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These practices are part of the proposed action. They were developed to minimize effects to resources but do not necessarily eliminate all impact. The PDCs in blue text are specifically designed to protect listed fish.

A. General Criteria

A1. Projects must be consistent with the Standards and Guidelines found in the Mt. Hood National Forest Land and Resource Management Plan (Forest Plan), the Northwest Forest Plan (NWFP) and consistent with practices outlined in the National Best Management Practices for Water Quality Management on National Forest System Lands for the protection of water quality.

A2. All management actions in riparian reserves would be developed in conjunction with a fisheries biologist to achieve Aquatic Conservation Strategy Objectives (ACSO).

A3. Spill Prevention - An approved Spill Prevention Control and Containment Plan (SPCCP) would be created, as required by contract provisions G.3.4.1/BT6.341, which describe measures to prevent or reduce impacts from potential spills. The SPCCP would include a description of the hazardous materials that would be used; and a spill containment kit would be located on-site. All trucks used for refueling would carry a hazardous material recovery kit. All vehicles and machinery would be free of petroleum leaks. Any leaks that occur would be immediately repaired. Power equipment would be refueled at least 150 feet from water bodies to prevent direct delivery of contaminants into a water body. If local site conditions do not allow for a 150-foot setback, then refueling would be as far away as possible from the water body; defined in the NWFP as portions of a watershed directly coupled to streams and rivers, that is, the portions of a watershed required for maintaining hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing waterbodies such as lakes and ponds, wetlands, streams, stream processes, and fish habitats. For all immobile equipment, absorbent pads would be used. All petroleum products being transported or stored would be in approved containers meeting Occupational Safety and Health Administration and Oregon Department of Transportation standards. The Contracting Officer

would be notified of any spills. Any contaminated soil, vegetation or debris must be removed from National Forest System lands and disposed of in accordance with state laws.

A4. Ground-based mechanized equipment, such as skidders, dozers, and feller-bunchers, operation will not be allowed outside the Normal Operating (Dry) Season (generally June 1 – October 15) within Riparian Reserves unless approved through the existing waiver process by a soils, hydrology, and/or fisheries specialist.

A5. Predicted changes in peak or base stream flows due to the implementation of this action must be minimal or immeasurable, based on hydrologic analysis. The Mt. Hood National Forest currently evaluates watershed impacts at a drainage (14 digit HUC) scale (i.e. typically 3,000 to 6,000 acres), to ensure timber harvest does not alter peak flows enough to increase bed or bank erosion or otherwise delay hydrologic recovery. Analysis of the Aggregate Recovery Percentage (ARP) is one of the methods used to determine the magnitude and duration of potential impacts.

A6. Erosion control measures would be implemented to prevent off-site movement of disturbed or exposed soil associated with road and landing construction, use and decommissioning/closure, (including cut-banks, fills, ditches, etc.) on road segments that have the potential to directly or indirectly deliver sediment to any stream channel. Erosion control measures include silt fences, wattles, straw bales, matting, mulch, slash, water bars, ditch check dams, grass seed, or other products. Existing vegetation in ditch lines hydrologically connected to streams (as defined in NWFP) must not be removed unless a biodegradable sediment control feature such as check dams constructed of bio-bags, straw bales, or other materials are installed. Sediment control features will be maintained in working order during the sale and left in place when the sale is released.

A7. All instream work will be completed during the Oregon Department of Fish and Wildlife (ODFW) instream work window. Exceptions to the ODFW in-water work windows must be requested by the Forest, and subsequently approved by ODFW, as well as National Marine Fisheries Service and/or U.S Fish and Wildlife Service, as applicable.

A8. Bare soils would be covered by slash or other vegetative material or seeded and mulched. The coverage of effective ground cover would be sufficient to prevent off-site movement of soils as guided by Forest Plan standard and guideline FW-025 and by Forest Service Handbook 2509 (R6 supplement). For restoration, revegetation, or erosion control on disturbed ground, use only locally adapted native plant materials i.e., seed, cuttings, divisions, corms, bulbs, and/or transplants that have been collected from the Mt. Hood National Forest. If for some reason, native plant materials from the Forest are not available, materials from the west side of the Gifford Pinchot National Forest or the north side of the Willamette National Forest can substitute. The following would not be appropriate to use: materials from outside this sub-region, non-native plants, invasive plants, orchard grass (*Dactylis glomerata*), annual ryegrass (*Lolium multiflorum*; also known as *L. perenne* ssp. *multiflorum*) or the cultivar Madsen sterile wheat (*Triticum aestivum*). Locally collected native blue wildrye (*Elymus glaucus*) and California brome (*Bromus carinatus*) are appropriate grasses to use as are locally collected native forbs (particularly broadleaf lupine [*Lupinus latifolius*], Canada goldenrod [*Solidago elongata*], pearly everlasting [*Anaphalis margaritacea*], and wild yarrow [*Achillea millefolium*]).

A9. Erosion-control measures would be implemented to prevent off-site movement of disturbed soils from logging, and other related actions. Areas of soil displacement on steep slopes resulting from yarding

systems would be treated to prevent rill and gully erosion and possible sediment delivery to stream courses. Where appropriate, erosion control treatment on bare soils may include water bar placement, hillslope contouring, creating small ditches or diversions to redirect surface water movement, scattering slash on disturbed soils, placement of mulch, and application of approved seed. Mulch may be used on slopes greater than 20%. Effective ground cover would be installed prior to shutting down for an extended period (e.g., two weeks or more). When operations occur when it is likely to soon become too wet to operate, erosion-control work would stay current and ground cover would be installed as soon as practicable. The coverage of effective ground cover would be sufficient to prevent off-site movement of soils as guided by Forest Plan standard and guideline FW-025 and by Forest Service Handbook 2509 (R6 supplement). These are standard contract provisions.

A10. Projects would utilize the concept of adaptive management. Proposed actions are identified that are considered appropriate at the time but sometimes situations change that warrant adjustment of the action. For example, when dealing with road closures, unauthorized Off-Highway Vehicle use or unauthorized target shooting, situations can change rapidly between planning and implementation and adaptive management is appropriate to make sure the desired outcome is actually achieved. The exact treatment details may be adjusted at the time of implementation, or conceivably after implantation if it becomes clear that more work is needed. Revised actions would be tailored to changing site-specific conditions with the objective of achieving desired outcomes.

