Cascade Vegetation Management Project
Scoping Report

Table of Contents

	Page
I. Introduction	2
II. Development of the Purpose and Need	2
III. Purpose and Need	7
IV. Summary of Proposed Action	9
A. Harvests	9
B. Reforestation	11
C. Fuel Reduction and Prescribed Burning	12
D. Connected Road Actions	12

Attachments

1. Project Area Age Class Distribution
2. Roadless Areas
3. List of Proposed Stands and Treatments
4. Description of Treatments

Figure 2: Proposed Action Map

I. Introduction

The purpose of the Cascade Project is to implement the Superior National Forest Land and Resource Management Plan (Forest Plan or FP). The Cascade Project proposed activities are intended to move the Cascade Project Area from its existing condition toward the desired conditions described in the Forest Plan. The proposed activities would manage forest vegetation composition, structure, and spatial patterns.

Proposed activities include:

- Creating young forest with final harvests
- Improving stand structure and within-stand diversity with intermediate harvests
- Restoring stand conditions without harvest, such as:
  - Planting long-lived tree species to enhance riparian areas
  - Mechanically preparing sites to reforest areas
  - Conducting prescribed burns to reduce the future risk of wildfire
- Construction of temporary roads to access units and obliteration of the roads when activities are complete.

The Cascade Project Area is located in Cook County about ten miles northwest of Grand Marais, MN. Activities would be located in portions of Townships 61 and 62 North, Ranges 1 and 2 West, and only are proposed on National Forest System land. The Project Area encompasses about 24,000 acres, of which 18,800 acres are National Forest System land, 400 acres are State of Minnesota, and 1,200 acres are other ownership or lakes. The Project Area location is shown on the Vicinity Map. The locations of proposed activities are shown on the Proposed Action Map.

If a decision is made to implement activities, proposed actions could be implemented beginning in 2008. Implementation of primary treatments could occur over five years.

This scoping package, which explains the Proposed Action, is being sent to the public, adjacent landowners, and others who have an interest in how this area is managed. The reasons for distributing the scoping package are to inform the public of the Proposed Action and to provide people with an opportunity to submit comments.

II. Development of the Purpose and Need

An interdisciplinary team of natural resource specialists compared the existing conditions in the Project Area with desired conditions and objectives in the Forest Plan. This was done through the Cascade Mid-level Analysis. The Cascade Mid-level Analysis considered all resources (vegetation, recreation, wildlife, watershed, etc.) and included recommendations of possible opportunities and management actions. The District Ranger selected the purpose of and need for action to include in this scoping document and environmental analysis. The scope of this project is limited to vegetation management actions and connected road actions. Other recommendations may be included in future environmental analyzes.

