Appendix A. Best Management Practices and Project Design Features

The BLM is responsible for implementing Best Management Practices (BMPs) to provide compliance with the Clean Water Act of 1972, as amended, State of Oregon water quality legislation (Chapter 340), and the O&C Act. For actions implemented consistent with the approved ROD/RMP, the BLM will design and implement BMPs in a manner that is consistent with the Oregon Department of Environmental Quality Memorandum of Understanding (ODEQ and USDI BLM 2011) and with the Clean Water Act.

Project Design Features (PDFs) are an integral part of the Proposed Action. They are developed to avoid or reduce the potential for adverse impacts to resources. PDFs include seasonal restrictions on many activities that help minimize erosion and reduce disturbance to wildlife. PDFs also outline protective buffers for sensitive species and delineate measures for specific areas such as protecting RRs. Where applicable, PDFs reflect BMPs. PDFs are measures incorporated into the site-specific design of the project to eliminate or minimize adverse impacts to the human environment. Specific to different types of activities, these processes would occur prior to project activities.

The BMPs and PDFs are an integral part of the Proposed Action and were developed to avoid or reduce the potential for adverse impacts to resources. The BMPs/PDFs included in this project can be found below:

Best Management Practices:

Roads and Landings

BMP #	Best Management Practice
General Construction	
R 01	Locate temporary and permanent roads and landings on stable locations, e.g., ridge tops, stable benches, or flats, and gentle to-moderate side slopes. Minimize road construction on steep slopes (> 60 %).
R 03	Locate roads and landings away from wetlands, RR, floodplains, and waters of the State, unless there is no practicable alternative. Avoid locating landings in areas that contribute runoff to channels.
R 05	Design roads to the minimum width needed for the intended use.
R 06	Confine pioneer roads (i.e., clearing and grubbing of trees, stumps, and boulders along a route) to the construction limits of the permanent roadway to reduce the amount of area disturbed and avoid deposition in wetlands, RR floodplains, and waters of the State. Install temporary drainage, erosion, and sediment control structures, as needed to prevent sediment delivery to streams. Storm proof or close pioneer roads prior to the onset of the wet season.
R 07	Design road cut and fill slopes with stable angles, to reduce erosion and prevent slope failure.
R 08	End-haul material excavated during construction, renovation, or maintenance where side slopes generally exceed 60% and any slope where side-cast material may enter wetlands, floodplains, and waters of the State.
R 09	Construct road fills to prevent fill failure using inorganic material, compaction, buttressing, sub-surface drainage, rock facing, or other effective means.
R 11	Locate waste disposal areas outside wetlands, RR, floodplains, and unstable areas to minimize risk of sediment delivery to waters of the State. Apply surface erosion control prior to the wet season. Prevent overloading areas, which may become unstable.
R 13	Use temporary sediment control measures (e.g., check dams, silt fencing, bark bags, filter strips, and mulch) to slow runoff and contain sediment from road construction areas. Remove any accumulated sediment and the