Before final actions are taken that may differ somewhat from the actions described or mapped, an interdisciplinary team would be assembled to review projects to ensure their effectiveness. The District Ranger would approve projects and certify that the anticipated effects and benefits fall generally within the range of effects and benefits described in the relevant NEPA document.

A11. Where firewood-size material remains at landings after operations, firewood would be made available to the public where feasible. Certain units or portions of units may be made available for the removal of green biomass and firewood as part of the prescription. A mix of commercial and personal use removal may occur where feasible.

A12. Contracts would contain provisions for the protection of heritage resource sites whether known at this point or found during project activities. In the event that sites are located during implementation, project activities would be halted until consultation with the Forest Archeologist can determine appropriate site-specific mitigation. Protection measures would be developed in consultation with the Oregon State Historic Preservation Officer (SHPO), appropriate Tribes, and, if necessary, the Advisory Council on Historic Preservation.

B. Tree Falling

B1. Streams within the project area must be protected with stream-protection buffers as shown in Table 1. Within these buffers, no commercial harvest is allowed. Stream buffers are measured from the edge of active channel (stream banks) on both sides of the stream. Buffers will be expanded to include slope breaks, where applicable. If stream temperature is currently impaired in a particular system, the Northwest Forest Plan (NWFP) Temperature TMDL Implementation Strategy (2012) guidance should be referenced.

Table 1 Minimum Stream Protection No-harvest Buffer Widths by Stream Type

Stream Type	Stream Protection No-harvest buffer
Listed Fish Habitat (LFH)	120 feet
Fish-bearing* stream (almost all are usually perennial)	100 feet within 1,000 feet of a LFH stream, 75 feet outside of 1,000 feet from a LFH stream
Non-fish perennial stream	60 feet
Intermittent stream	30 feet

*If not field verified by fish biologists or there is no information on file, perennial streams are presumed to be fish-bearing.

B2. Regeneration treatments must retain at least 15% of the stand, and are prohibited in Riparian Reserves.

B3. Prohibit harvest in unstable or potentially unstable areas. These areas are identified by features such as crevices in soil, tipped trees at multiple angles, and slump formations. The unstable areas will be identified by a geologist or soil scientist through field surveys of harvest units.

B4. Riparian Reserve treatments to attain ACSO require at least 50% canopy cover remain in treated areas. All legacy trees must also be retained.

B5. Stream restoration source wood may be obtained from any stand of appropriate size needed for successful stream restoration, including from Riparian Reserves.

B6. Fall-and-Leave treatments in Riparian Reserves must maintain a minimum of 40% canopy cover within the treated area of the protection buffer. Fall and leave can include moving trees closer to (and into) the stream to improve hydrologic and habitat complexity.

B7. Gaps outside of Riparian Reserves must be no greater than 3 acres in size in thinning units.

B8. Gaps in the 1st site-potential tree height (SPTH) of Riparian Reserves are prohibited. Gaps in the 2nd SPTH portion is allowed if treatment results in improvement to achieve ACSO, but shall not occupy more than 10% of the 2nd SPTH portion, and shall be 2.0 acres, or less, in size.

B9. Danger trees may be felled from stream-protection buffers where necessary for safety. Felled trees will be left in place unless they land on a road or need to be moved to facilitate safe operations. Danger trees may also be used directly (pushed/pulled) into a stream or floodplain, as well as stock piled for future instream restoration projects.

B10. Trees may be felled in protection buffers to allow for tail-hold tree (stump) anchor points for skyline cable, or other similar, logging system. Felled trees would be left in place unless they need to be moved to facilitate safe operations.

B11. Trees for harvest must be felled away or parallel to the stream-protection buffer. Trees that are inadvertently felled into the stream-protection buffer, fall and leave trees, or trees felled to create yarding corridors or non-system roads within the stream buffer, must be left on site.

B12. In pre-commercial thinning, require only hand-held equipment within the protection buffer, prohibit cutting of streambank stabilizing trees, and maintain a minimum of 200 trees per acre. Felled trees within the protection buffer will be left on site, and/or piled and burned. Felled trees in the outer zone (outside of protection buffers) of Riparian Reserve may be removed for other uses, such as firewood sales.

In pre-commercial thinning where piling occurs within riparian reserves, piles will not be placed on or in the following areas: ditch lines, the bottom of ephemeral channels, or within 100 feet of perennial or intermittent stream channels.

B13. Streams within the project area would be protected with buffers. Stream buffers are measured using slope distance from the edge of active channel (stream banks) on both sides of the stream. Within these buffers, tree felling or yarding would not occur (with the exceptions for danger trees, approved skyline corridors, and downed wood enhancement projects described in B5, B6, B9 and B10).

The following are minimum stream-protection buffer widths that supplement the distances described at B1.

Distances in Feet	Intermittent Streams	Perennial Streams Hill Slope < 30%	Perennial Streams Hill Slope 30 to 60%	Perennial Streams Hill slope > 60%
Thinning	50	70	75	85
Sapling Thinning	30	30	30	30

The streams that have a connection to fish habitat were examined by the fisheries biologist and the minimum widths above were adjusted based on site-specific circumstances including the proximity to listed fish habitat, stream gradient, stream orientation, and the cumulative quantity of other past management along these streams. The prescribed protection-buffer widths and the prescriptions for portions of the riparian reserve outside the protection buffers are specified in the Fisheries Report.

B15. In Riparian Reserves, skips would be created outside of protection buffers that would vary in size and would be up to 5% of each unit. Gaps would not occur within Riparian Reserves - this supersedes B8.

B16. Outside of riparian reserves, skips would vary in size and comprise up to 5% of each unit. Where Riparian Reserves cross through matrix, the protection buffers adjacent to streams may be counted as skips. Gaps would be created on up to 5% of each unit to help create variability and diversity while meeting stand-level objectives. Gaps would be up to 2 acres in size – this supersedes B7. Heavy thins with about 40 trees per acre would be created on up to 10% of the matrix component of each unit.

C. Yarding and Heavy Equipment Use

C1. Skyline (cable) yarding that requires clearing a corridor of trees is prohibited through the protection buffers on LFH streams.

