

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.

Differences Between the DEIS and the FEIS

Chapter 2 of this FEIS differs from the same chapter in the DEIS in the following ways:

- Tables 2-2, 2-5, and 2-7 were updated to reflect ground-truthing of timber salvage units. Ground-truthing operations included determining the merchantable value of a given area, the old growth or recruitment old growth status, Canada lynx habitat status, and the transportation system necessary to access the wood products. Areas with economically low timber volume per acre, areas meeting old growth or recruitment old growth definitions, areas meeting lynx habitat definitions, and areas that were economically inaccessible were eliminated from all alternatives. Sometimes entire units were eliminated and sometimes the unit shape was modified. The differences of total acres of proposed salvage harvest between the DEIS and FEIS are:
 - Alternative A: 0 acres in the DEIS, 0 acres in the FEIS.
 - Alternative B: 6346 acres in the DEIS, 4510 acres in the FEIS.
 - Alternative C: 3902 acres in the DEIS, 3278 acres in the FEIS.
 - Alternative D: 7465 acres in the DEIS, 5013 acres in the FEIS.
- Several areas not identified in the DEIS were determined to meet the purpose and need of the project. Units 58A, 60A, and 77A were added to Alternative B and the other two action alternatives if appropriate for the issues they were designed to address.
- Several units identified for bark beetle management objectives in Alternative D in the DEIS were determined to fully meet the purpose and need of the project and were added to Alternative B and the other two action alternatives if appropriate. These units are 8B, 17BN, 17BS, 28B, 43B, and 45B.

- Tables 2-4, 2-6, and 2-9 were updated to reflect the transportation system necessary to implement the ground-truthed timber salvage units described above. Some temporary roads described in the DEIS were determined to be not necessary (roads C, KS, T, XX, Y, and Z) while other new roads were determined to be necessary in at least one alternative (roads MM, NN, QQ, RR, SS, T1, T2, T3, and U2).
 - Alternative A: 0 miles in the DEIS, 0 miles in the FEIS.
 - Alternative B: 26.9 miles in the DEIS, 24.3 miles in the FEIS.
 - Alternative C: 9.5 miles in the DEIS, 9.3 miles in the FEIS.
 - Alternative D: 11.7 miles in the DEIS, 10.1 miles in the FEIS.
- Tables 2-3 and 2-8 were updated to reflect changes in the Snag and Down Wood Management Proposals, which are now referred to as Snag/Live Tree Prescriptions.
- Table 2-10 was updated to reflect the ground-truthed acres of proposed salvage harvest by alternative in Forest Plan Management Areas designated as unsuitable for timber management.
- Tables 2-11 and 2-12 were updated to reflect the revised alternative designs.
- The “Features Common to All Action Alternatives” section was expanded to include more detailed design features that resulted from field surveys conducted this past summer. Mortality guidelines were added.

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 would 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 were uncertain were 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 would 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, as outlined by contract or permit.

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 live sapling or multi-story lynx feeding habitat would be entered for timber salvage (Exhibit Rt-8). Salvage in current potential lynx habitats ("other" and "multistory feeding") would occur only where leave tree marking or modified prescriptions would retain habitat characteristics. 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.

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 located during project planning and project implementation. Proposed ground disturbing activities would be located no closer than 300 feet to the population of sensitive plants. A contract clause would be incorporated into all timber sale contracts specifying that the contract would be modified to protect these plants if located during implementation.

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 would 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 would 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/live tree prescription group was assigned to each unit. Snag/live tree 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 live trees standing wherever possible, if safe to do so.
- Sign and paint all high-quality wildlife trees 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 or highly likely to become infested with bark beetles.

The post-fire mortality guidelines (Exhibit P-15 and summarized in the following table) provide criteria for determining which trees are likely to live. The guidelines are based on research that followed trees for up to five years after fires and on observations after fires on the Flathead and Bitterroot National Forests over the last eight years. For Douglas-fir, they include predictions for Douglas-fir beetle caused mortality in addition to direct fire-caused mortality (Hood, et al. 2007). In some units with a high number of trees that are currently alive, a modified mortality guide would be used to retain Douglas-fir expected to survive the direct effects of the fire. Because these Douglas-fir trees are susceptible to bark beetles, these units would be protected with anti-aggregating pheromones, if funding is available. 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.

Table 2-1. Sheppard Post-Fire Mortality Guidelines.

Species	Diameter (DBH)	Moderate to Deep Bole Char: % of root crown circumference *	Remaining Live Crown Ratio	Mortality Probability (immediate or delayed)	Salvage Guideline
Larch or Ponderosa Pine	All	≥50%	(n.a.)	High	Available for removal, depending on snag prescription
		<50%	<30%	High	
			≥30%	Low	Leave Tree
Douglas-fir	25"+	(n.a.)	(n.a.)	High	Available for removal, depending on snag prescription
	15-24.9"	>0%	(n.a.)	High	
		0%	<30%	High	
		≥30%	Low	Leave Tree	
	<15"	≥25%	(n.a.)	High	Available for removal, depending on snag prescription
		<25%	<30%	High	
≥30%		Low	Leave Tree		
All Other Species	All	>0%	(n.a.)	High	Available for removal, depending on snag prescription
		0%	<30%	High	
		≥30%	Low	Leave Tree	

* For bole char, see Hood, et al. 2007, "Assessing Post-fire Douglas-fir Mortality and Douglas-fir Beetle Attacks in the Northern Rocky Mountains Supplement. Gen. Tech. Rep. RMRS-GTR-199."

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, 480, 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, Water, and Fisheries

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. Tractors may operate on some areas that exceed 25 percent slope with concurrence of the soil scientist. 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 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. 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 and rutting exceeding two inches in depth indicate conditions are too wet for operation.
- 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.
- Removal of non-sawlog products from proposed units with low amounts of available woody biomass would not be allowed. The district silviculturist and forest hydrologist would determine which units are available for non-sawlog product removal.
- Mechanical fuel treatments in proposed salvage areas are not planned. Any areas determined to require mechanical fuel treatments after salvage harvest operations would be accomplished with excavators to reduce soil disturbance (Land and Resource Management Plan Annual Monitoring Report, 1992 page 131-139).
- Two culverts on Road 2845 are currently creating unnecessary amounts of erosion and sediment as well as restricting fish passage. These culverts would be removed when the road is determined to be not necessary for project activities.

Applicable Best Management Practices (BMPs) would be implemented during all project activities to protect on-site soil conditions, water quality, and fish habitat. 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, culvert removals and installations, 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. All BMPs are designed to protect and minimize impacts to soil productivity, water quality, and fish habitat. Refer to Appendix C for a detailed discussion of BMPs and Soil and Water Conservation Practices.

All INFISH standards and guidelines would be implemented in all alternatives to protect or enhance fish habitat. Specifically, establishment of Riparian Habitat Conservation Areas (RHCA) are delineated in all alternatives.

