

II. Alternatives Considered

The Interdisciplinary Team (IDT) developed alternatives to the proposed action in response to the issues raised during scoping. Issues identified for this project also developed mitigation and management requirements that have been incorporated into the alternatives. All alternatives conform to Forest Plan direction and meet State and Federal laws and regulation, the Vegetation Management FEIS and Mediated Agreement, and Forest Service policies.

Alternatives Eliminated from Detailed Study.

Evenaged Management Objectives: The Forest Plan encourages the use of even-aged silvicultural systems in Management Areas C4 and E2. Using even-aged prescriptions as the primary treatment methods would not meet the purpose and need. The proposed action focuses on restoration of forest functions so they are more closely within the range of disturbance processes with which they evolved. Vegetation that evolved with frequent and mixed fire regimes dominate the planning area's landscape. Where these regimes interact together, stand replacement events usually do not occur. Large trees would be common in these stands and the stands would be unevenaged. The forested landscape would be open canopied, composed of early seral tree species. Though evenaged prescriptions are used in the proposed action, the objective is not to develop evenaged plantations. Once the shade tolerant understory is removed and the large ponderosa pine retained some stands would have the appearance of a shelterwood or seedtree harvest. Future management would allow early seral species to regain dominance of the site while maintaining an open canopy forest. An alternative using predominantly even-aged prescriptions would not retain stand components reflective of the fire return intervals. Even-aged management prescriptions would not meet the Forest Plan's Eco-Screen constraints for Dry Forests because large trees would have to be removed and Late Old Structure would be lost. Relying on even aged management would not retain forest cover needs for big game management.

Treatment using landscape prescribed fire only: This treatment was analyzed in the Eden Timber Sale and Fire Reintroduction Project Environmental Assessment. The analysis showed this type of action not feasible when 6 to 14 inch diameter understory needs to be removed. Stands that have deviated moderately to significantly from its historical fire return interval have increased fuels and stand structure. This causes a wildfire to have severe effects because of higher burn intensity. Trees that could withstand low intensity fires do not survive. The stands are at risk to losing key ecosystem components, particularly large trees. A prescribed fire or wildfire fire would kill targeted tree species (grand fir) and size classes (less than 14 inches). In fifteen to twenty years fuel loads would be higher than before the fire causing extreme fire behavior. Large fuels would make up a higher portion of the fuel load. The risk to fire fighter safety would increase. A wildfire would be harder to control. Observations of wildfires 15 to 30 years after an initial mosaic burn shows stand replacement events because of the amount of dead fuels accumulated from the initial burn. In the Pedro Planning Area approximately 92 percent of the frequent fire regime has deviated from its historical composition, structure and canopy closure. Complex fuel structures exist in stands that were maintained by low intensity wildfires. Tree mortality would be high and the resultant fuel loads would not be appropriate for protection along the wildland urban interface. It would take several prescribed fires to bring the fuel structure to within historic range. Trees killed in the first fire would fall. Large fuels would increase outside of the historical range because stocking levels are higher than what the historic fire return interval would have maintained.

Non-commercial thinning of small diameter ladder fuels: Mechanical pretreatments would remove 9 inch and smaller diameter trees from the landscape followed by underburning or leaving the material as mulch. This type of treatment would not work in all areas needing treatment to restore stand character maintained by short fire return intervals. Many stands have infilled with grand fir that has grown beyond pole size. These trees have caused an increase in surface fuel conditions and provide ladder fuel structure that increases the risk to large tree, greater than 21 inches, mortality. Four to six foot flame lengths in the summer with torching of individual trees increases the risk of fire reaching into the intermediate crowns and the overstory. Landscape resilience would be hard to maintain since fire intolerant tree species would remain on the landscape. It would be harder to protect the private lands along the Forest boundary without removal of commercial size trees. The landscape would not be able to function within the range of fire intensities that would maintain large ponderosa pine and western larch because stand replacement events would likely occur. Avoiding pretreatments in stands with commercial size trees does not protect or restore stand structure characteristic of short fire return intervals to the landscape. It would be harder to protect large diameter trees from mortality when a wildfire occurs. Future fire suppression efforts would carry more risk because of the mortality in the small to medium size classes of trees from underburning. Fuel loads would be high and the high level of snags would place fire fighters at risk. Wildfire behavior would become severe in an area that historic disturbance cycles would have maintained as low intensity wildfires.

A finding from the Interior Columbia Basin Ecosystem Management Project said the best approach for managing wildfire damage was a mixture of silvicultural prescriptions (Graham and et al, 1999, PNW-GTR-463). The proposed action and alternatives provide a mixture of treatments based on current stand conditions and the need for mechanical pretreatment. Timber harvest is proposed in stands that have a commercial understory that needs removal to break up complex crown structure and reduce the shade tolerant, fire intolerant tree species. Mastication is proposed in units that treating the less than

9-inch material would be effective. Understory burning is being proposed in the majority of the area needing only fuels reduction without mechanical pretreatments. A full range of treatments is needed to restore resilience to the landscape and provide for fire fighter safety.

Changes to the Proposed Action: Several units from the proposed action were dropped or modified. Field review to verify the data used for developing the action indicated there was no need for treatment in Units 10, 11, 12, and 67 at this time. Several units were dropped or reduced in size for buffering of Class IV streams; Units 12, 16, 38, 63 and 72. As the action is implemented there would be additional reduction in unit size for Class IV streams. Treatment of viewshed Units 1, 2, and 3 would have moved these stands towards a dominance of western larch. Since this is not compatible with lynx habitat, the units were dropped and there is no over-riding need, such as disease or growth and vigor, to treat them at this time. Units 49, 51, 53, 57, 64, 68, 73, and 74, within the Highway 204 Undeveloped Area (see chapter 3, Roadless Areas and Undeveloped Areas), are being dropped because field review indicated treatment for fuel reduction is not needed at this time. Approximately 45 percent of the Highway 204 Undeveloped Area is transitioning from historic fire maintained stand structure, but has not deviated enough to require treatments. Units 66 and 69 will not be a part of Alternative B but included in other alternatives as part of a fuel reduction strategy along the forest boundary. The Modified Proposed Action proposes vegetation restoration and maintenance using prescribed fire or mechanical treatments over a total 5,560 acres rather than 9,200 acres and timber harvest on approximately 1,110 acres rather than the 1,560 acres proposed during scoping.

Alternative A: No Action

Alternative A is the "no action" alternative required by the National Environmental Policy Act of 1969. It represents the existing situation, uses, and environmental processes. No new management actions would take place. Current management direction and existing activities such as grazing, fire protection, and road maintenance would continue. Current biological and physical processes, creating stand disturbance and change, would be allowed to continue. This alternative would serve as a base line to compare the differences and effects of the proposed action and alternatives to the proposed action.

Alternative B: Modified Proposed Action, Forest Health

This alternative proposes a landscape approach to restore ecosystem functions and break up fuel continuity using prescribed fire and/or timber harvest. Timber harvest would be used to reduce stocking levels and fuel structure prior to igniting prescribed fire. Fire intolerant species or small diameter trees that would not survive fire would be removed in preparation for understory prescribed fire. Returning stand dominance to early seral tree species would increase stand resilience to the frequent, low intensity wildfires natural to the planning area and lower the risk of epidemic insect infestations. Stands would be thinned to recommended stocking levels based on plant association. In Management Area E2, stocking levels would be reduced to the lower end of recommended levels and allowed to grow to the upper end before considering another treatment. Stocking levels would be reduced to the upper end of recommended levels in Management Area C4. By managing stands within the recommended range, the susceptibility or vulnerability to insect, diseases, parasites, and other harmful agents can be reduced. Stands in C4 would be managed to allow a degree of intertree competition to allow the development of suppressed trees and fluxes in the endemic insect population.

Timber removal and prescribed fire would emulate landscape structure and patterns that would have developed as a result of natural fire disturbance. Wildfires tend to burn in random patterns depending on topography, weather, and fuels. The different burn intensities create a mosaic of unburned, lightly to moderately burned, and severely burned vegetation that results in a mix of tree species, ages, and structures across the landscape. Much of the frequent fire regime has departed from its historic structure placing the landscape at higher risk for uncharacteristic, large scale, fire disturbance. The proposed treatments would not only break up the landscape for easier control of wildfires but would also restore resilience to future wildfire events.

Forest management goals for this alternative would:

- Restore habitat diversity that reflects the disturbance processes found in the frequent and mixed fire regimes. Where early seral species occur, or did occur, they would be restored to either dominance or co-dominance depending on the successional development and fire regime.
- Reduce fuels so that fire can be reintroduced to the landscape and burn with behavior and intensity levels closer to historical conditions.
- Increase stand resilience to insect epidemics and root diseases by reducing stocking levels and/or favoring non host tree species.
- Provide wood fiber consistent with the goals and objectives of the Forest Plan.
- Reduce non-point sediment sources by obliterating roads no longer needed and reduce the risk of sediment transport by using a low ground impact logging system or special project design measures.

Description of Alternative B:

Landscape prescribed fire (underburning), reduction of fuels by mastication or grapple piling, and timber harvest would occur on approximately 5,560 acres. Timber harvest is proposed on 1,108 acres and natural fuels underburning on 4,452 acres. A cut to length logging system would be used to harvest 4,620 mbf from 608 acres and a helicopter system would harvest 5,390 mbf from 500 acres. Multiple sales are proposed from this analysis. Units for the sales would be assigned at a later time. Harvest would occur on 771 acres of frequent fire regime, 318 acres of mixed fire regime, and 19 acres of infrequent fire regime.

Harvest residues would be treated using a variety of methods to reduce post harvest fuel loads in preparation for landscape prescribed fire. Underburning would be used to treat 797 acres where fire can play a role in shaping the species composition and structure by reducing surface and ladder fuels. Approximately 96 acres would have additional non-commercial size trees thinned by mastication prior to underburning. Grapple pile and burn or machine mastication (215 acres) would occur in stands with species that are not fire tolerant or where underburning is expected to cause high mortality. Stands would be evaluated after harvest to determine if fuels have been rearranged enough so that prescribed fire is not needed or if jackpot burning or machine mastication would be the best treatment. Jackpot burning uses spot ignitions to remove only the heavier fuel concentrations. Underburning would occur in the spring to reduce heavy fuel concentrations with follow-up burning occurring in the fall. Jackpot and light underburning would occur in the fall.

Underburning (understory prescribed fire) of natural fuels would occur in stands needing maintenance to keep its short fire return character. Timber harvest is not needed in these stands. Small, non-commercial size trees and the building surface fuels would be removed from these stands by prescribed fire.

Summary of Fuel Reduction Methods

Treatment Type	Acres
Total acres underburning	5,345
Underburning with Harvest Pretreatment	797
Underburning Natural Fuels	4,452
Harvest, Masticate, and Underburn	96
Harvest, grapple pile and burn or masticate only	215

Landscape Fuel Treatments

Four fuel management areas were identified to provide a focus for fuel treatments that would aid in the control of wildfires. Removing the ladder fuels and reducing the surface fuel would provide defensible areas to control the size and intensity of a wildfire. Approximately 31 percent of the proposed treatment is in Condition Class 1, most of this accomplished using prescribed fire. These areas have not departed significantly from historic disturbance cycles. Treatments in Condition Class 1 would be to maintain stand structure. Treatments in Condition Class 2 and 3 include removal of merchantable trees and/or mechanical mastication treatments prior to ignition of understory prescribed fire. Pretreatments would thin the understory to reduce ladder fuels. Commercial size trees would be removed. Non-commercial trees and slash would be scattered to carry prescribed fire. Treatments would occur on 3,977 acres of the frequent fire regime and on 1,155 acres of the mixed fire regime. Harvest is proposed on 670 acres within the fuel management areas. There is an additional 438 acres of harvest proposed outside the fuel management areas to help break up landscape fuel continuity.