	control measures when work or haul is complete. When long-term structural sediment control measures are incorporated into the final erosion control plan, remove any accumulated sediment to retain capacity of the control measure.
Surface Drainage	
R 30	Effectively drain the road surface by using crowning, insloping or outsloping, grade reversals (rolling dips), and waterbars or a combination of these methods. Avoid concentrated discharge onto fill slopes unless the fill slopes are stable and erosion resistant.
R 31	Outslope temporary and permanent low volume roads to provide surface drainage on road gradients up to 6 % unless there is a traffic hazard from the road shape.
R 32	Consider using broad-based drainage dips or lead-off ditches in lieu of cross drains for low volume roads. Locate these surface water drainage measures where they will not drain into wetlands, floodplains, and waters of the State.
R 33	Avoid use of outside road berms unless designed to protect road fills from runoff. If road berms are used, breach to accommodate drainage where fill slopes are stable.
R 34	Construct variable road grades and alignments (e.g., roll the grade and grade breaks) which limit water concentration, velocity, flow distance, and associated stream power.
R 35	Install underdrain structures when roads cross or expose springs, seeps, or wet areas rather than allowing intercepted water to flow down gradient in ditchlines.
R 36	Design roads crossing low-lying areas so that water does not pond on the upslope side of the road. Provide cross drains at short intervals to ensure free drainage.
R 37	Divert road and landing runoff water away from headwalls, slide areas, high landslide hazard locations, or steep erodible fill slopes.
R 38	Design landings to disperse surface water to vegetated stable areas.
Cross Drains	
R 39	Locate cross drains to prevent or minimize runoff and sediment conveyance to waters of the State. Implement sediment reduction techniques such as settling basins, brush filters, sediment fences, and check dams to prevent or minimize sediment conveyance. Locate cross drains to route ditch flow onto vegetated and undisturbed slopes.
R 40	Space cross drain culverts at intervals sufficient to prevent water volume concentration and accelerated ditch erosion. At a minimum, space cross drains at intervals referred to in the BLM Road Design Handbook 9113-1 (USDI BLM2011), Illustration 11, increase frequency through erodible soils, steep grades, and unstable areas.
R 41	Choose cross drain culvert diameter and type according to predicted ditch flow, debris and bedload passage expected from 18”.
R 42	Locate surface water drainage measures (e.g., cross drain culverts, rolling dips and water bars) where water flow will be released on convex slopes or other stable and non-erosive areas that will absorb road drainage and prevent sediment flows from reaching wetlands, floodplains, and waters of the State. Where practicable locate surface water drainage structures above road segments with steeper downhill grade. Locate cross drains at least 50 feet from the nearest stream crossing and allow for a sufficient non-compacted soil and vegetative filter.
R 43	Armor surface drainage structures (e.g., broad based dips and lead-off ditches) to maintain functionality in areas of erosive and low-strength soils.
R 44	Discharge cross drain culverts at ground level on non-erodible material. Install downspout structures or energy dissipaters at cross drain outlets or drivable dips where alternatives to discharging water onto loose material, erodible soils, fills, or steep slopes are not available.
R 45	Cut protruding shotgun culverts at the fill surface or existing ground. Install downspout or energy dissipaters to prevent erosion.
R 46	Skew cross drain culverts 45-60 degrees from the ditchline and provide pipe gradient slightly greater than ditch gradient to reduce erosion at cross drain inlet.

R 47	Provide for unobstructed flow at culvert inlets and within ditchlines during and upon completion of road construction prior to the wet season.
Maintaining Water Quality -Non-native Invasive Plants, including Noxious Weeds	
R 53	Locate equipment-washing sites in areas with no potential for runoff into wetlands, RR, floodplains, and waters of the State. Do not use solvents or detergents to clean equipment on site.
Erosion Control Measures	
R 61	During roadside brushing, remove vegetation by cutting rather than uprooting.
R 64	Place sediment-trapping materials or structures such as straw bales, jute netting, or sediment basins at the base of newly constructed fill or side slopes where sediment could be transported to waters of the State. Keep materials away from culvert inlets or outlets.
R 65	Use biotechnical stabilization and soil bioengineering techniques to control bank erosion (e.g., commercially produced matting and blankets, live plants or cuttings, dead plant material, rock, and other inert structures).
R 66	Suspend ground-disturbing activity if projected forecasted rain will saturate soils to the extent that there is potential for movement of sediment from the road to wetlands, floodplains, and waters of the State. Cover or temporarily stabilize exposed soils during work suspension. Upon completion of ground-disturbing activities, immediately stabilize fill material over stream crossing structures. Measures could include but are not limited to erosion control blankets and mats, soil binders, soil tackifiers, or placement of slash.
Road Maintenance	
R 69	Prior to the wet season, provide effective road surface drainage maintenance. Clear ditch lines in sections where there is lowered capacity or obstructed by dry ravel, sediment wedges, small failures, or fluvial sediment deposition. Remove accumulated sediment and blockages at cross-drain inlets and outlets. Grade natural surface and aggregate roads where the surface is uneven from surface erosion or vehicle rutting. Restore crowning, outsloping or insloping for the road type for effective runoff. Remove or provide outlets through berms on the road shoulder. After ditch cleaning prior to hauling, allow vegetation to re-establish or use sediment entrapment measures (e.g., sediment trapping blankets and silt fences).
R 70	Retain ground cover in ditch lines, except where sediment deposition or obstructions require maintenance.
R 71	Maintain water flow conveyance, sediment filtering and ditch line integrity by limiting ditch line disturbance and groundcover destruction when machine cleaning within 200 feet of road stream crossings.
R 72	Avoid undercutting of cut-slopes when cleaning ditch lines.
R 73	Remove and dispose of slide material when it is obstructing road surface and ditch line drainage. Place material on stable ground outside of wetlands, RR, floodplains, and waters of the State. Seed with native seed and weed-free mulch.
R 74	Do not sidecast loose ditch or surface material where it can enter wetlands, RR, floodplains, and waters of the State.
R 75	Retain low-growing vegetation on cut-and fill slopes.
Road Stormproofing	
R 77	Inspect and maintain culvert inlets and outlets, drainage structures and ditches before and during the wet season to diminish the likelihood of plugged culverts and the possibility of washouts.
R 78	Repair damaged culvert inlets and downspouts to maintain drainage design capacity.
R 79	Blade and shape roads to conserve existing aggregate surface material, retain or restore the original cross section, remove berms and other irregularities that impede effective runoff or cause erosion, and ensure that surface runoff is directed into vegetated, stable areas.
R 80	Stormproof open resource roads receiving infrequent maintenance to reduce road erosion and reduce the risk of washouts by concentrated water flows. Stormproof temporary roads if retained over winter.
R 83	Decommission temporary roads upon completion of use.
R 91	Implement tillage measures, including ripping or subsoiling to an effective depth. Treat compacted areas including the roadbed, landings, construction areas, and spoils sites.
Wet-season Road Use	