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 9:00 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 4510 acres of commercial timber salvage is proposed for harvest. Harvest activities would occur in 173 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 is 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 2-2 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 991 acres of planting and 745 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 2-2. Alternative B Units for Commercial Timber Harvest

Unit Number	Acres	Yarding System [^]	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
1	32	Tractor	WW-Multi	Plant	Yes
2E	13	Tractor	WW-Multi	Plant	Yes
2W	6	Tractor	WW-Multi	Plant	Yes
3	10	Tractor	WW-Multi	Plant	Yes
4	16	Tractor	WW-Multi	Plant	Yes
5	46	Tractor	WW-Multi	Plant	Yes
8	32	Tractor	WW-Single	Natural	Yes
8AN	24	Skyline	WW-Multi	Natural	No
8AS	32	Skyline	WW-Multi	Natural	No
8B	7	Tractor	WW-Multi	Natural	Yes
11	6	Tractor	WW-Multi	Plant	Yes
13	21	Tractor	WW-Multi	Plant	Yes
14C	3	Tractor	WW-Multi	Plant	Yes
14E	18	Tractor/Swing	WW-Multi	Plant	Yes
14W	8	Skyline	WW-Multi	Plant	No
15	8	Tractor	WW-Multi	Natural	Yes
16	40	Tractor	WW-Multi	Natural	Yes
17	15	Skyline	WW-Multi	Natural	No
17BN	11	Tractor	WW-Multi	Plant	Yes
17BS	7	Tractor	WW-Multi	Plant	Yes
18	18	Cable	WW-Multi	Natural	No
19	54	Tractor	WW-Single	Plant	Yes
20	24	Tractor	WW-Single	Plant	Yes
21	21	Tractor	WW-Multi	Natural	Yes
23	82	Tractor	WW-Multi	Natural	No
23A	60	Tractor	WW-Multi	Plant	Yes
24	14	Tractor	WW-Single	Plant	No
25	10	Tractor	WW-Multi	Natural	Yes

Unit Number	Acres	Yarding System [^]	Snag/Live Tree Rx Group ^{**}	Regeneration Method [@]	Winter Logging Required Ω
27	15	Skyline	WW-Multi	Plant	No
28	2	Tractor	WW-Multi	Plant	Yes
28A	2	Tractor	WW-Multi	Plant	Yes
28B	44	Tractor	WW-Multi	Natural	Yes
29	12	Tractor	WW-Multi	Plant	Yes
31	124	Tractor	WW-Multi	Plant	Yes
33	18	Tractor	WL	Natural	Yes
34	17	Tractor	WW-Single	Plant	No
36	8	Tractor	WW-Single	Natural	Yes
37	6	Skyline	WL	Natural	No
38	49	Tractor	DF	Interplant	No
40	16	Tractor	DF	Interplant	Yes
43	20	Skyline	WW-Single	Natural	No
43B	14	Tractor	WW-Multi	Plant	Yes
44A	36	Tractor	DF	Natural	Yes
44C	5	Tractor	WW-Multi	Interplant	Yes
44E	22	Tractor	WW-Multi	Interplant	Yes
44W	12	Tractor	WW-Multi	Interplant	Yes
45B	21	Tractor	DF	Natural	Yes
46	24	Tractor	WW-Multi	Interplant	Yes
47	5	Tractor	DF	Natural	Yes
48	26	Tractor	WW-Single	Natural	No
49	11	Tractor	DF	Natural	No
49A	7	Skyline	DF	Natural	No
51	22	Tractor	DF	Natural	No
52	4	Tractor	DF	Natural	Yes
52A	1	Tractor	DF	Natural	Yes
53A	21	Tractor	DF	Natural	Yes
53B	9	Tractor	DF	Natural	Yes
53C	4	Tractor	DF	Natural	Yes
54	78	Skyline	DF	Interplant	No
55	41	Tractor	DF	Interplant	Yes
55A	2	Tractor	DF	Interplant	Yes
56	4	Tractor	DF	Interplant	Yes
57	5	Tractor	DF	Natural	Yes
58	16	Tractor	WL	Natural	Yes
58A	34	Cable	DF	Natural	No
59	64	Skyline	DF	Interplant	No
59A	7	Cable	DF	Interplant	No
60	45	Skyline	DF	Interplant	No
60A	44	Skyline	DF	Interplant	No
61	11	Skyline	DF	Natural	No
62	17	Tractor	WW-Multi	Natural	Yes
63	23	Skyline	WL	Natural	No
64A	12	Skyline	WW-Multi	Interplant	No
64B	38	Skyline	DF	Interplant	No
64C	4	Skyline	WW-Multi	Interplant	No
64D	11	Skyline	DF	Interplant	No
64E	9	Skyline	WW-Multi	Interplant	No
64F	10	Tractor	DF	Interplant	Yes
64G	24	Skyline	DF	Natural	No
64H	23	Tractor	DF	Natural	Yes
64I	9	Skyline	DF	Natural	No
64J	34	Skyline	WW-Multi	Interplant	No

Unit Number	Acres	Yarding System [^]	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
64K	2	Skyline	WW-Multi	Interplant	No
64L	90	Skyline	WW-Multi	Natural	No
64M	10	Tractor	WW-Multi	Interplant	Yes
64N	2	Tractor	WW-Multi	Interplant	Yes
65	90	Tractor	WW-Multi	Natural	Yes
65A	37	Skyline	DF+LTM	Natural	No
65B	8	Skyline	DF+LTM	Natural	No
65C	4	Tractor	WW-Multi+LTM	Natural	Yes
66	13	Skyline	DF	Interplant	No
67	9	Tractor	DF	Natural	Yes
68	21	Skyline	DF	Natural	No
68A	10	Skyline	DF	Natural	No
69	38	Skyline	DF	Interplant	No
69A	11	Skyline	DF	Interplant	No
70	3	Tractor	DF	Plant	Yes
71	2	Skyline	DF	Natural	No
73A	44	Skyline	DF	Natural	No
73B	19	Skyline	DF+LTM	Natural	No
74	87	Tractor	DF	Natural	Yes
74A	32	Tractor	WW-Single	Plant	Yes
75	18	Skyline	DF	Natural	No
76	10	Skyline	DF	Plant	No
77	52	Skyline	DF	Plant	No
77A	40	Skyline	DF	Natural	No
78	19	Skyline	DF	Plant	No
80	56	Skyline	DF	Natural	No
81	11	Tractor	DF+LTM	Natural	Yes
82	16	Skyline	DF	Interplant	No
83	41	Tractor	WW-Multi	Plant	Yes
83A	22	Tractor	WW-Multi	Plant	No
84	17	Tractor/Swing	WW-Multi	Interplant	Yes
84A	16	Skyline	WW-Multi	Interplant	No
85	33	Tractor	WW-Single+LTM	Plant	No
86	39	Tractor	WW-Multi	Interplant	No
86A	4	Skyline	WW-Multi	Interplant	No
87A	7	Skyline	WW-Multi	Plant	No
87B	2	Tractor	WW-Multi	Plant	Yes
87C	3	Tractor	WW-Multi	Plant	Yes
88	3	Tractor	WW-Multi	Interplant	Yes
89	85	Tractor	WL	Natural	Yes
89A	7	Tractor	DF	Natural	Yes
92	43	Tractor	WL	Natural	No
93	16	Tractor	DF	Natural	Yes
94	19	Tractor	WW-Multi	Natural	Yes
95A	3	Cable	WW-Single	Plant	Yes/No
95B	3	Cable	WW-Single	Plant	Yes/No
96	2	Tractor	DF	Natural	Yes
97	38	Skyline	WL	Natural	No
98	24	Tractor	WL	Natural	Yes
99	7	Tractor	WL	Natural	No
99A	6	Cable	WL	Natural	No
99C	15	Cable	WL	Natural	No
99D	14	Cable	WL	Natural	No
100	8	Skyline	DF	Natural	No