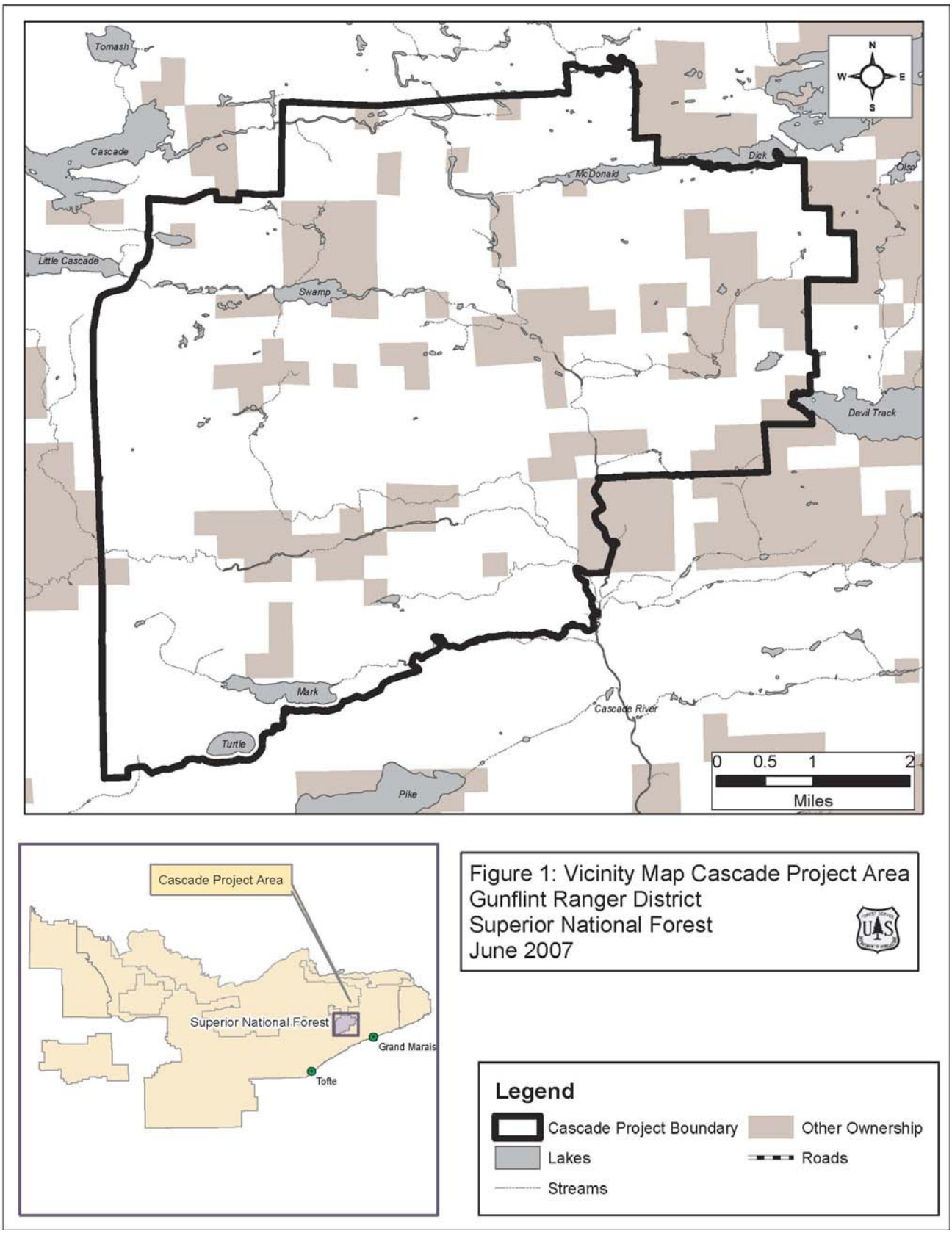

Figure 1: Vicinity Map Cascade Project Area
Gunflint Ranger District
Superior National Forest
June 2007

The Forest Plan provides objectives for managing large geographic areas called Management Areas (MA), and native plant communities, called Landscape Ecosystems (LE). The Cascade Project Area is located primarily in the General Forest - Longer Rotation MA. The southwest edge of the project area is in the Recreation Use in a Scenic Landscape MA, but no activities are proposed in this area. Cascade project area is primarily within the Mesic Birch-Aspen-Spruce-Fir (MBA) Landscape Ecosystem (Table 1).

According to the Forest Plan, some of the desired conditions of the General Forest-Longer Rotation Management Area are:

- Stands are a mix of young, even-aged and older multi-aged vegetative growth stages and a mix of tree species found in the Mesic Birch-Aspen-Spruce-Fir LE.
- Forest vegetation is managed with practices that mimic less severe stand maintenance disturbance along with some practices that mimic stand replacement. A variety of stand sizes, shapes, crown closures and age structures occur. A full range of silvicultural practices is employed. However, compared to the General Forest MA, there is more uneven-aged and partial cut harvesting resulting in more uneven-aged and multi-aged forests. When clearcutting is used, it is often at longer rotation ages.
- Some larger, forest patch sizes would occur although those associated with young even-aged vegetative conditions would be less frequent than in the General Forest MA.
- Natural disturbances are mimicked through the use of management activities such as harvest and prescribed fire to maintain or restore vegetation communities. Fire is also used as a tool to prepare sites for regenerating new forest and to reduce woody fuel that could cause wildfires.

The Cascade Project Area represents 5% of the total forest-wide Mesic Birch-Aspen-Spruce-Fir LE. Twelve percent of the project area is in the Lowland Conifer Landscape Ecosystem (LC LE) but no actions are proposed in the Lowland Conifer LE. Forest Plan objectives for vegetation, age class, tree species diversity, and management indicator habitat (MIH) are applicable to an entire Landscape Ecosystem, and, therefore, are not directly applicable to smaller project areas. However, management actions in project areas such as Cascade, contribute to meeting forest-wide LE objectives based on opportunities in the specific area. Tables 2 and 3 compare the age class and composition of the Cascade Project Area with Forest Plan objectives.

