

CHAPTER 2

ALTERNATIVES

I. INTRODUCTION

This Chapter describes and compares the alternatives considered by the Forest Service for the Firefighter Project. It includes a discussion of how alternatives were developed, a description and map of each alternative considered in detail, design criteria common to all alternatives, and a comparison of these alternative focusing on the significant issues and monitoring. Chapter 2 is intended to present the alternatives in comparative form, defining the issues and providing a clear basis of choice among options for the Decision Maker and the public (40 CFR 1502.14).

Some of the information used to compare alternatives at the end of Chapter 2 is summarized from Chapter 3, “Affected Environment and Environmental Consequences.” Chapter 3 contains the detailed scientific basis for establishing baselines and measuring the potential environmental consequences of each of the alternative. For a full understanding of the effects of the alternatives, consult Chapter 3.

II. ALTERNATIVE DEVELOPMENT PROCESS

Public Involvement

In January 2008, the Firefighter Project was first listed in the Flathead National Forest’s Schedule of Proposed Actions (SOPA). The listing informed the public of our plan to analyze the Firefighter Project area for resource management reasons. The Firefighter Project has appeared quarterly in the SOPA since this first listing. The SOPA list is displayed nationally on the Forest Service’s Washington Office website, and locally on the Flathead National Forest website.

On March 17, 2008, a scoping letter was sent to approximately 40 individuals, government agencies, organizations, and groups potentially interested in, or affected by, the Firefighter Project. This letter provided an overview of the project, displayed the details of the Proposed Action (Alternative 2 in this EA), and requested public input on the Firefighter Project. We received feedback on the Proposed Action from nine people through letters and emails. The Daily Inter Lake published an article on the Firefighter Project on March 23, 2008.

Summary of Comments

The following is a summary of some of the public comments we received during scoping.

Access/Roads and Existing Condition: Comments were received related to the status (e.g. bermed, decommissioned) and condition (drivable or not) of roads in the area. Several comments questioned the amount of road decommissioning that has been accomplished under

the Paint Emery Decision, and the effect of this project on decommissioning. Several individuals/groups felt the existing condition of roads in the project area (open/closed) was unclear as presented in the scoping documents; others wanted to know when Amendment 19 standards would be met.

Economics: Several comments indicated a lack of trust that the Forest Service could fund road reclamation and other habitat improvement work with logging receipts, and they would like to see other funding sources. Other comments urged the Forest Service to conduct a cost-benefit analysis, and to consider all long-term and short-term costs and benefits.

Fisheries/Hydrology: Some individuals/groups were concerned that culverts would eventually wash out on bermed roads; they wanted roads reclaimed rather than bermed. Other comments requested we assess the road network for sediment and erosion sources and refrain from building temporary roads to protect water quality and other values.

Climate Change/Carbon Sequestration: We received comments related to the relationship of broadcast burning and timber harvesting to global climate change (refer to the Miscellaneous section of the Project File for a document addressing this subject), and the effect of harvesting on carbon sequestered in the soil.

Past Projects/Monitoring: Several comments indicated that monitoring data from past projects should be analyzed to determine whether past projects have been effective, and to determine if the Firefighter Project would be effective. Some were unhappy because all of the logging in a past project has been completed, but the road decommissioning has not; they would like the Forest Service to complete one project before beginning another in the same area.

Silviculture: Comments indicated that several people wanted the effects from this project to old-growth forests, riparian areas, and wetlands defined and analyzed. Some wanted more trees cut and some wanted less or none cut; snags should be left to Forest Plan designated levels.

Soils: Effects to soil erosion, sedimentation, and productivity from temporary roads and other project activities were areas of concern.

Wildlife: Comments centered on TES species, species of concern, brown-headed cowbirds, elk winter range/habitat, and the effectiveness of the Firefighter Mountain Winter Range Project in improving winter range. Grizzly bear security core, wildlife corridors, thermal cover, and lynx habitat were all mentioned.

Issue Development Process

The Interdisciplinary Team (ID Team) reviewed all comments received in response to the scoping letter to identify significant issues, determine appropriate analysis procedures, and identify alternatives to the Proposed Action. Some comments we received were beyond the scope of this project; others were addressed by the Flathead National Forest Land and Resource Management Plan (Forest Plan) or other regulatory framework; some were beyond the geographical influence of this project; and some did not pertain to this specific proposal.

Comments and concerns that fell into these categories were not considered relevant to this project-specific assessment and were not addressed further.

The remaining comments were examined to determine how they could best be addressed in this Environmental Assessment (EA). A few comments were best addressed by developing an alternative to the Proposed Action. These concerns became the key issues that are described below. Other comments were best addressed by disclosing the effects of implementing the Proposed Action and its alternatives, or by developing design features common to all Action Alternatives. The Project File contains more information on the comments received during scoping, including how the ID team accounted for them during the analysis process.

Issues Used for Alternative Development

The following issue was used to develop an alternative to the Proposed Action:

Snow depth, as influenced by forest canopy cover, is a primary driver of winter elk distribution and habitat use in this area. As such, the currently proposed Firefighter Project would not improve winter habitat for elk but may compromise the area as elk winter range.

Issue Indicators:

- Acres harvested in stands currently providing snow intercept cover
- Forest cover to forage opening ratio

Analysis Issues

Issues associated with the resources listed below were identified during the scoping period or are addressed as required by law, regulation, or policy. These issues are analyzed by disclosing, comparing, and contrasting the environmental and social effects of the Proposed Action and its alternatives. The results of the effects analysis on these resources are described in detail in Chapter 3.

Forest Vegetation	Fisheries
Fire and Fuels	Soils
Threatened, Endangered, and Sensitive Plants	Heritage Resources
Noxious Weeds	Recreation
Wildlife	Scenic Resources
Hydrology	Air Quality
	Economics

III. ALTERNATIVES CONSIDERED IN DETAIL

The Environmental Assessment (EA) considered the Proposed Action (Alternative 2) and two alternatives in detail. Alternative 1 is the No-Action Alternative, under which the project area would have no change to elk habitat, wildlife security, or forest diversity and productivity. Alternative 2 is the Proposed Action, which was designed to satisfy the Purpose and Need of the Firefighter Project. Alternative 3 represents a way to satisfy the Purpose and Need of the project that is different from the Proposed Action; it responds with a different emphasis to the key issues discussed earlier in this chapter. Maps of all alternatives considered in detail are included in this EA.

Alternative 1 (No-Action Alternative)

The emphasis of this alternative is to represent the existing condition against which the other alternatives are compared. Alternative 1 proposes no improvement to elk habitat, wildlife security, forest diversity and productivity, or the Douglas-fir test-tree plantation. It includes those activities listed as ongoing and foreseeable actions in Chapter 3. It does not preclude activities in other areas at this time, or preclude activities in the Firefighter Project area at some time in the future. CEQ regulations (40 CFR 1502.14d) require that a No-Action Alternative be analyzed in every EA or Environmental Impact Statement (EIS). Under this alternative, management activities would be limited to ongoing and foreseeable actions listed in Chapter 3 of this EA.

Alternative 2 (Proposed Action)

Introduction

Tree harvesting and thinning activities, designed to improve elk habitat, and forest diversity and productivity, would occur on National Forest System lands near Firefighter Mountain. Thinning of the Douglas-fir test-tree plantation would also occur in this vicinity, and security for grizzly bears and other wildlife would be improved by reducing motorized access. All project activities would occur within the Emery Firefighter and Riverside Paint Grizzly Bear Subunits. The Emery Firefighter subunit would meet Forest Plan standards related to Amendment 19 (grizzly bear standards) upon completion of this project; the Riverside Paint subunit meets these standards under the Paint Emery Decision.

The following table provides a summary of the components in the Proposed Action. A detailed description of the Proposed Action follows the table.

Table 2-1. Alternative 2 (Proposed Action) Component Summary

Proposed Action Component	Acres/Miles
Tree Harvest Followed by Prescribed Burning (primarily for elk habitat forage production)	536 acres
Tree Harvest (primarily to promote forest diversity and productivity)	205 acres
Thinning of Sapling Stands (Douglas-fir genetic test-tree plantation)	8 acres

Proposed Action Component	Acres/Miles
Roads to be Decommissioned (currently closed to wheeled motorized vehicles)	13.8 miles
Roads to be Bermed (currently closed to wheeled motorized vehicles)	14.9 miles
Roads to be Gated Yearlong (that are currently open to wheeled motorized vehicles)	1.3 miles

Harvesting and Thinning Treatments

Tree harvesting/thinning is proposed across approximately 749 acres of Flathead National Forest land, in 32 separate harvest units (Map 2-1 and Table 2-2). Proposed harvesting would occur on lands designated as Management Area (MA) 7, 13, 15, and 16, and would be consistent with the Forest Plan direction for these MAs (Chapter 1 contains a brief description of each Management Area). With the exception of the Douglas-fir test-tree plantation (13 year-old planted Douglas-fir), all harvest units consist of trees approximately 70-80 years old, 50-70 feet tall, that are relatively densely stocked (400+ trees per acre). Lodgepole pine is the most common species present, followed by western larch, and in some areas, Douglas-fir, spruce, and subalpine fir.

Most of the proposed activity areas have suitable terrain for the use of mechanized equipment (e.g. feller-bunchers, rubber tired skidders, excavators, etc) to remove trees and other woody material. Some work may be carried out by hand, particularly in the sapling thinning areas, although mechanized equipment may be used in these areas. Skyline yarding systems or helicopter logging would be necessary on two units, unit 15 and unit 9c, respectively (for a total of 158 acres). A helicopter landing would be located in Unit 9b. Up to 2 acres would be affected (same landing area used to facilitate the mechanical logging in Unit 9b). To prevent sediment from entering a stream in Unit 9b, there would be at least a 230-foot vegetation buffer between the lower end of the landing and the stream channel. This landing area would be ripped to lessen compaction when use is no longer needed.

