Chapter 2 Alternatives, Including the Proposed Action

Introduction

This chapter describes and compares the alternatives considered for the Kahler Dry Forest Restoration Project. It includes a description and 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., helicopter logging versus the use of skid trails) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of erosion caused by helicopter logging versus skidding).

Alternatives Considered in Detail

The Forest Service developed 3 alternatives, including the No Action and Proposed Action alternatives, in response to issues raised by the public.

Alternative 1

No Action

Under the no action alternative, current management plans would continue to guide management of the project area. No vegetation treatment and road maintenance would be implemented to accomplish project goals.

Alternative 2 - The Proposed Action

Alternative 2 was developed to meet the Purpose and Need for the Kahler Dry Forest Restoration Project, while addressing the issues identified in Chapter 1.

Upland Forest Thinning

The Kahler project proposes to use variable density thinning with skips and gaps to reduce tree density, shift species composition, and promote old forest structure across approximately 10,600 acres within the project area. Approximately 10-15% of each proposed unit will remain untreated in “skips” that are half an acre or larger in size, and approximately 10-15% of each proposed unit will become open “gaps” that are ½ to 2 acres in size. Between the skips and gaps, units will be thinned to a variable density with an average residual basal area that is determined by the unit’s plant association. There will be an option to remove select young (<150 years old) grand fir and Douglas-fir trees that are 21 inches or greater in diameter and interacting with the crown of a desirable leave tree. No other trees that are 21 inches or greater will be removed. Tree species preference will be for ponderosa pine and western larch. Diseased trees and those with severe mistletoe infestations will be targeted for removal where they are outside historical ranges. Trees may be removed using ground-based, skyline, or helicopter methods. Minimum snag and downed wood standards will be maintained. Thinning of western juniper (7 inches to 21 inches in diameter) may occur within commercial harvest units in order to reduce and/or eliminate its encroachment into upland forest stands. Treatment is proposed in Class 4 riparian areas where it did not historically occur in order to maintain or improve the quality of

upland forest habitat, the diversity and productivity of riparian plant communities, and water availability for native vegetation.

Shrub Steppe Enhancement

Western juniper and other conifer species (including ponderosa pine and Douglas-fir) have spread from historically occupied habitat into grassland and shrub-steppe habitats in the Kahler area, based on examination of 1939 aerial photographs. Shrub-steppe habitats are characterized as having some component of upland shrubs, including bitterbrush, sagebrush, and mountain mahogany. Conifers were often absent from these areas, largely due to periodic fires. These areas provide unique habitat for a number of groups of wildlife, including invertebrates, birds, small mammals, and large herbivores. Encroachment of juniper and other conifers from historically occupied sites has impacted site characteristics, including microclimate. Invading conifers compete with characteristic grassland and shrub-steppe vegetation for limited resources. In order to improve habitat conditions in grassland and shrub-steppe where encroachment has occurred, western juniper up to 21 inches in diameter and not showing old growth characteristics would be removed where it did not historically occur. As juniper was historically present in some areas within these proposed units (rock bluffs, scabs, and other sites with shallow soils), measures will be taken to ensure that large, old juniper and smaller diameter juniper regeneration are retained in these areas. Grassland/shrub-steppe enhancement through conifer reduction would occur on approximately 333 acres in the project area.

Prescribed Fire

Following mechanical treatment, approximately 31,000 acres of the project area will be treated using prescribed fire. Ignition may take place from within RHCAs. Burning may occur in spring or fall; acreage would not be burned all at once, but rather in small increments over a period of several years. This treatment would reintroduce fire to a fire-dependent ecosystem by blackening about 50-75% of the area to lessen the impact of a future wildfire, improve forage quality for big game, and encourage ponderosa pine recruitment. Existing roads and the use of natural barriers would be used to contain prescribed fires. All ignition methods may be used, including hand held drip torch, ATV-mounted drip torch, and helicopter ignition.

Noncommercial Thinning

Noncommercial thinning would occur on approximately 6,135 acres; 1,077 acres outside harvest units and 5,058 acres within harvest units. The noncommercial thinning treatment will cut conifer seedlings, saplings, and small poles, generally up to 7 inches in diameter at breast height (DBH), and western juniper trees less than 12 inches diameter, to help meet forest vegetation needs identified in the Kahler project's purpose and need, including tree vigor improvement for insect and disease resistance, restoring and maintaining a sustainable species composition, increasing forage for native and domestic ungulates, and addressing fire hazard by reducing ladder fuels.

For the noncommercial thinning treatments, tree species would be retained in this order of preference: ponderosa pine, western larch, Douglas-fir, Engelmann spruce, grand fir, lodgepole pine, and western juniper.

Noncommercial thinning units would be treated by hand using chainsaws, or treated by mechanical equipment such as masticators. Stands would meet or exceed minimum stocking levels after treatment, and no reforestation would be required. Created slash would either be lopped and scattered to within 18 inches of the ground surface, mechanically treated (grapple

piling, chipping, or slash busting), or hand piled and burned, depending on post-treatment fuel loads and site characteristics or limitations.

Note that trees being cut in the noncommercial thinning treatment may have commercial value depending on tree diameter and tree-size limitations associated with the harvest system or processing equipment being used. Generally, trees 7 inches DBH or smaller are not considered to have commercial value, although smaller-diameter trees may have value for chips, hog fuel, and other non-sawtimber products, depending on market conditions and a treatment unit's characteristics (proximity to markets, etc.). Markets for small-diameter trees are unreliable, so it is unknown at this time whether trees below 7 inches DBH would be cut in the commercial treatments. Due to uncertainty about market conditions, the need to cut trees less than 7 inches in diameter (less than 12 inches in diameter for western juniper) will be analyzed as a noncommercial treatment for this environmental assessment.

Riparian Area Thinning

Approximately 800 acres of dry upland, high density forest stands are within intermittent stream riparian habitat conservation areas (category 4 RHCAs) in proposed units, and they would be treated to maintain or restore RHCA vegetation conditions including improvement of channel function and floodplain connectivity using a variable width no-mechanical zone adjacent to the stream channels. The no-mechanical zone width would vary depending on topography, stream type and vegetation. Within selected areas of the no-mechanical zone, hand thinning of small diameter (≤7" DBH) trees may occur. Selected trees may be felled along streams and left in the channel to provide for recruitment of woody material. Some skipped areas within units would be located adjacent to stream no-mechanical zones to create variability along the stream corridor.

Tamarack Fire Lookout Thinning

An administrative site that includes a rental cabin, fire lookout, and communications equipment on Tamarack Mountain will be treated to improve public and firefighter safety, improve fire sighting capabilities from the lookout, and reduce the risk of loss from wildfire. Approximately 25 acres of surrounding forest stands and travel corridors have been identified for thinning. A portion of this thinning occurs within the C1 management area. Thinning prescriptions will be tailored to improve sight line distances in order to prevent potential wildfires into this area. To improve sight line distances, thinning from above would occur with skips/ gaps incorporated. Some trees over 21 inches DBH may be felled or topped.

In order to facilitate a fire safety buffer to the tower, a group opening thinning would occur within the 3.5 acre administration site. Select trees nearest the lookout cabin would be retained.

