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Whyte Forest Management Project

Environmental Assessment

Superior National Forest
Laurentian Ranger District



Bunchberry (*Cornus canadensis*)

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Whyte Environmental Assessment

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Chapter 1: Purpose and Need

1.1 Introduction

In May 2006, the Laurentian Ranger District of the Superior National Forest (SNF) notified the public that the Superior National Forest is considering vegetation and road management activities in the Whyte Project Area. The Whyte Forest Management Scoping Report contained a detailed site-specific proposal to manage vegetation and associated roads. The Report was mailed to the public and asked for input on the proposed action. The Whyte Scoping Report is available electronically at the following web address: www.fs.fed.us/r9/superior. To access the Scoping Report, navigate to “Projects and Plans” then to the “Whyte Forest Management Project Scoping Report”. A paper copy is also available upon request.

The Whyte project area is located north of Two Harbors, Minnesota in Lake and St. Louis Counties. The scope of this project is limited to vegetation management actions and connected road management actions. The Whyte project area encompasses about 219,000 acres of land of which 94,146 acres are National Forest System land.

The purpose of this Whyte Project Preliminary Effects Analysis is to provide an official 30-day public comment opportunity to determine if there is additional analysis that should be completed prior to the decision-maker (Laurentian District Ranger) making a decision. The Preliminary Effects Analysis contains information about the project and the effects of vegetation management and connected road actions on the project area. Comments received during the official 30-day comment period will be incorporated into the analysis prior to the District Ranger deciding if and how to proceed with the project.

1.2 Organization of the Environmental Assessment

This Environmental Assessment is organized into four chapters with appendices, and follows the format established by the Council on Environmental Quality (CEQ) regulations (40CFR 1500-1508) for implementing the National Environmental Policy Act (NEPA). The major sections of the EA are as follows:

- **Chapter 1: Purpose and Need.** This chapter provides introductory material that explains the purpose and need for the proposed action, provides background information about the project area, and describes the issues to be addressed.
- **Chapter 2: Alternatives.** This chapter describes the No-Action Alternative and the action alternatives, including the proposed action, which are analyzed in detail in Chapter 3. This chapter also includes a summary comparison of the environmental effects of the alternatives.
- **Chapter 3: Affected Environment and Environmental Effects.** This chapter discloses the effects of the significant issue raised during the scoping period. It also briefly summarizes the effects likely to occur with the implementation of each alternative.

- **Chapter 4: References.** This chapter provides the names of the resource specialists who contributed to this project, the names of those who were mailed the Preliminary Effects Analysis, and a list of literature cited.
- **Maps:** The actions are shown on the enclosed maps.

An important consideration in the preparation of this Environmental Assessment has been to reduce paperwork as specified in 40 CFR 1500.4. The objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental effects of the alternatives and how any adverse effects can be mitigated or avoided. Additional information is available at the Laurentian District office and upon request.

The entire planning record will be available at the Laurentian Ranger District Office in Aurora, Minnesota, upon issuance of this Environmental Assessment. Other reference documents, such as the Superior National Forest Land and Resource Management Plan (Forest Plan) and associated Record of Decision and Final Environmental Impact Statement, are available at libraries around the region as well as at all Superior National Forest offices. The Unit Cards, which provide detailed descriptions of each of treatment unit, are available at the Laurentian District Office or on the internet at: <http://www.fs.fed.us/r9/forests/superior/>.

1.3 Why: Purpose and Need for Action

The overall objective of the Whyte Project is to maintain and improve forest health by moving the vegetative component towards the Landscape Ecosystem objectives described in the 2004 Superior National Forest Land and Resource Management Plan (Forest Plan p. 2-23, O-VG-1).

Forest Plan direction provides objectives for managing the native plant communities and ecological systems, called Landscape Ecosystems (LEs). The LEs provide specific vegetation, age class, tree species diversity, and management indicator habitat (MIH)¹ objectives for each LE on the Superior National Forest. Managing toward these objectives will provide for the full diversity of desired wildlife habitats (Forest Plan Record of Decision, page 10).

A team (The Team) of resource specialists compared the existing resource conditions in the Whyte Project Area with the Forest Plan objectives and desired conditions. The resource specialists made recommendations of possible opportunities and management actions to move the Project Area towards the Forest Plan desired conditions. The recommendations identify a need to address the vegetative component in the Project Area. The District Ranger selected the potential actions to include in this environmental analysis and the actions are specific to the purpose and need described below.

¹ Management indicator habitats – These habitats represent the habitats used by a wide variety of native species, including the majority of management indicator species and Regional Forester Sensitive Species that are part of that habitat. Management indicators provide a means of monitoring and evaluating the effects of actions on biotic resources, including specific species, communities, habitats and interrelationships among organisms.

Currently, the vegetative component in the Whyte Project Area does not meet the desired condition for age class, species composition, management indicator habitats, or within stand species diversity in the respective landscape ecosystems. The difference between the existing condition and desired condition was used to develop the purpose and need for this project.

The following describes the specific purpose and need for this project:

- 1. Create young forest to move the area towards the long-term Landscape Ecosystem objectives in the Forest Plan for age class composition and management indicator habitats.** In particular, create young forest in the aspen and birch forest types in the upland LEs (MIH 4) and black spruce in the lowland LEs (MIH 9). Most of the young forest would be provided through regeneration harvests of mature-aged forest. (Forest Plan p. 2-24, O-VG-13 and O-VG-16)

The Forest Plan provides specific age class objectives for each LE. In all of the LEs in the Project Area, there is an abundance of mature-aged forest. Some of this mature forest is needed to grow into the old forest age class and some is available to contribute to the young age class. Currently, there is young forest in all of the LEs but within 10 years all of the young forest will grow out of the 0-9 age class. Therefore, there is a need to create young forest to maintain the young age class. In addition, the Forest Plan provides management indicator habitat objectives. Management indicator habitats are based on groupings of forest types in different age groups. These objectives show a need to maintain/increase the amount of young birch and aspen forest (MIH 4) and lowland black spruce (MIH 9).
- 2. Increase the amount of white pine and jack pine on appropriate sites to move towards meeting the vegetation composition objectives.** (Forest Plan p. 2-23, O-VG-2, and p. 2-35, O-WL-32)

The Forest Plan provides objectives for vegetation composition for each LE. In most of the LEs, there is not very much white pine and the LE desired conditions show a need to increase the amount of white pine on the landscape. There is also a need to increase the amount of jack pine in Mesic Birch/Aspen/Spruce-fir LE. Several stands in the Project Area are suitable for converting to white and jack pine.
- 3. Enhance riparian forest habitat through planting and where needed, creating conditions that are more suitable for planting long-lived species such as white pine, white and black spruce, tamarack, and red oak.** (Forest Plan p. 2-12, O-WS-3 and p. 2-35, O-WL-34)

The Forest Plan has objectives for enhancing riparian forest conditions including planting and management of longer-lived tree species. There are several opportunities within stands adjacent to streams and lakes to either plant or create more suitable conditions followed by planting long-lived species.
- 4. Enhance the growing conditions in red pine, maple, and white spruce stands by conducting intermediate treatments, such as thinning and selection harvest.** (Forest Plan p. 2-23, O-VG-6 and O-VG-9)

Many of the red pine, maple, and white spruce stands contain high stocking levels where growth on individual trees is beginning to slow. By reducing the stocking levels (removing some of the smaller and less healthy trees) the growth can be concentrated on the remaining trees. Generally the trees retained would be species that meet the tree species diversity objectives such as white and red pine, white cedar, white spruce, tamarack, and yellow birch and decreasing the amount of aspen.

- 5. Reduce fragmentation and create larger-sized patches of young forest by harvesting adjacent to recently harvested areas.** These large patches will be coordinated with other landowners. (Forest Plan p. 2-22, D-VG-7; p. 2-26, O-VG-21 and O-VG-23; p. 2-35, O-WL-35)
Past harvest methods have contributed to smaller-sized patches of similar age and kind of trees. Historically, there was a diverse mix of patch sizes, including some much larger-sized patches of similar vegetation on the landscape. The Forest Plan direction is to reduce the amount of forest edge created through vegetation management activities and increase the amount of interior forest habitat, while still retaining a range of small patches and edge habitat. There are opportunities in the Project Area to create some larger-sized patches of young forest, while maintaining large patches of mature forest.
- 6. Improve the fire regime condition class ratings through moving the Project Area towards the LE objectives.** (Forest Plan p. 2-22, D-VG-3 and p. 2-23, D-VG-8)
There is a need to restore forest health and reduce fuels in the forest communities by changing the fire regime condition class through vegetation management. Fire suppression, and the lack of vegetative management that addresses historic native forest communities, has resulted in some forest communities that are altered from their natural range. These forest communities are at risk of losing key ecosystem components such as vegetation characteristics, fuel composition, and fire frequency. Vegetation communities can be changed from Condition Class 3 (those most altered from their natural range), to Condition Class 1 (those within their natural range), or Condition Class 2 (those moderately altered), through vegetation management activities that mimic the different types of natural disturbances, such as even-aged and uneven-aged harvest methods, mechanical treatments, and prescribed fire.
- 7. Provide sustainable forest products.** (Forest Plan p.2-20, O-TM-1 and D-TM-1)
This area has provided timber for local industry for many years. The Forest Plan states that the amount of commercial timber sales available for purchase is at a level that is sustainable over time. The Record of Decision for the Forest Plan (p. 6) states that timber harvest will be the primary tool for reaching vegetative objectives. There are opportunities to use the timber harvest from this project to supply sustainable forest products.
- 8. Provide an adequate transportation system for managing the National Forest lands. Road management plans will include managing gravel pits.** (Forest Plan p. 2-47, D-TS-2 and p. 2-49, O-TS-7)
There is a need to add roads for adequate access to manage the National Forest lands. There is also a need to decommission some unauthorized roads that are not needed for future access.

1.4 Proposed Action

The proposed action was developed by the project interdisciplinary team and follows the Forest Plan objectives for Landscape Ecosystem (LE) and Management Area (MA) goals and objectives. The proposed action also incorporates the Forest Plan standards and guidelines. Forest Plan direction provides a framework within which to manage vegetation by considering multiple-use and other resource desired conditions.

The Team considered the existing condition for age class, species composition, and Management Indicator Habitats in each of the Landscape Ecosystems, both in the Project Area and across the forest. This forest-wide information showed there was a need to create young forest, especially aspen and paper birch and black spruce, and the project area information showed there was an opportunity to create conditions that would move the vegetation towards the desired conditions outlined in the Forest Plan. The Team identified possible management actions that would move the area towards the desired conditions. In addition, the Team considered Forest Plan direction for other resources in developing the proposed action, such as protecting and, where appropriate, enhancing wildlife habitat, watershed health, soil resources, scenic integrity, riparian habitat, and heritage resources. Some specific resources considered included:

- Patches of mature forest greater than 300 acres. No regeneration harvests were proposed in mature patches greater than 300 acres although some opportunities for intermediate harvest (such as thinning or group selection) were identified. In addition, forest that would grow into a 300-acre mature patch within ten years was also considered as a mature patch. These patches would also provide habitat for those species needing larger tracts of mature forest such as boreal owl, goshawk, and lynx.
- Recent regeneration harvests. Opportunities to harvest adjacent to existing young stands was considered, including those proposed to be harvested on other ownership to create larger-sized patches of young forest.
- Habitat needed for threatened, endangered, and sensitive species. Management action was deferred in some stands to maintain habitat for some species such as boreal owl, goshawk, and rare plants. Management action was proposed in other areas to create or enhance habitat, such as riparian management and planting of white pine for future bald eagle nesting habitat, enhancing wolf and lynx habitat by decommissioning unneeded roads and creating young forest for prey species such as deer and snowshoe hare.
- Riparian Emphasis and Eligible Wild, Scenic, and Recreational River Management Areas. The Project Area includes lands in both of these MAs and the Forest Plan provides specific vegetation management objectives. Some of the original treatment prescriptions were modified for the units within these management areas to better meet Forest Plan objectives. For instance, most of the clearcut prescriptions were changed to shelterwood with reserves followed by converting to white pine. Creating white pine forest would meet objectives in both Management Areas for providing older growth stages, mimicking natural disturbance, retaining long-lived species, and leading toward the development of a big-tree character. (Forest Plan 3-19 and 3-31)

During the development of the proposed action, the Team also collaborated with the Sand Lake Seven Beavers Memorandum of Understanding parties (made up of the State of Minnesota, Lake County, The Nature Conservancy and US Forest Service) in considering where to create young forest and where to maintain large patches of mature forest. Collaboration included planning similar harvest activities across ownership boundaries and accessing units using the same roads.

The proposed action is displayed in Table 1.1. The specific vegetation actions, including treatment definitions and a list of the treatment units, are included in Appendix A. The specific road actions and gravel pits are in Appendix B. The mitigations that would be implemented with the actions are included in Appendix C. The monitoring actions are in Appendix D.

Table 1.1. Proposed Action	
Vegetation Management	Acres
Create young aspen, paper birch, black spruce, and spruce-fir forest through a variety of even-aged management treatments such as clearcut, overstory removal, and shelterwood harvest.	4,414
Increase the amount of white pine through two-aged management treatments including shelterwood with reserves and shelterwood with canopy gaps.	428
Increase the amount of jack pine through a clearcut with reserves harvest followed by site preparation and planting jack pine.	32
Increase the amount of white pine by converting upland brush and poor quality aspen stands.	156
Enhance riparian habitat by planting longer-lived tree species and releasing existing long-lived tree species adjacent to streams and lakes.	241
Enhance yellow birch forest through site preparation to encourage regeneration of over-mature stand.	29
Improve the quality of red pine, white spruce, upland black spruce, and northern white cedar-aspen/birch stands through a variety of intermediate treatments such as thinning, group selection, variable retention, and shelterwood with canopy gaps.	3,639
Restore the ecological effects of fire in older red pine forest through underburning.	50
Improve Nabokov Blue butterfly habitat by eliminating brush through mechanical or prescribed burning methods.	2
Total acres of vegetation management.*	8,991
Fire Regime	Acres
Restore and/or maintain fire regime condition classes 1, 2, and 3 to condition class 1 and 2 through vegetation management.	8,989
Roads	Miles
Add existing unauthorized road to the managed system to provide adequate access to lands that are in need of management.	2
Decommission unauthorized road.	24
Use previously used temporary road corridor to access vegetation management units.**	48
Construct new temporary road to access vegetation management units.**	17
Gravel Pits	Number
Approve management plans for gravel extraction.	5

*Vegetation acres are stand acres. Actual treated acres would be less to account for legacy patches, reserve areas, and other parts of a stand not treated.

**All temporary roads would be decommissioned on completion of management activities.

1.5 Decision to be Made

The Laurentian District Ranger is the decision maker for this project and will decide the following:

Will the project have a significant impact that would trigger a need to prepare an Environmental Impact Statement?

Is the project in compliance with the Forest Plan?

Which actions, if any, will be approved that will move the Whyte Project Area toward the Forest Plan desired conditions?

What mitigation measures, monitoring requirements, and other actions will be applied to project activities?

1.6 Scoping and Public Involvement

On April 3, 2006, the Laurentian Ranger District mailed a letter to over 800 people stating the District would soon be issuing the Whyte Project Scoping Report. The letter was mailed to those who either live or own land within or adjacent to the Project Area, and those who are on the Forest-wide mailing list and asked to be notified of these projects. A stamped postcard was included with the letter and asked recipients to return the postcard if they wanted to receive a copy of the Scoping Report. Over 300 people returned the postcard and these folks were mailed a copy of the Whyte Project Scoping Report on May 12, 2006. The project was also listed in the Schedule of Proposed Actions and included in the Superior Quarterly beginning in January 2006. (See http://www.fs.fed.us/r9/forests/superior/publications/quarterly_reports/SQ.php)

The public was also notified of the Whyte Scoping Report through a paid advertisement placed in the newspaper of record, the Mesabi Daily News, on May 12, 2006. A news release was printed in the Lake County Chronicle, the newspaper nearest the project area, on May 19, 2006. The Scoping Report was also made available online at <http://www.fs.fed.us/r9/superior>. The purpose of scoping was to identify significant environmental issues deserving of further study and to de-emphasize the insignificant issues (40 CFR 1500.4g).

The District also hosted an Open House on May 31, 2006. Two people came to the open house. A private landowner identified a road proposed for closure that he uses for access to his private land. This road is no longer proposed for closure and will be addressed as a special use request in a future analysis. A representative from the MN Department of Natural Resources also attended to obtain additional information about the project.

The Scoping Report included specific information on how to submit comments on the project. Comments were requested to be submitted by June 9, 2006. Eleven responses from individuals, groups, and agencies were received by June 9. Several letters were received after June 9. The list of people who commented is included in Appendix E. See www.fs.fed.us/r9/superior for the letters and the Forest Service response.

The Whyte Project Preliminary Effects Analysis was developed to disclose the significant issue, alternatives, and effects analysis. This document was mailed to the public on February 12, 2007. The legal notice starting the official 30-day comment period was published on February 14, 2007 in the Mesabi Daily News. Nine comments were received during the 30-day period. The Preliminary Effects Analysis is the basis for this EA. Minor changes have been made to correct information and clarify analysis. No additional significant issues were raised and therefore no additional alternatives were developed to be analyzed in detail. Two additional alternatives were considered but eliminated from further study. See Section 2.4.

Tribes

Members of the District interdisciplinary team met with the Bois Fort Band on March 17 and the 1854 Authority, representing the Grand Portage and Bois Fort Bands of the Lake Superior Chippewa, on March 23, 2006. A draft proposal was shared with the tribes and with the 1854 Authority.

Topics addressed at these meetings included hunting access and moose and white tail deer habitat. Both hunting access and game species management were considered during the development of the proposed action.

1.7 Significant Issue

The Scoping Report defined issues as points of disagreement, debate, or dispute about the potential effects of a proposed activity and are based on some anticipated outcome. Significant issues are issues that are within the scope of the proposed action, are relevant to the decision to be made, are not already decided by law, regulation, or policy, and are not conjectural or unsupported by scientific evidence. The interdisciplinary team categorized the comments received on the Scoping Report and the District Ranger determined whether issues were significant or not. The District Ranger decided that one significant issue was raised from the comments received in response to the Scoping Report. This significant issue was used to develop alternatives and to disclose the effects of the project. The other relevant comments have been incorporated into the Project analysis.

1. Biological Diversity of Stands Ranked by the Minnesota Department of Natural Resources, Minnesota County Biological Survey

There is concern that harvest within some of the higher-ranked Minnesota County Biological Survey (MCBS) sites would decrease the biological diversity of those sites.

The Forest Plan defines biological diversity as “The variety of life and its ecological processes; the variety of organisms considered at all levels, from genetic variants belonging to the same species, through arrays of genera, families, and still higher taxonomic levels. It includes the variety of ecosystems, which comprise both the communities of organisms within particular habitats, and the physical conditions under which they live.” (Forest Plan p. Glossary-2)

See Chapter 3 for more information on MCBS Sites, rankings, and how this project might affect biological diversity.

1.8 Other Analysis

The effects of the project on other relevant resources will also be disclosed in Chapter 3 of this Environmental Assessment. Additional information on all resources is available in the Project Record.

Chapter 2: Comparison of Alternatives

2.1 Introduction

This chapter describes:

- how a range of alternatives was developed,
- alternatives analyzed in detail,
- alternatives considered but not analyzed in detail, and
- a comparison of effects and accomplishment of the purpose and need.

In accordance with the National Environmental Policy Act, a No Action Alternative is included in this analysis. This alternative is intended to serve as a control showing the environmental and social effects of taking no action, as well as to provide the deciding officer the option of taking no action at this time.

If there are unresolved issues about effects, alternatives are developed. Alternatives are used to provide the responsible official with choices for avoiding or minimizing effects. The purpose and need for action and the significant issues raised during scoping sets the range of alternatives since all alternatives must in some way meet the purpose and need.

2.2 Development of a Range of Alternatives

The implementation guidelines (40 CFR 1500) developed by the Council on Environmental Quality require that an environmental review must "...rigorously explore and objectively evaluate all reasonable alternatives." The courts have established that this direction does not mean that every conceivable alternative must be considered, but that selection and discussion of alternatives must permit a reasoned choice and foster informed public participation and decision-making.

The Whyte Forest Management interdisciplinary planning team developed a Proposed Action that would meet the purpose and need for the Project. This Proposed Action was included in the May 2006 Scoping Report. Based on additional field reviews and new information, the team modified the Scoping Report Proposed Action to better fit conditions on the ground and to better meet Forest Plan direction. The Scoping Report Proposed Action will not be analyzed in detail in this document but is considered as part of the range of alternatives considered.

Public comments received on the Scoping Report were used to identify significant issues (listed in Chapter 1 of this EA). The Scoping Report stated that significant issues will be used to develop alternatives and to disclose the effects of the alternatives analyzed. One significant issue was raised during the Scoping comment period. One additional action alternative was developed that addressed the concern raised in the significant issue and is analyzed in detail.

When developing the proposed action and alternatives, the interdisciplinary team identified standard management requirements and mitigation measures to minimize impacts on resources from the activities proposed. Standard management requirements include Forest Service policies, Forest Plan Standards and Guidelines, and Minnesota Forest Resource Council Forest Management Guidelines. Where needed on individual units, site-specific mitigation measures are

identified to further reduce effects of management activities. Unit cards contain detailed information on site-specific harvest prescription, mitigation measures, and regeneration activities. Unit cards are available at the Laurentian District office, on the internet, and by request. The enclosed map shows the location of the harvest units. Please reference Appendix A for information on the action occurring in each unit under each alternative. The map provided with the earlier Scoping Report can also be used to reference locations of specific units.

The planning team also collaborated with the Sand Lake Seven Beavers Memorandum of Understanding (MOU) parties during the development of the proposed action. The parties of the MOU are the Superior National Forest, Lake County, State of Minnesota and the Nature Conservancy. The purpose of this group is to coordinate and cooperate in a wide range of activities including sharing data, planning, monitoring, surveying, inventorying, and managing resources. District staff collaborated with the Sand Lake Seven Beavers MOU parties and St. Louis County resource managers, on vegetation management throughout the Whyte Project Area.