Private contractors and Forest Service crews would be used to accomplish tree removal, prescribed burning, and/or slash disposal work. Small sawlogs, posts, poles, pulpwood, and firewood are all potential commercial materials that may be removed from some of the units. An estimated volume of approximately 3 mmbf may be removed from the project area, this includes both sawlog and non-sawlog material.

Trees removed from the project area may provide a commercial product. Sale of these commercial products would be pursued to increase the economic efficiency of the project and reduce the cost to taxpayers.

Treatment Details

Elk Habitat

Approximately 536 acres (21 units) of harvesting followed by prescribed burning would occur to improve elk habitat. These units are within Forest Plan designated winter range (MA 13 and most of MA 7 within the Firefighter Project area), and were located to take advantage of the site potential for forage production. The opening up of dense canopies of trees and prescribed burning would stimulate the production and growth of shrubs and other forage for elk utilization.

Prescribed fire plans (burn plans) would include plans for ignition, holding, escape fire contingency, mop-up, and patrol. This would ensure that each burn meets the objectives prescribed for that particular area. The plan would be designed to use the prescribed weather, personnel, and equipment needed to control the burn within the identified boundaries. Prescribed burns would generally be ignited by hand, and would occur when suitable burn and air quality conditions exist. Additionally, burning would be done in such a manner to minimize damage to residual trees whenever possible.

Most of the units would be planted with conifer seedlings to help shift the future stand composition towards stands with a higher proportion of Douglas-fir, a favorable tree species for elk and deer habitat.

Forest Diversity and Productivity

About 205 acres would be harvested in 10 units outside of Forest Plan designated elk winter range. Units would be located within stands where treatment would improve forest species diversity and timber productivity, primarily by treating the mature lodgepole pine dominated forests. Following harvest, many of these units would be planted to conifer seedlings (western larch, Douglas-fir, and western whitepine) to increase species diversity and management opportunities in the future stand.

Douglas-fir Test-Tree Plantation

One 8-acre unit of 13-year-old sapling-size trees would be thinned. Removal of some of the naturally regenerated lodgepole pine that is inhibiting growth of the planted Douglas-fir would occur in a Douglas-fir test-tree plantation, established in 1995, to allow the Douglas-fir to grow freely and develop into future seed production trees.

Stand Group Descriptions and Treatments

Current forest conditions within the proposed units fall into one of five forest stand groups. Because of differing forest stand conditions and treatment objectives, different prescriptions are proposed for each of these groups.

Stand Group 1

Mature lodgepole pine forest occurring in designated elk winter range habitat (MA 13), some of which is in areas of high scenic value (MA 7). These high-density (500+ trees/acre) stands are approximately 75 years old. Trees are 50-65' tall, with diameters at breast height (dbh) from 3-9". Some stands have minor amounts of other species present, typically larch or Douglas-fir; spruce and subalpine fir are occasionally present in these stands. This group includes Units 3, 5, 6, 7, 8, 13, 14, 15, 18, 20, 23, 26, 29, 30, and 61, and covers approximately 270 acres.

Treatment: Regeneration treatments (seedtree harvests) would occur in Group 1 units, removing all, or nearly all, lodgepole pine, and leaving all larch and Douglas-fir in fair or better condition. This would result in a very open stand condition, with residual tree densities from ~10-30 trees per acre (TPA). Broadcast burning of the slash would occur

to reduce fuel loadings from logging slash, prepare the site for planting, and to stimulate browse species for elk and deer. Conifer seedlings (Douglas-fir, larch, and western whitepine) would be planted in all of these units (270 acres) to supplement the expected natural regeneration of lodgepole pine and to increase the proportion of desired species.

Stand Group 2

These are mixed-species stands located in designated elk winter range (MA 13), with a small portion within an area appropriate for timber harvesting using aerial systems (MA 16). Larch and sometimes Douglas-fir or spruce occupy >50% of the stand; lodgepole pine composes the remainder of the stand. These stands are about 75 years old, 60-70' tall, and from 5-12" dbh. This stand group includes Units 9b, 9c, 11, 19, 21, and 60, and covers approximately 266 acres.

Treatment: Regeneration treatments (shelterwood harvests) would occur in these units, removing all of the lodgepole pine and leaving most of the larch and Douglas-fir in fair or better condition. This would result in relatively open stand conditions with residual tree densities of approximately 30-60 TPA. A low-intensity underburn would be applied to reduce fuel loading from logging slash, prepare the site for planting, and to stimulate browse species for elk and deer. Conifer seedlings (Douglas-fir, larch, and western whitepine) would be planted in four of the six units in this stand group (99 acres) to supplement the expected natural regeneration of lodgepole pine and to increase the proportion of desired species.

Stand Group 3

These mature lodgepole pine forests are outside of designated elk winter range, mostly within areas where timber management is a primary consideration (MA 15), with a few acres in areas of high scenic value (MA 7). These stands have the same characteristics as Group 1. This stand group includes Units 16, 40, 47, 49, 50, and 56, and covers approximately 107 acres.

Treatment: Regeneration treatments (seedtree harvests) would occur in these units, removing all, or nearly all, lodgepole pine, and leaving all larch and Douglas-fir in fair or better condition. This would result in a very open stand condition with residual tree densities ranging from about 10-30 TPA. Mechanized treatment of the slash would occur in most areas, usually by excavator piling. Broadcast burning would occur in Unit 40 because of the steeper slopes (>45% slope). Objectives of slash treatments would be to reduce fuel loading and fire hazard, and to prepare the site for planting. Conifer seedlings (Douglas-fir, larch, and western whitepine) would be planted in all six units (107 acres) to supplement the expected natural regeneration of lodgepole pine and to increase the proportion of desired species.

Stand Group 4

These mixed-species stands are outside of the designated elk winter range area, and are within areas suitable for timber management (MA 15). This group has the same characteristics as stand Group 2, and includes Units 2a, 2b, 41, and 43. This stand group covers approximately 98 acres.

Treatment: Regeneration treatments (shelterwood harvests) would occur in Units 2b, 41, and 43; a thinning would occur in Unit 2a which has a higher density of larch and Douglas-fir. All of the lodgepole pine would be removed, leaving all larch or Douglas-fir in fair or better condition. This would result in moderately open stand conditions with residual tree densities of approximately 30-80 TPA. Mechanized treatment of the slash would occur, typically by excavator piling, to reduce fuel loads and fire hazard. Natural regeneration, primarily larch, Douglas-fir, and lodgepole pine, would occur in the shelterwood harvest units.

Stand Group 5

Stand Group 5 is the Douglas-fir tree improvement test plantation established in 1995. This is a 5-10' tall sapling stand of naturally regenerated lodgepole pine and planted Douglas-fir (MA 13). The tree improvement plantation was planted with Douglas-fir in 1995, following the clearcutting of the previous stand in 1993. This stand group includes only Unit 70, and covers approximately 8 acres.

Treatment: Thinning treatments would occur in this tree improvement test plantation. The sapling lodgepole pine trees currently competing with the planted Douglas-fir trees would be thinned by hand, and the cut trees lopped and scattered.