Connected Actions

In addition to the above treatments, the following connected actions would occur as a part of this project:

Danger Tree Removal

Danger trees or hazard trees are defined as "a standing tree that presents a hazard to people due to conditions such as, but not limited to, deterioration or physical damage to the root system, trunk, stem, or limbs and the direction or lean of the tree" (USDA Forest Service 2007). The objective of removing danger trees is to improve public safety for visitors to the Kahler planning area by reducing danger-tree hazards in areas where people travel and recreate.

A danger tree is any tree hazardous to people or facilities because of: (1) its location; (2) its degree and direction of lean; (3) presence and type of physical damage; (4) deterioration of limbs, stem, or root system from disease, decay, and other biotic factors; (5) presence of overhead hazards from dead tops, hung-up trees, or unattached branches; and (6) a combination of the above (Toupin et al. 2008, USDA Forest Service 2007).

Danger trees are identified and evaluated using a standard protocol (Toupin et al. 2008). Danger tree evaluations are completed by qualified personnel who have completed specific training for this activity. The Forest Service has established policy and direction for how danger trees will be identified, evaluated, and managed along the transportation system (USDA Forest Service 2007). Three types of danger trees are identified by the evaluation protocol: (1) trees with a low failure probability (within 10 years of rating); (2) trees with a likely failure probability (within 3-5 years of rating); and (3) trees with an imminent failure probability (within 1 year of rating).

For the Kahler Dry Forest Restoration Project, danger trees will be identified, evaluated, and removed (or addressed by using other remediation actions such as felling and leaving in place) from any portion of the transportation system used for timber sale activities, along access roads for developed recreation sites such as Fairview Campground, and for administrative sites such as Tamarack fire lookout. When possible and economically feasible, danger trees will be removed during the course of other timber harvest operations. A Kahler project design feature is specifically directed toward remediation of danger trees – it is design feature VG8 in the Vegetation section of the Kahler project design features table.

Aspen Restoration

Approximately 43 acres of aspen were identified during field reconnaissance (6 acres were identified as extirpated). Select aspen stands (clones) that are in the project area would be treated in order to enhance aspen regeneration and recruitment success. Aspen stands outside of units would be limited to non-mechanical methods. Restoration treatment options will include combinations of prescribed burning, fencing and reducing conifer competition. Treatment combinations will vary depending on the condition of the aspen stand. Competing conifers that are less than 150 years old may be reduced up to 100 feet around the clone.

Reforestation

In units with a low proportion of early seral trees (primarily due to past logging) reforestation of ponderosa pine and/or western larch may occur after harvest and burning activities are complete. Reforestation will primarily occur to the larger gaps 1-2 acre openings where contributing ponderosa pine or western larch seed is expected to be low and where artificial regeneration will help facilitate desired future conditions.

Treatment of Residual Debris

All units with residual fuel loads above the Forest Plan standard would be treated manually (lop and scatter or piled), mechanically (grapple piling, grinding, crushing), removed off site and used as Biomass material, and/or with prescribed burning to reduce fuel loads to standard. Burning of residual materials would depend upon the harvest system used. The types of burning treatment options would range from all residual materials left in the units to be burned when conditions permit, to materials piled and burned at each landing. Landings would be about ¼ acre in size and occur on average once every 25 acres. Fire would be applied by hand-held drip torch, ATV-mounted drip torch, or helicopter. Burning could occur in either spring or fall after thinning or

harvest activities are complete. Existing roads and or natural barriers would be used to contain prescribed fires. Water would be drafted from pre-approved sources for control.

Access

A new permanent road 0.3 mile in length will be constructed in Alternative 2 and 3 to avoid using and existing road going through private land without a Right of Way or an old road converted to OHV trail O-2400140. This new road will avoid the need to build a crossing going through a stream channel and the need to harden a private road for haul. OHV trail O-2400140 will then be decommissioned after the project as funds allow. This new road will also give more constant access to NF lands without impacting a private inholding.

Temporary roads may be used to access some proposed units, and would be decommissioned following the project. Some closed roads would be re-opened to access treatment units for the duration of activities. Opening would involve removal of closure devices, brush clearing, and blading as necessary. These roads would be re-closed using the same type of closure device (signs or barricades) following the completion of activities. Waterbars and/or seeding with native seed would be applied as needed to prevent soil movement.

All roads and road crossings will be evaluated as to their potential negative impacts to wildlife and aquatic resources and remedies, including closures, may be addressed. See the Travel Action Plan (Appendix J) for tables of open and closed roads in Alternative 2.

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) (IPCC 2014), the most recent National Climate Assessment (Melillo et al. 2014), and other sources suggest that the magnitude and pace of climate change in forest ecosystems will be unprecedented. Climate change is capable of changing forests to meadows, and changes of this extent will trigger a cascade of associated impacts on plants, wildlife, and other ecosystem components.

For the Blue Mountains ecoregion containing the Kahler planning area, monthly average temperature is projected to increase by ~3.3°C in winter (December-February) and 5.0°C in summer (June-August). Projected changes in precipitation vary substantially among models, but the central tendency is for increased precipitation (~15%) in winter (November-February) and decreased precipitation (17%) in summer (June-September) (Mauger and Mantua 2011).

Changes in temperature and precipitation are expected to have important implications on soil moisture, water availability, and streamflow timing. Projections for the end of this century are for a 69-72% decrease in April 1st snowpack, with snowmelt occurring at least 3 week earlier than at present. Projected changes in soil moisture, which have important implications on tree growth and stand vigor (Grant et al. 2013), show increases in average winter amounts (12-13% for January-April) and decreases in average summer storage (4-7% for June to September) (Mauger and Mantua 2011).

In order to fulfill its mission, vision, and guiding principles, the Forest Service will need to respond to climate change promptly and effectively. Two responses are especially important – actions designed to increase near-term resistance to climate change (mitigation), and actions designed to improve long-term resilience to climate change (adaptation).

As described in Table 4-40 of the Vegetation Report, the Kahler Dry Forest Restoration Project includes resistance and resilience actions.

When considering possible influences on climate change, including production of greenhouse gases, the overall scope of the Kahler proposed action is minor because approximately 12,220 acres of silvicultural activity (the Kahler Proposed Action) will affect:

1. 37% of the Kahler planning area (consisting of 32,840 acres)
2. 6% of the Heppner Ranger District (consisting of 209,930 acres)
3. 1% of the Umatilla National Forest (consisting of 1,406,510 acres)
4. 0.2% of the Blue Mountain national forests (Malheur, Umatilla, Wallowa-Whitman) (consisting of 5,135,750 acres).
   [When establishing a climate change context for the Kahler proposed action, all three of the Blue Mountains national forests are included because the Blue Mountains ecoregion (province) is considered to be the most appropriate scale at which to evaluate climate change impacts.]

See Forest Vegetation Report, particularly figures 16 and 17 in that source, for more information about projected climate change effects on vegetation conditions of the Kahler Project area.

Luce and Holden (2009) published a study of trends in stream flow over a 58 year period. It noted that while increasing variability in annual stream flows had been recorded, the nature of the changes were largely unexplored. They tested for trends in the distribution of annual streamflow at 43 gages in the Pacific Northwest for water years 1948 to 2006. Seventy-two percent of the stations showed significant declines in the 25th percentile annual flow, with half of the stations exceeding a 29 percent decline. Fewer stations showed significant declines in either median or mean annual flow, and only five had a significant change in the 75th percentile. This demonstrated that increases in variance result primarily from a trend of increasing dryness in dry years.