R 93	On active haul roads, during the wet season, use durable rock surfacing and sufficient rock depth to resist rutting or development of sediment on road surfaces that drain directly to wetlands, floodplains, and waters of the State.
R 94	Prior to winter hauling activities, implement structural road treatments such as: increasing the frequency of cross drains, installing sediment barriers or catch basins, applying gravel lifts or asphalt road surfacing at stream crossing approaches, and armoring ditch lines.
R 95	Remove snow on surfaced roads in a manner that will protect the road and adjacent resources. Retain a minimum layer (4 inches) of compacted snow on the road surface. Provide drainage through the snowbank at periodic intervals to allow snowmelt to drain off the road surface.
R 96	Avoid removing snow from unsurfaced roads where runoff drains to waters of the State.
R 97	Maintain road surface by applying appropriate gradation of aggregate and suitable particle hardness to protect road surfaces from rutting and erosion under active haul where runoff drains to wetlands, RR, floodplains, and waters of the State.

Timber Harvest Activities

BMP #	Best Management Practice
Cable Yarding	
TH 01	Design yarding corridors crossing streams to limit the number of such corridors, using narrow widths, and using the most perpendicular orientation to the stream feasible. Minimize yarding corridor widths and space corridors as far apart as is practicable given physical and operational limitations, through practices such as setting limitations on corridor width, corridor spacing, or the amount of corridors in an area. For example, such practices could include, as effective and practicable: setting yarding corridors at 12±15-foot maximum widths, and -setting corridor spacing where they cross the streams to no less than 100 feet apart when physical, topography, or operational constraints demand, with an overall desire to keep an average spacing of 200 feet apart.
TH 02	Directionally fall trees to lead for skidding and skyline yarding to minimize ground disturbance when moving logs to skid trails and skyline corridors.
TH 03	Require full suspension overflowing streams, non-flowing streams with highly erodible bed and banks, and jurisdictional wetlands.
TH 04	When logging downhill into RR, design the logging system to prevent converging yarding trails from intersecting the stream network.
TH 05	Prevent stream banks and hillslope disturbance on steep slopes (generally > 60 %) by requiring full-suspension within 50 feet of definable stream channels. Yard the remaining areas across the RR using at least one-end suspension.
TH 06	Implement erosion control measures such as waterbars, slash placement, and seeding in cable yarding corridors where the potential for erosion and delivery to waterbodies, floodplains, and wetlands exists.
Ground-based Harvesting	
TH 08	Limit designated skid trails for thinning or regeneration harvesting to ≤ 15 % of the harvest unit area to reduce displacement or compaction to acceptable limits.
TH 09	Limit width of skid roads to single width or what is operationally necessary for the approved equipment. Where multiple machines are used, provide a minimum-sized pullout for passing.
TH 10	Ensure leading end of logs is suspended when skidding.
TH 12	Incorporate existing skid trails and landings as a priority over creating new trails and landings where feasible, into a designated trail network for ground-based harvesting equipment, consider proper spacing, skid trail direction and location relative to terrain and stream channel features.
TH 13	Limit non-specialized skidders or tracked equipment to slopes less than 35 %, except when using previously constructed trails or accessing isolated ground-based harvest areas requiring short trails over steeper pitches. Also, limit the use of this equipment when surface displacement creates trenches, depressions, excessive removal of organic horizons, or when disturbance would channel water and sediment as overland flow.