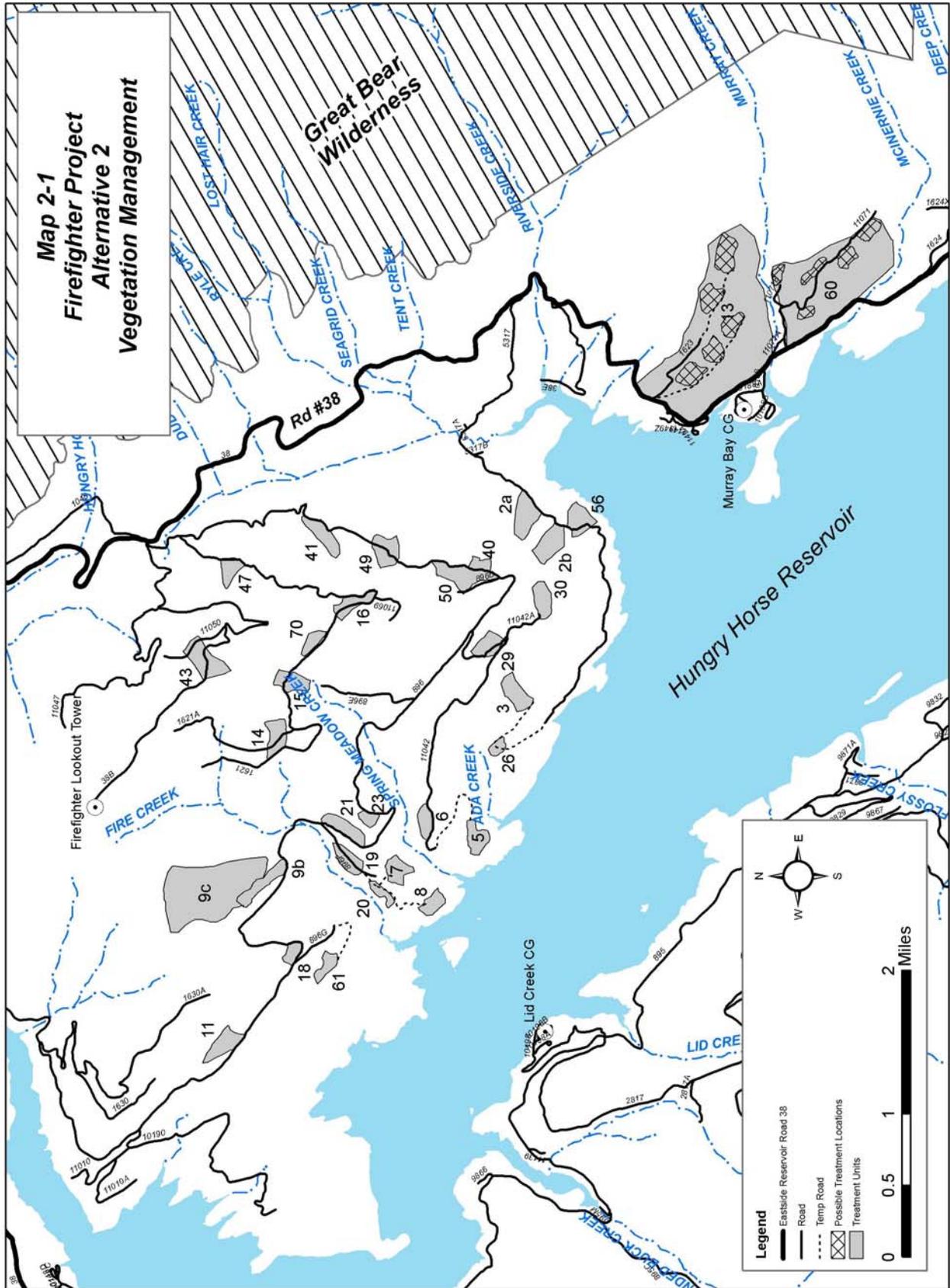


Table 2-2. Alternative 2 Treatment Summary by Unit

Unit	Acres	Stand Group	Mgmt. Area	Harvest Treatment	Logging Method	Post-Harvest Treatment	Reforestation Method	Temporary Roads Needed?
2a	25	4	15	Thinning	Mechanical	Mechanical	None	Probably not
2b	23	4	15	Regeneration (Shelterwood)	Mechanical	Mechanical	Natural Regeneration	Probably
3	20	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
5	16	1	7	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
6	13	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	No
7	16	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
8	12	1	7	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
9b	20	2	13	Regeneration (Shelterwood)	Mechanical	Burn	Plant	No
9c	151	2	13/16	Regeneration (Shelterwood)	Helicopter	Burn	Natural Regeneration	No
11	20	2	13	Regeneration (Shelterwood)	Mechanical	Burn	Plant	No
13a-x ¹	80	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
14	19	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	No
15	17	1	13	Regeneration (Seedtree)	Skyline	Burn	Plant	No?
16	17	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
18	10	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	No
19	16	2	13	Regeneration (Shelterwood)	Mechanical	Burn	Natural Regeneration	No
20	8	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes

Unit	Acres	Stand Group	Mgmt. Area	Harvest Treatment	Logging Method	Post-Harvest Treatment	Reforestation Method	Temporary Roads Needed?
21	19	2	13	Regeneration (Shelterwood)	Mechanical	Burn	Plant	No
23	7	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	No
26	6	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
29	18	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	No
30	17	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	No
40	7	3	15	Regeneration (Clearcut)	Cable	Burn	Plant	No
41	20	4	15	Regeneration (Shelterwood)	Mechanical	Mechanical	Natural Regeneration	No
43	30	4	15	Regeneration (Shelterwood)	Mechanical	Mechanical	Natural Regeneration	No
47	13	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
49	21	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
50	30	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
56	19	3	7/15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	Yes
60a-x ²	40	2	13	Regeneration (Shelterwood)	Mechanical	Burn	Plant	Yes
61	11	1	13	Regeneration (Seedtree)	Mechanical	Burn	Plant	Yes
70	8	5	13	Thin	Hand	Lop/Scatter	None	No
TOTAL	749							

¹ The entire Unit 13 boundary is 427 acres; however, treatment would consist of several smaller openings of about 20-acres each.

² The entire Unit 60 boundary is 250 acres; however, treatment would consist of several smaller openings of about 10-acres each.

Expected and Desired Post-Treatment Stand Conditions

The desired forest condition would emulate the condition that might occur under natural disturbance and succession regimes. Managing within this range of historic variability would better assure the ecosystem remains healthy and sustainable. Alternative 2 moves towards the achievement of the desired forest conditions by removing lodgepole pine (mature with low vigor) and favoring the retention of larch and Douglas-fir (immature, higher vigor, long-lived), and by treating stands currently in a mid-successional stage of development (except Unit 70) by converting them to an earlier successional stage. Overall, these treatments would affect a small proportion of the landscape. Regeneration harvesting would comprise only 5% of the total project area; 10% (377 acres) of the total mature lodgepole pine stands would be treated and 4% (364 acres) of the total mixed-species stands would be treated.

Regeneration harvest areas would have variable amounts of residual overstory trees remaining in the stand consisting of 50-70' tall, 75 year-old larch and Douglas-fir; occasionally lodgepole pine would be present. These residual trees would occur as scattered individuals or as groups of trees, totaling from 3-40+ TPA. Thinned units would have 50+ TPA left, irregularly distributed across the area with larch and Douglas-fir the dominant species retained.

Understory vegetation in all areas would be composed of grass, forbs, and shrubs typical of earlier successional stages of these moist-site forests. The vegetation would be healthy, abundant, and vigorous due to the increased available light. Some units would receive a prescribed burning treatment following harvesting; this treatment more closely emulates natural processes than does mechanized treatment of slash. These units would receive the additional stimulation and nutrient flush caused by the post-harvest slash burning activity.

Conifer seedlings would appear soon after harvest, growing vigorously due to the available light and moisture. Lodgepole pine, Douglas-fir, and larch would be the most common species present, with western whitepine, spruce, and subalpine fir present in some areas. Planting of Douglas-fir, larch, and western whitepine would increase the species diversity of the forest, which, in many of these areas, is now overwhelmingly dominated by lodgepole pine. This species diversity would improve the future value as deer and elk foraging and thermal cover habitat. These species have longer life spans than lodgepole pine, can grow to substantially larger sizes, have a greater ability to survive any future low- or moderate-intensity fire, and provide additional wildlife habitat values.

Access/Roads

Most units would be accessed using existing National Forest System (NFS) roads. No new permanent roads would be constructed to conduct treatment activities in this project. Some temporary roads would be built, or historic roads utilized, to access units. Temporary and historic roads would be rehabilitated following project treatments. Further discussion on access roads is in the Design Criteria section of this chapter.

The following table displays those units requiring the use of temporary roads (new and historic) on NFS lands.

Table 2-3. Alternative 2 Historic and Temporary Roads Needed on NFS Lands

Unit	Access Need	Miles
3	Access using new temporary road	0.5
5	Access using historic road/new temporary road	0.2/0.4
7	Access using new temporary road	0.2
8	Access using new temporary road	0.5
13 a-x	Access using historic road/new temporary road	0.9/0.5
20	Access using new temporary road	0.2
26	Access using new temporary road	0.3
56	Access using new temporary road within unit	0.2
61	Access using new temporary road	0.4
Total		4.3

There are segments of the existing road system in the Firefighter Project area that would require improvements in the road surface/stream drainage systems to meet current Montana State Best Management Practices (BMP) and/or INFISH Standards. The work activities could include the installation of additional cross-drain culverts, drive-through-dips, flappers, filter windrows, sediment traps, etc. It also includes the upsizing of six culverts; 1 on Forest Road 5317, 1 on Forest Road 5320, 2 on Forest Road 1614, and 2 on Forest Road 546. Approximately 30 miles of haul route roads (roads used to haul commercial products) would receive road drainage improvement work. There would also be approximately 4.5 miles of non-haul route roads requiring resource enhancement BMP improvements on open, gated, or bermed roads.

Effects to soils would be avoided or minimized by using low-impact equipment to remove wood products and the use of designated skid trails.

Wildlife Habitat Security

The Firefighter Project would occur in two grizzly bear subunits: the Emery Firefighter Subunit and the Riverside Paint Subunit. A component of the Proposed Action is to improve grizzly bear security by changing travel status on some of the roads within the Emery Firefighter Grizzly Bear Subunit. A grizzly bear subunit approximates the size of the home range of an adult female grizzly bear. Amendment 19 of the Forest Plan includes management direction for maintaining or improving security for grizzly bears via three parameters; open motorized access density (OMAD), total motorized access density (TMAD), and security core. In grizzly bear subunits where at least 75% of the area is NFS land, the objective is to limit high-density OMAD (>1 mile/mile²) to no more than 19%; to limit high-density TMAD (>2 miles/mile²) to no more than 19%; and to have at least 68% of a subunit in security core (minimum of 2,500 acre blocks).

The Firefighter Project Proposed Action would continue the progress made in the earlier Paint Emery Project Decision towards improving grizzly bear security, and would fully meet the Amendment 19 (A19) road density standards after implementation. Table 2-4 below displays the A19 access density parameters for the On-the-ground condition, Firefighter Project Alternatives 2 and 3 (access management would be the same for Alternatives 2 & 3), and for a fully

implemented Paint Emery Project Decision in the Emery Firefighter and Riverside Paint Grizzly Bear Subunit.