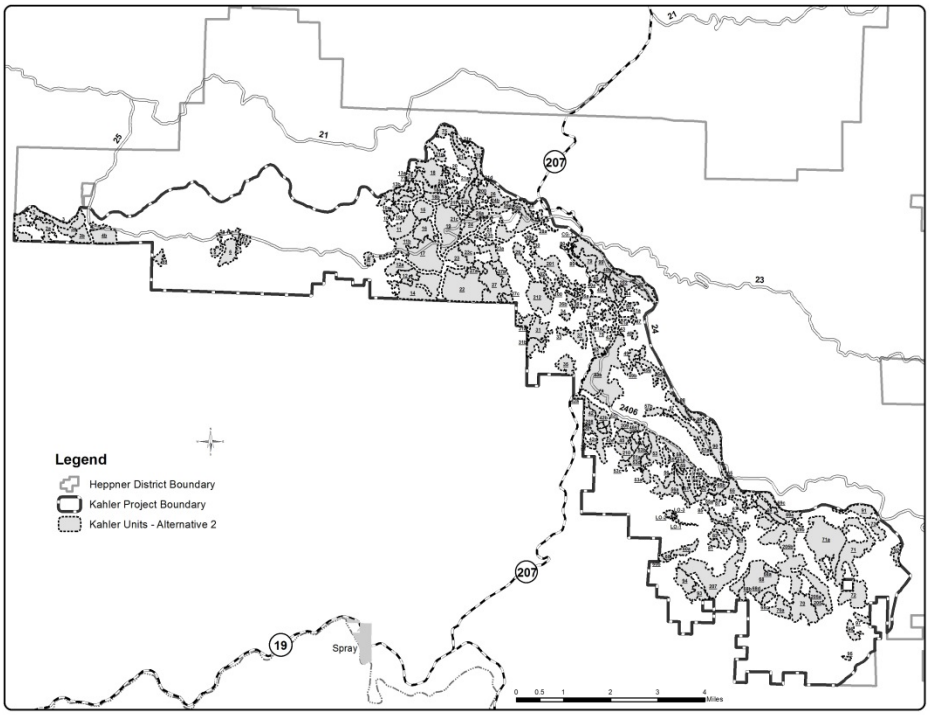
Lawler et al. (2008), reports that the Blue Mountains of Oregon have gotten warmer and drier since 1970, based on existing weather records. Future climate is predicted to be warmer and wetter, especially in the eastern part of the state. Snow packs in the transitional rain on snow watersheds are expected to melt earlier, with earlier peak flows. Precipitation is expected to be greater in the winter and less in the summer, with an overall increasing trend. The rate of increase in precipitation is expected to accelerate over the next 100 years.

These findings imply reduced stream flows in dry years with the possibility of increasing flows during the winter and increasing, but earlier peak flows during wetter years. Reduced flows translate into reductions in the quality and quantity of aquatic habitat. The upper extent of perennial streams may decrease. In addition, flow has a strong control on stream temperatures and flow reduction would likely exacerbate stream temperature increases. Terrestrial ecology would also be affected by increased fire occurrence, increased forest mortality, and decreased tree growth. Regarding sedimentation, increasing dryness in dry years may translate into less risk of sedimentation after disturbance. Increasing winter flows in wet years may indicate greater sedimentation during those years.

Analysis of projected climate change impacts suggest that a project of Kahler's scope will contribute such minimal amounts of greenhouse gas that its impact on global or national climate change will be infinitesimal. Therefore, direct and indirect contributions to greenhouse gas and climate change from implementation of either alternative 2 or 3 will be negligible.

In addition, because the direct and indirect effects will be negligible, the projected contribution from either action alternative to cumulative effects on greenhouse gases and climate change will also be negligible.

Figure 2-1. Alternative 2.



Alternative 3

Alternative 3 was developed to meet the Purpose and Need for the Kahler Dry Forest Restoration Project, while addressing the issues identified in Chapter 1.

This alternative would drop commercial thin units, modify unit boundaries, or change unit prescriptions to retain marginal and satisfactory cover for elk in larger patches distributed across the landscape. Dropped unit acres generally provide dense cover habitat that was identified during project development and reconnaissance as receiving moderate to high elk use or having habitat characteristics (dense understory vegetation, high canopy closure, etc.) that are selected for by elk. Alternative 3 would provide larger patches of cover that would be available for elk during periods of high disturbance (e.g. hunting season) as refugia. Dropping these acres would also partially address Issue 2 by retaining dense multi-strata ponderosa pine and mixed conifer stands distributed across the landscape to provide for the needs of associated wildlife species, including the pileated woodpecker. A reduction in the acres of commercial thinning would also reduce the miles of temporary road and closed roads required to access treatment units, which partially addresses Issue 3. Dropping treatment acres would also partially address Issue 4 because RHCAs proposed for treatment would be retained in their current condition. Road closures proposed under Alternative 2 would also be altered slightly under this alternative. There would be an additional 0.9 miles of year-round closure on two road segments, and 1.8 fewer miles of seasonal road closure (close entire 2100-035 road and 0.5 miles of 2407-020 year round; remainder of 2407-020 would remain open year round).

Upland Forest Thinning

Alternative 3 will also utilize variable density thinning with skips and gaps to reduce tree density, shift species composition, and promote old forest structure. Approximately 9,200 acres of upland forest thinning would occur within the project area.

Juniper Non-Commercial Thinning

In Alternative 3, an additional 153 acres of western juniper will be non-commercially thinned in order to open up certain areas for wildlife movement.

Shrub Steppe Enhancement

Under Alternative 3, Shrub/Steppe areas would be treated the same as Alternative 2 - approximately 1,500 acres.

Prescribed Fire

Prescribed fire would be the same under Alternative 3 as Alternative 2 - approximately 31,000 acres of the project area will be treated.

Noncommercial Thinning

Noncommercial thinning would occur the same as Alternative 2 with the exception of an additional 153 acres of juniper thinning. Portions of two units (23 and 12) would be non-commercially thinned (by hand) of juniper in marginal elk cover stands to fuels, silviculture, and wildlife concerns related to juniper encroachment in these stands and retain elk cover adjacent to the Wheeler Point burn.

Riparian Area Thinning

Riparian areas treatment would be decreased to 657 acres under Alternative 3.

Tamarack Fire Lookout Thinning

Thinning operations near the Tamarack Fire Lookout under alternative 3 would be the same as Alternative 2.

Connected Actions

The connected actions in Alternative would be the same as Alternative 2: Danger tree removal (less due to changes in use and maintenance of access and haul roads described below) would occur where necessary, 43 acres of aspen restoration, reforestation where needed, and treatment of residual debris.

