

CHAPTER 2 - ALTERNATIVES

Introduction

This chapter describes and compares the alternatives considered for the Sheppard Creek Post-Fire Project. It includes a verbal description, a series of tables, and a map 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.

The proposed action and alternatives for the Sheppard Creek Project were developed from the purpose and need for the project and the issues identified in Chapter One. The ID Team grouped the alternatives into one of two categories referred to as “alternatives considered in detail” and “alternatives considered but eliminated from detailed study.” Rationale has been provided for alternatives not studied in detail.

Alternatives Considered in Detail

The ID Team developed four alternatives which include the No Action, Proposed Action (Alternative B), and Alternatives C and D. All alternatives, except the No Action, are intended to meet the Purpose and Need for the decision but utilized different approaches. Alternatives B, C, and D are referred to as “action alternatives.”

The ID Team created the proposed action using resource information from historic records, data derived from aerial photography and satellites, and direct field observations to identify treatment areas and formulate potential treatment prescriptions to different land units. Alternatives C and D provide a different response by applying the significant issues to the activities presented in the proposed action. Each action alternative represents a site-specific proposal developed through intensive interdisciplinary evaluation of current and desired conditions, based on field verification.

The proposed action and the other action alternatives respond to the goals and objectives outlined in the Forest Plan, and help move the project area towards desired conditions described in that plan. The Forest Plan embodies the provisions of the National Forest Management Act (NFMA), its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Flathead National Forest. This Draft EIS tiers to the Forest Plan Final EIS and Record of Decision, in compliance with 40 CFR 1502.2. The Forest Plan uses “management areas,” or MAs, to guide management of National Forest System lands. Each MA provides a unique combination of activities, practices, and uses. Activities would take place in the Sheppard Creek Project area within Management Areas 2C, 7, 12, 15, and 17, as described in the Forest

Plan (2001 version) on pages III-5 through III-11, III-25 through III-30, III-52 through III-60, III-70 through III-76, and III-82 through III-88. Descriptions of the goals and objectives of these and all management areas in the project area are described in Appendix B of this DEIS.

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 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.

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 the late fall of 2008. If a bark beetle infestation is determined to be likely, salvage areas would be prioritized to treat units with the highest hazards or levels of bark beetle infestation first. 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. Timing of other activities for particular resources are detailed below.

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 provisions 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

Old Growth Habitat

No old growth habitat or recruitment old growth habitat will be entered for timber salvage (Exhibits Q-5 and Q-7). This includes areas where the status of old growth or recruitment old

growth is still uncertain at the time of project implementation. All areas of proposed salvage where old growth or recruitment values are uncertain will be field-reviewed for old growth habitat attributes in 2008 (Exhibits Q-1 and Q-2). The post-fire mortality guidelines (Exhibit P-15) provide criteria for determining the amount of live trees in these areas.

Wildlife Security

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 general 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 to the public by sign or gate during implementation of all proposed activities. From September 1 through the end of the general hunting season, gates will be closed after each vehicle and locked at the end of each work day.

Threatened, Endangered, and Sensitive Wildlife

Biological evaluations and assessments and consultation with the U.S. Fish and Wildlife Service (USFWS) for this project is ongoing and would be completed for any threatened and endangered wildlife species potentially inhabiting the project area.

All contractors and others implementing the project would be required to comply with a food-storage and sanitation order.

If any of the following are found within or close to any timber salvage unit or temporary road location, operations within that unit or on that road would cease until the Forest Service wildlife biologist is notified and activities are modified, if necessary:

- Active denning sites used by grizzly bears, wolves, lynx, fishers, or wolverines;
- Active nesting sites used by Bald Eagles or Northern Goshawks;
- Active rendezvous (pup rearing) sites used by wolves;
- Concentrations of boreal toads.

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.

No lynx feeding habitat or lynx multi-story non-feeding habitat will be entered for timber salvage (Exhibit Rt-8). In addition, no lynx other (travel) habitat in the Sheppard or Lower Griffin Lynx Analysis Units would have salvage. This includes areas where the habitat value to lynx is still uncertain at the time of project implementation. All areas of proposed salvage where lynx habitat values are currently uncertain will be field-reviewed in 2008. The post-fire mortality guidelines (Exhibit P-15) provide criteria for determining the amount of live trees in these areas.

Deciduous trees and shrubs might be planted in conjunction with conifer plantings to increase wildlife security cover. These plantings would take place in and near riparian areas. Planting locations and acreage would be determined in the summer of 2008.

Riparian Wildlife Habitat

Standing and downed trees within 75 feet of wetlands (not streams) would not be removed for bark beetle concerns or other reasons. If bark beetle larvae are present, the beetles may be removed or killed by debarking or other methods that do not include felling or removal of the tree or log. Standing trees within 75 feet of wetlands would be left standing wherever they are not a safety hazard. Logs of all species that have any part extending into wetlands or wetland edges would remain in place. Wetlands would be identified by presence of wetland vegetation and marked during non-winter seasons.

If trees or snags of any species that are within a tree length of wetlands are felled for safety reasons, they would be directionally felled towards the wetland.

After logging, all slash within 75 feet of wetlands would be left in place and would not be piled, burned, or further scattered.

Sensitive Plants

Populations of sensitive plants would be evaluated and protected as necessary if initially located during project implementation. A contract clause would be incorporated into all timber sale contracts specifying that the contract would be modified to protect these plants if located.

Noxious Weed Control

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

- Off-road equipment use associated with timber harvest and road maintenance would be power scrubbed or steam cleaned on the undercarriage and chassis to remove all soil, plant parts, seeds, vegetative matter, or other debris that could contain or hold seeds before transport to and from the project area. All subsequent move-ins of equipment to the project area would be treated in the same manner as the initial move in. "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. During periods of operations with snow cover (ten inches minimum) or frozen ground, washing of equipment as described above is only required upon entering the project area but not when leaving.
- Reestablish vegetation on bare ground created at log landings with a Montana-Certified weed free grass ground cover (seed mix of native plants will be specified by the Forest Botanist), as soon as feasible after disturbance to provide for site protection until native species are established.

- Herbicides would be sprayed within the road prism along designated haul routes (Exhibit M-3) before log hauling begins and after all purchaser activities are completed, with the exception of roads used in the first winter of the contract. These roads used in the first winter of the contract would be treated for weeds before subsequent summer activities begin. 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. Treatments would only occur during the periods from June 1 to July 15 or September 1 to September 30. 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).
- Obliteration of new temporary roads should occur to discourage future access and create a vegetation community which will resist infestations. Revegetate with native shrubs or native seed mix (specified by the Forest Botanist) after topsoil is replaced as soon as feasible after disturbance to provide for site protection until native species are established. Temporary roads built on historic templates would have the first 100 feet obliterated where these roads meet a road open to public motorized use to discourage the spread of weeds by unauthorized entry. Roads would be obliterated as soon as access is no longer needed.
- The Forest Weeds Coordinator or Forest Botanist would provide noxious weed informational materials of target species for distribution to contracted workers in the project area emphasizing the importance of spread prevention measures and communication of infestations to Forest personnel.
- Unburned noxious weed vegetation, seeds, and root systems potentially remain in low to moderate vegetation burn severity areas that had timber harvest activity previous to the Brush Creek Fire. Winter logging these units would help reduce noxious weed spread. Units with proposed tractor or tractor/swing operations close to existing populations of noxious weeds are proposed for winter logging (see alternative description tables later in this chapter).

Air Quality

Landing pile burning is the only prescribed burning action 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, Flathead Valley, Kootenai National Forest, and Cabinet Mountain Wilderness 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.

Snags and Downed Wood

Amendment 21 of the Flathead Forest Plan specifies minimum numbers of snags, snag replacement trees, and pieces of downed wood to be left, or requires the preparation of site-specific snag and downed wood prescriptions. Although the minimum diameters are not always present in a given stand, the intent of the Forest Plan would be met or exceeded under all alternatives (Exhibits Q-10 and Rd-13). To provide for snag and downed wood habitat needs, as well as living tree canopy and large trees, the following would be prescribed:

- Minimum retention diameters by species to keep the largest snags and most of the live trees within salvage units. A snag prescription group was assigned to each unit for analysis. However, the group will be determined in the field for each unit for its prescription. Snag prescriptions do not change between alternatives, although in a few cases a unit that is much smaller in a different alternative may have a different prescription reflecting its stand conditions. For more information, see the alternative descriptions below and Exhibit Rd-13.
- Retain all black cottonwood, quaking aspen, paper birch, and ponderosa pine live trees and snags.
- All of the live trees and designated snags would be left standing wherever possible, unless they need to be felled for reasons such as hazard trees, landing locations, skid trails, and skyline corridors.
- Trees felled for safety reasons would be left on site.
- Leave all unmerchantable snags or trees standing wherever possible, if safe to do so.
- Sign and paint all high-quality wildlife snags left within 200 feet of a road open to wheeled motorized use by the public.

Slash Reduction

Some salvage harvest units may require whole tree yarding to the log landing due to excessive amounts of stem and top material. Individual unit harvest prescriptions would be prepared to reflect slash accumulation potential and reduction needs.

Retention of Live Trees

All action alternatives would primarily remove trees killed by the Brush Creek Fire and trees likely to die because of severe fire injury or bark beetle infestation. Live trees that are not infested with bark beetles or that exceed diameters specified for snag and snag replacement would be left in the salvage units. In many units, live trees that are smaller than the specified diameters would be removed. In addition, some of the larger live trees designated for retention would likely be cut to facilitate logging operations, such as in landings, skid trails, or temporary road locations, or for safety reasons. Some of the trees proposed for removal

appear to be alive, but they are dying. These include trees with no sign of fire damage on the bole or crown but that have extensive root damage, or Douglas-fir and spruce trees that are infested with bark beetles.