Table 2-4. Amendment 19 Condition in the Project Area

Access Density Parameter	On-the-Ground Condition	Fully Implemented Paint Emery Decision	Alternatives 2 & 3
Emery Firefighter Grizzly Bear Subunit			
Open Motorized Access Density	20%	20%	19%
Total Motorized Access Density	30%	18%	19%
Security Core	38%	51%	68%
Riverside Paint Grizzly Bear Subunit			
Open Motorized Access Density	18%	18%	18%
Total Motorized Access Density	31%	15%	16%
Security Core	60%	71%	71%

Access Changes

To achieve increased grizzly bear security in the Emery Firefighter Grizzly Bear Subunit, motorized access would be changed on several roads within this subunit. Refer to Maps 2-2, 2-3, and 2-4 for access management reflecting the existing on-the-ground condition, with the Paint Emery decision fully implemented, and for the Action Alternatives access management, respectively. Some of the more prominent access management changes under the Action Alternatives are as follows:

- 1.3 miles of the currently open yearlong Road 546 (Emery Creek Road) would be closed yearlong with a gate. Space for vehicle/trailer turnaround including space for parking would be accommodated at the new gate location.
- 0.8 miles of the northwest end of Road 896 (Firefighter Road) would be open yearlong providing access to Hungry Horse Bay.
- 5.8 miles of currently gated yearlong Road 896 (Firefighter Road) would be bermed; this would affect the western portion of the road.
- Two currently gated yearlong roads (Roads 1614 and 1048) would be bermed rather than decommissioned as prescribed in the Paint Emery Decision. Additionally, currently gated Road 1615 was to be decommissioned under Paint Emery, but would now remain gated. These roads are a part of the Desert Mountain groomed snowmobile system and berming or gating the roads would preserve this recreational activity. This would affect 5.6 miles of Road 1614 (Oliver Margaret Road), 2.3 miles of Road 1048, and 3.6 miles of Road 1615 (Emery Sidehill Road).
- Approximately 13.8 miles of road would be decommissioned within the Firefighter Project area. These roads are currently bermed or gated yearlong. These roads would replace some of the roads planned for decommissioning in the Paint Emery Decision.

Tables 2-5 and 2-6 display the change in road management between the fully implemented Paint Emery Decision and Firefighter Project Alternatives 2 and 3.

Table 2-5. Travel Status of Roads in the Emery Firefighter Grizzly Bear Subunit

Travel Status	With a Fully Implemented Paint Emery Decision	Alternatives 2 and 3
Closed Yearlong – Berm	11.5 miles	18.2 miles
Closed Yearlong – Gate	28.8 miles	21.0 miles
Open Seasonally	3.7 miles	3.7 miles
Open Yearlong	24.8 miles	24.3 miles
Small Private Roads	.03 miles	.04 miles
Total System Roads	68.8 miles	67.2 miles

All road mileages displayed in the above table are estimated from computer analysis. Actual miles affected during implementation may be slightly more or less than shown in the tables.

Table 2-6. Motorized Access Management Activities

Road	Alternatives 2 & 3 Status	Paint Emery Decision	Miles
Roads to be Decommissioned			
10190	Decommissioned	Gated yearlong	2.3
11010	Decommissioned	Gated yearlong	0.6
11010A	Decommissioned	Gated yearlong	0.7
11042	Decommissioned	Gated yearlong	0.5
11042A	Decommissioned	Bermed	0.3
11047	Decommissioned	Bermed	2.1
11050	Decommissioned	Bermed	0.5
11069	Decommissioned	Bermed	0.1
1621	Decommissioned	Gated yearlong	1.5
1621A	Decommissioned	Bermed	1.1
1630	Decommissioned	Bermed	1.9
1630A	Decommissioned	Bermed	1.7
5320	Decommissioned	Bermed	0.5
Total Miles of Road to be Decommissioned			13.8
Roads to be Bermed			
896	Bermed	Gated yearlong	5.8
1048	Bermed	Decommission (most of road)	2.3
1614	Bermed	Decommission	5.6
5317	Bermed	Gated yearlong and Bermed	0.6
5360	Bermed	Decommission	0.6
Total Miles of Road to be Bermed			14.9
Roads to be Gated			
546	Gated yearlong	Open Yearlong	1.3
1615	Gated yearlong	Decommission	3.6

Road	Alternatives 2 & 3 Status	Paint Emery Decision	Miles
10188A	Gated yearlong	Decommission	0.5
Total Miles of Road to be Gated			5.4
Roads to be Re-opened			
896	Open Yearlong	Gated yearlong	0.8
11140	Open Yearlong	Decommission	0.1
Total Miles of Road to be Re-Opened			0.9

Yearlong road restrictions using gates, road berms, and road decommissioning would reduce road densities, and would increase grizzly bear habitat security as well as security habitat for other wildlife species and stream habitat for aquatic species. Road decommissioning would include actions to minimize the potential for future sedimentation of streams or noxious weed development. These actions could include placement of waterbars, culvert removals (approximately 17 culverts would be removed in this project), grass seeding, slash or debris placement on roads, planting of shrubs, and/or physical alteration of the road template. Berms would be placed at the beginning of decommissioned roads to restrict wheeled motorized vehicle access. After decommissioning, roads would be considered historic and would be taken off the transportation system.

Culvert removals and stream restoration would occur where the roads to be decommissioned intersect streams. To reduce the amount of ground disturbance, cross-drain culverts would not typically be removed but waterbars would be placed nearby to ensure adequate drainage. The degree of physical alteration to the road template from culvert removal or waterbar creation would vary according to the sites involved. When removing or upsizing culverts, streams would be dewatered and rerouted. Stream sites would also be rehabilitated with wattles, filter cloth, shrubs, grass seed, etc.

The proposed berms on roads that serve as a part of the existing Desert Mountain Winter Trail System would be designed to accommodate the groomers and snowmobiles (e.g. Forest Roads 1614 and 1048).

Access Management Map 2-2 (Existing) Here

Back of Map 2-2

Access Management Map 2-3 Here (Paint Emery Implemented)

Back of Access Map 2-3

Access Management Map 2-4 Here (Action Alts. Map)

Back of Map 2-4

Alternative 3

Introduction

This alternative was developed as the result of public comments concerning the effectiveness of the Proposed Action to improve elk habitat in the area designated as winter range. The importance of the role the forest canopy plays in intercepting snow in this particular area was noted by the commenter. Thus, Alternative 3 was designed to open up dense stands within designated winter range to provide some level of increased shrub production while retaining enough canopy to provide adequate snow intercept. This was accomplished principally by retaining more trees within units (i.e. thinning rather than regeneration harvests). It resulted in dropping some units that were proposed under Alternative 2 and changing the harvest prescription in others. Units were dropped for one or more of the following reasons:

- They were very dense, small diameter lodgepole pine units that have exceptionally high vulnerability to windthrow upon opening up of the stand canopy. Loss of trees to windthrow would ultimately result in a more open stand condition than desired, eliminating the benefit of snow intercept.
- In some stands (particularly the dense, small diameter stands), in order to leave adequate canopy cover to intercept snow, a very low proportion of the merchantable trees would be removed. This would increase the cost of the treatment substantially to a point where it was determined the cost outweighed the benefit.
- Stands were already at a desired density to provide snow intercept, along with adequate production of shrubs in the understory. These stands were typically those that had been precommercial thinned in the past.

Alternative 3 would treat approximately half of the acreage treated under Alternative 2. Since prescribed burning would kill many if not most of the small diameter leave trees, all but one unit would receive post-harvest mechanized slash treatments rather than being burned as described under Alternative 2 (Unit 40 would have a prescribed burn due to steep slopes). All treatments would occur in the Emery Firefighter Grizzly Bear Subunit, there would be no treatments in the Riverside Paint Subunit.

Table 2-7. Alternative 3 Component Summary

Alternative 3 Components	Acres/Miles
Thinning Harvest (primarily to provide for elk habitat)	167 acres
Regeneration Tree Harvest (primarily to promote forest diversity and productivity)	180 acres
Thinning of Sapling Stands (Douglas-fir test-tree plantation)	8 acres
Roads to be Decommissioned (currently closed to wheeled motorized vehicles)	13.8 miles
Roads to be Bermed (currently closed to wheeled motorized vehicles)	14.9 miles
Roads to be Gated Yearlong (of those currently open to wheeled motorized vehicles)	1.3 miles

Harvesting and Thinning Treatments

Tree harvesting or thinning is proposed across approximately 355 acres of National Forest System lands in 20 separate units. Proposed harvesting would occur on lands designated as MA

7, 13, and 15, and would be consistent with the Forest Plan direction for these MAs (Chapter 1 contains a brief description of each MA). With the exception of the Douglas-fir test-tree plantation (13-year-old planted Douglas-fir), all units consist of trees approximately 70-75 years old, 50-70 feet tall, that are relatively densely stocked (400+ TPA). Lodgepole pine is the most common species present, followed by western larch, and in some areas, Douglas-fir, spruce, and subalpine fir.

All proposed activity areas have suitable terrain for the use of mechanized equipment (e.g., feller-bunchers, rubber tired skidders, excavators, etc) to remove trees, slash and other excess woody material. Some work may be carried out by hand, particularly in the sapling thinning areas, although mechanized equipment may be used in these areas.

Private contractors and Forest Service crews would be used to accomplish thinning, tree removal, prescribed burning, and/or slash disposal work. Small sawlogs, posts, poles, pulpwood, and firewood are all potential commercial materials that may be removed from some of the mechanized fuel reduction units. An estimated volume of approximately 1 mmbf may be removed from the site, this includes both sawlog and non-sawlog material.

Trees removed from the project area may provide a commercial product. Sale of these commercial products would be pursued to increase the economic efficiency of the project and reduce the cost to taxpayers.