Underburning would occur in the fall for stands managed for ponderosa pine. Where surface fuels are high, burning would occur in the spring, when conditions are cooler. No more than 2,500 acres would be burned in a year. It is estimated to take 2 to 3 burning entries over a period of ten to fifteen years to achieve the desired result. As fuel levels are lowered, burning would occur under drier conditions, consuming additional fuels and modifying vegetative structure and composition, reducing grand fir and Douglas-fir in the understory. The resulting stand condition would:

- Have thinned canopy
- Have reduced ground and ladder fuels
- Be more resilient to a late summer wildfire
- Buffer areas of heavy fuels
- Increase the ease of suppression efforts
- Reduce the risk for crown fires

Fuel Management Area A: 2,630 acres, 1,990 acres proposed for fuel reduction. This area extends from Dry Creek east to Rocky Ridge, on both sides of Finley Creek. It covers the western most ridge system in the planning area from the mouth of Finley Creek to Forest Road 31, the Summit Road. Prescribed fire would be used to reduce fuel loads and maintain open

conditions to both restore historical forest composition and structure, and control wildfires moving across the planning area. Approximately 482 acres would have timber harvest.

Fuel Management Area B: 180 acres, all proposed for fuel reduction. The area is a small, east west, ridge system at the end of Glenn Ridge in the middle of the planning area. The area provides a good control point for wildfires moving up Phillips Creek. Prescribed fire or mastication would be used to modify the understory and reduce ladder fuels. There will be no timber harvest needed.

Fuel Management Area C: 3,800 acres, 2,306 acres proposed for fuel reduction. This area is the east side of Phillips Creek to the top of Ninemile Ridge and the lower portion of Middle Ridge. It extends from the Forest Boundary in the south to Forest Road 31 in the north. Prescribed fire would be used to reduce fuel loads and maintain open conditions to both restore historical forest composition and structure and control wildfires moving across the planning area. Timber harvest would occur on 188 acres.

Fuel Management Area D: 1,000 acres, 654 acres proposed for fuel reduction. This area extends from the middle reaches of East Phillips Creek, across Pedro Creek to Middle Ridge. Prescribed fire or mastication would be used to thin stands and remove ladder fuels. It is part of a network of fuel treatments that would help in control of wildfires moving south to north, up drainages. Timber harvest is not needed for pretreatment.

Activity Components of Prescribed Fire:

Fireline construction: Blackline would be developed by hand ignitions along natural breaks in slope or along the outside boundary of the RHCAs. Ignition for natural fuel treatments along perennial streams would stop 500 feet from the channel and at 200 feet from intermittent channels. The fires would be allowed to back toward the RHCA. Ignitions of activity fuels would occur to the outer edge of the RHCA. The outer boundary of RHCAs for fish bearing streams is 300 feet. The RHCA for non-fish bearing perennial streams and intermittent streams is 150 feet. Hand firelines may be needed between the end of the blackline and the RHCA to control the lateral movement of the prescribed fire along the outer burn perimeter.

Ignition: Piles and construction of blacklines would be ignited by hand. Aerial ignition methods would be used over the majority of the area when a total of 500 acres or more is planned for ignition during any burn window. Plastic Spheres are used with aerial ignitions using a Plastic Sphere Dispensing Machine (PSDM). Antifreeze is inserted when the balls are dropped. A gallon of antifreeze is used per 1,000 spheres and 5 to 7 spheres are used per acre. No mixing or preparing of fuels would occur in the planning area. Fuel needed for hand ignitions are mixed prior to reaching the area. Ignitions of natural fuels would occur no closer than 500 feet from perennial streams and 200 feet from intermittent. Activity fuel units may have ignitions to the edge of RHCAs. Hand ignitions of strips would be used when the amount and intensity of landscape fire needs to be controlled to protect large diameter leave trees.

Helispots: A Landing near the burn units will be used for fueling the helicopter and refilling the PSDM. Fuel for the helicopter will not be stored on site. A fuel truck would be used for the day of the burn. Potential landings sites will be the ones used as service landings during the logging operation, High Ridge Lookout, or rock sources. No landings will be located within RHCAs.

Mop-up: Mop-up would occur when fire creep causes unacceptable risk to mortality of leave trees. Grapple piling is proposed in areas of concern, approximately 215 acres in harvest units. Mop-up could also occur within RHCAs when fire severity indicates a backing fire would not keep 90 percent of the blackened area in non-lethal severity with no more than 5 percent in a lethal fire severity. (See management requirements)

Drafting: Fall and spring water sources for fire mop-up/suppression needs would be ponds off Forest Road 3100 located on 3100270, 3100287, and Ruckel Junction. These ponds are not connected to stream systems. A late spring early summer water source would be Phillips Creek where Forest Road 3740 crosses the stream. This portion of Phillips Creek along the migratory route for steelhead spawning in the upper reaches of the Creek. The scour pool below the arch crossing does not contain spawning gravels. Dry Creek also has a source above where Forest Road 3200 crosses the stream. (See management requirements)

Activity Components of Timber Harvest:

Logging Systems: 608 acres, 4,620 mbf cut to length; 500 acres, 5,390 mbf helicopter. Total harvest of 1,108 acres and 10,010 mbf.

Landings and skid trail: Helicopter service landing would be located in previous disturbance sites such as a rock source or road intersection. There are two previously used tractor landings about FR 3738 that would be used by helicopters for the

units above Phillips Creek. Other helicopter log landings would be located on existing roads, outside of RHCAs. Drop points would be established at several locations along a road where it is wide enough to deck logs. When one site fills with logs the helicopter moves to another until the logs are hauled and the site becomes available for decking again. The helicopter typically moves between multiple drop points while the logs are being hauled. This helps to confine the use to the road without constructing a landing or expanding them into scablands. All helicopter landings would be outside of Riparian Habitat Conservation Areas (RHCAs).

Forwarder landings would be located along the road right-of-way; no construction is needed. Forwarder route spacing would be approximately every 50 feet with low levels of soil displacement, less than 4 percent; and compaction, less than 2 percent of the activity area.

Slash Treatment: Treatment of activity fuels include: 797 acres understory burn; 215 of mastication or grapple pile and burn; and 96 acres of mastication followed by underburning.

Landing rehab: Helicopter landings would be seeded with native seed. Subsoiling would occur where there is enough soil. There would be a total of approximately 3 acres of landing rehab.

Tree Felling: Mechanical felling with a processor would occur in forwarder units and hand felling in helicopter units.

Reforestation: Actions include collecting of native seeds, scattering of native seed, hand planting of trees, and fuels reduction by underburning or burning of piles. Tree planting would occur on 376 acres. Native seed would be used to restore helicopter landings and other disturbed sites from construction or harvest actions, approximately 5 acres.

Silvicultural Prescriptions: See Appendix B for a discussion on the use of regeneration harvest prescriptions for this activity. Shelterwood and Seedtree prescriptions in the frequent fire regime are not being used to regenerate the stands. They are being called shelterwood and seedtree harvests because of their appearance after harvest and not for a regeneration objective. The prescription would favor frequent fire conditions (an open ponderosa pine stand) by reducing crown closure and removing understory structure, thus the stands would have the appearance of being regenerated. Stands would be maintained in open condition. Calling the treatments shelterwood and seedtree discloses stands would change from multistructure to single structure and look like a created opening on the landscape. This limits the units to 40 acres in size; limiting the size of what some might call a created opening. As a result the restoration of the frequent fire regime would take longer. Limiting the number of acres opened at one time allows the landscape to adjust slowly. However, it also increases the risk of losing the large tree component in untreated stands should a wildfire move across the landscape.

HIIM, Improvement Harvest: This is an intermediate cutting in stands past the sapling stage to improve their composition and quality. Trees of undesirable species, form or condition are removed from the main canopy. A fully stocked stand is left. Stands in E2 would be thinned to the lower end of recommended levels and those in C4 to the upper end. The target basal area reduction is based on the plant association and tree species for management.

Objectives include increased growth and vigor to reduce the risk of epidemic insect infestations, removal of shade tolerant and fire intolerant tree species, shifting stand composition to a greater representation of early seral tree species (generally ponderosa pine and western larch) and the retention of large diameter (greater than 21 inches) trees in stands managed for ponderosa pine.

HITH, Commercial thinning: This is an intermediate cutting that stimulates growth and development of residual stands. Commercial thinnings are also made to increase the yield of usable (merchantable) material that would be available at a future harvest. A fully stocked stand remains. The stand would be thinned to recommended stocking levels based on plant association and the tree species being managed.

HCPH, Patch Clearcut: This prescription would remove part of a stand using patches that are too small to manage as individual stands after harvest. Patches would be less than 5 acres in size. These stands would use patch removal to control or emulate root rots and increase the stand composition of western larch.

HSST, Reserve Tree Seed Cut: This prescription would remove a significant portion of the canopy to promote seed production of ponderosa pine or western larch. It will create conditions that are conducive to the establishment and survival of natural or planted regeneration. It is being proposed in stands that currently have a low composition of pine or larch that historically would have been higher. The leave trees would be left for future snags and down wood. Several of the stands have high infestation of root rots. Root rot resistant species would be encouraged either as leave trees or planted. Less than 12 trees per acre would be left.

HSSW, Reserve Tree Shelterwood Harvest: This prescription would remove a significant portion of the canopy to promote seed production of ponderosa pine or western larch. It will create conditions that are conducive to the establishment

and survival of natural or planted regeneration. It is being proposed in stands that currently have a low composition of pine or larch that historically would have been higher. The leave trees would be left for future snags and down wood. This prescription would leave more trees than seed tree, approximately 18 trees per acre.

Trees larger than 21 inches dbh may be removed from Moist Forest stands because the stands are within historic range of variability. It is estimated that less than 10 percent of the trees identified for removal in the Moist Forest would be large trees. In the Dry Forest stands, no tree large than 21 inches will be cut because old forest single structure is below historical range. Single stratum, late old structure would be restored from stands that have become multi-structure stands.

Forest Plan Amendments

1. Moving of C1, Dedicated Old Growth: There is a portion of Forest Plan Management Area C1, Dedicated Old Growth, along Dry Creek that occurs on both sides of Forest Road 32. It is proposed to move the C1 boundary 100 feet off the road to allow the removal of hazard trees. Doing so would leave a narrow, isolated portion of C1 to the east of the road that is predominately western exposure of grasslands and forest. The adjusted boundary would leave a core area west of Forest Road 32 and delete the C1 area east of the road. A new C1 area would be created in upper Dry Creek from a stand that is currently late old structure. Approximately 127 acres of C1 will be replaced with 127 acres of E2. This change is needed to provide Forest Plan protection to the old growth forest that can be added to the existing C1 area while keeping the acres the same as currently designated in the Forest Plan. The old C1 area would become E2. See map in Appendix E.
2. Changing Management Area C3 – Big Game Winter Range to C4 – Wildlife Habitat: 880 acres. Years of big game monitoring indicate that the C 3 area is very seldom used in the winter by elk. Snow depths force them to lower elevations in the Grande Ronde valley. The District wildlife biologist has monitored use and found elk to use the area in late fall and early spring. Winter snow depths exceeded 18 inches. Elk move when snow depth exceeded 12 to 20 inches. There is only 880 acres in the C3 area. The low acres makes questionable the use of the HEI model when it is intended to be used for areas over 2,000 acres. HEI is a measure of how well the landscape can support optimum populations of elk. A small change in forage, cover, or spacing would have a major effect on HEI when modeled on too small of acres. The result has no meaning. Management actions that would benefit late winter and early fall use by big game would not be possible because a small change in habitat could cause the action to not meet Forest Plan Standards and Guidelines for C3. Actions that improve spring forage and open forest conditions can be accomplished if the area became C4. The dry forest habitat has more value to deer because browse would be available longer in the winter. HEI has no meaning for deer habitat. The winter snow depth makes the area questionable winter range, particularly for foraging elk.

Summary of Prescriptions, Alternative B

Prescription	Number of Units	Unit Acres	Treatment Acres	Volume MBF
HIIM	19	482	355	3,295
HITH	4	79	66	655
HSST	17	359	314	5,016
HSSW	2	78	56	711
HCPH	5	110	23	336
Total	47	1108	814	10,013

Summary of Harvest Prescriptions Acres by Structural Stage

Prescription	YFMS	OFMS	UR	SECC	Total Acres
HCPH	110				110
HIIM	256	125	101		482
HITH	37		14	28	79
HSST	82	215	33	29	359
HSSW	78				78
Total Acres	563	340	148	57	1,108

YFMS is young Forest multistrata; OFMS is Old Forest Multistrata; UR is understory reinitiation; SECC is stem exclusion closed canopy. These are structural stages used in the Historic Range of Variability (HRV) analysis.