The post-fire mortality guidelines (Exhibit P-15) provide criteria for determining which trees are likely to live. These guidelines would be used to develop site-specific silvicultural prescriptions and to identify areas with relatively few trees killed by the fire, as described above for old growth and Canada lynx habitat concerns.

Reforestation

All salvage units would be reforested through either natural regeneration or tree planting of native conifer species (western larch, Douglas-fir, western white pine, lodgepole pine, Engelmann spruce, 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 alternative 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 and salvage harvesting 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 and trails within two years of piling.
- Emphasize low cut or angle cut stumps in the immediate foreground (100 feet) along Trail 171 (Ingalls Mountain Trail), Trail 252 (Elk Mountain Trail), and Trail 258 (Dunsire Pass Trail).
- Rehabilitate log landing areas next to open roads. Dispose of slash, scarify, and plant native vegetation where necessary to establish new vegetation.
- Trees marked with paint for retention or boundaries visible within 100 feet of Trails 171, 252, and 258 would be repainted with black paint as needed or painted trees would be removed as logging is completed.

Public Firewood Gathering

Currently, a temporary closure order is in place that restricts firewood cutting in the Flathead National Forest portion of the Brush Creek fire area. All action alternatives would extend this closure order restricting public firewood cutting throughout proposed salvage sale operations. Personal use firewood gathering would not be allowed by contractors or other workers on roads closed to use by the general public.

Soil and Water

Detrimental soil disturbance from salvage actions could result in decreased site productivity and increased sediment delivery to streams, especially on soils burned with high severity.

Specific concerns related to project activities include excessive compaction, erosion, and potential loss of coarse woody material that maintains micro-site habitat and long term soil productivity. All proposed units would have field review by a soil scientist and/or field technicians to evaluate current conditions and prescribe adequate design features to maintain soil productivity.

Management practices designed to maintain soil productivity and prevent accelerated erosion are shown below. These requirements would be incorporated into timber sale contracts through the inclusion of the contract clauses.

- Summer ground-based harvest would be restricted to units with slopes less than 25 percent and with predominantly low soil burn severity. Within units that have retained green or lightly-burned foliage but are girdled, in-woods processing to retain a slash mat for equipment would be required. Back hauling slash from the landing would only be allowed to supplement in-woods slash sources.
- Equipment operation in summer would only occur when soils are at an acceptable level of dryness, as determined by the timber sale administrator based on site-specific sampling. Dry soils are determined using the hand squeeze method (USDA Program Aid Number 1619). Clumping or muddy color on fingers indicate conditions are too wet for operation. Ruts cannot exceed two inches in depth.
- Winter harvest operations with ground-based equipment would be restricted to slopes less than 40 percent and would be allowed on all soil burn severities.
- Winter logging requires that there be enough snow to prevent muddy water from mixing into the snow where equipment operates. This would require about ten inches of snow. 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.
- Main skid trails and temporary access roads would be designated by the timber sale administrator.
- All skyline corridors would have waterbars installed and slash placed on bare soils, to provide ground cover and reduce soil erosion potential.
- All ground based skid trails would have a slash mat placed on them to minimize compaction, prevent soil deformation and rutting, and to reduce erosion potential. The depth of the slash mat would vary depending on local conditions. No equipment tracks would be visible on the soil.
- If mechanical fuel treatments are deemed necessary, they would be accomplished with excavators to reduce soil disturbance (Land and Resource Management Plan Annual Monitoring Report, 1992 page 131-139).

Applicable Best Management Practices (BMPs) would be implemented during all project activities to protect on-site soil conditions and water quality. BMPs are designed to prevent or minimize non-point source pollution, and are the primary tool that is used to comply with the Clean Water Act. For this project, BMPs would focus primarily on timber harvest, road use, road construction, and/or road reconstruction. Typical BMPs include avoiding equipment operation in wet areas (wetlands, seeps, riparian areas, etc.), designing road and skid trail systems to prevent or minimize erosion, and proper design of road/stream crossings.

Refer to Appendix C for a detailed discussion of BMPs and Soil and Water Conservation Practices.

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.

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 during high-traffic periods, the following restrictions to log hauling on the Star Meadow Road FS #539 would apply in 2009: On Memorial Day weekend, hauling would cease at 5:00 PM on Friday, May 22 through 6:00 PM Monday, May 25. On the Fourth of July holiday, operations would cease at 5:00 PM on Thursday, July 2 up to 9:00 PM on Sunday, July 5. On all weekends between July 10 and August 16, operations would cease at 5:00 PM on Friday through 9:00 PM on Sunday. There would be no restrictions in 2010 and beyond as log hauling activities would be substantially reduced after the first summer of operations.

All lands, trails, and campgrounds within sale area boundaries may be closed to public access for the duration of the sale contracts. The closures for public safety include snowmobiling and trails leading into and out of the sale area boundaries.

Public Safety / Roads

Road rehabilitation involves improving roads to meet or exceed Best Management Practices (BMPs) guidelines, a process that generally involves the installation or improvement of drainage features such as culverts. Road rehabilitation by application of BMPs on roads that we anticipate having heavy truck traffic would be completed prior to the beginning of salvage logging activities with the exception of roads used in the first winter of the contract. Appendix C includes a complete list of the project-specific Best Management Practices along with a discussion of their effectiveness. 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, road management, and slash disposal 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.

All new temporary roads constructed for salvage harvest would be obliterated immediately after the harvest activity is complete. Obliteration would consist of removing drainage features and recontouring slopes to match the previous landscape. Temporary roads constructed on historic templates would be reclaimed after salvage harvest activity is complete. This reclamation would consist of removal of any culverts, ripping the road surface, scattering slash on the road surface, and revegetating the disturbed area with native grasses, shrubs, and trees. The first 100 feet of a temporary road constructed on a historic template would be obliterated where it meets a road open to public motorized use. All culvert installations and removals would be conducted during low stream flow (July 15-March 1) and require a Montana Department of Fish, Wildlife, and Parks 124 Permit.

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.

Alternative A- The No Action Alternative

Under the No Action alternative, the Forest Plan and past project plans would continue to guide management of the project area. No timber salvage harvest or road improvements would be implemented to accomplish project goals. None of the actions 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 action proposed by the Forest Service to meet the purpose and need is timber salvage harvest. Other actions associated with meeting the purpose and need include planting within salvage units, temporary road construction, road maintenance, road restoration, and temporary road reclamation. The action was developed as a strategy to salvage merchantable wood while complying with Forest Plan direction. Specific timber salvage units were identified and their corresponding treatment prescriptions were developed based on the level of known or predicted mortality, the amount of salvage wood material available, the economics of yarding and transporting the material, and consideration of protection of resource values; such as water quality and soil productivity.

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 B Proposed Vegetation Treatment map (Figure 2-1) for locations of the salvage units. Vegetation treatments would include:

- Approximately 6346 acres of commercial timber salvage is proposed for harvest. Harvest activities would occur in 135 different units within the project area. Areas

proposed for salvage 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 requirements. Material primarily targeted for removal are dead trees affected by the fire; however, in many units, live trees that are smaller than the specified diameters would also be removed. In addition, some of the larger live trees designated for retention would likely be cut to facilitate logging operations, such as in landings, skid trails, or temporary road locations, or for safety reasons. Definitions of dead trees are discussed in detail in Exhibit P-15. 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, water, and wildlife. Helicopter operations in the immediate vicinity of Sylvia Lake would be restricted for public safety and wildlife security. Some units would be required to be logged in winter conditions for site protection. Please see Table 2-1 for a unit by unit description.

- 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 the pile burning would not create a wildland fire risk. The number and locations of these landings are not currently known. Reducing activity related fuels within the salvage units would not be necessary.
- Approximately 1844 acres of planting and 2337 acres of interplanting would occur. The planting and interplanting would consist of seedling sized trees of western larch, Douglas-fir, lodgepole pine, spruce, western white pine, ponderosa pine, and 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 2-1. Alternative B Units for Commercial Timber Harvest

Unit Number	Acres	Yarding System [^]	Snag Rx Group ^{**}	Regeneration method [@]	Winter Logging Required ^Ω
1	51	Tractor	Whitewoods	Plant	Yes
2	28	Tractor	Whitewoods	Plant	Yes
3	19	Tractor	Whitewoods	Plant	Yes
4	94	Tractor	Whitewoods	Plant	Yes
5	72	Tractor	Whitewoods	Plant	Yes
6	20	Tractor	Whitewoods	Plant	Yes
7	27	Tractor	Whitewoods	Interplant	Yes
8	49	Tractor	Whitewoods	Plant	Yes
8A	64	Skyline	Whitewoods	Plant	No
9	11	Tractor	Whitewoods	Plant	Yes
10	22	Tractor	Past Harvest	Plant	Yes
11	36	Tractor	Whitewoods	Interplant	Yes
12	9	Tractor	Whitewoods	Plant	Yes
13	26	Tractor	Whitewoods	Plant	Yes
14	39	Skyline	Whitewoods	Plant	No
15	8	Tractor	Whitewoods	Natural	Yes
16	40	Tractor	Whitewoods	Plant	Yes