Unit Number	Acres	Yarding System [^]	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
101	4	Tractor	WL	Natural	Yes
102	43	Skyline	DF	Natural	No
103	3	Cable	DF	Plant	Yes
104	41	Skyline	DF	Natural	No
105	11	Tractor	DF	Natural	No
106	4	Tractor	WW-Single	Natural	Yes
107	35	Tractor	DF	Natural	Yes
107A	3	Tractor	DF	Natural	Yes
107B	31	Skyline	DF	Natural	No
107C	11	Cable	WL	Natural	Yes
108	24	Skyline	DF	Natural	No
109	15	Tractor/Swing	WW-Multi	Natural	Yes
111	153	Helicopter	WW-Multi+LTM	Natural	No
111A	23	Skyline	WL	Natural	No
112	44	Tractor	WW-Multi	Natural	No
113	47	Skyline	DF	Natural	No
113A	6	Skyline	WW-Multi	Natural	No
114	11	Helicopter	WW-Multi	Interplant	No
115	120	Tractor/Swing	WW-Multi	Plant	Yes
116	126	Skyline	WL	Natural	No
117	56	Tractor	WW-Multi	Natural	No
118	70	Helicopter	DF	Natural	No
119	31	Tractor	WW-Multi	Plant	Yes
119A	21	Tractor	WL	Natural	Yes
120	58	Tractor	DF+LTM	Natural	Yes
121	44	Tractor	DF+LTM	Natural	No
122	12	Tractor	DF	Interplant	No
123	5	Tractor	DF	Interplant	No
124	15	Tractor	DF	Interplant	No
125	14	Tractor	DF	Natural	Yes
126	41	Skyline	DF	Natural	No
128	23	Skyline	WL+LTM	Natural	No
129	90	Skyline	WW-Multi+LTM	Natural	No
130	182	Tractor	WL	Natural	Yes/No
131	11	Skyline	WL	Plant	No
132	61	Skyline	WW-Multi	Plant	No
134	10	Tractor	DF	Natural	Yes
TOTAL	4510				

[^] 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/Live Tree Prescription Group: See the Snag/Live Tree Prescriptions Section below. “LTM” means additional trees would be marked to leave.

@ Regeneration Method: Plant- units expected to not have adequate regeneration would 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/Live Tree Prescriptions

Table 2-3 describes the snag and live tree prescriptions for Alternative B. These are the same as for Alternative C, below. 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. In all snag/live tree prescription groups, units with lower burn severities would have additional trees marked to leave. This would retain live trees that would otherwise be removed under the standard prescriptions. These units have “+LTM” in the Snag/Live Tree Prescription Group column in Table 2-2 above.

Table 2-3. Alternatives B and C Snag/Live Tree Prescriptions in Commercial Timber Harvest Units (Exhibit Rd-13).

Snag/Live Tree Prescription Group	Western Larch Retention	Douglas-fir Retention
Douglas-fir	All	None
Larch	16” DBH and larger	None
Whitewoods—single-species	All	All
Whitewoods—multi-species	14” DBH and larger	None

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/live tree 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/live tree prescription group was assigned to each salvage unit.

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 15.6 miles of historic road templates would be temporarily opened to access proposed salvage units; these roads would be reclaimed after use. These temporary roads on historic templates were system roads constructed to the best road construction standards of their day but later removed or decommissioned from the Forest’s transportation system for a variety of reasons. The road template, drainage ditches, and ditch relief culverts are typically still in place. Stream crossing culverts may or may not have been removed. Many of the roads have been naturally revegetated with grass, shrubs, and thick clumps of alder. Reconstruction of the roads would typically only require the replacement of stream culverts and possibly brush cutting. Table 2-4 describes this and the new temporary road construction.
- Approximately 8.7 miles of new temporary roads would be constructed to access proposed salvage units. These temporary roads would be obliterated after use. Obliteration typically means to recontour the temporary road to its original slope or

near its original slope. It may also include placement of natural debris or revegetation with shrubs or trees. Culvert removals and stream restoration would occur where roads to be obliterated intersect streams.

- 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 2-4. New and Historic Temporary Road Construction for Alternative B.

Road Number	New or Historic	Length (miles)	Units Accessed
A	Historic	0.6	1, 2E, 2W, 3, 5
B	Historic	0.7	3, 8B
D	Historic	0.4	5
E	Historic	0.3	8, 8AN
F	Historic	0.6	16, 17, 18, 19, 20, 21
G	Historic	1.1	115, 116, 119, 131, 132
H	Historic	0.5	23, 23A
I	Historic	0.6	125, 126, 128
J	Historic	0.4	24, 34
K	Historic	0.8	34
L	Historic	0.3	40
N	Historic	0.5	64E, 64F, 64G, 67, 71
M	Historic	2.3	62, 63, 64D, 64F, 64G, 64H, 64I, 64M
O	Historic	1.6	64B, 66, 74, 74A
P	Historic	3.8	69, 69A, 73B, 76, 77, 77A, 78
Q	Historic	0.7	80
R	Historic	0.4	80
TOTAL HISTORIC		15.6	
AS	New	0.3	1
FS1	New	0.7	16, 17, 18, 19, 20
FS2	New	1.2	16, 17, 18
GS	New	0.5	115, 116
IS	New	0.3	125, 126
KK	New	0.2	82, 83A
MM	New	0.1	64E, 64F
NN	New	0.2	64F, 64G
PP	New	0.2	64E, 64F, 64G
QQ	New	0.2	64L
RR	New	0.1	64B
S	New	1.1	54, 55
SS	New	0.3	55
T1	New	0.3	107, 107A
T2	New	0.5	107B, 107C
T3	New	0.1	107C
U2	New	1.0	65, 65A, 65B, 65C
X	New	0.5	85
YY	New	0.5	111A, 112, 113, 113A
ZZ	New	0.4	60
TOTAL NEW		8.7	

Figure 2-1

Sheppard Creek

Post-Fire Project
Tally Lake Ranger District

Alternative B

Legend

-  National Forest System Roads
-  Trails
-  Streams
-  Sections
-  Riparian Habitat Conservation Areas (RHCA)
-  Private Land Ownership
-  Project Area Boundary

