

## **Appendix II – Activity Categories, Program Administration, Conservation Measures, Project Design Criteria and Removal & Fill Thresh holds that will guide work conducted under a renewed Army Corps of Engineers (ACOE) Regional General Permit 4 and Oregon Department of State Lands (ODSL) GP-42104-RF, hereinafter referred to as the “PERMIT.”**

### **A. Aquatic Restoration Activity Categories**

The BLM and FS propose to implement the following 11 aquatic restoration categories under the proposed PERMIT.

1. Fish Passage Restoration
  - Stream Simulation Culvert and Bridge Projects
  - Headcut and Grade Stabilization
2. Large Wood, Boulder, and Gravel Placement
  - Large Wood and Boulder Projects
  - Porous Boulder Weirs and Veins
  - Gravel Augmentation
3. Legacy Structure Removal
4. Off- and Side-Channel Habitat Restoration
5. Streambank Restoration
6. Set-back or Removal of Existing Berms, Dikes, and Levees along Floodplains, Freshwater Deltas, and Estuaries
7. Reduction/Relocation of Recreation Impacts
8. Livestock Fencing, Stream Crossings, and Off-Channel Livestock Watering
9. Road and Trail Erosion Control and Decommissioning
10. Juniper Removal
11. Riparian Vegetative Planting

### **B. Program Administration**

The framework under which the 11 aquatic restoration categories are to be implemented is constrained by location, the number of allowable projects, reporting of such projects, and program level meetings between the BLM, FS, ACOE, and ODSL.

1. **Location of Projects** – The aquatic restoration projects to be implemented under a PERMIT will occur in the state of Oregon where BLM and Forest Service (FS) administered lands occur.
2. **Wyden Amendment Projects** – The BLM and FS propose that aquatic restoration. The projects occur on non-federal lands when such projects directly assist the BLM and/or FS in achieving their aquatic restoration goals and are funded in part by the BLM and FS. The BLM and FS are permitted to fund such projects under Wyden Amendment authority (16 U.S.C. 1011(a), as amended by Section 136 of PL 105-277). When such projects occur, the BLM and FS will implement the following process:
  - i. **County Signatures** – The sub-applicant (non-federal landowners) shall complete a Wyden form that will include a section for county signatures. Refer to Appendix V. This will be kept in the BLM and/or FS project file. The project notification will identify a project as a “Wyden Project” and reference the accompanying county signature form.
  - ii. **Compliance with PERMIT** – The BLM and FS will ensure that projects covered under the Wyden Authority on non-federal land undergo the same process and compliance as projects occurring on BLM and/or FS administered lands. This includes compliance with the Federal Endangered Species and Clean Water Acts, cultural resources requirements (SHPO), and all other requirements included in this application and subsequent PERMIT.
  - iii. The project notification form (described in B. 9.) will be accompanied by a completed Wyden form found in Appendix V.

3. **Number of Projects** – Within the state of Oregon, the BLM and FS propose to conduct no more than 170 projects each year.
4. **Integration of Project Design Criteria (PDC) and Conservation Measures (CM) into Project Design and Contract Language** – Appropriate aquatic and terrestrial CMs along with PDCs listed in the PERMIT shall be incorporated into contract language or force-account implementation plans.
5. **Coordination with ODFW** – As early in the planning and design as possible, a scoping letter, or similar form of correspondence, shall be sent to the local ODFW District Fisheries Biologist identifying the project being proposed under the PERMIT. During planning and design, a good faith effort must be taken to incorporate any reasonable comments or suggestions made by ODFW.
  - a. **Resolution of conflict with ODFW** – When the ODFW receives the 60-day pre-project notification (described in B. 9. below) and they have concerns that the project does not fit the PERMIT as designed, they may contact the ODSL coordinator. To do so, the ODFW must have provided related comments during the scoping process. The ODSL may determine based on this feedback that the project is not covered by the PERMIT, will contact the ACOE, and may require authorization through a General Authorization or Individual Permit.
6. **Oregon State Marine Board (OSMB):** Inform the OSMB when the following PERMIT actions occur on a waterway as listed in Appendix IV:
  - a. Fish Passage Restoration
  - b. Large Wood, Boulder, and Gravel Placement
  - c. Legacy Structure Removal (when structures are replaced in the channel)
  - d. Off- and Side-Channel Habitat Restoration (when main channel structures are required)
  - e. Streambank Restoration (when stabilization material, such as large wood, extends into the channel)
  - f. Reduction/Relocation of Recreation Impacts (when projects restrict existing boat access)
  - g. Livestock Fencing, Stream Crossings, and Off-Channel Livestock Watering (when fences are constructed across the channel)