C2. Full suspension is required when cable yarding (including lateral yarding) over perennial stream channels. Full suspension over intermittent streams will occur whenever feasible, however, bump logs within the channel will be utilized if full suspension cannot be achieved.

C3. Require cable yarding operations to maintain a minimum of one-end suspension except at the landing and tail trees where it is not possible. During lateral yarding, use one-end suspension to the extent practicable.

C4. Limit the establishment of skyline yarding corridors that clear corridors of trees over all streams to no more than five corridors per 1,000 lineal feet of stream. Individual corridor widths must not exceed 12 feet. Corridors will be spaced at least 100 feet apart (along the stream).

C5. In Riparian Reserves, ground-based mechanical equipment will be required to operate on continuous slash-covered path, as much as practical, to minimize soil compaction.

C6. Ground-based mechanical equipment is prohibited within protection buffers of all streams except as allowed under PDC C7, or if on existing system roads.

C7. Skid trails should not be designated to cross streams, but when stream crossings are necessary the following will apply:

a) Prohibit skid trails across LFH streams,

b) Skid trail stream crossings are prohibited within 1,000 feet of LFH.

c) Limit skid trail corridors through protection buffers to less than 15-foot width, and no more than one crossing per 1,000 feet of stream.

d) Require bank protection in the crossing with the use of logs felled from the corridor, or other bank protection technique. All trees felled in protection buffers must be left on site.

e) Require stream crossings to be removed before the wet season (generally October 16 to May 31).

f) Require skid trails to be perpendicular to the stream channel and take the shortest corridor through the protection buffer.

C8. Prohibit designating skid trails through wetlands or other wet areas. (Streams crossings are described in PDC C7.)

C9. Untethered mechanical equipment would generally operate on slopes less than 35%, but may operate on slopes from 35 to 40% if equipment stays on existing approved skid trails or moves straight up and down the slope without turning. Tethered ground-based equipment would operate on a layer of woody debris that would be as thick as possible given the slash available from harvested trees and other available material.

C10. Tethered ground-based equipment may operate on slopes up to 60% but the following shall be applied:

- Limited to dry season (generally June 1 – October 15).
- Shall operate on slash mat.
- Outside of 1 SPTH, or protection buffer, whichever is greater.

- Required monitoring on all units with this methodology for 5 years, even if not in Riparian Reserves (any unit where used).

C11. Adjacent to stream-protection buffers there would be additional restrictions for certain ground-based equipment (except as described at PDC C7). Only mechanical harvesting equipment used for tree falling would be allowed within 205 feet of listed fish habitat, or within 100 feet of other perennial streams, or within 75 feet of intermittent streams. Distances are measured slope distance in the direction of the slope aspect. Exceptions may be made for the use of existing skid trails by the District Ranger based on recommendations from the unit fisheries biologist or hydrologist, and where there is low risk of sediment entering streams. Additional erosion control measures may be required.

D. Road and Landing Construction/Reuse

D1. Prohibit the construction of new system roads or landings within Riparian Reserves.

D2. There must be no net increase in system roads after completion of project activities within a 12 digit HUC watershed (sixth-field subwatershed).

D3. New system road construction should be on or near stable ridgetop locations, or on stable, relatively gentle topography.

D4. Require full-bench construction of any new system roads when hill slope exceeds 30%. Side-cast road-construction techniques would not occur when the hill slope exceeds 30%.

D5. New road construction must not increase the stream drainage network. New roads will be out-sloped, or the outflow of new ditch relief drainage structures will drain to well-vegetated areas with no stream connection.

D6. Require new system road compacted width not to exceed 24 feet (including ditch line).

D7. Use of existing landings within Riparian Reserves will be allowed if there are no erosion potential and sedimentation concerns to area streams, or those concerns can be mitigated, as determined by a Soil Scientist, Hydrologist or Fish Biologist.

If a landing is approved for use in Riparian Reserves, erosion control measures will be installed prior to use, where appropriate, to prevent soil movement downslope from the landing. Erosion control measures may include, but are not limited to, straw bales around landing perimeter, wattles, rock surfacing, or avoidance during wet conditions. The portion of the landing outside a system road prism would be rehabilitated after use (compacted soils fractured, covered with slash or seeded and mulched).

D8. Prohibit new construction of non-system roads within protection buffers, unless needed to cross streams. If non-system road construction is required to cross streams the following will apply.

- a) Prohibit non-system roads from crossing LFH streams.
- b) Prohibit new non-system road stream crossings within 1000 feet of LFH.
- c) Stream crossings on non-LFH streams will be removed before the wet season if the road is needed for more than one operating season. If it is not feasible to remove stream crossings during the wet season the road must be hydrologically stabilized before the wet season in concurrence with an aquatics specialist.

- d) Require non-system road crossings to be perpendicular to the stream channel.

The reuse of existing alignments that cross streams may occur within 1,000 feet of LFH where existing cut and fill slopes are relatively well vegetated and stable, and where temporary crossing structures are designed to minimize sediment to the stream. For example, structures would be outside the bankfull channel and have site-specific designed erosion control features to prevent road runoff from connecting to the stream channel.

E. Road Work (System Road Maintenance and Reconstruction)

E1. Generally require road maintenance and reconstruction activities to be implemented during the dry season (generally June 1 to October 15) unless the road segment has no hydrologic connection to streams. Addition of gravel (including blading and compacting) for wet season haul and unforeseen slide removal is allowed in the wet season.

E2. Require all waste material generated from road maintenance (ditch cleaning, blading, etc.) be placed in a pre-designated area outside of Riparian Reserves.

E3. It is always preferred that ditch lines remain vegetated, but conditions occur where ditch lines eventually need to be deepened/cleaned. When removing vegetation from ditch lines where ditches are hydrologically connected to any stream, install an effective sediment trap to prevent ditch erosion from entering streams (e.g. wattles, mulching cleared ditches within 100 feet of stream-crossing culverts) until vegetation is re-established.

E4. All new replacement culverts will be designed to pass at least a 100-year flood streamflow, including associated bedload and debris.

E5. Culvert and bridge replacements occurring on fish-bearing streams will adhere to the design criteria in the Aquatic Restoration Biological Opinion II (ARBOII). Projects will follow all provisions in the following sections:

- a) Section 1.3.2: General Aquatic Conservation Measures
- b) Section 1.3.2 #20: Work Area Isolation & Fish Capture and Release
- c) Section 1.3.3 #21. Project Design Criteria for Aquatic Restoration Activity Categories: Fish Passage Restoration.