Table 1: Cascade Project Area Acres by Landscape Ecosystem (LE)*

Landscape Ecosystem	Cascade Acres in LE	% of Cascade Acres in LE	Forest-wide LE Acres**	Cascade Contribution to Forest-wide LE (%)
Mesic Birch-Aspen-Spruce-Fir	14,573	77%	281,300	5%
Lowland Conifer	2,269	12%	205,500	1%
Non-Forested Land	1,371	7%	132,224	1%
Cedar	584	3%	31,300	2%
Sugar Maple	48	<1%	51,000	<1%
Total Acres	18,845	100%	N/A	N/A

*Total acres include upland and lowland types within each LE

**Acres taken from the 2004 Superior National Forest Land Resource and Management Plan

Table 2: Vegetation Composition Conditions and Objectives for the Mesic Birch-Aspen-Spruce-Fir LE

Upland Forest Type	Cascade Project Area		Forest-wide Existing Condition 2006	Forest Plan Objectives Decade 1
	Acres	%	%	%
Jack Pine	735	5	4	4
Red Pine	501	3	5	5
White Pine	233	2	3	3
Spruce-Fir	2217	15	25	26
Black Spruce/Jack Pine	1,381	9	4	4
Aspen	8,540	59	44	43
Paper Birch	948	7	15	14
Total	**14,555**	**100%**	**100%**	**100%**

Table 3: Vegetation Age-Class Conditions and Objectives for the Mesic Birch-Aspen-Spruce-Fir LE

Age Class	Cascade Project Area		Forest-wide Existing Condition 2006	Forest Plan Objectives Decade 1
	Acres	%	%	%
0-9	793	5	6	10
10-49	4,419	30	36	45
50-79	6,117	42	28	15
80-99	2,429	17	21	21
100+	797	5	9	9
Total	**14,555**	**100%**	**100%**	**100%**

Cascade Project Area is in Spatial Zone 3 which has an objective of managing large patches (FP 2-25). This zone is adjacent to the Boundary Waters Canoe Area Wilderness (BWCAW) which contributes to the desired landscape patterns.

The Interdisciplinary Team (IDT) took forest-wide objectives and desired conditions and applied them to the specific conditions in the Cascade Project Area. Considerable time was spent by foresters, biologists, engineering technicians and other specialists doing field reconnaissance. Field observations revealed site-specific vegetation patterns in the project area. Some salient ecological features of the area are:

- The project area is divided relatively equally by two Ecological Subsections: The Border Lakes Subsection to the north and the North Shore Uplands to the south. The differences in soil and vegetation are obvious. The soils in the north half are generally poorer and rockier, and the terrain is more irregular. Several soil types may occur within a relatively small area, including drier sites along-side lowlands, exposed bedrock next to relatively rich sites. More extensive areas of better soil, some of the best on the Gunflint Ranger District, occur in the southern half, and the terrain is generally flatter as well.

- Fire disturbance would have been more common in the north half under natural conditions, with a stand replacement return interval between perhaps 30 and 100 years. The return interval in the southern half could have been more like 60 to 150 years. Forest stand size and species type has been controlled by timber harvest since the start of the last century. As a result, these patterns are generally more fragmented and the stands smaller than would have occurred with fire.
- Even though most of the area's vegetation is a result of timber harvest, a major fire did shape the current vegetation in the north half. In 1929, a fire started outside the project area and burned approximately 25,000 acres. The burn extended across the northern half of the project area eastward to McDonald Lake and south about half way down the project area. Much of this area had been harvested prior to the burn, and the area had received very little rain that year. With these conditions the fire burned hot in the slash, killing most of the remaining trees and consuming the organic soil. As a result, the natural seed source was limited and the area predominantly reforested to low quality paper birch and aspen.
- The stands in the southern part of the area are predominantly in a younger age class since most of this area was harvested in the last 15 years. Aspen was the major species harvested. The good soil here produced big trees, and the natural aspen regeneration is expected to grow the same. The overall age class and composition distribution of the Project Area is displayed in Attachment 1.
- The area's forests are also fragmented. The existing old aspen and birch is declining; the windstorm of, 1999, blew over many individuals and pockets of trees; much of the spruce and most of the balsam fir was killed by spruce budworm during the 1980's and 90's; and with these events combined, many hundreds of acres are regenerating in pockets or are dominated by shrubs with sparse tree cover.
- A large esker provides an interesting feature of the topography. It runs generally east-west between Devil Track Lake and the Cascade River; and then northwest toward Swamp Lake. County Road 57 is built on this esker. Its height offers views and the existing, large, old growth trees scattered along the route indicate the potential to manage for big-tree character on more of the route.
- White cedar is relatively common, especially in the northern half of the project area. Several ages are present, and it appears to be increasing in some areas. This is unlike most other areas on the Gunflint District.
- The Cascade River corridor divides the project area east-west. It is one of the major watersheds on the SNF. The Cascade and its tributaries are among the most important managed trout streams of the Arrowhead Region. Mississippi, Thompson, and Mark Creeks are some of these tributaries in the project area.