The correspondence shall reference the PERMIT and direct to the Oregon State Marine Board, PO Box 14145, Salem, OR 97309 or OSMB contact Douglas Baer (503) 378-2603.
7. **Tribal Coordination and Compliance with the Section 106 of National Historic Preservation Act:**
  - a. Document that the appropriate Tribes have evaluated the proposed project and determined it will not impact such things as cultural resources, treaty fishing access sites, usual and accustomed areas, burial sites, or Traditional Cultural Properties. This process may occur through a locally established protocol between the BLM/FS and a Tribe.
  - b. Document coordination with the State Historic Preservation Office (SHPO).
8. **Wild and Scenic Rivers** – When work is conducted in or along a state or federal wild and scenic river, the following pre-implementation processes will be conducted.
  - a. State Wild and Scenic Rivers – The BLM and FS will contact the Oregon Department of Parks and Recreation to ensure that all projects within Oregon’s wild and scenic rivers are in accordance with state statutes.
  - b. Federal Wild and Scenic Rivers – Aquatic restoration projects will be in accordance with the federal Wild and Scenic Rivers Act by protecting and enhancing the free-flow condition, water quality, and “Outstandingly Remarkable Values.” The BLM and FS will use locally established protocols to make such determinations.
9. **Project Notification** – Under a PERMIT, individual BLM and FS administrative units will notify the ACOE, ODSL, and ODFW of each project at least 60 days prior to implementation through a pre-project notification form. The notification is not a request for approval but to inform the ACOE, ODSL, and ODFW as to what projects will be implemented under the PERMIT and to provide an opportunity for such agencies to submit essential information to the BLM and FS that may not have been available during project planning. The notification will include the following information:
  - a. Action identifier – The same unique identification number is necessary for each project’s Action Notification and Project Completion report.
  - b. Project Name – Use the same project name from notification to completion (i.e., Jones Creek, Tillamook Co. OR, culvert replacement).

- c. Location – 6th field HUC, stream name, and latitude and longitude (decimal degrees)
- d. Agency Contact – Agency and project lead name
- e. Timing – Project start and end dates
- f. Activity Type – As listed in section I. A. above.
- g. Project Description – Brief narrative of the project and objectives
- h. Extent – Number of stream miles or acres to be treated
- i. Species Affected – Listed Fish and or Wildlife species, Critical Habitat, and or EFH, or non-listed fish species affected by project
- j. Date of Submittal
- k. For any action requiring a site assessment for contaminants, include a copy of the report explaining the likelihood that contaminants are present at the site.
- l. Verification – Check box that verifies that all appropriate General Aquatic Conservation Measures, Wildlife Conservation Measures, Project Design Criteria for Aquatic Restoration Activity Categories, and Project Design Criteria for Terrestrial Species and Habitats have been thoroughly reviewed and will be incorporated into project design, implementation, and monitoring.

**10. Project Completion Report** – On an annual basis, the BLM and FS will provide the ACOE, ODSL, and ODFW a project completion report, which summarizes all projects for a given year, no later than January 31 of the following year. The form will include the information elements used for project notification along with additional completion information.

- a. Action identifier (same number as in notification)
- b. Action name (same name as in notification)
- c. Location – 6th field HUC, stream name, latitude and longitude
- d. Agency Contact – Agency and project lead name
- e. Timing – Actual project start and end dates
- f. Activity Type – As listed in section I. A. above.
- g. Project Description – Brief narrative of the completed project and objectives
- h. Extent – Number of stream miles or acres treated
- i. Species effected – Fish and or Wildlife species affected by the project, Critical Habitat and or EFH
- j. Number of Northern Spotted Owl, or Marbled Murrelet nests disrupted and disturbed during critical nesting period
- k. Fish Pursuit and Capture – If fish are pursued and/or captured during salvage operations, the project biologist will describe removal methods, stream conditions, and the number of fish handled, injured, or killed. More detailed information will be required for excessive mortality. This report will likely be limited to fish passage, dam removal, and channel restoration/relocation projects.
- l. State-specific 401 Certification monitoring results. If protocol conditions were not met, describe effects and any remedial actions.
- m. Post Project Assessment – Effects not considered and remedial actions taken, including any dates work ceased due to high flows
- n. Date of Submittal

**11. Annual Program Report** – The BLM Oregon State Office and FS Region 6 Office will provide an annual program report to ACOE, ODSL, and ODFW by February 15 of each year that describes BLM and FS projects implemented under the PERMIT. The report will include the following information:

- a. An assessment of overall program activity
- b. A map showing the location and type of each action carried out under the PERMIT
- c. A list of any actions which BLM and FS funded or carried out using the PERMIT.
- d. Data or analyses that the BLM and FS deem necessary or helpful to assess habitat trends as a result of actions carried out under the PERMIT.