E6. Require an approved dewatering plan for all perennial stream crossing culvert replacements that maintains downstream flow, if stream flow is sufficient for de-watering to be possible. On fish-bearing streams, maintaining continuous stream flow is required.

E7. Require the complete excavation of fill material over the culvert at each replacement site prior to extracting the existing culvert.

E8. Replacement bridges, including temporary bridges, must consist of a single span with the abutments located outside of bankfull width. Abutment work areas must be isolated from any flowing water.

E9. Fresh concrete (cured less than 72 hours), concrete contaminated wastewater, welding slag and grindings, concrete saw cutting by-products, and sandblasting abrasives shall be contained and not come in contact with waterbodies or wetlands. Prepare concrete at least 150 feet from water bodies.

E10. Dust abatement is limited to the application of water or lignosulfonate only. If lignosulfonate is used for dust abatement, one application will occur during the dry season (generally June 1 to October 15) at a dilution rate of 50 percent lignosulfonate and 50 percent water. Lignosulfonate will remain on the road surface and not go over road edge. During blading, small berms may be created or wattles used at stream crossings to assist with keeping palliatives on the road surface. A 1 foot no-application buffer on the edge of gravel shall be used if road width allows. Lignosulfonate will not be applied when raining, and a 3 day forecast of clear weather shall follow application.

E11. Surface water may be diverted to meet dust abatement, maintenance or construction needs, but only if developed sources are unavailable or inadequate. In LFH, diversions may not exceed 10% of the available flow and fish screen(s) will be installed, operated, and maintained according to NMFS's fish screen criteria (NMFS 2011e stating that pipe intakes would be screened with woven wire screens having a maximum 1.75 mm gap, and perforated plate screens would have a maximum opening of 3/32nd inch). No more than a 50% reduction in flow may occur in non-ESA streams and fish screens will be used in all streams.

F. Rock Quarry Operation

F1. New rock quarries shall not be developed in Riparian Reserves.

F2. For existing quarries within Riparian Reserves, conduct activities with the potential to introduce sediment into streams only during the dry season (generally June 1 to October 15). If unusual circumstances (e.g. emergency road repair) require such activities to occur outside of the dry season (or occur at any time adjacent to Listed Fish spawning or rearing habitat), erosion control measures will be implemented to prevent off-site soil movement, to prevent damage to water quality and fish habitat. Erosion control measures include use of filter materials (such as straw bales or silt fencing) and other mitigation measures.

F3. For existing quarries within Riparian Reserves, prepare and carry out an erosion and pollution control plan, commensurate with the scope of activity at the quarry that includes the following information:

- (a) The name, phone number, and address of the responsible official;
- (b) Best management practices to confine vegetation and soil disturbance to the minimum area, and minimum length of time, as necessary to complete the action, and otherwise prevent or minimize erosion and sedimentation associated with the action;
- (c) Best management practices to confine, remove, and dispose of hazardous materials generated, used, or stored at the work site;
- (d) Procedures to contain and control a spill of any hazardous material generated, used or stored at the work site, including notification of proper authorities.

F4. For blasting, follow setback criteria from LFH based on the following table.

Table 2. Setback distances for blasting activities based on charge weight

Charge Weight (lbs.)	Setback Distance (ft.)	Setback Distance (mi)
10	282	0.053
20	397	0.075
40	564	0.107
60	689	0.13
80	797	0.151
100	889	0.168
140	1,053	0.199
150	1,089	0.206
200	1,260	0.239
500	1,991	0.377
1,000	2,815	0.533
5,000	6,299	1.193
10,000	8,907	1.687
15,000	10,909	2.066

G. Road Decommissioning and Closure (System and Non-System)

G1. Decommissioning will include at a minimum removing all stream culverts and water-barring the road. May also include removal of ditch relief culverts, side cast pull back, de-compaction and re-contouring the slope. Decommissioning includes the administrative action of removing the system road from the road system.

Where previous system roads were decommissioned using the entrance management technique, and are subsequently reused, they would be put back into the same condition after temporary use. In locations where a barrier closure device has been determined not to be an effective tool, the first portion (approximately 1/8 mile) of a road segment would made impassable by vehicles using mechanical methods (i.e., the road entrance would be obliterated so vehicles cannot travel beyond it).

G2. Road decommissioning and closure will follow PDCs in the Aquatic Restoration Biological Opinion (ARBO II) programmatic, including culvert removal on fish bearing streams shall adhere to the measures as described in Fish Passage Restoration.

G3. Closed roads will be hydrologically stabilized. This usually includes removing all stream culverts and water-barring, but sometimes deep fill stream crossings will be stabilized by reducing the fill material over culverts left in place, or other measures to hydrologically stabilize the road as determined by a hydrologist.

G4. Closed roads (level 1) with any stream culverts left in place will receive a low level of maintenance to ensure culverts are not plugged.

G5. Culvert-removal sites will be dewatered while the culvert is being removed if stream flow is sufficient for dewatering to be possible. On fish-bearing streams, maintaining continuous stream flow is required.

G6. Excavations to remove stream culverts will be matched to the approximate bed elevation and bank-full stream width of the existing streambed. At a minimum the bottom of the fill will be excavated to 1.5 times the width of the culvert being removed and fill removal slopes must be at least 1.5:1 slope, or match natural-bank slopes. Fill-removal slopes should be 2:1 and the bottom of fill removals should be equal to or greater than bank-full width.

G7. All non-system roads will be rehabilitated after completion of project activities. At a minimum rehabilitation includes removing all stream crossings, and closing the road to vehicle access. Non-system roads, temporary roads, and most existing alignments would be rehabilitated using a suite of techniques site-specifically designed for each, and may include placement of one or more berms at the road's entrance, construction of water bars, and/or placement of debris such as root wads, slash, logs or boulders where available. Native surfaced roads would be decompacted as needed with the jaws of a log loader or excavator. Roads or sections of roads that have rock surfacing may be decompacted where site-specific circumstances warrant. The technique known as "cratering," which is a standard practice often used for system road decommissioning, may be used to decompact temporary roads or reused existing road alignments.