Transportation System and Access Management

Access for crew and support vehicles would be needed for project activities, inspecting and monitoring, log haul, movement of heavy equipment for road maintenance or moving in and out of forwarder and processor, helicopter support, and fueling of light and heavy equipment. Fuel for heavy equipment and light hand equipment would be hauled to the site each day. The Helicopter service landing would be located at a ridgetop rock source. Fuel is normally stored on site for the helicopter and the contract requires construction of a facility that would contain an accidental spill.

Road reconstruction and maintenance: Maintenance would be performed using standard specifications to accomplish surface blading, hazard tree removal, construction of drainage dips or water bars, dust abatement with water, surface rock replacement, roadside brushing, ditch cleanout, culvert maintenance or removal and replacement, road surface shaping and draining, and surface material processing. Traffic control measures would be taken when actions occur next to roads.

Finely Creek Area, Colt Timber Sale: Approximately 17.2 miles of road would be used for haul with 6.5 miles on paved road. Standard maintenance would occur on Forest Roads 3148, 3217, 3217040, 3217025, and 3217030. Shaping and blading would occur on 4.66 miles. There would be 2.20 miles of heavy clearing and roadside brushing and light brushing on 2.46 miles. Spot rocking would occur on 1.5 miles. Forest Road 3217030 would have 5, 18-inch culverts removed and replaced with rolling dips. The earth mound closing 3217030 would be replaced with a gate. A turn around would be constructed at the end of 3217030 in a naturally wide area with minimal excavation. Established drainage patterns on Forest Road 3217040 would be maintained by keeping the surface hard and by the placement of surface rock.

Phillips Creek Area, Pedro Timber Sale: Brushing would occur on approximately 3.5 miles, surface blading on 22 miles, and ditch and culvert cleanout on 1.0 miles of Forest Road 3740. The type 3 barricade on Forest Road 3734 and 3734030 would be replaced with a gate. There would be 0.6 miles of reconstruction on Forest Road 3734; the surface would be outsloped and drainage dips constructed. Sediment prevention measures would be used during roadwork.

Dust Abatement: Helicopter yarding would most likely occur in late spring or in the fall when available moisture would keep the road surface hard. For forwarder logging, less than 8 loads per day between 9:00 am and 5 pm. is the norm and would not cause a dusting problem during the summer. When more than 8 loads per day are hauled dust abatement would be required for public safety. Water would be the method of abatement. Water sources needed for maintenance would be ponds off Forest Road 3100 located on 3100270, 3100287, and Ruckel Junction. These ponds are not connected to stream systems. The preferred late spring early summer water source for the Pedro portion would be where Forest Road 3740 crosses Phillips Creek. This portion of Phillips Creek along the migratory route for steelhead spawning in the upper reaches of the Creek. The scour pool below the arch does not contain spawning gravels. When water is no longer available in Phillips Creek the source would shift to East Phillips Creek.

Rock Sources: Two rock sources would be used. The Pedro portion would use an existing source located on Forest Road 3734133. The Colt portion uses the upper rock source on Forest Road 3217040.

Road Decommissioning: It is proposed to decommission or remove from the system approximately 7.5 miles of road; 0.6 miles are within Riparian Habitat Conservation Areas (RHCAs) of Class III streams and 0.5 miles in RHCAs of Class IV streams. The current road surfaces are 1.6 miles of improved and 3.1 miles of native surface. Forest Roads 3734060, 3734130, 3738045, and 3100286 would be decommissioned by subsoiling and constructing waterbars. Forest Roads 3734010, 3734040, and 3738500 are ridgetop roads that would be sloped to drain and converted to a trail to provide future fire access. All roads proposed for decommissioning are currently listed as closed in the District's Access and Travel Management Plan. The first 0.9 miles of Forest Road 3738045 would be obliterated where it crosses many drainages before it intersects with Forest Road 3738. This is the location used by the private landowners before the Forest Service acquired the land. There is a better location to access this area from Forest Road 3738 where it would not cross major drainages. This new road location is not needed for this project and may be built at a later time.

Noxious Weed Treatments: Noxious weeds along the haul route would be mechanically treated by hand pulling, mowing, or burning of individual plants. Mechanical methods would remove the seed heads during the time of haul to reduce the risk of spreading the weeds to new locations. Treatments would be done in accordance with the *Environmental Assessment for the Management of Noxious Weeds* (Noxious Weed EA) and its **Decision Notice** (May 24, 1995).

Changes to the Access and Travel Management Plan:

The District's Access and Travel Management Plan was reviewed to see if adjustments were needed due to changed conditions and past obliteration or closure of open road systems. Middle Ridge is important elk calving area and no changes are proposed.

Forest Road 3217040 would be changed from closed to open. This would allow access to Finley Ridge for dispersed use. The ridge was accessed in the past via Forest Road 3217, which was obliterated in the late 1990's.

Unit Summary Alternative B

Unit	Log Sys	Rx	Gross Acres	Net Acres	Vol/Net acre Removed MBF	Unit Volume MBF	Fire Regime	Condition Class	Silv. Objective	Prescribed Fire	Structure
4	H	HIIM	31	18	18	324	Mix	1	Stocking	UB	YFMS
5	F	HIIM	16	9	3	27	Mix	1	Stocking	GR	UR
6	F	HIIM	11	7	3	21	Mix	1	Stocking	GR	UR
7	F	HSST	33	32	20	640	Mix	1	Regen	UB	UR
8	F	HSST	16	8	12.1	97	Mix	1	Regen	UB	OFMS
9	F	HSST	27	20	5.8	116	Mix	1	Regen	UB	OFMS
14	H	HSST	13	10	26.3	263	Frequent	3	PP-DF	UB	OFMS
15	H	HSST	24	13	18.2	237	Frequent	3	PP-DF	UB	OFMS
16	H	HITH	19	19	20	380	Infrequent	1	Stocking	GR	YFMS
17	H	HIIM	21	17	4.3	73	Frequent	3	PP	UB	YFMS
18	H	HIIM	44	28	4.3	120	Frequent	3	PP	UB	YFMS
19	H	HSST	24	24	24.5	588	Frequent	2	Root Rot	UB	YFMS
20	H	HSST	32	30	14	420	Frequent	3	PP	UB	OFMS
23	H	HSST	25	25	14	350	Frequent	3	PP	UB	OFMS
24	H	HSST	10	10	10.7	107	Frequent	2	Regen	UB	YFMS
25	H	HSST	29	29	24.7	716	Frequent	2	Root Rot	UB	SECC
26	F	HSST	8	8	10.7	86	Frequent	2	Regen	UB	YFMS
27	F	HIIM	24	18	9.4	170	Mix	1	PP-WL	GR	YFMS
28	H	HSST	40	32	12	384	Frequent	2	PP-WL	UB	OFMS
29	H	HIIM	6	6	14	84	Frequent	2	PP-WL	UB	YFMS
31	F	HIIM	24	17	14	238	Frequent	2	PP-WL	Mast, UB	YFMS
32	F	HSSW	40	28	10	280	Mix	1	WL	UB	YFMS
33	F	HIIM	25	24	5	120	Frequent	2	PP	GR	UR
37	H	HIIM	47	40	13	520	Frequent	2	PP-WL	UB	OFMS
39	H	HSST	13	13	16.7	217	Frequent	2	Root Rot	UB	OFMS
40	H	HSST	16	11	16.7	184	Frequent	2	Root Rot	UB	OFMS
41	F	HSST	40	40	11.5	460	Frequent	2	Root Rot	GR	YFMS
43	F	HCPH	23	5	10	50	Mix	2	WL	Mast, UB	YFMS
44	F	HCPH	8	2	15	30	Frequent	2	WL	UB	YFMS
45	F	HCPH	34	7	18	126	Frequent	2	WL	UB	YFMS
46	H	HSST	5	5	16.7	84	Frequent	2	Root Rot	UB	OFMS
47	F	HIIM	18	17	5	85	Frequent	2	PP	GR	UR
48	F	HSST	4	4	16.7	67	Frequent	2	Root Rot	UB	OFMS
50	F	HITH	28	26	6	156	Frequent	2	Stocking	GR	SECC
52	F	HCPH	19	4	10	40	Mix	1	PP	Mast, UB	YFMS
54	H	HITH	14	10	6.3	64	Frequent	2	PP	UB	UR
55	F	HITH	18	11	5	55	Frequent	2	PP-WL	GR	YFMS
56	H	HIIM	16	14	2	28	Frequent	2	PP	GR	YFMS
59	H	HIIM	14	7	6.4	45	Frequent	2	PP	UB	UR
60	H	HIIM	36	26	2	52	Frequent	2	PP	UB	YFMS
61	F	HIIM	36	24	15	360	Mix	1	PP-WL	UB	OFMS
62	H	HIIM	17	13	6.4	83	Frequent	2	PP	UB	UR
65	F	HIIM	42	30	15.5	465	Mix	1	PP-WL	UB	OFMS
77	F	HSSW	38	28	15.4	431	Frequent	2	PP-WL	UB	YFMS
78	F	HIIM	30	24	12	288	Frequent	2	Stocking	Mast, UB	YFMS
79	F	HIIM	24	16	12	192	Mix	1	WL	UB	YFMS
80	F	HCPH	26	5	18	90	Frequent	2	PP-WL	UB	YFMS
Alternative B Total			1108	814		10013					

Fire Regimes: Frequent Fire Regime is National Fire Plan Group I with a 0 to 35 year return interval and a low fire severity. Mix fire regime is National Fire Plan Group III with a 35 to 100 year return interval and a mixed severity fire. Infrequent Fire Regime is National Fire Plan Group V with a greater than 200 year return interval and a stand replacement fire severity. Harvest is being proposed in the Mixed fire regime for several reasons: ponderosa pine is a co-dominant species in the overstory indicating a short fire return interval; western larch is present in the stand and need thinning to retain growth rates and produce large trees. In some cases the amount of mortality from past insect damage indicates a need to regenerate.

Condition Class 1 is where the fire regime is within or near historical range, the risk of losing key ecosystem components is low and vegetation attributes are intact and functioning within an historical range.

Condition Class 2 is where fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components has increased to moderate and vegetation attributes have been moderately altered. Fire frequencies have departed by more than one return interval resulting in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.

Condition Class 3 has fire regimes that are significantly altered from their historic range. The risk of losing key ecosystem components is high and vegetation attributes have been significantly altered. Fire frequencies have departed by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.

Silvicultural Objectives: PP is ponderosa pine emphasis. WL is western larch emphasis. DF is Douglas-fir emphasis. Stocking is mixed species stocking control. Root Rot is to control the spread of root diseases. Regen is regeneration harvest of grand fir because of high levels of rot and loss of stand growth.

Prescribed Fire: UB is underburning, a low intensity understory burn to remove surface and small diameter vertical fuels. GR: Either grapple pile and burn or mastication would be used to reduce fuel loads in units with fire sensitive overstory. Mast, UB: After harvest the unit would be mechanically non-commercially thinned and burned.

Management Requirements

See the Specific Management Requirements Common to All Action Alternatives section below.

Alternative C Ridgetop treatments of ponderosa pine stands

This alternative responded to big game cover by avoiding treatments in western larch stands or other moist forest stands that provide satisfactory cover. Dry forest with historic short fire return interval favoring ponderosa pine provides the focus for this alternative. Root rot is also prevalent in the area causing areas of high mortality. Stands with root rots located in strategic fire control areas would also receive treatments to reduce and confine the spread of root rots.

This alternative provides the minimum fuel reduction for control of wildfires. Treatments along ridgetops and dry midslope stands form a mosaic of reduced fuels from the wildland-urban interface along the southern planning area boundary, up and along ridgetops. These actions would aid in the control and confinement of wildfires. Landscape prescribed fire is not being proposed to maintain the frequent fire character at the scale of Alternative B. Harvest and prescribed fire would be used to break up vertical fuel structure and connect to natural areas of control, such as grasslands. Ponderosa pine stands would be restored to open structures typical of frequent fire regime.