**12. Annual Coordination Meeting** – The BLM Oregon State Office, FS Region 6 Office, will meet with the ACOE, ODSL, and ODFW by April 30 each year to discuss the annual program report and any actions that will improve conservation under the PERMIT or make the program more efficient or accountable.

## C. General Aquatic Conservation Measures

General Aquatic Conservation Measures (ACM) are intended to minimize effects to the aquatic environment, and the following apply, when relevant, to all 11 aquatic restoration categories.

### 1. Technical Skill and Planning Requirements

- a. Ensure that an experienced fisheries biologist or hydrologist is involved in the design of all projects covered by a PERMIT. The experience should be commensurate with technical requirements of a project.
- b. Planning and design includes field evaluations and site-specific surveys, which may include reference reach evaluations that describe the appropriate geomorphic context in which to implement the project. Planning and design involves appropriate expertise from staff or experienced technicians (e.g., fisheries biologist, hydrologist, geomorphologist, wildlife biologist, botanist, engineer, silviculturist, fire/fuels specialists.)
- c. The project fisheries biologist/hydrologist will ensure that project design criteria are incorporated into implementation contracts. If a biologist or hydrologist is not the Contracting Officers Representative (COR), then the biologist or hydrologist must regularly coordinate with the project COR to ensure the project design criteria and conservation measures are being followed.

### 2. Wetland Identification and Impact Analysis:

- a. Conduct an inspection for all projects to identify wetland areas. Wetlands are defined and identified through criteria set forth in the Corps 1987 Wetland Delineation Manual and regional supplements.  
<http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf>  
<http://www.oregonstatelands.us/ODSL/WETLAND/docs/fact4.pdf> (laymen edition)  
<http://www.oregonstatelands.us/ODSL/WETLAND/wetlandfacts.shtml>
- b. Initial wetland inspections will rely on a survey conducted by a botanist (or a person with technical expertise in plant identification) to determine if hydrophytic vegetation is present in the project area as that may indicate presence of a wetland. Hydrophytic vegetation is identified in the **National List of Plant Species that Occur in Wetlands, USFWS 1988 and 1993 update**:  
[http://rsgisias.crrel.usace.army.mil/NWPL/static/cfg/doc/pdf\\_2013\\_pub/National/National\\_2013v1.pdf](http://rsgisias.crrel.usace.army.mil/NWPL/static/cfg/doc/pdf_2013_pub/National/National_2013v1.pdf)
- c. Any questionable areas may require additional inspection by a hydrologist and/or soils scientist to determine if the criteria for a wetland are present.
- d. If wetlands exist in the project site, use the following practices in preferential order:
  - i. Flag off wetlands or potential wetlands and avoid construction activities or operating machinery.
  - ii. If wetlands cannot be avoided for access, equipment access through wetlands shall occur only when the wetlands are dry or over removable mats or pads to prevent compaction or rutting. Any compaction, rutting, or other disturbance shall be restored to pre-existing conditions following construction.
  - iii. Wetland projects that are approved under this PERMIT include the following:
    - a) An aquatic restoration project that converts wetlands to other waters of the state to improve or restore fish habitat lost by past land use activities. This practice applies only to Reconnection of Existing Side Channel and Alcove projects, where disconnected side channels and alcoves contain wetland features that will be converted (upon project completion) to a flowing water regime.
    - b) As part of Large Wood Placement projects, large wood may be placed in wetlands, which are located in floodplains, as long as wetland values and functions are not diminished.
    - c) Removal of anthropogenic fill in floodplain/wetland areas under the following aquatic restoration categories: Set-back or Removal of Existing Berms, Dikes, and Levees along Floodplains, Freshwater Deltas, and Estuaries; Reduction/Relocation of Recreation Impacts
  - iv. If project removal or fill actions cannot meet these criteria, the project is not eligible under the PERMIT.

**3. Climate Change** – Consider climate change information, such as predictive hydrographs for a given watershed or region, when designing PERMIT projects.

**4. Lamprey** – To the extent possible, incorporate lamprey BMPs found in Best Management Practices to Minimize Adverse Effects to Pacific Lamprey, *Entosphenus tridentatus* (USFWS 2010).

**5. In-water Work Period** – Follow the appropriate ODFW (2008) guidelines for timing of in-water work: ([http://www.dfw.state.or.us/lands/inwater/Oregon\\_Guidelines\\_for\\_Timing\\_of\\_%20InWater\\_work2008.pdf](http://www.dfw.state.or.us/lands/inwater/Oregon_Guidelines_for_Timing_of_%20InWater_work2008.pdf))

If work occurs in occupied Oregon chub habitat, in-water work will not occur between June 1 and August 15. The BLM and FS will request exceptions to in-water work windows through ODFW and Level I NMFS and/or USFWS representatives when ESA-listed species or critical habitat occur in the project area.