Cross-drains or water bars would typically be installed every 150 feet, or more frequently, where the road grade exceeds 5%. Actual placement distances may vary with topography to ensure proper drainage. Temporary culverts would be removed.

Available logging slash, logs or root wads would be placed across the road and landing surface. Where slash, logs or root wads are not available in sufficient quantities, bare soils would be seeded and mulched. The coverage of effective ground cover would be sufficient to prevent off-site movement of soils as guided by Forest Plan standard and guideline FW-025 and by Forest Service Handbook 2509 (R6 supplement).

H. Timber and Rock Transport (Haul)

H1. Require system roads used for haul to meet minimum design standards to ensure safe haul without road failure. Prohibit timber haul on roads that are failing, or likely to fail, if failure causes direct sediment impacts to streams.

H2. Haul operations will be stopped immediately, even in the dry season, if road use is causing deep rutting of the road surface, there is ponding of water on the road, there is failure of any drainage structure, or other situation occurs which may result in sediment delivery to a stream. The road must be repaired before haul can continue.

H3. There are no timing restrictions on haul over paved roads.

H4. Log and rock haul on aggregate or native (system and temporary) roads shall be prohibited at any time there is 1.0 inch of precipitation within any given 24-hour period as measured at the lowest elevation along the haul route. To measure precipitation, the purchaser may install a temporary rain gauge on National Forest System land near or adjacent to the lowest elevation along the haul route; otherwise,

precipitation would be measured according to a running average of the data measured from an agreed upon [RAWS station](#)¹.

H5. Hauling on aggregate roads is allowed during the dry season. Haul is only allowed during the wet season (generally October 16 to May 31) on aggregate surfaced roads and landings if all the following criteria are met:

- a) Roads must meet design standards for being able to support wet weather haul (e.g. competent subgrade, minimum 6-inch depth of compacted aggregate) as determined by engineering during project planning.
- b) Haul routes must be inspected weekly, or more frequently if weather conditions warrant. Inspections will focus on road surface condition, drainage maintenance, and sources of sediment delivery to streams. If sediment traps are used, they would be inspected weekly during wet conditions and entrained soil would be removed when the traps have filled to ½ capacity. Removed materials would be deposited in a stable site that is not hydrologically connected to a stream.
- c) In subwatersheds with listed fish habitat adequate cross drainage has been installed near streams so that there is less than 200 feet of ditch line (on each side of crossing) draining directly to any stream.
- d) On road segments that have the potential to deliver sediment to any stream channel, implement erosion control measures to prevent offsite movement of soil. This work will occur in the dry season (generally June 1 to October 15), and may include methods such as placing water bars to redirect road drainage to vegetated areas rather than allowing direct run-off to stream channels. (Reference PDC A6)
- e) The approach and crossing of each LFH stream is paved or has a high quality, well drained, and recently maintained aggregate surface.
- f) Haul will be stopped by the contract administrator when road sediment can be observed moving into ditches, perennial, or intermittent streams.

H6. Haul on native surfaced roads and landings is only allowed during the dry season (generally June 1 to October 15). No waivers will be granted outside of this season if there are any hydrologic connection of native surface haul routes to streams.

H7. For this project, the precipitation measurements described at H4 may be measured according to a running average of the data measured from the Remote Automated Weather Station at [Log Creek](#)².

H8. To prevent road damage, haul would not occur when the roadbed is under freeze-thaw conditions. To determine if freeze-thaw conditions exist, measurements of the road surface temperature should be taken at the highest and lowest elevations along the haul route on National Forest System Roads to ensure that haul roads are either completely frozen or completely thawed. Temperature readings at these locations should both be at or below 28° F., or both be at or above 38° F. Roads that have been under standing snow for at least 3 days with no evidence of snow melt may be assumed to be completely frozen. The Contracting Officer may allow haul to proceed if other methods are used to determine that the haul roads

¹ <https://www.wrh.noaa.gov/pqr/raws.php>

² <https://www.wrh.noaa.gov/mesowest/getobext.php?wfo=pqr&sid=LGFO3&num=72&raw=0>

are either completely frozen or completely thawed. The Contracting Officer would suspend haul if it is determined that road damage is occurring based on observation of field conditions.

H9. If snowplowing occurs, snow would be removed in a manner which protects the transportation resource and all other adjacent or connected resources. Upon completion of snowplowing, windrows and snow berms would be removed or breached to avoid accumulation or channelization of snow melt on the road. Breaching would avoid the discharge of water from the road into streams or onto erosive slopes. Any loss of roadway surfacing materials as a result of snowplowing operations would be replaced in kind by the operator. The operator would repair or replace any roadway structures that are damaged as a result of snowplowing operations.

I. Fuels Treatment

I1. Fuels treatment of any kind is prohibited within the protection buffers (Table 1), with 2 exceptions: fire backing into the protection buffers during under-burning that will be kept to a minimal extent, and pile burning of pre-commercial thin material.

I2. Low severity burns shall constitute the dominant type of controlled burn within Riparian Reserves, resulting in a mosaic pattern of burned and unburned landscape. Low severity burn is defined as: Small diameter woody debris is consumed; some small twigs may remain. Leaf litter may be charred or consumed, and the surface of the duff may be charred. Original forms of surface materials, such as needle litter or lichens may be visible; essentially no soil heating occurs.

Moderate severity burns are permitted in no more than 20% of Riparian Reserves to invigorate desirable deciduous species. Moderate severity burn is defined as: Foliage, twigs, and the litter layer are consumed. The duff layer, rotten wood, and larger diameter woody debris is partially consumed; logs may be deeply charred; shallow ash layer and burned roots and rhizomes are present. Some heating of mineral soil may occur if the soil organic layer was thin.

Ignition could occur within the Riparian Reserve, but outside of the protection buffer.

I3. Piling of fuels intended for burning is prohibited closer than 20 feet from the protection buffer. Where piling occurs within riparian reserves, piles will also not be placed on or in ditch lines or the bottom of ephemeral channels.

I4. Mechanical fuels treatment, or the construction of mechanical fire control line is prohibited within the protection buffers.

I5. Mechanical fuels treatments are subject to the same slope standards as ground-based yarding equipment (generally <40% if untethered, and up to 60% if tethered).

I6. Prohibit the construction of hand-built fire lines where water could be channeled into areas of instability, headwalls or streams. Construct waterbars on fire line to reduce soil erosion.