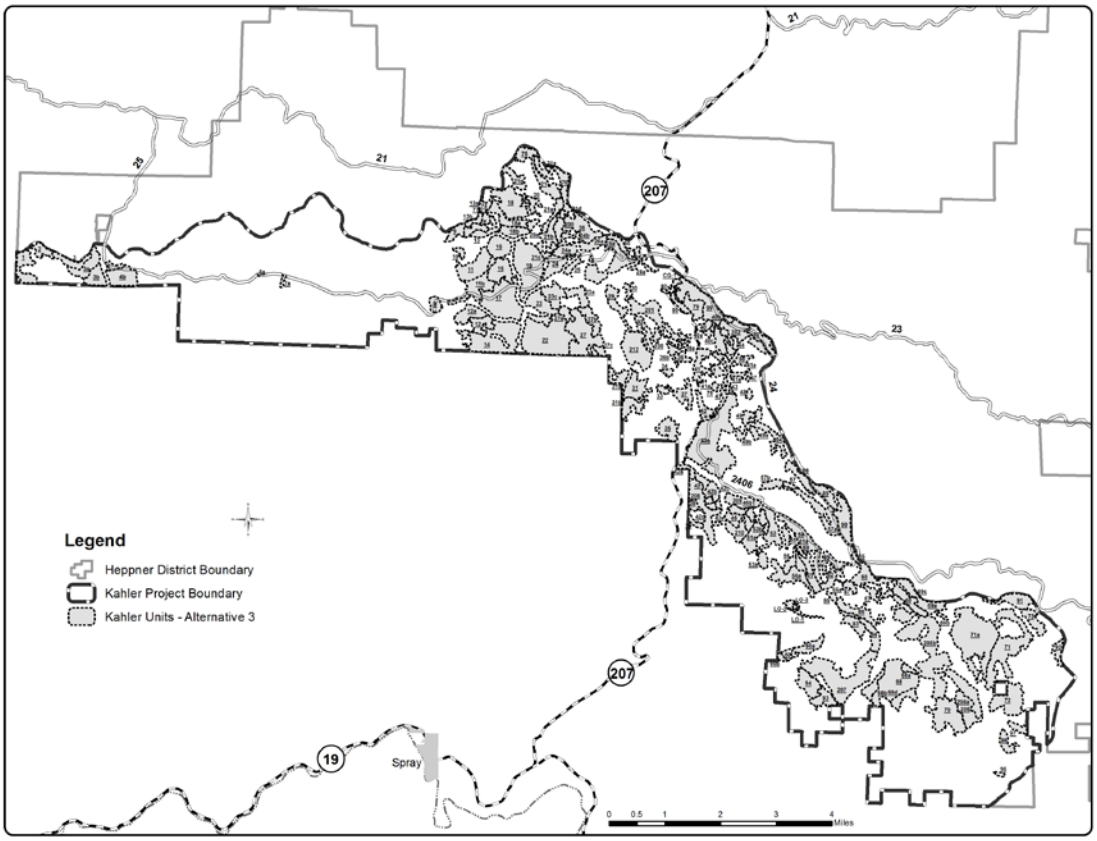
Access

The miles of roads would be decreased under Alternative 3 to promote wildlife and habitat. See the Travel Action Plan (Appendix x) for tables of open and closed roads in Alternative 3.

Climate Change

Climate change for Alternative 3 will be the same as it is in Alternative 2.

Figure 2-2. Alternative 3.



Design Features / Monitoring / Mitigation Common to Action Alternatives 2 and 3

Design Features

Design features and management requirements common to all action alternatives are described in Table 2-1.

Table 2-1 Design Features

Fire and Fuels and Air Quality		
Project Area	Label	Design Element
All Units	PF1	Burn prescriptions are designed to mimic low intensity fire (under 4 foot flame lengths). Where heavy fuel accumulations exist, adjust timing or method of fuel reduction, or exclude these areas from landscape underburns.
	PF2	As part of the plan for retention of logs and snags, protection measures will be used during prescribed underburning to reduce consumption of these large woody fuels needed for wildlife habitat and hydrologic stability. If slash piling occurs, locate piles at least 25 feet from the drip line of live trees (all species, including large old juniper) and snags (>10 inches DBH). Locate piles at least 10 feet from downed wood (>12 inches DBH). Pull back slash from and do not place piles near archeological sites. Pull burnable material away from and scrape to mineral soil around dendroglyph sites or exclude those areas from burning.
	PF3	Within proposed treatment units, protect large diameter snags and green trees (≥20 inches

		DBH), where needed, from adverse impacts (consumption, mortality, felling as hazards to operations) associated with burning. This may include scratch lining, raking litter and duff, or pulling harvest-created slash away from these habitat features.
	PF4	Direct lighting may take place in class 4 RHCAs. For RHCA Class 1, 2, and 3 follow the prescribed fire criteria as described in the Umatilla Forest Plan and the Blue Mt. PDC II. Alter prescribed fire ignition methods and holding actions in the RHCA's as needed to maintain ecosystem structure, function and processes.
	PF5	Firelines needed to conduct the proposed treatments shall consist of natural breaks, existing roads, black line or constructed lines. Firelines may be used to keep fire out of sensitive areas such as historic sites or private property.
	PF6	The Forest Service will take steps to notify adjacent landowners in advance of planned burn operations.
	PF7	Conduct prescribed fire treatments, including pile burning for slash disposal, in a manner that encourages efficient burning to minimize soil and smoke impacts while achieving treatment objectives.
	PF8	Burn piled material under conditions that reduce the likelihood of scorch on residual trees
	PF9	In prescribed fire unit 7, FS road 2500-150 is proposed to be decommissioned. Time the decommission to take place after unit 7 has been prescribed burned. In unit 6, a portion of the 2141 and 2141-060 is to be decommissioned. Blackline is the preferred method for fireline control.
	PF 10	Road closures related to Units 3 (2500-068/063/062), 9 (2141), and 14 (2406-040) should receive gates as the preferred method of closure. This will enable use of the roads as control lines for planned burning and wildfire.
	AQ1	In compliance with the Clean Air Act, burning of any kind will not occur unless prior approval is granted by the Oregon Department of Forestry.
	AQ2	Burning shall be planned for times when the transport winds and mixing heights are sufficient to displace much of the smoke from the area. Use biomass utilization, if feasible, to reduce emissions from burning.
Botany		
Project Area	Label	Design Element
Units 14, 22, 211	Bot1	"Areas to protect" will be implemented at 4 rare plant population locations in units 14 (proposed henry Creek botanical Area), 22 and 211. All three of these units are proposed for ground-based commercial thinning. These 'areas to protect' are buffered (30 m) rare plant populations.
	Bot2	These 'areas to protect' shall be excluded from ground-disturbing treatments by implementing a no-ground-disturbance buffer around each site of a size adequate to provide protection from implementation impacts. All off-road vehicles, trucks, and equipment shall avoid operation and travel in these areas. Decking, yarding, and piling of slash shall not occur in these areas. Project related camps and staging areas shall not be allowed. Fire control lines shall not be constructed in these areas. Each buffer size will be determined based on the site-specific setting of the occurrence, although the customary minimum is 30 meters. If it is determined to be necessary for project implementation, these areas will be identified on the ground. 'Areas to protect' will be specified in timber sale contract maps. Trees will be directionally felled away from these 'areas to protect.'
All Units	Bot3	If any new rare plant populations are located before or during project implementation, a Forest Service Botanist will be notified and the area will be protected until a determination is made. The population will be evaluated and design features shall be developed in consultation with the botanist.
Hydrology		
Project Area	Label	Design Element
All Units	WQ1	Harvest unit design should ensure favorable conditions of water flow, water quality and fish habitat.
	WQ2	Prevent downstream water quality degradation by the timely identification of areas with high erosion potential and adjustment of harvest unit design

<table>
<tr><td></td><td>WQ3</td><td>Delineate the location of protection areas and available water sources as a guide for both the purchaser and the sale administrator, and to ensure their recognition and proper consideration and protection on the ground.</td></tr>
<tr><td></td><td>WQ4</td><td>Equipment staging, parking and refueling will be outside of RHCAs and in areas designated by the sale administrator that have previous soil disturbance. This includes prescribed fire activities.</td></tr>
<tr><td></td><td>WQ5</td><td>Landings, skid trails, and slash piles would be chosen to avoid, minimize or mitigate potential for erosion and sediment delivery to nearby waterbodies. Sale administrator would work with contractor to locate these areas on the ground wherever possible. See Table 2-2 below.