## 6. Fish Passage

- a. **Projects Implemented under the Fish Passage Restoration category** – Fish passage will be provided for any adult or juvenile fish likely to be present in the action area during construction, unless stream isolation and dewatering is required during project implementation or where the stream reach is naturally impassible at the time of construction. After construction, adult and juvenile passage that meets NMFS’s fish passage criteria (NMFS 2011) will be provided for the life of the action. Further, all projects should meet ODFW fish passage criteria as defined in OAR 635-412-0035.
- b. **Remaining restoration activity categories** – All projects will maintain existing fish passage in areas currently or historically occupied by native fish.

## 7. Site Assessment for Contaminants

– In developed or previously developed sites, such as areas with past dredge mines, or sites with known or suspected contamination, a site assessment for contaminants will be conducted on projects that involve excavation of > 20 cubic yards of material. The action agencies will complete a site assessment to identify the type, quantity, and extent of any potential contamination. The level of detail and resources committed to such an assessment will be commensurate with the level and type of past or current development at the site. The assessment may include the following:

- a. Review of readily available records, such as former site use, building plans, and records of any prior contamination events
- b. Site visit to observe the areas used for various industrial processes and the condition of the property
- c. Interviews with knowledgeable people, such as site owners, operators, occupants, neighbors, local government officials, etc.
- d. Report that includes an assessment of the likelihood that contaminants are present at the site.

## 8. Pollution and Erosion Control Measures (PCEM)

– When heavy machinery will be used to complete a project, implement the following PCEMs:

- a. Project Contact: Identify a project contact (name, phone number, an address) that will be responsible for implementing PCEMs.
- b. List and describe any hazardous material that would be used at the project site, including procedures for inventory, storage, handling, and monitoring; notification procedures; specific clean-up and disposal instructions for different products available on the site; proposed methods for disposal of spilled material; and employee training for spill containment.
- c. Temporarily store any waste liquids generated at the staging areas under cover on an impervious surface, such as tarpaulins, until such time they can be properly transported to and treated at an approved facility for treatment of hazardous materials.
- d. Procedures based on Best Management Practices to confine, remove, and dispose of construction waste, including every type of debris, discharge water, concrete, cement, grout, washout facility, welding slag, petroleum product, or other hazardous materials generated, used, or stored on-site.
- e. Procedures to contain and control a spill of any hazardous material generated, used or stored on-site, including notification of proper authorities. Ensure that materials for emergency erosion and hazardous materials control are onsite (e.g., silt fence, straw bales, oil-absorbing floating boom whenever surface water is present).
- f. 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 associated with the action area.
- g. No uncured concrete or form materials will be allowed to enter the active stream channel.
- h. Steps to cease work under high flows, except for efforts to avoid or minimize resource damage.

## 9. Site Preparation

- a. **Flagging Sensitive Areas** – Prior to construction, flag critical riparian vegetation areas, wetlands, and other sensitive sites to minimize ground disturbance.
- b. **Staging Area**– Establish staging areas for storage of vehicles, equipment, and fuels to minimize erosion into or contamination of streams and floodplains.

- i. No Topographical Restrictions – place staging area 150 feet or more from any natural water body or wetland in areas where topography does not restrict such a distance.
- ii. Topographical Restrictions –place staging area away from any natural water body or wetland to the greatest extent possible in areas with high topographical restriction, such as constricted valley types.
- c. **Temporary Erosion Controls** – Place sediment barriers prior to construction around sites where significant levels of erosion may enter the stream directly or through road ditches. Temporary erosion controls will be in place before any significant alteration of the action site and will be removed once the site has been stabilized following construction activities.
- d. **Stockpile Materials** – Minimize clearing and grubbing activities when preparing staging, project, and or stockpile areas. Any large wood, topsoil, and native channel material displaced by construction will be stockpiled for use during site restoration. Materials used for implementation of aquatic restoration categories (e.g., large wood, boulders, fencing material etc.) may be staged within the 100-year floodplain.
- e. **Hazard Trees** - Where appropriate, include hazard tree removal (amount and type) in project design. Fell hazard trees within riparian areas when they pose a safety risk. If possible, fell trees towards a stream. Keep felled trees on site when needed to meet coarse woody debris objectives.