I7. Water used for fuels treatment may be drawn from sources near the units treated. In LFH, diversions may not exceed 10% of the available flow and fish screen(s) will be installed, operated, and maintained according to NMFS's fish screen criteria (NMFS 2011e stating that pipe intakes would be screened with woven wire screens having a maximum 1.75 mm gap, and perforated plate screens would have a

maximum opening of 3/32nd inch). No more than a 50% reduction in flow may occur in non-ESA streams, and fish screens will be used in all streams. The District Fish Biologist or District Hydrologist will be consulted prior to utilizing any water sources.

I8. Do not pump directly from a water source if chemical products are going to be injected into the pump or pumping system. If chemicals are needed, use a fold-a-tank from which to pump water. Do not use surfactant and foam near waterbodies or in Riparian Reserves.

I9. Where slash is piled for later burning, machine or hand piles would be no less than 6 feet high by 6 feet in diameter and would be no greater than 12 feet high by 20 feet in diameter. Landing piles may be larger. Piles would be constructed 20 feet or farther from live trees where leave-tree spacing allows. Where leave-tree spacing does not allow a 20-foot gap between a live tree and a pile, piles would be constructed closer to the minimum size of 6 feet high by 6 feet in diameter to minimize tree scorch. Where piles are created away from landings, pieces between 1 and 4 inches in diameter at the large end and longer than 24 inches in length in would be piled. Piles would not be constructed in roadside ditches or in areas where burning may damage infrastructure. Fuels would not be treated or piles created within the riparian protection-buffers. Piles would be covered with 6 mil black polyethylene plastic over at least 50% of the pile. Piles would be constructed to minimize soil movement to protect soil productivity and provide for efficient burning.

I10. Fuels would be treated within some units.

- a. Within regeneration harvest units that have a ground-based logging system, activity fuels would be grapple piled. Grapple piling of slash for site preparation would occur in Unit 129. To the extent feasible, piling equipment would operate on existing skid trails or roads to minimize additional soil impact. To the extent feasible, piles would be placed on top of areas already impacted by heavy equipment such as skid trails, to minimize additional soil impact from severe burning.
- b. Where broadcast burning or underburning is prescribed, burning would be accomplished at the appropriate time of year to consume a sufficient quantity of slash and brush while protecting soil and leave trees. Where fire line is constructed, techniques to minimize erosion and sedimentation risks, would be included such as constructing water bars on fire lines during initial fire-line construction where slopes are greater than 20%. Where Riparian Reserves are involved, I2 would apply.
- c. Where pile burning is prescribed, burning would be accomplished at the appropriate time of year to consume a sufficient quantity of slash while protecting soil and leave trees. Fire creeping between piles is allowed as long as flame intensity is low enough to not cause soil damage or substantial harm to leave trees. Where creep occurs, the area would be regularly monitored to ensure that the operation remains consistent with burn prescriptions.
- d. Operational slash along roads 1828, 2612, 2613 and 2656 would be treated within 40 feet of the running surface of the road to create fuel breaks where total tonnage is reduced to approximately 7 tons per acre. Tonnage would be assessed by the Forest Service using USDA Forest Service General Technical Report PNW-105, May 1980. Pieces between 1 and 4 inches in diameter at the large end and longer than 24 inches in length may be placed in landing piles or pulled back away from the road to achieve the tonnage goal. If slash is moved beyond 40 feet into the unit, or if trees are directionally felled away from the road, the final height of slash would not exceed 18 inches from mineral soil. Any operational slash remaining within 40 feet of the road would also be lopped down to no more than 18 inches from mineral soil.

I11. Prescribed fire burn plans would follow the Interagency Prescribed Fire Planning and Implementation Procedures Guide 2017 as well as the Best Smoke Management Practices to minimize smoke effects. The Oregon Smoke Management Plan, which is administered by the Oregon State Forester, regulates the amount of forestry related burning that can be done at any one time.

I12. If the operator processes chips at the landing, the waste product called flail, would be spread out across the landings and skid trails to a maximum depth of 6 inches, keeping at least a 10-foot buffer of bare ground between the flail and the edges of slash piles. The total size of the flail spread would not exceed 2,500 square feet at each site. Any material that cannot be spread in this manner would be piled and covered with 6 mil black polyethylene plastic for later burning.

J. Scenery

J1. A 100-foot no-harvest protection buffer would be maintained as a vegetative screen along certain travel routes. These include Trails #492, 774, 776C, 2000, Road 1825109, and along the paved portion of Road 2656 adjacent to Unit 102. Beyond the 100-foot no-harvest buffer, and up to a distance of 300 feet from the travel route, the following would also apply:

- Unnecessary removal of low-branched understory and ground cover vegetation would be avoided where beneficial as a visual screen.
- Where leave trees are marked, paint would be on the side facing away from the travel route.
- Boundary signs would face away from the travel route where feasible. Where boundary signs and flagging are visible from the travel route, they would be removed after operations are completed.
- In the event that boundary paint is visible from the travel route, it would be covered over with an appropriate color paint by the Forest Service after operations are completed, as feasible.
- Stumps visible from the travel route would have a maximum height of 6 inches on the uphill side.
- Skidding or the use of heavy equipment would be avoided along the listed trails and the direction of skidding would be away from the trails.
- Within one year of project completion, skid trails, landings, and temporary roads visible from the travel route would be re-seeded with locally collected native grass to reduce color contrasts.

J2. In Unit 180, where Trail #492 would be crossed by temporary roads or skid trails, there would be a limit of one such crossing. Where feasible, such temporary roads or skid trails would avoid alignments that result in long visual corridors from the recreational trail and would have the potential visual corridor shortened by curving the route of the temporary road or skid trail as close as feasible to the recreational trail crossing.

Additional Scenery Measures

PDCs J3 to J10 apply in special focus areas. These include the visible areas within 660 feet of the trails listed in J1; the visible areas within ½ mile of Roads 1825 and 1825100, Trail #797, campgrounds in the Old Maid Flat area (portions of Units 2, 4, 6, 16, 18, 20, 24, 26, 28, 62, 64, 68, & 74); the visible areas within ½ mile of road 1825109 directly adjacent to Unit 74 (portions of units 74, 80 & 82); the visible areas along road 1800 and adjacent to the power line (portions of Units 2, 4, 7, & 8); the visible areas within ½ mile of Road 2656 north of the junction with Road 2612, Trillium Lake, Trillium Dam, Trillium Lake Campground (portions of Units 102, 104, 106, 108, 110, 174, 175, 176, 178, & 182); and the visible areas within ½ mile of the Salmon River (portions of Units 119, 120, 128, 136, 139 & 140).