The Whyte Project Environmental Assessment discloses the effects of three alternatives considered in detail and six alternatives considered but not analyzed in detail. These nine alternatives provide an adequate range of alternatives because they address issues raised by the public during the Scoping period and the 30-day official comment period. This following two sections shows how the alternatives either meet the purpose and need and are considered in detail or do not meet the purpose and need and are not considered in detail. The purpose and need of the Whyte Project is move the vegetative conditions towards the Forest Plan Landscape Ecosystem objectives. The alternatives analyzed in detail and those considered but not analyzed in detail provide enough information on the range of effects for the decision maker to make an informed decision, including the tradeoffs between resources

2.3 Alternatives Considered in Detail

Table 2.1 shows the specific actions that would occur under each of the alternatives. The enclosed map of the project area shows the location of the treatment units and proposed road changes. Please reference Appendix A for information on the treatment definitions and a list of the treatment units that shows the type of activity that would occur in each unit under each alternative. Information on the proposed road actions and gravel pits are in Appendix B. The mitigations that would be implemented with the actions are included in Appendix C. Project monitoring is listed in Appendix D. The projects considered for cumulative effects are discussed in Appendix F. All acres and miles listed in the following table are estimates.

Table 2.1 Comparison of Alternatives Considered in Detail			
	Alternative 1	Alternative 2	Alternative 3
Vegetation Management	Acres	Acres	Acres
Create young aspen, paper birch, jack pine, balsam-fir/spruce, and black spruce forest through a variety of even-aged management treatments such as clearcut with reserves, overstory removal, and shelterwood harvest.	4414	0	3985
Increase the amount of white pine through two-aged management treatments including shelterwood with reserves.	428	0	428

Table 2.1 Comparison of Alternatives Considered in Detail			
	Alternative 1	Alternative 2	Alternative 3
Vegetation Management	Acres	Acres	Acres
Increase the amount of white pine by converting upland brush and poor quality aspen stands.	156	0	156
Increase the amount of jack pine through a clearcut with reserves on non-jack pine sites followed by site preparation and seeding or planting jack pine.	32	0	32
Enhance riparian habitat by planting longer-lived tree species and releasing existing long-lived tree species adjacent to streams and lakes	241	0	241
Enhance yellow birch forest through site preparation to encourage regeneration of over-mature stand.	29	0	29
Improve the quality of red pine, white spruce, upland black spruce, sugar maple, and northern white cedar-aspen/birch stands through a variety of intermediate treatments such as thinning, group selection, variable gap dynamics, and shelterwood with canopy gaps.	3639	0	2943
Improve Nabokov Blue butterfly habitat by eliminating brush through mechanical or prescribed burning methods.	2	0	2
Restore the ecological effects of fire in older red pine forest through underburning.	50	0	50
Total Acres of Vegetation Management	8991	0	7865
Fire Regime Condition Class	Acres	Acres	Acres
Restore and/or maintain fire regime condition classes through vegetation management.	8989	0	7863
Road Management	Miles	Miles	Miles
Add existing unauthorized road to the managed system to provide adequate access to lands that are in need of management.	2	0	2
Decommission unauthorized road.	24	0	24
Use previously-used temporary road corridors to access vegetation management units. ¹	48	0	44
Construct new temporary roads to access vegetation management units. ¹	17	0	15
Gravel Pits	Number	Number	Number
Approve management plans for gravel extraction	5	0	5

¹All temporary roads would be decommissioned upon completion of management activities.

Alternative 1: Proposed Action

The proposed action was developed by the project interdisciplinary team and follows the Forest Plan objectives for Landscape Ecosystem (LE) and Management Area (MA) goals and objectives. The proposed action also incorporates the Forest Plan standards and guidelines. Forest Plan direction provides a framework within which to manage vegetation by considering multiple-use and other resource desired conditions. This proposed action is a modified version of the proposed action included in the Scoping Report. Some of the proposed treatment units included in the Scoping Report have been dropped from the Proposed Action following additional field reviews, and some prescriptions have been modified to better address conditions on the ground and to respond to new information. (See Section 2.4, Alternative 4.)

This alternative was developed in collaboration with the State of Minnesota, Lake County, St. Louis County, and the Nature Conservancy. In particular, agency resource staff collaborated where larger-sized patches of both young and mature vegetation could be created or maintained across land ownership boundaries. Some of the stands proposed for harvest are located adjacent to either recently harvested areas or areas planned to be harvested in the near future, on other ownership. This would result in increasing the size of patches and reducing habitat fragmentation.

Alternative 2: No Action

Under the no action alternative no new management actions would be proposed at this time. Existing management actions such as previously approved timber sales or road projects would be allowed to continue. Natural succession processes would take place. Current road use would continue. Selection of this alternative would not preclude future management actions in the project area. The purpose of the No Action Alternative is to provide a baseline to show the difference in effects between the action alternatives and no action.

Alternative 3

This alternative was developed in response to a significant issue raised during the public scoping period. The Minnesota County Biological Survey (MCBS) expressed a concern that harvest within some of the higher-ranked MCBS sites would decrease the biological diversity of those sites. The planning team developed an alternative that followed the MCBS recommended action (or no action), for management in the units they identified. See Table 2.2 for the list of units and the specific differences between Alternative 1 and Alternative 3.

Alternative 3 would treat 1,128 fewer acres than Alternative 1, and would use a variable retention harvest instead of a clearcut with reserves harvest on 175 acres. This issue will be used to disclose the differences in effects between alternatives.

Unit #s	Acres	MCBS Site and Ranking	MCBS Issue	Indicator	Alternative 1, Proposed Action	Alternative 3
190-192	251	Marble Beaver River - High	Quality of large, undisturbed mature patch	<ul style="list-style-type: none"> ●Patch size (acres) ●Treatment within the patch (acres), ●Rare species, and ●Description of 	Variable Retention	No action

Unit #s	Acres	MCBS Site and Ranking	MCBS Issue	Indicator	Alternative 1, Proposed Action	Alternative 3
				biological changes to mature patch		
268-274	529	Marble Kit Creek - High	Quality of large, undisturbed, mature patch	<ul style="list-style-type: none"> ●Patch size (acres) ●Treatment within the patch (acres), ●Impacts to Canada yew and oak, and ●Description of biological changes to undisturbed patch 	Group selection	No action
250, 258-260	175	Marble Kit Creek - High	Native plant community and disturbance regime	<ul style="list-style-type: none"> ●Changes to native plant community, ●Changes to micro-climate, and ●Cedar regeneration 	Clearcut with reserves and manage for aspen	Variable retention.
7	52	Seven Beavers – Ranking in Progress	Fragmentation of bog complex and impacts to older growth stages	Changes in older growth stages as measured by species composition and age class.	Shelterwood with canopy gaps and plant white pine.	No action
33-40	296	Wet Foot Hills - Ranking in Progress	Fragmentation of site	Amount of fragmentation as measured by acres of young patch, miles of edge, and edge density	clearcut 33, 34, 37, & 38; thin 35 & 36; overstory removal 39 & 40. Intent of clearcuts is to create larger-sized patches of young forest in collaboration with TNC.	No action

2.4 Alternatives Considered But Eliminated From Detailed Study

Alternative 4, Initial Proposed Action

The planning Team developed a proposed action early in the planning process to meet the Purpose and Need. This alternative included more than 300 treatment units on approximately 12,000 acres. After additional field review and preliminary effects analysis, some of these units were dropped from further consideration and others were modified to better meet either Management Area direction or to address a resource concern. It is important to include this as an alternative considered but eliminated from detailed study because it shows the process the interdisciplinary planning team used to develop a proposed action that limits adverse effects to the extent practical, addresses resource concerns during project development, and implements the Forest Plan. This alternative proposed a greater amount of regeneration harvest than Alternatives 1, 3, or 5. For instance, this alternative originally included mostly clearcut harvest within several

units in the Eligible Wild, Scenic, and Recreational River corridor and Riparian Emphasis Management Area. While this type of management is allowed, the planning team deferred some units and modified the treatment of some other units because it would better meet the Eligible Wild, Scenic, and Recreational River and Riparian Emphasis Management Area direction. (See Forest Plan pp. 3-16 through 3-20) The project record contains additional information on these and other changes made to the initial proposed action.

Alternative 5, Scoping Report Proposed Action

The Proposed action included in the Scoping Report proposed treating approximately 10,264 acres. This alternative is no longer being considered because after additional field reviews and obtaining new information, some stands have been dropped or the prescriptions modified because of on-the-ground conditions. This alternative shows the continuing process of developing an alternative that meets Forest Plan direction, follows Forest Plan standards and guidelines, and addresses specific resource concerns. For instance, this alternative proposed thinning in stands with a basal area that is currently at the desired level, clearcutting stands where most of the overstory has already died and site preparation activities are more suited, or would require long access roads for small treatment areas. (See “Change to Proposed Action between Scoping and Preliminary EA”, August 10, 2006)

Alternative 6, Additional Roads to remain open for motorized use

The 1854 Authority asked the planning team to specifically review roads proposed to be closed to determine if any could remain open after harvest so tribal members would have motorized access to recently harvested areas. Tribal members use this area for moose and deer hunting and use motorized access to these areas. They asked specifically about access off the Stony River Grade.

The interdisciplinary team reviewed the road access opportunities along the Stony Grade. The project does not propose closing the only Forest Service-administered system road off the Stony Grade. This existing system road would be used to access harvest units 132 – 135 and would remain open for use after harvest. Three other harvest units are located adjacent to the road and would be accessed via a temporary road. The Forest Plan provides clear direction that temporary roads are not open for public use and are to be closed upon completion of management actions. Because the units are adjacent to the road, they can be accessed via foot with minimal effort. No other temporary or system road changes are proposed along the Stony Grade. A large amount of land along the road is under other ownership and while the planning team is not aware of other new roads on other ownership, it does limit the opportunities to provide access on federal land.

The 1854 Authority mentioned a short spur of old railroad track located at the junction of Forest Highway 11. The planning team contacted 1854 Authority to clarify their need for this section of road proposed to be decommissioned. They indicated they can complete the winter track survey work by utilizing the existing road and snowmobile trail and do not need the old railroad grade. Therefore, the old railroad grade is proposed to be decommissioned under both action alternatives.

Alternative 7, Harvest within RARE II/Roadless Area Conservation Rule Areas

An area around Phantom Lake was included in the final nation-wide inventory of roadless areas in a process called Roadless Area Review and Evaluation (RARE II). Phantom Lake was also included in the Forest Service Roadless Area Conservation Rule (RACR).

Based on the Roadless Area analysis conducted during the Forest Plan revision process, the Phantom Lake area did not meet plan revision criteria and was subsequently removed from the

Roadless Area Inventory. This was primarily because it did not meet the inventory criteria for semi-primitive acres (only 1000 acres semi-primitive). (FEIS Volume II Appendix C p. C-7). The forest Plan designated this in the General Forest Management Area. The Scoping Report Proposed Action proposed managing vegetation in this area following the Forest Plan direction.

A recent court case (United States District Court, Northern District of California, No. C05-03508 EDL consolidated with No. C05-04038 EDL (September 19, 2006) reinstated the Roadless Rule.

Because of this recent court decision, the proposal to manage the vegetation on approximately 856 acres within the Phantom Lake Roadless Area is being deferred from consideration at this time. The proposal to decommission the unauthorized road in the Roadless Area will remain in Alternatives 1 and 3.

Alternative 8, Harvest Young Stands before the Culmination of the Mean Annual Increment

The Minnesota council on Environmental Advocacy suggested an alternative that would harvest young trees in an effort to create larger-sized patches of young forest in areas where harvest has already occurred and then not harvest within or adjacent to the larger-sized patches of mature forest. MCEA feels this would provide young forest, and would better maintain interior forest habitat.

The Forest Plan states that “Even-aged regeneration harvest is allowed after a stand has reached at least 95% of culmination of the mean annual increment. This does not preclude salvage using even-aged harvest after natural disturbances such as fire, wind, insects, or disease or to meet other resource objectives.”

This alternative is not being considered in detail because there is not a need to do this to meet other resource objectives and the Forest Plan did not show a need to harvest these young stands to meet Plan objectives or desired conditions. The Project does propose to harvest the mature stands adjacent to recently harvested sites to create larger-sized patches of young forest. There may be ten to 15 years difference in age in these created patches but they would still have similar patch characteristics and would grow into a larger-sized patch of mature forest if the harvest occurs.

Alternative 9, Develop an Alternative that Better Meets Range of Natural Variability

The Minnesota Center for Environmental Advocacy suggested an alternative that would move the vegetative condition toward the range of natural variability. This would be accomplished through less aspen clearcutting and more partial harvest and converting to pine and spruce-fir forest.

The purpose and need for the Project including creating young aspen and birch forest and increasing the amount of white pine and jack pine. The Forest-wide Landscape Ecosystem objectives also show a need to increase the amount of spruce-fir forest but not young spruce-fir. See Tables 3.8.1 and 3.7.1. Spruce-fir forest will be increasing naturally through succession of some of the older aspen, birch, and jack pine stands that are not managed. As these stands continue to age and the aspen, birch, and jack pine die, they will be replaced by the more shade tolerant species of spruce and fir. Therefore, there is not a need to actively manage for more spruce-fir to meet the Forest Plan objectives. There is a need to create young aspen forest. The Whyte Project is based on the Forest Plan objectives. Developing an alternative that moved the vegetative conditions towards range of natural variability would not meet long-term Forest Plan objectives.

2.5 Comparison of Alternatives

Comparison of How Alternatives Meet Purpose and Need

Table 2.1 shows a comparison of the three alternatives presented in this environmental assessment. The following tables show how each alternative addresses the purpose and need listed in Chapter 1.

1. Create young forest to move the area towards the long-term Landscape Ecosystem objectives in the Forest Plan for age class composition and management indicator habitats.

In particular create young forest in the aspen and birch forest types in the upland LEs (MIH 4) and black spruce in the lowland LEs (MIH 9).

	Alternative 1	Alternative 2	Alternative 3
Acres of young forest*	4,466	0	3,985
Acres of Young Aspen and Birch Forest (MIH 4)	3,403	0	3,134
Acres of young Black Spruce (MIH 9)	560	0	491

*Includes all clearcuts with reserves, shelterwood, and 156 acres of upland brush converted to white pine.

Table 2.3 shows that Alternative 1 would create more acres of young forest, more acres of young aspen and birch forest and more acres of young black spruce forest than Alternative 3, although both create young forest. Alternative 2 would not provide any young forest.

2. Increase the amount of white pine and jack pine on appropriate sites to move towards meeting the vegetation composition objectives.

	Alternative 1	Alternative 2	Alternative 3
White Pine Conversion*	584	0	534
Diversity Planting**	404	0	295
Jack Pine Conversion	32	0	32

*Includes shelterwood with reserves harvest and reforestation.

**Diversity planting includes primarily white pine with red pine, white spruce, cedar, and red oak. Acres include restoration planting, natural and diversity plant regeneration, and 10 acres per stand treated in Natural Regeneration with Riparian Planting and Site Preparation with Riparian Planting treatment prescriptions.

Table 2.4 shows that Alternative 1 would convert the most acres to white pine and would diversity plant more acres than Alternative 3. Alternatives 1 and 3 convert the same number of acres to jack pine. See Chapter 3 Section 3.8 and Appendix F for information on how each Landscape Ecosystem would be affected.

3. Enhance riparian forest habitat through planting and where needed, creating conditions that are more suitable for planting long-lived species such as white pine, white and black spruce, tamarack, and red oak.

Table 2.5 Acres of Riparian Habitat Improvement			
	Alternative 1	Alternative 2	Alternative 3
Riparian Habitat Improvement	241	0	241

Table 2.5 shows that both action alternatives would improve the same number of acres of riparian habitat. No riparian habitat would be improved under Alternative 2.

4. Enhance the growing conditions in red pine, maple, and white spruce stands by conducting intermediate treatments, such as thinning and selection harvest.

Table 2.6 Acres of Enhanced Growing Conditions in Red Pine, Spruce, and Maple Stands			
	Alternative 1	Alternative 2	Alternative 3
Enhanced Red Pine	858	0	796
Enhanced White Spruce	557	0	467
Enhanced Maple	2,100	0	1,385

Table 2.6 shows that Alternative 1 would enhance more acres of red pine, white spruce, and maple than would Alternative 3. Alternative 2 would not enhance any red pine, spruce, or maple stands.

5. Reduce fragmentation and create larger-sized patches of young forest by harvesting adjacent to recently harvested areas. These large patches will be coordinated with other landowners.

Tables 2.7 through 2.10 display the changes that would occur to the amount of fragmentation. Fragmentation is measured by the management indicator habitats (MIH) 11, 12, and 13. The MIHs measure the amount of edge, amount of interior forest habitat, the number of 300-acre patches, and the average patch size.

Table 2.7 Indicators for MIH 11 – Acres of Upland and Lowland Edge Habitat*					
	Forest Plan direction	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Upland Edge Habitat	Reduce the amount of forest edge while retaining a range of small patches and edge habitat	23	22	23	21
Lowland Edge Habitat		26	25	30	26

*Based on stands 0-19 years old.

Table 2.7 shows that Alternatives 1 and 3 would reduce the amount of upland and lowland edge through management actions. This would happen as a result of creating some larger-sized patches of young forest and harvesting adjacent to recently harvested stands. Alternative 2 would not reduce edge habitat.

	Forest Plan objective for Spatial Zone 1	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Mature Interior Forest	Maintain or increase the amount of mature interior forest habitat	6,553	5,969	6,850	6,114

Table 2.8 shows there would be a decrease in the amount of interior forest as a result of management action. Alternative 1 would decrease the amount of interior forest by approximately 9 percent, Alternative 2 would result in an increase of 1 percent, and Alternative 3 would result in a 7 percent reduction in interior forest. The reduction in interior forest is the result of harvesting stands over approximately 20 acres in size. Stands less than 20 acres in size are generally not large enough to provide interior forest conditions. Stands larger than 20 acres also might not provide interior forest conditions if they are more linear in shape. While the Forest Plan shows an objective to maintain or increase the amount of mature interior forest, there is also an objective to increase patch size and to provide young forest. The Whyte Project includes actions that would increase patch size and create young forest (see Table 2.10) and this means there would be a reduction in the amount of mature interior forest. Under Alternatives 1 and 3 there would be an increase in the amount of young interior forest and this young forest would eventually grow into better quality interior habitat in the future. These large young patches would provide better quality interior forest than if young patches are not created. The Forest Plan FEIS shows a 9 percent decrease in the mature upland patches by the second decade from the existing condition. (FEIS p. 3.3.2-5)

	Forest Plan objective for Spatial Zone 1	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Number of patches greater than 300 acres	Maintain or increase the acres and number of 300 acre patches	18	18	18	18
Acres of forest in patches greater than 300 acres		10,550	10,550	10,550	10,550

Table 2.9 shows there would be no change in the number of patches greater than 300 acres or in the acres of forest in the 300 acre patches.

Table 2.10 Patch Size of Young Forest Aged 0-19 on NF Land and Number of Young Patches Created that are Adjacent to Existing and Planned Young Patches on Other Ownership					
	Forest Plan direction for Spatial Zone 1	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Average size of young patches* (acres)	Increase the average size of temporary openings	35	45	Not Applicable	44
Number of young patches created that are adjacent to existing young patches on other ownership		Not applicable	56	0	49
Number of young patches created that are adjacent to planned young patches on other ownership		Not applicable	27	0	23

*Does not include acres of existing or planned young forest on other ownership.

Table 2.10 shows that the average size of young forest patches increases under both of the action alternatives. Alternative 1 would result in a slightly greater increase in patch size than Alternative 3. Alternative 2 would not create any young patches and therefore would not directly increase or decrease patch size. Alternative 1 would also create more young patches that are adjacent to either existing young patches or planned young forest, than would Alternative 3.

6. Improve the fire regime condition class ratings through moving the Project Area towards the LE objectives.

Table 2.11 Fire Regime Condition Class			
	Alternative 1	Alternative 2	Alternative 3
Acres of restored and/or maintained condition class	8,989	0	7,934

Table 2.11 shows that Alternative 1 restores or maintains more acres in Condition class 1 or 2 than does Alternative 3. Alternative 2 does not restore any acres.

7. Provide for sustainable forest products.

Table 2.12 Volume of Timber Harvested			
	Alternative 1	Alternative 2	Alternative 3
Millions of Board Feet (MMBF)	36	0	32

Table 2.12 shows that Alternative 1 would create more volume than would Alternative 3. Alternative 2 would not provide any forest products.

**8. Provide an adequate transportation system for managing the National Forest lands.
Road management plans will include managing gravel pits.**

	Alternative 1	Alternative 2	Alternative 3
Miles of Unauthorized Roads Added to Managed Road System	2	0	2
Miles of Unauthorized Roads Decommissioned	24	0	24
Gravel Pits Approved for Use	5	0	5

Table 2.13 shows that Alternative 1 and 3 would add the same roads to the managed road system, would decommission the same roads, and manage the same gravel pits. Alternative 2 would not result in any changes to the road system.

Chapter 3: Environmental Consequences

3.1 Introduction

This Chapter discloses the environmental effects that would occur under each of the alternatives described in Section 2.3. Environmental effects include physical, biological, social, and economic factors and changes that would occur under the various alternatives. Environmental effects are considered from a direct, indirect, and cumulative effect perspective.

- **Direct effects** are impacts that occur at the same time and place as the initial action.
- **Indirect effects** are impacts that occur as a result of the initial action but are either later in time or are spatially removed from the action (occur in a different place).
- **Cumulative effects** result from the incremental impacts of actions that when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such further action. The list of projects considered for cumulative effects is listed in Appendix F.

The Interdisciplinary Team (IDT) examined and analyzed data to estimate the effects of each alternative. The data and level of analysis were commensurate with the importance of the possible impacts (40 CFR 1502.15). The effects are quantified where possible, although qualitative discussions may also be included. Acreage figures are estimates based on information from the Superior National Forest Geographic Information System (GIS) database. Acres may vary slightly in implementation based on field verification using Geographic Positioning System (GPS) data. The accuracy of the estimated acreage is sufficient for the analysis.

When a gap in information was identified, the analysis team concluded that the missing information may have added precision to estimates or better specified a relationship; however, the basic data and central relationships are sufficiently well-established in the respective sciences that additional information was considered unlikely to reverse or nullify understood relationships. Thus additional information would be welcomed and add precision but it is not considered essential to provide adequate information for the decision-maker to make a reasoned choice among alternatives.