The northwest portion of the Project Area is within the Roadless Area Conservation Rule (RACR) (displayed on Figure 2). This area is to be maintained roadless for the time being (Attachment 2 provides more information on RACR). This area provides a sizable forest patch of over 4,000 acres that will not be regenerated through any harvesting or artificial techniques. Much of this patch is mature or old forest stemming from the 1929 fire discussed above. From field reconnaissance, the canopy on many acres in these stands is opening from natural mortality and succession. Most likely natural tree regeneration will fill in these gaps over time. In some areas brush is likely to become predominant and maintain control for many years, perhaps

decades. This large, upland, mature, forest with its structural diversity will provide one of the patches to meet the spatial management objectives in the Forest Plan.

III. Purpose of and Need for Action

The interdisciplinary team identified several resource conditions that could be managed to move the project area toward the desired conditions in the Forest Plan. Listed below are the specific needs for action in the Project Area. Protecting watershed health, riparian areas, and soil resources (FP pp. 2-10 to 2-15); maintaining and protecting habitat for threatened, endangered, sensitive, and other terrestrial and aquatic species (FP pp. 2-27 to2-36); protecting recreational opportunities (FP pp. 2-40 to 2-44); protecting scenic integrity (FP p. 2-45); and preserving the quality of heritage resources (FP p. 2-38) have been and will continue to be primary considerations throughout the planning process.

While developing the Proposed Action, the interdisciplinary team collaborated with and reviewed data from State of Minnesota representatives. The primary reason for collaboration was to coordinate forest management activities that would occur across ownership boundaries and share data.

The purpose of this project is to:

1. **Create acres of young age class and increase the amount of white pine, white spruce and white cedar.**

The young age class (0 to 9 years) objective for Mesic Birch-Aspen-Spruce-Fir LE is 10% forest-wide in the first decade (FP p. 2-70). Currently, 5 % of the project area is in the young age class, predominately in the southern portion of the project area (Table 3). Within the next ten years all of these acres will move out of this age class. Upland stands that are over 50 years old are experiencing mortality. Some natural regeneration is filling behind the stands with heavy mortality; however some are being replaced by brush. A large, mature upland patch in the northwest corner (within the RACR) will be maintained now and into the future to fulfill the desired condition of Spatial Zone 3. Since the Forest canopy is relatively discontinuous outside the RACR, this project provides a good opportunity to create patches of younger forest for future, mature forest patches and meet Forest Plan guidelines for younger age classes. The purpose of this project is to create young age class to contribute to the forest-wide objective.

Mesic Birch-Aspen-Spruce-Fir LE composition objectives call for a limited amount of change in forest type (increasing conifers and decreasing aspen) (FP p. 2-70). The Mesic Birch-Aspen-Spruce-Fir LE objectives also include increasing within-stand diversity for tree species and forest structure (FP p. 2-71). Field observations revealed site-specific conditions that are suitable and would be conducive to increasing the amount of white pine, white spruce and white cedar across the landscape. The purpose of this project is to increase white pine, white spruce and white cedar either as a forest type or within a stand.

2. **Improve habitat for viable populations of native and desired non-native species.**

Moving toward Management Indicator Habitats MIH objectives identified in the Forest Plan would improve habitat for most species, including threatened and sensitive species and game species such as grouse, deer, and moose. In general, reestablishing the natural diversity of tree species and ages across this area will benefit the native fauna and flora, all of which have evolved together. There is an opportunity within the project area to increase the component of young upland forest (MIH2) and young aspen-birch forest (MIH4) (FP, pp. 2-28 D-WL-3 and 2-72 MBA-4). There is the opportunity for increasing long lived species in riparian areas to improve watershed conditions. Reestablishing white pine near the area's lakes will eventually benefit bald eagles. Reestablishing the native tree diversity to the areas burned in the 1929, fire would offer hope to eventually reestablish a taller, more varied and continuous canopy for the area's wildlife favored by such conditions.