Unit Number	Acres	Yarding System [^]	Snag Rx Group ^{**}	Regeneration method [@]	Winter Logging Required ^Ω
17	15	Skyline	Whitewoods	Plant	No
18	18	Cable	Whitewoods	Plant	No
19	54	Tractor	Whitewoods	Plant	Yes
20	24	Tractor	Whitewoods	Plant	Yes
21	80	Tractor	Whitewoods	Natural	Yes
22	46	Tractor/Swing	Whitewoods	Natural	Yes
23	124	Tractor	Whitewoods	Natural	Yes/No
24	16	Tractor	Whitewoods	Natural	No
25	5	Tractor	Whitewoods	Natural	Yes
26	25	Skyline	Whitewoods	Plant	No
27	26	Skyline	Whitewoods	Plant	No
28	18	Skyline	Whitewoods	Plant	No
29	52	Tractor	Whitewoods	Plant	Yes
30	44	Tractor	Whitewoods	Plant	Yes
31	124	Tractor	Larch	Interplant	Yes
32	30	Skyline	Douglas-fir	Natural	No
33	17	Tractor	Larch	Natural	Yes
34	15	Tractor	Whitewoods	Plant	No
35	17	Tractor	Whitewoods	Plant	Yes
36	26	Tractor	Whitewoods	Interplant	Yes
37	30	Skyline	Whitewoods/DF	Interplant	No
38	155	Helicopter	Whitewoods	Interplant	No
39	34	Helicopter	Whitewoods	Plant	No
40	29	Tractor	Whitewoods	Interplant	Yes
41	30	Tractor	Past Harvest	Plant	Yes
42	8	Cable	Whitewoods	Plant	No
43	40	Tractor/Swing	Whitewoods	Natural	Yes
44	69	Tractor	Whitewoods	Plant	Yes
45	152	Helicopter	Douglas-fir	Plant	No
46	85	Tractor	Whitewoods	Plant	Yes
47	13	Tractor	Douglas-fir	Plant	Yes
48	118	Tractor	Larch	Natural	No
49	44	Skyline	Larch	Natural	No
50	50	Helicopter	Larch	Natural	No
51	24	Tractor	Whitewoods	Plant	No
52	10	Tractor	Whitewoods	Plant	Yes
53	60	Tractor	Whitewoods	Plant	Yes
54	117	Skyline	Whitewoods/DF	Interplant	No
55	56	Tractor	Douglas-fir	Interplant	Yes
56	6	Tractor	Douglas-fir	Interplant	Yes
57	6	Tractor	Past Harvest	Natural	Yes
58	16	Skyline	Past Harvest	Interplant	No
59	75	Skyline	Douglas-fir	Natural	No
60	47	Skyline	Whitewoods	Interplant	No
61	57	Skyline	Douglas-fir	Natural	No
62	13	Tractor	Larch	Natural	Yes
63	28	Skyline	Whitewoods	Natural	No
64	332	Skyline	Whitewoods/DF	Interplant	No
65	136	Tractor	Whitewoods	Interplant	Yes
66	13	Skyline	Douglas-fir	Plant	No
67	9	Tractor	Whitewoods	Natural	Yes
68	38	Skyline	Whitewoods/DF	Natural	No
69	49	Skyline	Douglas-fir	Plant	No

Unit Number	Acres	Yarding System [^]	Snag Rx Group ^{**}	Regeneration method [@]	Winter Logging Required ^Ω
70	10	Tractor	Douglas-fir	Natural	Yes
71	4	Cable	Whitewoods	Interplant	Yes
72	94	Tractor	Past Harvest	Natural	Yes
73	65	Skyline	Whitewoods/DF	Natural	No
74	120	Tractor	Douglas-fir	Interplant	Yes
75	19	Skyline	Douglas-fir	Natural	No
76	10	Skyline	Whitewoods	Natural	No
77	52	Skyline	Whitewoods	Plant	No
78	19	Skyline	Douglas-fir	Interplant	No
79	8	Tractor/Swing	Larch	Natural	Yes
80	56	Skyline	Douglas-fir	Interplant	No
81	14	Tractor	Douglas-fir	Natural	Yes
82	21	Skyline	Douglas-fir	Plant	No
83	55	Tractor	Whitewoods	Plant	Yes
84	40	Tractor/Swing	Whitewoods	Plant	Yes
85	34	Tractor	Whitewoods	Natural	No
86	44	Tractor	Whitewoods	Plant	No
87	40	Tractor	Whitewoods	Interplant	Yes
88	7	Tractor	Whitewoods	Plant	Yes
89	95	Tractor	Larch	Natural	Yes
90	10	Skyline	Past Harvest	Plant	No
91	34	Tractor	Past Harvest	Interplant	Yes
92	38	Tractor	Whitewoods	Natural	No
93	21	Tractor	Whitewoods	Interplant	Yes
94	12	Tractor	Whitewoods	Plant	Yes
95	6	Cable	Whitewoods	Natural	Yes/No
96	8	Tractor	Douglas-fir	Natural	Yes
97	42	Skyline	Whitewoods	Plant	No
98	25	Tractor	Larch	Natural	Yes
99	57	Tractor	Past Harvest	Interplant	No
100	11	Skyline	Whitewoods	Natural	No
101	15	Tractor	Past Harvest	Plant	Yes
102	36	Skyline	Douglas-fir	Natural	No
103	16	Cable	Whitewoods	Interplant	Yes
104	58	Skyline	Douglas-fir	Natural	No
105	47	Skyline	Past Harvest	Natural	No
106	6	Tractor	Past Harvest	Natural	Yes
107	11	Tractor	Whitewoods	Interplant	Yes
108	54	Skyline	Douglas-fir	Natural	No
109	19	Tractor/Swing	Douglas-fir	Natural	Yes
110	120	Skyline	Douglas-fir	Interplant	No
111	171	Helicopter	Whitewoods	Interplant	No
112	58	Tractor	Whitewoods	Natural	No
113	72	Skyline	Whitewoods	Natural	No
114	10	Helicopter	Whitewoods	Plant	No
115	123	Tractor/Swing	Larch	Plant	Yes
116	128	Skyline	Larch	Natural	No
117	63	Tractor	Whitewoods	Interplant	No
118	75	Helicopter	Whitewoods	Interplant	No
119	70	Tractor	Whitewoods/ Larch	Interplant	Yes
120	59	Helicopter	Larch	Natural	No
121	38	Tractor	Larch	Natural	No

Unit Number	Acres	Yarding System [^]	Snag Rx Group ^{**}	Regeneration method [@]	Winter Logging Required ^Ω
122	19	Tractor	Douglas-fir	Natural	No
123	7	Tractor	Douglas-fir	Natural	No
124	167	Tractor	Douglas-fir	Natural	No
125	32	Tractor	Douglas-fir	Natural	Yes
126	28	Skyline	Whitewoods	Natural	No
127	5	Tractor	Douglas-fir	Natural	Yes
128	23	Skyline	Whitewoods	Natural	No
129	90	Skyline	Whitewoods	Interplant	No
130	178	Tractor	Whitewoods/DF	Interplant	Yes/No
131	14	Cable	Whitewoods	Plant	Yes
132	55	Skyline	Whitewoods	Interplant	No
133	58	Tractor	Larch	Natural	Yes/No
134	10	Cable	Douglas-fir	Natural	No

[^] Yarding Systems: Cable and Tractor yarding are ground based systems having little or no suspension of the log; Skyline yarding partially or fully suspends the logs; Tractor/Swing uses both a partially suspended skyline system and ground based tractor system; and Helicopter yarding fully suspends the logs.

^{**} Snag Prescription Group: See the Snag and Downed Wood Management Proposals section below.

[@] Regeneration Method: Plant- units expected to not have adequate regeneration will be hand planted; Interplant- units expected to have some natural regeneration but would also be planted for species diversity; Natural- units expected to have enough live trees to naturally regenerate.

^Ω Units designated with 'Yes/No' indicated approximately half of the unit acres are required winter log.

Snag and Down Wood Management Proposals

Table 2-2 describes the snag and downed wood prescriptions for Alternative B. These are the same as for Alternative C. The “whitewood” group was divided into a) stands dominated by a single whitewood species, such as lodgepole pine, spruce, or subalpine fir, and b) stands dominated by whitewoods but with a representation of larch or Douglas-fir.

Table 2-2. Alternatives B and C Snag and Downed Wood Prescriptions in Commercial Timber Harvest Units (Exhibit Rd-13).

Snag Prescription Group	Western Larch Retention	Douglas-fir Retention
Douglas-fir	All	25” DBH and larger
Larch	18” DBH and larger	None
Past Harvest *	All	All
Whitewoods—single-species	All	All
Whitewoods—multi-species	15” DBH and larger	25” DBH and larger

* “Past Harvest” applies to past regeneration harvest only. Western larch and Douglas-fir retention in these units may be revised after field visits.

These minimum retention diameters by species are intended to keep the largest snags and most of the live trees within the salvage units. Across the acreage in all but one of the snag prescription groups, an average of eight of these larger trees and snags per acre is expected to remain after salvage. The exception is the single-species whitewoods group, where an average of only five larch and Douglas-fir over 12 inches DBH exist per acre. A snag prescription group was assigned to each salvage unit for analysis purposes. However, the group will be determined in the field for each unit for its prescription.