Treatment Details

Elk Habitat

Approximately 167 acres (10 units) in Forest Plan designated elk winter range (MA 13) would be thinned to reduce inter-tree competition, increase growth on residual trees, and increase production of shrubs and other forage, while retaining adequate crown cover for snow intercept values. Approximately 70 – 120 TPA would remain following the thinning treatments. Residual trees would consist primarily of lodgepole pine, with the exception of Unit 70, but western larch and Douglas-fir would be left where they exist. Unit 70 (Douglas-fir test-tree plantation) would receive a thinning to release the planted Douglas-fir saplings.

Following timber harvesting, mechanical fuel reduction treatments would be applied to the units. Disturbance of the soil would be minimized to avoid damage to roots of understory shrubs and other vegetation.

Four of the thinned units (61 acres) would be planted with Douglas-fir seedlings to help establish tree species more favorable to long-term development of quality elk habitat conditions. In comparison to lodgepole pine and larch, Douglas-fir has a greater capability to survive and grow under the partial shade conditions that would exist in the thinned units.

Forest Diversity and Productivity

A total of 205 acres in 10 separate units outside of Forest Plan designated elk winter range would be treated. Approximately 180 acres (9 units) outside of Forest Plan designated elk winter range

would receive a regeneration harvest (i.e. seedtree or shelterwood harvest). These units would be located in MA 15, although Unit 56 would be partially in MA 7. Units were located within stands where treatment would improve forest species diversity and timber productivity; primarily by treating lodgepole pine dominated forests.

Unit 2a (25 acres) would also be outside of Forest Plan designated elk winter range (MA 15), but would receive a thinning treatment, not a regeneration harvest as discussed above. This would be because Unit 2a has a relatively high amount of western larch and Douglas-fir, all of which would be left along with enough lodgepole pine to achieve target tree density. Approximately 70 TPA would remain following the thinning treatment.

Most of the units would receive mechanical treatment of fuels following harvest; however, Unit 40 would receive a prescribed burn treatment because the slopes are too steep for mechanical treatment. Disturbance of the soil would be minimized to avoid damage to roots of understory shrubs and other vegetation.

Following harvest, four of these units (107 acres) would be planted with western larch, Douglas-fir, and/or western whitepine. Planting would help ensure that the desired conditions of increased species diversity, stand growth, tree size potential, stand vigor, and resistance to future disturbances would be met.

Douglas-fir Test-tree Plantation

The treatment for the Douglas-fir test-tree plantation would be the same as described under Alternative 2.

Stand Group Descriptions and Treatments

All stand group descriptions are the same as the Alternative 2 stand group descriptions. The units in each stand group and treatments under Alternative 3 follow below.

Stand Group 1

Comprised of Units 14, 23, 26, 29, and 30 (67 acres).

Treatment: A thinning would occur in these units, all within MA 13 (designated elk winter range). There would be 70 – 120+ residual overstory TPA, consisting mostly of lodgepole pine, but with western larch and Douglas-fir retained where these species exist. This would result in more open stand conditions with increased light and moisture available to the remaining trees. Mechanical fuels reduction would occur after thinning to reduce fuel loadings from thinning slash and prepare the site for planting. Four of the five units (61 acres) would be planted with conifer seedlings (Douglas-fir, larch, and western whitepine) after harvest to supplement the expected natural regeneration of lodgepole pine and to increase the proportion of desired species.

Stand Group 2

Comprised of Units 9b, 11, 19, and 21 (75 acres).

Treatment: A thinning would occur in these four units, all within MA 13 (designated elk winter range). There would be 70 – 120+ residual overstory TPA, consisting mostly of lodgepole pine, but with western larch and Douglas-fir retained where these species exist. This would result in more open stand conditions with increased light and moisture available to the remaining trees. Mechanical fuels reduction would occur after thinning to reduce fuel loadings from thinning slash and prepare the site for planting. Three of the four units (45 acres) would be planted with conifer seedlings (Douglas-fir, larch, and western whitepine) after harvest to supplement the expected natural regeneration of lodgepole pine and to increase the proportion of desired species.

Stand Group 3

Comprised of Units 16, 40, 47, 49, 50, and 56 (107 acres).

Treatment: Treatment for this stand group would be the same as described under Alternative 2.

Stand Group 4

Comprised of Units 2a, 2b, 41, and 43 (98 acres).

Treatment: Regeneration treatments (shelterwood harvests) would occur in Units 41 and 43, and thinning would occur in Units 2a and 2b. The treatment descriptions for Stand Group 4 would be the same as described under Alternative 2.

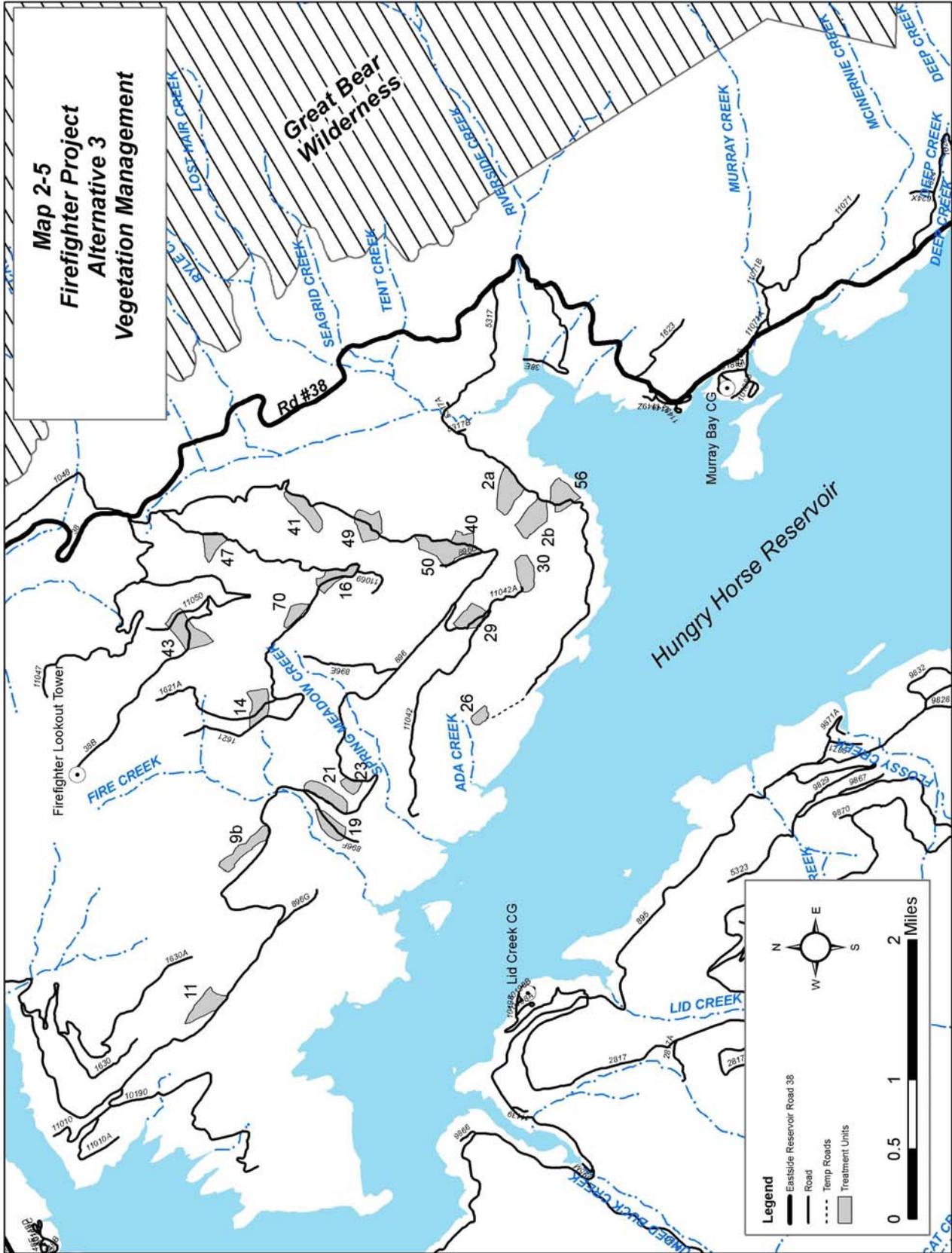
Stand Group 5

Unit 70, 8 acres, is the only unit in Stand Group 5.

Treatment: Treatment for Stand Group 5 would be the same as described under Alternative 2.

Table 2-8. Alternative 3 Treatment Summary by Unit

Unit	Acres	Stand Group	Mgmt. Area	Treatment	Logging Method	Post-Harvest Treatment	Reforestation Method	Temporary Roads Needed?
2a	25	4	15	Thinning	Mechanical	Mechanical	None	Probably not
2b	23	4	15	Regeneration (Shelterwood)	Mechanical	Mechanical	Natural Regeneration	Probably
9b	20	2	13	Thinning	Mechanical	Mechanical	None	No
11	20	2	13	Thinning	Mechanical	Mechanical	None	No
14	19	1	13	Thinning	Mechanical	Mechanical	Plant	No
16	17	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
19	16	2	13	Thinning	Mechanical	Mechanical	None	No
21	19	2	13	Thinning	Mechanical	Mechanical	None	No
23	7	1	13	Thinning	Mechanical	Mechanical	Plant	No
26	6	1	13	Thinning	Mechanical	Mechanical	None	Yes
29	18	1	13	Thinning	Mechanical	Mechanical	Plant	No
30	17	1	13	Thinning	Mechanical	Mechanical	Plant	No
40	7	3	15	Regeneration (Seedtree)	Cable	Burn	Plant	No
41	20	4	15	Regeneration (Shelterwood)	Mechanical	Mechanical	Natural Regeneration	No
43	30	4	15	Regeneration (Shelterwood)	Mechanical	Mechanical	Natural Regeneration	No
47	13	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
49	21	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
50	30	3	15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	No
56	19	3	7/15	Regeneration (Seedtree)	Mechanical	Mechanical	Plant	Yes
70	8	5	13	Thin Sapling	Hand	Lop/Scatter	None	No
TOTAL	355							



Expected and Desired Post-Treatment Stand Conditions

The expected and desired post-treatment stand conditions for Alternative 3 would be similar to those indicated under Alternative 2, except that about half the number of acres would be treated. Thus, the change in condition across the landscape would be far less noticeable. Alternative 3 would result in an approximately 1% change in species composition, stand structure, and successional stage across the project area. Alternative 3 would treat 174 acres (5%) of the total acres of mature lodgepole pine and 173 acres (2%) of the mixed-species stands.