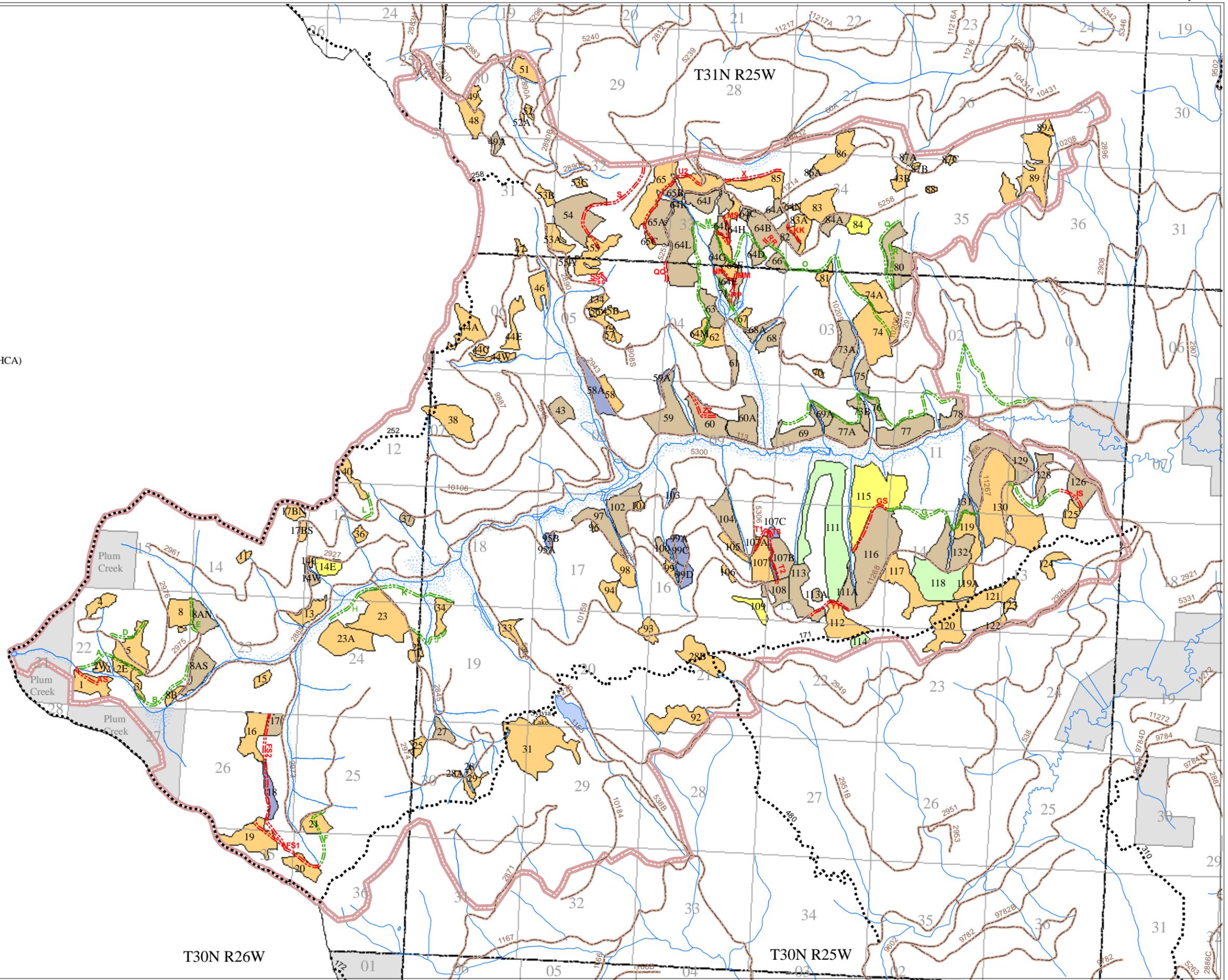
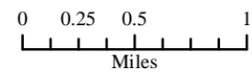
Temporary Roads

-  New
-  Historic

Logging Systems

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

North



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, T1, T2, and T3 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.

Helicopter Landings

An estimated three 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 led by the District Hydrologist. 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; 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 3278 acres of commercial timber salvage is proposed for harvest. Harvest activities would occur in 131 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 2-5 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 653 acres of planting and 550 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 2-5. Alternative C Units for Commercial Timber Harvest.

Unit Number	Acres	Yarding System [^]	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
1	32	Tractor	WW-Multi	Plant	Yes
2E	13	Tractor	WW-Multi	Plant	Yes
2W	6	Tractor	WW-Multi	Plant	Yes
3	10	Tractor	WW-Multi	Plant	Yes
4	16	Tractor	WW-Multi	Plant	Yes
5	46	Tractor	WW-Multi	Plant	Yes
8	32	Tractor	WW-Single	Natural	Yes
8AN	24	Skyline	WW-Multi	Natural	No
8AS	32	Skyline	WW-Multi	Natural	No
8B	7	Tractor	WW-Multi	Natural	Yes
13	21	Tractor	WW-Multi	Plant	Yes
14C	3	Tractor	WW-Multi	Plant	Yes
14E	18	Tractor/Swing	WW-Multi	Plant	Yes
14W	8	Skyline	WW-Multi	Plant	No
17BN	11	Tractor	WW-Multi	Plant	Yes
17BS	7	Tractor	WW-Multi	Plant	Yes
23	82	Tractor	WW-Multi	Natural	No
24	14	Tractor	WW-Single	Plant	No
25	10	Tractor	WW-Multi	Natural	Yes
27	15	Skyline	WW-Multi	Plant	No
28	2	Tractor	WW-Multi	Plant	Yes
28A	2	Tractor	WW-Multi	Plant	Yes
28B	44	Tractor	WW-Multi	Natural	Yes
29	12	Tractor	WW-Multi	Plant	Yes
31	124	Tractor	WW-Multi	Plant	Yes
34	6	Tractor	WW-Single	Plant	No
36	8	Tractor	WW-Single	Natural	Yes
40	16	Tractor	DF	Interplant	Yes
43B	14	Tractor	WW-Multi	Plant	Yes
44A	36	Tractor	DF	Natural	Yes

Unit Number	Acres	Yarding System[^]	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
44C	5	Tractor	WW-Multi	Interplant	Yes
44E	22	Tractor	WW-Multi	Interplant	Yes
44W	12	Tractor	WW-Multi	Interplant	Yes
45B	21	Tractor	DF	Natural	Yes
46	24	Tractor	WW-Multi	Interplant	Yes
48	26	Tractor	WW-Single	Natural	No
49	11	Tractor	DF	Natural	No
49A	7	Skyline	DF	Natural	No
51	22	Tractor	DF	Natural	No
52	4	Tractor	DF	Natural	Yes
52A	1	Tractor	DF	Natural	Yes
53A	21	Tractor	DF	Natural	Yes
53B	9	Tractor	DF	Natural	Yes
53C	4	Tractor	DF	Natural	Yes
54	46	Tractor	DF	Interplant	Yes
55A	2	Tractor	DF	Interplant	Yes
56	4	Tractor	DF	Interplant	Yes
57	5	Tractor	DF	Natural	Yes
58	16	Tractor	WL	Natural	Yes
58A	34	Cable	DF	Natural	No
59	64	Skyline	DF	Interplant	No
59A	7	Cable	DF	Interplant	No
60	45	Skyline	DF	Interplant	No
60A	44	Skyline	DF	Interplant	No
61	11	Skyline	DF	Natural	No
62	17	Tractor	WW-Multi	Natural	Yes
63	23	Skyline	WL	Natural	No
64A	12	Skyline	WW-Multi	Interplant	No
64B	38	Skyline	DF	Interplant	No
64C	4	Skyline	WW-Multi	Interplant	No
64G	20	Skyline	DF	Natural	No
64H	23	Tractor	DF	Natural	Yes
64I	9	Skyline	DF	Natural	No
64J	34	Skyline	WW-Multi	Interplant	No
64K	2	Skyline	WW-Multi	Interplant	No
64L	90	Skyline	WW-Multi	Natural	No
64M	10	Tractor	WW-Multi	Interplant	Yes
64N	2	Tractor	WW-Multi	Interplant	Yes
65	35	Tractor	WW-Multi	Natural	Yes
67	9	Tractor	DF	Natural	Yes
68	21	Skyline	DF	Natural	No
68A	10	Skyline	DF	Natural	No
69	33	Skyline	DF	Interplant	No
70	3	Tractor	DF	Plant	Yes
73A	44	Skyline	DF	Natural	No
74	87	Tractor	DF	Natural	Yes
74A	32	Tractor	WW-Single	Plant	Yes
75	18	Skyline	DF	Natural	No
77	52	Skyline	DF	Plant	No
77A	40	Skyline	DF	Natural	No
78	19	Skyline	DF	Plant	No
80	56	Skyline	DF	Natural	No
81	11	Tractor	DF+LTM	Natural	Yes

