

Project Design Features for Water

The Forest developed the following project design features to address project objectives, to minimize resource impacts, and to ensure compliance with the Forest Plan and applicable laws and regulations. The Table displays the design features developed for this project, along with the applicable units. Project design features will be implemented in all action alternatives unless otherwise designated.

Westside Fire Recovery Project Design Features and applicable stands and/or alternatives

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
Watershed - 1	All ground disturbing activities within or outside of the normal operating season (NOS) between May 1 to October 31 will be implemented according to the Forest's Wet Weather Operation Standards (Klamath National Forest, 2002). Wet weather operations in riparian reserves outside of the NOS will be limited to landings, existing roads, fuels units, roadside hazard units, and site prep and planting.	All units where applicable	All Activities as applicable	BMP 1.5
Watershed - 2	Areas where soil has been disturbed by project activities within Riparian Reserves must be stabilized prior to the end of the normal operating season, prior to sunset if the National Weather Service forecast is a "chance" (30%) of rain within the next 24 hours, or at the conclusion of the operations, whichever is sooner. This includes skid trails that cross swales (i.e. linear depressions perpendicular to the slope contour that do not meet definition for designation as a Riparian Reserve). Restoration generally consists of removing excess sediment, reshaping and waterbarring former approaches, and spreading slash on the former crossing.	All units where applicable	Any place where work will disturb soil in Riparian Reserves.	Waiver of Waste Discharge Requirements for Non-point source Discharges Related to Certain Federal Land Management Activities on National Forest Lands (Water Board Waiver) Order No. R1-2010-0029.
Watershed - 3	Project Riparian Reserves are established in the following manner per the Forest Plan (site tree for Salmon and Happy Camp districts is 170 feet, site tree for Scott and	All units where applicable	All units	S&G MA10-2

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	<p>Oak Knoll districts is 150 feet):</p> <p>For fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 340 feet (680 feet total).</p> <p>For permanently flowing non-fish-bearing streams, it is the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream), whichever is greatest. For Salmon and Happy Camp ranger districts, this will be 170 feet (340 feet total) and 150 feet for the Oak Knoll and Scott River Ranger District.</p> <p>For intermittent streams, the stream channel and extending to the top of the inner gorge, or extension from the edges of the stream channel to a distance equal to the height of one site potential tree, or 100 feet slope distance, whichever is greatest.</p> <p>For unstable lands, it is the extent of unstable and potentially unstable areas.</p> <p>Consistent with Forest Plan direction, riparian reserves for wetlands and springs will be defined by the edge of the feature out to a distance equal to 1 site potential tree. These riparian reserves will be flagged and avoided during salvage harvest.</p>			
Watershed - 4	Tractors and mechanical harvesters will be	All units where applicable	Units with Unstable Lands:	Unstable Lands: S&G MA10-

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	<p>excluded from all riparian reserves associated with stream channels, active landslides, inner gorges, and toe zones of dormant landslide deposits. In Roadside hazard tree units the equipment will be restricted to the road surface.</p> <p>Equipment will be excluded from wetlands or wet meadows (excluding small springs and seeps).</p> <p>To limit slope disturbance, inner gorge terrain (> 65% slope) that extends beyond riparian reserves will be buffered by 20-foot slope distance and excluded from mechanical equipment activities. In areas where treatments may conflict, a hydrologist will be consulted.</p>		<p>P036-2, P057, P076, P080, P082, P083, P084, P083, P092, P093, P093, P098, P103, P104, P106, P107, and P160.</p>	<p>7, BMP 1.6, BMP 1.18 and BMP 1.19</p>
Watershed - 5	<p>New temporary roads or landings will not be constructed in any riparian reserve associated with stream channels, on toe zones of landslides, active landslides or inner gorges. Exceptions for this project design feature: Landings # DZ03, DZ10, DZ23, L043, L044, and L090. New landings in stream-course Riparian Reserves will not involve removing stream shade over perennial stream channels. For the six new landings in Riparian Reserve approved for use in this project, Forest Service watershed specialists will be involved in site specific decisions related to vegetation removal, drainage and erosion control, and hydrologic stabilization.</p>	All units where applicable		<p>Restriction on unstable lands is intended to not prevent attainment of ACS objectives and to meet BMP 1.6.</p>
Watershed - 6	<p>There will be no salvage logging on active landslides except for units 5, 23, 32, 39, 55, 56, 57, 59, 64, 226, 268, 406, 520, 524, 525, and 530 which have been field reviewed by the Forest Geologist (see Geology amendment for details on criteria for exceptions).</p>	1128, 228, 3, 65, 225, 500, 532,	None (all units with landslides are exemptions per the PDF).	<p>S&G MA10-7 and BMP 1.6</p> <p>Exceptions are intended to meet S&G 2-1 (manage vegetation on unstable lands to maintain or enhance slope stability).</p>
Watershed - 7	Limit equipment disturbance within 20 feet	All units where applicable		