Because there would be post-harvest mechanical fuels reduction rather than prescribed burning, the understory vegetation would not receive the additional stimulation and nutrient flush effect of a burn. Mechanized slash treatment would not compromise ecosystem processes, but it would not provide the same ecological benefits as burning.

Access/Roads

Most units would be accessed using existing NFS roads. No new permanent roads would be constructed to conduct treatment activities for this project. Some temporary roads would be built, or historic roads utilized, to access units. Temporary and historic roads would be rehabilitated following project treatments.

The following table displays units requiring the construction of temporary roads on NFS lands.

Table 2-9. Alternative 3 Temporary Roads Needed on NFS Lands

Unit	Access Need	Miles
26	Access using new temporary road	0.3
56	Access using new temporary road within unit	0.2
Total		0.5

There are segments of the existing road system in the Firefighter Project area that would require improvements in the road surface/stream drainage systems to meet current Montana State Best Management Practices and INFISH Standards. The work activities could include the installation of additional cross-drain culverts, drive-through-dips, flappers, filter windrows, sediment traps, etc. It also includes the upsizing of six culverts as described under Alternative 2. About 26 miles of haul route roads (roads used to haul commercial products) would receive road drainage improvement work. There would also be approximately 6.2 miles of non-haul route roads requiring resource enhancement BMP improvements prior to being gated or bermed.

Effects to soils would be avoided or minimized by using low-impact equipment to remove wood products and/or the use of designated skid trails.

Wildlife Habitat Security

Wildlife habitat security needs (i.e. motorized access management) under Alternative 3 are identical to those described under the Proposed Action (Alternative 2).

IV. DESIGN CRITERIA

Many concerns expressed during public involvement processes are best addressed through development of design features that are common to both Action Alternatives (Alternatives 2 & 3) and that specifically avoid or reduce potential environmental impacts. These design features are an integral part of each Action Alternative, and are considered requirements should an Action Alternative be selected. They are listed here to avoid repeating them in each alternative description.

Duration and Timing of Activities

Mechanized harvesting treatments could possibly begin in the summer of 2010. Mechanical harvesting would not occur during the winter months (December thru March 31) primarily because of existing winter range restrictions. Prescribed burning and planting within these units could occur during the fall of 2010 or later. Other project activities (BMPs, road management actions) may begin in the summer of 2009.

Mechanized harvesting/thinning treatments may require up to 3 years for completion. Most project activities would not occur between April 1 and June 30 to minimize effects to grizzly bears during the critical spring-use period. Exceptions to this restriction include prescribed burning, planting, and noxious weed spraying activities. Road treatments, including BMPs, slash burning, pile burning, and sapling thinning may occur during the spring period if located along open roads.

A portion of the road decommissioning in the vicinity of the timber sales may be completed during the timber contract period. The remaining portion of the road decommissioning would be completed in 2014 and 2015 if funding were available. Appropriated dollars received from Congress is anticipated to be the mechanism used to fund road decommissioning; however, other funds may be tapped to help supplement these dollars. Based on current funding trends, there is a high expectation that funding for road decommissioning would be available. Other road closures would be completed as soon as possible.

Soil Productivity

All mechanized units that remove commercial products would be logged using designated skid trails. Equipment would occasionally leave the trails to access trees or accomplish other activities.

Skid trails must be spaced an average of 75-100 feet apart except for Units 3, 5, 8, 26, and 61 where skid trails would be at least 100 feet apart. The goal would be to occupy less than 15% of the treatment area, which would include soils disturbance from skid trails, temporary roads, and landings associated with past or proposed activities.

All existing roads and skid trails would be reused to the extent feasible, unless doing so would adversely affect soil, water, or other resources. If roads or trails cannot be reused, their extent must be considered when laying out additional skid trails.

Mechanical slash treatments would occur after the material to be piled has sat for one wet season. These units are proposed for regeneration harvest treatments and would have a high amount of material removed.

To the extent possible, logging would occur when the soils are drier than field capacity as determined by the hand-feel method (refer to the soils section in the Project File).

Sale administrators would monitor soil moisture conditions prior to allowing equipment to begin operation in summer and fall. Monitoring must be documented in the Timber Sale Daily Report.

All prescribed burning within units would be ignited when burning conditions would maintain soil erosion and nutrient levels within the range of historic burns.

All treatment areas currently have less than 15% detrimental soil disturbance. If post-implementation monitoring indicates that detrimental soil disturbance in Units 3, 5, 8, 26, and 61 exceed 15%, then all or some of the following actions would be used to begin the restoration of soil quality. Restoration would occur on areas with a high amount of detrimentally disturbed ground such as designated skid trails and landings.

- Scarify heavily-used skid trails and landings with the teeth on an excavator bucket to a depth of 2-4”.
- Plant Montana-certified, weed-free native grasses on the scarified soils as recommended by the Forest Botanist.
- Plant native shrubs/trees where needed to augment natural vegetation and scarification.

Site conditions would determine which of the above mitigations would be used. These mitigations do not result in instant restoration of detrimentally disturbed soils; rather they begin the restoration process.

Where there is a risk of soil erosion, it would be minimized by implementing the following management practices:

- Reducing the area where equipment operates (see skid trail spacing design criteria above)
- Locating landings on relatively flat ground that can be drained
- Locating skid trails on slopes less than 35 percent that have soils with a low or moderate erosion hazard
- Using erosion control features such as water bars, replanting, and placing slash on disturbed soils

Access/Roads

Public access would remain restricted on closed roads on NFS lands during administrative use. To protect the safety of the public using the area, contractors would be required to post signs warning of activities and traffic associated with treatment.

Erosion control work (drain dips, etc) and road maintenance work (road grading, etc) would occur as needed. Grading may be needed to maintain road drainage during project activities. Dust abatement (using non-petroleum based products on open roads) and blading would occur as needed on main haul routes.

Personal use firewood gathering would not be allowed by contractors or other workers on newly constructed roads or any other roads not open to motorized use by the public.

All newly constructed (temporary) roads would be closed by sign or gate to public motorized use during and after road building and other activities. All existing roads currently closed to public motorized use would remain closed during implementation of all activities.

Hunting, transporting of hunters, and transporting of game would be prohibited by timber, road building, or other contract workers while working on or off roads closed to motorized vehicle use by the public.

All temporary roads utilizing existing historic road templates would be reclaimed by removing any installed culverts or temporary bridges, by placing large-woody material on the template (where material is available), installing erosion control features where needed, by spraying weeds (see Noxious Weeds section below), and by seeding exposed soils with the native plant mix specified by the Forest Botanist.

All newly constructed temporary roads would be reclaimed, as soon as logistically practicable. This could be accomplished by recontouring the entire road template to natural ground contour, by placing large, woody material on the template (where material is available), by spraying weeds (see Noxious Weeds section below), by seeding exposed soils with the native-plant mix specified by the Forest Botanist, and by placing the topsoil back on the soil surface when possible.

The decision for the Paint Emery Project included a statement that the upper gate on Road 38B (about a mile from the Firefighter Lookout) would be closed when the lookout was not being used administratively, but would be open during the day when the lookout was occupied. Since it was a possibility this road could be used by the public, this road has been shown in the Forest transportation database as seasonally open to motorized use (July 1 through October 14). This upper gate, for the most part, has been closed yearlong since the signing of this past decision because the lookout has not been actively used. To clarify the status of this road and gate, all alternatives would allow for this gate to be open July 1 through October 14, with the provision this gate could be closed temporarily in the event there is a need for administrative use of the lookout.

Old-Growth Forest

The intention of the Firefighter Project is to avoid treatment in old-growth forest. Old-growth forests are limited in the area due to past fire history and harvest activities.

Snags, Downed Woody Material, Hardwood Tree Species

All large, live, old ($\geq 18''$ dbh, >150 years) Douglas-fir and western larch trees, and Douglas-fir and larch snags $>16''$ dbh would be left standing within the units, unless they create a safety hazard. If felled for safety reasons, these trees would be left on site. A maximum of 12 tons/acre of existing downed woody debris would be left on the site. All larger ($>12''$ diameter), soft (partially rotted) downed wood would be left on site unless removal is necessary for operational

reasons or to reduce fuels to an acceptable level. Hardwood trees would not be targeted for removal and would be left intact to the extent possible, considering operational feasibility.

Noxious Weeds

All off-road logging and construction equipment use associated with this project and temporary road construction would be power scrubbed or steam cleaned on the undercarriage and chassis before transport to the project area. This cleaning would remove all soil, plant parts, seeds, vegetative matter, or other debris that could contain or hold seeds. All subsequent entries of equipment to the project area would be treated in the same manner as the initial entry. Off-road equipment includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles.

Landings, temporary roads, skid trails, and roadsides with soil disturbance would be seeded with a Montana-certified, weed-free, grass ground cover as soon as practical after disturbance, to provide for site protection until native species are established (seed mix specified by the Forest Botanist).