Section 3.2 provides the detailed effects analysis of the Significant Issue raised by the Minnesota Department of Natural Resources, Minnesota County Biological Survey during the Scoping process. This issue concerns biological diversity (or biodiversity).

Sections 3.3 through 3.23 provide summaries of the effects that the project would have on the other resources. The summaries are based on full resource reports located in the Project File. The Deciding Officer will consider the information in the Project File in addition to what is disclosed in this document prior to making a reasoned decision and determination on whether an EIS is necessary based on significance factors (context and intensity per 40 CFR 1500).

3.2 Biological Diversity of Stands Ranked by Minnesota Department of Natural Resources, Minnesota County Biological Survey

There is concern that harvest within some of the higher-ranked Minnesota County Biological Survey sites would decrease the biological diversity of those sites.

MCBS sites are ranked according to four levels based on the relative significance for native biological diversity of surveyed areas. Important factors in ranking sites include rare species and native plant community elements. Sites ranked “outstanding” contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities and/or the largest, most intact functional landscapes present. Sites ranked “high” contain the “best of the rest” such as sites with very good quality occurrences of the rarest species, high quality examples of the rarest native plant communities, and/or functional landscapes. (Definitions from “Guidelines for MCBS Statewide Biodiversity Significance Rank.”) MCBS commented on those sites ranked either outstanding or high within the North Shore Highlands subsection. The Laurentian Uplands subsection ranking has not yet been completed but the stands identified by MCBS will still be addressed.

MCBS provided recommendations for either deferring management action or modifying the proposed action in select stands to address the concern about decreasing biological diversity and fragmenting larger-sized patches of mature forest. The planning team clarified that some of the thinning prescriptions were intended to be a combination of individual tree and group selection, especially in the sugar maple units. (See definition of Thin on page Attachment 1-2 in the Scoping Report. This has been clarified in Appendix A of this document.) The group selection prescription is similar to the gap management recommended by MCBS. The sugar maple units to be treated with group selection would also incorporate aspects of gap management. See Appendix A, Vegetation Treatment Information, for harvest definitions and harvest prescriptions for each unit by alternative.

The Forest Plan defines biological diversity as “The variety of life and its ecological processes; the variety of organisms considered at all levels, from genetic variants belonging to the same species, through arrays of genera, families, and still higher taxonomic levels. Includes the variety of ecosystems, which comprise both the communities of organisms within particular habitats, and the physical conditions under which they live.” (Forest Plan p. Glossary-2)

Because biodiversity is made up of the variety of life, it is important to identify specific indicators that can be used to measure the effects of the project. Therefore, only the site-specific biodiversity concerns raised by MCBS will be used as indicators for each site to measure how management might affect the biological diversity of that site.

See Table 2.2 for an overview of the issues and indicators for each site and the differences between Alternatives 1 and 3.

3.2.3 Analysis Area

The site-specific biodiversity concerns raised by MCBS will be used to determine how management might affect that specific aspect of biodiversity. The analysis area for the direct and

indirect effects is the specific unit(s) identified by MCBS. The analysis area for cumulative effects includes the actions occurring on other ownership directly adjacent to or within the specific MCBS sites. This boundary was chosen because each site was evaluated on its own qualities and criteria and the boundaries were established by MCBS after extensive reviews. The time period for analyzing the direct, indirect, and cumulative effects is 2006 through 2014. This time period was chosen because the project would likely be fully implemented in this time period. The effects would begin to diminish after implementation and would no longer be measurable within five years because vegetation would be re-established on all of the sites.

3.2.4 Affected Environment and Environmental Consequences

The Forest Plan incorporates approaches for addressing biological diversity at site and landscape-levels. The landscape ecosystem objectives help to maintain or restore ecological processes and functions. (Forest Plan, Record of Decision, p. 5) The Landscape Ecosystems (LE), including management indicator habitats and species, and Management Area (MA) objectives, all provide direction for addressing biological diversity.

The Proposed Action addresses biodiversity by identifying specific actions that would move the Project area towards the desired conditions identified in the LE and MA direction in the Forest Plan. (See Forest Plan p. 2-22 {D-VG-1, D-VG-2, and D-VG-3}, and pp. 2-55 through 2-78 for LE goals and pp. 3-1 through 3-37 for MA goals.) The MCBS provided some new information on specific aspects of biological diversity that might be affected by the Proposed Action. Because biodiversity incorporates all aspects of the ecosystems, it is necessary to decide which aspect of biodiversity will be measured and analyzed. Therefore, the specific biodiversity aspect identified by MCBS will be used to disclose the effects of the project on the concern about decreasing biological diversity.

The specific aspects of biodiversity identified by MCBS for each site are identified below. This information was provided by MCBS from the “MCBS Site Database Summaries for Sites in the USFS Whyte Project area where Survey work is completed as of 7/14/2006”. Rankings are complete for two of the sites and are not complete for three of the sites. This environmental analysis will not attempt to determine if proposed actions would result in a change (either positive or negative) to the MCBS ranking. If MCBS provides rationale that a particular action in one of the sites would result in changing the ranking of a site, then that information will be used to update this analysis prior to the District Ranger making a decision on this project.

Members of the Project planning team used an interdisciplinary process to analyze and disclose the effects of the project on each specific aspect of biodiversity identified for each site. Resource specialists used professional resource knowledge and personal knowledge of the specific sites to disclose the effects of the project on the identified biodiversity characteristic of each site. Both qualitative and quantitative measures (also called indicators) will be used to describe the effects that would occur under each alternative.

It is important to note that vegetation management does not necessarily lower the MCBS ranking or adversely affect the overall biological diversity of a site. For instance, the proposed action proposes to conduct a two-aged management prescription on three units in the Headwaters Site which is ranked outstanding. MCBS stated that converting these units to white pine through the proposed two-aged management prescription would move the sites towards the long-term ecological objectives.

Direct and Indirect Effects

The following five areas within four MCBS sites will be addressed. Each area of concern includes a brief description of the site as provided by MCBS, identifies the specific action that would occur under each alternative and the indicators that will be used for analysis, and discloses the effects by alternative.

Area 1: Marble Beaver River Site 1 (Rank: High)

MCBS description of site: *“There are few recent disturbances in the Site, but county land adjacent to the Lillian Creek South pcRNA¹ was recently clearcut. Rare species recorded include occurrences of Torreyochloa, Botrychium, and Arethusa. The biodiversity significance reflects a site with high-quality plant communities and little disturbance, with several adjacent High and Moderate biodiversity sites. The greater area is semi-remote, divided only by Highway 11. A block of older northern hardwoods along the highway in the north end of the site has a rolling topography and large old trees.”*

“Stands are portion of a larger patch of Sugar Maple-North Shore in older growth stage. Maintain very large, old, upland patch identified by the SNF that is in the center of this MCBS Site. Thinning from 120 BA to 80 BA would lower the biological diversity of the stand. Recommends deferral because of where stands are located and size of surrounding patch. Variable gap dynamics would mitigate loss of biological diversity.”

Table 3.1 lists the units of concern, shows the differences between the alternatives, and describes the indicators that will be used to show the differences between alternatives.

Unit #s	Acres	MCBS Issue	Indicators	Alternative 1, Proposed Action	Alternatives 2 and 3
190-192	251	Quality of large, undisturbed mature patch	<ul style="list-style-type: none"> • Patch size (acres) • Treatment within the patch (acres), • Rare species, and Description of biological changes to mature patch 	Variable Retention*	No action

*See Appendix A for definitions of the various harvest prescriptions.

¹ Lillian Creek South pc RNA was identified as a potential research natural area during the forest planning process. This potential RNA was not carried forward as a Candidate Research Natural Area, as documented in the Forest Plan Record of Decision (pp. 8, 18, and 21).

Table 3.2 shows size of the patch and acres of vegetation treatment under each alternative

Indicator	Alternative 1, (Variable Retention)	Alternative 2 (No Action)	Alternative 3 (No Action)
	Acres	Acres	Acres
Patch Size	1,275	1,275	1,275
Vegetation treatment within patch	251	0	0

Direct and Indirect Effects

Alternative 2 (No-Action)

- Patch size would not change.
- No vegetation treatment would occur within the patch.
- Rare species within the stands would not be impacted.
- Natural biological changes to the patch, such as vegetation succession and possible gap creation through blowdown would continue to occur.

Alternative 1 (Proposed)

- Patch size would not change because variable retention treatment maintains adequate canopy cover to maintain mature forest conditions and therefore would not reduce the size of the patch.
- Vegetation treatment of variable retention would occur on approximately 20% of the mature patch retaining approximately 80 percent of the original patch in current condition. Treatment activities in the 20 percent of the patch would retain larger tree sizes and mimic small natural disturbance patterns thereby limiting the direct effects to existing vegetation.
- Forest Plan direction would be followed for any threatened, endangered, or sensitive species found in the stands. It is unlikely that *Torreyochloa* and *Arethusa* would occur in treatment areas of units 190-192 because they are wetland species and units 190-192 are upland sites. Any wetland inclusions within these or other units would be protected as specified in the mitigations (Appendix C). Wetlands with known occurrences of *Torreyochloa* or *Arethusa* would be identified on unit cards for protection. *Botrychium mormo* (goblin fern) and *Botrychium lanceolatum* (lance-leaf grapefern) are two Regional Forester sensitive species with suitable habitat in units 190-192. Although these specific stands were not surveyed for goblin fern and lance-leaf grapefern, twelve proposed treatment units (totaling 830 acres) with similar suitable habitat were surveyed and neither species was found. If these species occur in units 190-192, their populations may be impacted by soil compaction, loss of soil nutrients, and changes in moisture regimes and the spread of exotic earthworms. To limit these potential impacts to goblin fern suitable habitat, the variable retention harvest would occur during the winter. (See the biological evaluation [available upon request] for more information.)
- Biological changes to the site's current high-quality plant community would occur as a result of variable retention treatment, potentially lessening current biodiversity values. However, since this treatment is similar to variable gap dynamics, potential impacts to biodiversity would be mitigated through: 1) replicating natural disturbance by creating various size gaps and retaining untreated areas, 2) retaining legacy patches and leave trees, 3) emphasizing retention of larger-sized trees, and 4) retaining tree species and sizes of trees present at older growth stages.

Alternative 3

- Same as Alternative 2.

Cumulative Effects

Potlatch owns land within the MCBS Site and a small part of the mature patch extends on to Potlatch land. Potlatch has not indicated they have plans to harvest this site. However, if Potlatch did clearcut part of the mature patch, it would result in a decrease in the overall patch size but it would not change the size of the patch on Federal land. Additionally, a clearcut in this site would likely lessen the biodiversity quality for which this site is ranked whether or not the Forest Service conducted vegetation treatment activities.

Conclusion

Under all alternatives, there would be no change in the size of the mature patch and thus all alternatives would perpetuate the biodiversity value of Marble Beaver River Site 1 that is associated with its being a large patch of mature forest.

Under Alternative 1 management activities would occur within about 20 percent of the patch. This may negatively affect the quality of the site as an undisturbed high-quality plant community. However, potential negative impacts to the site would be mitigated because a) 80% of the patch would remain undisturbed, thereby maintaining high-quality plant community characteristics on those acres and b) the variable retention treatment method would mitigate potential negative impacts to biodiversity by 1) replicating natural disturbance by creating various size gaps and retaining untreated areas, 2) retaining legacy patches, 3) emphasizing retention of larger-sized trees, and 4) retaining tree species and sizes of trees present at older growth stages. Under Alternatives 2 and 3 there would be no vegetation treatments and thus the qualities of the site would be maintained.

Known locations of sensitive species would be protected under all alternatives. Under Alternative 1, but not Alternatives 2 or 3, it is possible that sensitive species such as goblin fern and lance-leaved grape-fern could be negatively impacted from variable retention treatment, as described above. Some impacts, such as potential spread of exotic earthworms would be mitigated by winter only harvest. (See Appendix C Mitigations, p. C-4) Overall, negative impacts to rare species would lessen the quality of the site, but would not be likely to contribute to a trend toward federal listing of species or a loss of viability of these species on the Forest (See Whyte Forest Project Biological Evaluation).

Under Alternatives 2 and 3, biological changes to the patch, such as vegetation succession, gap creation through blowdown, would continue to occur, and would maintain the biodiversity quality of Marble Beaver River Site 1. Under Alternative 1 some changes in the biological diversity of the stands would occur that may lessen the overall quality of the site in the short term; however, the variable retention prescription would mitigate impacts and may in the long term restore or enhance the biological diversity because the treatment emulates aspects of the natural disturbance regime.

Area 2: Marble Kit Creek Site 1 (Rank: High)

MCBS general site comments: “*The Superior National Forest’s Water Tank Lake p Candidate Research Natural Area² is within the Site and is notable for its old growth lowland conifer black spruce/white cedar forests and old northern hardwood forests. Portions of the site could be considered OUTSTANDING. Canada yew frequently occurs in the area, and numerous other species of interest have been documented. The site is notable for its relatively intact landscape, older forest, low level of fragmentation and oaks.*”

“*Consider deferring this planning period. Stands are part of a much larger patch of red oak-sugar maple-basswood forest in older growth stage. Large, old, upland patch identified by the SNF is also part of the larger patch. Any thinning would break up the continuity of a large, intact patch. There are 2 species of oak, which are rare in the North Shore Highlands.*”

Table 3.3 lists the units of concern, shows the differences between the alternatives, and describes the indicators that will be used to show the differences between alternatives.

Unit #s*	Acres	MCBS Issue	Indicators	Alternative 1, Proposed Action	Alternatives 2 and 3
268-274	529	Quality of large, undisturbed, mature patch	<ul style="list-style-type: none"> • Patch size (acres) • Treatment within the patch (acres), • Impacts to Canada yew and oak, and • Description of biological changes to undisturbed patch 	Group selection	No action

Table 3.4 shows the size of the patch and acres of treatment under each alternative.

Indicators	Alternative 1 (Group Selection)	Alternative 2 (No Action)	Alternative 3 (No Action)
	Acres	Acres	Acres
Patch Size*	1,059	1,059	1,059
Acres of treatment within patch*	529	0	0

*Units 269, 270, and 271 do not meet Forest Plan criteria for being part of a large patch because they are separated by private land. However, from a biological perspective, they are part of a mature patch because the private land is currently mature forest. For the purposes of this analysis, the private land and Units 269-271 will be counted as part of the patch.

² Water Tank Lake candidate RNA was identified as a potential research natural area during the forest planning process. This potential RNA was not carried forward as a Candidate Research Natural Area, as documented in the Forest Plan Record of Decision (pp. 8, 18, and 21).

Direct and Indirect Effects

Alternative 2 (No-Action)

- Patch size would not change.
- No vegetation treatment would occur within the patch.
- There would be no impacts to existing Canada yew or oak trees.
- Natural biological changes to the patch, such as vegetation succession and gap creation through blowdown would continue to occur. Patch would remain undisturbed (unfragmented).

Alternative 1 (Proposed)

- Patch size would not change because group selection treatments would maintain adequate canopy cover to maintain mature forest conditions.
- Group selection would occur on approximately 50% of patch. Group selection would emulate stand maintenance disturbance and would retain some aspects of the older-growth stages such as larger trees and a variety of gap sizes and would also create gaps of young forest that may or may not occur under Alternatives 2 or 3.
- Stands containing Canada yew have been identified and those areas would not be impacted by treatment. There is a chance that some yew could be impacted because most of these units would be harvested in winter. The minor impacts to yew would not likely contribute to a trend toward federal listing of species or a loss of viability. No oak trees would be harvested. (See Appendix C Mitigations, pp. C-1 and C-4).
- Patch would no longer be an undisturbed patch of mature forest. The group selection treatment would adversely affect the existing undisturbed patch qualities because it would fragment the overall continuity of the patch. The changes to the patch would be mitigated by implementing some aspects of variable retention such as emphasizing the retention of larger-sized trees, retaining some untreated area, creating gaps of varying size, and looking for opportunities to replicate natural disturbance.

Alternative 3

- Same as Alternative 2.

Cumulative Effects

No other projects are proposed for Federal or other ownership adjacent to the identified units. Therefore, there would be no cumulative effects.

Conclusion: The size of the patch would not change under any of the alternatives.

Under Alternative 1 management activities would occur within about 50 percent of the patch. This would negatively affect the quality of the site as an undisturbed high-quality plant community. However, potential negative impacts to the site would be mitigated because 1) 50% of the patch would remain undisturbed, thereby maintaining high-quality plant community characteristics on those acres and 2) the group selection treatment method would mitigate potential negative impacts to biodiversity by emphasizing the retention of larger-sized trees, retaining some untreated areas, creating gaps of varying size, and looking for opportunities to replicate natural disturbance. Under Alternatives 2 and 3 there would be no vegetation treatments and thus the undisturbed and intact patch qualities of the site would be maintained.

Known locations of Canada yew would be protected under all alternatives. Under Alternative 1, but not Alternatives 2 or 3, it is possible that some locations of Canada yew could be negatively

impacted from group selection treatment, as described above, but would not be likely to contribute to a trend toward federal listing of species or a loss of viability of these species on the Forest (See Whyte Forest Management Project Biological Evaluation). Oak trees would not be harvested. They are not on the Regional Foresters list of sensitive species and therefore incidental impacts would not contribute toward federal listing or loss of viability but might have a minor impact on the species diversity in the stand.

Under Alternatives 2 and 3, biological changes to the patch, such as vegetation succession and possible gap creation through blowdown, would continue to occur, and would maintain the existing biodiversity quality of Marble Kit Creek Site 1. Under Alternative 1 some changes in the biological diversity of the stands would occur that may lessen the overall quality of the site in the short-term; however, the group selection prescription would mitigate some of the impacts and may in the long-term restore or enhance the biological diversity because the treatment emulates aspects of the natural disturbance regime.

Area 3: Marble Kit Creek Site 2 (Rank: High)

MCBS unit specific comment: *“Consider variable density and variable retention thinning versus clearcut. These stands appear to be more mesic and therefore would have had less catastrophic disturbance. Clearcut would set the stand back because that kind of harvest changes the micro-climate and would result in less biodiversity right after harvest. Variable gap dynamics would better manage for the native plant community of aspen/birch/spruce/fir and would create better conditions for cedar to seed in from adjacent site.”*

Table 3.5 lists the units of concern, shows the differences between the alternatives, and describes the indicators that will be used to show the differences between alternatives.

Unit #s	Acres	MCBS Issue	Indicators	Alternative 1, Proposed Action	Alternative 2	Alternative 3
250, 258-260	175	Native plant community and disturbance regime	<ul style="list-style-type: none"> • Changes to native plant community, Changes to micro-climate, and • Cedar regeneration 	Clearcut with reserves and manage for aspen	No Action	Variable retention.

Table 3.6 shows the native plant community for each of the units. Native plant community information can be found on the Minnesota DNR web site at <http://deli.dnr.state.mn.us>. Additional information on the native plant community descriptions can be found in the Field Guide to the Native Plant Communities of Minnesota. The Field Guide defines a Native Plant Community as a “group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native species form recognizable units, such as oak forest, prairie, or marsh that tend to reoccur over space and time. Native plant communities are classified and described by physiognomy, hydrology, landforms, soils, and natural disturbance regimes.” The native plant community occupying the greatest area in each stand is listed first in the following table.

Table 3.6 Native Plant Communities			
Unit	Acres	Forest Type	Native Plant Community Classes and Descriptions¹
250	39	Aspen/ Spruce/ Fir	<p>MHn44 – Mesic Hardwood Forest System, Northern Wet-Mesic Boreal Hardwood Conifer Forest. Wet-mesic or mesic hardwood and hardwood-conifer forests. Catastrophic disturbances were rare. The rotation of catastrophic fires was about 430 years, and the rotation of catastrophic windthrow was about 960 years. Events that result in partial loss of trees, such as light surface fires and patchy windthrow, were much more common, with an estimated rotation of about 160 years.</p> <p>FPn63a – Forested Rich Peatland System, White Cedar Swamp. Catastrophic disturbances were rare, with an estimated rotation of 920 years. Trees are susceptible to windthrow resulting in somewhat shorter rotations for both catastrophic windthrow (about 600 years) and windthrow of small patches of canopy trees (about 380 years). White cedar-dominated swamps on wet peat soils.</p> <p>MHn45c – Mesic Hardwood Forest System, Sugar Maple Forest. Catastrophic fires were exceedingly rare. There is almost no evidence of catastrophic fire or windthrow. Events that result in partial loss of trees were also uncommon and are estimated to have a rotation in excess of 1,000 years. Canopy is dominated by sugar maple with yellow birch as a co-dominant. White spruce may be present in the canopy but is seldom abundant.</p>
258	58	Aspen/ Spruce/ Fir	<p>FDn43 – Fire-dependent Forest/Woodland System, Northern Mesic Mixed Forest. Mesic pine, aspen, white cedar, or birch forest on loamy soils. Crown and severe surface fires were common historically. The rotation of all fires is estimated to be 115 years with catastrophic fires about 220 to 260 years. Windthrow was not common. The early growth stage was typically dominated by aspen with less jack pine and paper birch.</p> <p>FDn43c – Fire-dependent Forest/Woodland System, Upland White Cedar Forest. Canopy is usually dominated by white cedar. Includes sites dominated by quaking aspen, paper birch, and balsam fir that have (or had) a white cedar component.</p> <p>WFn53a – Wet Forest System, Northern Wet Cedar Forest. Wet conifer or conifer-hardwood forests on much or peat soils. Catastrophic disturbances were infrequent. The rotation of catastrophic fires was about 800 years and the rotation of catastrophic windthrow was about 365 years. Events that result in partial loss of trees, such as patchy windthrow or light surface fires, were also rare, with a rotation of about 340 years.</p>
259	47	Aspen/ Spruce/ Fir	<p>FDn43 – Fire-dependent Forest/Woodland System, Northern Mesic Mixed Forest. Mesic Fire-dependent forest/woodland System – Mesic pine, aspen, white cedar, or birch forest on loamy soils. Crown and severe surface fires were common historically. The rotation of all fires is estimated to be 115 years with catastrophic fires about 220 to 260 years. Windthrow was not common. The early growth stage was typically dominated by aspen with</p>

Table 3.6 Native Plant Communities			
Unit	Acres	Forest Type	Native Plant Community Classes and Descriptions ¹
			less jack pine and paper birch.
260	31	Aspen/ Spruce/ Fir	<p>FDn43 – Fire-dependent Forest/Woodland System, Northern Mesic Mixed Forest. Mesic Fire-dependent forest/woodland System – Mesic pine, aspen, white cedar, or birch forest on loamy soils. Crown and severe surface fires were common historically. The rotation of all fires is estimated to be 115 years with catastrophic fires about 220 to 260 years. Windthrow was not common. The early growth stage was typically dominated by aspen with less jack pine and paper birch.</p> <p>MHn45c – Mesic Hardwood Forest System, Sugar Maple Forest. Catastrophic fires were exceedingly rare. There is almost no evidence of catastrophic fire or windthrow. Events that result in partial loss of trees were also uncommon and are estimated to have a rotation in excess of 1,000 years. Canopy is dominated by sugar maple with yellow birch as a co-dominant. White spruce may be present in the canopy but is seldom abundant.</p>

¹MH – Mesic Hardwood Forest communities are found on upland sites with moist soils, usually in setting protected from fire. They are characterized by continuous, often dense, canopies of deciduous trees, including sugar maple, basswood, paper birch, and northern red oak. Tree mortality is rather constant, with stand-regenerating disturbances such as wildfires and windthrow uncommon. The death of established trees most often involves individual canopy trees or small patches that are affected by minor windthrow, disease, or other fine-scale disturbances. MH communities historically had low to very low rates of catastrophic disturbance from fires and windstorms, with rotation periods in excess of 400 years and often greater than 1,000 years. Moderate disturbances from light surface fires and patchy windthrow were frequent to occasional, with rotation periods generally ranging from 40 to 300 years.