3. Provide sustainable timber products.

The Cascade Project Area contains many acres of land classified as capable of producing timber. A Forest Plan desired condition is to provide sustainable timber sales and a continuous supply of timber to area mills (FP, p. 2-20 D-TM-1 and O-TM-1). Similarly, one emphasis of the General Forest-Long Rotation MA is timber production. There is demand for forest commodities, such as pulpwood and saw timber, and the purpose of this project is to contribute to providing sustainable forest products.

4. Reforest poorly stocked stands.

The forest cover in some upland stands is undergoing heavy mortality, which in many cases is being replaced by shrubs. In other stands, shrub regeneration has prevented desirable tree regeneration following timber harvest. In some of these stands natural regeneration of balsam fir, spruce or aspen is filling in; however many of these stands need management to reestablish tree species. Forest Plan objectives are to re-establish adequately stocked stands to maintain forest continuum (FP, pp 2-22 D-VG-7) and address timber management objectives where there is adequate ecological representation of brush species (FP, p. 2-24 O-VG-12). There is a need in this project area to reforest those stands with appropriate species and means to return them to a forested condition.

5. Reduce hazardous fuels in wildland urban interface areas.

A Forest Plan desired condition is to minimize the effects of unwanted wildland fire by treating areas of highest fire risk based on the values at risk (FP, p. 2-19, O-ID-3). The project area has 2,700 acres of high fire risk stands. The hazardous fuels present within the project area consist of older stands of hardwoods with conifer understory and older stands of Jack Pine. These stands have an overstory component which is dying off and contributing to dead and down fuel loadings in the understory. They also have a component of fir in the understory which creates ladder fuels which allows fire to carry into the crowns. With accumulations of both ladder fuels and dead and down fuels, fire could spread within these stands with high intensity. The western portion of the project area has high fuel hazards and fire risk stands that are within ½ mile to the

south and west of urban interface areas (Devil's Track Lake). The purpose of this project is to reduce hazardous fuels in high risk areas.

In addition to treating current fuel hazards within the project area, there is a need to treat fuel hazards created by the proposed treatments. Slash created from activities such as harvesting will be disposed of properly based on the proximity of the treatment to values at risk.

IV. Summary of Proposed Actions

The following sections summarize the proposed harvest, reforestation, fuel reduction, prescribed burning and connected road actions. Attachment 3 lists all treatments prescribed for each stand and Attachment 4 defines each treatment type. The location of stands and treatments is shown on Figure 2: Proposed Action Map. Forest Plan Operational Standards and Guidelines that would be implemented with the proposed actions are summarized in a separate document and are available on request or on the Superior National Forest web site (www.fs.fed.us/r9/superior). The Operational Standards and Guidelines are designed to minimize effects to resources such as soils, visuals or wildlife habitat and are critical to the project design.

A. Harvests

All of the harvest treatments would create young age class except the single tree selection method. Table 4 shows the amount of proposed harvest in different forest types. One should be aware of the limitations in the forest type. In order to analyze and display effects, a forest type must be given to a stands based on regional forest type codes. However, there can be considerable variability in a given forest type. A stand typed as aspen may be 100% aspen or it may be 55% aspen and 45% birch. Likewise, in determining the new forest type, we were constrained by forest type codes. For example, although we may label a new forest stand as paper birch, we may be interplanting white pine and expect a large conifer component. The specific proposal for regeneration of a stand can be found in Attachment 3. Table 5 summarizes the proposed secondary treatments and the regeneration method.

Potential Harvest Unit 181-26

Table 4. Harvest Treatments

Primary Treatment	Stand Acres	Treatment Acres	jack pine	white pine	balsam fir/aspen/paper birch	upland black spruce	spruce/fir/aspen	quaking aspen	paper birch	aspen/spruce/fir
Clearcut with Reserves	1,183	935	0	0	108	92	77	381	100	177
Patch Clearcut	51	8	0	0	0	0	0	0	0	8
Seed-Tree Cut	23	21	21	0	0	0	0	0	0	0
Shelterwood Seed Cut with Reserves	357	305	0	17	35	35	0	0	133	85
Single-Tree Selection	25	23	0	0	0	0	0	0	0	23
Totals:	1,639	1,292	21	17	143	127	77	381	233	293
Changes in Forest Type as a Result of Actions*			+6	+44	-143	+59	+23	-25	+10	-61
*There would also be increases in red pine (4 ac.), mixed pine (33 ac.), and white spruce (50 ac.) Treatment acres are estimated and slight changes in acreages would be expected.										