Figure 2-1. Alternative B (Proposed Action)

Sheppard Creek






Post-Fire Project





Tally Lake Ranger District

Alternative B






Legend

Temporary Roads:

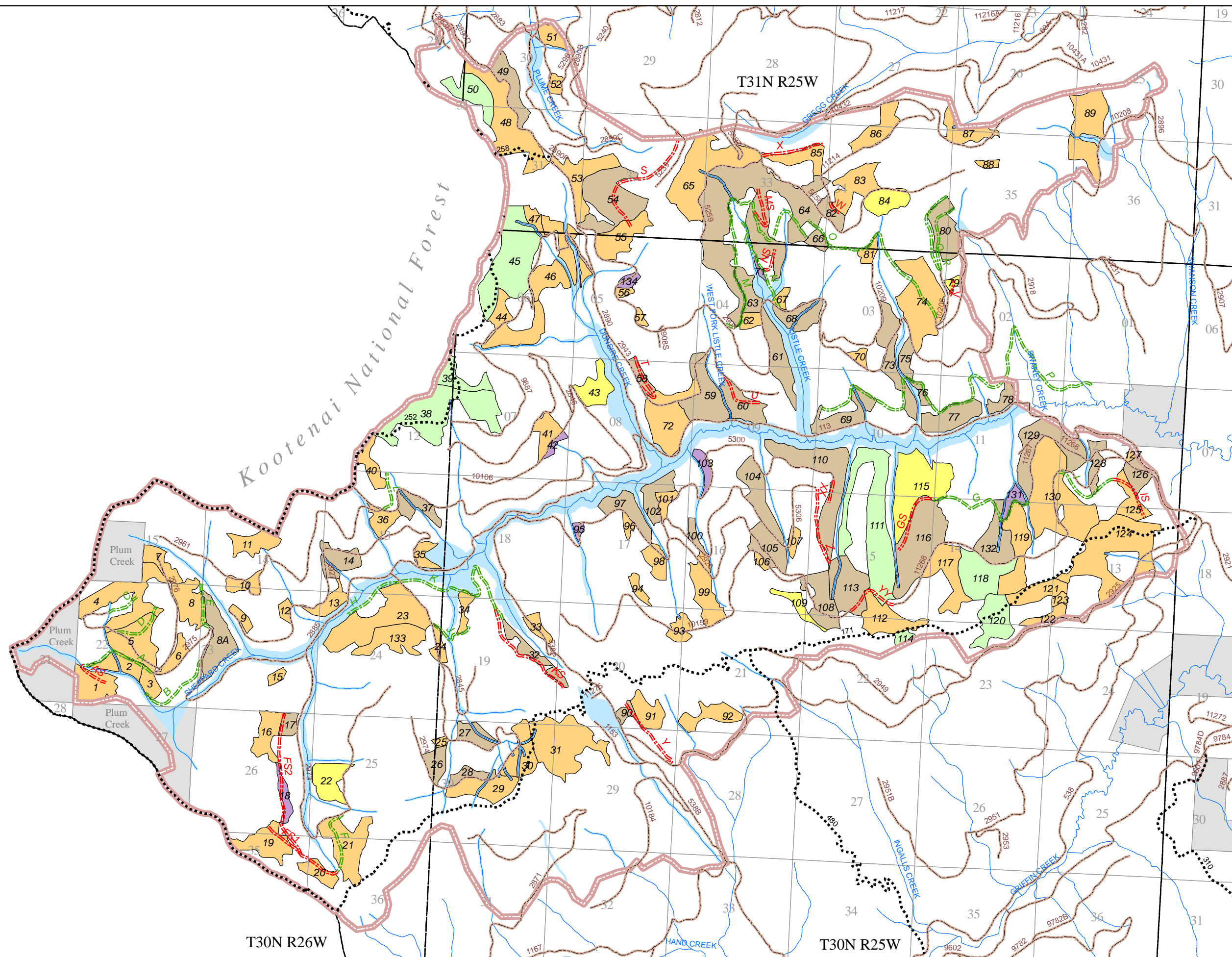
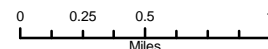
-  New
-  Historic
-  National Forest System Roads
-  Trails
-  Streams

-  Sections
-  Riparian Habitat Conservation Areas (RHCA)
-  Private Land Ownership
-  Project Area Boundary

Logging System Designation

-  Cable
-  Helicopter
-  Skyline
-  Tractor
-  Tractor-Swing

North



Transportation Management Proposals

Transportation management proposals within the project area for Alternative B would involve temporary road construction, road maintenance, and road restrictions. No new permanent system roads would be built, and no road construction would take place on Forest Plan MA 2C lands.

Road Construction and Maintenance

- Approximately 9.6 miles of new temporary roads would be constructed to access proposed salvage units. These temporary roads would be obliterated after use.
- Approximately 17.3 miles of historic road templates would be temporarily opened to access proposed salvage units; these roads would be reclaimed after use. Table 2-3 describes this and the new temporary road construction.
- Road maintenance actions consisting of brushing and blading may be needed on some haul roads within the project area. Other drainage work such as the placement of drain dips, additional culverts, and replacement of culverts would likely take place. Dust abatement and blading would occur as needed on the main haul routes.

Table 2-3. New and Historic Temporary Road Construction for Alternative B.

Road Number	New or Historic	Length (miles)	Units Accessed
A	Historic	0.7	1, 2, 3, 5
AS	New	0.3	1
B	Historic	0.7	3
C	Historic	0.3	4
D	Historic	0.5	4, 5
E	Historic	0.4	8, 8A
F	Historic	0.6	16, 17, 18, 19, 20, 21
FS1	New	0.7	16, 17, 18, 19, 20
FS2	New	1.2	16, 17, 18
G	Historic	1.1	115, 116, 119, 131, 132
GS	New	0.6	115, 116
H	Historic	0.5	23
I	Historic	0.6	125, 126, 128
IS	New	0.4	125, 126
J	Historic	0.4	24, 34
K	Historic	1.4	32, 34
KS	New	1.0	32
L	Historic	0.4	40
M	Historic	2.3	62, 63, 64
MS	New	0.5	64
N	Historic	0.8	64, 71
NS	New	0.2	64
O	Historic	1.6	64, 66, 74, 81
P	Historic	3.8	69, 73, 76, 77, 78
Q	Historic	0.7	80
R	Historic	0.6	80

Road Number	New or Historic	Length (miles)	Units Accessed
S	New	1.1	54, 55
T	New	0.5	58, 72
U	New	0.4	60
V	New	0.1	79
W	New	0.1	82, 83
X	New	0.5	85
XX	New	0.2	110
Y	New	0.7	90, 91
YY	New	0.5	111, 112, 113
Z	New	0.6	110

Revegetation of Temporary Roads

Native vegetation cover greatly reduces the potential for weed invasion. Temporary roads revegetated with native forbs and shrubs in addition to grass seeding have less invasion potential providing quicker native vegetation cover than roads that are only seeded. In areas showing no or low weed infestations, temporary roads GS, YY, XX, and Z 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 to the specifications of the Forest Botanist.

Helicopter Landings

An estimated 10 areas covering approximately 1.0 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), Forest Plan management areas 2C and 7, or other areas determined as “sensitive” by an interdisciplinary review. In addition, they would be located in generally level areas. In some cases, roads may be used as landing areas. Areas with concentrations of live trees and larch and Douglas-fir snags over 18 inches in diameter would be avoided to the greatest extent possible. Approach and departure flight paths may need live and/or dead tree falling to facilitate safe helicopter operations.

Alternative C

Timber Salvage Management Proposals

Timber salvage and related activities are proposed to meet the purpose and need of this project. In addition, significant issues one through six as described in Chapter One were considered during the development of the alternative. To summarize these issues as they influenced Alternative C: no helicopter yarding is proposed; no salvage harvest in possible old growth wildlife habitat or possible recruitment old growth habitat is proposed; some salvage harvest was not retained from the proposed action to create previously unharvested burned reserve areas; salvage harvest and road construction/reconstruction in lynx habitat was reduced; and temporary road construction and reconstruction was reduced. Please refer to the Alternative C Proposed Vegetation Treatment map (Figure 2-2) for locations of the salvage units. Vegetation treatments would include:

- Approximately 3902 acres of commercial timber salvage is proposed for harvest. Harvest activities would occur in 96 different units within the project area. Areas proposed for salvage 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 requirements. Material primarily targeted for removal are dead trees affected by the fire; however, in many units, live trees that are smaller than the specified diameters would also be removed. In addition, some of the larger live trees designated for retention would likely be cut to facilitate logging operations, such as in landings, skid trails, or temporary road locations, or for safety reasons. Definitions of dead trees are discussed in detail in Exhibit P-15. 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, water, and wildlife. Some units would be required to be logged in winter conditions for site protection. Please see Table 2-4 for a unit by unit description.
- 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 are not known at this time. Reducing activity related fuels within the salvage units would not be necessary.
- Approximately 1198 acres of planting and 1654 acres of interplanting would occur. The planting and interplanting would consist of seedling sized trees of western larch, Douglas-fir, lodgepole pine, spruce, western white pine, ponderosa pine, and 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 2-4. Alternative C Units for Commercial Timber Harvest.

Unit Number	Acres	Yarding System [^]	Snag Rx Group ^{**}	Regeneration method [@]	Winter Logging Required ^Ω
1	51	Tractor	Whitewoods	Plant	Yes
2	27	Tractor	Whitewoods	Plant	Yes
3	19	Tractor	Whitewoods	Plant	Yes
4A	33	Tractor	Whitewoods	Plant	Yes
4B	23	Tractor	Whitewoods	Plant	Yes
4C	18	Tractor	Whitewoods	Plant	Yes
5	72	Tractor	Whitewoods	Plant	Yes
6	20	Tractor	Whitewoods	Plant	Yes
7	27	Tractor	Whitewoods	Interplant	Yes
8	49	Tractor	Whitewoods	Plant	Yes
8A	64	Skyline	Whitewoods	Plant	No
9	11	Tractor	Whitewoods	Plant	Yes
10	22	Tractor	Past Harvest	Plant	Yes
11	36	Tractor	Whitewoods	Interplant	Yes
12	9	Tractor	Whitewoods	Plant	Yes
13	26	Tractor	Whitewoods	Plant	Yes
14	39	Skyline	Whitewoods	Plant	No