FP – Forest Rich Peatland System communities are conifer- or tall shrub-dominated wetlands on deep (>15 inches), actively forming peat. They are characterized by mossy ground layers, often with abundant shrubs and forbs.

FD - Fire-dependent communities where fires are the major source of species mortality and exert strong influence on patterns of plant reproduction.

WF – Wet Forest Communities occur commonly in narrow zones along the margins of lakes, rivers, and peatlands. They also occur in shallow depressions or other settings where groundwater table is almost always within reach of plant roots but does not remain above the mineral soil surface for long periods during the growing season. The dominant tree species are black spruce and white cedar.

Table 3.7 shows the acres that would be treated and regenerated. Under Alternative 1, the stands would be managed under a clearcut with reserves harvest method with an objective of regenerating the aspen to maintain the site in the younger growth stages. Harvest would not occur on the wet-forest or rich peatland systems and these areas would add to the legacy patches and reserve areas so generally the acres treated would be approximately one-half to three-quarters of the stand acres. Under Alternative 3, the stands would be managed under a variable retention harvest. Again, no harvest would occur on the wet-forest or peatland systems. Harvest in the other native plant communities would be partial harvest based on individual and group selection, resulting in small canopy gaps. This type of harvest would maintain the age of the stands and the stands would continue to age and move towards the older growth stages but would also contain gaps with younger-aged forest.

Indicators	Alternative 1	Alternative 2	Alternative 3
Acres Treated	203	0	203
Acres regenerated	203	0	0

¹Forest Service staff visited these units during October 2006 to gather better on-the-ground conditions.

Under Alternative 1, the following prescriptions would be followed:

Unit 250 - Contains pockets of aspen and fir with scattered cedar and yellow birch. Approximately 60 percent of stand would be treated through clearcut to remove older aspen and fir. No harvest of cedar or yellow birch. No harvest would occur in or north of the ash swale.

Unit 258 – Contains mostly older aspen, balsam fir, and some spruce and small amount of sugar maple. Regenerate approximately 75 percent of stand (aspen and fir) with no cut of sugar maple, ash, cedar, or spruce. Drop cedar drainage from unit.

Unit 259 – Contains very old aspen and balsam fir. High risk because of mortality. Clearcut for aspen regeneration with no cut of cedar, sugar maple, or yellow birch.

Unit 260 – Changed prescription to overstory removal of aspen, birch, and fir and retain sugar maple. Stand is about half sugar maple.

Alternative 2 (No-Action)

- Native plant community would not change. The native plant community would be maintained in an older growth stage throughout the stand.
- There would be no change to the current micro-climate.
- Less cedar may seed in compared to Alternative 3 because of fully-stocked conditions in the stands.

Alternative 1 (Proposed, see footnote under Table 3.7)

- Native plant community would not change. However, the prescription (clearcut with reserves) would maintain the native plant community in a younger growth stage than Alternatives 2 or 3.
- Areas of each stand would not be treated and those areas would move toward the older growth stages. This treatment would emulate a more catastrophic disturbance than under Alternative 3.
- Harvest would emulate a more catastrophic disturbance. (Stands 258, 259, and 260 are primarily fire-dependent where crown and severe fires were common historically with catastrophic fires occurring every 220 to 260 years. These stands also contain components of more- mesic forest types where catastrophic fires were rare. Stand 250 is more of a mesic forest type where catastrophic disturbances were rare. Less catastrophic disturbances were more much more common.)
- Clearcut with reserve treatment would result in the greatest change to the micro-climate in the short-term.
- Cedar would likely spread onto harvested sites but probably less than under Alternative 3 because clearcut with reserves harvest would have a bigger impact on the micro-climate than group selection.

Alternative 3 (Variable Retention)

- Native plant community would not change. The variable retention prescription would maintain the native plant community in an older age class and would create conditions for pockets of young forest. This type of treatment would emulate a partial-loss-of-trees type of disturbance.
- Harvest would emulate a less catastrophic disturbance.
- Would result in some micro-climate change but less than Alternative 1.

- Cedar would probably seed in better than under Alternatives 1 or 2 because of some disturbance to the canopy but limited change in the micro-climate.

Cumulative effects:

Harvest on federal land occurred near these stands. The proposed clearcut harvest would result in a larger-sized patch of similar-aged forest although the larger area would be a mosaic of clearcut harvest and unharvested areas. The effects of the past harvest have been taken into account in regards to existing age class and species composition. No other actions are proposed for this area so there would be no cumulative effects resulting from this action.

Conclusion

The native plant community would not change under any of the alternatives, although the growth stages would differ under each of the alternatives in Marble Kit Creek Site 2.

Alternative 1 would set the stands back to the young growth stage although there would also be untreated areas and scattered or clumps of trees retained in each unit. These areas would remain in the older growth stage. There would also be less micro-climate change in these untreated areas but generally this alternative would result in a greater impact on the micro-climate than Alternatives 2 or 3.

Under Alternative 2, the stands would continue to move toward the older growth stage in a more uniform manner across all the stands. There would be no change to the micro-climate.

Under Alternative 3, the stands would continue to move toward the older growth stage but there would be pockets of young forest within the mature stand. Alternative 3 would have less impact on the micro-climate than Alternative 1 and more of an impact than Alternative 2.

The primary difference between Alternatives 1 and 3 concerns the amount of harvest. More trees would be harvested under Alternative 1 to create opportunities to regenerate the mature and over-mature aspen and balsam fir. Whereas under Alternative 3, a smaller number of mature and over-mature trees would be harvested. Areas not treated under Alternative 1 (pockets of cedar, wet areas, etc.) would also not be treated under Alternative 3.

Area 4: Seven Beavers Site (Ranking – In Progress)

Neither the ranking nor the boundaries of this site are final at this time. Draft boundaries will be used as these are not expected to change enough to eliminate the identified stands.

MCBS unit specific comment: *“Consider deferring this planning period to maintain predominantly unfragmented rich fen/forested bog/upland complex. Stand is surrounded by true bog and there is not much true bog in area. Harvest would impact the older growth stages that are recommended in the Riparian Emphasis MA.”*

Table 3.7 lists the unit of concern, shows the differences between the alternatives, and describes the indicators that will be used to show the differences between alternatives.

Unit #	Acres	MCBS Issue	Indicators	Alternative 1, Proposed Action	Alternatives 2 and 3
7	52	Fragmentation of bog complex and impacts to older growth stages	Changes in older growth stages as measured by species composition and age class.	Shelterwood and canopy gaps. Maintain stand age. Riparian planting of white and red pine.	No action

Alternative 2 (No-Action)

- There would be no change in the current growth stage. The stand would continue to move towards older growth stages under natural conditions.
- Changes in species composition include: There would be no increase in the amount of white pine because no planting would occur. There would be a decrease in the amount of paper birch over time as mature trees die and conditions are not suitable for paper birch to regenerate. There would be an increase in the amount of balsam fir because conditions suitable for balsam fir regeneration would exist.
- There would be no change to the age class in the short-term.

Alternative 1 (Proposed)

- Treatment would not set the age of the stand back to zero and therefore it would continue to move toward the older growth stages.
- Changes in species composition include: There would be an increase in longer-lived conifers such as white pine because of the planting. Treatment would create gaps to regenerate paper birch. There would be an increase in balsam fir but it would be less than under Alternative 2.
- There would be no change to the age class of the stand although treatment would create some pockets of young forest within the stand.

Alternative 3

- Same as Alternative 2

Cumulative Effects: The bog is surrounded by NF land and there are no other proposed projects so there would be no cumulative effects.

Conclusion

All alternatives maintain the stand in the older growth stages in the Seven Beavers Site. The bog would not be fragmented under any alternative.

Under Alternative 1, there would be some pockets of young forest within the stand which helps ensure continuation of paper birch on the site. There would be an increase in the amount of white pine within the unit.

Under Alternatives 2 and 3, there would be a gradual reduction in the amount of paper birch over time and an increase in balsam fir. There would be no increase in white pine. Natural processes would dictate any changes.

Area 5: Wet Foot Hills Site (Ranking – In Progress)

Neither the ranking nor the boundaries of this site are complete at this time. Draft boundaries will be used as these are not expected to change enough to eliminate the identified stands.

MCBS site specific comment: *“Consider deferring this planning period to maintain predominantly unfragmented portion of large wetland/upland complex in low relief landform. Unit 36 is immediately adjacent to State Natural Area.”*

Table 3.9 lists the units of concern, shows the differences between the alternatives, and describes the indicators that will be used to show the differences between alternatives.

Unit #s	Acres	MCBS Issue	Indicators	Alternative 1, Proposed Action	Alternatives 2 and 3
33-40	296	Fragmentation of site	Amount of fragmentation as measured by acres of young patch and miles of edge and edge density resulting from treatment	Clearcut with reserves in units 33, 34, 37, & 38; thin 35 & 36; overstory removal 39 & 40. Intent of clearcuts is to create larger-sized patch of young forest in collaboration with TNC.	No action

The proposed action was developed in collaboration with The Nature Conservancy. Proposed harvest would occur across landownership and would follow natural stand boundaries. It is not known if The Nature Conservancy would harvest if the SNF did not harvest. For this analysis, Alternative 2 (No Action) shows the effects of not harvesting by the Forest Service or TNC. Alternative 1 shows the effects of both the Forest Service and TNC harvesting. Alternative 3 shows the effects of TNC harvesting and the Forest Service not harvesting.

Alternative 2 (No-Action)

Table 3.10 shows what would happen if neither the Forest Service nor the Nature Conservancy harvested.

Units	Acres of Young Patch	Miles of Edge of Young Forest	Square Miles of Treated Area	Edge Density - Miles of Edge per Square Mile
35 and 36	0	0	0	0
33 and 34	0	0	0	0
37 and 38	0	0	0	0
39 and 40	0	0	0	0

- There would be no young patches created and therefore no edge or edge density. There would be no fragmentation with surrounding vegetation.

Alternative 1

Table 3.11 shows the combined acres of treatment between the Superior National Forest and the Nature Conservancy.

Table 3.11 Alternative 1 (Proposed Action) Acres of Young Patch, Miles of Edge, and Edge Density				
Units*	Acres of Young Patch TNC + SNF =	Miles of Edge of Young Forest	Square Miles of Treated Area	Edge Density - Miles of Edge per Square Mile
35 and 36** and TNC	39+46=85	0	0.1	0
33 and 34 and TNC	32+93=125	3	0.2	15
37 and 38 and TNC	51+72=123	3.7	0.2	19
39 and 40*** and TNC	79+90=169	0	0.3	0

*The Forest Service and Nature Conservancy would harvest in a collaborative manner. Harvest on TNC land would be expected to be similar to that done on SNF land.

**Stands 35 and 36 would be thinned. There would be no edge created.

***Stands 39 and 40 would be treated with an overstory removal. Existing young vegetation is old enough and therefore there would not be a distinct edge between treated and adjacent untreated area.

- This alternative creates the largest sized young patches. Units 33, 34, 37, and 38 would be clearcut with reserves and would create two patches of young forest greater than 100 acres in collaboration with harvest on The Nature Conservancy land. Units 39 and 40 would create forest aged 20-29 years old through an overstory removal. This would have minimal effect on fragmentation because there would not be an abrupt edge between the 20-29 year old forest and the adjacent stands.
- This alternative would result in more miles of edge; however, the edge density would be less than Alternative 3 because of the creation of larger-sized patches of young forest through the collaboration with adjacent landowner.

Alternative 3

Table 3.12 shows what would happen if just The Nature Conservancy harvested.

Table 3.12 Alternative 3 Acres of Young Patch, Miles of Edge, and Edge Density				
Units*	Acres of Young Patch - TNC Acres Only	Miles of Edge of Young Forest	Square Miles of Treated Area	Edge Density - Miles of Edge per Square Mile
TNC	39	0	0.06	0
TNC	32	1.4	0.05	28
TNC	51	2.3	0.08	28
TNC	79	0	0.1	0

* Harvest on TNC land would be expected to be similar to that done on SNF land.

- The patches of young forest would be smaller than those created under Alternative 1.
- This alternative would have fewer miles of edge but the edge density would be greater than under Alternative 1 because patches are smaller.

Cumulative Effects: Effects of treatment on adjacent land was considered under direct and indirect effects because treatments on these sites were developed collaboratively with TNC. No

other actions are expected so there would be no additional cumulative other than what has already been disclosed.

Conclusion

Under Alternative 1, the SNF and TNC would collaborate on the harvest of Units 33 and 34, and 37 and 38 to create two larger-sized patches of young forest. Harvest in Units 35 and 36, and 39 and 40 would result in larger-sized patches of similarly managed vegetation.

Under Alternative 2, no harvest would occur and no change in edge or patches would result.

Under Alternative 3, TNC would harvest but not the SNF. There would be less edge overall but a higher edge density in Units 33 and 34, and 37 and 38 because patch sizes would be smaller.

Cumulative Effects of Actions on all MCBS Sites

The effects of actions on other ownership were addressed in the direct and indirect effects disclosed above, if they were known. For instance, the effects in the Wetfoot Hills Site included actions proposed by The Nature Conservancy. No other planned actions are known.

The planning team carefully considered the effects of the action, including known proposed actions on other ownership in completing the direct, indirect and cumulative effects analysis. We are not aware of actions occurring on other ownership other than what has already been addressed. If MCBS or other agencies or individuals provide information about actions occurring on other ownership, additional analysis would be conducted. The Forest Service does not plan to propose vegetation management activities in this area within the foreseeable future.

3.3 Threatened and Endangered Species

A biological assessment was prepared and submitted to the US Fish and Wildlife Service for their concurrence with the determination of effects. Consultation with the Fish and Wildlife Service specific to the Whyte Project is documented in the project file. They concurred with the determination documented in the BA on February 14, 2007. The biological assessment is available on the internet at www.fs.fed.us/r9/superior and upon request from the Laurentian District office.

The Whyte Project Biological Assessment (BA) documents the potential effects on federally proposed, candidate, threatened or endangered species and designated critical habitat that could result from proposed vegetation management and associated activities as proposed in the Whyte Forest Management Project. The Whyte Project BA tiers to the Programmatic Biological Assessment for the revision of the Forest Plan (USDA Forest Service 2004, pp. 6-7) and provides more specific information on site-specific effects of the project to threatened and endangered species. The following summarizes the information in the BA.

The action alternatives include the following activities, in different amounts and locations:

- Timber harvest including even-aged, uneven-aged, and thinning methods for timber production and habitat and timber stand improvement.
- Mechanical site preparation for planting and natural regeneration.
- Planting of white pine, white spruce, and other conifer species to improve within stand diversity and eagle habitat.
- Road management including decommissioning, creation and subsequent removal of temporary access roads.

- Mature upland forest patches were analyzed for size and configuration, Patches of mature forest greater than 300 acres were retained. Mature forest patches less than 300 acres in size were configured to retain interior forest whenever possible.
- Young upland forest was consolidated where possible to create large, young forest patches and reduce the likelihood of future habitat fragmentation.

Bald Eagle

Population Status in Project Area:

- Project site-specific surveys: Aerial occupancy and productivity surveys of known nests within the project area took place on April 29, 2005 and June 21, 2005, respectively, as part of a statewide survey. Aerial surveys during 2005 included looking for new nests in suitable habitat within the project area. Coworkers on the Laurentian District report to the biologist any eagle and osprey nests found during their field work.
- Known occurrences: One adult eagle was seen incubating at the nest on the east side of Seven Beavers Lake in April 2005. One juvenile was seen at the nest in June 2005.
- Potential habitat: There are other large lakes in the project area that provide feeding opportunities. There are some possible historic eagle nests on Big Lake, Greenwood Lake and Katherine Lake but they have not been used in the past four years. Overall, nesting habitat is limited.

Factors Affecting Eagle Environment (see section 2.5 of program-level BA)

- Terrestrial habitat (habitat loss, forest management, etc)
- Aquatic habitat (changes in aquatic prey base, etc
- Human Disturbance (forest management, roads, recreation activities, trauma, etc)

Direct/Indirect Effects Analysis Area:

- Habitat indicators: The analysis area for habitat indicators is 1/2 mile from fish bearing streams and lakes greater than 20 acres.
- Human Disturbance indicators: The analysis area for direct effects of human disturbance indicators in the project is 1/2 mile from known nests. The analysis area for indirect effects of human disturbance is the project area.

Cumulative Effects Analysis Area: The Whyte project area is the cumulative effects analysis area.

- Rationale: Foreseeable actions on federal lands are most likely to be known in the current project area. Other projects outside the project area may be located near eagle nests but those projects would be mitigated to protect nesting eagles.

Tables 3.3.1 and 3.3.2 display the determination of effects for bald eagle.

Table 3.3.1 Determination of Effect for Bald Eagle		
Management Activity	Determination	Consistent with Programmatic BA determination?
Timber Harvest	Not Likely to Adversely Affect	Y
Reforestation	Not Likely to Adversely Affect	Y
Non-harvest restoration	Not Likely to Adversely Affect	Y
Road Management	Not Likely to Adversely Affect	Y

Table 3.3.2 Alternatives and Determination of Effect for Bald Eagle		
Alternative	Determination	Summary of Rationale
Alternative 1	Not Likely to Adversely Affect	<p>Alternative 1 would result in the most treatment acres and most temporary roads. Future habitat (young pine) would increase more under Alternative 1 than Alternative 2 or 3.</p> <p>There is a decrease in the miles (2.1 mi) of unclassified roads within a ½ mile of suitable foraging lakes under this alternative which is the result of road closures. There will be more temporary roads needed than Alternative 2 and 3.</p> <p>In general, available habitat for eagles will increase under Alternative 1. Alternative 1 would result in 152 acres of white pine planted within 1/2 mile of lakes > 20 acres. In addition, the red and white pine forest type would increase from the existing 4.6% of the upland forest to 5.8% in the year 2014. Cumulative effects are expected to be minimal.</p>
Alternative 2 (No action)	Not Likely to Adversely Affect	<p>Alternative 2 is the no-action Alternative which results in no proposed treatments or changes in the transportation system. There would be no planned disturbance within close proximity to the known nest in the project area. However, there would also be no habitat improvements (pine planting) with this alternative. As with the other alternatives, young pine would continue to naturally regenerate in some areas but brush competition would prevent regeneration in some stands. No temporary roads would result from this Alternative. No existing unclassified roads would be added to the system, decommissioned and/or closed so open road miles would remain higher under this Alternative than under Alternatives 1 or 3. In general, available habitat for eagles would be maintained under this alternative. The red and white pine forest type would remain at 4.6% of the upland forest in the year 2014. Cumulative effects are expected to be minimal</p>
Alternative 3	Not Likely to Adversely Affect	<p>Alternative 3 would result in more treatment acres and more temporary roads than Alternative 2 (no action) but less than Alternative 1. Future habitat (young pine) would increase more than Alternative 2 but less than Alternative 1.</p> <p>There is a decrease in the miles (2.1 mi) of unclassified roads within a ½ mile of suitable foraging lakes under this alternative which is the result of road closures. There will be more temporary roads needed than Alternative 2.</p> <p>In general, available habitat for eagles will increase under this alternative. Alternative 3 would result in 122 acres of white pine planted within 1/2 mile of lakes > 20 acres. In addition, the red and white pine forest type would increase from the existing 4.6% of the upland forest to 5.7% in the year 2014. Cumulative effects are expected to be minimal.</p>

Conclusion

The analysis shows that all alternatives maintain existing habitat and all alternatives are in compliance with Forest Plan direction. Alternatives 1 and 3 both create future habitat by planting young pine with Alternative 1 planting more acres than Alternative 3. Alternatives 1 and 3 would decrease the amount of roads within 1.2 mile of suitable foraging lakes. Temporary roads used during timber harvest would not impact known nest sites and if new nest sites are located prior to or during sale activity, all activities would be halted and additional mitigation would be developed prior to resuming activities. Nesting habitat would be protected and human disturbance factors would be minimized through mitigations. Future nesting habitat would be improved through planting pine in riparian areas. Alternative 2 does not create future habitat nor does it close roads suitable foraging lakes.

The additional harvest on other ownership and the other known projects occurring within the Project Area are unlikely to result in cumulative adverse effects on bald eagle because none of the foreseeable projects would impact nesting sites or foraging areas.

Canada lynx

Population Status in Project Area:

- Project site-specific surveys: 122 miles of winter snow track surveys. Also, lynx have been tracked, trapped, and located with radio telemetry in the project area through the NRRI forest-wide lynx study.
- Known occurrences: Lake County, which contains the project area, has had 104 reported lynx sightings between March 2000 and July 6, 2006 (http://www.dnr.state.mn.us/ecological_services/nhnrp/research/lynx_sightings.html). This is the highest number of sightings in any Minnesota county. There have been numerous radio-collared lynx in the project area including two known denning females (L7 and L31). The 2005 winter track survey recorded two sets of lynx tracks (probably same lynx) just off the Stony River Forest Road. Scat was collected and L31 was later captured and fitted with a radio-collar from this spot.