TH 14	Limit the use of specialized ground-based mechanized equipment (those machines specifically designed to operate on slopes greater than 35 %) to slopes less than 50 %, except when using previously constructed trails or accessing isolated ground-based harvesting areas requiring short trails over steeper pitches. Also, limit the use of this equipment when surface displacement creates trenches, depressions, excessive removal of organic horizons, or when disturbance would channel water and sediment as overland flow.
TH 15	Designate skid trails in locations that channel water from the trail surface away from waterbodies, floodplains, and wetlands, or unstable areas adjacent to them.
TH 16	Apply erosion control measures to skid trails and other disturbed areas with potential for erosion and subsequent sediment delivery to waterbodies, floodplains, or wetlands. These practices may include seeding, mulching, water barring, tillage, and woody debris placement. Use guidelines from the road decommissioning section.
TH 17	Construct waterbars on skid trails using guidelines, where potential for soil erosion or delivery to waterbodies, floodplains, or wetlands exists.
TH 18	Subsoil skid trails, landings, or temporary roads where needed to achieve no more than 20 % detrimental soil conditions, and minimize surface runoff, improve soil structure, and water movement through the roadbed.
TH 19	Block skid trails to prevent public motorized vehicle and other unauthorized use at the end of seasonal use.
TH 20	Allow harvesting operations (cutting and transporting logs) when ground is frozen or adequate snow cover exists to prevent soil compaction and displacement.
TH 21	Minimize the area where more than half of the depth of the organically-enriched upper horizon (topsoil) is removed when conducting forest management operations.
TH 22	Maintain at least the minimum % of effective ground cover needed to control surface erosion, table A-1 following forest management operations. Ground cover may be provided by vegetation, slash, duff, medium to large gravels, cobbles, or biological crusts.

Table A-1. Soil cover based on erosion hazard ratings (Table C-3 from ROD/RMP)

NRCS Erosion Hazard Rate*	Minimum Percent Effective Ground Cover – Year 1	Minimum Percent Effective Ground Cover – Year 2
Very Severe	60%	75%
Severe	45%	60%
Moderate	30%	40%
Slight	20%	30%

*Rating obtained from Natural Resources Conservation Services County Soil Survey information by map unit.

Fire and Fuels Management

BMP #	Best Management Practices
Pile and Burn	
F 02	Reduce fuel loads by whole tree yarding, and piling material, as necessary, prior to burning in dry forest types where fuel loads are elevated.
F 07	Avoid burning piles within 35 feet of a stream channel.
F 08	Avoid creating piles greater than 16 feet in height or diameter. Pile smaller diameter materials and leave pieces >12 inches diameter within the unit. Reduce burn time and smoldering of piles by extinguishment with water and tool use.
F 09	When burning machine-constructed piles, preferably locate and consume organic materials on landings or roads. If piles are within harvested units and more than 15 % of the burned area mineral soil (the portion beneath the pile) surface changes to a reddish color, then consider that amount of area towards the 20 % detrimental soil disturbance limit.
F 10	Do not operate ground-based machinery for fuels reduction within 50 feet of streams (slope distance), except where machinery is on improved roads, designated stream crossings, or where equipment entry into the 50-foot zone would not increase the potential for sediment delivery into the stream. Do not operate ground-based

BMP #	Best Management Practices
	machinery for fuels reduction on slopes > 35 %. Mechanical equipment with tracks may be used on short pitch slopes of greater than 35 % but less than 45 % when necessary to access benches of lower gradient (length determined on a site-specific basis, generally less than 50 feet (slope distance)).
F 11	Use temporary stream crossings if necessary to access the opposite side with any equipment or vehicles (including OHVs). Follow Temporary Stream Crossing practices under Roads section.
F 12	Place residual slash on severely burned areas, where there is potential for sediment delivery into waterbodies, floodplains, and wetlands.

Table A-2. Water bar spacing by gradient and erosion class (ROD/RMP, p. 191)

Gradient (%)	High (Feet)	Moderate (Feet)	Low (Feet)
2-5%	200	300	400
6-10%	150	200	300
11-15%	100	150	200
16-20%	75	100	150
21-35%	50	75	100
36+%	50	50	50

Specific to Dry Forest

BMP #	Best Management Practices	Unit(s)
Roads and Landings: General Construction, Maintenance, Timber Harvest: Cable Yarding		
DF 01	Use full log suspension whenever practicable on TPCC soils identified as prone to surface erosion, category FM in Table 4. Use one-end suspension on these soils if full suspension is not practicable. Restrict yarding to the dry season, generally from June to end of September. Suspend the leading end over TPCC soils identified as prone to mass movement, category FP in Table 4. Restrict yarding to the dry season.	01-2

Project Design Features:

Harvest Operation

PDF #	Project Design Features
PDF 1	To caution forest road users of potential hauling and operational activities, warning signs would be placed where appropriate to satisfy Oregon Safety and Health Administration (OSHA) standards. The proper use and maintenance of the signs will be monitored using Oregon OSHA regulations.

