CHAPTER 2. ALTERNATIVES CONSIDERED

Introduction

This chapter describes and compares the alternatives considered for the West Side Reservoir Post-Fire Project. It includes a description and maps of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., acres of salvage proposed) and some of the information is based upon the environmental, social, and economic effects of implementing each alternative (i.e., the effect of alternative transportation management plans on public motorized access).

Alternatives for the West Side Reservoir project were developed from the issues identified in Chapter 1. The IDT Team grouped the alternatives into one of two categories based on their level of feasibility. These categories are "alternatives considered in detail" and "alternatives considered but eliminated from detailed study." Rational has been provided for alternatives not studied in detail.

Alternatives Considered in Detail

The Forest Service developed five alternatives, which include the No Action and Proposed Action alternatives. All alternatives, except the No Action, are intended to meet the Purpose and Need for the decision but utilized different approaches.

Features Common to All Action Alternatives

Many concerns expressed in the scoping period are best addressed through development of design features that are common to all action alternatives (Alternatives B through E) and that specifically avoid or reduce potential environmental impacts. These design features are an integral part of each action alternative, and therefore are considered requirements should an action alternative be selected. They are listed here to avoid repeating them in each alternative description.

Timing of Activities

If an action alternative were chosen, forest products from the proposed harvest units would be offered in several sale packages beginning in fiscal year 2005. Completion of harvest activities would be expected within two to three years after any given sale contract is awarded. All projects other than salvage logging, such as tree planting, would be completed as soon as possible. Road decommissioning would expect to be completed within five years

of the date a decision is made as funding is available. Road closures for wildlife security purposes would be completed as soon as possible.

Heritage Resources

Field investigation in accordance with the National Historic Preservation Act is ongoing. This includes consultation with the State Historic Preservation Office, the Advisory Council on Historic Preservation, and local Native American tribes.

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.

Special timber sale contract provision "B6.24# Protecting of Cultural Resources" would be included in any timber sale contract that requires identification and protection of known resources and allows modification or cancellation of the timber sale or other contracts if necessary to protect resources discovered while project implementation is in progress.

Wildlife and Fish

Biological evaluations and assessments and consultation with the US Fish and Wildlife Service (USFWS) for this project would be completed for any threatened or endangered species potentially inhabiting the project area.

The following contract provisions would be included in any timber sale contract:

- Use of Roads by Purchaser - Specifies conditions under which purchaser may use roads for hauling.
- Closure to Use by Others - Prohibits hunting, discharging of firearms, transportation of hunters or big game animals by the purchaser involving motorized access on roads closed to the public.
- Protection of Habitat - For protecting any listed threatened, endangered, or sensitive species encountered during project implementation.
- Conduct of Logging - Sets forth methods of felling, skidding, and yarding required to implement silvicultural prescriptions and meet other land management objectives.

A 100 foot buffer would be maintained from the edge of both sides of all avalanche chutes that are within or adjacent to salvage units in the Ball Fire.

All salvage-related activities south of the Doris Creek drainage would be restricted from April 1 to May 31 for grizzly bear security in the first year of salvage operations. Any salvage in subsequent years would be restricted south of Doris Creek from April 1 to June 30. Salvage in subsequent years would not be restricted June 1 to June 30 if salvage operations were not conducted in June of the first year. Additionally, all salvage-related activities in areas between road 895 and Hungry Horse Reservoir would be restricted from October 1 to December 1 for bald eagle migration security.

Ground-based and skyline salvage harvest operations, all wheeled motorized access, and temporary road construction in grizzly bear security core areas would be restricted to the winter denning period of November 15 to April 1.

If wolverine denning activity, or a fisher den, raptor nest, or communal bat roost were discovered during salvage operations, USFS wildlife biologists are to be consulted to determine if adjustments to activities are necessary.

If nests of black-backed woodpeckers or concentrations of this species are observed during salvage operations in or adjacent to units, USFS wildlife biologists are to be notified.

Crews implementing the proposed action would consult with USFS biologists to identify and protect any cave resources, mines, or bat roost sites discovered during project activities.

Sensitive Plants

If unknown populations of sensitive plants were found during project implementation, they would be evaluated and protected as necessary to retain population viability. A contract clause would incorporate this into any timber sale contract. This clause specifies that the contract would be modified to protect these plants if located.

Air Quality

Landing pile and "jackpot" burning are the only prescribed burning actions proposed with this project. Prior to prescribed burning, a burn plan would be prepared for each prescribed burn proposed with the action alternatives. Air quality sensitive areas, such as the Bob Marshall Wilderness Complex, Glacier National Park, and the Flathead Valley would be identified in each specific burn plan. Prescribed burning resulting from this project would be scheduled when smoke would not accumulate in unacceptable concentrations. Burn timing would also be planned to minimize effects on these smoke sensitive areas. Extended meteorological and spot weather forecast on mixing height, atmospheric stability, and wind speed would be required prior to burning to ensure that federal and state ambient air quality standards are met.

Prescribed burning would use effective firing techniques to minimize smoke output per unit area and appropriate fuel moisture conditions to remove only those fuels needed to meet the prescribed burn objectives. The prescribed burn plan would contain the appropriate mop-up category to ensure actions taken reduce impacts of residual smoke on visibility and health.

The Flathead National Forest cooperates with the State Air Quality Bureau and 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.

Removal of Trees

All action alternatives focus on removing trees that were affected by the fire and exhibit the conditions specified in the Post-Fire Mortality Analysis and Guidelines contained in Appendix E of this FEIS. It is acknowledged that in following these guidelines, there may be

some trees that are removed that would otherwise live, and some trees that are left that may die. This recognizes the value that live trees can hold across a burned landscape.

For the purpose of brevity in the remaining portions of the FEIS, the trees that exhibit these conditions discussed in Appendix E and are proposed for salvage removal will be referred to as "dead and dying." Please note that the trees proposed for removal also include Douglas-fir within diameter limits and spruce trees that are infested with bark beetles and may appear alive.

Retention of Live Trees

Live trees of all species that are not infested with bark beetles would be left within the salvage units. Depending upon management objectives (e.g. snag retention and recruitment, soil and water protection), additional trees with varying degrees of fire injuries would also be left. The post-fire mortality guidelines (Appendix E) provide criteria for leave tree selection that would be followed in all salvage units. Please note that some live trees would likely be cut for logging access or safety reasons. These trees would be left on the ground except where felled to create or access landing areas and skyline corridors.

Snags

Dead, larger-diameter larch and Douglas-fir trees would be left within all salvage units as per the site-specific prescriptions to provide primarily wildlife snag habitat, long term soil productivity, and forest structural diversity objectives. In all action alternatives, all live trees and snags designated for retention would be left standing wherever possible. This would exclude hazard trees and areas such as landings, skid trails, and skyline corridors. It should be noted that the snag distribution would be highly variable across both fire landscapes due to pre-fire variations in vegetation, as well as the variation in fire severities. The prescriptions for dead wood are detailed in Exhibit Rd-8 and in the alternative descriptions in this chapter and in Chapter One.

High-quality wildlife snags would be left standing wherever safe to do so. Although dispersed snags and leave patches would not be required adjacent to open roads, high-quality wildlife snags left within 200 feet of a road open to wheeled motorized use by the public would be signed and painted to protect it from firewood cutting (Exhibit Rd-6). These snags are generally larch, ponderosa pine, cottonwood, or Douglas-fir; typically larger diameter; and usually show signs of decay, broken tops, woodpecker use, other animal use, etc. (Hutto 1995, Caton 1996, Hitchcox 1996, Saab and Dudley 1998). Leave patches would be retained in most units to ensure that some of these high-quality snags remain in units. They would also provide post–fire salvage leave patch habitats, which have been shown to have higher use and nest success as opposed to individual snags left scattered across the landscape (Saab and Dudley 1998, Bunnell et al. 2002).

Trees felled during the logging operation but not removed from the site would be left as intact as possible. Unmerchantable trees would be left standing, if safe to do so.

Downed Wood

All action alternatives would use the default Amendment 21 course woody debris standards for Moist Potential Vegetation Groups in the salvage harvest units (Exhibit Rd-8). This would be provided by un-merchantable pre-fire down wood, un-merchantable material left standing, later windfall of leave trees and snags, and felled hazard or un-merchantable trees. The standards call for the retention of coarse woody debris greater than six feet in length in the treatment areas at the following densities: 32 pieces average per acre 9 to 20 inches diameter and 15 pieces average per acre greater than 20 inches diameter. Hydrologists and soil scientists determined these standards were appropriate for these fire areas. These standards may retain adequate numbers and distribution of large downed logs for most wildlife species. It should be noted that the log distribution would be highly variable across both fire landscapes due to pre-fire variations in vegetation, as well as the variation in fire severities.

Slash reduction

In all action alternatives, logging practices would be specified to leave most unmerchantable trees standing, minimize excessive slash concentrations, and avoid or minimize soil impacts. Small (less than one acre) concentrations of logging slash may be reduced through spot or "jackpot" burning when necessary for reforestation site preparation.

Tree Planting

All salvage units would be reforested through either natural regeneration or tree planting of native conifer species (primarily larch, Douglas-fir, western white pine, or ponderosa pine). This would restore the productive capacity of the land in a timely manner and ensure desired species diversity in the future forest. Refer to the alternatives descriptions within this chapter for projected planting areas and amount of acres.

Scenic / Visual Resources

In order to reduce the short-term visual impacts of slash residue in units in close proximity to "foreground viewing areas" or "middle-ground viewing areas," the following actions would be taken:

- Dispose of burn piles along open roads within two years.
- Low cut or angle cut stumps in the immediate foreground (100 feet) along the West Side, Clayton Creek, and Alpha-Beta roads (maximum stump height – 12 inches).
- Rehabilitate log landing areas next to open roads. Dispose of slash and scarify as necessary to establish new vegetation. Landings would be evaluated on a case-by-case basis for dispersed recreation opportunities and may be established as parking areas.
- All skyline corridors would have slash placed on bare soils to provide ground cover.