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	on either side of swales by minimizing equipment crossings and avoiding running trails up the axis of swales, except at designated crossings.			
Watershed - 8	In salvage units and subsequent site preparation, skidding equipment will be restricted to slopes less than 35 percent. Skid trails that connect benches in dormant landslide terrain can have minor portions of the skid trails on slopes greater than 35 percent. Ground-based equipment can travel up to 100 feet on slopes 35 to 45 percent.	All salvage units.	All salvage units.	Soil types with granitic or schist parent material are most susceptible to rutting and displacement of soil organic matter. See S&G 3-3.
Watershed-9	In site preparation units (where no salvage will occur) mastication, felling, and skidding equipment will be restricted to slopes less than 35% on granitic and schist soil types, and up to 45% on all other soil types. Site preparation treatments in Riparian Reserves will be by hand only.	The following site prep and planting units have granitic or schist soil and slopes greater than 35 percent: P031_1, P039, P051, P051-1, P160, P172, P180, P189, P191, P194, and P201.	The following site prep and planting units have granitic or schist soil and slopes greater than 35 percent: P031_1, P039, P051, P051-1, P160, P172, P180, P189, P191, P194, and P201.	Soil types with granitic or schist parent material are most susceptible to rutting and displacement of soil organic matter. See S&G 3-3.
Watershed - 10	During site preparation, material greater than 8" inches in diameter would not be removed unless needed to reduce 1,000 hour fuel loading to seven tons per acre, retain as close to seven tons per acre as possible.	All units where applicable		S&G 3-6
Watershed - 11	Site preparation treatments would be designed to meet soils management direction in the Forest Plan. Site preparation will be used to reduce fuels where the sum of one hour, ten hour, and 100 hour fuels exceeds 7 tons per acre, .	All units where applicable		
Watershed - 12	All hazard trees cut within 25 feet of a stream channel or spring will be left on site unless it continues to pose a threat to safety or accessibility (see watershed-4 for equipment exclusion restrictions). Along all stream channels (perennial and intermittent), all hazard trees 26 inches in	All units where applicable		S&G MA10-56, MA10-58, MA10-53.

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	<p>diameter at breast height and greater within the first site tree (150-170 feet) will be left on site unless after felling, it continues to pose a threat to safety, infrastructure, forest road drainage system integrity or accessibility.</p> <p>Any hazard tree (equal or greater than 26 inches) below a road that would contact a fish bearing stream channel if felled that direction will be retained on site.</p>			
Watershed - 13	Live trees directly rooted into the banks or otherwise integral to the stability of the channel bank will not be felled unless they pose an overhead hazard and, if felled, will be left on site unless this poses a hazard on the ground per Forest Service safety requirements.	All units where applicable		S&G MA10-58, MA10-55, MA-10-56.
Watershed - 14	Directional felling will be used to protect streambanks where hazard trees need to be mitigated for public or employee safety.	All units where applicable		S&G MA10-61, MA10-59.
Watershed - 15	Improvements to existing system roads in the project area will avoid over-steepened road cuts where possible, minimize sidecasting, and maintain ditches, cross drains, and any outsloped road segments.	All units where applicable		S&G MA10-42, MA10-45, MA10-48.
Watershed - 16	Roads will be watered as appropriate to maintain road fines on site. Other materials may be used for dust abatement as approved by the Forest Service.	All units where applicable		S&G MA10-45, MA10-48.
Watershed - 17	Upgrades or improvements to stream crossings will be built to Forest Plan standards.	All units where applicable		S&G MA10-44.
Watershed - 18	Activities which require culvert replacement or removal will occur during the least critical periods for water and aquatic resources: when streams are dry or during low-water conditions; and in compliance with spawning and breeding season restrictions.	All units where applicable		S&G MA10-44.