Unit Number	Acres	Yarding System^	Snag Rx Group**	Regeneration method@	Winter Logging Required Ω
25	5	Tractor	Whitewoods	Natural	Yes
26	25	Skyline	Whitewoods	Plant	No
27	26	Skyline	Whitewoods	Plant	No
28	18	Skyline	Whitewoods	Plant	No
29	52	Tractor	Whitewoods	Plant	Yes
30	44	Tractor	Whitewoods	Plant	Yes
31	124	Tractor	Larch	Interplant	Yes
35	17	Tractor	Whitewoods	Plant	Yes
36	26	Tractor	Whitewoods	Interplant	Yes
37	30	Skyline	Whitewoods/DF	Interplant	No
38	48	Tractor	Douglas-fir	Interplant	Yes
40	29	Tractor	Douglas-fir	Interplant	Yes
41	30	Tractor	Past Harvest	Plant	Yes
42	8	Cable	Whitewoods	Plant	No
43	40	Tractor/Swing	Whitewoods	Natural	Yes
44	69	Tractor	Whitewoods	Plant	Yes
46	85	Tractor	Whitewoods	Plant	Yes
47	13	Tractor	Douglas-fir	Plant	Yes
48	95	Tractor	Larch	Natural	No
49	39	Skyline	Larch	Natural	No
51	24	Tractor	Whitewoods	Plant	No
52	10	Tractor	Whitewoods	Plant	Yes
53	51	Tractor	Whitewoods	Plant	Yes
54	46	Skyline	Whitewoods	Interplant	No
55	56	Tractor	Douglas-fir	Interplant	Yes
56	6	Tractor	Douglas-fir	Interplant	Yes
57	6	Tractor	Past Harvest	Natural	Yes
59	56	Skyline	Douglas-fir	Natural	No
60	47	Skyline	Whitewoods	Interplant	No
61	57	Skyline	Douglas-fir	Natural	No
62	13	Tractor	Larch	Natural	Yes
63	28	Skyline	Whitewoods	Natural	No
64	318	Skyline	Whitewoods/DF	Interplant	No
65	136	Tractor	Whitewoods	Interplant	Yes
67	9	Tractor	Whitewoods	Natural	Yes
68	16	Skyline	Douglas-fir	Natural	No
70	10	Tractor	Douglas-fir	Natural	Yes
73	21	Skyline	Douglas-fir	Natural	No
74	120	Tractor	Douglas-fir	Interplant	Yes
75	19	Skyline	Douglas-fir	Natural	No
80	17	Skyline	Larch	Interplant	No
81	14	Tractor	Douglas-fir	Natural	Yes
82	21	Skyline	Douglas-fir	Plant	No
83	55	Tractor	Whitewoods	Plant	Yes
84	40	Tractor/Swing	Whitewoods	Plant	Yes
86	44	Tractor	Whitewoods	Plant	No
87	40	Tractor	Whitewoods	Interplant	Yes
88	7	Tractor	Whitewoods	Plant	Yes
89	95	Tractor	Whitewoods	Natural	Yes
90	10	Skyline	Past Harvest	Plant	No
91	34	Tractor	Past Harvest	Interplant	Yes
92	38	Tractor	Whitewoods	Natural	No
94	9	Tractor	Whitewoods	Plant	Yes

Unit Number	Acres	Yarding System [^]	Snag Rx Group ^{**}	Regeneration method [@]	Winter Logging Required Ω
95	6	Cable	Whitewoods	Natural	Yes/No
96	2	Tractor	Douglas-fir	Natural	Yes
97	42	Skyline	Whitewoods	Plant	No
98	25	Tractor	Larch	Natural	Yes
101	15	Tractor	Past Harvest	Plant	Yes
102	36	Skyline	Douglas-fir	Natural	No
103	16	Cable	Whitewoods	Interplant	Yes
104	58	Skyline	Douglas-fir	Natural	No
105	47	Skyline	Past Harvest	Natural	No
106	6	Tractor	Past Harvest	Natural	Yes
107	11	Tractor	Douglas-fir	Interplant	Yes
108	39	Skyline	Whitewoods/DF	Natural	No
109	16	Tractor/Swing	Douglas-fir	Natural	Yes
110	73	Skyline	Whitewoods	Interplant	Yes
112	58	Tractor	Whitewoods	Natural	No
116	128	Skyline	Whitewoods/ Larch	Natural	No
117	63	Tractor	Whitewoods	Interplant	No
119	29	Tractor	Whitewoods	Interplant	Yes
119A	41	Tractor/Swing	Larch	Interplant	Yes
125	22	Tractor	Douglas-fir	Natural	Yes
126	28	Skyline	Whitewoods	Natural	No
127	5	Tractor	Douglas-fir	Natural	Yes
128	13	Skyline	Whitewoods	Natural	No
129	55	Skyline	Whitewoods	Interplant	No
130	178	Tractor	Whitewoods/DF	Interplant	Yes/No
132	48	Skyline	Larch	Interplant	No

A discussion of symbols [^], Ω , and [@] can be found at the end of Table 2-1.

** Snag Prescription Group: See the Snag and Downed Wood Management Proposals section below.

Snag and Down Wood Management Proposals

Please see the “Snag and Down Wood Management Proposals” above in the Alternative B description.

Transportation Management Proposals

Transportation management proposals within the project area for Alternative C would involve temporary road construction, road maintenance, and road restrictions. No new permanent system roads would be built, and no road construction would take place on Forest Plan MA 2C lands.

Road Construction and Maintenance

- Approximately 6.6 miles of new temporary roads would be constructed to access proposed salvage units. These temporary roads would be obliterated after use.

- Approximately 2.9 miles of historic road templates would be temporarily opened to access proposed salvage units; these roads would be reclaimed after use. Table 2-5 describes this and the new temporary road construction.
- Road maintenance actions consisting of brushing and blading may be needed on some haul roads within the project area. Other drainage work such as the placement of drain dips, additional culverts, and replacement of culverts would likely take place. Dust abatement and blading would occur as needed on the main haul routes.

Table 2-5. New and Historic Temporary Road Construction for Alternative C.

Road Number	New or Historic	Length (miles)	Units Accessed
A	Historic	1.2	1, 2, 3, 5
ASC	New	.02	1
B	Historic	0.7	3
D	Historic	.05	4A, 5
E	Historic	0.4	8, 8A
I	Historic	0.6	125, 126
IS	New	0.4	125, 126
L	Historic	0.4	40
M	Historic	1.8	62, 63, 64
MS	New	0.5	64
N	Historic	0.3	64
NS	New	0.2	64
O	Historic	0.6	74
R	Historic	0.3	80
U	New	0.4	60
W	New	0.1	82, 83
Y	New	0.7	90, 91
YY	New	0.3	112

Revegetation of Temporary Roads

Native vegetation cover greatly reduces the potential for weed invasion. Temporary roads revegetated with native forbs and shrubs in addition to grass seeding have less invasion potential providing quicker native vegetation cover than roads that are only seeded. In areas showing no or low weed infestations, temporary road YY 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 to the specifications of the Forest Botanist.

Figure 2-2. Alternative C

Sheppard Creek

Post-Fire Project

Tally Lake Ranger District

Alternative C

Legend

Temporary Roads:

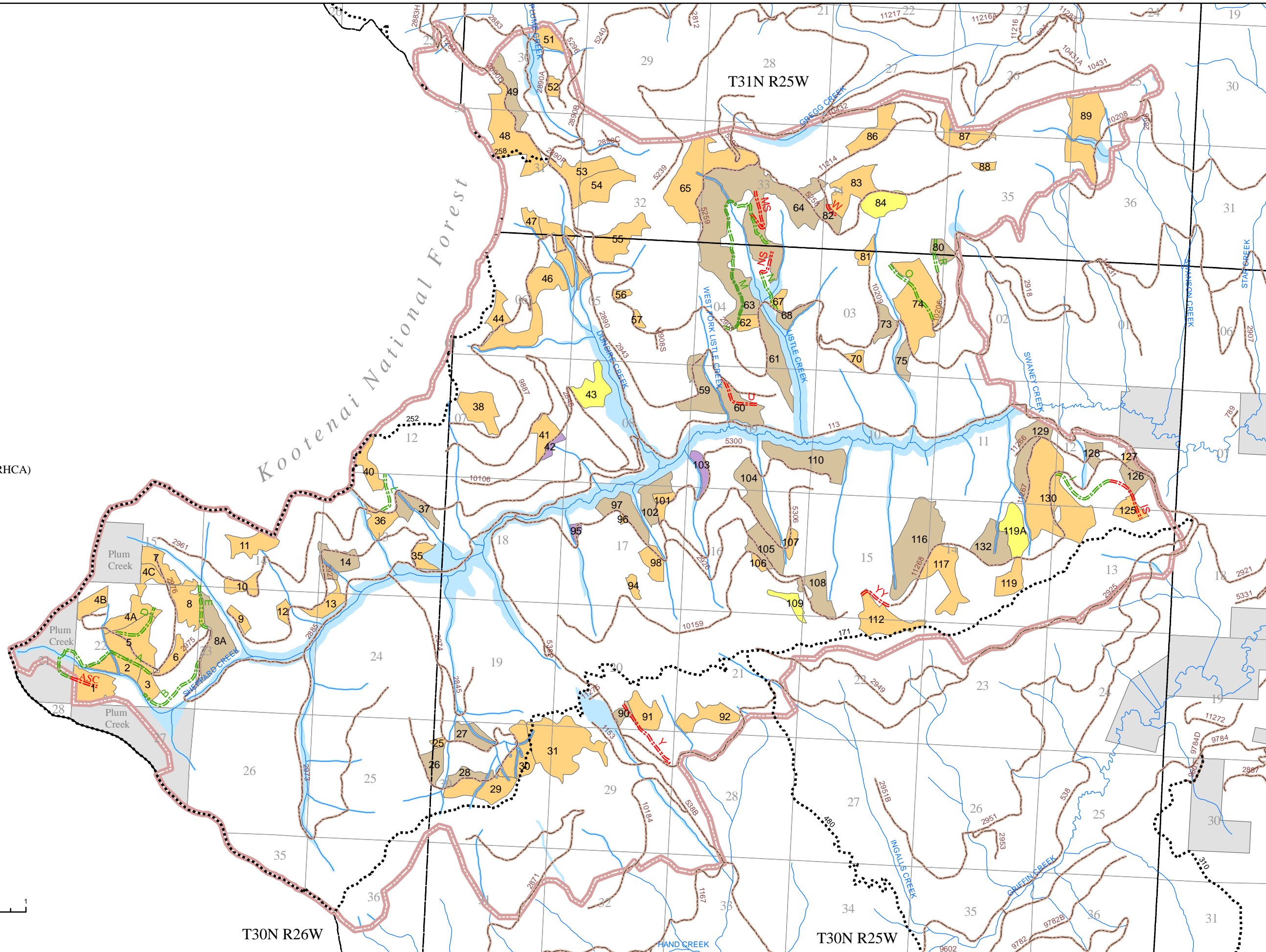
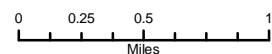
- New
- Historic
- National Forest System Roads
- Trails
- Streams