## 10. Heavy Equipment Use

- a. **Choice of Equipment** – Heavy equipment will be commensurate with the project and operated in a manner that minimizes adverse effects to the environment (e.g., minimally-sized, low pressure tires, minimal hard turn paths for tracked vehicles, temporary mats or plates within wet areas or sensitive soils).
- b. **Fueling and Cleaning and Inspection for Petroleum Products and Invasive Weeds**
  - i. All equipment used for instream work will be cleaned for petroleum accumulations, dirt, plant material (to prevent the spread of noxious weeds), and leaks repaired prior to entering the project area. Such equipment includes large machinery, stationary power equipment (e.g., generators, canes, etc.), and gas-powered equipment with tanks larger than five gallons.
  - ii. Store and fuel equipment in staging areas after daily use.
  - iii. Inspect daily for fluid leaks before leaving the vehicle staging area for operation.
  - iv. Thoroughly clean equipment before operation below ordinary high water or within 50 feet of any natural water body or areas that drain directly to streams or wetlands and as often as necessary during operation to remain grease free.
- c. **Temporary Access Roads** – Existing roadways or travel paths will be used whenever possible. Minimize the number of temporary access roads to lessen soil disturbance and compaction and impacts to vegetation. Temporary access roads will not be built on slopes where grade, soil, or other features suggest a likelihood of excessive erosion or failure. When necessary, temporary access roads will be obliterated and/or revegetated. Temporary roads in wet or flooded areas will be restored by the end of the applicable in-water work period. Construction of new permanent roads is not permitted.
- d. **Stream Crossings** – Minimize number and length of stream crossings. Such crossings will be at right angles and avoid potential spawning areas to the greatest extent possible. Stream crossings shall not increase the risk of channel re-routing at low and high water conditions. After project completion, temporary stream crossings will be abandoned and the stream channel and banks restored.
- e. **Work from Top of Bank** – To the extent feasible, heavy equipment will work from the top of the bank, unless work from another location (instream) would result in less habitat disturbance, less floodplain disturbance, and/or better meet PERMIT design criteria. In another way, operate heavy equipment in streams only when project specialists believe that such actions are the only reasonable alternative for implementation, or would result in less sediment in the stream channel or damage (short- or long-term) to the overall aquatic and riparian ecosystem relative to other alternatives.
- f. **Timely Completion** – Minimize time in which heavy equipment is in stream channels, riparian areas, and wetlands. Complete earthwork (including drilling, excavation, dredging, filling and compacting) as quickly as possible. During excavation, stockpile native streambed materials above the bankfull elevation, where it cannot reenter the stream, for later use.

## 11. Site Restoration

- a. **Initiate Rehabilitation** – Upon project completion, rehabilitate all disturbed areas in a manner that results in similar or better than pre-work conditions through removal of project related waste, spreading of

stockpiled materials (soil, large wood, trees, etc.) seeding, and/or planting with local native seed mixes or plants.

- b. **Short-term Stabilization** – Measures may include the use of non-native sterile seed mix (when native seeds are not available), weed-free certified straw, jute matting, and other similar techniques. Short-term stabilization measures will be maintained until permanent erosion control measures are effective. Stabilization measures will be instigated within three days of construction completion.
- c. **Revegetation** – Replant each area requiring revegetation prior to or at the beginning of the first growing season following construction. Achieve re-establishment of vegetation in disturbed areas to at least 70% of pre-project levels within three years. Use an appropriate mix of species that will achieve establishment and erosion control objectives, preferably forb, grass, shrub, or tree species native to the project area or region and appropriate to the site. Barriers will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
- d. **Planting Manuals** – All riparian plantings shall follow Forest Service direction described in the Regional letter to Units, Use of Native and Nonnative Plants on National Forests and Grasslands May 2006 (Final Draft), and or BLM Instruction Memorandum No. OR-2001-014, Policy on the Use of Native Species Plant Material.
- e. **Decompact Soils** – When necessary, loosen compacted areas, such as access roads and paths, stream crossings, staging, and stockpile areas.

**12. Monitoring** – Monitoring will be conducted by BLM or FS staff during and after a project to track effects and compliance with PERMIT.

a. **Implementation**

- i. Visually monitor during project implementation to ensure effects are not greater (amount, extent) than anticipated and to contact Level 1 representatives if problems arise.
  - ii. Fix any problems that arise during project implementation.
  - iii. Regular biologist/hydrologist coordination with COR if biologist/hydrologist is not always on site to ensure contractor is following all stipulations.
- b. **401 Certification** – To minimize short-term degradation to water quality during project implementation, follow current 401 Certification provisions of the Federal Clean Water Act for maintenance or water quality standards described by the Oregon Department of Environmental Quality.
- c. **Post Project** – A post-project review shall be conducted after winter and spring high flows.
- i. For each project, conduct a walk through/visual observation to determine if there are post-project affects that were not considered during consultation? For fish passage and revegetation projects, monitor in the following manner:
    - (a) **Fish Passage Projects** – Note any problems with channel scour or bedload deposition, substrate, discontinuous flow, vegetation establishment, or invasive plant infestation.
    - (b) **Revegetation** – For all plant treatment projects, including site restoration, monitor for and remove invasive plants until native plants become established.
  - ii. In cases where remedial action is required, such actions are permitted without additional consultation if they use relevant PERMIT PDCs and CMs and the effects of PERMIT programmatic actions are not exceeded.
- d. **Compliance Monitoring** – The BLM and FS will conduct compliance monitoring each year, and a protocol will be co-developed with the BLM, FS, ODSL, and ACOE during the summer of 2014.