Factors Affecting Lynx Environment (see section 4.5 of program-level BA)

- Roads and trails
- Winter dispersed recreation
- Trapping and shooting
- Vehicle collisions
- Other factors: Most mortality has been related to human activities, such as being hit by a train, hit by a car, or trapped.

Direct and Indirect Analysis Area

- Habitat indicators: Analysis area is federal lands within LAUs 12, 15-17, and 21-23.
- Human Disturbance indicators: Analysis area is federal roads within LAUs 12, 15-17, and 21-23.

Cumulative Effects Analysis Area (for both NEPA and ESA):

- Cumulative effects consider land-based activities on all ownerships and federal roads within the Whyte project area (Appendix A of the BA).
- Rationale: The Whyte project area (219,018 land acres in all ownerships) incorporates more acres of land than any of the Whyte project's Lynx Analysis Units (See Table 1 in the BA) and cumulative effects are reasonably foreseeable at this scale. See Superior National Forest Plan Appendix E: Canada Lynx Section 5. Scales of Analysis, pg E-3 for

rationale for spatial analysis boundary (USDA 2004a). The temporal analysis boundary of 10 years is an appropriate timeframe because it includes all known future projects and provides a reasonably reliable estimate of what is expected to happen.

Tables 3.3.3, 3.3.4, and 3.3.5 show the effects that the Project would have on lynx.

3.3.3 Determination of Effects for Canada Lynx		
Management Activity	Determination	Consistent with Programmatic BA determination?
Timber Harvest	Not Likely to Adversely Affect	Yes
Reforestation	Not Likely to Adversely Affect	Yes
Non-harvest restoration	Not Likely to Adversely Affect	Yes
Road Management	Not Likely to Adversely Affect	No* (Programmatic BA – Likely to Adversely Affect)

3.3.4 Lynx Habitat Changes		
Alternative	Determination	Summary of Rationale
Alternative 1	Not Likely to Adversely Affect	Habitat changes are temporary and would provide an adequate amount and diversity of lynx and lynx prey habitat as stands age. Connectivity is provided by habitat on all ownerships. Habitat for lynx prey is improved. Human disturbance factors are minimized by road closures. All LAUs will have a decrease in road density except SNF 12 which will remain the same.
Alternative 2 (No action)	Not Likely to Adversely Affect	Habitat changes would occur due to succession and natural disturbances. Adequate lynx and lynx prey habitat and spatial needs would be available.
Alternative 3	Not Likely to Adversely Affect	Habitat changes are temporary and would provide an adequate amount and diversity of lynx and lynx prey habitat as stands age. Connectivity is provided by habitat on all ownerships. Habitat for lynx prey is improved. Human disturbance factors are minimized by road closures. All LAUs will have a decrease in road density except SNF 12 which will remain the same.

3.3.5 Lynx Habitat outside LAUs		
Alternatives	Determination	Summary of Rationale
Alternative 1	Not Likely to Adversely Affect	484 acres of treatment will occur on USFS land outside designated LAUs. Only 134 acres of this will temporarily make this habitat unsuitable for snowshoe hare. Habitat changes are temporary and would provide an adequate amount and diversity of lynx and lynx prey habitat as stands age. Connectivity is provided by habitat on all ownerships. Habitat for lynx prey is improved. Human disturbance factors are minimized by road closures.
Alternative 2 (No action)	Not Likely to Adversely Affect	Habitat changes would occur due to succession and natural disturbances. Adequate lynx and lynx prey habitat and spatial needs would be available.
Alternative 3	Not Likely to Adversely Affect	484 acres of treatment will occur on USFS land outside designated LAUs. Only 134 acres of this will temporarily make this habitat unsuitable for snowshoe hare. Habitat changes are temporary and would provide an adequate amount and diversity of lynx and lynx prey habitat as stands age. Connectivity is provided by habitat on all ownerships. Habitat for lynx prey is improved. Human disturbance factors are minimized by road closures.

Habitat conditions for Canada lynx will improve as a result of the Project. Alternative 1 modified will increase the within stand species and structure diversity through conifer planting and will improve cone production at an earlier age in red pine and spruce plantations, positively affecting red squirrels (prey species). Hiding cover will be improved through planting of conifers and natural regeneration. Prey habitat is abundant with more than 53 percent of the federal land in hare habitat and/or more than 30 percent of the federal land in squirrel habitat in all Lynx Analysis Units. Foraging and denning habitat are and will remain well distributed through out the project. The amount of unsuitable habitat will remain well below 15 percent.

Alternative 1 modified will result in bringing LAU SNF 16 below 2.0 miles per square mile road density. The existing road density of SNF 16 is 2.09 miles per square mile. The road density will decrease to 1.98 miles per square mile.

Gray Wolf

The Gray wolf is not longer a threatened or endangered species. The delisting of the gray wolf by the Fish and Wildlife Service is published in the final rule *Designating the Western Great Lakes Populations of Gray Wolves as a Distinct Population Segment; Removing the Western Great Lakes Distinct Population Segment of the Gray Wolf From the List of Endangered and Threatened Wildlife Species* (Federal Register / Vol. 72, No. 26 / Thursday, February 8, 2007, pp. 6052-6103).

Following Forest Service Eastern Region 9 policy and framework for sensitive species management (FSM 2672.11) directs that "...species delisted by the FWS in the last five years... will be designated as a Regional Forester Sensitive Species (RFSS) for the National Forests and

Grasslands on which they occur." Therefore, gray wolf is automatically designated as an RFSS. It also retains its Superior NF status as a management indicator species. See Section 3.5 for information on effects to gray wolf.

3.4 Regional Forester's Sensitive Species

The Whyte Forest Management Project Biological Evaluation (BE) evaluates the effects of the Whyte Forest Management Project on threatened, endangered, proposed, and Regional Forester-listed (R9) sensitive species (U.S. Department of Agriculture (USDA) Forest Service Manual sections 2670.3, 2670.5 (3), 2672.4). The species evaluated in this report include all species on the newly revised R9 sensitive species list (R9RFSS– USDA Forest Service 2006).

The Whyte Forest Management Project Biological Evaluation is available on the internet at www.fs.fed.us/r9/superior and upon request from the Laurentian Ranger District office. The BE includes information on the potential habitat available in the project area and whether or not the species are present in the project area. (See BE Table 2) The BE also includes existing condition information, including populations and trends and information on project area surveys; habitat needs and limiting factors; habitat trends; direct and indirect effects; cumulative effects; the determination; and mitigations. Information on how species were screened and selected is provided in the Forest Plan FEIS (Vo. 2, pp. B-25-26) and on the Forest Service website for sensitive species (http://www.fs.fed.us/r9/wildlife/tes/tes_lists.htm).

The BE considered all 87 sensitive species listed on the Superior National Forest. Of the 87 species, 29 species are known to occur in the project area and suitable habitat is present for 65 of these species. Because of the number of species analyzed in the BE, the effects of the project are briefly summarized below. Please see the full BE for the complete effects analysis for each species.

Analysis Area

The following describes the general analysis area for effects to species disclosed in the BE. See the BE for more specific information on each species.

The area covered by the analysis of direct and indirect effects generally includes all lands administered by the Superior National Forest within the Whyte project area (see Whyte Forest Management Preliminary Environmental Analysis (PEA) for map). This is appropriate because the area's large size contains known or potential populations, individuals, and enough habitats of many sensitive species to evaluate the effects of proposed activities. The analysis boundary includes that area to which direct and indirect effects would occur.

The area covered by the cumulative effects analysis includes lands of all ownerships within the Whyte project area because the area's large size contains enough habitat of most of the sensitive species to evaluate the effects of the project.

The time scale used for the analysis of direct, indirect and cumulative effects is 10 years (or the year 2014). This time scale is chosen because it is reasonable to assume that all proposed projects would be implemented by this time and expected effects have occurred and it coincides with the Forest Plan Decade 1 objectives. This is also an appropriate time scale for cumulative effects because it allows for the most realistic prediction of reasonably foreseeable future projects. Past

actions are taken into account in the existing condition. Present and foreseeable future (10 years) actions are considered (Appendix A, Biological Evaluation).

Environmental Consequences

Alternative 2 would retain conditions as they are and natural ecological processes would continue. Alternatives 1 and 3 consist of a variety of other activities besides timber harvest that are included in this project. These activities will be discussed for each species that utilizes habitat that would be affected by the activities. Below is a list of the activities and the habitat they will affect.

- Vegetation management – includes timber harvest and site preparation. This will have the potential to alter habitats for terrestrial, aquatic, and plant species by changing the amount, distribution, or quality of habitat. All harvest areas would be re-vegetated.
- Prescribed Burning – This will have the potential to affect upland habitat types.
- Gravel Pits - This will have the potential to affect many different upland habitat types.
- Reforestation – This will have the potential to change brush stands to forested stands.
- Restoration – This will add a white pine or yellow birch component to already forested stands.
- Roads – Some roads will be added to the system and some will be decommissioned. This will have the potential to affect both upland and lowland habitats.

Wildlife

Alternative 2 (No action) would have no direct, indirect, or cumulative effects to heather vole, northern goshawk, boreal owl, olive-sided flycatcher, black-throated blue warbler, bay-breasted warbler, Connecticut warbler, three-toed woodpecker, great gray owl, wood turtle, northern brook lamprey, creek heelsplitter, black sandshell, tiger beetle, Mancinus alpine butterfly, red-disked alpine butterfly, jutta arctic butterfly and Quebec emerald dragon fly for a variety of reasons as disclosed in the Biological Evaluation.

Alternatives 1, 2 and 3 would have no direct, indirect, or cumulative effects to Le Conte's sparrow, yellow rail, peregrine falcon, sharp-tailed grouse, lake sturgeon, shortjaw cisco, Nabokov's blue butterfly and Freija's grizzled skipper butterfly because either the species are not known to occur in the project area or the project would have no impact on the respective type of habitat. Alternatives 1 and 3 would improve habitat for Nabokov butterfly by eliminating undesirable brush from 2 acres.

For Alternatives 1 and 3, the proposed activities may adversely impact the following individuals: Heather vole, northern goshawk, boreal owl, black-throated blue warbler, bay-breasted warbler, Connecticut warbler, three-toed woodpecker, great gray owl, wood turtle, northern brook lamprey, creek heelsplitter, black sandshell, tiger beetle, Mancinus alpine butterfly, red-disked alpine butterfly, jutta arctic butterfly and Quebec emerald dragon fly but none of the impacts are likely to cause a trend toward federal listing or loss of viability. The effects on each species, including cumulative effects, is disclosed in the BE. Alternatives 1 and 3 may have a beneficial impact to the olive-sided flycatcher because residual trees would be retained in all harvest units with forest structure being most varied in two-aged and birch shelterwood units.

Vascular plants, lichens, and bryophytes

Alternative 2 would have no direct, indirect, or cumulative effects to the following species because no action would occur: swamp beggar-ticks, floating marsh-marigold, Katahdin sedge,

linear-leaved sundew, neat spike rush, moor rush, Vasey's rush, auricled twayblade, fall dropseed muhly, American shoregrass, dwarf water lily, club-spur orchid, northern bur-reed, awlwort, lance-leaved violet, *Cladonia wainoi*, large-leaved sandwort, Appalachian fir clubmoss, *Arctoparmelia centrifuga*, *Arctoparmelia subcentrifuga*, small shinleaf, cloudberry, fairy slipper, ram's head lady's slipper, *Caloplaca parvula*, *Certraria aurescens*, *Menegazzia terebrata*, *Ramalina thrausta*, *Sticta fuliginosa*, *Usnea longissima*, *Pseudocyphellaria crocata*, *Frullania selwyniana*, triangle grapefern, goblin fern, New England sedge, Canada yew, barren strawberry, Canada ricegrass, or *Peltigera venosa*.

The proposed activities in Alternatives 1, 2, and 3 may impact individuals of pointed moonwort, common moonwort, Michigan moonwort, pale moonwort, ternate grapefern, and least moonwort but are not likely to cause a trend to federal listing or loss of viability. Alternative 2 (No Action) may indirectly impact these species because they need periodic disturbance to maintain quality habitat.

The proposed activities in Alternatives 1 and 3 may adversely impact individuals of swamp beggar-ticks, floating marsh-marigold, Katahdin sedge, linear-leaved sundew, neat spike rush, moor rush, Vasey's rush, auricled twayblade, fall dropseed muhly, American shoregrass, dwarf water lily, club-spur orchid, northern bur-reed, awlwort, lance-leaved violet, *Cladonia wainoi*, large-leaved sandwort, Appalachian fir clubmoss, *Arctoparmelia centrifuga*, *Arctoparmelia subcentrifuga*, small shinleaf, cloudberry, fairy slipper, ram's head lady's slipper, *Caloplaca parvula*, *Certraria aurescens*, *Menegazzia terebrata*, *Ramalina thrausta*, *Sticta fuliginosa*, *Usnea longissima*, *Pseudocyphellaria crocata*, *Frullania selwyniana*, triangle grapefern, goblin fern, New England sedge, Canada yew, barren strawberry, Canada ricegrass, or *Peltigera venos* but are not likely to cause a trend to federal listing or loss of viability.

Conclusion

Alternative 1 was designed to minimize impacts to certain species through protecting important existing habitat and to produce better future habitat. If species are known to occur within treatment units, specific mitigation measures would be followed to avoid the species. Under Alternatives 1 and 3, there may be direct, indirect, or cumulative impacts to some individuals but none of the alternatives would lead to a trend toward federal listing or loss of viability for any of the species analyzed. This conclusion is based on the following findings:

- Clearcut with reserves would occur on approximately 4,950 stand acres (actual treatment acres would be less because of reserve areas, legacy patches, wetland inclusions, etc).
- Approximately five percent of the federal land and three percent of the federal, state, county, and The Nature Conservancy lands would be impacted by clearcut with reserves.
- Vegetation activities would occur on less than 9,564 stand acres (see note above). This is about ten percent of the federal land and five percent of the federal, state, county, and The Nature Conservancy lands. More than 90 percent of the Federal land would remain in its current condition, undergoing natural ecological processes.
- The federal, state, county, and The Nature Conservancy land managers generally follow the Minnesota Forest Resource Council Voluntary Site-level forest Management Guidelines. This book includes guidelines for wildlife habitat, including leave trees, coarse woody debris, conifer retention and regeneration, riparian habitat, sensitive communities and sites, and legacy patches.
- All of the federal lands undergoing clearcut with reserves treatment would revegetate within five years. All other treatment areas would remain vegetated. There would be some changes to the overall age class and species composition however, the changes

would move the vegetation in the Project Area towards Forest Plan desired vegetation conditions which would provide for the full diversity of desired wildlife habitats...(Forest Plan Record of Decision p. 10).

- The Project creates young forest which is needed by some species.
- The project retains all of the patches greater than 300 acres. Vegetation management activities occurring in the patches would maintain 50 percent crown cover and this maintains the patch age and size and can create conditions similar to small-scale natural disturbance.
- The project creates a variety of temporary openings. Some of the temporary openings were designed to create larger-sized patches of young forest. This young forest would eventually grow into larger-sized patches of mature forest, creating more interior forest.
- Known sensitive species within treatment units would be avoided.
- The cumulative effects of past, on-going, and reasonably foreseeable future projects were considered for each species. The cumulative effects were considered in the determination that none of the alternatives would lead to a trend toward federal listing or loss of viability for any of the species analyzed.

3.5 Management Indicator Species

The Forest Plan designed four Management Indicator Species: bald eagle, white pine, northern goshawk, and gray wolf. (Forest Plan p. 2-34) Impacts to bald eagle are discussed in Section 3.3 Threatened and Endangered Species of this document and are not duplicated here. Additional information on Gray wolf (recently delisted as a threatened and endangered species) can be found in the Whyte Project Biological Assessment additional information on northern goshawk can be found in the Whyte Project Biological Evaluation.

White Pine

Analysis Area

The Project Area is the boundary for direct, indirect, and cumulative effects because this is the area being impacted by the project. Effects of the project on white pine would not go beyond the project boundary. The time period for analyzing effects is through 2014 because all of the proposed actions are expected to be implemented during this timeframe.

Effects

Table NSU-2 on page 2-59 of the Forest Plan shows a decade 1 objective of increasing the amount of white pine by 1 percent. Part of the purpose and need for the Whyte Project was to increase the amount of white pine, primarily in riparian areas and other areas where longer-lived conifers are desirable. Alternative 1 would increase the amount of white pine the most by planting 930 acres. Alternative 3 would plant white pine on 850 acres. Alternative 2 would not result in any additional increase in the amount of white pine. Alternatives 1 and 3 would both plant 241 acres of white pine in riparian settings. Alternative 2 would not result in any additional white pine in riparian areas. There are not expected to be any measurable adverse cumulative effects to white pine because they would not be harvested if found within units and the numbers of white pine would increase under the action alternatives.

Northern Goshawk

Analysis Area

The area covered by the analysis of direct and indirect effects includes all lands administered by the Superior National Forest within the Whyte project area (see Whyte Forest Management

Environmental Assessment (EA) for map). This is appropriate because the area's large size contains known or potential populations, individuals, and enough habitats of many sensitive species to evaluate the effects of proposed activities. The analysis boundary includes that area to which direct and indirect effects would occur.

The area covered by the cumulative effects analysis includes lands of all ownerships within the Whyte project area because the area's large size contains enough habitat of most of the sensitive species to evaluate the effects of the project. The time scale used for the analysis of direct, indirect and cumulative effects is 10 year (or the year 2014). This time scale is chosen because it is reasonable to assume that all proposed projects would be implemented by this time and expected effects have occurred and it coincides with the Forest Plan Decade 1 objectives. This is also an appropriate time scale for cumulative effects because it allows for the most realistic prediction of reasonably foreseeable future projects. Past actions are taken into account in the existing condition. Present and foreseeable future (10 years) actions are considered (Appendix A of Whyte Project Biological Evaluation).

Effects

The effects of the Whyte Project on the northern goshawk are disclosed in the Whyte Forest Management Project Biological Evaluation. See also Section 3.4. Surveys for nesting goshawk were conducted on the Laurentian Ranger District over the past eight years. Ten occupied nest sites were found; none within the Whyte Project Area. There have been two incidental sightings in the project area in the past few years. Two nests were found that have the potential to be historic goshawk nests based on shape and proximity to each other. These nest sites would be monitored during the next two springs to determine if they are used by goshawk. (See 2005 Monitoring Report)

Roads (temporary, system, special use) should have a minimal impact on goshawks as long as they don't directly impact goshawk nesting habitat of which none is known in the project area. Gravel pits would have a minimal impact on goshawks as long as they are not established in goshawk nesting habitat of which none is known. Prescribed burning should have a minimal impact on goshawks as long as the burn does not kill existing or potential nest trees in quality habitat. Prescribed burn objectives should ensure this does not happen. Reforestation and restoration projects should benefit goshawks by providing future foraging and nesting habitat and by increasing within stand diversity, therefore increasing future habitat quality for goshawks.

The effects of vegetation management on goshawk were measured based on mature forest, patch size, and stand complexity. Alternative 2 would provide the most mature forest habitat and would not decrease the area or number of 100-acre and larger patches. Alternative 2 would maintain stand complexity and the current amount of mature forest. Alternatives 1 and 3 would decrease the amount of mature forest by approximately 7 to 8 percent. The young forest created would provide habitat for important forage species such as ruffed grouse and snowshoe hares. The Project was developed to minimize adverse effects to species needing mature forest and larger patch sizes through maintaining all mature patches greater than 300 acres in size. These larger contiguous blocks provide higher quality habitat than do smaller patches. In addition, the project creates some larger-sized patches of young forest that would eventually grow into larger-sized mature patches.

Management actions on other ownerships may also impact individuals, however, these actions are also not likely to cause a trend toward federal listing or loss of viability or result in adverse cumulative effects.

Determination

The proposed resource management activities planned in the project area for Alternatives 1 and 3 may impact individuals but are not likely to cause a trend to federal listing or loss of viability. Short-term this project will provide sufficient habitat in the Project Area as a whole. All alternatives would maintain over 50 percent suitable habitat. All action alternatives would maintain all existing mature patches over 300 acres in the Project Area, would reduce fragmentation by positioning harvest adjacent to recent clearcuts to increase stand size and increase future stand complexity. Also, there are no known goshawk territories in the project area. This determination is consistent with the determination in the Forest Plan Programmatic BE. Alternative 2 would have no effect on goshawks. All Alternatives are consistent with Forest Plan O-WL-18, G-WL-11, G-WL-12 and S-WL-5. Goshawk species specific Standards and Guideline S-WL-10 and G-WL-22 do not apply since there are no known nests in the project area. If one is found they would be implemented.

Gray Wolf

Direct/Indirect Effects Analysis Area

- Habitat indicators: Analysis area for all indicators is federal lands within the project area.
- Human Disturbance indicators: Analysis area for all indicators is federal roads within the project area.

Cumulative Effects Analysis Area

- Cumulative effects analysis area is the project area.
- Rationale for analysis areas: The analysis area boundaries are appropriate because they are large enough to overlap the territories of numerous packs and are an appropriate size to address the impacts to these packs. Per ESA Section 7 Consultation Handbook, cumulative effects are to be considered in the action area (for purpose of this analysis action area = project area).
- The programmatic BA has done a complete job of considering cumulative effects to wolf habitat across a broad landscape, to which effects are similar at the project scale. It is not necessary to go out to the Wolf Zone scale because this project does not change the road density of OML 3-5 roads. The appropriate scale for cumulative effects is the project scale because the concern for negative impacts comes primarily from human disturbance which is best measured at the site-specific scale. Human access effects of this project will not go beyond the project area scale. Therefore, cumulative effects should be measured at this scale. Past actions are taken into account in the existing condition. Present and foreseeable future (10 yrs) actions are considered. This is an appropriate timeframe because it includes all known future projects and provides a reasonably reliable estimate of what is expected to happen.

Tables 3.5.1, 3.5.2, and 3.5.3 show the effects of the project on Gray Wolf.