Forest management goals for this alternative are:

- Restore single stratum ponderosa pine stands in areas that historically had frequent fires.
- Reduce surface and ladder fuels to increase the success of wildland control fire along the wildland-urban interface and across the planning area.
- Increase stand resilience to insect epidemics and root diseases by reducing stocking levels in ponderosa pine stands and favoring non-host tree species.
- Retain big game cover on moist sites.
- Provide wood fiber consistent with the goals and objectives of the Forest Plan.
- Reduce non-point sediment sources by obliterating roads no longer needed and reduce the risk of sediment transport by using a low ground impact logging system or special project design measures, see management requirements for soils and water protection measures later in this Chapter.

Description of Alternative C

Fuel reduction and ponderosa pine restoration would occur on approximately 2,300 acres treating high priority stands with timber harvest, prescribed fire in harvested stands, and less natural fuels. An estimated 10,150 thousand board feet (mbf) of timber would be harvested from 1,586 acres. A cut to length logging system would be used on 1,012 acres removing 4,900 mbf and a helicopter system would be used on 574 acres removing 5,250 mbf. Harvest prescriptions include patch clearcut, shelterwood, seedtree, thinning, and improvement harvest. Two sales are proposed from this analysis; the Pedro Timber Sale and the Colt Timber Sale. Harvest would occur on 1,382 acres of frequent fire regime and 204 acres of mixed fire regime.

Harvest residues would be treated using a variety of methods to reduce post harvest fuel loads in preparation for understory prescribed fire. Underburning (1,469 acres) would be used in stands where fire can play a role in shaping the species composition and structure by reducing surface and ladder fuels. Grapple pile and burn or machine mastication (157 acres) would occur in stands with species that are not fire tolerant or where fire mortality is expected to be high using under burn methods. Non-commercial thinning units would be treated using mechanical mastication to break up surface fuels and thinning slash so the organic material can decompose. Stands would be evaluated after harvest to determine if fuels have been rearranged enough so that prescribed fire is not needed or if jackpot burning or machine mastication would be the best

treatment. Jackpot burning uses spot ignitions to remove only heavier fuel concentrations. Burning would occur in the fall in stands managed for ponderosa pine. Units with high slash loads may receive a spring burn to reduce fuels under cooler and moister conditions to be followed by a fall burn.

Non-commercial thinning is proposed for 140 acres, to reduce fuels and separate crowns along the Forest boundary. Mechanical mastication would be used.

Landscape fuel treatments would not occur as in Alternative B. Three areas would use understory burning between harvest units to modify stand structure and provide areas of reduced fuels. There would be 551 acres of natural fuels treated outside of harvest units.

Summary of Fuel Reduction Methods

Treatment Type	Acres
Total acres underburning	1,979
Underburning with Harvest Pretreatment	1,280
Underburning Natural Fuels	551
Harvest, Masticate, and Underburn	148
Harvest, grapple pile and burn or masticate only	158
Non-commercial thinning, mastication	140

Activity components of Prescribed Fire

Same as Alternative B.

Activity Components of Timber Harvest

The same descriptions as Alternative B apply with the following changes.

Logging Systems: 1,012 acres, 4,900 mbf with a cut to length; 574 acres, 5,250 mbf with a helicopter. Total harvest on 1,586 acres with 10,220 mbf.

Slash Treatment: Treatment of activity fuels include: 1,280 acres understory burn; 158 of mastication or grapple pile and burn; and 148 acres of mastication followed by underburning.

Reforestation: Actions include collecting of native seeds, scattering of native seed, hand planting of trees, and fuels reduction by underburning or burning of piles. Tree planting would occur on 304 acres. Native seed would be used to restore helicopter landings and other disturbed sites from construction or harvest actions, approximately 4 acres.

Silvicultural Prescriptions and Objectives:

This alternative would focus on the restoration of ponderosa pine in the frequent fire regime and developing an area of reduced fuels and stand structure along the Forest Boundary. Treatments would occur mainly on ridgetops and associated ponderosa pine stands in the upper portions of the slope. Prescribed fire would be used only in the identified units, there is no general landscape prescribed fire as used in Alternative B. Where stocking levels and surface fuels have increased beyond historical ranges, removal of trees is proposed prior to using understory prescribed fire. Vegetation treatments are expected to reduce surface and ladder fuels, reduce stocking levels, and increase the stand composition of ponderosa pine. Vegetative treatments would focus on creating areas that ease the control of wildfire by restoring open stand conditions associated with frequent fire regimes.

Ridgetop and midslope ponderosa pine management: Harvest and prescribed fire would be used to restore single structure ponderosa pine and reduce fuels for the control of wildfire. Treatment methods include harvest, non-commercial thinning, mastication of surface fuels, and burning natural fuels. There would be 26 units treating 1,247 acres.

Forest Health and Disease: Several units have high levels of root rots. The pockets are extensive and are spreading to other trees within the stands. Host tree species would be removed and western larch, or other resistant species, planted to control the spread of the disease. Treatment methods include harvest and mastication of surface fuels. There would be 8 units treating 172 acres.

Wildland, Rural-Urban Interface: These units are located along the Forest Boundary. Treatments would break up surface fuels and reduce or isolate pockets of ladder fuels. Treatments would separate crowns to reduce the risk of crown fires along the Forest boundary. Under normal weather patterns, a wildfire would remain on the ground in this area.

Pockets or thickets of trees for big game bedding areas would be retained. Individual pockets may flair or torch when a fire passes through, however the adjacent fuel reductions would reduce the risk of fire spreading to adjacent crowns. Treatment methods include harvest, non-commercial thinning, mastication of surface fuels, and burning natural fuels. There would be 12 harvest units treating 858 acres.

Silvicultural Prescriptions:

Additional prescriptions not discussed in Alternative B.

PCT: Thinning of non-commercial size trees to create a fuel break and remove diseased trees. Mechanical mastication would break up surface fuels and thinning slash. The residual biomass would be allowed to decompose.

UB: Understory burning would be used to reduce surface fuels and kill small trees in the understory. It would reduce ladder fuels and maintain stands in an open condition. It may take multiple treatments with fire to accomplish the desired fuel loading and structure. Underburning would be used for treating residual slash from harvest units and natural fuels.

Forest Plan Amendments: Same as Alternative B

Summary of Prescriptions, Alternative C

Prescription	Number of Units	Unit Acres	Treatment Acres	Volume MBF
HCPH	2	43	13	94
HIIM	24	1,167	1,061	5,056
HITH	2	32	21	119
HSST	13	306	276	4,448
HSSW	1	38	28	431
PCT	2	140	140	
UB	3	551	449	
Total	46	2,277	1,988	10,148

Summary of Harvest Prescriptions Acres by Structural Stage

Prescription	YFMS	OFMS	UR	SECC	SEOC	Total Acres
HCPH	56					56
HIIM	590	125	74		365	1,154
HITH	18		10			28
HSST	105	172		29		306
HSSW	38					38
Total Acres	807	297	84	29	365	1,582

Transportation system and Access Management

The following changes would occur to the activities proposed in Alternative B:

Finely Creek Area, Colt Timber Sale: Approximately 16.0 miles of road would be used for haul with 6.5 miles on paved road. Standard maintenance would occur on Forest Roads 3148, 3217, and 3217040. Shaping and blading would occur on 4.66 miles. Forest Road 3217030 would not have the drainage structures removed because the road would not be needed for haul. Established drainage patterns on Forest Road 3217040 would be maintained by keeping the surface hard and by the placement of surface rock.

Phillips Creek Area, Pedro Timber Sale: Approximately 18.0 miles of road would be used for haul. The Forest Road 3740 system would not be needed for haul. The culvert on Forest Road 3734, where it crosses Little Phillips Creek, would not be replaced.

Rock Sources: The Colt portion uses the upper rock source on Forest Road 3217040.

Proposed road obliteration and changes to the Access and Travel Management Plan would be the same as Alternative B.

Unit Summary Alternative C

Unit	Log Sys	Rx	Gross Acres	Net Acres	Vol/Net acre Removed MBF	Unit Volume MBF	Fire Regime	Condition Class	Silv. Objective	Prescribed Fire	Structure
14	H	HSST	13	10	26.3	263	Frequent	3	PP-DF	UB	OFMS
15	H	HSST	24	13	18.2	237	Frequent	3	PP-DF	UB	OFMS
17	H	HIIM	21	17	4.3	73	Frequent	3	PP	UB	YFMS
18	H	HIIM	44	28	4.3	120	Frequent	3	PP	UB	YFMS
19	H	HSST	24	24	24.5	588	Frequent	2	Root Rot	UB	YFMS
20	H	HSST	32	30	14	420	Frequent	3	PP	UB	OFMS
23	H	HSST	25	25	14	350	Frequent	3	PP	UB	OFMS
25	H	HSST	29	29	24.7	716	Frequent	2	Root Rot	UB	SECC
28	H	HSST	40	32	12	384	Frequent	2	PP-WL	UB	OFMS
31	F	HIIM	19	17	14	238	Frequent	2	PP-WL	Mast, UB	YFMS
33	F	HIIM	25	24	5	120	Frequent	2	PP	GR	UR
37	H	HIIM	47	40	13	530	Frequent	2	PP-WL	UB	OFMS
39	H	HSST	13	13	16.7	217	Frequent	2	Root Rot	UB	OFMS
40	H	HSST	16	11	16.7	184	Frequent	2	Root Rot	UB	OFMS
41	F	HSST	40	40	11.5	460	Frequent	2	Root Rot	GR	YFMS
45	F	HCPH	13	3	18	54	Frequent	2	WL	UB	YFMS
46	H	HSST	5	5	16.7	84	Frequent	2	Root Rot	UB	OFMS
47	F	HIIM	18	17	5	85	Frequent	2	PP	GR	UR
48	F	HSST	4	4	16.7	67	Frequent	2	Root Rot	UB	OFMS
54	H	HITH	14	10	6.4	64	Frequent	2	PP	UB	UR
55	F	HITH	18	11	5	55	Frequent	2	PP-WL	GR	YFMS
56	H	HIIM	16	14	2	28	Frequent	2	PP	GR	YFMS
59	H	HIIM	14	7	6.4	45	Frequent	2	PP	UB	UR
60	H	HIIM	36	26	2	52	Frequent	2	PP	UB	YFMS
61	F	HIIM	36	24	15	360	Mix	1	WUI, PP-WL	UB	OFMS
62	H	HIIM	17	13	6.4	83	Frequent	2	PP	UB	UR
65	F	HIIM	42	30	15.5	465	Mix	1	WUI, PP-WL	UB	OFMS
69	F	HSST	41	40	11.8	478	Frequent	2	Root Rot	GR	YFMS
77	F	HSSW	38	28	15.4	431	Frequent	2	PP-WL	UB	YFMS
78	F	HIIM	30	24	12	288	Frequent	2	PP-WL	Mast, UB	YFMS
82	F	HIIM	106	106	2	210	Frequent	3	PP	UB	SEOC
83	F	HIIM	169	169	1.5	250	Frequent	2	PP	UB	SEOC
84	M	PCT	65	65	0	0	Frequent	3	Fuels	GR	SI
86	F	HIIM	31	31	8	250	Frequent	2	WUI, PP	UB	YFMS
87	F	HIIM	77	77	6	462	Mix	2	WUI, WL-DF	UB	YFMS
88		UB	238	200	0	0	Mix	2	WUI, Fuels	UB	NA
90	F	HIIM	65	65	3	195	Frequent	3	WUI, PP	UB	YFMS
91	M	PCT	75	75	0	0	Frequent	3	WUI, Fuels	GR	UR
92	F	HIIM	62	62	2	125	Frequent	2	WUI, WL	Mast, UB	YFMS
93	F	HIIM	49	49	5	245	Mix	2	WUI, PP-WL	UB	YFMS
94	F	HIIM	90	90	1	90	Frequent	2	PP	UB	SEOC
95	F	HCPH	43	10	4	40	Frequent	2	WUI, PP	UB	YFMS
96		UB	55	55	0	0	Frequent	2	Fuels	UB	NA
97		UB	258	194	0	0	Frequent	2	Fuels	UB	NA
98	H	HIIM	103	94	7.5	705	Frequent	2	WUI, WL	UB	YFMS
99	F	HIIM	37	37	1	37	Frequent	2	WUI, PP	Mast, UB	YFMS
Alternative C Total			2277	1988		10148					

WUI: Wildland Urban Interface Units

Alternative D: Fuels Reduction without Commercial Harvest

This alternative looked at different ways to accomplish fuel reductions and protection along the wildland urban interface without the use of a conventional timber sale contract. It recognized the need to remove commercial size trees to modify the ladder fuel composition because killing the trees and leaving them in place would cause unacceptable wildfire behavior in the future. This alternative considers fire fighter and public safety and the protection of private lands by developing a fuel reduction project that provides for a low intensity wildfire and low levels of surface large fuels. Fuels reduction was concentrated to those areas identified in Alternative B and C as needing active management for restoring habitat diversity reflective of historic landscape disturbance processes.