- 32 Sections
- Riparian Habitat Conservation Areas (RHCA)
- Private Land Ownership
- Project Area Boundary

Logging System Designation

- Cable
- Skyline
- Tractor
- Tractor-Swing

North



Alternative D

Timber Salvage Management Proposals

Timber salvage and related activities are proposed to meet the purpose and need of this project. In addition, significant issue seven as described in Chapter One was featured during the development of this alternative. To summarize this issue as it influenced this alternative: additional areas of timber salvage harvest are proposed to manage for possible epidemic levels of Douglas-fir and spruce bark beetles. Some of these additional areas are within Riparian Habitat Conservation Areas. Please refer to the Alternative D Vegetation Treatment map (Figure 2-3) for locations of the salvage units. Vegetation treatments would include:

- Approximately 7465 acres of commercial timber salvage is proposed for harvest. Harvest activities would occur in 192 different units within the project area. Areas proposed for salvage 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 requirements. Material primarily targeted for removal are dead trees affected by the fire; however, in many units, live trees that are smaller than the specified diameters would also be removed. In addition, some of the larger live trees designated for retention would likely be cut to facilitate logging operations, such as in landings, skid trails, or temporary road locations, or for safety reasons. Definitions of dead trees are discussed in detail in Exhibit P-15. 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, water, and wildlife. Helicopter operations in the immediate vicinity of Sylvia Lake would be restricted for public safety and wildlife security. Some units would be required to be logged in winter conditions for site protection. Please see Table 2-6 for a unit by unit description.
- Approximately 1070 acres proposed for harvest would be treated only if monitoring detects elevated bark beetle infestations in or near the units. These units are designated with a “B” at the beginning of the unit number in the following table. Trees to be removed include Douglas-fir and/or Engelmann spruce infested with bark beetles; all other tree species would remain. Portions or all of some of these units are in an RHCA and would require special treatment zones to ensure protection of soil, water, wildlife, and other resources. Within the special treatment zone and depending on site specific prescriptions, protection measures may include: no ground-based equipment within specified distances of streams and wet areas, logs would be suspended or skidded over a minimum six inch deep mat of other logs and not directly on the ground surface, trees not designated for removal and/or tops and branches from designated trees would be left, and trees felled for safety should be felled toward the stream and left intact.
- Commercial timber harvest activities typically generate a large volume of waste wood and 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 2174 acres of planting and 2915 acres of interplanting would occur. The planting and interplanting would consist of seedling sized trees of western larch, Douglas-fir, lodgepole pine, spruce, western white pine, ponderosa pine, and 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 2-6. Alternative D Units for Commercial Timber Harvest.

Unit Number*	Acres	Yarding System [^]	Snag Rx Group**	Regeneration method@	Winter Logging Required ^Ω
1	51	Tractor	Whitewoods	Plant	Yes
2	31	Tractor	Whitewoods	Plant	Yes
3	19	Tractor	Whitewoods	Plant	Yes
4A	33	Tractor	Whitewoods	Plant	Yes
4B	23	Tractor	Whitewoods	Plant	Yes
4C	18	Tractor	Whitewoods	Plant	Yes
5	72	Tractor	Whitewoods	Plant	Yes
6	20	Tractor	Whitewoods	Plant	Yes
7	27	Tractor	Whitewoods	Interplant	Yes
8	49	Tractor	Whitewoods	Plant	Yes
8A	64	Skyline	Whitewoods	Plant	No
9	11	Tractor	Whitewoods	Plant	Yes
10	22	Tractor	Past Harvest	Plant	Yes
11	36	Tractor	Whitewoods	Interplant	Yes
12	9	Tractor	Whitewoods	Plant	Yes
13	26	Tractor	Whitewoods	Plant	Yes
14	42	Skyline	Whitewoods	Plant	No
15	8	Tractor	Whitewoods	Natural	Yes
16	40	Tractor	Whitewoods	Plant	Yes
17	15	Skyline	Whitewoods	Plant	No
18	18	Cable	Whitewoods	Plant	No
19	54	Tractor	Whitewoods	Plant	Yes
20	24	Tractor	Whitewoods	Plant	Yes
21	21	Tractor	Whitewoods	Natural	Yes
21A	59	Helicopter	Whitewoods	Natural	No
22	46	Tractor/Swing	Whitewoods	Natural	Yes
23	69	Tractor	Whitewoods	Natural	No
23A	56	Helicopter	Whitewoods	Natural	No
24	16	Tractor	Whitewoods	Natural	No
25	5	Tractor	Whitewoods	Natural	Yes
26	25	Skyline	Whitewoods	Plant	No
27	26	Skyline	Whitewoods	Plant	No
28	18	Skyline	Whitewoods	Plant	No
29	52	Tractor	Whitewoods	Plant	Yes
30	44	Tractor	Whitewoods	Plant	Yes
31	124	Tractor	Larch	Interplant	Yes
32	30	Helicopter	Douglas-fir	Natural	No
33	17	Tractor	Larch	Natural	Yes

Unit Number*	Acres	Yarding System^	Snag Rx Group**	Regeneration method@	Winter Logging RequiredΩ
34	5	Tractor/Swing	Whitewoods	Plant	No
34A	11	Helicopter	Whitewoods	Plant	No
35	33	Tractor	Whitewoods	Plant	Yes
36	27	Tractor	Whitewoods	Interplant	Yes
37	33	Skyline	Whitewoods/DF	Interplant	No
38	48	Tractor	Douglas-fir	Interplant	Yes
38A	107	Helicopter	Douglas-fir	Interplant	No
39	34	Helicopter	Whitewoods	Plant	No
40	29	Tractor	Douglas-fir	Interplant	Yes
41	30	Tractor	Past Harvest	Plant	Yes
42	8	Cable	Whitewoods	Plant	No
43	43	Tractor/Swing	Whitewoods	Natural	Yes
44	69	Tractor	Whitewoods	Plant	Yes
45	156	Helicopter	Douglas-fir	Plant	No
46	94	Tractor	Whitewoods	Plant	Yes
47	13	Tractor	Douglas-fir	Plant	Yes
48	118	Tractor	Larch	Natural	No
49	44	Skyline	Larch	Natural	No
50	50	Helicopter	Larch	Natural	No
51	24	Tractor	Whitewoods	Plant	No
52	10	Tractor	Whitewoods	Plant	Yes
53	60	Tractor	Whitewoods	Plant	Yes
54	46	Tractor	Whitewoods	Interplant	Yes
54A	70	Helicopter	Whitewoods/DF	Interplant	No
55	56	Tractor	Douglas-fir	Interplant	Yes
56	6	Tractor	Douglas-fir	Interplant	Yes
57	6	Tractor	Past Harvest	Natural	Yes
58	16	Helicopter	Past Harvest	Interplant	No
59	75	Skyline	Douglas-fir	Natural	No
60	47	Skyline	Whitewoods	Interplant	No
61	58	Skyline	Douglas-fir	Natural	No
62	13	Tractor	Larch	Natural	Yes
63	28	Skyline	Whitewoods	Natural	No
64	318	Skyline	Whitewoods/DF	Interplant	No
64A	14	Helicopter	Douglas-fir	Interplant	No
65	136	Tractor	Whitewoods	Interplant	Yes
66	13	Helicopter	Douglas-fir	Plant	No
67	9	Tractor	Whitewoods	Natural	Yes
68	42	Skyline	Whitewoods/DF	Natural	No
69	49	Helicopter	Douglas-fir	Plant	No
70	10	Tractor	Douglas-fir	Natural	Yes
71	5	Helicopter	Whitewoods	Interplant	No
72	94	Tractor	Past Harvest	Natural	Yes
73	47	Skyline	Douglas-fir	Natural	No
73A	19	Helicopter	Whitewoods	Natural	No
74	120	Tractor	Douglas-fir	Interplant	Yes
75	19	Skyline	Douglas-fir	Natural	No
76	12	Helicopter	Whitewoods	Natural	No
77	52	Helicopter	Whitewoods	Plant	No
78	19	Helicopter	Douglas-fir	Interplant	No
79	8	Tractor/Swing	Larch	Natural	Yes
80	58	Skyline	Douglas-fir	Interplant	No
81	14	Tractor	Douglas-fir	Natural	Yes