3.5.1 Determination of Effects on Gray Wolf		
Management Activity	Determination	Consistent with Programmatic BA determination?
Timber Harvest	Not Likely to Adversely Affect	Yes
Reforestation	Not Likely to Adversely Affect	Yes
Non-harvest restoration	Not Likely to Adversely Affect	Yes

Road Management	Not Likely to Adversely Affect*	No (Likely to Adversely Affect in Programmatic BA)
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*Due to a decrease in road miles from decommissioning

3.5.2 Wolf Prey Habitat		
Alternative	Determination	Summary of Rationale
Alternative 1	Not Likely to Adversely Affect	Habitat for wolf prey is improved through burning, interplanting and planting of mixed conifer, and connection of young, deciduous forest patches for moose forage through harvesting. Increases in human disturbance factors are minimized by decommissioning temporary roads and some unclassified roads.
Alternative 2 (No action)	Not Likely to Adversely Affect	Habitat changes would occur due to succession and natural disturbances. Adequate wolf and wolf prey habitat and spatial needs would be available. Large patches of young forest would not be available for moose. Human disturbance factors would not change from the current condition. No roads would be decommissioned.
Alternative 3	Not Likely to Adversely Affect	Habitat for wolf prey is improved through burning, interplanting and planting of mixed conifer, and connection of young, deciduous forest patches for moose forage through harvesting. Increases in human disturbance factors are minimized by decommissioning temporary roads and some unclassified roads.

3.5.3 Wolf Critical Habitat		
Management Activity	Determination	Summary of Rationale
Alternative 1	Not Likely to Adversely Affect	Habitat for wolf prey is improved through burning, interplanting and planting of mixed conifer, and connection of young, deciduous forest patches for moose forage through harvesting. Increases in human disturbance factors are minimized by decommissioning temporary roads and some unclassified roads.
Alternative 2 (No action)	Not Likely to Adversely Affect	Habitat changes would occur due to succession and natural disturbances. Adequate wolf and wolf prey habitat and spatial needs would be available. Large patches of young forest would not be available for moose. Human disturbance factors would not change from the current condition. No roads would be decommissioned.
Alternative 3	Not Likely to Adversely Affect	Habitat for wolf prey is improved through burning, interplanting and planting of mixed conifer, and connection of young, deciduous forest patches for moose forage through harvesting. Increases in human disturbance factors are minimized by decommissioning temporary roads and some unclassified roads.

There are no known wolf dens in the Project Area. All alternatives are in compliance with the Forest Plan and Gray Wolf Recovery Plan. The overall effect is that the Whyte Project is not likely to adversely affect the grey wolf. Alternative 2 would maintain adequate wolf habitat and prey habitat. Young forest would not be created for prey species. Human disturbance factors would not change and unauthorized roads would remain open. Alternatives 1 and 3 would improve habitat for prey species by creating young forest and planting mixed conifer forest, and would reduce human disturbance by decommissioning unauthorized roads.

The effects of other known projects in addition to the Whyte Project are unlikely to result in adverse cumulative effects because neither the Whyte Project nor the other known projects would result in major changes in the amount of young upland forest, miles of temporary or system roads, or changes in the amount of critical habitat.

3.6 Game Species

Three game species are analyzed – white-tailed deer, ruffed grouse, and moose. Additional information on the effects to game species can be found in the “Resource Report for White Pine, Deer, Moose, and Grouse” in the Project Record.

White-tailed Deer

Alternatives 1 and 3 would result in less winter thermal habitat than Alternative 2, however, both action alternatives would lead to an increase in conifer so the quality of the thermal cover would improve. Alternative 2 would result in the most winter thermal cover and Alternative 3 provides slightly more cover than Alternative 1. Alternative 2 would not produce any foraging habitat. Alternatives 1 and 3 would provide double the amount of forage habitat when compared to the No Action alternative. Alternative 1 provides slightly more forage habitat than Alternative 3. Both action alternatives would continue to provide for similar amounts of deer habitat. Alternative 2 would likely result in a decrease in deer habitat.

Ruffed Grouse

Alternatives 1 and 3 would create similar amounts of brood cover and spring/fall cover but more of both than Alternative 2. Without the Whyte Project all existing brood cover would be gone by 2016. All alternatives would provide adequate amounts of grouse habitat. Alternatives 1 and 3 would provide slightly less grouse habitat than currently exists because of converting aspen/birch forest to conifer forest. Aspen/birch forest would continue to dominate the project area and comprise more than 56% of all upland USFS acres.

Moose

The effects to moose will be measured through two indicators – amount of winter thermal cover (uplands ≥ 10 years of age and lowlands ≥ 20 years of age) and foraging habitat (uplands ≤ 25 years of age).

Alternative 2 would result in the greatest amount of winter thermal cover because no mature forest would be converted to young forest. However, this alternative would not create any foraging habitat and existing foraging habitat would decrease because of stands growing out of the less-than-25-year age class.

Under Alternatives 1 and 3 there would be a small decrease in the amount of thermal winter cover because of the harvest of mature forest, however, there would also be an increase in conifer

through planting pine and this would result in better quality thermal cover in the future. The harvest of mature forest would also create foraging habitat and would maintain the current amount of foraging habitat acres in the project area.

Cumulative Effects for Deer, Ruffed Grouse, and Moose

This project, as a whole, would be moving vegetative conditions towards the Forest Plan Landscape Ecosystem Objectives. Under the “coarse-filter” approach, the belief is that forest conditions within RNV (Range of Natural Variability) will generally provide for the maintenance of native species because they evolved under similar circumstances (Hunter 1999). Applying that rationale to deer, grouse, and moose habitat suggests at least minimum sustainable populations would occur under any alternatives. In reality, this project would continue to provide for deer, grouse, and moose numbers comparable to current populations. If this project does not occur there may be a lack of quality habitat distribution in the project area which probably would lead to a decrease in the local deer population. The Forest Plan Revision, Final Environmental Impact Statement on page 3.3.1-26 states that (for Modified Alternative E, which is what the Forest Plan LE objectives are based on) “The amounts of young forest in MIHs 1, 2, and 4 that are important to deer and moose populations, would remain within RNV (Range of Natural Variability). Thus the population of these species would be healthy...” See also Section 3.7 Management Indicator Habitats.

3.7 Management Indicator Habitats

Management Indicator Habitats 1 - 9

“For purposes of analysis, use of Indicators 1-10 assumes that, in general, there is a correlation between amount of management indicator habitats (MIHs) and potential species populations. MIHs provide a coarse filter approximation of the amount of potentially suitable habitat” (refer to Forest Plan FEIS, Volume I, p. 3.3.0: How Management Indicator Species are Addressed and Chapter 3.1.3: Range of Natural Variability for information on coarse filter ecosystem management approach). The use of MIHs as surrogate measures acknowledges that habitat for each of thousands of species is a unique combination of vegetation and other features that are often not readily detected by forest type and age alone. Because of this complexity, the use of MIHs provides a simplified, practical and reasonable approach to address a broad spectrum of species at the programmatic level. (The background information and rationale for this type of analysis approach is summarized in the Forest Plan FEIS Volume I, p. 3.3.0-1 to 3.3.0-2.)

A key assumption in evaluating MIHs 1-10 is that ecological conditions are likely to provide for species viability and maintain well-distributed habitats if there is an adequate representation of the range of habitats that would have been present under the range of natural variability (USDA Forest Service, Committee of Scientists 1999, also refer to Chapter 3.1.3 and Appendix G for description of coarse filter management and the use of range of natural variability as a tool for evaluating impacts).” (Forest Plan Revision, Final Environmental Impact Statement, P. 3.3.1-2)

The Forest Plan contains a description of each MIH and its associated suite of wildlife species. This can be found in the FEIS Forest Plan Revision Volume I pages 3.3.1-1 to 3.3.1-62, and Volume II Appendix D pages D-1 to D-70. In addition, documentation of the selection process is described in greater detail in Forest Plan FEIS Volume II, pages B-24 to B-31. By moving towards Forest Plan Objectives for Management Indicator Habitats the forest will move toward

long-term desired conditions for desired amounts, quality and distribution of Management Indicator Habitats and their associated species.

Management Indicator Habitats were used during the development of the Whyte Project proposed action. The ID Team compared the 2003 Forest Plan condition with the 2006 existing condition and the desired condition for Decade One. This information is available in the “Resource Report for Management Indicator Habitats 1 – 9.” Opportunities to move the Project Area toward the MIH objectives was used to develop the purpose and need and proposed action.

Analysis Area

Only SNF lands were used to set objectives for MIH objectives. The objectives are based on forest-wide conditions and therefore, the effects of the project will be displayed forest-wide. It is appropriate to make this comparison at the Landscape Ecosystem scale rather than the project scale because objectives are based on the entire landscape ecosystem. Management Indicator Habitats are not evenly distributed across each LE, and projects only provide a small percentage of change in the various Indicator Habitats. It is also important to consider what is happening in the Project Area and this is included in Table 3.7.1. Activities on other ownership are not considered because objectives are based on SNF lands only.

The Whyte Project purpose and need showed a need to create young forest, especially MIH 4 and 9. See Chapter 2, Table 2.3 for information on how the Whyte Project would contribute to these two MIHs. The forest-wide MIH objectives also show either an increase or decreases in the amount of mature and old/old growth and multi-aged forest. The need for this was also considered in the development of the Proposed Action. However, because the forest will continue to age on its own, direct management action is not needed to achieve the old/old growth MIH objectives. As long as the objectives for young forest are not exceeded, it is expected there would be enough acres to meet and/or move into the older aged forest.

Table 3.7.1 shows the overall amount of young forest the Whyte Project would contribute under each action alternative in Management Indicator Habitats 1 – 9 for each affected landscape ecosystem. Alternative 2 would not provide any young forest and therefore is not included in the table. The effects of the Project on Management Indicator Habitats 11 – 13 can be found in Chapter 2.

Management Indicator Habitat for Young Forest Aged 0 - 9	Forest-wide				Project Area	
	Acres of Young Forest in 2003 ¹	Acres of Young Forest in 2006 ²	Forest Plan Objectives for change in amount of habitat ³	Acres based on Cumulative Actions in 2014 ⁴	Acres of Young Forest as a result of Alt. 1	Acres of Young Forest as a result of Alt. 3
Sugar Maple Landscape Ecosystem						
1. Upland Forest	3,942	2,045	-	1,668	859	796
2. Upland Deciduous Forest	1,971	1,017	-	1,009	841	778
3. Northern Hardwood Forest	89	37	-	37	0	0
4. Aspen-Birch Forest	1,882	980	-	972	841	778
5. Upland conifer Forest	1,971	1,027	-	658	18	18
6. Spruce-fir Forest	1,684	315	-	253	0	0

Table 3.7.1 Management Indicator Habitats for Young Forest						
Management Indicator Habitat for Young Forest Aged 0 - 9	Forest-wide				Project Area	
	Acres of Young Forest in 2003 ¹	Acres of Young Forest in 2006 ²	Forest Plan Objectives for change in amount of habitat ³	Acres based on Cumulative Actions in 2014 ⁴	Acres of Young Forest as a result of Alt. 1	Acres of Young Forest as a result of Alt. 3
7. Red and White Pine Forest	275	712	-	406	18	18
8. Jack Pine Forest	13	0	-	0	0	0
Mesic Birch/Aspen/Spruce-fir Landscape Ecosystem						
1. Upland Forest	41,679	17,306	-	11,427	2870	2740
2. Upland Deciduous Forest	20,156	11,122	+	7,607	2313	2196
3. Northern Hardwood Forest	198	300	+	138	0	0
4. Aspen-Birch Forest	19,958	10,822	+	7,469	2313	2196
5. Upland conifer Forest	21,524	6,184	-	3,820	557	544
6. Spruce-fir Forest	18,222	1,160	-	1,562	130	117
7. Red and White Pine Forest	2,799	4,662	-	2,018	387	387
8. Jack Pine Forest	503	362	+	240	40	40
Jack Pine/Black Spruce Landscape Ecosystem						
1. Upland Forest	29,191	21,236	+	17,623	241	241
2. Upland Deciduous Forest	12,340	10,746	+	4,486	146	146
3. Northern Hardwood Forest	114	129	-	0	0	0
4. Aspen-Birch Forest	12,226	10,617	+	4,486	146	146
5. Upland conifer Forest	16,851	10,490	+	13,137	95	95
6. Spruce-fir Forest	5,744	2,476	-	2,117	46	46
7. Red and White Pine Forest	4,307	3,979	-	2,644	48	48
8. Jack Pine Forest	6,800	4,035	+	8,377	0	0
Mesic Red and White Pine Landscape Ecosystem						
1. Upland Forest	22,158	13,404	-	3,734	169	169
2. Upland Deciduous Forest	11,555	9,229	-	2,436	76	76
3. Northern Hardwood Forest	48	47	m	20	0	0
4. Aspen-Birch Forest	11,507	9,182	-	2,416	76	76
5. Upland conifer Forest	10,603	4,176	-	1,298	93	93
6. Spruce-fir Forest	7,499	625	-	80	0	0
7. Red and White Pine Forest	2,119	2,785	-	984	93	93
8. Jack Pine Forest	985	765	m	234	0	0
Lowland Conifer Forest in all Landscape Ecosystems						
9. Lowland Conifer Forest	6,800	4,258	+	2,051	595	526

¹Acres of young forest in 2003 come from pages 2-61 through 2-77 of the Superior National Forest. Land and Resource Management Plan.

²Acres of young forest in 2006 are based on the forest-wide stand information as of October 2006.

³The Forest Plan objectives for change in amount of habitat comes from the MIH objectives tables on pages 2-61 through 2-77 of the Land and Resource Management Plan.

⁴The acres based on cumulative actions are a projection of forest-wide young forest based on decisions made on other vegetation projects and specific proposed actions. Includes changes that would occur as a result of Echo Trail EIS, Dunk EA, Inga South EA, Devil Trout proposed action, and Alternative 1 of Whyte Project.

Alternative 2 (No Action)

This alternative does not contribute any young forest to any of the Landscape Ecosystems and therefore does not move the project area towards Forest-wide LE objectives. Over the short-term, this alternative would not lead to adverse effects because in most cases, the Forest Plan shows a decrease in the amount of young forest. However, even if the Plan shows a decrease in the amount of young forest, there is still a need for young forest and as current and planned young forest ages, it would move out of the young age class, resulting in a shortage of young forest.

Alternatives 1 and 3

- Sugar Maple LE – Forest Plan objectives show a decrease in the amount of young forest for MIH 1-8. In all cases except MIH 7 (red and white pine), there would be a decrease in young forest projected in 2014. The Whyte Project would only contribute 18 acres of young red and white pine.
- The Mesic Birch/Aspen/Spruce-fir and Jack Pine LEs show a combination of increase and decrease in the amount of young forest. Alternative 1 would provide more young forest than does Alternative 3. Both alternatives 1 and 3 move the project area towards MIH objectives.
- Lowland Conifer LE (MIH 9) shows there is a need to increase the amount of young forest across the LE. Alternative 1 would create more young forest than Alternative 3.

Both Alternatives 1 and 3 create young forest and therefore move the project area towards the overall MIH objectives better than Alternative 2 does. Alternatives 1 and 3 would change the distribution and composition of Management Indicator Habitats across the Whyte Project Area. The effects of this change would have beneficial effects to some species and negative effects to other species. However, by providing and maintaining well-distributed habitats based on the Forest-wide MIH objectives, it is not expected there would be a loss of viability of any species.

Management Indicator Habitats 11, 12, and 13

Tables 3.7.2 through 3.7.5 display the changes that would occur to the amount of edge, mature interior forest, patches greater than 300 acres, and the size of young patches within the Project Area.

Information is only shown for the project area because the spatial changes are more meaningful when considered at the project level because it shows how this project moves towards Forest Plan objectives for vegetative conditions. Forest-wide information is also presented below. Management indicator habitats are based only federal land and therefore, the effects analysis will not consider changes occurring on other ownership.

	Forest Plan direction	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Upland Edge Habitat	Reduce the amount of forest edge while retaining a range of small patches and edge habitat	23	22	23	21
Lowland Edge Habitat		26	25	30	26

*Based on stands 0-19 years old.

Table 3.7.2 shows that Alternatives 1 and 3 would reduce the amount of upland and lowland edge through management actions. This would happen as a result of creating some larger-sized patches of young forest and harvesting adjacent to recently harvested stands. Alternative 2 would not reduce edge habitat.

Currently, the forest-wide upland edge density is 26 miles/square mile. This would decrease to 25 miles per square mile under alternatives 1 and 3 (including the changes resulting from other approved projects on the forest) in 2014.

Table 3.7.3 displays the changes in acres of mature interior forest habitat for each alternative in the Project Area.

	Forest Plan objective for Spatial Zone 1	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Mature Interior Forest	Maintain or increase the amount of mature interior forest habitat	6,553	5,969	6,850	6,114

Table 3.7.3 shows there would be a decrease in the amount of interior forest as a result of management action. Alternative 1 would decrease the amount of interior forest by approximately 9 percent, Alternative 2 would result in an increase of 1 percent, and Alternative 3 would result in a 7 percent reduction in interior forest. The reduction in interior forest is the result of harvesting stands over approximately 20 acres in size. Stands less than 20 acres in size are generally not large enough to provide interior forest conditions. Stands larger than 20 acres also might not provide interior forest conditions if they are more linear in shape. While the Forest Plan shows an objective to maintain or increase the amount of mature interior forest, there is also an objective to increase patch size and to provide young forest. The Whyte Project includes actions that would increase patch size and create young forest (see Table 2.10) and this means there would be a reduction in the amount of mature interior forest. Under Alternatives 1 and 3 there would be an increase in the amount of young interior forest and this young forest would eventually grow into better quality interior habitat in the future. These large young patches would provide better quality interior forest than if young patches are not created. The Forest Plan FEIS shows a 9 percent decrease in the mature upland patches by the second decade from the existing condition. (FEIS p. 3.3.2-5)

Currently, forest-wide there are 133,354 acres of interior forest habitat. In 2014, based on Alternative 1 and the other approved projects occurring on the forest, there would be 129,645 acres of interior forest. This is less than a 3 percent decrease in the amount of interior forest.

Table 3.7.4 Indicators for MIH 13- Patches of Upland Mature Forest Greater than 300 Acres					
	Forest Plan objective for Spatial Zone 1	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Number of patches greater than 300 acres	Maintain or increase the acres and number of 300 acre patches	18	18	18	18
Acres of forest in patches greater than 300 acres		10,550	10,550	10,550	10,550

Table 3.4.7 shows there would be no change under any of the alternatives in the number of patches greater than 300 acres or in the acres of forest in the 300 acre patches in the project area.

Currently, forest-wide there are 78 patches greater than 300 acres, encompassing nearly 45,000 acres. In 2014, based on Alternative 1 and other approved projects on the forest, there would be 81 patches, totaling nearly 48,000 acres.

Table 3.7.5 Patch Size of Young Forest Aged 0-19 on NF Land and Number of Young Patches Created that are Adjacent to Existing and Planned Young Patches on Other Ownership					
	Forest Plan direction for Spatial Zone 1	Existing Condition (2006)	Alternative 1 (2014)	Alternative 2 (2014)	Alternative 3 (2014)
Average size of young patches* (acres)	Increase the average size of temporary openings	35	45	Not Applicable	44
Number of young patches created that are adjacent to existing young patches on other ownership		Not applicable	56	0	49
Number of young patches created that are adjacent to planned young patches on other ownership		Not applicable	27	0	23

*Does not include acres of existing or planned young forest on other ownership.

Table 3.7.5 shows that the average size of young forest patches increases under both of the action alternatives. Alternative 1 would result in a slightly greater increase in patch size than Alternative 3. Alternative 2 would not create any young patches and therefore would not directly increase or decrease patch size. Alternative 1 would also create more young patches that are adjacent to either existing young patches or planned young forest, than would Alternative 3.

3.8 Vegetation

The Forest Plan provides vegetation composition, age class, and tree species diversity objectives for each Landscape Ecosystem. See Forest Plan pp. 2-61 through 2-77 for the existing condition and specific objectives for each Landscape Ecosystem. The “Effects Disclosure for Vegetative Management for the Whyte Project” displays and analyzes the effects of each alternative by Landscape Ecosystem. That Report is summarized in this section.

The Whyte Project proposes management activities in seven of the LEs. However, the majority of the project area is in the Mesic Birch/Aspen/Spruce-fir, Sugar Maple, and Lowland Conifer within Mesic Red and White Pine and Mesic Birch/Aspen/Spruce-fir LEs. Therefore, the summary included here will focus on those three LEs. See Appendix G for the Landscape Ecosystem tables that are not shown in this section.

Effects Related to Even-Aged and Two-Aged Management Actions

The following tables show how the composition and age class would change in the Whyte Project Area as a result of the even-aged and two-aged management actions. The columns under the Whyte Project Area heading show how many acres of either a species or age class currently exists on federal land. The Alternative 1, 2, and 3 columns show the acres that would change as a direct result of the Whyte Project.

The columns under the Forest-wide heading show current forest-wide existing condition and the decade 1 objectives as per the Forest Plan.

Tables 3.8.1 and 3.8.2 show the composition and age class changes to the Mesic Birch/Aspen/Spruce-fir LE, Tables 3.8.3 shows the age class changes to the Lowland Conifer LE (there are no proposed changes to lowland species composition), and Tables 3.8.4 and 3.8.5 show the changes to composition and age class in the Sugar Maple LE.

Table 3.8.1 Vegetation Composition for Mesic Birch/Aspen/Spruce-fir Landscape Ecosystem						
Forest-wide Upland Forest Types	Whyte Project Area				Forest wide	
	Existing Acres 2006	Alt. 1	Alt. 2	Alt 3	Existing Condition Percent 2006*	Desired Condition Percent 1 st Decade
Jack Pine	1,551	+32	0	+32	3%	4%
Red Pine	1,538	0	0	0	5%	5%
White Pine	308	+464	0	+464	2%	3%
Spruce-fir	10,377	+165	0	+77	25%	26%
Aspen	8,761	-160	0	-160	44 %	43%
Paper Birch	6,643	-400	0	-312	15%	14%
Upland brush	1,782	-101	0	-101	N/A	N/A

*Existing forest wide condition is as of December 2006. Derived from data run on 12/26/2006.