Unit Number	Acres	Yarding System [^]	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
82	16	Skyline	DF	Interplant	No
83	41	Tractor	WW-Multi	Plant	Yes
83A	22	Tractor	WW-Multi	Plant	No
84	17	Tractor/Swing	WW-Multi	Interplant	Yes
84A	16	Skyline	WW-Multi	Interplant	No
86	39	Tractor	WW-Multi	Interplant	No
86A	4	Skyline	WW-Multi	Interplant	No
87A	7	Skyline	WW-Multi	Plant	No
87B	2	Tractor	WW-Multi	Plant	Yes
89	85	Tractor	WL	Natural	Yes
89A	7	Tractor	DF	Natural	Yes
92	43	Tractor	WL	Natural	No
93	16	Tractor	DF	Natural	Yes
94	19	Tractor	WW-Multi	Natural	Yes
96	2	Tractor	DF	Natural	Yes
97	38	Skyline	WL	Natural	No
98	24	Tractor	WL	Natural	Yes
99	7	Tractor	WL	Natural	No
99A	6	Cable	WL	Natural	No
99C	15	Cable	WL	Natural	No
99D	14	Cable	WL	Natural	No
100	8	Skyline	DF	Natural	No
101	4	Tractor	WL	Natural	Yes
102	43	Skyline	DF	Natural	No
103	3	Cable	DF	Plant	Yes
104	41	Skyline	DF	Natural	No
105	11	Tractor	DF	Natural	No
106	4	Tractor	WW-Single	Natural	Yes
108	24	Skyline	DF	Natural	No
109	15	Tractor/Swing	WW-Multi	Natural	Yes
111A	23	Skyline	WL	Natural	No
112	44	Tractor	WW-Multi	Natural	No
113	28	Skyline	DF	Natural	No
116	126	Skyline	WL	Natural	No
117	56	Tractor	WW-Multi	Natural	No
119	31	Tractor	WW-Multi	Plant	Yes
119A	21	Tractor	WL	Natural	Yes
120	38	Tractor	DF+LTM	Natural	Yes
122	12	Tractor	DF	Interplant	No
123	5	Tractor	DF	Interplant	No
124	15	Tractor	DF	Interplant	No
125	14	Tractor	DF	Natural	Yes
126	41	Skyline	DF	Natural	No
128	13	Skyline	WL+LTM	Natural	No
129	73	Skyline	WW-Multi+LTM	Natural	No
130	182	Tractor	WL	Natural	Yes/No
132	61	Skyline	WW-Multi	Plant	No
134	10	Tractor	DF	Natural	Yes
TOTAL	3278				

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

** Snag/Live Tree Prescription Group: See the Snag Management Proposals section for Alternative B, above.

Figure 2-2

Sheppard Creek

Post-Fire Project
Tally Lake Ranger District

Alternative C

Legend

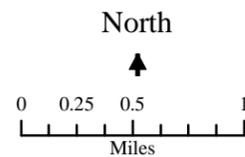
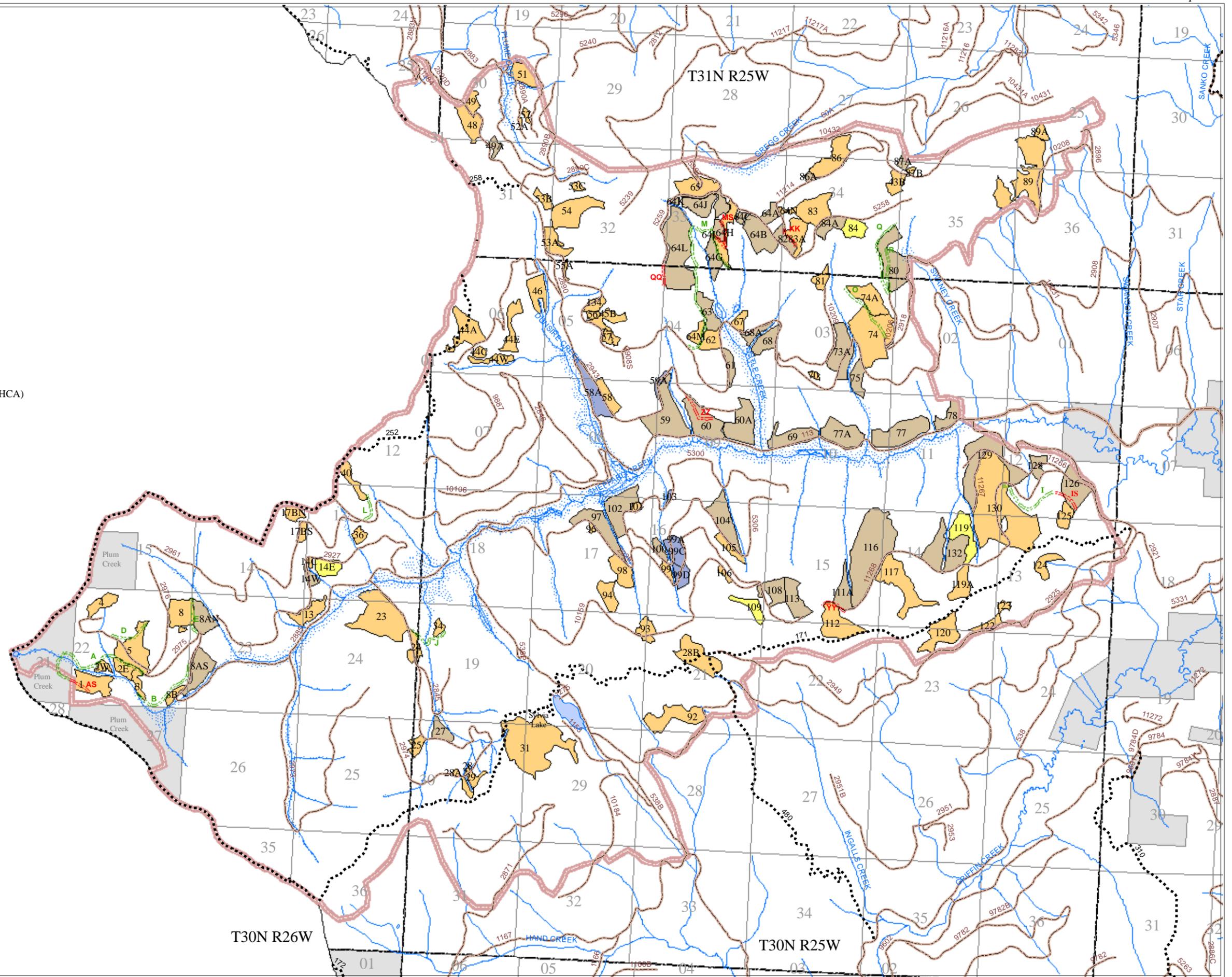
- National Forest System Roads
- Trails
- Streams
- Sections
- Riparian Habitat Conservation Areas (RHCA)
- Private Land Ownership
- Project Area Boundary

Temporary Roads

- Historic
- New

Logging Systems

- Cable
- Skyline
- Tractor
- Tractor - Swing



Snag/Live Tree Prescriptions

Please see the “Snag/Live Tree Prescriptions” 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 7.4 miles of historic road templates would be temporarily opened to access proposed salvage units; these roads would be reclaimed after use. Table 2-6 describes this and the new temporary road construction.
- Approximately 1.9 miles of new temporary roads would be constructed to access proposed salvage units. These temporary roads would be obliterated after use.
- 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 2-6. New and Historic Temporary Road Construction for Alternative C.