Service contracts would be used to remove merchantable trees placing the logs in decks. The decked material would later be sold. Small trees would be broken up using mechanical mastication. Where current fuel loads are heavy, prescribed fire would be used to lower fuel levels prior to tree removal. These stands would have a second prescribed fire to reduce slash

loads after large dead fuels are removed. The first burn may occur in the spring so that heat generated from the large fuels would be reduced.

Mechanical mastication would be used to reduce complex ladder fuels on flat ground. The unit would be evaluated for additional tree removal based on the amount of ladder fuels removed and the risk for fire moving into the crowns. This would be a phased approach to harvesting merchantable trees. If the mastication accomplishes the fuels objective on its own, additional harvest would not be necessary.

Forest management goals for this alternative would:

- Restore landscape habitat diversity reflective of the short fire return intervals found in the planning area. Where early seral species occur, or did occur, they would be restored to either dominance or co-dominance depending on the successional development and fire regime.
- Reduce surface and ladder fuels to increase the success of control of wildland fire along the wildland urban interface and across the planning area.
- Increase stand resilience to insect epidemics and root diseases by reducing stocking levels and/or favoring non host tree species.
- Provide wood fiber consistent with the goals and objectives of the Forest Plan.
- Reduce non-point sediment sources by obliterating roads no longer needed and reduce the risk of sediment transport by using a low ground impact logging system or special project design measures.

Description of Alternative D

There are approximately 2,700 acres proposed for fuel reduction treatments. Leaving the desired tree composition would utilize the following prescriptions: seedtree, shelterwood, commercial thinning, improvement harvest, non-commercial thinning to improve stand conditions and species composition, and understory burning with and without tree removal.

Summary of Fuel Reduction Methods

Treatment Type	Acres
Total acres underburning	2,276
Underburning with Harvest Pretreatment	1,530
Underburning Natural Fuels	551
Harvest, Masticate, and Underburn	195
Harvest, grapple pile and burn or masticate only	256
Non-commercial thinning, mastication	140

Commercial size trees would be removed from approximately 1,980 acres to restore surface fuels and stand structure characteristic of the frequent fire regime. Approximately 1,378 acres would potentially utilize a forwarder (7,005 mbf), and 603 acres a helicopter (6,095 mbf). In stands that are losing their western larch component, trees would also be removed to allow western larch to regenerate. Trees are being removed in preparation for understory prescribed fire. Approximately 13,100 mbf of timber would be removed using a service contract. The system used to remove the trees to decking areas would be low ground disturbing such as forwarders, helicopters, or small yarding equipment.

Treatments in stands with complex ladder fuels: These stands have a high percentage of saplings and/or poles allowing wildfire to move upward into the overstory. Mechanical mastication would be used to remove the small understory. After treatment the units would be evaluated for additional tree removal or underburning. The goal is to reduce the ladder fuels and the risk for a wildfire moving into the crown. Units 33, 44, 45, 47, 77, 82, 83, 93, and 94, totaling 537 acres with up to 494 acres of underburning.

Treatments in stands with high fuel loads and complex overstory: Units currently with high fuel loads would be treated with prescribed fire prior to any tree removal. The burning and removal of trees would meet stocking level objectives. Existing fuels need to be reduced so that burning the additional slash from the removal would be less likely to kill the desired large trees. Units 7, 25, 28, 41, 50, and 55 totaling 188 acres.

Treatments in stands managed for ponderosa pine restoration: Units 14, 15, 17, 18, 20, 23, 31, 37, 54, 56, 59, 60, 62, 78, 84, 96, and 97 would be restored to a dominance of ponderosa pine. Harvest with underburning would occur on 357 acres, underburning for stand maintenance on 313 acres, and non-commercial thinning on 65 acres.

Treatments in stands management for western larch restoration and stocking level control: These stands would be managed to maintain and increase the composition of western larch or increase stand vigor. Units 3, 5, 6, 16, 27, 29, 32, 43, 52, 79, and 80 totaling 239 acres. Grapple piling and mastication would occur on 51 acres and underburning on 188 acres.

Treatments in stands managed for disease control: These stands have extensive root rots and will be regenerated to western larch or other resistant species, to control the spread of the root disease. Units 19, 39, 40, 46, 48 and 69 totaling 103 acres. Unit 69 would still have many thin barked species left and would require grapple pile or mastication, 41 acres, all other units would have underburning.

Treatments in the Wildland-Urban Interface: These units are located along the Forest Boundary. Treatments would break up surface fuels and reduce or isolate pockets of ladder fuels. Treatments would separate crowns to reduce the risk of crown fires along the Forest boundary. The width of treatment should be able to provide an area to control the spread of wildfires while allowing pockets or thickets of trees for big game bedding areas. Areas of cover may torch during a wildfire, however the adjacent treatments would reduce the risk of fire spreading to crowns. Treatment methods include harvest, non-commercial thinning, breaking up of surface fuels, and prescribed fire. Units 61, 65, 86, 87, 88, 90, 91, 92, 95, 98, and 99 are within the wildland-urban interface. Harvest would occur on 496 acres followed by underburning. Underburning for maintenance would occur on 238 acres. Non-commercial thinning would occur on 75 acres.

Treatments to Regenerate Grand Fir Stands: Units 8, 9, 24, and 26 totaling 61 acres have stopped growing and would be regenerated. Indian paint fungus has infected the large, overstory trees. Underburning would follow the tree removal.

Forest Plan Amendments: Same as Alternative B

Summary of Prescriptions, Alternative D

Prescription	Number of Units	Unit Acres	Treatment Acres	Volume MBF
HIIM	29	1,271	1,135	5,860
HITH	4	79	66	655
HSST	18	400	354	5,498
HSSW	2	78	56	711
HCPH	6	153	33	376
PCT	2	140	140	0
UB	2	551	449	0
Total	63	2,672	2,233	13,100

Summary of Harvest Prescriptions Acres by Structural Stage

Prescription	YFMS	OFMS	UR	SECC	SEOC	Total Acres
HCPH	153					153
HIIM	680	125	101		365	1,271
HITH	37		14	28		79
HSST	123	215	33	29		400
HSSW	78					78
Total Acres	1,071	340	148	57	365	1,981

Activity components of Prescribed Fire

Same as Alternative B.

Activity Components of Timber Harvest

The same descriptions as Alternative B apply with the following changes.

Logging Systems: 1,378 acres, 7,005 mbf with a cut to length; 603 acres, 6,095 mbf with a helicopter. Total harvest of 1,981 acres and 13,100 mbf.

Slash Treatment: Treatment of activity fuels include: 1,036 acres understory burn; 256 of mastication or grapple pile and burn; and 689 acres of mastication followed by underburning.

Reforestation: Actions include collecting of native seeds, scattering of native seed, hand planting of trees, and fuels reduction by underburning or burning of piles. Tree planting would occur on 410 acres. Native seed would be used to restore helicopter landings and other disturbed sites from construction or harvest actions, approximately 5 acres.

Transportation System and Access Management

This Alternative would have the same road work as Alternative B to haul logs from the decks. Road obliteration and access and travel management changes would also be the same as Alternative B.

Unit Summary, Alternative D

Unit	Log Sys	Rx	Gross Acres	Net Acres	Vol/Net acre Removed MBF	Unit Volume MBF	Fire Regime	Condition Class	Silv. Objective	Prescribed Fire	Structure
4	H	HIIM	31	18	18	324	Mix	1	Stocking	UB	YFMS
5	F	HIIM	16	9	3	27	Mix	1	Stocking	GR	UR
6	F	HIIM	11	7	3	21	Mix	1	Stocking	GR	UR
7	F	HSST	33	32	20	640	Mix	1	Regen	UB	UR
8	F	HSST	16	8	12.1	97	Mix	1	Regen	UB	OFMS
9	F	HSST	27	20	5.8	116	Mix	1	Regen	UB	OFMS
14	H	HSST	13	10	26.3	263	Frequent	3	PP-DF	UB	OFMS
15	H	HSST	24	13	18.2	237	Frequent	3	PP-DF	UB	OFMS
16	H	HITH	19	19	20	380	Infrequent	1	Stocking	GR	YFMS
17	H	HIIM	21	17	4.3	73	Frequent	3	PP	UB	YFMS
18	H	HIIM	44	28	4.3	120	Frequent	3	PP	UB	YFMS
19	H	HSST	24	24	24.5	588	Frequent	2	Root Rot	UB	YFMS
20	H	HSST	32	30	14	420	Frequent	3	PP	UB	OFMS
23	H	HSST	25	25	14	350	Frequent	3	PP	UB	OFMS
24	H	HSST	10	10	10.7	107	Frequent	2	Regen	UB	YFMS
25	H	HSST	29	29	24.7	716	Frequent	2	Root Rot	UB	SECC
26	F	HSST	8	8	10.7	86	Frequent	2	Regen	UB	YFMS
27	F	HIIM	24	18	9.4	170	Mix	1	PP-WL	GR	YFMS
28	H	HSST	40	32	12	384	Frequent	2	PP-WL	UB	OFMS
29	H	HIIM	6	6	14	84	Frequent	2	PP-WL	UB	YFMS
31	F	HIIM	24	17	14	238	Frequent	2	PP-WL	Mast, UB	YFMS
32	F	HSSW	40	28	10	280	Mix	1	WL	UB	YFMS
33	F	HIIM	25	24	5	120	Frequent	2	PP	GR	UR
37	H	HIIM	47	40	13	520	Frequent	2	PP-WL	UB	OFMS
39	H	HSST	13	13	16.7	217	Frequent	2	Root Rot	UB	OFMS
40	H	HSST	16	11	16.7	184	Frequent	2	Root Rot	UB	OFMS
41	F	HSST	40	40	11.5	460	Frequent	2	Root Rot	GR	YFMS
43	F	HCPH	23	5	10	50	Mix	2	WL	Mast, UB	YFMS
44	F	HCPH	8	2	15	30	Frequent	2	WL	UB	YFMS
45	F	HCPH	34	7	18	126	Frequent	2	WL	UB	YFMS
46	H	HSST	5	5	16.7	84	Frequent	2	Root Rot	UB	OFMS
47	F	HIIM	18	17	5	85	Frequent	2	PP	GR	UR
48	F	HSST	4	4	16.7	67	Frequent	2	Root Rot	UB	OFMS
50	F	HITH	28	26	6	156	Frequent	2	Stocking	GR	SECC
52	F	HCPH	19	4	10	40	Mix	1	PP	Mast, UB	YFMS
54	H	HITH	14	10	6.4	64	Frequent	2	PP	UB	UR
55	F	HITH	18	11	5	55	Frequent	2	PP-WL	GR	YFMS
56	H	HIIM	16	14	2	28	Frequent	2	PP	GR	YFMS
59	H	HIIM	14	7	6.4	45	Frequent	2	PP	UB	UR
60	H	HIIM	36	26	2	52	Frequent	2	PP	UB	YFMS
61	F	HIIM	36	24	15	360	Mix	1	PP-WL	UB	OFMS
62	H	HIIM	17	13	6.4	83	Frequent	2	PP	UB	UR
65	F	HIIM	42	30	15.5	465	Mix	1	PP-WL	UB	OFMS
69	F	HSST	41	40	11.8	478	Frequent	2	Root Rot	GR	YFMS
77	F	HSSW	38	28	15.4	431	Frequent	2	PP-WL	UB	YFMS
78	F	HIIM	30	24	12	288	Frequent	2	Stocking	Mast, UB	YFMS
79	F	HIIM	24	16	12	192	Mix	1	WL	UB	YFMS
80	F	HCPH	26	5	18	90	Frequent	2	PP-WL	UB	YFMS
82	F	HIIM	106	106	2	210	Frequent	3	PP	UB	SEOC
83	F	HIIM	169	169	1.5	250	Frequent	2	PP	UB	SEOC
84	M	PCT	65	65	0	0	Frequent	3	Fuels	GR	SI
86	F	HIIM	31	31	8	250	Frequent	2	WUI, PP	UB	YFMS
87	F	HIIM	77	77	6	462	Mix	2	WUI, WL-DF	UB	YFMS
88		UB	238	200	0	0	Mix	2	WUI, Fuels	UB	NA
90	F	HIIM	65	65	3	195	Frequent	3	WUI, PP	UB	YFMS
91	M	PCT	75	75	0	0	Frequent	3	WUI, Fuels	GR	UR
92	F	HIIM	62	62	2	125	Frequent	2	WUI, WL	Mast, UB	YFMS
93	F	HIIM	49	49	5	245	Mix	2	WUI, PP-WL	UB	YFMS