Botanical

PDF #	Project Design Features
Preventing the Introduction and Spread of Non-native Invasive Plants	
PDF 2	Prior to initial move-in of any equipment, and all subsequent move-ins, the operator would make the equipment available for BLM inspection at an agreed upon location off federally administered lands. Only equipment inspected by the BLM would be allowed to operate within BLM-administered lands.
PDF 3	Equipment and vehicles that leave established road surfaces will be cleaned of soil, seeds, vegetative matter, and other debris that could contain noxious weed seeds prior to entering BLM administered lands. If work occurs in an area known to contain priority noxious weeds, equipment shall be cleaned before moving to another project area. Areas appropriate for cleaning equipment prior to leaving the project area will be designated as appropriate. Cleaning may be accomplished by using a pressure hose.
PDF 4	Ensure that there will be no parking of vehicles or mechanical equipment where high priority noxious weed infestations are known to occur that have not been effectively treated prior to disturbance. Equipment, vehicles,

PDF #	Project Design Features
	and personnel will avoid working within flagged noxious weed sites. Orange flagging labeled in black with "INVASIVE SPECIES" will be used to delineate avoidance boundaries.
PDF 5	If potential landing sites are infested with noxious weeds, a botanist will be consulted for appropriate containment methods prior to use of the landing. Methods may include blading infested soil away from activity zone and covering this soil or adding a barrier to the landing so seed banks cannot be transported.
PDF 6	Native seed and certified weed-free straw, prescribed by the project botanist, would be used for post-treatment restoration where project activities such as decommissioning and other such activities result in bare soil. Ensure hay, straw, and mulch are certified as free of prohibited noxious vegetative parts or seeds, per 75 FR 159:51102. Straw or hay must be obtained from the BLM or purchased from growers certified by the Oregon Department of Agriculture's Weed Free Forage and Mulch Program.
PDF 7	All material, including rock and gravel, utilized in the building, reconstruction, or maintenance of roads (temp, permanent, etc.) must be free of noxious weed seeds and originate from an accredited weed free quarry approved by the project botanist.
Threatened, Endangered & Bureau Sensitive species	
PDF 9	No project activities will occur within areas flagged with yellow and black striped flagging to protect threatened, endangered, candidate, and sensitive botanical species. Populations of threatened, endangered, candidate, and sensitive botanical species populations will be buffered and flagged for avoidance.
PDF 10	Trees would be directionally felled away from all no disturbance buffers.
PDF 11	In the event any threatened, endangered, or sensitive botanical species are discovered before or during the various phases of the project, the area will be flagged and avoided until a Bureau botanist can be consulted and appropriate protection measures can be put in place.
Prescribed Fire	
PDF 12	Pile material at least 25 feet away from plant sites.
PDF 13	Rehabilitate pile burn scars with native seed and mulch when adjacent to listed plant sites or in critical habitat.

Cultural Resources

PDF #	Project Design Features
Newly Identified Sites through Surveys	
PDF 14	If, during project implementation, the contractor encounters or becomes aware of any cultural sites or objects on federal lands, immediately suspend all operations in the vicinity and notify the Contracting Officer or Contract Officer Representative so the site can be evaluated by a BLM Archaeologist. Cultural sites or objects would include historic or prehistoric ruins, graves, grave markers, fossils, and prehistoric and historic artifacts.
Inadvertent Discoveries	
PDF 15	If previously unidentified cultural resources are discovered during project implementation, work will be halted in the immediate vicinity of the find, and the resource area archaeologist will determine the appropriate course of action which may include: evaluation of the resource for NRHP eligibility (if not eligible, work may proceed); project redesign to avoid impacts; and/or development of mitigation measures in consultation with the SHPO and Native American tribes.

Terrestrial Wildlife Species

PDF #	Project Design Features
Snags and Coarse Woody Debris	
PDF 16	Maintain existing snags (>20" DBH; snags 6-20" DBH in decay classes III, IV,V) except those that need to be felled for safety reasons or fuels reduction reasons or for logging systems (e.g., skyline corridors) to minimize impacts to cavity-dependent species. Snags felled for these reasons would be left on site unless they would also pose a safety hazard as coarse woody debris (CWD) in the unit.