Table 2-2 Draft Skid Trail Location Key (heavy equipment exclusion zones or buffers, see WQ24).
<table>
<tr><th colspan="4">Average Buffer Slope %</th><th>Allowed Activity</th></tr>
<tr><td rowspan="3">Frist 100’ from stream edge = 0-20% slope</td><td>Yes</td><td>Last 100' to 700' with slope < 35%</td><td>Yes</td><td>Skid trails between 100' and 700' from stream</td></tr>
<tr><td>Yes</td><td>Last 100' to 700' with slope > 35%</td><td>No</td><td>No ground disturbance except fire</td></tr>
<tr><td>No</td><td></td><td></td><td>No ground disturbance except fire</td></tr>
<tr><td rowspan="3">First 75' from stream edge = 21% to 40% slope</td><td>Yes</td><td>Last 75' to 300' with slope < 35%</td><td>Yes</td><td>Skid trails between 75' and 300' from stream</td></tr>
<tr><td>Yes</td><td>75' to 300' with slope > 35%</td><td>No</td><td>No ground disturbance except fire</td></tr>
<tr><td>No</td><td></td><td></td><td>No ground disturbance except fire</td></tr>
<tr><td>First 75” = 40% slope or more</td><td>Yes</td><td></td><td></td><td>No ground disturbance except fire</td></tr>
</table></td></tr>
<tr><td></td><td>WQ6</td><td>Erosion control and sediment plans will cover all disturbed areas including skid trails, roads, landings, cable corridors, temporary road fills, water source sites, borrow sites or other areas disturbed during mechanical vegetation treatments.</td></tr>
<tr><td></td><td>WQ7</td><td>Install sediment and stormwater controls prior to initiating surface disturbing activities to the extent practicable.</td></tr>
<tr><td></td><td>WQ8</td><td>Avoid ground equipment operations on unstable, wet or easily compacted soils and steep slopes as described per Forest Plan.</td></tr>
<tr><td></td><td>WQ9</td><td>Use of ground based harvest equipment or log haul will not be permitted if ruts greater than 2-4 inches occur.</td></tr>
<tr><td></td><td>WQ10</td><td>Implement mechanical treatments on the contour on sloping ground (35% or greater) to avoid or minimize water concentration and subsequent accelerated erosion.</td></tr>
<tr><td></td><td>WQ11</td><td>Design and locate skid trails and skidding operations to minimize soil disturbance to the extent practicable. Designated skid trails will be reviewed by a soils specialist to the extent practicable. Equipment traffic outside of designated trails will be reviewed by a Soils Specialist before proceeding; unless traffic way can be buffered by >1ft of slash during activity</td></tr>
</table>

	WQ12	Specify RHCA layout, maintenance, and operating requirements in contracts, design plans and other necessary project documentation.
	WQ13	Use mechanical vegetation treatments in the RHCAs only when suitable to achieve long-term desired conditions and management objectives.
	WQ14	Modify mechanical vegetation treatment prescription and operations in the RHCAs as needed to maintain ecosystem structure, function and process.
	WQ15	Utilize yarding mechanisms or mechanical treatments that avoid or minimize disturbance to the ground and vegetation consistent with project objectives.
	WQ16	Avoid felling trees into streams or waterbodies, except to create habitat features. Leave all standing trees on stream banks.
	WQ17	Trees may be felled in RHCAs when they pose a safety risk. If possible, keep felled trees on site to meet woody material objectives. Also, safety risk trees along roads within RHCAs or within 100 feet of stream crossings which are cut must be left on site. When feasible, fall safety risk trees toward streams.
	WQ18	Locate landings and skid trails, outside RHCA's to the extent practicable.
	WQ19	Do not use drainage bottoms as turn-around areas for equipment.
	WQ20	Use suitable measures to disperse concentrated flows of water from road surface drainage features to avoid or minimize erosion and sediment transport to waterbodies.
	WQ21	Aquatics specialists would monitor RHCA's whenever possible during mechanical operations to evaluate compliance with prescription and mitigation requirements.
	WQ22	The source location, quantity, and timing of water use for dust abatement will be approved by the FS before sale, in order to protect water resources during low flows. Pond sources may be available and the pump must be screened.
	WQ23	All skid trails, forwarder trails, and landings which are within RHCA's will be stabilized, by planting, seeding, protection of plants, earthwork, and cultivation practices as necessary to reduce soil erosion and compaction.
	WQ24	Heavy equipment will not operate off roads within Class 1, 2, or 3 RHCAs, or the heavy equipment exclusion zones (see Table 2-2) in WQ5.
	WQ25	Springs, wetlands, and ponds that are less than an acre will have a minimum of 100 ft. buffer. Wetlands and the area to the outer edges of riparian vegetation, if less than one acre, are protected under PACFISH Category 4 strategies/buffers. Ponds without wetland characteristics, less than one acre are not protected. Wetlands and ponds greater than 1 acre are protected under PACFISH Category 3 strategies/buffers, with a 150' buffer from the edge of the wetland.
	WQ26	To reduce the risk of sediment production from equipment traffic in ephemeral draws; no ephemeral draws will be used as skid trails and crossings will be a minimum of 100 feet apart (crossings will be designated by FS personnel). When crossings are allowed if there is opportunity for localized bank instability harvest debris will be used as a way to minimize soil disturbance (i.e. slash mat) with effective ground cover and a buffer for equipment traffic disturbance. Slash should be obtained from harvest debris and not collected from RHCA ground vegetation. Do not cut or drive over shrubs, hardwoods, or trees unnecessarily in RHCA's.
	WQ27	Directionally fell trees to facilitate efficient removal along pre-designated yarding patterns with the least number of passes and least amount of disturbed area.
	WQ28	Landing locations are selected for least amount of excavation and erosion potential. Sidecast will not enter drainages nor damage other sensitive areas.
	WQ29	Locate landings outside of the RHCAs and avoid locating landings on steep slopes or highly erodible soil.
	WQ30	Design roads and trail approaches to minimize overland flow entering the landing.
	WQ31	Existing landings will be used where possible.
	WQ32	Use suitable measures as needed to restore and stabilize the landing after use.
	WQ33	Ensure culverts do not become plugged from logging activities and thereby do not affect the functionality of the roads

	WQ34	Install and maintain suitable erosion control on skid trails prior to spring runoff.
	WQ35	Road blading would be done only when necessary. Ditches would not be routinely bladed, and exposed soil areas on road prisms, ditches, cuts, and fills would be treated if funds are available.
	WQ36	Newly created roads would favor lower slope routes when consistent with other environmental protections. They would be located outside of RHCAs
	WQ37	Use of temporary roads will minimize or mitigate adverse effects to soil, water quality and riparian resources.
	WQ38	Maintain the natural drainage pattern of the area wherever practical, apply soil protective cover on disturbed areas.
	WQ39	Temporary roads will be inspected to verify that erosion and stormwater controls are implemented and functioning and are appropriately maintained.
	WQ40	There will be measures to close and/or physically block re-opened closed roads and temporary road entrances so that unauthorized motorized vehicles cannot access the road after project implementation.
	WQ41	Implement measures to promote infiltration of runoff and intercepted flow and/or desired vegetation growth on the road prism and other compacted areas.
	WQ42	Slash piles will be placed 50 ft. or more from the stream or lopped and scattered within the 50 ft. buffer.