Road Number	New or Historic	Length (miles)	Units Accessed
A	Historic	1.2	1, 2E, 2W, 3, 5
B	Historic	0.7	3, 8B
D	Historic	0.4	5
E	Historic	0.3	8, 8AN
I	Historic	0.6	125, 126
J	Historic	0.4	34
L	Historic	0.3	40
M	Historic	1.8	62, 63, 64G, 64H, 64I, 64M
O	Historic	0.6	74, 74A
Q	Historic	0.7	80
R	Historic	0.4	80
TOTAL HISTORIC		7.4	
AS	New	0.2	1
IS	New	0.3	125, 126
KK	New	0.2	82, 83A
MS	New	0.4	64H, 64I
QQ	New	0.2	64L
YY	New	0.2	111A, 112
ZZ	New	0.4	60
TOTAL NEW		1.9	

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.

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 issues five, six, and seven as described in Chapter One were featured during the development of this alternative. To summarize these issues as they influenced this alternative: additional areas of timber salvage harvest are proposed to manage for possible epidemic levels of Douglas-fir and spruce bark beetles; and temporary road construction and reconstruction was reduced from that in the Proposed Action. 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 5013 acres of commercial timber salvage is proposed for harvest. Harvest activities would occur in 204 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 2-7 for a unit by unit description.
- Approximately 507 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 or at risk to 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 would 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, adequate trees and logs would be retained to meet INFISH Riparian Management Objectives, and trees felled for safety should be felled toward the stream and left intact. The forest soil scientist would perform infield consultation with the sale administrator to avoid tractor operation in wet soil areas and/or on steep slopes in these areas.

- 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 1116 acres of planting and 1099 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 2-7. Alternative D Units for Commercial Timber Harvest.

Unit Number *	Acres	Yarding System^	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
1	32	Tractor	WW-Multi	Plant	Yes
2E	13	Tractor	WW-Multi	Plant	Yes
2W	6	Tractor	WW-Multi	Plant	Yes
3	10	Tractor	WW-Multi	Plant	Yes
4	16	Tractor	WW-Multi	Plant	Yes
5	46	Tractor	WW-Multi	Plant	Yes
8	32	Tractor	WW-Single	Natural	Yes
8AN	24	Skyline	WW-Multi	Natural	No
8AS	32	Skyline	WW-Multi	Natural	No
8B	7	Tractor	WW-Multi	Natural	Yes
11	6	Tractor	WW-Multi	Plant	Yes
13	21	Tractor	WW-Multi	Plant	Yes
14C	3	Tractor	WW-Multi	Plant	Yes
14E	18	Tractor/Swing	WW-Multi	Plant	Yes
14W	8	Skyline	WW-Multi	Plant	No
15	8	Tractor	WW-Multi	Natural	Yes
16	40	Helicopter	WW-Multi	Natural	No
17	15	Helicopter	WW-Multi	Natural	No
17BN	11	Tractor	WW-Multi	Plant	Yes
17BS	7	Tractor	WW-Multi	Plant	Yes
18	18	Helicopter	WW-Multi	Natural	No

Unit Number*	Acres	Yarding System^	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
19	54	Helicopter	WW-Single	Plant	No
20	24	Helicopter	WW-Single	Plant	No
21	21	Tractor	WW-Multi	Natural	Yes
23	82	Tractor	WW-Multi	Natural	No
23A	60	Helicopter	WW-Multi	Plant	No
24	14	Tractor	WW-Single	Plant	No
25	10	Tractor	WW-Multi	Natural	Yes
27	15	Skyline	WW-Multi	Plant	No
28	2	Tractor	WW-Multi	Plant	Yes
28A	2	Tractor	WW-Multi	Plant	Yes
28B	44	Tractor	WW-Multi	Natural	Yes
29	12	Tractor	WW-Multi	Plant	Yes
31	124	Tractor	WW-Multi	Plant	Yes
33	18	Tractor	WL	Natural	Yes
34	6	Tractor	WW-Single	Plant	No
34A	11	Helicopter	WW-Single	Plant	No
36	8	Tractor	WW-Single	Natural	Yes
37	6	Skyline	WL	Natural	No
38	49	Tractor	DF	Interplant	No
40	16	Tractor	DF	Interplant	Yes
43	20	Skyline	WW-Single	Natural	No
43B	14	Tractor	WW-Multi	Plant	Yes
44A	36	Tractor	DF	Natural	Yes
44C	5	Tractor	WW-Multi	Interplant	Yes
44E	22	Tractor	WW-Multi	Interplant	Yes
44W	12	Tractor	WW-Multi	Interplant	Yes
45B	21	Tractor	DF	Natural	Yes
46	24	Tractor	WW-Multi	Interplant	Yes
47	5	Tractor	DF	Natural	Yes
48	26	Tractor	WW-Single	Natural	No
49	11	Tractor	DF	Natural	No
49A	7	Skyline	DF	Natural	No
51	22	Tractor	DF	Natural	No
52	4	Tractor	DF	Natural	Yes
52A	1	Tractor	DF	Natural	Yes
53A	21	Tractor	DF	Natural	Yes
53B	9	Tractor	DF	Natural	Yes
53C	4	Tractor	DF	Natural	Yes
54	42	Tractor	DF	Interplant	Yes
54A	36	Helicopter	DF	Interplant	No
55	41	Tractor	DF	Interplant	Yes
55A	2	Tractor	DF	Interplant	Yes
56	4	Tractor	DF	Interplant	Yes
57	5	Tractor	DF	Natural	Yes
58	16	Tractor	WL	Natural	Yes
58A	34	Cable	DF	Natural	No
59	64	Skyline	DF	Interplant	No
59A	7	Cable	DF	Interplant	No
60	45	Skyline	DF	Interplant	No
60A	44	Skyline	DF	Interplant	No
61	11	Skyline	DF	Natural	No
62	17	Tractor	WW-Multi	Natural	Yes
63	23	Skyline	WL	Natural	No

Unit Number *	Acres	Yarding System ^	Snag/Live Tree Rx Group**	Regeneration Method @	Winter Logging Required Ω
64A	12	Skyline	WW-Multi	Interplant	No
64B	38	Skyline	DF	Interplant	No
64C	4	Skyline	WW-Multi	Interplant	No
64D	11	Helicopter	DF	Interplant	No
64E	9	Helicopter	WW-Multi	Interplant	No
64F	10	Helicopter	DF	Interplant	No
64G	19	Skyline	DF	Natural	No
64H	23	Tractor	DF	Natural	Yes
64I	9	Skyline	DF	Natural	No
64J	34	Skyline	WW-Multi	Interplant	No
64K	2	Skyline	WW-Multi	Interplant	No
64L	90	Skyline	WW-Multi	Natural	No
64M	10	Tractor	WW-Multi	Interplant	Yes
64N	2	Tractor	WW-Multi	Interplant	Yes
64P	5	Helicopter	DF	Natural	No
65	35	Tractor	WW-Multi	Natural	Yes
65A	37	Helicopter	DF+LTM	Natural	No
65B	8	Helicopter	DF+LTM	Natural	No
65C	4	Helicopter	WW-Multi+LTM	Natural	No
65D	55	Helicopter	WW-Multi+LTM	Natural	No
66	13	Helicopter	DF	Interplant	No
67	9	Tractor	DF	Natural	Yes
68	21	Skyline	DF	Natural	No
68A	10	Skyline	DF	Natural	No
69	38	Skyline	DF	Interplant	No
69A	11	Helicopter	DF	Interplant	No
70	3	Tractor	DF	Plant	Yes
71	2	Helicopter	DF	Natural	No
73A	44	Skyline	DF	Natural	No
73B	16	Helicopter	DF+LTM	Natural	No
74	87	Tractor	DF	Natural	Yes
74A	32	Tractor	WW-Single	Plant	Yes
75	18	Skyline	DF	Natural	No
76	10	Helicopter	DF	Plant	No
77	52	Skyline	DF	Plant	No
77A	40	Skyline	DF	Natural	No
78	19	Skyline	DF	Plant	No
80	56	Skyline	DF	Natural	No
81	11	Tractor	DF+LTM	Natural	Yes
82	16	Skyline	DF	Interplant	No
83	41	Tractor	WW-Multi	Plant	Yes
83A	22	Tractor	WW-Multi	Plant	No
84	17	Tractor/Swing	WW-Multi	Interplant	Yes
84A	16	Skyline	WW-Multi	Interplant	No
85	33	Helicopter	WW-Single+LTM	Plant	No
86	39	Tractor	WW-Multi	Interplant	No
86A	4	Skyline	WW-Multi	Interplant	No
87A	7	Skyline	WW-Multi	Plant	No
87B	2	Tractor	WW-Multi	Plant	Yes
87C	3	Tractor	WW-Multi	Plant	Yes
88	3	Tractor	WW-Multi	Interplant	Yes
89	85	Tractor	WL	Natural	Yes
89A	7	Tractor	DF	Natural	Yes