Unit	Log Sys	Rx	Gross Acres	Net Acres	Vol/Net acre Removed MBF	Unit Volume MBF	Fire Regime	Condition Class	Silv. Objective	Prescribed Fire	Structure
94	F	HIIM	90	90	1	90	Frequent	2	PP	UB	SEOC
95	F	HCPH	43	10	4	40	Frequent	2	WUI, PP	UB	YFMS
96		UB	55	55	0	0	Frequent	2	Fuels	UB	NA
97		UB	258	194	0	0	Frequent	2	Fuels	UB	NA
98	H	HIIM	103	94	7.5	705	Frequent	2	WUI, WL	UB	YFMS
99	F	HIIM	37	37	1	37	Frequent	2	WUI, PP	Mast, UB	YFMS
Total Alternative D			2672	2233		13100					

Alternative E: Fuels Reduction Using Landscape Prescribed Fire and Harvest Pretreatments

This alternative proposes using a combination of landscape prescribed fire and associated commercial and non-commercial tree removal needed to mechanically pretreat areas before reintroducing fire. It involves the commercial harvest, non-commercial thinning, and prescribed burning units identified in Alternative D plus the landscape prescribed fire areas of Alternative B. This alternative treats stands along the Forest Boundary in an area of wildland-urban interface as well as using landscape prescribed fire treatments to restore and maintain ecosystem character of the frequent fire regime. The majority of the acres treated would only use prescribed fire to reduce small diameter ladder fuels. Harvest prescriptions would reduce stocking levels in stands that have missed multiple fire return intervals and/or are overstocked because of an increase in dominance of fire intolerant tree species. With the exception of unit 16 (approximately 19 acres) management activities would occur in the frequent fire regime and the mixed fire regime. Commercial thinning would favor ponderosa pine and western larch, seral species maintained by fire, to reduce the risk to insect and disease. It is necessary to thin western larch because this species does not release once canopies have closed in and they have lost their lower limbs. Without periodic fire to thin them, the stands become stagnant and remain small diameter. In addition to restoring frequent fire character, treatments would target species susceptible to root rots in 9 units that currently have high infestations.

Forest management goals for this alternative would:

- Restore habitat diversity that reflects the disturbance processes found in the frequent and mixed fire regimes. Where early seral species occur, or did occur, they would be restored to either dominance or co-dominance depending on the successional development and fire regime.
- Reduce surface and ladder fuels to increase the success of controlling wildfires along the wildland-urban interface and across the planning area.
- Reduce fuels so that fire can be reintroduced to the landscape and burn with behavior and intensity levels closer to historical conditions.
- Increase stand resilience to insect epidemics and root diseases by reducing stocking levels and/or favoring non host tree species.
- Provide wood fiber consistent with the goals and objectives of the Forest Plan.
- Reduce non-point sediment sources by obliterating roads no longer needed and reduce the risk of sediment transport by using a low ground impact logging system or special project design measures.

Description of Alternative E

Landscape prescribed fire (underburning), reduction of fuels by mastication or grapple piling, and timber harvest would occur on approximately 6,641 acres. Timber harvest is proposed on 1,981 acres and natural fuels underburning on 4,520 acres without harvest pretreatments. A cut to length logging system would be used to harvest 7,005 mbf from 1,378 acres and a helicopter system would harvest 6,095 mbf from 603 acres. Multiple sales are proposed in this alternative. Units numbers for the sales would be assigned at a later time. Harvest would occur on 1,494 acres of frequent fire regime, 468 acres of mixed fire regime, and 19 acres of infrequent fire regime.

Unit 28 would use underburning to reduce surface fuels loads prior to selecting trees for harvest. Prescribed fire would reduce the surface fuels and kill a portion of the merchantable size trees. These trees would be removed under a timber sale contract and others, where needed, to reach the recommended stocking level.

Harvest residues would be treated using a variety of methods to reduce post harvest fuel loads in preparation for understory prescribed fire. Underburning (1,811 acres) would be used in stands where fire can play a role in shaping the species composition and structure by reducing surface and ladder fuels. Approximately 195 acres would have additional non-commercial size trees thinned by mastication prior to underburning. Grapple pile and burn or machine mastication (256 acres) would occur in stands with species that are not fire tolerant or where fire mortality is expected to be high using underburning. Stands would be evaluated after harvest to determine if fuels have been rearranged enough so that prescribed fire is not needed or if jackpot burning or machine mastication would be the best treatment. Jackpot burning uses spot ignitions to

remove only heavier fuel concentrations. Burning would occur in the fall in stands managed for ponderosa pine. Units with high slash loads may receive a spring burn to reduce fuels under cooler and moister conditions to be followed by a fall burn.

Non-commercial thinning is proposed for 140 acres to reduce fuels and separate crowns along the Forest boundary. Non-commercial thinning units would be treated using mechanical mastication to break up surface fuels and thinning slash so organic material can decompose.

Underburning (understory prescribed fire) of natural fuels would occur in stands needing maintenance to keep its short fire return character. Timber harvest is not needed in these stands. Small, non-commercial size trees and the building surface fuels would be removed from these stands by prescribed fire.

Forest Plan Amendments: Same as Alternative B

Summary of Fuel Reduction Methods

Treatment Type	Acres
Total acres underburning	6,245
Underburning with Harvest Pretreatment	1,530
Underburning Natural Fuels	4,520
Harvest, Masticate, and Underburn	195
Harvest, grapple pile and burn or masticate only	256
Non-commercial thinning, mastication	140

Activity components of Prescribed Fire

Same as Alternative B.

Activity Components of Timber Harvest

The same descriptions as Alternative B apply with the following changes.

Logging Systems: 1,378 acres, 7,005 mbf with a cut to length; 603 acres, 6,095 mbf with a helicopter. Total harvest of 1,981 acres and 13,100 mbf.

Slash Treatment: Treatment of activity fuels include: 1,616 acres understory burn; 256 of mastication or grapple pile and burn; and 195 acres of mastication followed by underburning.

Reforestation: Actions include collecting native seeds, scattering native seed, hand planting trees, and fuels reduction by underburning or burning of piles. Tree planting would occur on 410 acres. Native seed would be used to restore helicopter landings and other sites disturbed during construction or harvest actions (approximately 5 acres).

Summary of Harvest Prescriptions Acres by Structural Stage

Prescription	YFMS	OFMS	UR	SECC	SEOC	Total Acres
HCPH	153					153
HIIM	680	125	101		365	1,271
HITH	37		14	28		79
HSST	123	215	33	29		400
HSSW	78					78
Total Acres	1,071	340	148	57	365	1,981

Transportation System and Access Management

This Alternative would have the same road work as described in Alternative B. Road obliteration would also be the same as Alternative B as well as the same changes to the Access and Travel Management Plan.

Unit Summary, Alternative E

Unit	Log Sys	Rx	Gross Acres	Net Acres	Vol/Net acre Removed MBF	Unit Volume MBF	Fire Regime	Condition Class	Silv. Objective	Prescribed Fire	Structure
4	H	HIIM	31	18	18	324	Mix	1	Stocking	UB	YFMS
5	F	HIIM	16	9	3	27	Mix	1	Stocking	GR	UR
6	F	HIIM	11	7	3	21	Mix	1	Stocking	GR	UR
7	F	HSST	33	32	20	640	Mix	1	Regen	UB	UR
8	F	HSST	16	8	12.1	97	Mix	1	Regen	UB	OFMS
9	F	HSST	27	20	5.8	116	Mix	1	Regen	UB	OFMS
14	H	HSST	13	10	26.3	263	Frequent	3	PP-DF	UB	OFMS
15	H	HSST	24	13	18.2	237	Frequent	3	PP-DF	UB	OFMS
16	H	HITH	19	19	20	380	Infrequent	1	Stocking	GR	YFMS
17	H	HIIM	21	17	4.3	73	Frequent	3	PP	UB	YFMS
18	H	HIIM	44	28	4.3	120	Frequent	3	PP	UB	YFMS
19	H	HSST	24	24	24.5	588	Frequent	2	Root Rot	UB	YFMS
20	H	HSST	32	30	14	420	Frequent	3	PP	UB	OFMS
23	H	HSST	25	25	14	350	Frequent	3	PP	UB	OFMS
24	H	HSST	10	10	10.7	107	Frequent	2	Regen	UB	YFMS
25	H	HSST	29	29	24.7	716	Frequent	2	Root Rot	UB	SECC
26	F	HSST	8	8	10.7	86	Frequent	2	Regen	UB	YFMS
27	F	HIIM	24	18	9.4	170	Mix	1	PP-WL	GR	YFMS
28	H	HSST	40	32	12	384	Frequent	2	PP-WL	UB	OFMS
29	H	HIIM	6	6	14	84	Frequent	2	PP-WL	UB	YFMS
31	F	HIIM	24	17	14	238	Frequent	2	PP-WL	Mast, UB	YFMS
32	F	HSSW	40	28	10	280	Mix	1	WL	UB	YFMS
33	F	HIIM	25	24	5	120	Frequent	2	PP	GR	UR
37	H	HIIM	47	40	13	520	Frequent	2	PP-WL	UB	OFMS
39	H	HSST	13	13	16.7	217	Frequent	2	Root Rot	UB	OFMS
40	H	HSST	16	11	16.7	184	Frequent	2	Root Rot	UB	OFMS
41	F	HSST	40	40	11.5	460	Frequent	2	Root Rot	GR	YFMS
43	F	HCPH	23	5	10	50	Mix	2	WL	Mast, UB	YFMS
44	F	HCPH	8	2	15	30	Frequent	2	WL	UB	YFMS
45	F	HCPH	34	7	18	126	Frequent	2	WL	UB	YFMS
46	H	HSST	5	5	16.7	84	Frequent	2	Root Rot	UB	OFMS
47	F	HIIM	18	17	5	85	Frequent	2	PP	GR	UR
48	H	HSST	4	4	16.7	67	Frequent	2	Root Rot	UB	OFMS
50	F	HITH	28	26	6	156	Frequent	2	Stocking	GR	SECC
52	F	HCPH	19	4	10	40	Mix	1	PP	Mast, UB	YFMS
54	H	HITH	14	10	6.4	64	Frequent	2	PP	UB	UR
55	F	HITH	18	11	5	55	Frequent	2	PP-WL	GR	YFMS
56	H	HIIM	16	14	2	28	Frequent	2	PP	GR	YFMS
59	H	HIIM	14	7	6.4	45	Frequent	2	PP	UB	UR
60	H	HIIM	36	26	2	52	Frequent	2	PP	UB	YFMS
61	F	HIIM	36	24	15	360	Mix	1	PP-WL	UB	OFMS
62	H	HIIM	17	13	6.4	83	Frequent	2	PP	UB	UR
65	F	HIIM	42	30	15.5	465	Mix	1	PP-WL	UB	OFMS
69	F	HSST	41	40	11.8	478	Frequent	2	Root Rot	GR	YFMS
77	F	HSSW	38	28	15.4	431	Frequent	2	PP-WL	UB	YFMS
78	F	HIIM	30	24	12	288	Frequent	2	Stocking	Mast, UB	YFMS
79	F	HIIM	24	16	12	192	Mix	1	WL	UB	YFMS
80	F	HCPH	26	5	18	90	Frequent	2	PP-WL	UB	YFMS
82	F	HIIM	106	106	2	210	Frequent	3	PP	UB	SEOC
83	F	HIIM	169	169	1.5	250	Frequent	2	PP	UB	SEOC
84	M	PCT	65	65	0	0	Frequent	3	Fuels	GR	SI
86	F	HIIM	31	31	8	250	Frequent	2	WUI, PP	UB	YFMS
87	F	HIIM	77	77	6	462	Mix	2	WUI, WL-DF	UB	YFMS
88		UB	238	200	0	0	Mix	2	WUI, Fuels	UB	NA
90	F	HIIM	65	65	3	195	Frequent	3	WUI, PP	UB	YFMS
91	M	PCT	75	75	0	0	Frequent	3	WUI, Fuels	GR	UR
92	F	HIIM	62	62	2	125	Frequent	2	WUI, WL	Mast, UB	YFMS
93	F	HIIM	49	49	5	245	Mix	2	WUI, PP-WL	UB	YFMS
94	F	HIIM	90	90	1	90	Frequent	2	PP	UB	SEOC
95	F	HCPH	43	10	4	40	Frequent	2	WUI, PP	UB	YFMS
98	H	HIIM	103	94	7.5	705	Frequent	2	WUI, WL	UB	YFMS
99	F	HIIM	37	37	1	37	Frequent	2	WUI, PP	Mast, UB	YFMS
Total Alternative E			2359	1984		13100					