Public Firewood Gathering

Currently, a temporary closure order (up to one year) is in place that restricts firewood cutting within all West Side Reservoir fire areas. All alternatives would extend this closure order restricting public firewood cutting during proposed salvage sale operations.

Water

All timber sale contracts would require dust abatement measures to minimize the airborne delivery of sediment to streams.

Best Management Practices would be employed during all applicable project activities. These would include the stabilization of all reconstructed stream channels with straw mats, the planting of native grasses and shrubs, and other measures as necessary. Refer to Appendix C for a detailed discussion of BMPs and Soil and Water Conservation Guidelines.

Soils

Management practices to protect soil from erosion and maintain soil productivity include the following. These requirements would be incorporated in to any timber sale contract through the inclusion of the contract clauses.

- Use ground-based mechanized equipment (such as skidders and feller-bunchers) in summer logging conditions only on areas where soil burn severity was low and slopes are less than 15 percent.
- Ground-based equipment can be used on slopes up to 40 percent in winter logging conditions. They can also operate on any soil burn severity rating in winter.
- Winter logging would be done when the ground has enough snow or is frozen enough to protect soils. This would be about 10 inches of snow
- Operate equipment in summer only when soils are at an acceptable level of dryness, as determined by the timber sale administrator based on site-specific sampling.
- Designate main skid trails and temporary access roads.
- In units of low or moderate fire severity, where fine needles and branches remain on the trees, tops and branches would be left in the unit for at least one wet season to provide ground cover that reduces soil erosion rates and nutrients. In some units, abundance of unmerchantable material may provide enough fine organic material to supply the needs for productivity. In addition, depending upon how long after the fire event the salvage harvest occurs, most if not all of the needles will have already fallen from the scorched trees, providing nutrients to the site.
- To minimize erosion and other detrimental impacts to the soil resource, salvage harvest would be completed using BMPs or Soil and Water Conservation Practices (SWCPs). The practices are described in detail in the Forest Service Soil and Water Conservation Handbook (FSH 2509.22), the Soil Management Handbook (FSH 2509.18) and the Forest Plan (pages II: 40-46). Included are such practices as providing for sufficient road drainage, limiting tractor logging operations to periods when soils are dry or under winter snow and less subject to compaction, seeding of landings and cut and fill slopes of roads, and maintaining vegetative buffer strips between cut-

ting units and streams for sediment filtration. Each harvest unit and all proposed road work would be reviewed and applicable SWCPs identified on a site-specific basis for protection of the soil and water resource. These practices would be listed and described in the Decision. Refer to Appendix C.

- All skyline corridors would have waterbars installed and slash placed on bare soils as needed, to provide ground cover and reduce soil erosion. All skid trails would have waterbars installed and slash placed on the trails as needed.
- If mechanical fuel treatments were deemed necessary, they would be accomplished with excavators to reduce soil disturbance (Land and Resource Management Plan Annual Monitoring Report, 1992 page 131-139).

Dry soils are determined using the hand squeeze method. If a sample of soil does not form a sturdy clump or ball when squeezed and does not leave a wet muddy coating on one's fingers, then it is at the proper moisture level to put equipment on the ground.

A slash mat would be thick enough to prevent deformation of the soil surface by the equipment tracks or wheels. In other words, no tracks would be visible in the soil. The depth of the slash mat would vary with the type of material available for the slash mat.

Winter logging requires that there be enough snow so muddy water does not mix into or bleed into the snow where equipment operates. The depth of snow varies with the snow conditions. It takes more dry powder snow than wet dense snow to protect the soil surface. Soils must be frozen enough to prevent deformation of the soil surface where equipment operates.

Additional design measures to minimize soil erosion and compaction based on burn severity ratings (the fire's effect on soil), and slope (which relates to erosion hazard) were developed. In addition, special management practices were developed for units where the fine branches and needles were completely burned. These practices are specific to individual salvage units, and are described in detail in Appendix C - Best Management Practices.

Noxious Weeds

Features listed under the *Soils* section above would also serve to reduce the risk of noxious weed establishment and spread. Specific actions related to noxious weed concerns include the following:

- Wash all off-road equipment before entering and upon leaving the area.
- Reestablish vegetation on bare ground created by road decommissioning or timber harvest activity. Use native material where appropriate and available.

Recreation

All trails would be protected during salvage harvesting. No skidding would occur down any trail. In addition, crossing a trail with heavy equipment would be minimized and trees would be felled away from the trail. Any trail crossings that may be necessary would occur at 90-degree angles to the trail. Any damage that might occur during logging and associated site preparation activities would be repaired in accordance with 2309.18 FSH Trails Standards.

Skid trails used during logging would have slash and other material placed on the trail to discourage off-road wheeled motorized use.

Any new road closure devises installed on roads previously open to public travel would be located to insure sufficient parking and turn-around opportunities for safe public travel.

Existing dispersed recreation sites used for logging operations would be rehabilitated to allow for continued recreation use after salvage is complete.

In order to allow for public safety on high-traffic holiday weekends, the following restrictions to logging operations and log hauling would apply: Operations would cease at 5:00 PM on Friday up to 6:00 PM Monday on Memorial Day and Labor Day weekends for the duration of the timber sale contract. For the Fourth of July Holiday in 2005, operations would cease at 5:00 PM on Friday up to 6:00 PM on Monday. For the Fourth of July Holiday in 2006, operations would cease at 5:00 PM on Friday up to 6:00 PM on Tuesday. There would be no restrictions for Fourth of July for the remainder of the timber sale contract.

Long-term road closures for public safety associated with log decking on Road 895 would be restricted to operating periods before Memorial Day weekend and after Labor Day weekend.

All lands within sale area boundaries may be closed to public access, including snowmobiling and trails leading into and out of the sale area boundaries, during 2005 to meet the needs for public safety. For the remainder of the timber sale contract, sale area boundaries may be closed to public access only on weekdays.

Public Safety / Roads

Road rehabilitation involves improving roads to meet or exceed Best Management Practices (BMPs) guidelines, a process that generally installs or improves drainage features and is particularly applicable to roads receiving heavy truck traffic. Road rehabilitation by application of BMPs on roads that we anticipate having heavy traffic would be completed prior to the beginning of salvage logging activities and is authorized by a separate decision from this DEIS signed on July 12, 2004 by the Forest Supervisor. Appendix C includes a complete list of the project-specific best management practices (BMPs). BMPs are features common to all action alternatives, although the location of specific practices varies by alternative.

Contractors would be required to post signs along Forest Service haul roads warning the public of truck traffic and activities. Warning signs and public announcements would be used to notify the public of logging/site preparation/road management activities in the area.

Grading may be needed in order to maintain road drainage during project activities. Dust abatement using non-petroleum based products on open roads and blading would occur as needed on the main haul routes.

Warning signs and public announcements would be used to notify the public of logging/site preparation/road management activities in the area.

Roads may be restricted for safety purposes during logging operations. Portions of the project area may be restricted to the public during helicopter operations.

All temporary roads constructed for timber harvest would be reclaimed immediately after timber harvest activity is complete. Reclamation would consist of removal of any culverts and revegetating the disturbed area with native grasses, shrubs, and trees.

On roads closed to wheeled motorized use that are needed to access salvage units, public access would remain restricted. Timber sale contracts would contain clauses to insure that roads remain closed to public motorized use with wheeled vehicles.

Helicopter Landings

An estimated 47 to 52 areas covering approximately 1 to 1.5 acres each would be used for helicopter landings. Landings would not be located on problematic soils, in riparian habitat conservation areas (RHCA), inventoried roadless areas, or other areas determined as "sensitive" by an interdisciplinary review. One exception is a helicopter service landing located at the junction of the Doris Creek Road (895A) and the main West Side road (895) within an RHCA. This landing would not require new excavation and logs would not be transported to this location, however runoff from the landing area would be restricted with berms, straw waddles, or similar devices. In addition, they would be located in generally level areas. In some cases, roads may be used as landing areas. Landings also would avoid areas with concentrations of live trees to the greatest extent possible. Approach and departure flight paths may need live and/or dead tree falling to facilitate safe helicopter operations.

Monitoring

Monitoring is gathering information and observing management activities in order to provide a basis for periodic evaluation of Forest Plan goals and objectives. The purpose is to determine how well objectives have been met and how closely management standards have been applied during the timber sale activities. Evaluation of the monitoring results would assist in the review of the conditions of the land as required by National Forest Management Act regulations. It may result in decisions for further action, such as modifying the management practice.

There are three basic types of monitoring:

(1) Implementation/Compliance Monitoring is used to determine if goals, objectives, standards, and management practices are implemented as detailed in the Forest Plan, this DEIS, or by other State or Federal agencies. This would be performed by contract administrators, the interdisciplinary team, and specialists.

(2) Effectiveness Monitoring is used to determine if management practices as designed and executed result in the desired resource condition.

(3) Validation Monitoring examines the quality of the data and assumptions used in the analysis process.

Several sources of funding exist for resource monitoring. Many items would be funded with Knutson-Vanderberg (KV) funds, while other items would be funded with appropriated funds. No assignment of funding source to the monitoring would be made at this time, as future availability of funds are unknown. Priorities for annual monitoring are established and agreed upon by the interdisciplinary team and the Responsible Official, and implementation would be based on annual budgets and program direction. All legally required monitoring would be performed.

Monitoring and evaluation for this proposal would be conducted according to the requirements outlined in the Implementation and Monitoring section of the Forest Plan on pages V-7 through V-21. In addition, monitoring activities specific to the West Side Reservoir proposal would be conducted. Proposed monitoring activities are found in Appendix F and are discussed by environmental component, consistent with those used in the DEIS. Those components not specifically discussed tier to the monitoring described in the Forest Plan.