PDF #	Project Design Features
PDF 17	Retain existing large coarse woody debris in the stands. (>20" diameter at the large end and >20' length, and 6-20" diameter at the large end and >20' length in decay classes III, IV, V). Retained CWD would be protected from disturbance to the greatest extent possible during harvest operations, burning and other project activities.
PDF 18	Locate skid trails to minimize disturbance to coarse woody debris. Where skid trails encounter large coarse woody debris, a section would be bucked out for equipment access. The remainder would be left in place and would not be disturbed. Snags and down wood in landings would be moved adjacent to the landing.
Northern Spotted Owls	
PDF 19	NSO surveys will continue according to protocol. If NSO are located during remaining surveys before the time of on the ground implementation, the project would be dropped or modified to reduce potential adverse effects that could lead to incidental take determination. No nest trees would be removed (BA p. 40). If NSO are found, mandatory USFWS Restriction Distances to Avoid Disturbance to nesting or presumed nesting NSO sites would apply to project activities (BA p. 143; Table A-1).
PDF 20	The USFWS could waive in a particular year if nesting or reproductive success surveys conducted according to the USFWS survey guidelines reveal that NSOs are non-nesting or that no young are present that year. Waivers are valid only until January 31st of the following year. Previously known well-established sites/activity centers are assumed occupied unless protocol surveys indicate otherwise (See the following five PDFs below).
PDF 21	No treatments would or yarding occur within any occupied NSO nest patch.
PDF 22	Follow USFWS recommended noise disturbance distances for activities to avoid disturbance to NSO (Table A-3).
PDF 23	Activities (such as tree felling, yarding, temporary route construction and re-construction, hauling on roads not generally used by the public, prescribed fire, and muffled blasting) that produce loud noises above ambient levels would not occur within specified distances (Table A-3) of any documented NSO site between March 1 and June 30 (or until two weeks after the fledging period, typically up to August 31) – unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. The distances may be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the work location and nest sites.
PDF 24	The action agency has the option to extend the restricted season until September 30 during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt) if the project would cause a nesting NSO to flush for disturbance distance.
PDF 25	The buffer distance to the prescribed area may be modified by the action agency biologist using topographic features or other site-specific information. Buffer distance for prescribed fire may be reduced if substantial smoke from prescribed fire would not enter the nest stand March 1 - June 30. The restricted area is calculated as a radius from the assumed nest site (tree).

Table A-3. Mandatory USFWS Restriction Distances to Avoid Disturbance to NSO Sites

Activity	Buffer Distance Around Owl Site
Heavy Equipment (including non-blasting quarry operations)	195 feet
Chainsaws	195 feet
Commercial Timber Harvest	195 feet up to 0.25 miles
Prescribed fire/Activity fuels burning	0.25 miles

* if below 1,500 feet above ground level

Water Quality, Soil Productivity, and Off-site Erosion

PDF #	Project Design Features
Prevention and Containment of Hazardous Material Spills	

PDF #	Project Design Features
PDF 26	The Purchaser would be required to be in compliance with OAR 629-605-0130 of the Forest Practices Act. Notification, removal, transport, and disposal of oil, hazardous substances, and hazardous wastes would be accomplished in accordance with OAR 340-142 (OARD, 2018), and the operator will have a Spill Prevention, Control, and Countermeasure Plan (SPCC) in place.
PDF 27	The Purchaser shall not refuel equipment, store, or cause to have stored any fuel or other petroleum products within 150 feet of streams, springs, or wetlands. All petroleum products shall be stored in durable containers and located so that any accidental releases will be contained and not drain into any stream system. Hydraulic fluid and fuel lines on heavy mechanized equipment would be proper working condition in order to minimize the potential for leakage into streams. Absorbent materials shall be onsite to allow for immediate containment of any accidental spills. Spilled fuel or oil and any contaminated soil shall be cleaned up and disposed of at an approved disposal site, according to the SPCC.
Ground-based Harvest Operations	
PDF 28	When using conventional ground-based yarding systems, whole tree yarding with tops attached is the preferred harvest method as long as the contractor can operate without causing bark slippage, girdling, broken tops, or damage to live crowns. If it is determined by the Authorized Officer that an unacceptable amount of damage is occurring, tree bucking and limbing would be required as directed by the Authorized Officer. Delivered log length would not exceed 41 feet. Equipment use may be restricted depending on soil type, soil moisture, ground pressure of the equipment, and presences of slash to operate on.
PDF 29	When ground-based yarding equipment is used off of designated skid trails, it shall walk on a mat of existing or created slash when practical.
PDF 30	Restrict ground-based yarding and soil ripping operations from October 15th to May 15th, or when soil moisture exceeds 25%. Restrict non-road, in-unit, ground-based equipment used for harvesting operations in areas with hydric soils. High soil moisture varies by texture and is based on site-specific considerations. Waivers to this restriction would not be approved when soil moisture at a depth of 4-6 inches is wet enough to maintain form when compressed (typically 15-25% soil moisture), or when soil at the surface would readily displace, causing ribbons and ruts along equipment tracks
PDF 31	Hauling on natural surface or rocked roads with insufficient rock depth, that received a ½ inch or more precipitation within a 24-hour period, would not resume for a minimum of 48 hours following any storm event, or until road surface is sufficiently dry, and as approved by the Authorized Officer.
PDF 32	Haul would not occur on hydrologically connected natural surface or rocked roads (34-6-2.0) when water is flowing in the ditchlines due to precipitation or during any conditions that would result in any of the following: surface displacement such as rutting or ribbons, continuous mud splash or tire slide, fines being pumped through road surfacing from the subgrade, resulting in a layer of surface sludge.
PDF 33	Apply water or approved road surface stabilizers/dust control additives to reduce surfacing material loss and buildup of fine sediment that can enter wetlands, floodplains and waters of the State at Coho Critical Habitat crossings. Apply water or approved road surface stabilizers/dust control additives to haul routes through residential areas as needed. Prevent entry of road surface stabilizers/dust control additives into waters of the State during application. For dust abatement, limit applications of lignin sulfonate to a maximum rate of 0.5 gal/yd^2 of road surface, assuming a 50:50 (lignin sulfonate to water) solution.
PDF 34	Limit road, temporary route, and landing construction, reconstruction, renovation and decommissioning activities to dry conditions. Keep erosion control measures concurrent with ground disturbance to allow immediate storm proofing.
PDF 35	Sediment reduction techniques would be implemented to reduce sedimentation into streams containing Bureau Sensitive Species. Sediment reduction techniques include settling basins, brush filters, sediment fences and/or check dams to prevent or minimize sediment conveyance to streams. Specifically, these sediment barriers would be installed at perennial stream crossings on BLM roads important for CCH habitat. Refer to Table A-4 for applicable roads.