Specific Management Requirements Common to All Action Alternatives

Fish and Water Quality

- Riparian Habitat Conservation Areas (RHCAs) will be protected as designated in PACFISH. Units are located in the Upper Grande Ronde Watershed. Class I and II streams (fish bearing streams) will have 300 foot buffers and Class III (perennial streams, non fish bearing streams) will have 150 foot buffers. All Class IV streams (seasonally intermittent streams) would have 150 foot buffers, the height of a site potential tree in Moist Forest and 120 foot buffers in Dry Forest. Harvest will occur outside of RHCAs. Forwarding would be conducted away from RHCAs. If a crossing of a Class IV stream is needed, the forwarding would occur over logs positioned to minimize soil disturbance in the draw bottom. Such crossings will occur during dry soil conditions.
- Ephemeral draws, the area above the Class IV streams, that show evidence of a drainage but without stream scour, will retain downed wood to the following standards:
 1. Retain all wood embedded in the soil.
 2. Retain at least 5 pieces of wood greater than 12 inches diameter and greater than 20 feet in length per 1,000 linear feet in draw bottoms.
 3. Retain at least 20 pieces of wood greater than 6 inches diameter and 10 feet in length per 1,000 linear feet in draw bottoms.
 4. Forwarder trails crossing the draw bottoms would be at approved locations.

Wildlife

- Protect identified big game bedding areas from logging and prescribed fire damage. Retain areas of high canopy cover along the Forest Boundary.
- Maintain snags and green replacement/roost trees greater than or equal to 15 inches dbh at 100 percent potential population levels of primary cavity excavators. Snags greater than or equal to 20 inches dbh are preferred with snags down to 15 inches dbh being left when larger snags are not available. Snag Retention: 20 inches and larger, 0.14 per acre; 12 inches and larger, 1.36 per acre; 10 inches and larger, 0.3 per acre; for a total of 2.25 per acre. The largest snags available in the diameter group should be chosen.
- Downed wood should be well scattered in the areas outside ephemeral draws and be at least 16 feet in length, have a minimum diameter of 12 inches at the small end and be left at the rate of 4 to 9 pieces per acre or 100 to 140 linear feet per acre for the Moist Forest and 1 to 3 pieces or 20 to 40 linear feet for the Dry Forest.
- Components of the ecosystem that provide special habitat needs will be retained in the stands:
 1. Defective trees or trees with dead tops will be included as replacement snags.
 2. Endemic levels of dwarf mistletoe can be managed by leaving infected trees surrounded by non-host tree species.
 3. Retain at least one pile of limbs and small material per two acres after slash treatments. Grapple piling can help create piles or leave existing concentrations.

Sensitive Plants

- Two species of *Carex* have been newly listed as sensitive. They are found near water. There will be no ground disturbing activities in any area that has water at least 10 months of the year unless surveys indicate the species are not present. Care needs to be taken where springs are adjacent to roads and where water sources are developed or cleaned.

Unit layout

- Units 17, 18, 20, 23, 28, and 37 transition to grand fir low on the slope where they approach Finley Creek. The lower unit boundary would be placed in the transition from ponderosa pine to grand fir.

General Control of Logging

- Landings will be evaluated and scheduled for subsoiling, if needed. Subsoiling would reduce compaction and break up the bark left behind after log haul
- Schedule harvest activities so that conflicts with grazing do not occur.
- Grand fir and subalpine fir stumps will be treated with borax to reduce the risk of root disease spreading to the remaining trees.
- Helicopter Units 4, 14, 15, and 16 have areas of unstable soils. These soils are located near the breaks in slope. Erosion control measures will avoid concentrating water or moving soils in the unstable areas.
- In HCPH units, down wood will only be removed from within the patch cuts.
- The HRV analysis indicates that large trees cannot be cut from the Dry Forest Biophysical Environment. Leave trees 21 inches or larger in Units 17, 18, 33, 47, 54, 59, and 62.

- Ponderosa pine larger than 21 inches will not be cut.
- There are five cultural sites in harvest units included in Alternative C and D that will be protected by avoidance.
- There are two cultural sites adjacent to roads. Keep equipment from entering or parking on the sites.
- Use of roads: Forest Roads 3738 and 3734 will be used during dry conditions. Greatest concern is in the spring when steelhead are migrating through the system. To prevent sediment from reaching the streams avoid use when water is flowing off the road or when the surface puddles.
- Use of Roads: The surface drainage of Forest Road 3217040 needs protection such that the existing moisture regime along the ridge top is maintained. Maintain the plant communities that have developed in response to the current snowmelt and spring moisture regime.
- All helicopter landings including Fuel and Service landings will be located outside RHCAs.
- It is not possible to know all new helicopter landing sites. If the purchaser requests a site not evaluated during the analysis it will be reviewed by an archeologist prior to construction. Any other resource concerns will be resolved prior to construction.

Protection of Soils:

- Logging systems will be chosen to minimize soil displacement and compaction in consideration with other constraints like Historical Range of Variability. Ground based systems should be able to operate with less than 5 percent detrimental disturbance.
- Forwarder Units 5, 6, 7, 8, 27, 32, 33, 43, 47, 50, 52, 61, 65, 77, 78, 80, 90, and 93 and mastication unit 84 are located on soils with a high risk to puddling. Units 7, 27, 32, 33, 43, 47, 50, 52, 77, 78, 80, 84, 86, 90, and 93 are of major concern because they have had past harvest entries, use existing trail system as much as possible. Ground based equipment will operate when the soil conditions are dry and are not at risk for compaction. Units with higher volume removals could be scheduled earlier because heavy slash mats will help reduce the risk to compaction.
- Forwarder Units 31, 79, 82, 83, 92, and 94 and Helicopter Units 4, 14, 15, 17, 18, 24, 29, 56, and 60 are located on soils with a severe risk to surface erosion. Minimize the amount of exposed soils in these units. Stabilize landing approaches with slash, bark, or native seed. Scatter slash on exposed sections of forwarder routes within 100 feet of the outer boundary of RHCAs.
- Units 41 and 55 have had past tractor harvests and are proposed to have grapple piling. To lower the risk of detrimental compaction, machinery will operate only in dry soil conditions. Helicopter yarding can be an alternative harvest method to forwarders.
- Units 82, 83, and 94 are ridgetop pine/grasslands units. Protect soils by locating routes in timbered areas and crossing the grasslands when dry. Avoid rutting or changing the natural drainage patterns.

Noxious Weed Plan:

The Prevention Strategy listed in the Region 6 Vegetation Management FEIS and Mediated Agreement will be used for the control of noxious weeds. The following measures would be taken in addition to those listed in the Umatilla National Forest Noxious Weed EA, and are a summary of those proposed in the Pedro Colt Noxious Weed Report. The Report is the site specific plan that will be implemented with these projects i.e. timber sales, prescribed fire, road obliteration, subsoiling, and applies to all actions implemented from this environmental analysis.

1. All logging, slash masticating, and road construction equipment will be cleaned prior to moving onto the Forest. The use of on-Forest cleaning sites will be approved in advanced.
2. Skidding, felling, masticating, and road construction equipment needs to be kept clean of noxious weed seed when moving between units. This can be accomplished by various methods such as washing equipment prior to leaving a noxious weed site, moving equipment through a site prior to seed formation, taking alternate routes around infestations or removal of seed heads or plants prior to moving.
3. Vehicles and equipment will not be allowed to park in any known or newly discovered noxious weed site.
4. The noxious weed sites to be controlled in the planning area will be mapped, and a map provided to purchasers and contractors. An identification review of the specific weed(s) may be necessary for the purchasers or contractors to comply with the implementation procedures.
5. To minimize the enlargement of known noxious weed sites, mineral soil should not be exposed adjacent to the site.
6. Ground cover should be maintained wherever possible to prevent new infestations from developing or the expansion of a current site.
7. Where soil is displaced for landings, temporary roads, or road obliteration, reseeded will be done with certified, weed free, non-persistent seed, preferably native grass seed if available. Fertilization should be considered as part of reseeded plans where a combination of seeding and fertilization will decrease the incidence of weeds.
8. Pretreatment of roadside and rock source noxious weed sites should occur prior to logging activity to reduce the spread of noxious weeds.
9. Monitor proposed or temporary roads, landings and other sites of ground disturbance or canopy reduction for new infestations of noxious weeds. Treatment of these newly identified sites would occur as soon as practicable

after a site-specific analysis, and timed to be most effective. Several treatments may need to be scheduled to control the infestation. After the final treatment, a site specific reseeding plan should be developed that will fully occupy the site with desired grass, forb or shrub species to reduce noxious weed reinvasion. Fertilization and burning should be considered as part of the reseeding plan if these measures will decrease the incidence of weeds.

10. Maintain a vigorous herbaceous cover along the edges of roads to reduce the risk of noxious weed infestations. Closed roads should be seeded (as recommended above) over the short term to control current noxious weed infestations or recently treated sites.
11. Where practicable, maintain tree cover along roads. Knapweed is one of the primary, widespread noxious weeds in the planning area. Shading reduces the incidence of new knapweed sites. Tree cover along roads has the additional benefit of screening big game.
12. In areas of high noxious weed infestations, roads may be closed temporarily to reduce enlargement of the site. This will be done with public input if the planned treatments are not effective because of vehicle travel. The road closure would provide time for restoration of vegetative cover without the introduction of new weed seed sources.

Prescribed fire

- Leave larger diameter trees because the initial prescribed fire is expected to be high intensity. Fire intolerant grand fir has a better chance of survival if the older, thick bark trees are left.
- Protect small areas of sapling and pole size regeneration, between 1/4 to 1/2 acres in size, for hiding cover and bedding areas. It is desired to retain one bedding area per 10 acres of burning. The preferred location for the bedding areas is near the break in slopes or near points of a ridge.
- The community of Elgin will need at least 24 hours notice of ignitions of prescribed fire.
- Protect regeneration in Units 31, 43, 52, 78, 92, and 99. The regeneration has desired species composition and would be non-commercial thinned. Before underburning these units, evaluate for jackpot burning so large clumps of regeneration are retained.
- In units or areas with a high risk to surface erosion, maintain a mosaic of duff adequate to reduce erosion derived sediment.
- Ignition will occur outside RHCAs. When burning natural fuels ignitions will stop within 500 feet of perennial streams and 200 of intermittent streams. When burning harvest activity fuels, ignitions are permitted to the outer edge of the RHCA. Prescribed fire would be allowed to back into the RHCA.
- For Protection of nesting migratory birds in the spring burning window: Spring burning of natural fuels would occur before the first week of May. Harvest generated fuels and Condition Class 2 natural fuels can be treated into June however, the total acres burned after the first week of May will be less than 500 acres. When harvest units are being burned it is proposed to include natural fuels adjacent to the unit. This reduces the need for fire lines and allows the area to be treated as a block. When this occurs, the additional natural fuels would be included in the 500 acres. If the burning window occurs late or the slash treatment needs are high it would be possible to exceed the 500-acre limit with the approval of the District wildlife biologist.
- Blackline needed for control of the prescribed fire will be constructed no closer than 500 feet from any perennial stream channel.
- Within RHCAs, mortality of trees: Fire severity in forested RHCAs will be kept within the non-lethal severity for 90 percent or more of the affected RHCA, and no more than 5 percent in a lethal fire severity. Non-lethal severity is defined as: more than 90 percent of the canopy cover or 70 percent of the basal area survives the burn. There will be no ignitions within RHCAs. Lethal (Stand-replacement) severity is less than 20 percent of the basal area or less than 10 percent of the canopy cover of the overstory vegetation remains after the fire.
- There will be no machine built firelines.
- A Landing near the burn units will be used for fueling the helicopter and refilling the PSDM. Fuel for the helicopter will not be stored on site. A fuel truck would be used for the day of the burn. Potential landings sites will be the ones used as service landings during the logging operation, High Ridge Lookout, or rock sources. No landings will be located within RHCAs. No service landings will be located within RHCAs.
- Drafting of Water: See Road Maintenance.
- Burn plans: Weather, fuel moisture, and topography will be monitored to determine when ignitions will occur. Resource protection measures will be captured in the plan and implemented during the burn. The burn would be designed for ease of control within the established burn boundaries. The burn plans have been an effective tool for the protection of resources and reducing the risk of escape.
- **For Jackpot burning and Underburning.**
 1. During firing operations, weather and fuel moisture conditions will limit soil exposure to 20 percent or less of the area.
 2. Time ignitions to reduce the risk of mortality to the large trees.