To protect riparian habitat and prevent noxious weed establishment in riparian corridors, temporary roads crossing intermittent streams accessing Units 7 and 8 (these two units are included in Alternative 2 but not in Alternative 3) would be revegetated using native forbs, shrubs, and grass seed to reduce the potential for nearby infestations to spread into these currently weed-free areas. These plantings should occur as soon as possible after the road is no longer needed, and would follow the specifications of the Forest Botanist.

Herbicides would be sprayed within the road prism along designated haul routes before log hauling begins and after all purchaser activities are completed. The road prism is defined as the road and associated toe of the fill to the top of the cut slope, including the running surface and turnouts. However, when a contiguous patch of weeds extends beyond the road prism, treatment beyond the road prism shall be the responsibility of the Forest. Although the intent is to spray pre- and post-hauling, there may be some exceptions to this due to timing of logging and appropriate season of application. Spraying typically occurs during the spring or fall, usually between June and early July, or during September. Treatment of invasive plants would be consistent with the strategy outlined in the Flathead National Forest Noxious and Invasive Weed Control Decision Notice and Finding of No Significant Impact (May 2001). Specific roads and mileage would be prepared in consultation with the Forest Weeds Coordinator.

Other roads to be bermed that are unassociated with unit treatments (not used for hauling) or to be decommissioned would be surveyed and evaluated for possible weed treatments before being bermed/decommissioned. Treatment of these roads would be evaluated and prioritized with the strategy outlined in the Flathead National Forest Noxious and Invasive Weed Control Decision Notice (May 2001).

These treatments would not eliminate the potential for new weed populations, but they would reduce the potential. Implementation of treatments would depend on sufficient availability of funds from implementing the contract. Should there be insufficient funds available from this contract, treatments would compete for funding with other forest-wide stewardship resource

conservation projects, or would be prioritized with other forest weed sites-of-concern using the Forest annual weed budgets.

Air Quality

All prescribed burning would comply with the Smoke Management Plan prepared by the Montana Air Quality Bureau and administered by the Montana State Airshed Group (Forest Plan, page II-64) through a Memorandum of Agreement. The Environmental Protection Agency (EPA) has approved these plans as meeting the requirements of the Clean Air Act as amended in 1990 and 1999 (42 U.S.C. 7401 et seq.). The U.S. Forest Service is a member of the Montana/Idaho State Airshed Group. This coordination ensures that during project implementation burning only occurs under conditions that would protect air quality and meet state and national standards.

Water, Riparian Areas, & Fish

No treatments would occur within riparian areas. All treatments would comply with Montana Stream Management Zone (SMZ) laws and Inland Native Fish Strategy (INFISH) direction. This includes retaining INFISH buffers along stream channels as follows:

Table 2-10. INFISH Buffers

Feature	Distance
Fish-Bearing Streams (e.g. Hungry Horse, Fire, Ryle, Tent, Riverside, Murray, and McInernie Creeks)	300 ft
Permanently Flowing, Non-Fish Bearing Streams (e.g. Ada and Spring Meadow Creeks)	150 ft
Seasonally Flowing or Intermittent Streams	50 ft
Ponds, Lakes, or Wetlands > 1 Acre	150 ft
Ponds, Lakes, or Wetlands < 1 Acre	100 ft
Landslide Prone Areas	100 ft

Best Management Practices (BMPs) would be employed during all applicable project activities. BMPs would be applied during the logging operations to reduce erosion from the landings, including grass seeding and water barring, as soon as possible following the completion of timber harvest activities. In addition, BMPs would include the stabilization of all reconstructed stream channels with straw mats, the planting of native grasses and shrubs, and other measures as needed. Refer to the Soils and Hydrology sections of this document for more information.

Stream channel work associated with culvert removals (road decommissioning – estimated about 17 culverts would be removed) and upsizing (6 culverts) would be performed after July 15 to minimize impact on fish spawning. Mitigation measures would be as described in the “Road Maintenance Likely to Adversely Affect Biological Assessment for Bull Trout.”

Wildlife and Threatened, Endangered, and Sensitive Species

If a den, nest site, or other important habitat feature for any threatened, endangered, or sensitive species were to be discovered within or in close proximity to any treatment unit, project activities would be adjusted and coordinated with the District Wildlife Biologist.

Any sightings or sign of grizzly bear, wolf, and lynx use of the project area would be documented and a copy of this documentation provided to the District Wildlife Biologist.

Documentation of a discussion between the contractor/purchaser and a Forest Service representative (e.g. Sale Administrator) regarding the requirements/responsibilities relative to the Northern Continental Divide Ecosystem Food Storage Order shall be provided to the District Ranger.

To the extent possible, prioritize completing Units 9, 11, 18, and 61 first (note: Units 18 and 61 are not included in Alternative 3), then place berms on Forest Road 896 to create temporary core until roads in the area are decommissioned expected in 2014 or 2015.

Unit 7 and its associated temporary road would be located at least 300 feet from an existing wetland to avoid impacts to sensitive plants. Pod grass (*Scheuchzeria palustris*) occurs in this wetland adjacent to Unit 7.

Any populations of sensitive plants found during project implementation would be evaluated and protected as necessary to retain population viability.

Heritage

If previously unknown heritage resources are encountered during implementation of the project, activities at the site would be halted and the Forest Archaeologist would be notified immediately. Activities would not resume until adequate protective measures are developed and specified in the field.

Scenery

In general, harvest units would have irregular boundaries where practical and feasible. More specifically, in Units 3 and 56, small islands of trees would be retained to add visual diversity.

Monitoring

The Contract Administrator would monitor all treatment units during implementation to ensure that contract specifications and applicable treatment objectives are being met. Contract specifications would be included to ensure resource protection during implementation.

To ensure the regeneration units are adequately stocked, monitoring the establishment and survival of planted or naturally regenerated conifer and shrub seedlings would be required. Additional monitoring would likely occur (depending upon funding sources) to assess the result of treatments on specific resources, including the following:

- Evaluation of post-treatment forest conditions (tree density, species, soil condition, down woody debris, etc.) within 3 years following treatments in all units.
- In all treated areas and other disturbed ground (such as constructed temporary roads and log landings) and along all system roads used to transport forest products, annual surveys would be conducted for three years following sale activities to identify any invasion of noxious weeds. Should weeds be discovered, the site would be evaluated for treatments and prioritized with the strategy outlined in the Flathead National Forest Noxious and Invasive Weed Control Decision Notice (May 2001).
- Units 3, 5, 8, 26, and 61 would be monitored to determine if the proposed activities meet soil quality standards. These units are the ones most likely to be close to exceeding the soil quality standards. If the proposed activities cause 15 percent or more detrimental soil disturbance, then restoration activities would occur to move the units towards an improved condition (refer to soils design criteria).
- Bermed and gated roads would be monitored on a regular basis to assure that culverts are functioning as designed, to provide maintenance, and to detect possible culvert failures. Open roads are monitored through regular administrative activities.

V. COMPARISON OF ALTERNATIVES

The following table displays a comparison of selected features between the three alternatives.

Table 2-11. Comparison of Features of the Alternatives

Activity	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Vegetation Management			
Regeneration Harvesting & Thinning Treatments			
Test-Tree Plantation Thinned	No	Yes	Yes
Regeneration Harvest	0 acres	716 acres	180 acres
Thinning Harvest	0 acres	33 acres	175 acres
Total Acres	0 acres	749 acres	355 acres
Harvesting & Thinning Treatments by Stand Group			
Harvesting & Thinning			
Stand Group 1 (LP- designated winter range)	0 acres	270 acres	67 acres
Stand Group 2 (Mix Species - designated winter range)	0 acres	266 acres	75 acres
Stand Group 3 (LP non-winter range)	0 acres	107 acres	107 acres
Stand Group 4 (Mix Species non-winter range)	0 acres	98 acres	98 acres
Stand Group 5 (DF test-tree plantation)	0 acres	8 acres	8 acres
Total Acres	0 acres	749 acres	355 acres

Activity	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Logging Method			
Mechanized	0 acres	566 acres	340 acres
Cable/Skyline	0 acres	24 acres	7 acres
Helicopter	0 acres	151 acres	0 acres
Hand Thinning	0 acres	8 acres	8 acres
Total Logged Acres	0 acres	749 acres	355 acres
Regeneration Method			
Natural Regeneration	0 acres	240 acres	73 acres
Planting	0 acres	476 acres	168 acres
None	0 acres	33 acres	114 acres
Total Acres	0 acres	749 acres	355 acres
Post-Harvest Treatments			
Prescribed Burning	0 acres	543 acres	7 acres
Mechanical Piling	0 acres	198 acres	340 acres
Lop/Scatter of Slash	0 acres	8 acres	8 acres
Total Acres	0 acres	749 acres	355 acres
Access Management			
Miles of Currently Closed Roads to be Decommissioned/Bermed	0 miles	28.7 miles	28.7 miles
Miles of Currently Open Roads to be Gated Yearlong	0 miles	1.3 miles	1.3 miles
Miles of Temporary Road Construction	0	4.3 miles	0.5 miles

Table 2-12. Comparison of Alternatives by Key Issue

	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Issue: Firefighter Proposed Action would not improve winter habitat for elk but may compromise the area as elk winter range.			
Forest Cover to Forage Opening Ratio	83:17	Firefighter Mountain Winter Range: 75:25	Firefighter Mountain Winter Range would remain unchanged (83:17) if the thinned lodgepole stands were capable of providing snow intercept cover. If stands not capable of providing snow intercept cover the ratio would be 80:20
		Mount Murray Winter Range: 75:25	Mount Murray Winter Range: 83:17
Acres Harvested in Stands Currently Providing Snow Intercept Cover	0 acres	407 acres (Harvesting in both Mount Murray and Firefighter Mountain Winter Ranges)	141 acres (Harvesting only in Firefighter Mountain Winter Range)