Wildlife

Project Area	Label	Design Element
All Units	WL1	Downed wood (≥12 inches at the large end) would not be removed from proposed commercial thin or non-commercial thin units. Smaller downed wood may be removed to prepare an area for burning; however, existing Forest Plan standards (minimums and desired levels, based on the best science available, are displayed in the Table 2-3 below) for downed wood would be met after harvest. In the event there are no logs ≥12 inches available, the largest available would be retained to meet desired levels for pieces per acre.
	WL2	Minimize hazard tree felling in units to minimize impacts to standing dead wood habitat, especially large diameter (>20 inches) snags. Work with operators to ensure their safety under these conditions.
	WL3	There will be no snag felling in treatment units, unless they are a safety hazard to operations or are a danger to traffic on roads adjacent to proposed units. Felled hazard trees (dead and live trees) greater than 12 inches should be left in treatment units to provide dead wood habitat. Timber Sale Administrators will consult with the Wildlife Biologist as to the disposition of these downed logs.
	WL4	Where possible, avoid identifying or marking "take" trees within or adjacent to patches of snags and other high value snag habitat (large diameter legacy snags with multiple existing cavities, etc.) especially in areas distant from open roads to minimize impacts to

Table 2-3 Forest Plan minimum standards and desired levels for downed wood (pieces per acre) by Forest Plan working group and Plant Community Type.

Working Group/Plant Community Type	Forest Plan (pieces/acre)	Diameter at large end (inches)	Length of individual pieces (feet)	Lineal feet/acre
Ponderosa Pine/Ponderosa Pine	3-6 minimum 6-8 desired	12 minimum	6 minimum Full length desired	18-36 minimum 100-200 desired
South Associated/Mixed Conifer	15-20 minimum 15-20 desired	12 minimum	6 minimum Full length desired	90-120 minimum 400-600 desired

		these high value structural features through hazard tree felling. Consider these areas for potential "skips" within treatment units.
	WL5	If a goshawk nest site is located during goshawk surveys or sale preparation, protect the site by eliminating harvest on at least 30 acres of the most suitable nesting habitat around the site (active and historic nests). Identify post fledging areas for active nest sites. A 400 acre post fledging area would be designated around this core nest area. Treatment could occur in this post fledging area if treatments retain late and old structure or move young stands toward a late old structure condition; consult with the district wildlife biologist and silviculturist to ensure that the standards provided in the Eastside Screens would be met.
	WL6	If raptor nest sites are encountered during layout or implementation, they will be protected. The level of protection will vary by species, and will be determined by the District Wildlife Biologist. It is the responsibility of the layout and marking crew to ensure that the District Wildlife Biologist is consulted prior to marking in these areas.
	WL7	In proposed treatment units retain broken top and spike (dead) top green trees at a rate of 1 per acre larger than 15 inches DBH, where they are available, to provide existing and future dead wood habitat features and to promote snag creation in the future. If none are available larger than 15 inches DBH, retain the largest available (minimum of 10 inches DBH).
	WL8	Recognize structural features important to late and old structure-associated wildlife when identifying trees to be retained, regardless of tree size. Providing features indicative of decadence is desired in treated stands in the long term. These features include flat tops, bole damage, broken or dead tops, multiple tops, large limbs, etc.
	WL9	Place skips in high wildlife use areas such as fir thickets, interior cover patches, high-density snag patches, or higher density patches. Skips provide hiding/screening cover for big game, foraging areas for cavity excavators and insect-gleaning birds, areas with locally high tree mortality (through insect and disease activity) that creates standing dead and downed wood habitat, and heterogeneity at the small scale.
	WL10	Protect unique habitats (seeps, springs, wallows, and wet areas including meadows) from harvest activities. Buffer wet meadows, ponds, springs, and wallows a minimum of 100 feet from vegetative treatment activities. If unique habitats (caves, cliff faces, etc.) are encountered during recon or layout, their value to wildlife would be evaluated, and appropriate protection, as determined by the District Wildlife Biologist, would be provided.
	WL11	Prescribed fire would preferably occur during the late summer and fall. If burning in the spring (fuel conditions and weather are appropriate), attempt to burn prior to the peak of migratory songbird breeding, generally May 15.
	WL12	During spring burning operations, attempt to maintain unburned blocks of habitat adjacent to burned habitats to ensure that low-level structure (grasses, forbs, shrubs, and reproduction) for migratory birds is present at some level across the landscape.
	WL13	Leave wildlife habitat clumps of uncut regeneration (small diameter) conifers ranging in size from ¼ acre up to 1 acre in size in non-commercial thin units. Clumps of uncut small diameter conifers would total approximately 2 acres for every 30 acres of treatment.
	WL14	Where hand or machine piling of harvest or thinning-created slash would occur, retain at least one unburned slash pile per acre in noncommercial thinning units.
	WL15	Large diameter, complex structures are a key habitat feature in dry forest habitat. A portion of Douglas-fir and white fire that are larger than 21 inches DBH and that are interfering with a desirable leave tree would be retained to provide large diameter dead wood habitat. A combination of actions, including girdling, topping, inoculation with disease agents, or felling and retaining them on the ground would be used. The number of these structures retained would vary by unit based on the existing availability of large dead wood and wildlife biologist recommendations.
	WL16	In order to provide for connectivity of old forest and designated old growth habitat, identified connectivity corridors lying within proposed treatment units would be marked and harvested such that the upper management limit (basal area) would be retained or a