J3. Landings (including helicopter landings) would be located as far away from identified focus areas as feasible and vegetative screening would be retained to the extent available.

J4. After completion of activities, logging residue would be cleaned up enough to appear natural where visible from identified focus areas. Slash would be scattered to a depth of 18 inches or less and pulled back an additional 40 feet beyond the 100-foot no-harvest buffer for Trails #492, 774, 776C, 2000, and along the paved portion of Road 2656 adjacent to Unit 102.

J5. Within one year of project completion, disturbed areas, including landings and helicopter landings, would be re-seeded with locally collected native grass to reduce color contrasts where visible from identified focus areas.

J6. Gaps would be a maximum of 2 acres in size, would be spaced to mimic natural vegetation patterns, and would have irregular, natural appearing edges that avoid unnatural lines and sharp edges. To the extent practical, gaps would resemble and be in scale with natural occurrences in the landscape, would incorporate islands of leave trees and shrubs, and would blend with existing openings.

J7. Edges of gaps would be scalloped and feathered to soften transitions from dense stands. Where Units 2, 4, 7, & 8 abut the transmission line right-of-way (where visible from Road 18), the locations and edge scalloping of gaps would be utilized, to the extent practical, to reduce the existing straight-line effect along the edge of the transmission line clearing.

J8. To the extent practical, a wide variety in size, species, spacing, texture, age class, and seasonal color would be encouraged for leave trees.

J9. Helicopter logging would occur in Units 102 and 182 to minimize negative impacts to scenery where visible from identified focus areas.

J10. For portions of Units 136 & 140 that are visible from the Salmon River (if any), treatment activities would be minimized to meet a VQO of Preservation, so that the existing landscape character remains intact with only minute deviations that would not be noticeable from the river.

K. Wildlife

K1. Snags and Down Wood

Snags would be retained in all units where safety permits. If snags must be cut for safety reasons, they would be left on site. To increase the likelihood that snags would be retained, they may be included in skips.

Certain live trees would also be selected as leave trees that have the “elements of wood decay” as described in the DecAID advisor. This may include trees with features such as dead tops, broken tops and heart rot. They may be retained in skips.

Old down logs currently on the forest floor would not be removed.

Additional down woody debris would be generated by operations. This would include the retention of cull logs, tree tops, broken logs and any snags that would be felled for safety reasons.

Some units have standing trees that were girdled or topped in the past. These would be protected where feasible.

Except in certain root rot patches where snags are abundant, live trees would be treated within harvest units and protection buffers to provide future snags and down wood. Tree topping is generally the technique used to create longer lasting snags and to create live trees with decay. Girdling is the technique used to create snags quickly but they decay, fall over sooner, and become down wood. Some trees are felled to get immediate down wood. After harvest, and after one or two winters elapse, the units would be examined to determine whether trees died or fell down. In areas where the following target levels are not already met, additional trees would be topped, felled or girdled. In LSRs, there should be three trees per acre with broken tops, five trees per acre should be dead and two trees per acre should be on the ground. In thinning units outside LSRs, there should be one tree per acre with a broken top, and two trees per acre should be either dead or down. In regeneration harvest units, outside the skips there should be one tree per acre either dead or with a broken top, and three trees per acre on the ground. If trees need to be treated to meet these numbers, they would be treated farther than one tree-height from system roads to minimize safety issues and potential losses from firewood gathering. Within regeneration harvest units, similar numbers would be created but they would be placed around the perimeter of units.

K2. Northern Spotted Owl: There are restrictions during the breeding season for certain activities based on the type of activity and the distance to activity centers. Restrictions apply to the use of chainsaws and heavy equipment (393 yards) between March 1 and July 15 for parts of Unit 8.

There is a restriction for the use of helicopters. Details on the restrictions and rationale are in the U.S. Fish and Wildlife Service's Letter of Concurrence. Helicopter logging would be restricted in Unit 8 between March 1 and July 15. Also, during this period, the use of large Type 1 helicopters (e.g., Chinook 47d) would be restricted in Units 4, 6, 7, and 8. Because helicopter restrictions apply both during yarding and transit to other sites, a wildlife biologist would be consulted to determine if any other restrictions are needed after operators finalize landing locations, flight paths and proposed seasons of operation.

K3. Deer and Elk: No harvest operations, road construction, use of motorized equipment or blasting would be permitted in winter range areas between December 1 and March 31. The restriction may be waived if snow accumulation levels are less than 12 inches or if it is determined that the area is not being used by elk. This applies to units 2, 4, 6, 8, 12, 13, 18, 20, 38, 39, 62, 74, 80, 82, 86, & 88. Also restricted during this time period are the proposed helicopter landings on roads 1800, 1825080, 1825111 and 1825380.

K4. Red Tree Vole

There is the possibility that red tree vole sites may be found, even after a decision is made for this project. As they are confirmed and validated, additional deletions or buffers may be incorporated where appropriate based on the direction in the Survey and Manage Standards and Guidelines (page 24), and the Red Tree Vole Management Requirements, as guided by the Pechman exemptions.

K5. Legacy Trees

Snags are addressed in PDC #K1. For this project, legacy trees are defined as large live trees that survived a stand-replacing wildfire. They are typically much larger and much older than the trees that grew up after the fire and they often have fire scars. Live legacy trees would be retained where safety permits. If legacy

trees are determined to be a safety hazard or need to be removed for operational purposes, they would be felled and left on site. Live legacy trees would be retained and would typically be included in the leave tree spacing in thinning units or in the green-tree retention component of regeneration harvest units. They may be incorporated into skips.

L. Wood Enhancement in Streams and Fish Log Acquisition

L1. For in-stream placement of wood, refer to the Aquatic Restoration Biological Opinion 2, for requirements. (ARBO II)(NMFS 2013 or most recent version).

L2. Fish Log Acquisition, where trees are pulled over to get fish logs with root wads attached.