Road Maintenance and Reconstruction

- There are two cultural sites that need protection adjacent to roads. Do not shift road alignment or drain water onto these sites. Keep equipment from entering or parking on the sites.
- When reconstructing and maintaining Forest Road 3217040 retain the current drainage pattern of the road to support the current microclimates and associated plant communities.
- Culvert replacement with perennial stream flows would occur during the instream-work period between August 15 and October 15.
- Replacement of the culvert on Forest Road 3734 with an arch would occur when the channel is dry and use sediment barriers or other techniques to limit sediment deposits into the channel.
- Maintenance of mid-slope roads crossing RHCAs should incorporate methods that reduce sediment yields into the stream channels. Surface hardening, by dust abatement or rocking, should be used when crossing RHCAs. Draining the road surface prior to entering RHCAs should be used when drainage water can be spread overland and filtered prior to reaching channels. Dips would reduce the length of ditch entering channels within RHCAs.
- Surface rock for open roads and roads used by mountain bikes or ATVs will be of a size to accommodate their use. Include restricted roads used by the ATV system plus the closed roads on Middle Ridge used by mountain bikes.
- Rock sources will be surveyed for noxious weeds. If weeds are found, the site source cannot be used unless seed sources can be isolated and not contaminate loads.
- Drafting of water: When water is needed from fish bearing streams:
 1. Drafting water for road maintenance, dust abatement, or fire applications will follow the guidelines described in Umatilla National Forest Measures to Accommodate Water Drafting Concerns with Regard to Mid Columbia River Steelhead. They are found in Appendix A of the Biological Opinion/ Letter of Concurrence for on going projects in the South Fork Walla Walla River Subbasin dated December 23, 2002 conducted by NOAA Fisheries.
 2. East Phillips Creek will not be available from August 15 to Oct 15 because of low flows.

Road Obliteration

- Steep grades will need waterbars or cross-ditches at about one per 6 feet vertical interval.
- Mulching combined with native seeding will be done at obliterated stream crossings.
- Instream work will occur during the instream-work period between August 15 and Oct 15.
- BMPs will be used inside RHCAs to reduce erosion and sediment transport. Sediment barriers will be used when working around perennial water. Avoid work during precipitation events and wet soil conditions.

Other Area Improvement Projects and Restoration Opportunities

Funding for the following projects are unknown at this time. The projects will occur in the reasonably foreseeable future and the potential effects from implementing these projects have been incorporated into the cumulative effects analysis. Improvement projects with secured funding would be included in the Decision Document for the Preferred Alternative. If funding comes later, a separate NEPA analysis and decision would be prepared.

- **Soil Restoration:** As mitigation to assure that the harvest activity would meet Forest Plan standard and guidelines for maintaining and enhancing soil productivity, subsoiling of old skid trails and landings would occur. Revegetation will be with native seed or certified "weed free" non-native, non-persistent seed. Once harvest and mechanical slash treatment is completed in Units 27, 33, 41, 47, 50, 55, and 94 there is a need to review 226 acres for detrimental soil impacts. Approximately 25 acres may need subsoiling.
- **Phillips Creek Aquatic Habitat Restoration:** This project is located along 1.5 miles of Phillips Creek on lands acquired through a land exchange in the early 1990s and along 1.25 miles of stream in the middle reaches. There is another 0.75 mile in the upper reaches of East Phillips Creek. Past harvest removed shading and simplified the aquatic habitat. Pool frequency is low and hiding cover is lacking. Vegetation recovery is proceeding well. Cottonwood trees are 10 to 20 feet tall. Conifers are regenerating, but are small. Instream wood is lacking. Willows have regenerated along the banks, but they do not provide instream habitat. There is a need to restore hiding, rearing, and pool generating habitat in the stream. It is proposed to place 100 to 160 trees with rootwads into the stream. The majority of the work would be done with a helicopter. The upper reaches of East Phillips Creek has wood close enough to the stream that a horse logger could drag them into the channel. There is perennial water and fish in the upper reaches of East Phillips Creek where the placement would occur. The placement of wood in Phillips Creek would most likely occur in the summer, when the channels are dry or the water is low. Large wood would come from blowdown in the upper elevations of the planning area. The priority sources of blowdown would be: 1. Non-lynx habitat; 2. blowdown crossing the road system; 3. Blowdown along forest edge and grasslands, such as Nine Mile Ridge. A hydrologist or fisheries biologist would direct the placement of the trees. Cultural resource protection will need to be reviewed when selecting trees for placement in the stream channel.

- **Rill and Gully restoration:** Approximately 0.25 mile of repair would occur in two locations. A culvert outfall on Forest Road 3738 in section 20/21, T2N, R38W, approximately 3.2 miles from the junction with Forest Road 31 would be repaired. A velocity deflector would be installed and current rilling repaired and seeded, approximately 200 feet.

The second project occurs on land acquired by the Forest Service in the early 1990's. A drainage got deflected from its natural course and formed gullies down the hill side. The natural drainage pattern would be restored. Where the gully is along an old skid trail, the material along the outer edge would be pulled into the gully and stabilized with native plants. Waterbars would also be placed along the length of the restoration. Approximately 0.25 mile of slope would be repaired and stabilized.

- **Culvert Replacement:** The culvert where FR 3738 crosses Phillips Creek and the culvert on FR 3734 at Little Phillips Creek and Highway 204 have been identified as a fish barrier. These culverts would be replaced with a structure that would allow fish passage.
- **Non-commercial thinning.** Approximately 580 acres of non-commercial thinning is proposed: 385 acres in past harvest units, and 195 acres in proposed harvest units. Thinning would be by mastication where surface fuels need to be reduced along the wildland urban interface or my hand.

Monitoring for Action Alternatives

1. Wildlife Measures:

Were snags and down wood left at the recommended levels after harvest?

2. Fuel Treatment:

- Have fuels been reduced to the level needed to reduce fire intensity within the frequent fire regime? How much 0 to 3 inch fuels remains? How many total tons per acre?
- How effective have been the measures used to reduce the mortality of large diameter ponderosa pine during prescribed fire.
- RHCAs: For fires that backed into RHCAs, monitor fire severity affects based on basal area, large woody debris, and duff consumption. How much fire entered within one site potential tree of the stream by severity and percent blackened.

3. Noxious Weeds:

- Noxious weed sites that have had treatment will be surveyed yearly for spread of noxious weeds to new sites. At the end of five years the monitoring would be adjusted according to the results of the surveys.
- Harvest units would be surveyed the first year after harvest and slash treatment, again the third year and fifth year to determine the presence of noxious weeds and if the post treatment crown closure was effective in reducing the risk to spread of noxious weeds. Any new sites would be treated by manual methods.
- Survey all Forest Roads used for travel for noxious weeds in the first and third years after harvest.

4. Fisheries:

- Were PACFISH RHCAs implemented for harvest units and road construction? Were protective measures taken for installing large wood?
- Survey the reaches of streams before and after the placement of large woody debris to evaluate the improvement of aquatic habitat. Were riparian objectives met for pool frequency and depth, frequency of large woody debris, amount of cover, gravel sorting and spawning gravel area?

5. Cultural Resources:

After prescribed fire, Units 6, 7 and Fire Area D would be reviewed for new sites. Fire Area A would also be reviewed for damage to known sites.

Comparison of Alternatives

Outputs for each alternative

Outputs	Alt A	Alt B	Alt C	Alt D	Alt E
Total Harvest Volume	0	10,013 mbf	10,220 mbf	13,100 mbf	13,100 mbf
Total Unit Acres	0	1,108	1,586	1,981	1,981
Total Harvest Acres	0	814	1,409	1,644	1,644
Acres of Fuel Reduction	0	5,560	2,277	2,672	6,641
Acres of understory burning outside of harvest units	0	4,452	551	551	4,520
Miles of Road Obliteration	0	7.5	7.5	7.5	7.5
Acres Improvement Harvest		355	1,074	1,135	1,135
Acres Thinning		66	21	66	66
Acres Seed Tree		314	276	354	354
Acres Group Selection		23	10	33	33
Acres Shelterwood		56	28	56	56
Acres of noncommercial mastication			140	634 *	140
Total Acres Blackened	0	3,340	1,282	1,603	4,030
Total Net Acres of Noxious Weed Control		157	157	157	157
Noxious Weed Net Acres outside Noxious Weed EA	0	15	15	15	15
Miles of Large Wood Placement		2.5	2.5	2.5	2.5
Fish Barrier Culvert Replacement		3	3	3	3

* 494 acres are also counted for harvest. These are units that would be masticated prior to designating trees for harvest.

Key Issue 1 - Comparison between meeting Wildlife Standards and Guidelines and meeting Forest Health, sustainability and biodiversity.

Indicator of Response	Alt A	Alt B	Alt C	Alt D	Alt E
HEI in C4	84.8	84.1	84.4	84.0	84.0
Percent Satisfactory Cover in C4	26	24	24	23	23
Percent Total Cover in C4	57	57	56	55	55
Percent reduction in Satisfactory Cover, C4	0	0	1	2	2
HEI in E2	72.9	69.9	74.1	75.1	75.1
Percent Satisfactory Cover in E2	38	14	29	28	28
Percent Total Cover in E2	58	51	54	53	53
Percent reduction in Satisfactory Cover, E2	0	7	4	5	5
Acres of Frequent Fire Regime Treated	0	4,174	1,835	1,971	5,061
Percent of Frequent Fire Regime Treated	0	34.6	15.2	16.3	41.9
Acres of Mixed Fire Regime Treated	0	1,345	442	682	1,709
Percent of Frequent Fire Regime Treated	0	16.7	5.5	8.5	21.2
Acres of Open Forest Restored	0	5,250	2,020	2,090	6,540
Miles of Edge Created	0	9.9	14.0	15.4	15.4
Acres early succession	0	900	1,210	1,340	1,340

Key Issue 2 - Harvest as the Method to Accomplish Landscape Resource Objectives

Indicator of Response	Alt A	Alt B	Alt C	Alt D	Alt E
Gross Acres Treated by Harvest	0	1,108	1,586	1,981	1,981
Gross Acres Treated by Underburning	0	5,345	1,980	2,296	6,555
Acres Treated by Mastication	0	215	297	870	870
Acres Treated without Harvest	0	4,452	691	691 to 1,228	4,830
Percent Treatment Acres in Condition Class 2 and 3	0	69	97	89	75
Percent Treatment Acres in Frequent Fire Regime	0	75.4	80.6	73.8	74.6

Key Issue 3 – Access and Travel Management

Indicator of Response	Alt A	Alt B	Alt C	Alt D	Alt E
Miles of Road Obliterated	0	7.5	7.5	7.5	7.5
Miles of New System Road Construction	0	0	0	0	0
Miles of Road Reconstruction and Maintenance	0	31	24	31	31
Miles of Road changed to Trail	0	4.9	4.9	4.9	4.9
Miles changed from Closed Road to Open	0	3	3	3	3