Unit Number*	Acres	Yarding System[^]	Snag Rx Group**	Regeneration method@	Winter Logging Required^Ω
82	21	Skyline	Douglas-fir	Plant	No
83	55	Tractor	Whitewoods	Plant	Yes
84	40	Tractor/Swing	Whitewoods	Plant	Yes
85	34	Helicopter	Whitewoods	Natural	No
86	44	Tractor	Whitewoods	Plant	No
87	40	Tractor	Whitewoods	Interplant	Yes
88	7	Tractor	Whitewoods	Plant	Yes
89	95	Tractor	Whitewoods	Interplant	Yes
90	10	Skyline	Past Harvest	Plant	No
91	34	Tractor	Past Harvest	Natural	Yes
92	38	Tractor	Whitewoods	Plant	No
93	22	Tractor	Whitewoods	Interplant	Yes
94	12	Tractor	Whitewoods	Natural	Yes
95	6	Cable	Whitewoods	Interplant	Yes/No
96	8	Tractor	Douglas-fir	Plant	Yes
97	43	Skyline	Whitewoods	Natural	No
98	25	Tractor	Larch	Natural	Yes
99	57	Tractor	Past Harvest	Plant	No
100	11	Skyline	Whitewoods	Natural	No
101	15	Tractor	Past Harvest	Interplant	Yes
102	36	Skyline	Douglas-fir	Natural	No
103	16	Cable	Whitewoods	Plant	Yes
104	58	Skyline	Douglas-fir	Natural	No
105	47	Skyline	Past Harvest	Interplant	No
106	6	Tractor	Past Harvest	Natural	Yes
107	11	Tractor	Douglas-fir	Natural	Yes
108	54	Skyline	Douglas-fir	Natural	No
109	19	Tractor/Swing	Douglas-fir	Natural	Yes
110	122	Skyline	Whitewoods	Interplant	No
111	172	Helicopter	Whitewoods	Interplant	No
112	58	Tractor	Whitewoods	Natural	No
113	76	Skyline	Whitewoods	Natural	No
114	10	Helicopter	Whitewoods	Plant	No
115	125	Helicopter	Larch	Plant	No
116	128	Skyline	Larch	Natural	No
117	63	Tractor	Whitewoods	Interplant	No
118	75	Helicopter	Whitewoods	Interplant	No
119	29	Tractor	Whitewoods	Interplant	Yes
119A	41	Tractor/Swing	Larch	Interplant	Yes
120	59	Helicopter	Larch	Natural	No
121	38	Tractor	Larch	Natural	No
122	19	Tractor	Douglas-fir	Natural	No
123	7	Tractor	Douglas-fir	Natural	No
124	167	Tractor	Douglas-fir	Natural	No
125	32	Tractor	Douglas-fir	Natural	Yes
126	28	Skyline	Whitewoods	Natural	No
127	5	Tractor	Douglas-fir	Natural	Yes
128	23	Skyline	Whitewoods	Natural	No
129	90	Skyline	Whitewoods	Interplant	No
130	178	Tractor	Whitewoods/DF	Interplant	Yes/No
131	14	Helicopter	Whitewoods	Plant	No
132	52	Skyline	Whitewoods	Interplant	No
132A	7	Helicopter	Whitewoods	Interplant	No

Unit Number*	Acres	Yarding System^	Snag Rx Group**	Regeneration method@	Winter Logging RequiredΩ
133	58	Tractor	Larch	Natural	Yes/No
134	10	Cable	Douglas-fir	Natural	No
B1	16	Cable	Beetle Unit	Plant	No+
B2	23	Tractor	Beetle Unit	Plant	No+
B3	7	Tractor	Beetle Unit	Interplant	No+
B4	27	Cable	Beetle Unit	Plant	No+
B5	45	Skyline	Beetle Unit	Interplant	No
B6	8	Cable	Beetle Unit	Interplant	No+
B7	7	Tractor	Beetle Unit	Interplant	No+
B8	11	Cable	Beetle Unit	Plant	No+
B9	23	Helicopter	Beetle Unit	Natural	No
B10	85	Tractor	Beetle Unit	Plant	No+
B11	7	Cable	Beetle Unit	Plant	No+
B12	7	Skyline	Beetle Unit	Plant	No
B13	8	Cable	Beetle Unit	Plant	No+
B14	25	Helicopter	Beetle Unit	Natural	No
B15	55	Skyline	Beetle Unit	Natural	No
B16	3	Cable	Beetle Unit	Plant	No+
B17	23	Tractor	Beetle Unit	Natural	No+
B18	26	Tractor	Beetle Unit	Plant	No+
B19	11	Tractor	Beetle Unit	Interplant	No+
B20	9	Tractor/Swing	Beetle Unit	Interplant	No+
B21	10	Helicopter	Beetle Unit	Interplant	No
B22	11	Cable	Beetle Unit	Interplant	No+
B23	27	Tractor	Beetle Unit	Interplant	No+
B24	17	Cable	Beetle Unit	Interplant	No+
B25	13	Helicopter	Beetle Unit	Interplant	No
B26	66	Tractor	Beetle Unit	Interplant	No
B27	9	Tractor	Beetle Unit	Interplant	No+
B28	61	Helicopter	Beetle Unit	Interplant	No
B29	13	Tractor/Swing	Beetle Unit	Natural	No
B30	7	Skyline	Beetle Unit	Interplant	No
B31	15	Skyline	Beetle Unit	Interplant	No
B32	16	Tractor	Beetle Unit	Natural	No
B33	25	Skyline	Beetle Unit	Interplant	No
B34	38	Tractor/Swing	Beetle Unit	Interplant	No+
B35	31	Tractor	Beetle Unit	Interplant	No+
B36	26	Cable	Beetle Unit	Plant	No+
B37	14	Tractor	Beetle Unit	Natural	No+
B38	39	Skyline	Beetle Unit	Interplant	No
B39	64	Helicopter	Beetle Unit	Interplant	No
B40	13	Tractor	Beetle Unit	Natural	No+
B41	26	Skyline	Beetle Unit	Natural	No
B42	8	Tractor	Beetle Unit	Plant	No+
B43	14	Tractor	Beetle Unit	Interplant	No+
B44	31	Tractor/Swing	Beetle Unit	Interplant	No+
B45	23	Tractor	Beetle Unit	Natural	No
B46	17	Cable	Beetle Unit	Interplant	No+
B47	10	Tractor	Beetle Unit	Natural	No

* Units starting with a B designate units that will only be harvested where monitoring detects bark beetle activity. Some of these units have a + symbol attached to the winter Logging Required Designation. This + symbol indicates which units have tractor, tractor/swing, or cable yarding systems and are all or partially

located in Riparian Habitat Conservation Areas. Special Treatment Zones may be designated in these areas to reduce the effects of log removal and skidding.

A discussion of symbols ^, Ω, and @ can be found at the end of Table 2-1.

** Snag Prescription Group: See the Snag and Downed Wood Management Proposals section below.

Snag and Down Wood Management Proposals

Table 2-7 describes the snag and downed wood prescriptions for Alternative D. These are the same as for Alternatives B and C except for the addition of the “Beetle Units.” The “white-wood” group was divided into: a) stands dominated by a single whitewood species, such as lodgepole pine, spruce, or subalpine fir, and b) stands dominated by whitewoods but with a representation of larch or Douglas-fir. The prescription for “Beetle Units” is unique to Alternative D. In these units, in addition to the larch and Douglas-fir retention shown in Table 2-7, all other tree species would be retained except for spruce trees that are infested or at risk to bark beetles.

Table 2-7. Alternative D Snag and Downed Wood Prescriptions in Commercial Timber Harvest Units (Exhibit Rd-13).

Snag Prescription Group	Western Larch Retention	Douglas-fir Retention
Douglas-fir	All	25” DBH and larger
Larch	18” DBH and larger	None
Past Harvest *	All	All
Whitewoods—single-species	All	All
Whitewoods—multi-species	15” DBH and larger	25” DBH and larger
Beetle Units	All	25” DBH and larger and any Douglas-fir not infested or at risk to bark beetles

* “Past Harvest” applies to past regeneration harvest only. Western larch and Douglas-fir retention in these units may be revised after field visits.

These minimum retention diameters by species are intended to keep the largest snags and most of the live trees within the salvage units. Across the acreage in all but one of the snag prescription groups, an average of eight of these larger trees and snags per acre is expected to remain after salvage. The exception is the single-species whitewoods group, where an average of only five larch and Douglas-fir over 12 inches DBH exist per acre. A snag prescription group was assigned to each salvage unit for analysis purposes. However, the group will be determined in the field for each unit for its prescription.

Figure 2-3. Alternative D

Sheppard Creek

Post-Fire Project

Tally Lake Ranger District

Alternative D

Legend

Temporary Roads:

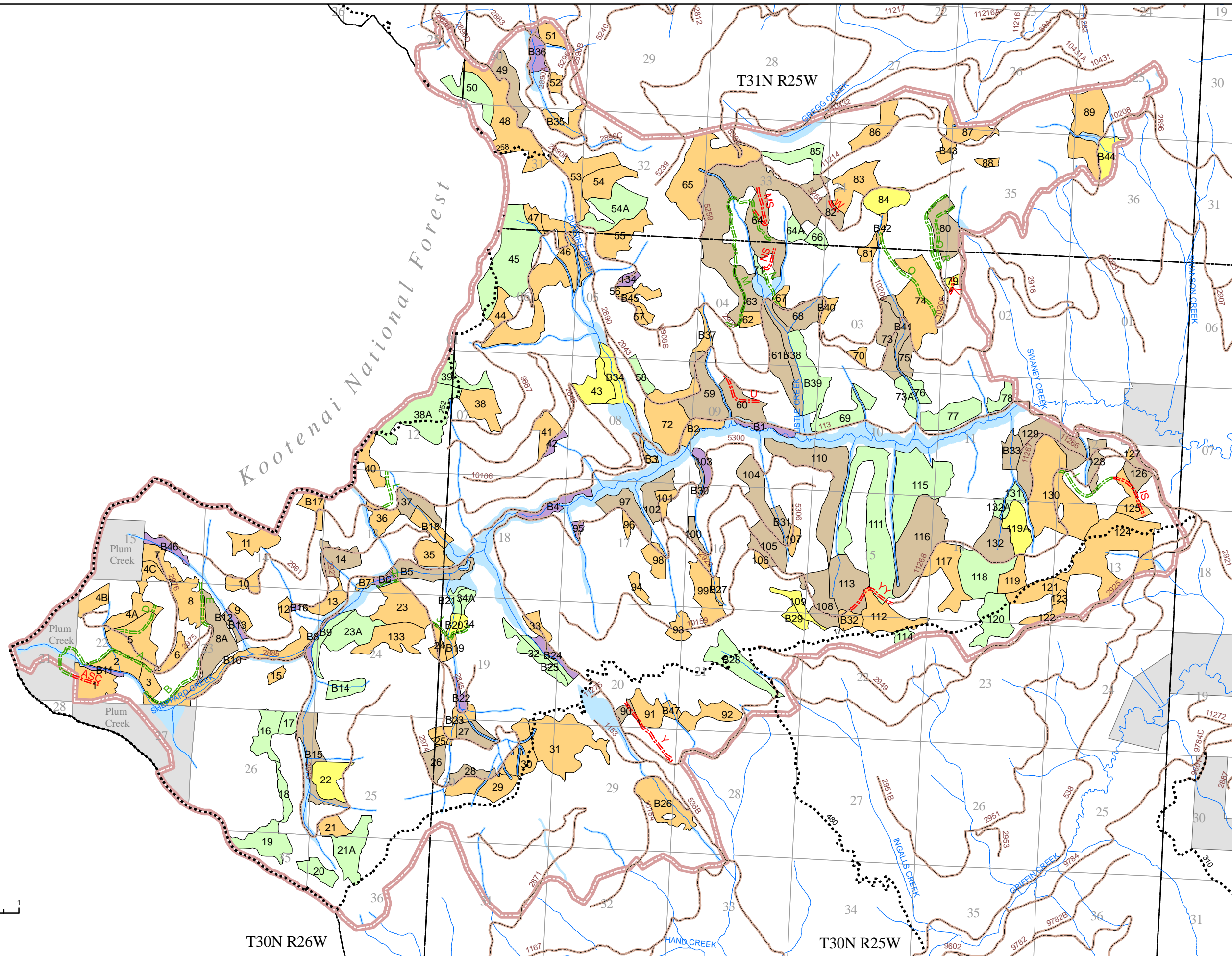
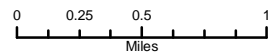
- New
- Historic
- National Forest System Roads
- .-.- Trails
- Streams