**D. Work Area Isolation & Fish Capture and Release**

Isolate the construction area and remove fish from a project site for projects that include concentrated and major excavation at a single location within the stream channel. This condition will typically apply to the following aquatic restoration categories: Fish Passage Restoration; Dam, Tidegate, and Legacy Structure Removal; Channel Reconstruction/Relocation.

- 1. **ODFW Scientific Take Permit (STP)** – Prior to work area isolation and fish salvage, acquire a STP from ODFW. For STP procedures refer to the following website:  
[http://www.dfw.state.or.us/fish/license\\_permits\\_apps/scientific\\_taking\\_permit.asp](http://www.dfw.state.or.us/fish/license_permits_apps/scientific_taking_permit.asp)
- 2. **Isolate Capture Area** – Install block nets at up and downstream locations outside of the construction zone and leave in a secured position to exclude fish from entering the project area. Leave nets secured to the stream channel bed and banks until construction activities within the stream channel are complete. If block nets or

traps remain in place more than one day, monitor the nets and or traps at least on a daily basis to ensure they are secured to the banks and free of organic accumulation and to minimize fish predation in the trap.

3. **Capture and release** – Fish trapped within the isolated work area will be captured and released as prudent to minimize the risk of injury, then released at a safe release site, preferably upstream of the isolated reach in a pool or other area that provides cover and flow refuge. Collect fish by seine or dip nets as the area is slowly dewatered, and minnow traps will be in place overnight. Fish must be handled with extreme care and kept in water the maximum extent possible during transfer procedures. A healthy environment for the stressed fish shall be provided—large buckets (five-gallon minimum to prevent overcrowding) and minimal handling of fish. Place large fish in buckets separate from smaller prey-sized fish. Monitor water temperature in buckets and well-being of captured fish. If buckets are not being immediately transported, use aerators to maintain water quality. As rapidly as possible (especially for temperature-sensitive bull trout), but after fish have recovered, release fish. In cases where the stream is intermittent upstream, release fish in downstream areas and away from the influence of the construction. Capture and release will be supervised by a fishery biologist experienced with work area isolation and safe handling of all fish.
4. **Electrofishing** – Use electrofishing only where other means of fish capture may not be feasible or effective. If electrofishing will be used to capture fish for salvage, NMFS’ electrofishing guidelines will be followed (NMFS 2000 - <http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf>). Those guidelines are available from the NMFS Northwest Region, Protected Resources Division in Portland, Oregon.
  - a. Reasonable effort should be made to avoid handling fish in warm water temperatures, such as conducting fish evacuation first thing in the morning, when the water temperature would likely be coolest. No electrofishing should occur when water temperatures are above 18°C or are expected to rise above this temperature prior to concluding the fish capture.
  - b. If fish are observed spawning during the in-water work period, electrofishing shall not be conducted in the vicinity of spawning adult fish or active redds.
  - c. Only Direct Current (DC) or Pulsed Direct Current (PDC) shall be used.
  - d. Conductivity <100, use voltage ranges from 900 to 1100. Conductivity from 100 to 300, use voltage ranges from 500 to 800. Conductivity greater than 300, use voltage to 400.
  - e. Begin electrofishing with minimum pulse width and recommended voltage and then gradually increase to the point where fish are immobilized and captured. Turn off current once fish are immobilized.
  - f. Do not allow fish to come into contact with anode. Do not electrofish an area for an extended period of time. Remove fish immediately from water and handle as described below. Dark bands on the fish indicate injury, suggesting a reduction in voltage and pulse width and longer recovery time.
  - g. If mortality is occurring during salvage, immediately discontinue salvage operations (unless this would result in additional fish mortality), reevaluate the current procedures, and adjust or postpone procedures to reduce mortality.
5. **Dewater Construction Site** –When dewatering is necessary to protect species and/or critical habitat, divert flow around the construction site with a coffer dam (built with non-erosive materials) and an associated pump, a by-pass culvert, or a water-proof lined diversion ditch. Diversion sandbags can be filled with material mined from the floodplain as long as such material is replaced at end of project. Small amounts of instream material can be moved to help seal and secure diversion structures. Pumps must have fish screens and be operated in accordance with NMFS fish screen criteria described in part 5 of this section. Dissipate flow energy at the bypass outflow to prevent damage to riparian vegetation or stream channel. If diversion allows for downstream fish passage, place diversion outlet in a location to promote safe reentry of fish into the stream channel, preferably into pool habitat with cover. When necessary, pump seepage water from the de-watered work area to a temporary storage and treatment site or into upland areas and allow water to filter through vegetation prior to reentering the stream channel.
6. **Fish screens for Dewatering**
  - a. **NMFS Hydro Fish Passage Review and Approve** – When using Fish screens for surface water that is diverted by gravity or by pumping at a rate that exceeds 3 cfs, the BLM and FS will ensure that the action is individually reviewed by the Portland office of the NMFS’ Habitat Conservation Division for consistency with criteria in *NOAA Fisheries Anadromous Salmonid Passage Facility Design* (NMFS 2011), located at: <http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf>