		higher proportion of skips provided in these areas when compared to the remainder of units outside mapped connectivity corridors. These corridors would be identified on unit specific data sheets provided to layout and marking crews in order to ensure implementation of this design criterion. Skips would continue to be distributed throughout proposed units and be representative of the available habitat in the entire unit.
	WL17	In order to eliminate potential disturbance at the Dry Creek bald eagle nest (.75 miles east of the project area) associated with project activities (helicopter use/noise, heavy equipment use/noise, and smoke) during the critical spring courting, nesting, and rearing season (approximately January 1 through June 1), activities will be coordinated with the District Wildlife Biologist. Utilize recommendations provided in the National Bald Eagle Management Guidelines (2007), where necessary, to eliminate or minimize potential impacts at the nest site and associated Bald Eagle Management Area (BEMA).
Visuals and Recreation		
Project Area	Label	Design Element
Highway 207 (Management Area A-4)	VQ1	A visual quality objective of Partial Retention will be maintained in the foreground (300 feet from Hwy 207) FLMP page 4-106. This will be accomplished by low cutting stumps and limiting use of skid trails and landings within 300 feet of Highway 207. Slash will not be piled within 300 feet of the highway.
	VQ2	Thinning and planting within 300 feet of Highway 207 will leave irregularly spaced trees. Planting within this area must include at least two tree species, with no more than 65% in a single species. FLMP page 4-109.
	VQ3	Prescribed fire will be of low intensity with minimal scorch within 300 feet of Highway 207. FLMP page 4-110.
Tamarack Cabin	VQ4	Trees within 300 feet (foreground) of Tamarack Cabin will be retained unless identified as a hazard tree. Hazard trees will be felled away from the cabin and their removal is optional.
	VQ5	Landings will be located at least 300 feet away from Tamarack Cabin. Any associated slash piles will be small and treated within one year after use of the landing is completed.
	VQ6	Prescribed fire will be of low intensity with minimal scorch within 300 feet of the cabins.
Fairview Campground	VQ7	Sufficient trees will be retained around campsites 2 and 5 to screen them from roads and provide shade.
	VQ8	Operations will avoid the areas around the spring and water fountain (the spring boxes are located several hundred feet uphill and away from the water fountain).
	VQ9	The use of skids trails will be limited to the extent possible to retain the maximum amount of vegetative coverage.
	VQ10	Any soil disturbance caused by the proposed activities will be repaired to pre-treatment conditions to the extent possible.
	VQ11	No landings will be located within the campground.
	VQ12	Access to the campground will be maintained to the best extent possible during the major big game hunting seasons (from the last week of August through the second week in November).
	VQ13	Prescribed fire will be of low intensity with minimal scorch within 300 feet of the campground.
Dispersed Camping	RC1	Areas around dispersed camps will be treated in a manner that retains a Partial Retention Visual Quality Objective. FLMP page 4-49. Examples include low cut stumps, no slash piles, minimal soil disturbance.
	RC2	Placement of landings will avoid dispersed campsites to the extent possible. If the best location is a dispersed camp from a resource protection standpoint, the landing will be treated after operations are complete to provide a level, debris-free area for camping.
Trails	RC3	Skid trails will avoid crossing system trails. Where no other option is available, a skid trail may cross a trail, but after the skid trail is no longer in use its intersection with the trail will be blocked with debris and the disturbed area repaired to discourage use.
	RC4	Any repair or obliteration of roadbeds that serve as designated OHV trails will retain a 50-inch wide tread that meets OHV standards. Road treatments should not significantly alter existing access or trail characteristics.

Recreational Access	RC5	Ensure that roads and trails are closed as needed during logging and prescribed fire activities and are re-opened as soon as possible after work is completed, especially during the major hunting seasons (last week of August through second week of November).
	RC6	Warning or informational signs will be placed along major travel routes during project operations (thinning, harvest, prescribed fire, etc.) to alert and inform the public. Current information will be posted on associated portal entry kiosks.
Range		
Project Area	Label	Design Element
All Units	RG1	All existing structural range improvements (hard and electric fences, gates, water developments, etc.) will be contractually protected.
	RG2	Fences which are damaged in order to facilitate the proposed action must be repaired to Forest Service standards.
	RG3	If livestock are present on either side of a fence, means will be taken to prevent the movement of livestock to the other pasture. If no livestock are present, gates and fences shall be operable prior to logging and burning activities before changing locations.
	RG4	It will be a contract requirement that all gates will remain closed during work and non-work hours while cattle are in the project area.
	RG5	Fence right of ways and stock driveways and trails will be cleared of slash produced by logging or post sale activities.
Noxious Weeds		
Project Area	Label	Design Element
All Units	NW1	Noxious weed sites will be treated consistent with the 2010 Umatilla National Forest Invasive Plant Treatment Record of Decision, before, during and after project activities.
	NW2	Prior to moving onto the forest, reasonable measures will be taken to insure that all off-road equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. In addition, prior to moving off-road equipment from a cutting unit known to be infested with invasive species to any other unit that is believed to be free of noxious weeds, reasonable measures will again be taken to make sure equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds (timber sale contract provision B/BT 6.35 or equivalent provision).
	NW3	Noxious weed-free straw and mulch will be used for all projects conducted or authorized by the Forest Service on National Forest System Lands.
	NW4	All gravel, fill, sand stockpiles, quarry sites, and borrow material will be inspected for invasive plants before use and transport. Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists.
	NW5	Road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants will be conducted in consultation with District or Forest-level invasive plant specialists. Invasive plant treatment and prevention practices will be incorporated as appropriate.
	NW6	Logging system design will consider the objectives of maintaining ground cover and minimizing ground disturbance. Forest Plan standards and guidelines for ground and soil disturbance will be followed.
	NW7	All soils disturbed by project activities will be revegetated with certified "weed free" native seed, when natural regeneration of the native plant community is likely not to occur
	NW8	Helicopter landings and parking areas will not be located in known areas of invasive plants.
	NW9	Project or contract maps will show currently inventoried high priority noxious weed infestations as a means of aiding in avoidance and/or monitoring.
Roads		
Project Area	Label	Design Element
All Units	RD1	Where existing closed, existing temporary and non-system roads are used for fire lines during landscape or activity fuels burning, minimize clearing of brush and dead wood to reduce the potential for illegal motorized use following treatment. Where feasible, rehabilitate those non-permitted (existing closed, existing temporary, and non-system routes

		by pulling brush and logs onto the road surface to mask its location, especially where these routes intersect open roads.
	RD2	Effectively close, to the degree possible given topography and available vegetation, closed system roads used to access timber harvest units following implementation to reduce the likelihood of illegal motorized use. To the degree possible given topography and available vegetation, obliterate temporary roads used during implementation. Methods for accomplishing this are described in the timber sale contract.
Vegetation		
Project Area	Label	Design Element
All Units	VG1	On the first day of marking and at several other times throughout the marking, the silviculturist would monitor the marking to ensure that the marking guides are being followed and understood.
	VG2	Protect mountain mahogany and remnant large aspen from harvest disturbance and burning where necessary and where feasible.
	VG3	Where feasible, pull harvest created slash away or refrain from locating slash adjacent to leave trees in order to reduce the risk of fire-related mortality.
	VG4	There will be no cutting of old growth juniper trees or juniper trees that are >21"DBH or juniper that shows old growth characteristics identifiable by canopy decadence, deep furrowed bark, and abundant lichen accumulation. In addition, juniper in all size classes would be retained in those areas historically occupied by this species. This includes rocky areas with shallow soils, rock scabs, rim rocks, and bluffs. Historical aerial photos would be used to aid in identification of these areas, as well as visual assessment on the ground of areas that contain old growth juniper.
	VG5	Mistletoe infected trees, (that are NOT within a skip or a designated clump); in the overstory and understory that are less than 150 years old would be removed to reduce the levels of mistletoe in the stand.
	VG6	There will be no cutting of 21 inch DBH or larger ponderosa pine and larch trees or Douglas-fir and white fir (that do not interfere with desirable leave trees) except for occasional administrative trees. Where possible, administratively felled trees ≥ 21 inches DBH would be retained where they are felled to provide downed wood habitat. Timber Sale Administrators will consult with the Wildlife Biologist as to the disposition of these trees.
	VG7	Within non-commercial units (except for aspen) thinning limits are set at 9"DBH. Piling should occur an adequate distance from large snags (>10"DBH) and down wood (>12"DBH).
	VG8	A Qualified Person will assess danger trees along haul routes using the 2008 Field Guide for Danger Tree Identification and Response and 7700 Forest Service Manual. In general, only those trees that rate as "imminent" would be felled along closed and existing temporary roads. Trees that are rated as "likely" would generally be maintained along closed and existing temporary roads.
	VG9	In all commercial units an emphasis shall be placed on a heterogeneous distribution of trees. This heterogeneity will take the form of clumps of trees. Thinning is allowed within clumps in order to reduce competition from late seral species.
	VG10	Along roads used to access proposed units, felled danger trees <20 inches may be removed. All danger trees (dead and live) ≥20 inches DBH should be retained where they are felled to provide large downed woody structure. Timber Sale Administrators will consult with the Wildlife Biologist as to the disposition of these trees.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that