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
Watershed - 19	Legacy sediment site treatments within or adjacent to streams will have erosion-prevention techniques applied such as silt fences, straw waddles, or mulch to minimize the risk of discharge.	All units where applicable		S&G MA10-42, MA10-45, MA10-48.
Watershed - 20	All project-related temporary structures, materials and project-related debris will not be stored for any length of time on active landslides and will be removed from riparian areas and stream channels prior to winter shutdown.	All units where applicable	All activities that produce spoils or debris.	BMP 1.6
Watershed - 21	For legacy sediment site repairs, fill materials generated will be reincorporated back into subgrade to the extent possible; all excess fill materials will be spoiled at a site reviewed and approved by Forest Service botanist, watershed, and heritage specialists.	All legacy site repair where applicable		S&G MA10-42, MA10-45, MA10-48.
Watershed - 22	Following harvest activities achieve at least 50 percent effective soil cover on new temporary roads (if it's available on site). Achieve 80% soil cover on hydrologically connected temporary roads and re-opened decommissioned roads within riparian reserves at the end of season of use. Block temporary roads after the harvest season (prior to the first winter after use). Depending on soil texture and slope, new temporary roads will also be sub-soiled, tilled (or tilled, or roughed up) after use. All temporary roads (new, existing or re-opened decommissioned roads) will have the takeoffs from system road obliterated or blocked to avoid unauthorized use. All temporary roads will be hydrologically stabilized including removal of culverts and fills at stream crossings, out-sloping of road surfaces, and proper construction of water bars. Erosion and sedimentation control structures (water bars) will be maintained	All new temp roads	All new temp roads	S&G 3-4, BMP 2.1

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.			
Watershed - 23	<p>Existing landings will be used to the extent possible. Existing landings in stream-course riparian reserves will not be expanded towards stream channels, or on to active landslides, or where vegetation that provides shade to a stream would need to be cut. Existing landings in riparian reserves will be shaped and treated for erosion control at the end of each season of use, and hydrologically restored at project completion (including subsoiling and covering with slash/mulch as needed). Reused landings in riparian reserves will have site specific erosion control measures to reduce risk of sediment delivery into streams.</p> <p>During opening or construction of any landings, material will not be sidecast into intermittent or perennial stream channels.</p> <p>At project conclusion, landings will be configured for long-term drainage and stability by reestablishing natural runoff patterns. All landings within riparian reserves will be covered with at least 80 percent effective soil cover at the end of season use. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.</p>	All units where applicable		S&G MA10-42, MA10-51.
Watershed - 24	Refueling will not take place within Riparian Reserves except at designated landings in locations where most disconnected from water resources. A spill containment kit will be in place where refueling and servicing take place. Helicopter refueling will not occur within Riparian Reserves. Equipment used for refueling will not exceed 150	All units where applicable		BMP 2.11