Table 5: Secondary Treatments and Regeneration Methods

Secondary Treatment	Acres*
Mechanical Pile and Burn	821
Mechanical Site Preparation	311
Site Preparation Burn	160
Total	**1292**
Regeneration Method	
Natural Regeneration	299
Natural Regeneration with interplanting	557
Planting	320
Seeding	116
Total	1292
*Treatment acres, not stand acres	

Units along Devil Track Road

The treatments proposed along Devil Track Road in units 158-12 and 181-25 are a combination of fuels reduction (hand piling and burning) and interplanting white pine and red pine. These activities should improve the scenic quality along the road by cleaning up excess debris and planting long lived species. In addition to fuels reduction and planting white pine and red pine, units 181-26 would be treated using the single tree selection method of regeneration and 182-01 would be treated using the shelterwood seed cut with reserves method of regeneration. These regeneration systems were chosen because they will preserve some of the overstory while

enhancing species and structural diversity. Visual impacts would be minimized by leaving greater tree densities along the road and retaining many overstory trees in both units.

Units along the Grade across from Eagle Mountain Trail Parking Area

Units 157-01 and 161-37 lie parallel to FR 170 and contain over-mature jack pine. Jack pine is a short lived species and usually converts to aspen, spruce, and balsam fir if left untreated. The amount of jack pine on the forest is decreasing and Forest Plan objectives include an increase in jack pine. Jack pine stands are sparse in the Cascade area and so the proposal is to open up these stands by harvesting and increase the available sunlight needed to regenerate jack pine The visual affects will be minimized by "feathering" the harvest away from the road. The heavy vegetation along the cut-bank adjacent to the road (FR 170) would be left as is; 12 to 18 mature trees per acre would be retained in the next 100 feet; and six to 12 trees would be retained in the remaining 40 to 150 feet making up the stand width. An underburn following the harvest would open the jack pine cones for natural seeding. Jack pine would be planted if and where the natural seed is lacking or does not germinate. Jack pine regeneration would do best in full sun. This prescription represents a compromise between opening the stand fully and retaining vegetation for aesthetic concerns.

Units Near Roadless Area Conservation Rule Areas

Several units are near the Roadless Area Conservation Rule (RACR) boundary. Proposed treatments would not take place within any RACR area. Units 157-01 and 161-37 are separated from the roadless area by a county road (The Grade). Unit 179-20 also has a road (FS-329) serving as a visible boundary for the RACR area. Units 179-2 and 3 are located adjacent to the RACR boundary. GPS units would be used to identify the RACR boundary. Units 176-38 and 39 are part in and part out of the RACR boundary. GPS units will be used to identify the RACR boundary and only the part of the stands outside the RACR boundary would be treated.

B. Reforestation

A number of stands in the project area have high mortality and with only minimal live standing trees remaining. Based on the low volume and the ecological need to retain the few remaining trees, these stands were not proposed for harvest. However these stands do no have adequate regeneration of trees species. Table 6 summarizes the proposed reforestation without harvest. Underplanting is proposed in riparian stands to increase long lived tree species.

Table 6. Proposed Reforestation

Primary Treatment	Stand Acres	Treatment Acres	upland black spruce	spruce/fir/aspen	paper birch	aspen/spruce/fir
Mechanical Site Preparation	171	149	0	104	0	45
Underplant	113	12	2		7	3
Total	284	161	2	104	7	48

C. Fuel Reduction and Prescribed Burning

Some of the above treatments would accomplish fuel reduction. However additional treatment is proposed in other high risk areas where harvest is not appropriate. Mechanical fuel reduction and hand piling and burning would only occur in the understory of stands.

One stand proposed for broadcast burning is adjacent to stands proposed for post-harvest, site preparation burning and a creek. This stand is not classified as suitable for timber production so no harvest is planned here. However, it would be burned to allow the use of a natural barrier (drainage) for the prescribed burn.

Table 7. Fuel Reduction and Prescribed Burning

Primary Treatment	Stand Acres	Treatment Acres	jack pine	white pine	quaking aspen	paper birch
Mechanical Fuels Reduction	98	95	30	0	65	0
Hand Pile and Burn	93	90	90	0	0	0
Broadcast Burn	21	21	0	0	0	21
Under Burn	49	49	0	31	18	0
Totals:	261	255	120	31	83	21

D. Connected road actions

To accomplish the proposed vegetation management, the following road actions are proposed:

- Construct 29 temporary roads with a combined mileage of about 14 miles to access units; temporary roads would be obliterated when treatment is finished. Obliteration techniques are described in Attachment 4 Description of Treatments.

Proposed road locations are shown on Figure 2: Proposed Action map.