Unit Number*	Acres	Yarding System^	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
92	43	Tractor	WL	Natural	No
93	16	Tractor	DF	Natural	Yes
94	19	Tractor	WW-Multi	Natural	Yes
95A	3	Cable	WW-Single	Plant	Yes/No
95B	3	Cable	WW-Single	Plant	Yes/No
96	2	Tractor	DF	Natural	Yes
97	38	Skyline	WL	Natural	No
98	24	Tractor	WL	Natural	Yes
99	7	Tractor	WL	Natural	No
99A	6	Cable	WL	Natural	No
99C	15	Cable	WL	Natural	No
99D	14	Cable	WL	Natural	No
100	8	Skyline	DF	Natural	No
101	4	Tractor	WL	Natural	Yes
102	43	Skyline	DF	Natural	No
103	3	Cable	DF	Plant	Yes
104	41	Skyline	DF	Natural	No
105	11	Tractor	DF	Natural	No
106	4	Tractor	WW-Single	Natural	Yes
107	35	Tractor	DF	Natural	Yes
107A	3	Tractor	DF	Natural	Yes
107B	46	Helicopter	DF	Natural	No
107C	11	Helicopter	WL	Natural	No
108	24	Skyline	DF	Natural	No
109	15	Tractor/Swing	WW-Multi	Natural	Yes
111	153	Helicopter	WW-Multi+LTM	Natural	No
111A	23	Skyline	WL	Natural	No
112	43	Tractor	WW-Multi	Natural	No
113	32	Skyline	DF	Natural	No
113A	6	Skyline	WW-Multi	Natural	No
114	11	Helicopter	WW-Multi	Interplant	No
115	120	Helicopter	WW-Multi	Plant	No
116	126	Skyline	WL	Natural	No
117	56	Tractor	WW-Multi	Natural	No
118	70	Helicopter	DF	Natural	No
119	31	Tractor	WW-Multi	Plant	Yes
119A	21	Tractor	WL	Natural	Yes
120	58	Tractor	DF+LTM	Natural	Yes
121	44	Tractor	DF+LTM	Natural	No
122	12	Tractor	DF	Interplant	No
123	5	Tractor	DF	Interplant	No
124	15	Tractor	DF	Interplant	No
125	14	Tractor	DF	Natural	Yes
126	41	Skyline	DF	Natural	No
128	23	Skyline	WL+LTM	Natural	No
129	90	Skyline	WW-Multi+LTM	Natural	No
130	182	Tractor	WL	Natural	Yes/No
131	11	Helicopter	WL	Plant	No
132	61	Skyline	WW-Multi	Plant	No
134	10	Tractor	DF	Natural	Yes
B2	23	Tractor	Beetle	Plant	No
B3	5	Tractor	Beetle	Interplant	No
B4	27	Cable	Beetle	Plant	No

Unit Number *	Acres	Yarding System^	Snag/Live Tree Rx Group**	Regeneration Method@	Winter Logging Required Ω
B5	23	Skyline	Beetle	Interplant	No
B6	4	Cable	Beetle	Interplant	No
B7	4	Tractor	Beetle	Interplant	No
B9	23	Helicopter	Beetle	Natural	No
B10	38	Tractor	Beetle	Plant	No
B16	3	Cable	Beetle	Plant	No
B19	11	Tractor	Beetle	Interplant	No
B20	8	Tractor/Swing	Beetle	Interplant	No
B21	8	Helicopter	Beetle	Interplant	No
B22	7	Cable	Beetle	Interplant	No
B23	19	Tractor	Beetle	Interplant	No
B25	13	Helicopter	Beetle	Interplant	No
B26	55	Tractor	Beetle	Interplant	No
B27	5	Tractor	Beetle	Interplant	No
B30	7	Skyline	Beetle	Interplant	No
B31	17	Skyline	Beetle	Interplant	No
B33	25	Skyline	Beetle	Interplant	No
B34	26	Tractor/Swing	Beetle	Interplant	No
B35	16	Tractor	Beetle	Interplant	No
B36	26	Cable	Beetle	Plant	No
B38	38	Helicopter	Beetle	Interplant	No
B39	63	Helicopter	Beetle	Interplant	No
B42	8	Tractor	Beetle	Plant	No
B47	5	Tractor	Beetle	Natural	No
TOTAL	5013				

* Units starting with a B designate units that would only be harvested if monitoring detects elevated bark beetle infestations in or near the units.

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

** Snag/Live Tree Prescription Group: See the Snag/Live Tree Prescriptions section below.

Snag/Live Tree Prescriptions

Table 2-8 describes the snag and live tree prescriptions for Alternative D. These are the same as for Alternatives B and C except for the addition of the “Beetle Units.” 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. In all snag/live tree prescription groups, units with lower burn severities would have additional trees marked to leave. This would retain live trees that would otherwise be removed under the standard prescriptions. These units have “+LTM” in the Snag/Live Tree Prescription Group column in Table 2-7 above. 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 2-8; all other tree species would be retained except for spruce trees that are infested or at risk to bark beetles.

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/live tree 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/live tree prescription group was assigned to each salvage unit.

Table 2-8. Alternative D Snag/Live Tree Prescriptions in Commercial Timber Harvest Units
(Exhibit Rd-13).

Snag/Live Tree Prescription Group	Western Larch Retention	Douglas-fir Retention
Douglas-fir	All	None
Larch	16" DBH and larger	None
Whitewoods—single-species	All	All
Whitewoods—multi-species	14" DBH and larger	None
Beetle Units	All	10-20" DBH at low risk to bark beetles *

* Douglas-fir at low risk to beetles are 10-15" DBH with <25% moderate or deep bole char and \geq 30% live crown ratio, or 15-20" DBH with no moderate or deep bole char and \geq 30% live crown ratio.

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 7.6 miles of historic road templates would be temporarily opened to access proposed salvage units; these roads would be reclaimed after use. Table 2-9 describes this and the new temporary road construction.
- Approximately 2.5 miles of new temporary roads would be constructed to access proposed salvage units. These temporary roads would be obliterated after use.
- 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.