PDF #	Project Design Features
PDF 36	On all units with fuel maintenance and where underburning may occur, do not have ignition points within a minimum 25 feet from bank full width of intermittent streams and 60 feet for perennial streams to protect streambank stability and riparian vegetation (RMP, pp. 82-83)
Storm Proofing	
PDF 37	Storm proofing temporary routes and landings would be done by properly installing water bars and/or applying slash or mulch. After all treatment activities are compete (e.g., harvest and activity fuels treatments), more than 50% of the surface area of all temporary routes and landings would be covered by slash or mulch.

Tree Retention Preference

PDF #	Project Design Features
PDF 38	Reserve Pacific yew and preferred hardwoods, where operationally feasible, to contribute to monitoring desired stand conditions (Pacific yew, Western red cedar, ponderosa pine, sugar pine, incense cedar, Douglas-fir, Western hemlock, and true fir).

Residual Stand Damage

PDF #	Project Design Features
PDF 39	The Authorized Officer may require logs to be bucked to a specified length to minimize or avoid residual stand damage.

Riparian Reserves

PDF #	Project Design Features
PDF 40	RR distances are one site potential tree (200 feet for Grave Creek) of fish bearing streams, and perennial and intermittent streams. Extend the RR to include stable areas between such an unstable area where there is potential for the failure to reach the stream (2016 ROD/RMP, pp. 75-77). The project area is in the dry zone west of highway 97, and therefore, stands thinned in the Outer and Middle Riparian Zones may be made available for sale (RMP, pp. 82-84).
PDF 41	On all units, commercial extraction would not occur within the Inner Riparian Zone buffer which is a minimum of 50 feet from bankfull width on all intermittent streams and 120 feet from bankfull width on all fish-bearing and perennial streams (RMP, pp. 82-83).
PDF 42	In the Inner Riparian Zone, where trees are cut for yarding corridors, skid trails, road construction, maintenance, and improvement, retain cut trees in adjacent stands as down woody material or move cut trees for placement in streams for fish habitat restoration, at the discretion of the BLM (RMP, pp. 75-76).
PDF 43	Slumps, intermittent seeps, irrigation ditches, wetlands, ponds and other features would be buffered (no treatment) by leaving one row of overstory trees or a 25-foot diameter buffer (whichever is greatest), from the outer edge of instability, around these areas for soil stabilization (RMP, p. 77).
PDF 44	During silvicultural treatment of stands in the RR, retain existing snags ≥ 6” DBH and existing down woody material ≥ 6” in diameter at the large end and >20 feet in length, except for safety, operational, or fuel reduction reasons. Retain cut snags as down woody material unless they would pose a safety hazard as down woody material (ROD/RMP, pp. 76).
PDF 46	Do not conduct fuels treatments within 60 feet of fish-bearing or perennial streams (RMP, p. 82).