- b. For the dewatering of a work site to remove or install culverts, bridge abutments, etc. a fish screen must be used on the pump intake to avoid juvenile fish entrainment that meets criteria specified by NMFS (2011, or most recent version).
  - c. All other diversions will have a fish screen that meets the following specifications: (a) An automated cleaning device with a minimum effective surface area of 2.5 square feet per cfs, and a nominal maximum approach velocity of 0.4 feet per second (fps), or no automated cleaning device, a minimum effective surface area of 1 square foot per cfs, and a nominal maximum approach rate of 0.2 fps; and (b) a round or square screen mesh that is no larger than 2.38 mm (0.094”) in the narrow dimension, or any other shape that is no larger than 1.75 mm (0.069”) in the narrow dimension.
  - d. Each fish screen will be installed, operated, and maintained according to NMFS’ fish screen criteria (NMFS 2011, or most recent version). NMFS fish screen criteria applies to federally listed salmonid species under their jurisdiction as well as bull trout, Oregon chub, shortnose sucker, Lahontan cutthroat trout, Lost River sucker, Modoc sucker, and Warner sucker under FWS jurisdiction.
- 7. Stream Re-watering** – Upon project completion, slowly re-water the construction site to prevent loss of surface water downstream as the construction site streambed absorbs water and to prevent a sudden increase in stream turbidity. Monitor downstream during re-watering to prevent stranding of aquatic organisms below the construction site.
- 8. Salvage Notice** – NOTICE: If a sick, injured, or dead specimen of a threatened or endangered species is found in the project area, the finder must notify NMFS through the contact person identified in the transmittal letter for this opinion, or through the NMFS Office of Law Enforcement at 1-800-853-1964, and follow any instructions. If the proposed action may worsen the fish’s condition before NMFS can be contacted, the finder should attempt to move the fish to a suitable location near the capture site while keeping the fish in the water and reducing its stress as much as possible. Do not disturb the fish after it has been moved. If the fish is dead, or dies while being captured or moved, report the following information: (a) NMFS consultation number; (b) the date, time, and location of discovery; (c) a brief description of circumstances and any information that may show the cause of death; and (d) photographs of the fish and where it was found. The NMFS also suggests that the finder coordinate with local biologists to recover any tags or other relevant research information. If the specimen is not needed by local biologists for tag recovery or by NMFS for analysis, the specimen should be returned to the water in which it was found, or otherwise discarded.

**E. Aquatic Restoration Activity Categories: Descriptions and Project Design Criteria**

The 11 aquatic restoration activity categories will be designed and implemented to help restore watershed processes. These projects will improve channel dimensions and stability, sediment transport and deposition, and riparian, wetland, floodplain and hydrologic functions, as well as water quality. As such, these improvements will help address limiting factors—related to spawning, rearing, migration, and more—for ESA-listed and other native fish species. Aquatic habitat restoration and enhancement projects are conducted within stream channels, adjacent riparian/floodplain areas, wetlands, and uplands. Work may be accomplished using manual labor, hand tools (chainsaws, tree planting tools, augers, shovels, and more), all-terrain vehicles, flat-bed trucks, and heavy equipment (backhoes, excavators, bulldozers, front-end loaders, dump trucks, winch machinery, cable yarding, etc.). Helicopters will be used for many large wood and salmon carcass placement projects.

The following Project Design Criteria (PDC) was developed to guide the design of aquatic restoration projects to be implemented under a PERMIT.

- 1. Fish Passage Restoration** includes the following: total removal of culverts or bridges, or replacing culverts or bridges with properly sized culverts and bridges, replacing a damaged culvert or bridge, and resetting an existing culvert that was improperly installed or damaged and stabilizing and providing passage over headcuts. Such projects will take place where fish passage has been partially or completely eliminated through road construction and stream degradation. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects.
- a. **Stream Simulation Culvert and Bridge Projects** – All road-stream crossing structures shall simulate stream channel conditions per *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings* (USFS 2008), located at: [http://stream.fs.fed.us/fishxing/aop\\_pdfs.html](http://stream.fs.fed.us/fishxing/aop_pdfs.html) .