were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of restoring the forest vegetation to historical levels, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, two alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

No Helicopter Logging Alternative

This alternative eliminated helicopter logging and replaced it with skyline operations. This alternative would require 7.6 miles of new road construction, and 0.5 miles of road reconstruction in order to convert the helicopter units to skyline systems. Road costs for the additional skyline acres would be approximately $475,000, making it impractical to implement. Also, this alternative would not meet some of the needs for the project; more roads would decrease wildlife habitat and cover.

Open Roads Only Alternative

Scoping comments expressed a concern about temporary roads and their impact on watersheds and wildlife habitat. The IDT developed an alternative that would not use temporary roads or closed roads but conduct all proposed activities from existing open roads. A buffer of 700 feet was imposed around these existing roads to represent a reasonable skid distance for commercial operators. Under these circumstances, an alternative that would only utilize existing open roads would reduce the area that could receive treatments by 53 percent.

The IDT considered this alternative and determined that it would greatly diminish the area within which we could address the purpose and need for the project. Under this alternative, project activities could only be accomplished in areas within physical reach of existing roads. This alternative would leave much of the project area where action is needed, without treatment.

Table 2-4 Treatment Area Under the Proposed Action Compared to the Decreased Roads Alternative (Acres)

Treatment	Proposed Action	Open Roads Only Alternative
Ground Based Commercial Thin	9126	3918
Helicopter	1446	571
Skyline	990	604
Precommercial Thinning	708	708
Total	12270	5801

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2-5 Timber Harvest Acreages

	Alternative 2 (Acres)	Alternative 3 (Acres)

Commercial Thinning	9,435	8,629
Non-Commercial Thinning	638	638
Juniper Non-Commercial Thinning		153
Shrub/Steppe Non-Commercial Thinning	38	38
Shrub/Steppe	1,426	1,426
Riparian Treatment (Class 4 Buffers)	682	657
TOTAL	12,219	11,541

Table 2-6 FS Roads Used for Haul (Miles)

	Alternative 2	**Alternative 3**
Open	80.4	73.9
Seasonal	5.7	5.7
Closed	58.2	53.5
OHV Trail Use	1.5	1.5
FS Haul	145.8	134.6
New Construction (Closed Road included above)	0.3	0.3
Private Road	1.2	1.6
Temporary Road	10	8.4
Total Proposed Road Closures including Seasonal/OHV Trail	16.9	16.0
Percent Total Roads Closed including Seasonal	8%	8%
New Open Density Mi/SqMi)	1.5	1.5
Decommission Roads	5.6	5.6

Table 2-7 Current Road Density Project Area

	Current	**Alt 2**	**Alt 3**
FS Open	72.4	53.7	55.5
FS Seasonal	8.6	16.1	14.3
FS Closed	96.9	105.9	106.8
OHV Open	9.4	9.4	9.4
OHV Seasonal	5.1	4.7	4.7
County Road	0.9	0.9	0.9
State Hwy	8.8	8.8	8.8
Overall Motorized Miles PA	202.1	201.7	201.7
Proposed Decommisioning	0	5.6	5.6
Overall Density proposed action Mi/sqMi	3.9	3.8	3.8
Open Density proposed action Mi/sqMi	1.8	1.5	1.5
Project Area (Acers)	32,840		
Project Area (sq mi)	51.3		

Table 2-8 Summary comparison of how alternatives address the Purpose and Need

Purpose & Need	Indicator or Measure	Alternative 1		Alternative 2		Alternative 3	
		2015	2065	2015	2065	2015	2065
Move species composition toward its historical range of variation (HRV)	Ponderosa pine is between 50% and 80% of the Dry Upland Forest (UF) biophysical environment (BE) after project implementation in 2015	64%	27%	79%	54%	78%	53%
	Douglas-fir is between 5% and 20% of the Dry UF BE after project implementation in 2015	29%	58%	16%	37%	17%	38%
	Grand fir is between 1% and 10% of the Dry UF BE after project implementation in 2015	5%	12%	3%	7%	3%	7%
Move forest structure toward its HRV	Stand initiation is between 15% and 25% of the Dry UF BE after project implementation in 2015	19%	12%	19%	12%	19%	12%
	Stem exclusion is between 10% and 20% of the Dry UF BE after project implementation in 2015	35%	16%	48%	14%	47%	14%
	Understory reinitiation is between 5% and 10% of the Dry UF BE after project implementation in 2015	32%	45%	19%	18%	20%	20%
	Old forest single stratum is between 40% and 60% of the Dry UF BE after project implementation in 2015	6%	0%	7%	39%	7%	37%
	Old forest multi-strata is between 5% and 15% of the Dry UF biophysical environment after project implementation in 2015	9%	27%	7%	16%	7%	17%
Move stand density toward its HRV	Low stand density is between 40% and 85% of the Dry UF BE after project implementation in 2015	38%	15%	75%	16%	73%	16%
	Moderate stand density is between 15% and 30% of the Dry UF BE after project implementation in 2015	17%	6%	9%	48%	9%	45%
	High stand density is between 5% and 15% of the Dry UF BE after project implementation in 2015	45%	79%	16%	37%	18%	39%

***Sources/Notes*: the historical range percentages provided for each indicator/measure are taken from Martin (2010); they pertain to the Dry Upland Forest PVG only. All percentage values in this table pertain to the Dry Upland Forest PVG, which comprises approximately 27,000 acres of the forest vegetation affected environment. Data sources are as follows:**
Alternative 1 (Alt 1) – existing (2012) and 2065 conditions in planning area for Dry UF BE (see tables 10, 12, and 14 for 2012 conditions, and tables 22, 25, and 28 for 2065 conditions).
Alternative 2 (Alt 2) – post-implementation conditions for Dry UF BE in 2015 and 2065 (see tables 31, 34, and 37).
Alternative 3 (Alt 3) – post-implementation conditions for Dry UF BE in 2015 and 2065 (see tables 40, 43, and 46).

Note: Gray cells show percentages that exceed the range of variation by 3% or more (above or below).