Activity Slash and Prescribed Fire

PDF #	Project Design Features
Reduce Impacts to Resources	

PDF #	Project Design Features
PDF 47	Merchantable sawlogs (including pole decks) would be removed from yarded material and may be hauled off site for processing. Debris at the landing sites would be burned, chipped, or otherwise removed from these sites within 24 months of unit harvest completion.
PDF 48	Hand piles would not be allowed on roadways, turnouts, shoulders, or on the cut bank unless authorized by the Authorized Officer.
PDF 49	The Authorized Officer will determine the location of pole/hardwood decks.
PDF 50	Activity slash remaining in units could be lopped-and-scattered, chipped, machine piled, or hand piled and burned to prevent an increase in fire hazard.
PDF 51	Activity slash within 20 feet of each finished landing pile will be added to the pile. Construct a fireline approximately 18 inches wide and down to mineral soil within 20 feet of each finished landing pile to prevent escaped fire. Each landing pile would be covered with a large enough piece of 4 mil polyethylene sheeting to ensure a dry ignition spot (generally 10 feet x 10 feet or large enough to cover 80 % of the pile).
PDF 52	Landing piles would not be placed adjacent to or within 15 feet of leave trees to minimize scorch and mortality. Landing piles would be as free of dirt as reasonably possible to facilitate desired consumption.
PDF 53	Landing and hand piles would be burned in the fall to spring season after 1 or more inches of precipitation has occurred. Patrol and mop-up of burning piles would occur when needed to prevent treated areas from re-burning or becoming an escaped fire.
PDF 54	Prescribed fire burn plans would be completed before ignition, as would smoke clearance to minimize impacts on air quality.
PDF 55	Each hand pile would be covered with a large enough piece of 4 mil polyethylene sheeting to ensure a dry ignition spot (generally 5 feet x 5 feet or large enough to cover 80 % of the pile). Hand piles would not be placed adjacent to or within 10 feet of leave trees or large woody debris to minimize scorch and mortality. Local residents would be advised of prescribed burning through news releases.
PDF 56	Prescribed burning would occur under atmospheric conditions that allow for the mixing of air to lessen the impact on air quality. All prescribed burning would be administered in a manner consistent with the requirements of the Oregon Smoke Management Plan administered by the ODF and the regulations established by the Air Quality Division of the Oregon Department of Environmental Quality.
PDF 57	Burning of slash piles would occur after a sufficient period of curing (generally over a year) and adequate seasonal moisture to ensure desired consumption of material and to minimize the risk of fire escape. Smoke clearance(s) would be obtained prior to ignition to minimize impacts on air quality.

Table A-4: Proposed Haul Routes Seasonal or Special Conditions

Units or Haul Routes	Surface Type	Wet Condition Haul Info
33-5-30.02 Miller Mobile	Aggregate	Rock Needed For Wet Condition Haul
33-5-31.01 Miller Gulch South Sp	Aggregate	Rock Needed For Wet Condition Haul
33-5-31.03 Miller Benjamin Rd	Aggregate	Rock Needed For Wet Condition Haul
33-5-32.00A Miller Gulch X Sp	Aggregate	Rock Needed For Wet Condition Haul
33-5-32.02A Miller Time	Natural	Dry Only - No Wet Condition Hauling
33-6-24.00A-B2 Miller Gulch	Aggregate	Good for Wet Condition Haul - No Rock Needed
34-6-01.00 Salmon Creek Spur	Aggregate	Rock Needed For Wet Condition Haul
34-6-01.01 Aiko Aiko Road	Aggregate	Rock Needed For Wet Condition Haul
34-6-01.02 Salmon School Road	Natural	Rock Needed For Wet Condition Haul
34-6-02.00A-D Salmon Creek	Aggregate	Rock Needed For Wet Condition Haul
Un-numbered Section 1 Road	Natural	Rock Needed For Wet Condition Haul
TR 1-02A	Natural	Dry Only - No Wet Condition Hauling

Units or Haul Routes	Surface Type	Wet Condition Haul Info
TR 1-02B	Natural	Dry Only - No Wet Condition Hauling
TR 32-1HA	Natural	Dry Only - No Wet Condition Hauling
TR 32-1HB	Natural	Dry Only - No Wet Condition Hauling

Table A-5: Critical Habitat Crossings within the Salmon Creek Thin Project Area

Structure #	Road #	Creek	HUC 10	Road Surface
1	33-6-24.0	Coyote Creek	Grave Creek	Rocked