Alternative Summary and Descriptions

The table on the following page numerically summarizes the features of the alternatives. Following the table are detailed descriptions of the activities proposed in each alternative.

Alternative A - The No Action Alternative

Under the No Action alternative, current management plans would continue to guide management of the project area. No timber salvage harvest, road improvements, or access changes would be implemented to accomplish project goals. None of the action proposed in any of the other alternatives would occur. The analysis for the No Action alternative in the following chapter will describe the possible or likely consequences of not managing the area as proposed in the action alternatives.

Alternative B – The Proposed Action

The description for Alternative B, the Proposed Action, is found in Chapter 1.

Table 2-1. Summary of the Features of the Alternatives.

Feature	Alt. A No Action	Alt. B Proposed Action	Alt. C	Alt. D	Alt. E
Miles of Road Open Yearlong to Wheeled Motorized Use (change from existing)	126 miles	97 miles (-29)	90 miles (-36)	84 miles (-42)	88 miles (-38)
Miles of Road Open Seasonally to Wheeled Motorized Use (change from existing)	13 miles	23 miles (+10)	11 miles (-2)	5 miles (-8)	33 miles (+20)
Net Change in Trail Restriction, from open to wheeled motorized to closed to these vehicles	0	40 miles	72 miles	45 miles	27 miles
Road Decommissioning	0	49 miles	69 miles	69 miles	49 miles
Temporary road construction	0	4 miles	4 miles	4 miles	4 miles
System road construction	0	0 miles	0 miles	0 miles	0 miles
Trail construction	0	1 mile	1 mile	1 mile	1 mile
Timber volume estimate in million board feet	0	49	35	50	56
Total harvest acres	0	4921	3949	5298	5338
- Helicopter Yarding	0	3513	2860	3760	3804
- Skyline Yarding	0	785	690	875	871
- Ground-based Yarding	0	623	399	663	663
Required Winter Logging	0	918	650	991	991
Acres of Tree Planting	0	1354	1221	1462	1472
Insect Control using trap trees and pheromone traps	0	no	no	yes	no

Alternative C

This alternative seeks to maintain and enhance security values for grizzly bear, bald eagle and numerous other wildlife species; protect soils in areas of high burn severity, address old growth management, restrict harvest in riparian areas, and manage for high quality elk and mule deer winter range while meeting the purpose and need of the project. Alternative C addresses Issue 1 (not enough snags are being left on the landscape), Issue 5 (grizzly bear security), Issue 6 (bald eagle and big game security), Issue 8 (water quality), and Issue 9 (old growth) as described in Chapter 1.

Alternative C was developed using the Proposed Action as the base. This alternative reduced salvage harvest in individual acres or dropped units altogether and increased the amount of road restrictions over the Proposed Action. Restrictions on public access to meet or exceed Amendment 19 standards emphasized closing trails to wheeled motorized vehicles over restricting motorized access on roads.

Timber Salvage Management Proposals

Timber salvage and related activities are proposed to meet the purpose and need of this project. Please refer to the Alternative C Proposed Salvage Plan (Figures 2-1 to 2-4) for locations of the salvage units. Vegetation treatments would include:

- Approximately 3949 acres of commercial timber salvage harvest, after patch reductions are included. Harvest activities would occur in 96 different units within the project area. Areas proposed for salvage logging were selected based on the amount, size, and type of burned timber available. Some areas that could be salvaged based on the size and amount of burned timber were avoided due to their Forest Plan management area designation or they were designated as inventoried roadless areas. Only dead trees affected by the fire are targeted for removal; however a small amount of green trees may need to be felled and removed to facilitate the log yarding operations and to meet safety guidelines. Definitions of dead trees are discussed in detail in Appendix E. Each timber salvage unit was designed to be logged using the most economical logging system practical for that particular site while still protecting resources such as soil and water. Some units would be required to be logged in winter conditions for site protection purposes or to maintain grizzly bear security. Please see the unit by unit description in the following table.

- Disposal of landing slash. Commercial timber harvest activities typically generate a large volume of waste wood at the log landing. This material is typically piled at or near the landing and later burned in the fall or early winter when pile burning would not create a wildland fire risk. The number and locations of these landings is not known at this time. Reducing activity related fuels within the salvage units would not be necessary.

- Approximately 1221 acres of tree planting of seedling sized trees of western larch, Douglas-fir, western white pine, and possibly a minor amount of other tree species. Site preparation prior to planting to remove down wood or vegetation that might hinder the planting operations would not be necessary. The remaining acres of salvaged ground would be reforested using natural regeneration methods.

Table 2-2. Alternative C Units for Commercial Timber Harvest.

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
Beta Fire							
1H	22	15	19	2&3	Helicopter	Natural	
1S	19	0	19	2	Skyline	Natural	
2S	59	25	44	1	Skyline	Natural	
3H	57	25	43	1&3	Helicopter	Natural	
4H	29	25	22	1	Helicopter	Natural	
5	7	0	7	1	Ground-based	Natural	yes
6S	10	0	10	2	Skyline	Natural	
9H	76	25	57	1	Helicopter	Natural	
9S	7	0	7	1	Skyline	Natural	
10H	75	15	64	2	Helicopter	Natural	

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
11	5	0	5	3	Ground-based	Natural	yes
11H	58	25	44	1	Helicopter	Natural	
12	68	25	51	1	Ground-based	Natural	yes
13S	123	25	92	1	Skyline	Plant	yes
14H	316	25	237	1&3	Helicopter	Natural	
15H	153	25	115	1	Helicopter	Natural	
16	78	25	59	1	Ground-based	Natural	yes
17S	78	25	59	1	Skyline	Plant	yes
18	9	0	9	3	Ground-based	Natural	yes
18S	84	25	63	1	Skyline	Natural	
19H	25	25	19	1	Helicopter	Natural	
19S	35	25	26	1	Skyline	Natural	
20	3	0	3	3	Ground-based	Natural	yes
21H	10	0	10	2	Helicopter	Natural	
22S	45	25	34	1	Skyline	Natural	
23S	8	0	8	1	Skyline	Natural	
24	11	0	11	1	Ground-based	Natural	yes
25H	330	25	248	1	Helicopter	Natural	
26H	50	25	38	1&3	Helicopter	Plant	
28	9	0	9	3	Ground-based	Natural	yes
subtotal	1859		1432				
Doe Fire							
101H	204	25	153	1	Helicopter	Plant	
102H	20	0	20	2	Helicopter	Natural	
103H	22	15	19	2	Helicopter	Natural	
104H	83	25	62	1	Helicopter	Natural	
105H	25	25	19	1	Helicopter	Natural	
106H	16	0	16	2	Helicopter	Natural	
subtotal	370		289				
Blackfoot Fire							
201H	48	25	36	1	Helicopter	Plant	
202	7	0	7	1	Ground-based	Natural	yes
202H	61	15	52	2	Helicopter	Plant	
202S	6	0	7	2	Skyline	Natural	
203H	91	15	77	1	Helicopter	Plant	
203S	96	25	72	1&3	Skyline	Plant	
204	15	0	15	1&3	Ground-based	Natural	yes
204H	17	0	17	2	Helicopter	Natural	
205H	109	25	82	1	Helicopter	Plant	
206	50	25	38	1&3	Ground-based	Natural	yes
206H	124	15	105	2&3	Helicopter	Plant	
207	4	0	4	1	Ground-based	Natural	yes
207H	74	25	56	1	Helicopter	Natural	
209H	30	15	26	2	Helicopter	Natural	
211	14	0	14	2	Ground-based	Natural	yes
212	31	25	23	1	Ground-based	Natural	yes
212S	20	0	20	2	Skyline	Natural	
213H	10	0	10	2	Helicopter	Natural	
216H	22	25	17	1	Helicopter	Natural	
216S	19	0	19	1	Skyline	Natural	
217H	51	15	43	2	Helicopter	Natural	
218H	6	0	6	2	Helicopter	Natural	
219H	61	25	46	1	Helicopter	Natural	

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
220S	53	15	45	2	Skyline	Natural	
221H	42	15	36	2	Helicopter	Natural	
222H	16	0	16	2	Helicopter	Plant	
223	6	0	6	2	Ground-based	Natural	yes
223H	54	15	46	2	Helicopter	Plant	
224H	40	25	30	1	Helicopter	Natural	
224S	52	25	39	1	Skyline	Natural	
225	8	0	8	1	Ground-based	Natural	yes
225H	33	15	28	2	Helicopter	Natural	
225S	35	25	26	1	Skyline	Natural	
226	9	0	9	2	Ground-based	Natural	yes
226H	86	15	73	2	Helicopter	Natural	
227H	3	0	3	2&3	Helicopter	Natural	
228H	34	15	29	2	Helicopter	Natural	
229H	44	15	37	2	Helicopter	Natural	
subtotal	1481		1223				
Ball Fire							
301H	20	0	20	2	Helicopter	Natural	
302H	11	0	11	1	Helicopter	Natural	
303H	113	25	85	1	Helicopter	Plant	
304H	34	15	29	2	Helicopter	Natural	
305	32	25	24	1	Ground-based	Plant	yes
305H	22	25	17	1	Helicopter	Plant	
306	29	25	22	1	Ground-based	Natural	yes
306H	17	0	17	1	Helicopter	Plant	
307	25	25	19	1	Ground-based	Plant	yes
307H	39	25	29	1	Helicopter	Plant	
308	16	0	16	1	Ground-based	Plant	yes
309H	57	15	43	2	Helicopter	Plant	
310H	11	0	11	1	Helicopter	Natural	
311H	51	25	38	1	Helicopter	Plant	
312H	94	25	71	1	Helicopter	Natural	
317H	96	0	96	1	Helicopter	Natural	
318	20	0	20	1	Ground-based	Natural	yes
319S	113	25	85	1	Skyline	Plant	yes
320S	15	0	15	2	Skyline	Natural	yes
321H	290	25	218	1	Helicopter	Natural	
323	20	0	20	2	Ground-based	Plant	yes
324H	117	15	99	2	Helicopter	Natural	
subtotal	1242		1005				
TOTAL	**4952**		**3949**				

* Units with an H or R designation indicate a helicopter logging system. Units with an S designation indicate a skyline system. All other units use ground-based logging systems.