In Table 3.8.1 the columns under the Whyte Project Area show the existing species composition and the specific changes that would occur to the species composition as a result of the Whyte

Project. The columns under Forest-wide heading show the forest-wide existing species composition and the desired species composition in decade one.

The table shows there is a forest-wide objective to increase jack pine, white pine, and spruce-fir and to decrease aspen and paper birch to meet the desired condition in the first decade of the Forest Plan. The Whyte Project would result in an increase in jack pine, white pine, and spruce-fir. The increase in jack pine and white pine is a result of converting aspen stands to pine, thereby decreasing the amount of aspen. The increase in spruce-fir is a result of the paper birch stands naturally succeeding to spruce-fir. The paper birch stands would be treated with an overstory removal harvest that removes the old paper birch and retains the advanced regeneration of spruce-fir. The paper birch would succeed to spruce-fir with or without vegetation management.

Age Class	Whyte Project Area				Forest-wide	
	Existing condition 2006 (acres)	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)	Existing Condition Percent 2006	Desired Condition Percent 1 st Decade
Uplands						
0-9	398	+2,792*	0	+2,662*	6%	10%
10-49	10,995	+223**	0	+134**	36%	45%
50-79	9,638	-1,466	0	-1,314	29%	15%
80-99	8,281	-1,392	0	-1,352	21%	21%
100+	3,194	-56	0	-28	9%	9%

* Includes 101 acres of upland brush being converted to white pine. Upland brush does not have an age class (no year of origin).

** This represents the over story removal harvest where the advanced regeneration is already greater than 10 years old.

In Table 3.8.2 the columns under the Whyte Project Area show the existing age class composition and the specific changes that would occur to the age classes as a result of the Whyte Project. The columns under Forest-wide heading show the forest-wide existing age class composition and desired age class in decade one.

The table shows there is a forest-wide objective to increase the amount of young forest and decrease the amount of 50-79 year old forest and maintain the amount of acres of forest aged 80-99 and 100+. Alternative 1 of the Whyte Project would contribute more young forest than does Alternative 3. Alternative 2 does not create any young forest.

Age Class	Whyte Project Area				Forest-wide	
	Existing condition 2006 (acres)*	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)	Existing Condition Percent 2006	Desired Condition Percent 1 st Decade
Uplands						
0-9	8	+509	0	+443	<1%	2%
10-39	416	0	0	0	5%	4%
40-79	7,705	-509	0	-443	27%	14%
80-159	11,559	0	0	0	52%	70%
160+	867	0	0	0	6%	10%

* Does not include Forest type 99; Upland Opening. This type does not have an age-class.

In Table 3.8.3 the columns under the Whyte Project Area show the existing age class composition and the specific changes that would occur to the age classes as a result of the Whyte Project. The columns under Forest-wide heading show the forest-wide existing age class composition and desired age class in decade one.

Table 3.8.3 shows the forest-wide objective is to increase the amount of young lowland conifer (black spruce) and lowland conifer over the age of 80. The objective also shows a decrease in the forest aged 40-79. The Whyte Project would decrease the 40-79 year old age class and increase the amount of young forest. Alternative 1 creates more young black spruce forest than does Alternative 3 and therefore contributes more towards meeting Forest Plan objectives. Alternative 2 does not create any young forest.

Forest-wide Upland Forest Types	Whyte Area				Forest wide	
	Existing Acres 2006	Alt. 1	Alt. 2	Alt 3	Existing Condition Percent 2006	Desired Condition Percent 1 st Decade
Red Pine	282	0	0	0	5%	5%
White Pine	0	+18	0	+18	1%	2%
Spruce-fir	602	0	0	0	14%	15%
Aspen	7,129	-18	0	-18	26%	25%
Paper Birch	1,181	0	0	0	16%	17%
Northern Hardwoods	1834	0	0	0	38%	39%

In Table 3.8.4 the columns under the Whyte Project Area show the existing species composition and the specific changes that would occur to the species composition as a result of the Whyte Project. The columns under Forest-wide heading show the forest-wide existing species composition and the desired species composition in decade one.

Table 3.8.4 shows the forest-wide objective of increasing white pine, spruce-fir, and paper birch, decreasing aspen, and maintaining red pine. The Whyte Project would convert 18 acres of aspen to white pine, thereby slightly decreasing the amount of aspen and increasing white pine.

Age Class	Whyte Project Area				Forest-wide	
	Existing condition 2006 (acres)*	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)	Existing Condition Percent 2006	Desired Condition Percent 1 st Decade
Uplands						
0-9	755	+852	0	+716	3%	4%
10-49	5,772	0	0	0	27%	34%
50-99	3,958	-852	0	-716	46%	38%
100-149	657	0	0	0	23%	23%
150+	101	0	0	0	1%	2%

* Does not include Forest type 99; Upland Opening. This type does not have an age-class

In Table 3.8.5 the columns under the Whyte Project Area show the existing age class composition and the specific changes that would occur to the age classes as a result of the Whyte Project. The columns under Forest-wide heading show the forest-wide existing age class composition and the desired age class in decade one.

Table 3.8.5 shows the forest-wide objective of increasing the amount of forest aged 0-9, 10-49, and 150+ and decreasing the forest aged 50-99. The Whyte Project would create acres of forest aged 0-9 and decrease acres of forest aged 50-99. Alternative 1 would create more young forest than Alternative 3. Alternative 2 would not create any young forest.

Effects Related to Intermediate Management and Restoration

In addition to the age class and vegetation composition changes that would occur, there would also be changes to tree species and growing conditions that would result from intermediate and restoration management actions. Intermediate management includes thinning, group selection, and variable retention. See Appendix A for definitions of vegetation treatments.

Under Alternative 2 there would be no change in the within stand diversity of tree species. Natural changes such as succession and blowdown would continue to occur. Conditions for enhancing growing conditions for sugar maple, and increasing the amount of white pine, yellow birch and other less common species would not occur and would not move towards meeting these Forest Plan objectives.

Alternative 1 and 3 would result in direct changes in growing conditions and tree species diversity. Growing conditions would be enhanced through reducing competition, removing diseased and suppressed trees, and retaining the bigger and better quality trees. In addition, species diversity would be enhanced by retaining less common species such as sugar maple, white pine, and yellow birch. The group selection and variable retention harvest would retain aspects of old-growth characteristics such as retention of larger-sized trees, retaining untreated areas, and creating gaps of varying size. This type of management would better emulate natural stand disturbances such as blowdown and would maintain patch size.

Summary

Alternative 2 does not move the project area towards the overall landscape ecosystem goals because it does not create any young forest nor does it decrease any mature-aged forest. The LE objectives show a need for young forest and there is an abundance of mature forest. Nor does Alternative 2 increase the amount of pine or decrease the amount of aspen where forest-wide objectives show a need for this. Natural changes would continue. Stands would continue to get older and over time the overstory would die. More shade tolerant species such as balsam fir and white spruce would grow in the understory. There would be less aspen and paper birch because these species need open conditions to regenerate. There would be no increase in the amount of white pine.

Alternatives 1 and 3 move the project area towards the LE goals, because they create young forest, they decrease the amount of forest in some of the older age classes, and they increase the amount of jack pine, white pine and other longer-lived species. Alternative 1 would create more young forest than Alternative 3. Both alternatives also considered the need for old forest. The amount of young forest that would be created does not adversely impact the amount of mature and old forest needed now or in the future.

Cumulative effects

There is a Memorandum of Understanding (MOU) between MN DNR, Lake County, US Forest Service, and The Nature Conservancy to attempt to “cooperate and coordinate management activities” in the Sand Lake – Seven Beavers area. This collaboration has also extended beyond the MOU area to the whole of the Whyte project area for vegetative management activities. Collaborative members have met several times. Efforts have concentrated on sharing resource data and plans, placing regeneration harvests next to each other on different ownerships, regenerating small areas left by recent treatments on other ownerships to create larger patches of young age class, retaining larger patches of mature upland forest, minimizing the amount of road building, and coordinating timing of harvests to minimize the frequency of entry into an area.

Management by all ownerships has been on-going across the project area with an estimated 8,700 acres of regeneration harvest by all ownerships over the past 10 years (4% of project area in the young age class). Planned harvests on state, federal, county and TNC lands and anticipated harvests (based on activity over the last 10 years) on corporate, private and county lands over the next 10 years would create from 18 to 20 thousand acres of young forest across the project area (8 to 9 % of the Project Area would be in the young age class). The Forest-wide vegetative age class objective for upland forest is 10% (See Forest Plan Table NSU-3, p. 2-60) so this project area is in line with the overall SNF LE goals. Therefore, the cumulative effects of vegetation management on all land in the Project Area would not result in adverse effects on vegetation.

The cumulative effect of collaborative efforts would be in line with the LE goals envisioned in the Forest Plan for age class and vegetative composition for the 1st decade. In addition, overall fragmentation of the landscape would be reduced by placing regeneration areas next to each other. This would minimize the number of entries and road building into many areas and would provide larger blocks of mature interior forest habitat for the future.

3.9 Wild, Scenic, and Recreational Rivers

The Cloquet and St. Louis Rivers are classified as eligible Recreational Rivers in the Forest Plan. The theme of the Eligible Wild, Scenic, and Recreational Rivers Management Area states that

“Under the interim protection, management activities in the river corridors will protect the river’s free-flowing condition, outstandingly remarkable values, and classification (Forest Plan pp. 3-16 to 3-20). There are no proposed actions located within ¼-mile of the St. Louis River and therefore it is expected that Whyte Project actions would not be seen from the river nor would they have any impact on the river’s free-flowing character. The following effects analysis refers only to the Cloquet River. The Forest Plan (Final Environmental Impact Statement Volume II, p. E-2) shows that the Cloquet River is listed as being eligible as a recreational river and that there are no outstandingly remarkable values in either the Cloquet or St. Louis River corridors. Additional information can be found in the Effects to the “Wild, Scenic, and Recreational Rivers Resource Report” and the Superior National Forest Wild and Scenic River Evaluation (February 1989) in the Project Record.

Analysis Area

The analysis area for the direct, indirect, and cumulative effects is the designated river corridor which extends to ¼-mile on each side of the river within the project area. This is the boundary established by the Wild and Scenic Rivers Act in 1968. Any actions occurring outside the 1/4-mile boundary would not affect the river’s eligibility for classification as a recreational river.

The time period for analyzing the effects would be five years past the time of the harvest. This is a suitable time period because effects would generally occur at the time of harvest and would diminish within five years after harvest. Actions are expected to be implemented by 2014.

Environmental Consequences

Alternative 2 (No Action)

There would be no change in the river’s free-flowing condition or classification. Over the long-term, there would not be as many white pine as under Alternatives 1 or 3 because no white pine would be planted. And generally the trees would not be as large because existing tree species such as aspen and paper birch do not generally attain large-tree character.

There is an unauthorized road accessing the river through treatment unit 117. This route would remain open for use.

Alternatives 1 and 3

Under Alternatives 1 and 3, 210 acres would be managed through two-aged (65 acres), intermediate (99 acres) and restoration (46 acres) management. The 210 acres is approximately five percent of this MA in the Project Area. Less than five percent of the MA in the Project Area would be impacted. This takes into account that there would be no harvest within 100 feet of the river, legacy patches would be retained, and no harvest would occur in the restoration units.

There would be no change in the river’s free-flowing condition because harvest activities would not occur within 100 feet of the river and the 100-foot buffer is fully vegetated. Some planting may occur within 100 feet of the river. The direct effects of harvesting timber in the river corridor include noise and the change in the age and type of vegetation. The noise would only last during the actual work and would have no effect on the river’s eligibility or classification. The vegetation changes would move the vegetation towards Forest Plan desired conditions; including retaining the existing larger-sized trees and increasing the longer-lived conifers such as white pine. Management actions include timber harvest, site preparation, and planting to convert some of the existing aspen stands to white pine. This type of activity is suitable within the river corridors as per Forest Plan desired conditions (D-WSR-2 p. 3-17). The two-aged management actions would result in a greater change in vegetation because more trees would be removed and the units would be converted to pine. Intermediate prescriptions such as thinning, would have a

minimal change in vegetation because generally the smaller trees would be removed and this would begin to create a big-tree character on those sites by retaining the larger-sized trees and enhancing growing conditions of the remaining trees. No harvest would occur in the restoration units although some trees may be cut down to create room for planting pine. The long-term effects of the vegetation management would result in a positive change by increasing the amount of white pine and other long-lived species and creating a large-tree character within the river corridor.

In places where harvest or site preparation activities occur, activities would only be noticeable while equipment was on-site and working. Visitors would not notice the small gaps where vegetation was removed or loss of tall trees in the distance. This type of management would not impact the river's free-flowing condition or change the overall character of the river.

The unauthorized road in unit 117 would be decommissioned upon completion of management activities. This would eliminate potential unauthorized motorized access to the river. Decommissioning may also reduce non-motorized access because decommissioning involves obliterating the road at the junction with a system road.

None of the gravel pits proposed for expansion are within ¼ mile of the Cloquet River.

Cumulative Effects

Based on a review of the existing young forest and possible future harvest on other ownership, there has been limited harvest within the river corridor. There was harvest on private land within the past ten years that is within the ¼ mile corridor. There are no known future management activities or other projects planned within the corridor on federal land or other ownership. The majority of the ownership along the river within the project area is federal. Therefore, there would be no cumulative effects on the free-flowing character or other characteristics of the river.

Conclusion

The type of management proposed under Alternatives 1 and 3 would have no measurable effect on the river's free flowing condition and would not change the river's eligibility for classification. Treatment areas would remain vegetated and most activity would be a minimum of 100-feet from the river. There would be changes in the number of trees remaining following the intermediate and two-aged harvests and the types of trees. Planting would increase the conifer component and increase the number of longer-lived tree species. In the long-term, the project would result in a greater diversity of tree species and a greater number of pine, which would add to the big-tree character in the future. The proposed action fits within the guidelines of the Eligible Wild, Scenic, and Recreational Management Area within the Forest Plan.

Under Alternative 2 there would be no trees planted so there would be fewer pine in the future. In the short-term, there would be few if any changes to the existing vegetation age or composition.

3.10 Forest Plan Inventoried Roadless Areas

The Superior National Forest recently completed the Forest Plan revision process and has an approved Forest Plan as of July, 2004. The Forest Plan revision process required an up-to-date inventory to address the ongoing roadless management issue. As required by Forest Service direction, Forest Plans must inventory, evaluate, and consider for wilderness recommendation

existing RARE II areas and other areas that may not have been previously inventoried in RARE II. The recent Forest Plan revision process conducted a Roadless Area Inventory and evaluation process that included three phases: inventory, evaluation, and alternative development. Further discussion regarding this process can be found in the Superior National Forest Final Environmental Impact Statement Volume II, Appendix C.

Based on this recent evaluation, there is one Inventoried Roadless Area in the project area: Seven Beavers. The Forest Plan Record of Decision does not recommend any additional areas for wilderness study. The Seven Beaver area was allocated to the Riparian Emphasis and Candidate Research Natural Area Management Areas (See Table C-5 – Forest Roadless Area Inventory Management Area Allocations FEIS Volume II p. C-13.)

The Final Environmental Impact Statement for the Forest Plan Revision states that “Once the Forest Roadless Area Inventory is finalized, any proposed site-specific projects within an inventoried area will require an environmental analysis which considers effects of the project proposal on the Roadless characteristics in the area” (p. 3.7-7).

Analysis Area

The analysis area for the direct, indirect, and cumulative effects analysis is the entire Seven Beaver Roadless Area. This area was chosen because it was used during the Forest Plan analysis. The time period for direct, indirect, and cumulative effects includes harvest within the past ten years and ten years beyond this proposed treatment. This time frame is used because the criterion used for selecting areas for evaluation considers harvest in the past 10 years (LRMP FEIS Appendix C-6).

Environmental Consequences

The Whyte Project proposes to conduct vegetation management activities on 58 acres within two stands located in the Seven Beaver Inventoried Roadless Area. The 58 acres is 1.1 percent of the 5,174 National Forest acres in the Seven Beavers Inventoried Roadless Area.

- Management within Unit 19 (25 acres) would restore white pine along Seven Beaver Lake. The Unit would be accessed via the lake so no road access would be needed. The activity would not be noticed, except by people present on the days when activity would occur. Overall, activity would move the area toward Landscape Ecosystem objectives and follows Management Area guidelines by restoring white pine. Activity would last for approximately 2 weeks.
- Management within Unit 20 (33 acres) would mimic stand replacement disturbance by extending harvest from adjacent private land to NF land. Access would be via temporary roads that would be decommissioned upon completion of activities. Harvest would mimic natural disturbance and there would be no unnatural boundaries. Harvest activities would last for approximately 4 months and would occur in winter when there would be fewer people in the area.

Based on no system roads being needed to access the units and the minimal amount of vegetation activity, there would be no measurable direct or indirect effects on the Roadless character.

There are no known future projects planned within this Inventoried Roadless Area and no timber harvest occurred within the past 20 years. Therefore, there would be no cumulative effects.

For additional information on the effects of the project on Roadless character, see the resource reports “Evaluating the Effects of Whyte Project Activities on Wilderness Attributes within the Sand Lake Seven Beavers Forest Plan Inventoried Roadless Area” and “Effects Disclosure for Forest Plan Roadless Area Inventory” in the Project Record.

3.11 Roadless Area Review and Evaluation (RARE II) and Roadless Area Conservation Rule (RACR)

An area around Phantom Lake was included in the final nation-wide inventory of roadless areas in a process called Roadless Area Review and Evaluation (RARE II). Phantom Lake was also included in the Forest Service Roadless Area Conservation Rule (RACR).

Based on the Roadless Area analysis conducted during the Forest Plan revision process, the Phantom Lake area did not meet plan revision criteria and was subsequently removed from the Roadless Area Inventory. This was primarily because it did not meet the inventory criteria for semi-primitive acres (only 1000 acres semi-primitive). (FEIS Volume II Appendix C p. C-7). This area is now in the General Forest Management Area.

The Scoping Report Proposed Action, sent out for public review and input in May 2006, included managing the vegetation on approximately 864 acres in the Phantom Lake RARE II area. Units would have been accessed via the existing system road that accesses the interior of the roadless area and temporary roads. The Proposed Action also included decommissioning about one mile of existing unauthorized and unneeded road.

A recent court case (Wilderness Society, et al. v. United States Forest Service, et al. September 2006) reinstated the prior Roadless Area Conservation Rule. While this court case is on-going, the planning team was directed to defer vegetation management action at this time. The road decommissioning however, remains in both of the action alternatives. See the “Effects Disclosure for Phantom Lake RARE II Area” in the Project Record.

Environmental Consequences

Under Alternative 2 (No Action) the unauthorized road would remain open for motorized use.

Under Alternatives 1 and 3 approximately 1 mile of unauthorized road would be decommissioned. This road was used in the past to access vegetation management units. Decommissioning this road would eliminate unauthorized motorized access, and would reduce impacts to soil and wetlands.

There are no other known on-going or proposed activities that would impact the Roadless Areas, therefore, there would be no cumulative effects.

3.12 Soil and Wetlands

The “Effects Disclosure for Soils and Wetlands”, filed in the Project Record, discloses the impacts to soils include soil quality, nutrient status, and wetlands.

Alternative 2 would not impact any additional soil or wetland because there would be no additional management. However, unauthorized roads would remain open for motorized use and impacts to soil and wetlands would continue.

Alternatives 1 and 3 would impact approximately 9,800 acres and 8,300 acres respectively. Mitigations such as winter harvest and excluding sensitive areas from treatment boundaries would limit or eliminate impacts. The site-specific unit cards identify the season of harvest and soil types of concern. Monitoring shows that mitigations and project design have adequately protected the soil and wetland resources on similar vegetation projects in the past. Temporary road access would be managed through proper placement, seasonal restrictions, and decommissioning the roads upon completion of management activities. Site preparation, including burning, is not expected to impact soil quality or nutrient status because of mitigation measures that limit these activities on sensitive soils. While gravel pit projects do impact soil quality or nutrient status because part of the soil resource is removed from the site, rehabilitation of these sites is focused on restoring soil quality and nutrients as quickly as possible.

Alternative 1 and Alternative 3 would have a positive effect because unauthorized roads would be decommissioned and this would reduce or eliminate on-going adverse impacts on soil and wetlands. Under Alternative 2, these roads would remain open and there would likely be continued resource damage.

Soil Productivity: Design features within the Whyte project come from Forest Plan standards and guidelines and Minnesota Forest Resource Council Guidelines. Forest Plan standards and guidelines were designed to protect the productivity of soil during mechanical and burning activities. Examples include retaining slash on low-nutrient soils and limiting mechanical activity to frozen ground or during dry periods for those soils susceptible to rutting.

Cumulative Effects

Management activities on non-federal lands would have minimal impacts to the soil resource on federal land. In addition, most other landowners follow the best management practices. Minimal cumulative effects are anticipated through the use of Forest Plan standards and guidelines and the use of best management practices. There are no reasonably foreseeable future actions that would occur on the same land impacted by proposed management activities. This project would not result in measurable cumulative effects to soil productivity, erosion, or compaction.

3.13 Scenic Quality

The Project includes vegetation management activities along the Superior National Forest Scenic Byway (Forest Highway 11) and within the eligible Wild, Scenic, and Recreational River corridor. Management activity along the Scenic Byway includes primarily intermediate and two-aged treatments. Intermediate treatments include thinnings where the majority of trees are retained and two-aged harvest where more trees are retained than in a clearcut. Harvest prescriptions and mitigations include direction for limiting the amount of harvest seen from the road, retaining legacy patches within the foreground, and retaining more trees in the foreground to maximize the amount of mature forest seen from popular roads in the project area. The harvest would be designed to emulate natural disturbance patterns such as a variety and mix of small openings and clumps of trees. This would effectively mitigate adverse effects on scenery. The future vegetation would be moving toward Forest Plan desired conditions for age class and

species composition. See the “Effects Disclosure for Scenery” in the Project Record for additional information.

Management activity within ¼-mile of the Cloquet River corridor would generally not be visible from the river because of the amount of vegetation along the shoreline and the low-relief of the land around the river. Management activity within the river corridor would generally help create a big-tree character and increase the longer-lived tree species. This meets both LE and MA direction. Alternative 2 would not change any of the existing vegetation. Stands would remain fully forested and natural in appearance. Alternatives 1 and 3 would change the vegetation and the prescriptions and mitigations would limit effects to the scenic quality and over time would enhance the scenic quality by increasing the number of pine and creating a large-tree character.