- During tree removal activities, district fish biologists or their designated inspector, would be on site to oversee the implementation and maintenance of resource protection measures, and conduct or oversee daily site inspections to ensure effectiveness of these measures.
- No trees would be harvested within one site-potential tree distance from a stream.
- Erosion control materials would be on site prior to excavation and erosion control work would be completed within 48 hours of project completion or prior to any expected precipitation event as defined by when the National Weather Service, or other accepted source, predicts a 50% or higher chance of one inch or more of precipitation for the local area for the next 24 hours.
- If project activities, including log haul, result in visible turbidity in streams, activities would be suspended until the site dries out so that activities can be completed without generating turbidity.
- Earth-disturbing operations would be suspended if there is more than one inch of rain in a 24-hour period at the Log Creek Remote Access Weather Station and/or the Bull Run River above the reservoirs exceeds 200 cubic feet per second (suggesting a rise in base flows in the watershed). Operations would remain suspended until the Bull Run River drops below 200 cubic feet per second and there is less than 1 inch of rain in a 24-hour period unless local conditions warrant otherwise.
- To minimize impacts to cavity nesters and other wildlife, no snags or trees with cavities or other signs of wildlife use, including nesting birds, would be removed. The District Wildlife Biologist would assist in selecting trees appropriate for removal each year.
- Oregon State Certified weed-free annual ryegrass straw or spring wheat straw or WoodStraw® would be present on the project in sufficient quantities prior to any tree removal and would be installed immediately upon completion of the trench for that section of road if not enough limbs are available for effective ground cover.
- Reseed or plant with locally collected native plant materials. Consult with the project botanist for appropriate species and sources. Planning for seed collection and propagation would begin at least one year prior to implementation.
- After the project is completed, the sides of the roads would be monitored for three years following completion of tree removal for any invasive plants, including but not limited to herb Robert, shiny leaf geranium, false brome, Japanese knotweed, invasive hawkweeds (orange, meadow, and common), invasive knapweeds (spotted, diffuse, and meadow), Scotch broom, St. John's-wort, tansy ragwort, English ivy, English laurel, English holly, Himalayan blackberry, and teasel.

- Invasive plants would be treated early (pre-disturbance) to prevent their spread. For many invasive plant species, herbicide treatment is required to effectively control them.
- Harvested trees around the existing dispersed sites in the project area would not negatively impact those sites, by either increasing footprint size, ingress/egress to sites, or the potential to create more user access trails from sites.
- Do not negatively impact trailheads or winter ski routes. Do not harvest trees with winter blue diamond markings.
- If delays are anticipated along travel corridors in the project area, advertise delays through the Forest's web page and coordinate with District staff.
- Limit visual impacts with adequate spacing between harvested trees.
- All work within the project area would stop and an archaeologist or cultural resource technician from the District would be notified immediately if anyone discovers any prehistoric or historic cultural remains.
- All measures would be taken to ensure safety for road users including but not limited to traffic control, advanced warning signing, and flaggers when necessary.
- Avoid selecting trees in the toe of the slope or drainage systems. If the road is undermined or drainage systems destabilized, full road repair and compaction would be required.
- Blading may be required if the road surface is damaged to reshape road and restore proper drainage.

M. Recreation

M1. Where operations such as skid trails or temporary roads cross system trails, the trail tread would be rehabilitated to meet standards associated with its designated use. This includes replacing any damaged trail markers or signage.

M2. Advance notice via informational signs of harvest activities or road work would be posted at affected trailheads, trail junctions, roads, and recreation sites.

M3. System trail segments within or directly adjacent to harvest units would be posted as closed to the public during operations for public safety; posting would occur at trailheads and other points of access.

M4. Skidding or use of heavy equipment along any trail tread would be avoided. Skid trail crossings would be kept to a minimum.

M5. Temporary closures due to harvest and road maintenance/construction activity would be scheduled to minimize impacts to recreationists to the greatest extent possible. Project implementation would not take place on weekends or holidays and activities that have the greatest potential to impact recreation will be scheduled to occur outside of peak recreation season (Memorial Day-Labor Day) to displace as few forest visitors as possible.

M6. Plowing of roads and vehicle/equipment use would be in accordance with seasonal and special use designations identified in the Mt. Hood Motor Vehicle Use Map. Snow removal or vehicle access would not occur on Roads 2656 or 1825 from December 1st to April 1st.

N. Botany

N1. All off-road equipment is required to be free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds prior to coming onto National Forest lands. Contracts include provisions (e.g., cleaning of equipment thoroughly with pressurized water before entering National Forest lands and inspection before or after entry) to minimize the introduction and spread of invasive plants. These provisions contain specific requirements for the cleaning of off-road equipment.

N2. Gravel or rock used for roads and landings would come from sources approved by the local botanist/invasive plant specialist.

N3. Road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants would be conducted in consultation with an invasive plant specialist.

N4. Seed used for erosion control or other reasons would preferably be grown under government-supervised contracts, or certified by the state of Oregon to assure noxious weed-free status. In certain cases, non-certified seed may be used if it is deemed free of Oregon State Class A & B noxious weeds.

N5. When straw and mulch are utilized for erosion control, it would be annual ryegrass straw or spring wheat straw certified as weed-free by the State of Oregon, or would originate from fields which grow State of Oregon certified weed-free annual ryegrass seed, or originate from Willamette Valley Oregon fields which grow only certified weed-free annual ryegrass seed for large-scale commercial seed production. In place of straw, wood fiber mulch (also called "wood straw") may be used.

N6. Locations of rare botanical species found in the project area would be protected with skips as described below. A botany skip would be a protection buffer with a radius of 85 feet. Skips are areas of no treatment within or adjacent to an area where trees are harvested. The range of skips in thinning units is described as up to 5% in the Matrix. Some skips may be placed randomly, but there are also many reasons to locate skips based on stand features. Skips are prioritized here based on their relative importance. Wet areas, seeps and survey and manage sites in stands over age 80 are the highest priority. Skips would have a moderate priority for certain features such as patches of snags, patches of legacy trees, and survey and manage sites in thinning units under age 80. Sites of non-listed species and other factors would be the lowest priority for the placement of skips. Moderate and low priority features may not end up in a skip based on the quantity of skips and other factors such as logging feasibility. Often, where a special feature is close to a unit edge, the unit boundary is adjusted to provide the desired protection.