@ Original Acres are based on size and shapes of units as they were originally prepared and presented to the public in February 2004.

# Patch Percent Reduction: A reduction in unit size is expected during the timber sale layout phase due to unmapped riparian areas, patches with high amounts of live trees, and the need to retain patches of untreated areas in or near treated areas. This reduction will be at a minimum the amount recommended by snag emphasis level. These levels are:
1 = High Emphasis Level (25%), 2 = Moderate Emphasis Level (15%), 3 = Low Emphasis Level (0%)
Units less than or equal to 20 acres did not have a patch reduction objective.

Figure 2-1

Figure 2-2

Figure 2-3

Figure 2-4

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Snag and Down Wood Management Proposals

The management strategy for retaining snags and down wood for Alternative C is the same as the strategy used for Alternative B, the Proposed Action. Snag emphasis levels and patch percent reductions may vary from unit to unit between these alternatives as a result of the influence of a different set of open or closed roads and/or a change in adjacent units. Please see Chapter 1 for a description of the snag and down wood management strategy for Alternative C.

Transportation Management Proposals

Transportation management proposals within the project area for Alternative C would involve temporary road construction, road maintenance, road and trail restrictions, and trail construction. Please refer to the Transportation Plan Map, Figures 2-5 and 2-6.

Road Construction and Maintenance

- Approximately 4.0 miles of temporary road would be built for short term use; these temporary roads would be reclaimed after use. Each of the temporary roads to be constructed is located on a historic road template. No stream crossings would be necessary for all proposed road construction. Temporary roads necessary for Alternative C are the same as those necessary for Alternative B; please see Table 1-3.

- Road maintenance actions consisting of brushing and blading may be needed on some of the haul roads within the project area. Other drainage work such as the placement of drain dips and additional culverts would likely take place. Dust abatement and blading would occur as needed on the main haul routes.

Road and Trail Restrictions

A discussion of rationale for road and trail restrictions and Amendment 19 applicable to Alternative C can be found in the same section for Alternative B in Chapter 1.

Alternative C would modify travel management within the six grizzly bear subunits to meet the ten-year standards from Amendment 19 (refer to Table 2-3). Alternative C has an approach to meeting the A19 standards by emphasizing the restriction of wheeled motorized access on system trails as opposed to restricting motorized public access on roads.

Description of road restriction types, required design, and funding for road restrictions in Alternative C is the same as that for Alternative B in Chapter 1.

All road mileages displayed in the following table are estimated from computer analysis. Actual miles affected during implementation may be slightly more or less than shown in the tables. However, road changes displayed on the maps in this DEIS would be implemented.

Trail Construction

Trail construction on Pioneer Ridge just north of Graves Bay is proposed to create a trail that directly accesses an open road thus eliminating the need to travel a section of closed road to reach the trailhead. Construction would be an extension of Trail 71 and consist of about 5000 feet of new trail. This proposed trail is shown on Figure 2-5.

Table 2-3: Comparison of Alternative C with the Existing Situation (Alternative A) and to Amendment 19 Standards

Grizzly Bear Subunit / A19 Standard	Existing Situation	Alternative C	A19 Standard (10 years)
Ball Branch			
Open Motorized Access Density*	20	8	≤ 19%
Total Motorized Access Density#	8	3	≤ 19%
Security Core @	76	86	≥ 68%
Doris Lost Johnny			
Open Motorized Access Density	60	19	≤ 19%
Total Motorized Access Density	22	13	≤ 19%
Security Core	31	73	≥ 68%
Jewel Basin Graves			
Open Motorized Access Density	22	19	≤ 19%
Total Motorized Access Density	24	19	≤ 19%
Security Core	56	68	≥ 68%
Kah Soldier			
Open Motorized Access Density	32	19	≤ 19%
Total Motorized Access Density	20	17	≤ 19%
Security Core	59	68	≥ 68%
Wheeler Quintonkon			
Open Motorized Access Density	29	19	≤ 19%
Total Motorized Access Density	25	18	≤ 19%
Security Core	54	71	≥ 68%
Wounded Buck Clayton			
Open Motorized Access Density	38	19	≤ 19%
Total Motorized Access Density	42	19	≤ 19%
Security Core	38	70	≥ 68%

* Open Motorized Access Density: percentage of area with less than **one** mile of road per square mile
# Total Motorized Access Density: percentage of area with less than **two** mile of road per square mile
@ Security Core: percentage of land area meeting security core conditions
Grey Cells: meets A19 standards

Table 2-4: Alternative C Travel Management Status

Road and Trail Status	Existing Estimated Miles after Spotted Beetle Implementation	Total estimated miles after implementation of Alternative C
Open Yearlong	126 miles	90 miles
Open Seasonally	13 miles	11 miles
Closed Yearlong/Gate	106 miles	54 miles
Closed Yearlong/Berm	49 miles	78 miles
Closed Yearlong/Natural Revegetation	28 miles	23 miles
Closed Yearlong/Bridge Out	14 miles	14 miles
Decommissioned Roads (since 1995)*	37 miles	37 miles
Proposed to be Decommissioned	n/a	69 miles
Motorized Trails	105 miles	33 miles
Proposed New Non-Motorized Trails	n/a	1 mile

* all of these miles are accomplished or scheduled from the Spotted Beetle Decision Notice

Figure 2-5

Figure 2-6

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Alternative D

This alternative seeks to meet the purpose and need of the project by salvaging more wood material than the Proposed Action. Alternative D addresses Issue 2 (Not Enough Snags are Proposed for Harvest), Issue 3 (Not Enough of the Burned Areas are Being Salvage Logged), Issue 4 (Bark Beetle Management), and Issue 5 (grizzly bear security) as described in Chapter 1.

Alternative D was developed using the Proposed Action as the base. This alternative increased the salvage harvest in units by requiring no more than a 15 percent patch reduction and increasing the minimum diameters for snag retention. The alternative also increased the amount of road restrictions over the Proposed Action. Restrictions on public access to meet or exceed Amendment 19 standards emphasized closing roads to wheeled motorized vehicles over restricting motorized access on trails.

Timber Salvage Management Proposals

Timber salvage and related activities are proposed to meet the purpose and need of this project. Please refer to the Alternative D Proposed Salvage Plan (Figures 2-7 to 2-10) for locations of the salvage units. Vegetation treatments would include:

- Approximately 5298 acres of commercial timber salvage harvest, after patch reductions are included. Harvest activities would occur in 122 different units within the project area. Areas proposed for salvage logging were selected based on the amount, size, and type of burned timber available. Some areas that could be salvaged based on the size and amount of burned timber were avoided due to their Forest Plan management area designation or they were designated as inventoried roadless areas. Only dead trees affected by the fire are targeted for removal; however a small amount of green trees may need to be felled and removed to facilitate the log yarding operations and to meet safety guidelines. Definitions of dead trees are discussed in detail in Appendix E. Each timber salvage unit was designed to be logged using the most economical logging system practical for that particular site while still protecting resources such as soil and water. Some units would be required to be logged in winter conditions for site protection purposes or to maintain grizzly bear security. Please see the unit by unit description in the following table.

- Disposal of landing slash. Commercial timber harvest activities typically generate a large volume of waste wood at the log landing. This material is typically piled at or near the landing and later burned in the fall or early winter when pile burning would not create a wildland fire risk. The number and locations of these landings is not known at this time. Reducing activity related fuels within the salvage units would not be necessary.

- Approximately 1462 acres of tree planting of seedling sized trees of western larch, Douglas-fir, western white pine, and possibly a minor amount of other tree species.

Site preparation prior to planting to remove down wood or vegetation that might hinder the planting operations would not be necessary. The remaining acres of salvaged ground would be reforested using natural regeneration methods.

- Measures for controlling Douglas-fir and spruce bark beetles populations. Beetle numbers would be reduced through salvage harvesting infested trees that do not meet snag retention prescriptions but additional measures such as using trap trees and pheromone traps would be employed. Trap trees are healthy, large diameter spruce and Douglas-fir that would be felled near roads in late April or early May and would be removed later in the summer after large populations of beetles have infested the log. Pheromone traps are plastic devices with a chemical attractant and insecticide that are effective in trapping and killing large numbers of beetles. Locations and numbers of trap trees and pheromone traps can not be determined until beetle populations in invested trees can be assessed. Trap tree numbers are not expected to exceed 100 and pheromone traps would not exceed 25.

Table 2-5. Alternative D Units for Commercial Timber Harvest.