- 32 Sections
- Riparian Habitat Conservation Areas (RHCA)
- Private Land Ownership
- Project Area Boundary

Logging System Designation

- Cable
- Helicopter
- Skyline
- Tractor
- Tractor-Swing

North



Transportation Management Proposals

Transportation management proposals within the project area for Alternative D would involve temporary road construction, road maintenance, and road restrictions. No new permanent system roads would be built, and no road construction would take place on Forest Plan MA 2C lands.

Road Construction and Maintenance

- Approximately 3.2 miles of new temporary roads would be constructed to access proposed salvage units. These temporary roads would be obliterated after use.
- Approximately 8.5 miles of historic road templates would be temporarily opened to access proposed salvage units; these roads would be reclaimed after use. Table 2-8 describes this and the new temporary road construction.
- Road maintenance actions consisting of brushing and blading may be needed on some haul roads within the project area. Other drainage work such as the placement of drain dips, additional culverts, and replacement of culverts would likely take place. Dust abatement and blading would occur as needed on the main haul routes.

Table 2-8. New and Historic Temporary Road Construction for Alternative D.

Road Number	New or Historic	Length (miles)	Units Accessed
A	Historic	1.2	1, 2, 3, 5
ASC	New	0.2	1
B	Historic	0.7	3, B10
D	Historic	0.5	4A, 5
E	Historic	0.4	8, 8A
H	Historic	0.2	23, B6
I	Historic	0.6	125, 126, 128
IS	New	0.4	125, 126
J	Historic	0.4	24, 34, B19, B20
L	Historic	0.4	40
M	Historic	1.8	62, 63, 64
MS	New	0.5	64
N	Historic	0.3	64, 71
NS	New	0.2	64
O	Historic	0.9	74, 81, B42
Q	Historic	0.7	80
R	Historic	0.6	80
U	New	0.4	60
V	New	0.1	79
W	New	0.1	82, 83
Y	New	0.7	90, 91
YY	New	0.5	111, 112, 113

Revegetation of Temporary Roads

Native vegetation cover greatly reduces the potential for weed invasion. Temporary roads revegetated with native forbs and shrubs in addition to grass seeding have less invasion potential providing quicker native vegetation cover than roads that are only seeded. In areas showing no or low weed infestations, temporary road YY 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 to the specifications of the Forest Botanist.

Helicopter Landings

An estimated 15 areas covering approximately 1.0 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), Forest Plan management areas 2C and 7, or other areas determined as “sensitive” by an interdisciplinary review. In addition, they would be located in generally level areas. In some cases, roads may be used as landing areas. Areas with concentrations of live trees and larch and Douglas-fir snags over 18 inches in diameter would be avoided 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 Draft EIS, 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.

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 Sheppard Creek Project

proposal would be conducted. Proposed monitoring activities are found in Appendix E and are discussed by environmental component, consistent with those used in this Draft EIS. Those components not specifically discussed tier to the monitoring described in the Forest Plan.

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 were determined to be either outside the scope of the purpose and need statement, 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 propose salvage harvest in areas identified as old growth prior to the wildland fire event in 2007 because they provide important ecological properties, no matter how severely they burned. Some areas identified as old growth or recruitment old growth prior to the Brush Creek Fire initially appeared from aerial photo interpretation and some ground-truthing to have a substantial live tree component after the fire. These areas were excluded from salvage in Alternative C. Areas of high vegetation burn intensity that showed complete or nearly complete tree mortality on aerial photos were available for inclusion in the action alternatives because these areas do not meet regional standards for old growth as defined by Green et al. (1992). Old growth forests do not stay old growth indefinitely. Fire, wind, insects, disease, and other natural 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 and the development of forests toward old growth habitat. Concerns regarding snag and downed wood habitats influenced the 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 2C 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 2-9. Acres Unsuitable for Timber Harvest Proposed for Salvage Harvest

Management Area	Alternative A	Alternative B	Alternative C	Alternative D
MA 2C	0	717	263	779
MA 12	0	0	0	487

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. Maps and tables of individual salvage areas and their Forest Plan management area designations are found in Exhibit D-5.

Rehabilitation of the Fire Area 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 weed management, tree planting, and reducing sediment sources. Weed management is a component of the action alternatives and will also be implemented using existing authorities. 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 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 and weed management activities 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, particularly in riparian areas. Individuals and groups responding to our proposed action pointed out that "reburns" have been historically documented in fires like the Brush Creek

Fire of 2007 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 much 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 if helicopter yarding systems are used.

Comparison of Alternatives

Although Chapter 3 presents a detailed discussion of the environmental effects of the alternatives, Chapter 2 concludes with a comparison of alternative features and a summary of the effects of the alternatives. Information in Table 2-11 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Comparison by Alternative Features

The table on the following page numerically summarizes the features of the alternatives.

Table 2-10. Summary of the Features of all Alternatives

Feature	Alt. A No Action	Alt. B Proposed Action	Alt. C	Alt. D
Temporary Road Construction	0	26.9 miles	9.5 miles	11.7 miles
-Historic Template	0	17.3 miles	6.6 miles	8.5 miles
-New Roads	0	9.6 miles	2.9 miles	3.2 miles
System Road Construction	0	0 miles	0 miles	0 miles
Road Rehabilitation of Timber Haul Routes (BMPs)	0	119 miles	109 miles	120 miles
Shrub and Forb Planting on Reclaimed Temp Road	0	1.9 miles	0.3 miles	0.5 miles
Timber Volume Estimate in Million Board Feet	0	27	17	32
Total Harvest Acres	0	6346	3902	7465
- Cable	0	76	30	209
- Helicopter	0	706	0	1464
- Skyline	0	2079	1464	1977
- Tractor	0	3209	2271	3522
- Tractor / Skyline Swing	0	276	137	293
Acres Required for Winter Logging	0	2644	2089	3144
Acres of Allowable Summer Slash Mat Yarding	0	881	322	718
Acres of Tree Seedling Regeneration				
- Plant	0	1844	1198	2159
- Interplant	0	2337	1654	2978
- Natural	0	2165	1050	2328

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 2-11. Response of Alternatives to Issues

Issue and Issue Indicators:	Alternative A No Action	Alternative B Proposed Action	Alternative C	Alternative D
#1. Helicopter Yarding <ul style="list-style-type: none"> Acres of salvage harvest using a helicopter yarding system. 	0	706	0	1464

Issue and Issue Indicators:	Alternative A No Action	Alternative B Proposed Action	Alternative C	Alternative D
#2. Old Growth Habitat <ul style="list-style-type: none"> Acres of salvage harvest in pre-fire old growth with unknown post-fire status. Acres of salvage harvest in apparent “recruitment” old growth. 	0	347	0	486
	0	541	0	726
#3. Canada Lynx Habitat <ul style="list-style-type: none"> Acres of salvage harvest in lynx feeding habitat. Acres of salvage harvest in apparent non-feeding lynx habitats. Miles of temporary road construction through lynx habitats. 	0	0	0	8
	0	740 - 1020	112	1040 - 1419
	0	6.2 - 6.9	0.8	2.1 - 2.5
#4. Post-Fire Reserve Areas <ul style="list-style-type: none"> Number of post-fire reserve areas. Percentage of the project area in post-fire reserve areas. Acreage of the largest post-fire reserve area. Percentage of total post-fire reserve area acreage that have past regeneration harvest. 	1	3	7	2
	84%	8%	27%	4%
	21,244	944	4173	644
	44%	60%	48%	69%
#5. Water Quality <ul style="list-style-type: none"> Miles of temporary road construction or reconstruction located within an RHCA and parallel to a stream. Number of new culvert installations on temporary roads. 	0	0.4	0	0.2
	0	12	3	3
#6. Stream Channel Stability and Morphology <ul style="list-style-type: none"> Miles of temporary road construction or reconstruction that are within RHCAs. Miles of temporary road construction near suppression activities and moist areas. 	0	1.0	0.1	0.4
	0	3.5	0.2	0.2
#7. Bark Beetle Management <ul style="list-style-type: none"> Acres of salvage harvest in stands with spruce bark beetle hazard. Acres of salvage harvest in stands with Douglas-fir bark beetle hazard. 	0	4890	2830	5885
	0	5065	3060	5860

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