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	gallons.			
Watershed - 25	Skid trail erosion control work will be kept current during implementation. Erosion control and drainage of skid trails will be complete prior to shutting down operations due to wet weather or at project completion.	All units where applicable		BMP 1.17
Watershed - 26	Use existing skid trails instead of building new skid trails unless using existing skid trails will have greater negative effects. Space skid trails at least 75 feet apart, except near landings and where trails converge. Use no skid trails in areas in which ground-based mechanical equipment is excluded. Designation of new skid trails will be approved by a Timber Sale Administrator. Erosion and sedimentation control structure will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement.	All units where applicable		BMP 1.17
Watershed - 27	No full bench skid trails will be constructed. Full bench skid trails have the entire skid trail cut into the hillslope.	All units where applicable		BMP 2.2
Watershed - 28	Locations where skid trails intersect roads will be obliterated or effectively blocked to vehicle access.	All units where applicable		
Watershed - 29	Skyline corridors will be placed on the landscape as to minimize disturbance to active landslides, inner gorges and toe zones of dormant landslide deposits. All skyline and ground-based yarding will require one-end suspension in corridors and on skid trails. Corridors for skyline yarding that are parallel to the stream channel will be placed outside of the riparian reserve. The corridor may cross the stream channel with full suspension of logs within 30 feet from the stream bank.	All units where applicable	Unstable Lands: 005-10, 005-10-1, 005-3, 022, 208, 21, 22, 224, 226, 226-1, 226-2, 228-1, 23, 23_11, 23_15, 23_16, 23_22, 23_4, 23_5, 23_7, 23-1, 23-2, 243-1, 265, 403, 414, 417, 501, 508, 51, 522, 523, 523-1, 524, 525-2, 53, 530, 55, 55_1_1, 55_2_1, 55-3, 55-4, 56, 57, 58, 59, 64	For Unstable Lands: BMP 1.6

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	Apply erosion control measures as necessary in cable corridors to control erosion and runoff. This could include hand construction of water bars and /or spreading slash from adjacent areas.			
Watershed - 30	Where skidding occurs through units with less than 50 percent soil cover, mulch skid trails of greater than 15 percent slope, to achieve at least 50 percent effective soil cover on skid trails (approximately 40 acres across the project area may require this). Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of certified weed free materials including straw, wood chips, or mulch may be used where on-site material is insufficient.	Based on soil burn severity data, these units are most likely to require this: 225, 264, 402, 525, 528, 540, 1109, 1129, 1136, 1140, 1142, 1151, and 1155.260.1, 521, 408.41, 262, 517, 508.9, 580.4, 263, 20, 33, and 213	260.1, 525, 521, 408.41, 262, 517, 508.9, 580.4, 263, 20, 33, and 213	S&G 3-4
Watershed - 31	Prescribed fire effects in riparian reserves will mimic a low intensity backing fire, except for handpiles where higher intensity may occur to consume pile material. Ignition of underburns will generally not occur in riparian reserves. Approval by the District Fish Biologist is needed for underburn riparian reserve ignitions.	All units where applicable		MA10-65, MA10-68.
Watershed - 32	Handpiles and windrows in riparian reserves will be placed in a checkerboard pattern whenever possible (not piled directly above another). Handpiles will be less than six feet in diameter. Hand piles will be more than 30 feet away from intermittent streams and 70 feet away from perennial streams except in wildland urban interface areas where piles shall be more than 30 feet from perennial streams. No more than 30 percent or any riparian reserve acre, or other contiguous riparian reserve area which is less than one acre, can have burn scars at any time which do not have organic mulch or vegetative	All units where applicable		MA10-65, MA10-68.