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
Beta Fire							
1H	46	15	39	1&3	Helicopter	Natural	
1R	7	0	7	3	Helicopter	Natural	
1S	39	15	33	1	Skyline	Natural	
2R	1	0	1	3	Helicopter	Natural	
2S	86	15	73	1	Skyline	Natural	
3H	62	15	53	1&3	Helicopter	Natural	
3R	3	0	3	3	Helicopter	Natural	
4H	29	15	25	1	Helicopter	Natural	
4R	11	0	11	2&3	Helicopter	Natural	
5	13	0	13	1	Ground-based	Natural	yes
6S	10	0	10	1	Skyline	Natural	
7	13	0	13	1	Ground-based	Natural	yes
7S	21	15	18	1	Skyline	Natural	
8	7	0	7	1	Ground-based	Natural	yes
9H	81	15	69	1	Helicopter	Natural	
9S	7	0	7	1	Skyline	Natural	
10H	76	15	65	2	Helicopter	Natural	
11	5	0	5	3	Ground-based	Natural	yes
11H	58	15	49	1	Helicopter	Natural	
12	68	15	58	1	Ground-based	Natural	yes
13S	123	15	105	1	Skyline	Plant	yes
14H	351	15	298	1	Helicopter	Natural	
15H	208	15	177	1	Helicopter	Natural	
16	88	15	75	1	Ground-based	Natural	yes
17S	77	15	65	1	Skyline	Plant	yes
18	9	0	9	1	Ground-based	Natural	yes
18S	84	15	71	1	Skyline	Natural	
19H	25	15	21	1	Helicopter	Natural	
19S	35	15	30	2	Skyline	Natural	
20	39	0	39	2&3	Ground-based	Natural	yes

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
21H	20	0	20	2	Helicopter	Natural	
22S	45	15	38	1	Skyline	Natural	
23S	8	0	8	1	Skyline	Natural	
24	11	0	11	1	Ground-based	Natural	yes
25H	330	15	281	1	Helicopter	Natural	
26H	48	15	41	1&3	Helicopter	Plant	
27	30	15	26	1&3	Ground-based	Natural	yes
28	9	0	9	1&3	Ground-based	Natural	yes
subtotals	2183		1883				
Doe Fire							
101H	204	15	173	1	Helicopter	Plant	
102H	20	0	20	2	Helicopter	Natural	
103H	22	15	19	2	Helicopter	Natural	
104H	83	15	71	1	Helicopter	Natural	
105H	25	15	21	1	Helicopter	Natural	
106H	21	15	18	2	Helicopter	Natural	
subtotals	375		322				
Blackfoot Fire							
201H	53	15	45	1	Helicopter	Plant	
202	7	0	7	1	Ground-based	Natural	yes
202H	60	15	51	2	Helicopter	Plant	
202S	6	0	6	2	Skyline	Natural	
203	33	15	28	1	Ground-based	Plant	yes
203H	58	15	49	1	Helicopter	Plant	
203S	96	15	82	1	Skyline	Plant	
204	15	0	15	1	Ground-based	Natural	yes
204H	17	0	17	2	Helicopter	Natural	
205	13	0	13	2&3	Ground-based	Natural	yes
205H	109	15	93	1	Helicopter	Plant	
206	74	15	63	1&3	Ground-based	Natural	yes
206H	113	15	96	1&3	Helicopter	Plant	
207	17	0	17	1	Ground-based	Natural	yes
207H	103	15	88	1	Helicopter	Natural	
207S	15	0	15	1&3	Skyline	Natural	
208H	9	0	9	2&3	Helicopter	Natural	
209H	33	15	28	2	Helicopter	Natural	
210	8	0	8	2&3	Ground-based	Natural	yes
210H	9	0	9	2&3	Helicopter	Natural	
211	14	0	14	2	Ground-based	Natural	yes
212	31	15	26	1	Ground-based	Natural	yes
212S	20	0	20	2	Skyline	Natural	
213H	17	0	17	2	Helicopter	Natural	
214H	9	0	9	2	Helicopter	Natural	
215H	46	0	46	1	Helicopter	Natural	
216H	22	15	19	1	Helicopter	Natural	
216S	28	15	24	1	Skyline	Natural	
217H	71	15	60	1	Helicopter	Natural	
218H	19	0	19	2	Helicopter	Natural	
219H	57	15	48	1	Helicopter	Natural	
220H	16	0	16	2	Helicopter	Natural	
220S	37	15	31	2	Skyline	Natural	
221H	46	15	39	1	Helicopter	Natural	
222H	21	15	18	2	Helicopter	Plant	

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
223	6	0	6	2	Ground-based	Natural	yes
223H	105	15	89	2	Helicopter	Plant	
224H	40	15	34	1	Helicopter	Natural	
224S	60	15	51	1	Skyline	Natural	
225	8	0	8	1	Ground-based	Natural	yes
225H	36	15	31	2	Helicopter	Natural	
225S	35	15	30	1	Skyline	Natural	
226	9	0	9	2	Ground-based	Natural	yes
226H	97	15	82	2	Helicopter	Natural	
227H	3	0	3	2&3	Helicopter	Natural	
228H	34	15	29	2	Helicopter	Natural	
229H	44	15	37	2	Helicopter	Natural	
232R	1	0	1	1	Helicopter	Plant	
234R	4	0	4	1&3	Helicopter	Plant	
235R	9	0	9	3	Helicopter	Plant	
subtotals	1793		1568				
Ball Fire							
301H	48	15	41	1	Helicopter	Natural	
302H	11	0	11	1	Helicopter	Natural	
303H	114	15	97	1	Helicopter	Plant	
304H	43	15	37	1	Helicopter	Natural	
305	32	15	27	1	Ground-based	Plant	yes
305H	22	15	19	1	Helicopter	Plant	
306	29	15	25	1	Ground-based	Natural	yes
306H	17	0	17	1	Helicopter	Plant	
307	25	15	21	1	Ground-based	Plant	yes
307H	39	15	33	1	Helicopter	Plant	
308	16	0	16	2	Ground-based	Plant	yes
309H	100	15	85	2	Helicopter	Plant	
310H	11	0	11	1	Helicopter	Natural	
311H	51	15	43	1	Helicopter	Plant	
312H	107	15	91	1	Helicopter	Natural	
313H	35	15	30	1	Helicopter	Plant	
314	20	0	20	1	Ground-based	Natural	yes
315	28	0	28	2	Ground-based	Natural	yes
316H	5	0	5	2	Helicopter	Natural	
317H	125	0	125	1	Helicopter	Natural	
318	27	0	27	1	Ground-based	Natural	yes
319S	123	15	105	1	Skyline	Plant	yes
320S	62	15	53	2	Skyline	Natural	yes
321H	274	15	233	1	Helicopter	Natural	
322H	153	15	130	2	Helicopter	Natural	
323	20	0	20	2	Ground-based	Plant	yes
323H	20	0	20	2	Helicopter	Natural	
324H	182	15	155	1	Helicopter	Natural	
subtotals	1739		1525				
TOTAL	**6090**		**5298**				

***** Units with an H or R designation indicate a helicopter logging system. Units with an S designation indicate a skyline system. All other units use ground-based logging systems.

@ Original Acres are based on size and shapes of units as they were originally prepared and presented to the public in February, 2004.

# Patch Percent Reduction: A reduction in unit size is expected during the timber sale layout phase due to unmapped riparian areas, patches with high amounts of live trees, and the need to retain patches of untreated areas in or near treated areas. This reduction will be at a minimum the amount recommended by snag emphasis level. These levels are:
1 = High Emphasis Level (25%), 2 = Moderate Emphasis Level (15%), 3 = Low Emphasis Level (0%)
Units less than or equal to 20 acres did not have a patch reduction objective.

Snag and Down Wood Management Proposals

The management strategy for retaining snags and down wood for Alternative D is similar to the strategy used for Alternative B, the Proposed Action. The deadwood prescription in Alternative D was altered (Table 2-6) to leave fewer dispersed trees and smaller unentered leave patches to address the issues mentioned above. Only the largest diameter western larch and Douglas fir snags would be retained in the salvage units, with many other large larch and Douglas-fir salvaged (Table 2-5, above).

Table 2-6. Deadwood Habitat Prescriptions Specific to Alternative D. See Exhibit Rd-8 for details.

Element	Prescription by Snag Emphasis Level		
	High (1)	**Moderate (2)**	**Low (3)**
Western Larch Snags (≥ 10 feet tall and where safe to leave standing)	Beta Fire: ≥ 22" DBH Doe and Blackfoot Fires: ≥ 22" DBH Ball Fire: ≥ 23" DBH	Beta Fire: ≥ 23" DBH Doe and Blackfoot Fires: ≥ 25" Ball Fire: ≥ 24" DBH	Leave only if have broken tops, nest holes, or decay.
Douglas-fir Snags (≥ 10 feet tall and where safe to leave standing)	Beta Fire: ≥ 25" DBH Doe, Blackfoot, and Ball Fires: ≥ 27"		
Units larger than 20 acres that were severely or moderately burned, OR had less than 4 larch or Douglas-fir per acre and low-severity fire. *	If necessary, add to the unentered leave patches (riparian areas, inoperable areas, etc.) to bring the total to at least 15% of the unit acreage.		Additional reserve patch areas not required for snags.

* = Acreage and percentages are based on original Proposed Action unit size.

Transportation Management Proposals

Transportation management proposals within the project area for Alternative D would involve temporary road construction, road maintenance, road and trail restrictions, and trail construction. Please refer to the Transportation Plan Map, Figures 2-11 and 2-12.

Road Construction and Maintenance

- Approximately 4.0 miles of temporary road would be built for short term use; these temporary roads would be reclaimed after use. Each of the temporary roads to be constructed is located on a historic road template. No stream crossings would be necessary for all proposed road construction. Temporary roads necessary for Alternative D are the same as those necessary for Alternative B; please see Table 1-3.

- Road maintenance actions consisting of brushing and blading may be needed on some of the haul roads within the project area. Other drainage work such as the placement of drain dips and additional culverts would likely take place. Dust abatement and blading would occur as needed on the main haul routes.

Road and Trail Restrictions

A discussion of rationale for road and trail restrictions and Amendment 19 applicable to Alternative D can be found in the same section for Alternative B in Chapter 1.

Alternative D would modify travel management within the six grizzly bear subunits to meet the ten-year standards from Amendment 19 (refer to Table 2-7). Alternative D has an approach to meeting the A19 standards by emphasizing the restriction of wheeled motorized access on system roads and trying to maintain as much wheeled motorized access on systems trails as possible.