There are no other known vegetation projects planned for adjacent to Forest Highway 11. Highway 2 south from the junction of Forest Highway 11 is proposed to be reconstructed in the near future. Reconstruction may have a short-term impact on scenery. The reconstruction and proposed management would not result in cumulative effects because only a small amount of thinning is proposed to be harvested adjacent to Highway 2 and thinning has minimal impact because of the number of trees retained during harvest.

3.14 Heritage Resources

All known historic properties within the treatment unit boundaries would be avoided during project implementation. All treatment units with a high probability of unknown heritage resources would be reviewed by heritage resource staff to determine if additional surveys are needed prior to ground disturbing activity. If new sites are found, they would be avoided. (Appendix C Heritage Resource Mitigations) The project would not result in any loss or destruction of National Register-eligible sites, or scientific, cultural, or historic properties.

The “Effects Disclosure for Heritage Resources” (See Project Record) indicates there would be no impacts on any properties listed in or considered eligible for listing in the National Register of Historic Places, nor would there be any loss or destruction of any scientific, cultural, or historic places under any of the alternatives. The Project Area has been reviewed by Heritage Resource staff. They have identified the known heritage sites within and adjacent to treatment sites and all known heritage resources would be avoided during implementation of the project. Any previously unrecorded heritage resources discovered during project implementation would be avoided and reported.

For treatment units that have a high potential for containing unrecorded heritage resources, a reasonable and good faith effort would be made to identify heritage resources in those locations prior to ground disturbing activity. The review would consider the potential for unrecorded archeological sites. Field survey would be conducted as deemed appropriate by the Heritage Resource Program Manager.

Based on the review of past surveys and recorded heritage resources, planned review of areas of higher potential prior to action, and the mitigation measures and monitoring associated with the actions, the Superior National Forest Heritage Program Manager concluded that there would be no direct, indirect or cumulative effects to heritage resources under any of the alternatives.

The Superior National Forest has a draft Programmatic Agreement (PA) with the Minnesota SHPO that directs the types of survey and consultation for heritage resources. The heritage review procedures have been reviewed by SHPO and are consistent with the provisions of the draft Programmatic Agreement. See Effects Disclosure for Heritage Resources in the Project File.

3.15 Tribal Communities

The Tribal communities (Bois Forte, Grand Portage, and Fond du Lac Bands, and 1854 Authority) were contacted during the development of the proposed action. Tribes expressed concern about changes to hunting opportunities and access to hunting areas. The project would maintain adequate habitat for game species such as ruffed grouse, deer, and moose. (See Section 3.6) The project would close 61 segments of road, totaling approximately 20 miles of unauthorized roads. The majority of these roads are short segments and many of them cross wetland areas and therefore are not suitable for wheeled vehicular access. Closing these roads would not have a measurable affect on access to the project area because some roads would be added to the managed road system and most system roads would remain open for motorized use.

3.16 Non-native Invasive Plants

All the alternatives have the potential to increase the spread of non-native invasive plants (NNIP) in the Project Area. The species most likely to spread along roads are orange and yellow hawkweeds and oxeye daisy. Canada thistle, spotted knapweed, St. Johnswort, leafy spurge, and tansy are much less likely to spread because of project activities. Based on the analysis, Alternative 1 has a slightly higher risk of NNIP spread than Alternative 3 because of the need for access to treatment units. The action alternatives all have a higher risk than the risk posed by Alternative 2. Under both action alternatives, the risk of spread of NNIP would be small because of: NNIP mitigations described in Appendix C of this document, the use of temporary winter roads would decrease disturbance to snow-covered seeds, and because of implementation of the Forest-wide NNIP Management EA which provides direction for treating NNIP when found. See “Effects Disclosure for Non-native Invasive Plants” in the Project Record.

3.17 Water Quality

The Whyte Project was designed to both mitigate any adverse effects that might occur as a result of proposed vegetation activities and to improve watershed health, riparian function, and aquatic wildlife habitat through active and adaptive management. Specific units with wetland, watershed, or riparian concerns have been identified and specific mitigations identified to lessen any adverse effects. These are noted on the unit cards and in the “Effects Disclosure for Aquatic Resources” report. The mitigations are listed in Appendix C.

Table 3.17.1 shows the number of stream crossings that would be eliminated under each alternative as a result of decommissioning roads, the number of new temporary stream crossings, and the acres of riparian management. Alternatives 1 and 3 are very similar. Alternative 2 would not reduce any stream crossings, create new stream crossings, or conduct any riparian management activities.

Alternatives 1 and 3 would have primarily positive effects resulting from eliminating road stream crossings and the riparian management activities. Mitigations, including season of harvest, harvest restrictions on certain soil types, and no harvest next to lakes and rivers, would effectively limit adverse effects (sedimentation and erosion) of harvest and temporary road construction on water quality.

Alternative 2 would result in continued impacts on water quality from the unauthorized roads remaining open. No riparian management would occur.

Table 3.17.1 Effects to Water Quality

	Decommissioned Roads		New Temp. Roads		Riparian Management	
	Miles of Road	# of crossings	Miles of Road	# of Crossings	Acres of Planting	Acres of Harvest
Alt. 1	24	6	17	2	99	75
Alt. 2	0	0	0	0	0	0
Alt. 3	24	5	15	2	96	75

The portion of each watershed that is in open upland and young upland condition is a good cumulative effects indicator. Research indicates that watersheds having more than 60 percent open upland and young upland forest conditions are susceptible to peak flows than can reshape channels, increase erosion and sedimentation, as well as decrease diversity within streams (Verry 2000).

Based on a review and analysis of the watersheds that occur within the Whyte Project Area and the vegetative conditions that would result from implementing Alternatives 1 or 3, there are no watershed values that would exceed the 60 percent threshold within the project area. Additionally, based on the percent of each watershed within and outside the project area, it is unlikely that proposed cumulative vegetative management associated with Alternatives 1 or 3 would result in an open upland and/or young upland value that would exceed 60 percent for any entire watershed within or intersecting the project area.

Monitoring performed by the Minnesota Forest Resource Council shows that past similar type management projects have not been causing adverse effects to aquatic resources. (See Project Record)

3.18 Recreation

The project would have little to no affect on any developed or dispersed recreation activities because no management activities would occur directly adjacent to any developed recreation site. Treatment units adjacent to roads and trails contain design criteria to lessen the visual impact of management activities. The roads proposed to be decommissioned may impact a small number of people who have used them in the past with motorized equipment. The roads would still be available for use and would provide access to the area, but access would be via non-motorized means. Minor impacts may occur at trail crossings and in places where trails are located on existing road corridors. Trails may be used in some cases when there is not other road access to a

unit. Use of trails would be avoided during main use season. Signing would be effective at warning users and limiting impacts.

3.19 Fire Regime Condition Class

Commercial timber harvesting has been and will be the primary mechanism to influence condition class rankings on federal land. Alternatives 1 and 3 would move the area toward its historical natural fire regime, and this would result in a healthy functioning ecosystem, reduction of hazardous fuels, and lead to healthier vegetation conditions in the Project Area. Alternative 1 treats more acres than Alternative 3.

Alternative 2 does not treat any acres and therefore does not result in a positive change to condition class. Without a disturbance process, these areas would continue to move further and further away from their natural vegetation structure and pattern. This would make the area more susceptible to insect and disease, create greater fuel loading, and create a higher fire danger.

Table 3.19.1 shows how condition classes would change under each alternative.

Existing Condition Class	Future Condition Class	Alt. 1	Alt. 2	Alt. 3
1	1	1,358	0	1,255
2	1	6,978	0	5,957
3	1	241	0	241
2	2	332	0	332
3	2	75	0	75
3	3	14	0	14
Total Acres		8,998	0	7,874

¹Acreage figures reflect only those stands in Project Area that are proposed for treatment.

3.20 Transportation System and Gravel Pits

The changes to the road system and gravel pits are disclosed in Appendix B. The existing road system (including unauthorized roads) was inventoried in 2005 and road needs were considered during the development of the proposed vegetation management needs. The “Whyte Project Road Analysis” contains information on the existing system and unauthorized roads in the Project Area. Alternatives 1 and 3 of the Whyte Project make recommendations on most of the unauthorized roads in the Project Area but some are deferred for a future analysis. Some unauthorized roads may be needed for access to private land. The purpose and need for the Whyte Project did not include providing access to private land owners. No road changes would occur under Alternative 2. The effects of the roads and gravel pits on other resources in the project area have been considered in the resource effects analyses.

Table B-2 Gravel Pits, in Appendix B, shows that for Alternatives 1 and 3, the proposal for gravel extraction includes four existing pits and one new pit. The proposed expansion for each gravel pit would be less than ½ acre for a total increase of 1.6 acres. The existing gravel pits occupy

approximately 4.7 acres. It is estimated that there is a total capacity of 50 acres. The 6.3 acres of existing and approved gravel extraction is less than 13 percent of the total gravel available. A gravel pit management plan would be developed for each pit and the plan would include mitigations listed in Appendix C and direction for how each pit would be developed and then rehabilitated. This would ensure an efficient use of gravel. Gravel pit extraction is not expected to result in other than minor impacts resulting from loss of vegetation and ground disturbance on less than then 1.6 acres. Gravel pits would be rehabilitated and re-vegetated upon completion of extraction activities.

No gravel pits would be approved for use under Alternative 2. When a project requiring gravel comes up, either gravel would be hauled in from an approved pit outside the project area, resulting in very high transportation costs, or another analysis would be completed, delaying gravel availability.

3.21 Economics

The estimated costs of implementation for each alternative are shown in Table 3.21.1. These costs would be spread over the life of the project, approximately 10 years for full implementation of all of the proposed actions.

Table 3.21.1 Estimated Costs of Implementation				
Activity	Cost / Acre	Alt. 1	Alt. 2	Alt. 3
Sale preparation	\$72	\$604,800	\$0	\$532,800
Sale administration	\$48	\$403,200	\$0	\$355,200
Site prep - mechanical	\$220	\$156,640	\$0	\$156,640
Site prep - burning	\$450	\$268,200	\$0	\$237,150
Restoration - underburn	\$400	\$20,800	\$0	\$20,800
Planting - Full	\$200	\$136,600	\$0	\$136,600
Seeding	\$150	\$89,400	\$0	\$79,050
Stocking surveys (Two/unit)	\$7	\$72,212	\$0	\$66,206
Release	\$210	\$143,430	\$0	\$143,430
Total:		\$1,895,282	\$0	\$1,727,876

Revenues are based on potential timber sale receipts. Table 3.21.2 shows the estimated revenues based on January 7, 2007 base period prices. The actual revenue generated would depend upon market value at the time of the sale.

Table 3.21.2 Estimated Revenue			
Factor	Alt. 1	Alt.2	Alt. 3
Harvest Volume (MMBF) ¹	33	0	30
Federal Revenue	\$1,954,790	\$0	\$1,800,301

1. MMBF – Million board feet. One board foot represents 12 inches x 12 inches x 1 inch.

Economic Discussion

The tables above show that the costs of implementing the project are less than the expected revenue for both action alternatives.

The least expensive harvest method with the greatest return of dollars and total volume is aspen clearcuts followed by jack pine or black spruce clearcuts with site preparation and seeding. Site preparation and seeding on jack pine sites might not be needed if harvesting is on light soils and is done with whole tree logging in the summer with slash re-distributed back across the unit. The variable retention and group selection harvest would be more costly to layout and would generate less volume and revenue than the other harvests methods because of the time required to mark specific trees to be removed and because fewer trees would be harvested.

Forest Plan goals for restoration, retention of large patches of mature forest, retention of trees for habitat and other values (legacy patches, leave tree requirements in clearcuts, MIH guidelines), and scenic and riparian protection or enhancement all require more effort in planning, sale preparation, reforestation and administration. This results in higher average unit costs and lower average unit revenues.

With Alternative 2 (no action) costs and revenues would be zero. Alternative 1 would cost more than Alternative 3 but would also generate more revenues. Alternatives 1 and 3 would both generate enough revenue to support the planned management activities.

Simple economic costs and revenues are important considerations but are not the only, or even primary, considerations in an environmental analysis. There are many non-market values associated with each of the alternatives such as the values of large patches of mature forest, large patches of young forest that will grow into mature patches, habitat and vegetation enhancements gained from what is left on and in the treated areas, riparian enhancements, and scenic protection.

The Forest Plan considered the costs and revenues of vegetation management across the Superior National Forest. For information on the economic sustainability of local communities see the Forest Plan Final Environmental Impact Statement (FEIS Volume I, pp. 3.9-1 to 58).

3.22 Public Health and Safety

Safety of users of the area (visitors and residents) would be protected under all alternatives by project design and mitigation measures listed in Appendix C. Specific mitigations for treatments have been identified such as posting signs at road and trail junctions during timber operations to warn trail users of logging activity. These have been effective at reducing conflicts. Other vegetation management projects on the Laurentian Ranger District have employed similar actions successfully. District recreation personnel, law enforcement personnel and sale administrators post the roads and trails. There is not expected to be any impact on public health or safety.

3.23 Environmental Justice

Following Executive Order 12898 (February, 1994) all federal land management agencies are mandated to address environmental justice in minority and/or low-income populations with the goal of achieving environmental protection for all communities regardless of their racial and economic composition. Implementation of any alternative would have no effect on opportunities for subsistence hunting, gathering, or other treaty rights guaranteed to Native American tribes.

Chapter 4: List of Preparers, Distribution List, and References

4.1 List of Preparers and Contributors

The following is a list of the Core Interdisciplinary Team (IDT). This section also lists other Forest Service staff that contributed to the preparation of this Environmental Assessment.

Interdisciplinary Planning Team

Sue Duffy, ID Team Leader, Environmental Planning Coordinator
Chuck Cutter, Silviculturist
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Jim Roerig, GIS Specialist
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Others who were not formal members of the IDT but who gathered information used in the analysis process and/or contributed to the development of alternatives include:

Susan Alexander, Public Information and Project Record
Jason Butcher, Fisheries Biologist
Erica Hahn, Forest NEPA Coordinator
Avery Beyer, Forestry Technician
Kendall Cikanek, Forest GIS Specialist
Erich Grebner, GIS Specialist
Tom McCann, GIS Specialist
Theresa Twite, Clerical
Mary Shedd, Forest Biologist
William Clayton, Archeologist
Walter Okstad, Forest Historian
Kim Norman, Forestry Technician
Kevin Gibson, Sale Administrator
Cory Beliveau, Forestry Technician
Renee Uhan, Information Assistant
Bruce Anderson, Forest Monitoring Program

4.2 Distribution Lists

Scoping Package

Over 800 individuals and organizations were mailed a letter that contained a stamped postcard, notifying the public that the Whyte Forest Management Project was being developed. The letter and post card was mailed to everyone on the Forest-wide mailing list that was interested in vegetation and road projects, and all of the landowners within the project area. Over 300 people

returned the post card. All of these were notified the scoping report was available either via an e mail message or they were mailed a copy of the report. A paid advertisement was listed in the Mesabi Daily News and a news release was published in the Two Harbors Chronicle.

The following people and organizations were notified that the Whyte Forest Management Project Preliminary Effects Analysis was available for the 30-day public comment period. The following people and organizations will also be notified the Decision Notice and Environmental Assessment are available.

Clifford Ahlgren	Thomas & Tatiana	Tom Gardner
Todd Aho	Chresand	V. Gebo
Bruce Andersen	Paul Clendening	William Gecox
Ron Anderson	Lynn Clodfelder	Emilie Gelwicks
Chel Anderson	Darrel Coleman	Lawson Gerdes
Bart Anderson	Lorraine Cords	Matt Gibbs
Jill Anderson	Bill Corrigan	Mark & Peggy Giese
Jerry Anderson	John Corso	Julie Godfrey
Lori Andreson	John Czeck	Paul Goff
Mark Annoni	Victor Dahleen	Allan Goodman
Rodney Arola	Steven & Susan Dahlstrom	Colleen Grams
Brett Ballavance	Bob Davies	Janet Green
Justin Barfuss	Joshua Davis	Gene Grell
Philip & Mary Bartusek	LeRoy DeFoe	David Grigal
Ben Bassett	Peter DeFoe	Robert Guildler
Tom & Ann Beaver	Griff & Teresa DeGolier	Eugene Gustafson
Eric Beck	Norman Deschampe	Charles Gustafson
Gary Beck	Laura & Don Diederich	Tom Gustin
Leonard Bellah	Blake, Od Dirks	R. Hagemann
Chester Bianco	Linville Doan	Fred Hall
Alex Bildeaux	James Dreier	Clyde Hanson
Grant Birkeland	Charles & Diane Dreyler	James & Janise Harner
Shirley Bittinger	Dan Durand	Sandra Harris
Wayne Bogen	Steve Eckes	Maryanna Harstad
Denny Bone	Barbara Edgar	Jack & Carol Hauck
Bart Boyer	Andy Edwards	Joseph Hauptman
Randall Breeden	Charles Egeberg	Merrie Healy
James Brewer	Jim Eilrich	Guthrie Hebenstreit
Ray Brisco	Craig Ellquist	David & Johanna Hecker
Ron Brodigan	James Fagin	Donald L Hedin
Dennis Burke	George Farlane	Curtis Heikkila
Kenneth Burnett	Thomas Fay	Marie Henri
Bob Butler	James Flinn	Cindy & George
Scott Byrne	Kirk & Lori Foley	Herbranson
Jim Cambell	Gerald Fondie	Isabelle Hill
Tim Carlson	J. K. Fort	William Holden
Bruce & Cyndee Carlson	Dave Foster	Rick Horton
Steve Carlson	Kathryn Frank	Mike Horvat
Randy Carter	Tom & Gail Gaetz	Bill Horvat
Marcus Carter	Rona Gahr	Michelle Hotzler
RJ Ceronisky	Paul Gallagher	Gerald How

Robert Huber	Elaine Loeffler	Tom Peterson
Ralph Hudella	Robert Lundberg	Bruce Pickar
Edward Hudella	Terry Maas	Theodore & Donna
Leonard Husser	Mike Magnuson	Polacec
Michael & Jodi Irving	Arne Sr. Maijala	James & Susan Porter
Rick Jannett	Curtis Maki	Kevin Proescholdt
Kelly Johnson	Anna Maki	Matt Puro
Darrel Johnson	Tim Mansmith	Kenneth Rahier
Paul Johnson	Christina Manuel	Pete Randall
Karl Johnson	Anne Markfort	Milo Rasmussen
Lyle Johnson	Larry Martin	Ron & Wanda Rau
Deborah L. Johnson	Michael Martinez	James Ravnikar
Richard Johnston	Tom Martinson	Arnold Regeski
Philip Johnston	Roger Martinson	Tom/ Julie Rieger/ Nelson
David Jones	John Mattila	Al Ringer
Paul Jones	Brian McCann	John Rinne
Grant Jones	James & Ellen McKinnon	Randy Roff
Deborah Kalow	Donald G Meyers	John Roth
Harvey Kaufmen	William Mickelson	Jerome Rouleau
Troy Kempf	Royal & Rita Miller	Doug Rowlett
Floyd & Bonnie Kempffer	Randy Miller	Ron Rude
Karl Kendall	Stanley Miller	Tom Rusch
Jim Kidney	Audrey Mismash	Lester Rustad
Regina Kijak	Dale Moe	Kevin Rustad
Barney Kimball	Dwight Moe	Anita Ruth
Susan & Ronald Kloss	Dennis Moen	George Saari
Jim Kohrt	Brad Moore	Jill Sadler
Wendy Koon	Edith & David Moore	John & Mary Schad
Jonathan Koop	Thomas & Donna	Doug Schmidt
David Kryzer	Muehlberger	Allan Schneider
Lloyd Kulaszewicz	Thomas Muehlberger	Mike Schrage
Karl Kunnari	Dana Murphy	Carl Schuller
Carl Kunnari	Sonny Myers	Howard Schultz
Gregory / Joseph Kunst /	Scott Nellis	Bob & Barb Sellman
Jeanne	Bonnie Nelson	William Severson
Robert LaFlamme	Teresa Nelson	Larry Sheils
Shirley LaFlamme	Mark Nelson	Laura Simpson
George Lampe	Jan Nelson	Eric Simso
Richard & Louise Larson	Robert Noland	Pete Smerud
Scott Larson	Brad Norris	Michael Smith
Bruce Larson	Brian Ogren	Carol Smith
Merton Larson	Tim O'Hara	Norman Smith
Lorry Larson	Lora Olson	Stephen Snyder
Lyle Lassondf	Dick Olson	Mun Song
Michael LeBeau	Joanne Olson	Nam S. Song
Kevin Leecy	Mike Olund	Bill Sperling
Jared Leonard	William Opsahl	Chuck Spoden
P. Leschak	WM & Jeannene Otto	Daniel Squires
Jeff Lightfoot	Ki Chul Park	William Steele
Daniel Lindberg	Jim Parranto	John Steingraeber
Gregory Liverseed	Fred Payne	Jack Sternquist

John Strandell	W. H. Westerback	Wolfwood Corp
Heather Sullivan	Ken Westlake	Jim Crouch & Assocs.
Albert Suomi	Scott & Isabelle Westman	National Park Service
Thomas Swenson	Mr. & Mrs. Russ Whatley	Forestry Library,
Bob Tammelin	John Wilkinson	University of Minnesota
Patricia Taylor	Milton & Norbert Wittlief	Lake County
LeRoy Teschendorf	Arthur Wright	Commissioners
David Thomas	LeRoy Yoki	
David Thomas	Gary R. Youngquist	
Pierre Thomey	Joseph Zastera	
Randy & Gail Thompson	Victor Zgaynor	
Corey Thompson	Paul & Kaylynn Zwak	
John Todd	Lawrence Zwak	
Dale Tressler		
John Truebenbach	The Nature Conservancy	
Thor & Carolyn Turgerson	North Shore Forest	
Ron Tveiten	Products	
W Van Kessel	Carlson Homes	
Darren Vogt	The Helpers Trust	
Robin Vora	Beaverlands Inc	
Ann Wagner	Finland Area Fisheries	
Gordon Walker	Izaak Walton League-	
Richard Watson	MNDiv	

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