Figure 2-3

Sheppard Creek

Post-Fire Project
Tally Lake Ranger District

Alternative D

Legend

- National Forest System Roads
- Trails
- Streams
- Sections
- Riparian Habitat Conservation Areas (RHCA)
- Private Land Ownership
- Project Area Boundary

Temporary Roads

- Historic
- New

Logging Systems

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

North

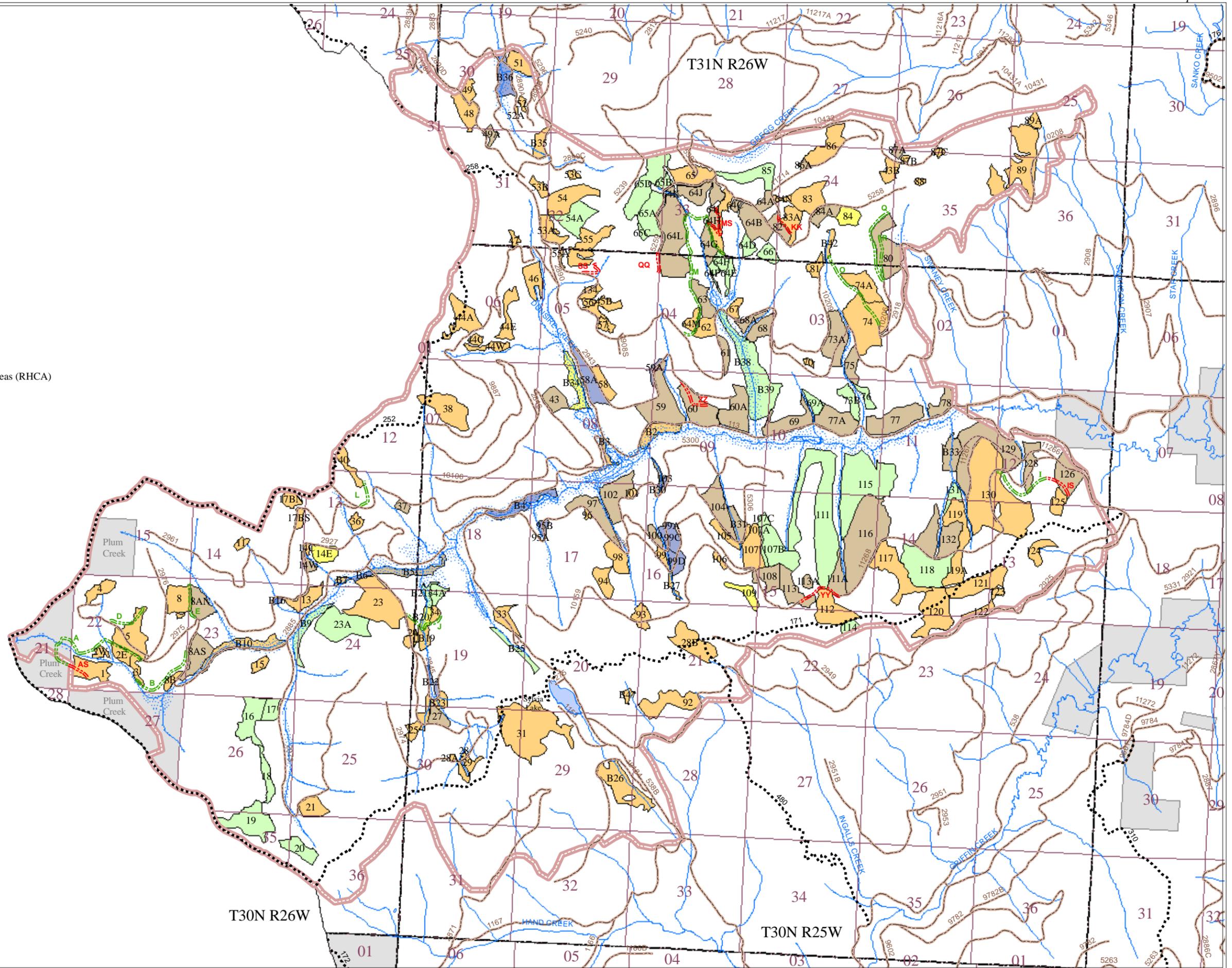
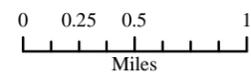


Table 2-9. New and Historic Temporary Road Construction for Alternative D.

Road Number	New or Historic	Length (miles)	Units Accessed
A	Historic	1.2	1, 2E, 2W, 3, 5
B	Historic	0.7	3, 8B
D	Historic	0.4	5
E	Historic	0.3	8, 8AN
I	Historic	0.6	125, 126, 128
J	Historic	0.4	24, 34, B19, B20
L	Historic	0.3	40
M	Historic	1.8	62, 63, 64G, 64H, 64I, 64M
O	Historic	0.8	74, 81, B42
Q	Historic	0.7	80
R	Historic	0.4	80
TOTAL HISTORIC		7.6	
AS	New	0.2	1
IS	New	0.3	125, 126
KK	New	0.2	82,83A
MS	New	0.4	64H, 64I
QQ	New	0.2	64L
SS	New	0.3	55
YY	New	0.5	111, 112, 113
ZZ	New	0.4	60
TOTAL NEW		2.5	

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.

Helicopter Landings

An estimated 12 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 led by the District Hydrologist. 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 2-10. Acres Unsuitable for Timber Harvest Proposed for Salvage Harvest

Management Area	Alternative A	Alternative B	Alternative C	Alternative D
MA 2C	0	296	197	296
MA 12	0	0	0	330

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 following table numerically summarizes the features of the alternatives.

Table 2-11. Summary of the Features of all Alternatives

Feature	Alt. A No Action	Alt. B Proposed Action	Alt. C	Alt. D
Temporary Road Construction	0	24.3 miles	9.3 miles	10.1 miles
-Historic Template	0	15.6 miles	7.4 miles	7.6 miles
-New Roads	0	8.7 miles	1.9 miles	2.5 miles
System Road Construction	0	0 miles	0 miles	0 miles
Road Rehabilitation of Timber Haul Routes (BMPs)	0	117 miles	101 miles	108 miles
Shrub and Forb Planting on Reclaimed Temp Road	0	1.9 miles	0.2 miles	0.5 miles
Timber Volume Estimate in Million Board Feet	0	29	21	32
Total Harvest Acres	0	4510	3278	5013
- Cable	0	114	79	152
- Helicopter	0	234	0	1049
- Skyline	0	1679	1337	1476
- Tractor	0	2313	1812	2252
- Tractor / Skyline Swing	0	170	50	84
Acres Required for Winter Logging	0	1857	1359	1521
Acres of Allowable Summer Slash Mat Yarding	0	552	415	696
Acres of Tree Seedling Regeneration				
- Plant	0	1013	735	1138
- Interplant	0	745	550	1099
- Natural	0	2759	1993	2776

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 2-12. 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	234	0	1049
#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 0	0 0	0 0	0 0
#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	0 165 3.7	0 0 0.4	8 165 0.9
#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 83% 21,097 44%	3 15% 3,352 53%	6 29% 5,991 50%	4 11% 1,293 53%
#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	0.4 14	0 3	0 3

Issue and Issue Indicators:	Alternative A No Action	Alternative B Proposed Action	Alternative C	Alternative D
#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 new temporary road construction near suppression activities and moist areas. 	0	0.9	0.1	0.1
#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	1650	1168	1948
	0	3642	2633	4000

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