Table 2-7: Comparison of Alternative D with the Existing Situation (Alternative A) and to Amendment 19 Standards

Grizzly Bear Subunit / A19 Standard	Existing Situation	Alternative D	A19 Standard (10 years)
Ball Branch			
Open Motorized Access Density*	20	12	≤ 19%
Total Motorized Access Density#	8	3	≤ 19%
Security Core @	76	82	≥ 68%
Doris Lost Johnny			
Open Motorized Access Density	60	19	≤ 19%
Total Motorized Access Density	22	13	≤ 19%
Security Core	31	72	≥ 68%
Jewel Basin Graves			
Open Motorized Access Density	22	19	≤ 19%
Total Motorized Access Density	24	19	≤ 19%
Security Core	56	68	≥ 68%
Kah Soldier			
Open Motorized Access Density	32	19	≤ 19%
Total Motorized Access Density	20	18	≤ 19%
Security Core	59	68	≥ 68%
Wheeler Quintonkon			
Open Motorized Access Density	29	19	≤ 19%
Total Motorized Access Density	25	19	≤ 19%
Security Core	54	68	≥ 68%
Wounded Buck Clayton			
Open Motorized Access Density	38	19	≤ 19%
Total Motorized Access Density	42	19	≤ 19%
Security Core	38	68	≥ 68%

* Open Motorized Access Density: percentage of area with less than **one** mile of road per square mile
# Total Motorized Access Density: percentage of area with less than **two** mile of road per square mile
@ Security Core: percentage of land area meeting security core conditions
Grey Cells: meets A19 standards

Figure 2-7

Figure 2-8

Figure 2-9

Figure 2-10

Figure 2-11

Figure 2-12

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Description of road restriction types, required design, and funding for road restrictions in Alternative D is the same as that for Alternative B in Chapter 1.

All road mileages displayed in the following table are estimated from computer analysis. Actual miles affected during implementation may be slightly more or less than shown in the tables. However, road changes displayed on the maps in this DEIS would be implemented.

Table 2-8: Alternative D Travel Management Status

Road and Trail Status	Existing Estimated Miles after Spotted Beetle Implementation	Total estimated miles after implementation of Alternative D
Open Yearlong	126 miles	84 miles
Open Seasonally	13 miles	5 miles
Closed Yearlong/Gate	106 miles	60 miles
Closed Yearlong/Berm	49 miles	82 miles
Closed Yearlong/Natural Revegetation	28 miles	23 miles
Closed Yearlong/Bridge Out	14 miles	14 miles
Decommissioned Roads (since 1995)*	37 miles	37 miles
Proposed to be Decommissioned	n/a	69 miles
Motorized Trails	105 miles	60 miles
Proposed New Non-Motorized Trails	n/a	1 mile

* all of these miles are accomplished or scheduled from the Spotted Beetle Decision Notice

Trail Construction

Trail construction on Pioneer Ridge just north of Graves Bay is proposed to create a trail that directly accesses an open road thus eliminating the need to travel a section of closed road to reach the trailhead. Construction would be an extension of Trail 71 and consist of about 5000 feet of new trail. This proposed trail is shown on Figure 2-11.

Alternative E

This alternative seeks to meet the purpose and need of the project by salvaging more wood material than the Proposed Action. Alternative E addresses Issue 2 (Not Enough Snags are Proposed for Harvest), Issue 3 (Not Enough of the Burned Areas are Being Salvage Logged), Issue 5 (grizzly bear security), and Issue 7 (Public Motorized Access is Reduced Too Much) as described in Chapter 1.

Alternative E was developed using the Proposed Action as the base. This alternative increased the salvage harvest in units by requiring no more than a 15 percent patch reduction and increasing the minimum diameters for snag retention in the same way as Alternative D. The alternative also decreased the amount of road restrictions over the Proposed Action slightly and added a feature of closing some roads with gates in the spring of the year that are open yearlong in the other alternatives for enhanced early season grizzly bear security.

Timber Salvage Management Proposals

Timber salvage and related activities are proposed to meet the purpose and need of this project. Initial unit configurations and acreage for proposed areas of salvage in this alternative are identical to those in Alternative B. Please refer to the Alternative B Proposed Salvage Plan (Figures 1-2 to 1-5) for locations of the salvage units for Alternative E. Vegetation treatments would include:

- Approximately 5338 acres of commercial timber salvage harvest, after patch reductions are included. Harvest activities would occur in 131 different units within the project area. Areas proposed for salvage logging were selected based on the amount, size, and type of burned timber available. Some areas that could be salvaged based on the size and amount of burned timber were avoided due to their Forest Plan management area designation or they were designated as inventoried roadless areas. Only dead trees affected by the fire are targeted for removal; however a small amount of green trees may need to be felled and removed to facilitate the log yarding operations and to meet safety guidelines. Definitions of dead trees are discussed in detail in Appendix E. Each timber salvage unit was designed to be logged using the most economical logging system practical for that particular site while still protecting resources such as soil and water. Some units would be required to be logged in winter conditions for site protection purposes or to maintain grizzly bear security. Please see the unit by unit description in the following table.

- Disposal of landing slash. Commercial timber harvest activities typically generate a large volume of waste wood at the log landing. This material is typically piled at or near the landing and later burned in the fall or early winter when pile burning would not create a wildland fire risk. The number and locations of these landings is not known at this time. Reducing activity related fuels within the salvage units would not be necessary.

- Approximately 1472 acres of tree planting of seedling sized trees of western larch, Douglas-fir, western white pine, and possibly a minor amount of other tree species. Site preparation prior to planting to remove down wood or vegetation that might hinder the planting operations would not be necessary. The remaining acres of salvaged ground would be reforested using natural regeneration methods.

Table 2-9. Alternative E Units for Commercial Timber Harvest.

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
Beta Fire							
1H	46	15	39	1	Helicopter	Natural	
1R	7	0	7	3	Helicopter	Natural	
1S	39	15	33	1&3	Skyline	Natural	
2R	1	0	1	3	Helicopter	Natural	
2S	85	15	72	1&3	Skyline	Natural	
3H	62	15	53	1&3	Helicopter	Natural	

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
3R	3	0	3	3	Helicopter	Natural	
4H	28	15	24	1&3	Helicopter	Natural	
4R	11	0	11	3	Helicopter	Natural	
5	13	0	13	1&3	Ground-based	Natural	yes
5R	8	0	8	3	Helicopter	Natural	
6R	7	0	7	3	Helicopter	Natural	
6S	10	0	10	1&3	Skyline	Natural	
7	13	0	13	1&3	Ground-based	Natural	yes
7R	7	0	7	3	Helicopter	Natural	
7S	21	15	18	1&3	Skyline	Natural	
8	7	0	7	1&3	Ground-based	Natural	yes
8R	9	0	9	3	Helicopter	Natural	
9H	81	15	69	1&3	Helicopter	Natural	
9R	4	0	4	3	Helicopter	Natural	
9S	7	0	7	1	Skyline	Natural	
10H	76	15	65	2	Helicopter	Natural	
10R	2	0	2	3	Helicopter	Natural	
11	5	0	5	3	Ground-based	Natural	yes
11H	58	15	49	1	Helicopter	Natural	
12	68	15	58	1	Ground-based	Natural	yes
13S	123	15	105	1	Skyline	Plant	yes
14H	351	15	298	1&3	Helicopter	Natural	
15H	208	15	177	1	Helicopter	Natural	
16	88	15	75	1	Ground-based	Natural	yes
17S	77	15	65	1&3	Skyline	Plant	yes
18	9	0	9	3	Ground-based	Natural	yes
18S	84	15	71	1&3	Skyline	Natural	
19H	23	15	20	1&3	Helicopter	Natural	
19S	33	15	28	1&3	Skyline	Natural	
20	39	0	39	2&3	Ground-based	Natural	yes
21H	20	0	20	2	Helicopter	Natural	
22S	43	15	37	1&3	Skyline	Natural	
23S	8	0	8	1&3	Skyline	Natural	
24	11	0	11	1&3	Ground-based	Natural	yes
25H	329	15	280	1&3	Helicopter	Natural	
26H	50	15	43	1&3	Helicopter	Plant	
27	30	15	26	1&3	Ground-based	Natural	yes
28	9	0	9	3	Ground-based	Natural	yes
subtotal	2213		1915				
Doe Fire							
101H	204	15	173	1	Helicopter	Plant	
102H	20	0	20	2	Helicopter	Natural	
103H	22	15	19	2	Helicopter	Natural	
104H	83	15	71	1	Helicopter	Natural	
105H	25	15	21	1	Helicopter	Natural	
106H	21	15	18	2	Helicopter	Natural	
subtotal	375		322				
Blackfoot Fire							
201H	53	15	45	1	Helicopter	Plant	
202	7	0	7	1	Ground-based	Natural	yes
202H	60	15	51	2	Helicopter	Plant	
202S	6	0	6	2	Skyline	Natural	
203	33	15	28	1	Ground-based	Plant	yes

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
203H	58	15	49	1	Helicopter	Plant	
203S	96	15	82	1&3	Skyline	Plant	
204	15	0	15	1&3	Ground-based	Natural	yes
204H	17	0	17	2	Helicopter	Natural	
205	13	0	13	2	Ground-based	Natural	yes
205H	109	15	93	1	Helicopter	Plant	
206	74	15	63	1&3	Ground-based	Natural	yes
206H	113	15	96	2&3	Helicopter	Plant	
207	17	0	17	1	Ground-based	Natural	yes
207H	103	15	88	1	Helicopter	Natural	
207S	15	0	15	1&3	Skyline	Natural	
208H	9	0	9	2&3	Helicopter	Natural	
209H	33	15	28	2	Helicopter	Natural	
210	8	0	8	2&3	Ground-based	Natural	yes
210H	9	0	9	2&3	Helicopter	Natural	
211	14	0	14	2	Ground-based	Natural	yes
212	31	15	26	1	Ground-based	Natural	yes
212S	20	0	20	2	Skyline	Natural	
213H	17	0	17	2	Helicopter	Natural	
214H	9	0	9	2	Helicopter	Natural	
215H	46	0	46	2	Helicopter	Natural	
216H	22	15	19	1	Helicopter	Natural	
216S	28	15	24	1	Skyline	Natural	
217H	71	15	60	1	Helicopter	Natural	
218H	19	0	19	2	Helicopter	Natural	
219H	57	15	48	1	Helicopter	Natural	
220H	16	0	16	2	Helicopter	Natural	
220S	37	15	31	2	Skyline	Natural	
221H	46	15	39	2	Helicopter	Natural	
222H	21	15	18	2	Helicopter	Plant	
223	6	0	6	2	Ground-based	Natural	yes
223H	105	15	89	2	Helicopter	Plant	
224H	40	15	34	1	Helicopter	Natural	
224S	60	15	51	1	Skyline	Natural	
225	8	0	8	1	Ground-based	Natural	yes
225H	36	15	31	2	Helicopter	Natural	
225S	35	15	30	1	Skyline	Natural	
226	9	0	9	2	Ground-based	Natural	yes
226H	97	15	82	2	Helicopter	Natural	
227H	3	0	3	2	Helicopter	Natural	
228H	34	15	29	2	Helicopter	Natural	
229H	44	15	37	2	Helicopter	Natural	
230R	6	0	6	3	Helicopter	Plant	
231R	2	0	2	1	Helicopter	Plant	
232R	1	0	1	3	Helicopter	Plant	
234R	4	0	4	3	Helicopter	Plant	
235R	9	0	9	3	Helicopter	Plant	
subtotal	1801		1576				
Ball Fire							
301H	48	15	41	1	Helicopter	Natural	
302H	11	0	11	1	Helicopter	Natural	
303H	114	15	97	1	Helicopter	Plant	