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	<p>recovery (i.e. not invasive weeds). Consider raking burn scars to restore ground cover and facilitate vegetative recovery as soon as the burn is completely extinguished.</p>			
Watershed - 33	<p>For underburning, hand-line construction in riparian vegetation shall be avoided and in general should be farther than 25 feet from stream channels. Handlines will be mitigated (waterbarred and covered with organic material) immediately following prescribed burning, when safe to do so.</p>	All units where applicable		MA10-65, MA10-68.
Watershed - 34	<p>Draft water only at sites designated by the Forest Service. Decisions related to where water drafting occurs will be coordinated with a Forest Service fisheries biologist so that potential impacts to anadromous fish, and the thermal refugia they rely upon, are sufficiently minimized.</p> <p>Sites that are not likely to have rearing Coho salmon present will be prioritized for use, such as mainstem sites on the Klamath, Scott, and Salmon rivers. Priority will also be given to sites that involve drafting relatively warmer waters in mainstem rivers; drafting from tributaries and colder water sources, especially in their lower reaches, will be avoided particularly during late summer and early fall (when fish survival is dependent upon thermal refugia). Water storage facilities such as foldable tanks are encouraged and will be assessed for sites with moderate flows that simultaneously support rearing SONCC coho salmon, and may be subject to high drafting use (e. g., Walker Creek). Project-related water drafting will be monitored, and shifted away from streams if their baseflows will no longer sustain drafting-related water withdrawal consistent with PDFs. The following creeks will be avoided, due to</p>	All units where applicable		Designed to prevent adverse effects to ESA-listed fish, and consistent with BMP 2.5.

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	<p>their small size, small summer base flows, and consistent presence of rearing SONCC Coho salmon - Tom Martin Cr, O'Neil Cr, Little Horse Cr, and China Cr.</p> <p>When drafting from waters designated as coho salmon Critical Habitat:</p> <p>NOAA Fisheries Water Drafting Specifications (2001) apply</p> <ol style="list-style-type: none"> 1. Intakes will be screened with 3/32" mesh for rounded or square openings, or 1/16" mesh for slotted openings. When in habitat potentially occupied by steelhead trout, intakes will be screened with 1/8" mesh size. Wetted surface area of the screen or fish-exclusion device shall be proportional to the pump rate to ensure that water velocity at the screen surface does not exceed 0.33 feet/second. <ol style="list-style-type: none"> a. Use of a NOAA approved fish screen will ensure the above specifications are met. 2. Fish screen will be placed parallel to flow. 3. Pumping rate will not exceed 350 gallons-per-minute or 10% of the flow of the anadromous stream drafted from. 4. Pumping will be terminated when tank is full. <p>Additional applicable specifications:</p> <ul style="list-style-type: none"> • There will be no modification/improvement of drafting sites in Coho Critical Habitat. <p>Water drafting by more than one truck shall not occur simultaneously.</p> <p>When drafting from waters that are not Coho Salmon critical habitat:</p> <p>Forest Service Best Management Practices (BMP) Handbook direction applies (BMP 2.5)</p>			

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	<p>1. For fish-bearing streams, the water drafting rate should not exceed 350 gallons per minute for streamflow greater than or equal to 4.0 cubic feet per second (cfs).</p> <p>2. Below 4.0 cfs, drafting rates should not exceed 20 percent of surface flows.</p> <p>3. Water drafting should cease when bypass surface flows drop below 1.5 cfs.</p> <p>4. Intakes, for trucks and tanks, shall be placed parallel to the flow of water and screened, with opening size consistent with the protection of aquatic species of interest.</p> <p>5. Fish-bearing streams that are temporarily dammed to create a drafting pool shall provide fish passage for all life stages of fish.</p> <p>When drafting from non-fish-bearing waters:</p> <p>Forest Service BMP Handbook direction applies (BMP 2.5)</p> <ul style="list-style-type: none"> • Drafting rate should not exceed 350 gallons per minute for stream flow greater than or equal to 2.0 cubic feet/second. • Drafting rate should not exceed 50 percent of surface flow. • Drafting should cease when bypass surface flow drops below ten gallons per minute. • Drafting by more than one truck shall not occur simultaneously. 			
Watershed - 35	<p>Rock and gravel will be applied to drafting sites if it is needed to prevent stream sedimentation.</p> <p>Water drafting sites located outside of Coho salmon Critical Habitat only may include minor instream modification, such as fine sediment removal and building of board/plastic dams. All boards and plastic</p>	All units where applicable		BMP 2.5

Project Design Feature	Description	Applicable Alternatives and Units	Applicable Units for Mod Alt. 3 ONLY	Rationale OR Applicable Standard and Guideline
	will be removed after use.			