunting is becoming increasingly more dependent on public lands due to the posting of private lands.

Brook Trout (stream)

Brook trout was selected as a MIS for small headwater and other streams on the GMNF. Optimal habitat south of Canada has been characterized as "...clear, cold spring-fed water, a silt-free rocky/gravel substrate with riffle-run areas, and approximate 1:1 pool-riffle ratio with areas of slow deep water, well vegetated stream banks, abundant in-stream cover, and relatively stable water flow, temperature regimes and stream banks" (Raleigh 1982). McCormick et al. (1972) cited that the most important limiting factor for brook trout reproduction and distribution appears to be suitable water temperatures. In addition, stream cover is considered to be one of the critical components of brook trout habitat.

Population Trends: Population viability will likely be maintained. In the northeast and in Vermont, the brook trout population is widespread and secure (N5, S5) (NatureServe 2001). This is also true for the brook trout population in the GMNF. Kirn (2000) analyzed brook trout populations in 12 Vermont watersheds (62 sites representing 53

streams). Present-day brook trout were characterized by abundant natural reproduction and multiple age-classes, including the contribution of older, larger fish. He stated “the long-term viability of Vermont’s wild brook trout stream populations will depend on the protection and enhancement of suitable physical habitat and water quality.”

Habitat Community Trends: As New England and Vermont’s upland forests mature, suitable habitat will continue to persist and improve. Riparian habitat in these upland forests will increasingly provide necessary thermal protection to streams and a source of woody material to maintain habitat quality. Habitat in low elevation streams and rivers is often limited by water temperature and may decline further with increasing urban/suburban/industrial development and concurrent decreases in coldwater habitat.

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF is in a position to contribute towards the management of stable and improving populations and habitat through resource protection strategies and active habitat restoration or enhancement. This is particularly important as the Forest works with other federal and state agencies, and organizations to meet brook trout management objectives. Also, the Forest has begun to contribute to habitat protection through purchase of low elevation river parcels.

American Bittern (marsh)

The American bittern was selected as a MIS for remote wetland areas on the GMNF that are dominated by marshy vegetation. American bitterns nest singly on both wet and dry ground, near or in freshwater swamps, marshes, bogs, or reedy lakes. Slow rivers or streams with dense vegetation along their borders provide appropriate habitat as well. Cover commonly consists of tall vegetation, such as reeds, cattails and bullrushes.

Population Trends: Globally, the American bittern population is widespread and apparently secure (G-4) but declining due to habitat destruction. Populations are considered vulnerable at the national (N3) and Vermont state levels (S3). BBS data for 1966-1987 indicate a decline in the north-central U.S. (Hands et al. 1989, Brewer et al. 1991) due mainly to loss and degradation of wetlands. The BBS for Vermont indicates a non-statistically significant population increase for the 1960-2000 and 1987-2000 trend periods.

Habitat Community Trends: Continued loss and degradation of wetlands is the most serious threat in the northeast and Vermont.

Relative Importance Of The GMNF To This Species/Habitat Community: Bittern sightings on the GMNF are rare and the Forest has a very limited amount of suitable bittern habitat. It has begun to contribute to habitat protection through the purchase of larger, low elevation wetlands within its proclamation boundary.

Peregrine Falcon (cliff)

The peregrine falcon was selected as MIS for mountain cliff sites on the GMNF. Typical peregrine eyries have been described as cliffs with sheer rock faces along mountain ridges overlooking open expanses of river valleys. Slopes below the cliffs are commonly wooded, while the areas above the cliffs are either semi-open or wooded. At this time, disturbance of nesting sites is considered the greatest threat to the continued recovery of this species.

Population Trends: Populations are considered apparently secure at the national (N4) but imperiled at the Vermont state level (S2) (NatureServe 2001). The Vermont Institute of Science (VINS), the Vermont Natural Heritage Program, and the GMFL have monitored falcons annually within Vermont since 1984, and on the GMNF since 1987. There has been a steady increase in the number of Peregrine falcon territorial pairs and successful nesting in both Vermont as a whole and on the GMNF.

Habitat Community Trends: With an increased demand for day hiking to cliff overlooks, there is more risk of nest failure or site abandonment. Closure orders and signing on public and private land has had mixed results for protecting sites.

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF has three active sites and several potential sites. Signing and closure at two sites has improved nesting success at those areas. The risk of disturbance of these sites by day hikers continues to be monitored and protective measures are working at this time. The risk is greater where new nests are established at previously unoccupied sites. As shown from one recent reoccupied site, it took several years of closure and postings along with public education before a successful nesting occurred.

Tree Swallow (beaver flowage)

The tree swallow was selected as a MIS for the beaver flowage wetland community. This species utilizes tree cavities in wetland habitats for nesting, and the wetland habitats themselves, for feeding. Beaver-created wetlands provide habitat for a variety of avian and mammalian wildlife. In this environment, tree swallows are dependent upon the cavity trees within the beaver flowage and along the edge of the forest opening that may or may not be flooded as the pond ages.

Population Trends: Population viability will likely be maintained. Nationally and statewide the tree swallow population is widespread and secure (N5, S5) (NatureServe 2001). The BBS for Vermont indicates a non-statistically significant population increase for the 1960-2000 trend period but a statistically significant increase for the 1987-2000 period. DeGraaf and Yamasaki (2001) consider them to be a common breeder in Vermont.

Habitat Community Trends: Downward trends in early successional habitat (see chestnut-sided warbler) may be causing a decline in suitable tree swallow habitat. However, increase in beaver populations would indicate an increase in suitable habitat.

Relative Importance Of The GMNF To This Species/Habitat Community: The GMNF is not in a unique position to influence population or habitat community trends statewide. It is likely that the current increase in beaver activities, protection and purchase of wetlands, and maintenance of suitable nesting cavities on the GMNF will maintain or increase suitable tree swallow habitat.

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