Unit Number*	Original Acres@	Patch Percent Reduction#	Revised Acres	Snag Emphasis Level	Yarding System	Regeneration Method	Winter Logging Required?
304H	43	15	37	1	Helicopter	Natural	
305	32	15	27	1	Ground-based	Plant	yes
305H	22	15	19	1	Helicopter	Plant	
306	29	15	25	1	Ground-based	Natural	yes
306H	17	0	17	1	Helicopter	Plant	
307	25	15	21	1	Ground-based	Plant	yes
307H	39	15	33	1	Helicopter	Plant	
308	16	0	16	1	Ground-based	Plant	yes
309H	100	15	85	2	Helicopter	Plant	
310H	11	0	11	1	Helicopter	Natural	
311H	51	15	43	1	Helicopter	Plant	
312H	107	15	91	1	Helicopter	Natural	
313H	35	15	30	1	Helicopter	Plant	
314	20	0	20	1	Ground-based	Natural	yes
315	28	0	28	2	Ground-based	Natural	yes
316H	5	0	5	2	Helicopter	Natural	
317H	125	0	125	1	Helicopter	Natural	
318	27	0	27	1	Ground-based	Natural	yes
319S	123	15	105	1	Skyline	Plant	yes
320S	62	15	53	2	Skyline	Natural	yes
321H	274	15	233	1	Helicopter	Natural	
322H	153	15	130	2	Helicopter	Natural	
323	20	0	20	2	Ground-based	Plant	yes
323H	20	0	20	2	Helicopter	Natural	
324H	182	15	155	1	Helicopter	Natural	
subtotal	1739		1525				
TOTAL	**6128**		**5338**				

* Units with an H or R designation indicate a helicopter logging system. Units with an S designation indicate a skyline system. All other units use ground-based logging systems.

@ Original Acres are based on size and shapes of units as they were originally prepared and presented to the public in February, 2004.

# Patch Percent Reduction: A reduction in unit size is expected during the timber sale layout phase due to unmapped riparian areas, patches with high amounts of live trees, and the need to retain patches of untreated areas in or near treated areas. This reduction will be at a minimum the amount recommended by snag emphasis level. These levels are:
1 = High Emphasis Level (25%), 2 = Moderate Emphasis Level (15%), 3 = Low Emphasis Level (0%)
Units less than or equal to 20 acres did not have a patch reduction objective.

Snag and Down Wood Management Proposals

The management strategy for retaining snags and down wood for Alternative E is the same as the strategy used for Alternative D. Snag emphasis levels and patch percent reductions may vary from unit to unit between these alternatives as a result of the influence of a different set of open or closed roads and/or a change in adjacent units. Please see the discussion above in the Alternative D section for Snag and Down Wood Management Proposals for a description of the snag and down wood management strategy for Alternative E.

Transportation Management Proposals

Transportation management proposals within the project area for Alternative E would involve temporary road construction, road maintenance, road and trail restrictions, and trail construction. Please refer to the Transportation Plan Map, Figures 2-13 and 2-14.

Road Construction and Maintenance

- Approximately 4.0 miles of temporary road would be built for short term use; these temporary roads would be reclaimed after use. Each of the temporary roads to be constructed is located on a historic road template. No stream crossings would be necessary for all proposed road construction. Temporary roads necessary for Alternative E are the same as those necessary for Alternative B; please see Table 1-3.

- Road maintenance actions consisting of brushing and blading may be needed on some of the haul roads within the project area. Other drainage work such as the placement of drain dips and additional culverts would likely take place. Dust abatement and blading would occur as needed on the main haul routes.

Road and Trail Restrictions

A discussion of rationale for road and trail restrictions and Amendment 19 applicable to Alternative E can be found in the same section for Alternative B in Chapter 1.

Alternative E would modify travel management within the six grizzly bear subunits to meet or make progress toward meeting the ten-year standards from Amendment 19 while allowing for continued motorized access to the most popular areas on the west side of Hungry Horse Reservoir (refer to Table 2-10). Project-specific forest plan amendments would be prepared to amend the Forest Plan to different standards for open density and security core in the Doris Lost Johnny subunit, open density in the Wheeler Quintonkon subunit, and open and total density plus security core in the Wounded Buck Clayton subunit in the Record of Decision if this alternative is selected for implementation.

A feature of Alternative E is seasonal road closures from April 1 to July 1 for wheeled motorized vehicles on five different road systems. These closures are designed to reduce the amount of grizzly bear disturbance during important spring habitat use. The roads proposed for spring closure are shown in the following table.

Description of road restriction types, required design, and funding for road restrictions in Alternative E is the same as that for Alternative B in Chapter 1.

All road mileages displayed in the following table are estimated from computer analysis. Actual miles affected during implementation may be slightly more or less than shown in the tables. However, road changes displayed on the maps in this DEIS would be implemented.

Figure 2-13

Figure 2-14

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Table 2-10: Comparison of Alternative E with the Existing Situation (Alternative A) and to Amendment 19 Standards

Grizzly Bear Subunit / A19 Standard	Existing Situation	Alternative E	A19 Standard (10 years)
Ball Branch			
Open Motorized Access Density*	20	12	≤ 19%
Total Motorized Access Density#	8	3	≤ 19%
Security Core @	76	82	≥ 68%
Doris Lost Johnny			
Open Motorized Access Density	60	57	≤ 19%
Total Motorized Access Density	22	19	≤ 19%
Security Core	31	36	≥ 68%
Jewel Basin Graves			
Open Motorized Access Density	22	19	≤ 19%
Total Motorized Access Density	24	19	≤ 19%
Security Core	56	68	≥ 68%
Kah Soldier			
Open Motorized Access Density	32	19	≤ 19%
Total Motorized Access Density	20	18	≤ 19%
Security Core	59	68	≥ 68%
Wheeler Quintonkon			
Open Motorized Access Density	29	25	≤ 19%
Total Motorized Access Density	25	19	≤ 19%
Security Core	54	68	≥ 68%
Wounded Buck Clayton			
Open Motorized Access Density	38	27	≤ 19%
Total Motorized Access Density	42	30	≤ 19%
Security Core	38	65	≥ 68%

* Open Motorized Access Density: percentage of area with less than **one** mile of road per square mile
# Total Motorized Access Density: percentage of area with less than **two** mile of road per square mile
@ Security Core: percentage of land area meeting security core conditions
Grey Cells: meets A19 standards

Table 2-11: Alternative E Spring Season Road Closures

Road Name/Drainage	Road Number(s)	Miles of Spring Season Road Closure
Wounded Buck	895C	1.5 miles
Clayton Creek	1633 / 2817	2.7 / 2.5 miles
Graves Creek	897	1.8 miles
Mazie Creek	5326	3.9 miles
Quintonkon Creek	381 / 381A	8.0 / 0.4 miles
	Total:	**20.8 miles**

Trail Construction

Trail construction on Pioneer Ridge just north of Graves Bay is proposed to create a trail that directly accesses an open road thus eliminating the need to travel a section of closed road to reach the trailhead. Construction would be an extension of Trail 71 and consist of about 5000 feet of new trail. This proposed trail is shown on Figure 2-13.

Table 2-12: Alternative E Travel Management Status

Road and Trail Status	Existing Estimated Miles after Spotted Beetle Implementation	Total estimated miles after implementation of Alternative E
Open Yearlong	126 miles	88 miles
Open Seasonally	13 miles	33 miles
Closed Yearlong/Gate	106 miles	46 miles
Closed Yearlong/Berm	49 miles	85 miles
Closed Yearlong/Natural Revegetation	28 miles	23 miles
Closed Yearlong/Bridge Out	14 miles	14 miles
Decommissioned Roads (since 1995)*	37 miles	37 miles
Proposed to be Decommissioned	n/a	49 miles
Motorized Trails	105 miles	78 miles
Proposed New Non-Motorized Trails	n/a	1 mile

* all of these miles are accomplished or scheduled from the Spotted Beetle Decision Notice

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of one or more of the purpose and need statements, impractical to implement due to limited funding opportunities, or determined to have components that would cause unnecessary environmental harm. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Burned-up Old Growth should not be Salvage Logged

An alternative was requested that would not salvage harvest areas identified as old growth prior to the wildland fire events in 2003 because they exhibit important ecological properties, no matter how severely they burned. Areas identified as old growth prior to the 2003 fires that initially appeared to have a live tree component from aerial photo interpretation were excluded from salvage in Alternative C. Areas of high burn intensity that showed complete or nearly complete tree mortality on aerial photos were available for inclusion in the Proposed Action because these areas do not meet regional standards for old growth as defined by Green et al. (1992) because not enough live trees remain. Old growth forests do not stay old growth indefinitely. Fire, wind, insects, disease, and other disturbances may substantially alter or eliminate old growth communities. In recognition of this, Forest Plan Amendment 21 has standards to retain sufficient structure (live trees, snags, and downed logs) to provide for ecosystem functions in the matrix that surrounds old growth forests. Concerns regarding snag and downed wood habitats drove in development of Alternative C.