Table 2-13. Comparison of Alternatives by Effects Indicator

Effects Indicator	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Forest Vegetation			
Stand/Tree Vigor & Growth	No change in current conditions – many lodgepole pine (LP) stands very densely stocked, poor vigor, will experience continued growth reduction & mortality	Treats the most acres (749), all would have improved stand and individual tree vigor and growth. Particularly true for the regeneration harvested stands in the dense mature LP; they would be converted to younger, vigorous sapling stands.	Treats fewer acres (355) than Alt. 2. About half (180 acres) would be regeneration harvested, converting mature, slow growing LP stands into young, vigorous sapling stands. The remaining 175 acres would be thinned, with only 33 acres of that total resulting in substantially improved tree vigor and growth. The remaining 142 thinned acres (of the 175 total thinned acres) would leave mostly LP. This LP would experience relatively little improvement in tree growth due to past suppression under dense stand conditions.
Stand & Landscape Diversity in Tree Species and Structure/Age Class	No change in current conditions. Over 80% of the project area landscape is dominated by older 70-80 year-old forests; 28% of the area is heavily dominated by LP.	Greatest increase in tree species and structural/age class diversity within treated stands and across the landscape. This would be due to regeneration harvesting (and the resulting conversion to young stands) of 716 acres of mature forest, and the planting of Douglas-fir (DF), and some western larch (WL) and white pine (WP) seedlings on 476 of those acres. Would change about 10% of the LP dominated stands to more mixed-species composition.	Increase in tree species and structural/age class diversity within treated stands and across the landscape (although lesser than Alt. 2). This would be due to the regeneration harvesting (and the resulting conversion to young stands) of 180 acres of mature forest, and the planting of DF and some WL and WP seedlings on 168 of those acres. Would change about 5% of the LP dominated stands to more mixed-species composition.
Insect & Disease, Other Mortality Factors	No change in current conditions. LP stands in project area would become increasingly susceptible to Mountain Pine Beetle attack, and risk of epidemic levels of beetle population would increase.	Forest stands and landscape would have improved resistance to effects of future fire and insects or disease, due to improved species diversity (conversion to more fire and insect and disease tolerant species) and structure/age class diversity. However, this effect is small, with treatment acres covering only 5% of the total project area. Low risk of tree loss in treated stands, due to the removal of most of the windthrow-susceptible mature LP.	Forest stands and landscape would have improved resistance to effects of future fire and insects or disease, due to improved species diversity and structure/age class diversity. Very small effect, due to small amount of area actually treated (about 2% of total project area). Increased risk of windthrow within the treated stands, due to the greater number of thinned, mature LP dominated stands compared to Alt. 2.

Effects Indicator	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Understory Vegetation	No change in current conditions.	Abundance and diversity of understory vegetation would increase across all 749 acres treated, due to the dramatic increase in light reaching the forest floor. Prescribed burning on 543 acres (nearly all occurring within elk habitat) would promote the growth of desirable forage species for ungulates, and provide greater protection to roots of existing plants than would the mechanical treatment of slash, which would occur across 198 acres.	Abundance and diversity of understory vegetation would increase across all 355 acres treated, due to the dramatic increase in light reaching the forest floor. Most units (340 acres) would have mechanical treatment of slash, due to the thinning treatments in LP dominated stands, and the need to prevent mortality of the leave trees. Mechanical treatment poses greater risk of damage to understory plant species and is less imitative of natural disturbance processes than prescribed fire.
Fire and Fuels			
Effects Indicators at the 97 th Percentile Weather Input (numbers are the range of values for Stand Groups 1-6)			
Acres Treated	0 acres	749 acres	355 acres
Predicted Rate of Fire Spread	7.0 – 35.5 chains/hour (1 chain = 66')	1.7 – 5 chains/hour	1.7 – 5 chains/hour
Predicted Flame Length	5.5 – 37.6 feet	1.1 – 3.4 feet	1.1 – 3.4 feet
Type of Predicted Fire	Passive	Surface	Surface
Torching Index	0 – 9.3 mph	24.0 – 458.2 mph	24.0 – 458.2 mph
Crowning Index	10.4 – 16.3 mph	15.9 – 69.7 mph	15.9 – 69.7 mph
Threatened, Endangered, and Sensitive Plants			
Suitable Habitat Types	11 habitat types in project area (749 acres under Alternative 2, 355 acres under Alternative 3)		
Known Populations	Sensitive species, Pod grass (<i>Scheuchzeria palustris</i>), is located near Unit 7, no known occurrences in units. No effect to TES plants.		
Noxious Weeds			
Existing Infestations	9 species of noxious weeds found in and around the project area.		
Temp. Roads & Haul Routes	0 miles	4.3 miles temp. roads 30 miles haul routes	0.5 miles temp. roads 26 miles haul routes
Acres of New Disturbance	0 acres	749 acres	355 acres
Risk of Spread	No risk over existing	Highest risk of weed spread of Action Alternatives, design criteria included to minimize weed spread.	Lowest risk of weed spread of Action Alternatives, design criteria included to minimize weed spread.

Effects Indicator	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Wildlife			
Grizzly Bear			
Denning Habitat	No effect	No effect	No effect
Food Production & Cover	No effect	Increased most under Alternative 2	Increased, but not as much as Alternative 2
Displacement	No effect	Potential for some short-term displacement	Less potential for displacement than Alt. 2
Habitat Security (A19)	No effects	Improved grizzly bear security following implementation, all A19 standards would be met.	
Canada Lynx			
Effects to Hare Habitat	No effect	Effects would be positive; the project would increase diversity of lynx habitat in the analysis area.	
Gray Wolf			
Ungulate Habitat and Habitat Security	No effect	Increased ungulate foraging habitat and improved ungulate habitat security (access restrictions), and lower risk of mortality for wolves following project implementation.	
Fisher			
Acres of Stream-Adjacent Habitat	No effect	Approximately 30 acres of fisher habitat could be affected, which is about 1% of habitat in the project area (greatest effect of the Action Alternatives).	Approximately 21 acres of fisher habitat could be affected, about 0.7% of habitat in the project area (least effect of the Action Alternatives).
Elk			
Ratio of Canopy Cover (snow intercept) to Early Spring Forage Sites.	83:17	<p><u>Firefighter Mountain Winter Range</u>: 407 acres providing snow intercept converted to openings (forage sites), ratio of 75:25.</p> <p><u>Mount Murray Winter Range</u>: 100 acres providing snow intercept converted to openings (forage sites), ratio of 75:25.</p> <p><u>Both winter ranges</u> would contain more diverse forest age classes providing elk different habitat selection and use options.</p>	<p><u>Firefighter Mountain Winter Range</u>: 141 acres providing snow intercept converted to openings (forage sites), ratio of 80:20. This winter ranges would contain more diverse forest age classes providing elk different habitat selection and use options.</p> <p><u>Mount Murray Winter Range</u>: No treatment – No effects.</p>
Brown-Headed Cowbird			
Habitat Presence	No effect	Most likely that the existing status would be maintained.	
Hydrology			
Water Yield	No effect	Increase 0% - 6.8% for analysis area watersheds	Increase 0% - 1.0% for analysis area watersheds

Effects Indicator	Alternative 1 (No-Action)	Alternative 2 (Proposed Action)	Alternative 3
Sediment Yield	No effect	-2,140 to 347,756 pounds for analysis area watersheds, should have no effects.	-2,140 to 57,532 pounds for analysis area watersheds, should have no effects
Nutrient Yield	No effect	May see a small, short-term increase only.	May see a small, short-term increase only.
Cumulatively, the past, present, and foreseeable actions along with project activities should not cause a measurable increase in water yield, sediment yield, or nutrient levels outside of the natural range of variation for streams in the analysis area.			
Fisheries			
Sedimentation Level Changes	No effect	May see a small, short-term increase only.	May see a small, short-term increase only.
Water Yield Changes	No effect	May see a small, short-term increase only.	May see a small, short-term increase only.
Riparian Impacts and Instream Woody Debris Amount	No effect	No effect	No effect
Soils			
Soil Productivity	No effect	Soils productivity would be maintained by meeting all Regional soil standards and guidelines and the design criteria in order to reduce physical impacts; productivity would also be maintained by leaving some live vegetation on site to provide organic matter and microorganisms.	
Soil Erosion	No effect	Minimal probability of erosion due to site conditions and adherence to Regional soil standards and guidelines, and to design criteria.	
Mass Failures	No effect	Risk of mass failure would be very low due to site conditions and adherence to Regional soil standards and guidelines, and to design criteria.	
Cumulatively, Alternative 2 has a higher risk of causing detrimental soil impacts because it treats more acres and implements more acres of regeneration harvesting, site preparation, and post-harvest mechanical fuel reduction. Impacts will be reduced by following all Regional soil standards and guidelines, and by following the design criteria developed for this project.			
Scenic Resources			
Change in Scenic Quality	No effect	Both alternatives would meet all applicable visual quality objectives; units may be visible but would be subordinate to the characteristic landscape.	
Air Quality			
Particulates <2.5 Microns	No effect	Level of particulate matter levels would meet all appropriate air quality standards and have no long-term effects.	
Economics			
Financial Efficiency	No effect	PNV (commercial activities) = \$-357,447.93 PNV (all activities) = \$-514,748.05	PNV (commercial activities) = \$-118,694.98 PNV (all activities) = \$-272,497.20

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