Forest Plan Management Areas Unsuitable for Timber Management should not be Salvage Logged

We were requested to avoid salvage harvesting in areas that the Forest Plan has identified as not suitable for long-term timber management to protect the resource values associated with these management areas. Forest Plan Management Areas located within units proposed for timber salvage and listed as unsuitable for timber management are Management Areas 2A, 2B, and 12. Please see Appendix B for descriptions of these Management Areas. The following table depicts the number of proposed salvage acres in each of these Management Areas.

Table 2-13. Acres* Unsuitable for Timber Harvest Proposed for Salvage Harvest

Management Area	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
MA 2A	0	20	20	20	20
MA 2B	0	178	130	178	178
MA 12	0	30	7	28	30

*Original Acres before patch reductions

Salvage harvest is allowed in these Management Areas under Forest Plan standards as long as important resource values are maintained, protected, or enhanced. We determined that our methods for salvage logging would meet these standards.

Rehabilitation of the Fire Areas Does Not Require Salvage Logging

An alternative designed to rehabilitate and restore the fire-affected areas with little to no salvage logging was considered. The alternative would include such actions as road decommissioning, tree planting, and reducing sediment sources. Road decommissioning is already a feature in all of the action alternatives. Reducing sediment through road improvements (e.g. installing cross-drain culverts and drain dips) is currently being implemented throughout various portions of the project area. Reforestation outside of proposed salvage units is currently being assessed and could occur over the next several years. Some of the rehabilitation actions needed to protect watersheds from the effects of the fire was done immediately after the fire. These actions included aerial seeding, placing straw wattles on severely burned areas, and cleaning road ditches. Additional watershed rehabilitation treatments and monitoring of the effectiveness of the completed work is continuing this year.

A restoration alternative without commercial timber harvest was eliminated for detailed study because it would not meet the project's Purpose and Need for action (please refer to Chapter 1 of this document). One of the purposes of the project is to recover merchantable wood fiber and contribute to the long-term yield of forest products, which is a Forest Plan goal. This would not be achieved if salvaging of merchantable wood did not take place.

The Knutson-Vandenburg Act of 1930 (PL 71-319, as amended) allows for funds generated from the sale of national forest timber to be used for forest improvement work within the sale

area. Much of the proposed road decommissioning and tree planting work may be accomplished with these funds. Congressionally appropriated funds are often limited and using K-V funds are legitimate to accomplish restoration activities.

Fuels Reduction in the Burned Areas is Necessary to Reduce the Potential for Future Wildland Fires

An alternative was considered to address the potential for future wildland fire events through fuels reduction activities both within the proposed harvest areas and outside these areas. Individuals and groups responding to our proposed action pointed out that "reburns" have been historically documented in fires like the ones that burned in 2003 and have the potential to create significant damage to the environment and human improvements.

An alternative to treat fuels outside of the proposed salvage harvest units was not fully developed because this activity would be beyond the scope of the purpose and need of the project. Fuel reduction on a landscape scale in this area could be part of some future environmental analysis.

There would be substantial reduction to the fuel bed mosaic accomplished within proposed salvage harvest units; please refer to the Fire and Fuels section of Chapter 3 for details. An alternative to further treat fuels inside these units beyond what would be accomplished with the salvage operations was not fully developed because soil conditions and the lack of live vegetation in the post-fire environment are not favorable to excavator piling or broadcast burning. Soil displacement and compaction using excavators are concerns on the steep slopes and burn intensities found on most of the proposed salvage units, please refer to the Soils section of Chapter 3 for details. Broadcast burning in a post-wildfire environment would be difficult due to the lack of fine fuels. A second burning activity soon after the wildland fire would also raise concerns over the adverse affects to the soil resource. Yarding unmerchantable material to landings is cost prohibitive, particularly using helicopter yarding systems.

Too Much Helicopter Yarding is Being Proposed

Many comments were received asking us to consider less helicopter yarding systems than what was shown in the Proposed Action because helicopter yarding does not provide enough economic income to the local economy. They said helicopter logging is very expensive and requires contractors who do not employ local workers. The concern was also expressed that the material proposed for salvage would loose value quickly to deterioration and checking and would not be valuable enough to make helicopter yarding economically viable.

The project area has a history of timber harvest in the Forest Plan suitable base spanning the past several decades. This previous timber harvest and road construction accessed the "easy" ground leaving less economically viable areas alone. Many of these areas burned in 2003 and then became available for our Proposed Action.

Early in the alternative development process, the district rangers determined new system road would not be built, temporary road construction would be discouraged, and previously built road templates might be available for temporary road construction. Without new roads to access burned areas of merchantable timber, helicopter systems were often the only method available.

Compared to many areas on the Flathead National Forest, the project area presents challenges to removing timber because of the very steep and relatively moist sites. Damage to soil and water resources is possible if ground-based or even skyline systems are employed in these types of conditions. Helicopter yarding, which typically picks logs straight up, reduces the potential for soil damage on moist and steep sites.

After receiving these comments, we went back to the Proposed Action logging plan and reviewed all salvage units designated for helicopter yarding. This analysis confirmed our initial plan and very few acres were considered for a change to ground-based or skyline logging systems. An alternative that considered less helicopter yarding was rejected.

Comparison of Alternatives

Although Chapter 3 presents a detailed discussion of the environmental effects of the alternatives, Chapter 2 concludes with a summary of the effects of the alternatives. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Comparison By Issue

Each alternative is evaluated for its effects on resources emphasized by key issues, which are the issues that drove the development of alternatives. Issue indicators are the parameters used to measure the effects of each alternative on the resources emphasized by those issues. These are summarized in the following table. A comparison between the effects of the alternatives on resources of concern is summarized in narrative form in the Summary section at the beginning of this document.

Table 2-14. Response of Alternatives to Issues.

Issue and Issue Indicators:	Alt. A No Action	Alt. B Proposed Action	Alt. C	Alt. D	Alt. E
#1. Not Enough Snags are being left					
• Average density of large larch and Douglas-fir after salvage across salvage units that support these trees	Beta/Doris: 7/ac Blackfoot/Doe: 11/ac Ball: 10/ac	Beta/Doris: 6/ac Blackfoot/Doe: 7/ac Ball: 8/ac	Beta/Doris: 7/ac Blackfoot/Doe: 9/ac Ball: 10/ac	Beta/Doris: 4/ac Blackfoot/Doe: 6/ac Ball: 5/ac	Beta/Doris: 4/ac Blackfoot/Doe: 6/ac Ball: 5/ac
• Percent of each fire area with high densities of large larch and Douglas-fir after salvage	Beta/Doris: 5% Blackfoot/Doe: 10% Ball: 8%	Beta/Doris: 4% Blackfoot/Doe: 9% Ball: 7%	Beta/Doris: 4% Blackfoot/Doe: 10% Ball: 8%	Beta/Doris: 1% Blackfoot/Doe: 8% Ball: 3%	Beta/Doris: 1% Blackfoot/Doe: 8% Ball: 3%

Issue and Issue Indicators:	Alt. A No Action	Alt. B Proposed Action	Alt. C	Alt. D	Alt. E
#2. Not Enough Snags are being salvaged					
• Average density of large larch and Douglas-fir removed by salvage across salvage units that support these trees	Beta/Doris: 0/ac Blackfoot/Doe: 0/ac Ball: 0/ac	Beta/Doris: 1/ac Blackfoot/Doe: 4/ac Ball: 2/ac	Beta/Doris: 0/ac Blackfoot/Doe: 2/ac Ball: 0/ac	Beta/Doris: 3/ac Blackfoot/Doe: 5/ac Ball: 5/ac	Beta/Doris: 3/ac Blackfoot/Doe: 5/ac Ball: 5/ac
• Percent of each fire area without high densities of large larch and Douglas-fir after salvage	Beta/Doris: 95% Blackfoot/Doe: 90% Ball: 92%	Beta/Doris: 96% Blackfoot/Doe: 81% Ball: 93%	Beta/Doris: 96% Blackfoot/Doe: 90% Ball: 92%	Beta/Doris: 99% Blackfoot/Doe: 92% Ball: 97%	Beta/Doris: 99% Blackfoot/Doe: 92% Ball: 97%
#3. Not Enough Salvage					
• Acres of salvage logging proposed	0	4921	3949	5298	5338
#4. Bark Beetle Management					
• Number of estimated traps:					
Trap Trees	0	0	0	<100	0
Pheromone Traps	0	0	0	<25	0
#5 Grizzly Bear Security					
• Number of A19 component standards met or exceeded	2	13	18	18	12
#6 Bald Eagle Security and Big Game Winter Range					
• Acres of bald eagle habitat alteration within the nest site area	0	39	0	39	39
• Acres of salvage in older Douglas-fir stands that burned at low or moderate intensity in known ungulate winter range	0	96	0	96	96
#7 Public Motorized Access is Reduced Too Much					
• Miles of road closed yearlong to public wheeled motorized vehicles over the existing condition	0	29	36	42	38
#8 Water Quality					
• Acres of salvage harvest in riparian areas or areas of high burn severity and steep slopes near streams	0	166	0	167	166
#9 Possible and "Recruit-ment" Old Growth					
• Acres of salvage harvest in pre-fire old growth with unknown post-fire status (would be dropped if post-fire survey reveals it is still old growth habitat)	0	766	0	766	766
• Acres of salvage harvest in "recruitment old growth"	0	179	0	177	177