**Stream Simulation Culvert and Bridge Projects – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
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ODFW Coordination via scoping and notification	2
Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	10

**ii. Excluded Projects** – Treated wood bridges are not covered.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to the replacement or removal of one road stream crossing structure (culvert or bridge). Project length, including grade control structures, shall not exceed 300’.
- b. For culvert replacement projects, both removal and fill will not exceed 800 cubic yards (each) below OHW. (This will accommodate large structures, such as open-bottom arches 30’x100’. These large structures will constitute <25% of the fish passage projects.) Substrate will be imported to embed culverts or open-bottom arches. The majority of projects will fall below this upper limit.
- c. For culvert removal and channel restoration projects, removal and fill amounts will be commensurate with that needed to restore floodplain and stream channel dimensions.
- d. Bypass roads that use culverts shall be constructed within the isolated work area, and the associated culvert shall be large enough to carry the highest flow reasonably to be expected to occur during construction. Bypass roads constructed from temporary bridges shall occur within or immediately adjacent to the dewatered area. For temporary bridges adjacent to the dewatered area, such bridges shall span the bankfull width and follow wetland guidelines in C. 2. d. of this appendix. Remove all construction material and restore area to pre-project conditions.

**i. Culvert Criteria** – Within the considerations of stream simulation, the structure shall, at a minimum, accommodate a bankfull wide channel plus constructed banks to provide for passage of all life stages of native fish species (for more information, reference Chapter 6, page 35 of the USFS Stream Simulation Guide). The following crossing-width guidance applies to specific ranges of entrenchment ratios as defined by Rosgen (1996):

- (a) Non-entrenched Streams: If a stream is not fully entrenched (entrenchment ratio of greater than 1.4), the minimum culvert width shall be at least 1.3 times the bankfull channel width. This is consistent with the *NOAA Fisheries Anadromous Salmonid Passage Facility Design* (section 7.4.2 “Stream Simulation Design”) (NMFS 2011), located at: <http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf> However, if the appropriate structure width is determined to be less than 1.3 times the bankfull channel width, processes for variances are listed in “iv” and “v” below.
- (b) Entrenched Streams: If a stream is entrenched (entrenchment ratio of less than 1.4), the culvert width must be greater than bankfull channel width, allow sufficient vertical clearance to allow ease of construction and maintenance activities, and provide adequate room for the construction of natural channel banks. Consideration should be given to accommodate the floodprone width. Floodprone is the width measured at twice the maximum bankfull depth (Rosgen, 1996).

**ii. Bridge Design**

- (a) Bridges with vertical abutments—including concrete box culverts, which are constructed as bridges—shall have their stream channels, including width, designed according to culvert guidelines.

- (b) Structure material must be concrete or metal. Concrete must be sufficiently cured or dried before coming into contact with stream flow. The use of treated wood for bridge construction or replacement is not allowed under this PERMIT.
  - (c) Riprap must not be placed within the bankfull width of the stream. Riprap may only be placed below bankfull height when necessary for protection of abutments and pilings. However, the amount and placement of riprap should not constrict the bankfull flow.
- iii. **Crossing Design**
- (a) All projects shall meet ODFW fish passage design criteria as defined in OAR 635-412-0035.
  - (b) Crossings shall be designed using an interdisciplinary design team consisting of an experienced Engineer, Fisheries Biologist, and Hydrologist/Geomorphologist.
  - (c) Crossing structures with widths that exceed 20 feet or with costs that exceed \$100,000 shall be reviewed by the USDA Forest Service AOP Design Assistance Team or a BLM equivalent.
  - (d) At least one member of the design team shall be trained in a week-long Aquatic Organism Passage course based on the USDA Forest Service’s guide, *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings* (USFS 2008) [http://stream.fs.fed.us/fishxing/aop\\_pdfs.html](http://stream.fs.fed.us/fishxing/aop_pdfs.html).
  - (e) Bankfull width shall be based on the upper end of the distribution of bankfull width measurements as measured in the reference reach to account for channel variability and dynamics.
- iv. **NMFS Hydro Fish Passage Review and Approve** - If the structure width is determined to be less than the established width criteria as defined above, a variance may be requested from the Portland office of the NMFS’ Habitat Conservation Division for consistency with criteria in NMFS (2011).
- b. **Headcut and Grade Stabilization** – Headcuts often occur in meadow areas, typically on Rosgen “C” and “E” channel types. Headcuts develop and migrate during bankfull and larger floods, when the sinuous path of Rosgen E type streams may become unstable in erosive, alluvial sediments, causing avulsions, meander cut-offs, bank failure, and development of an entrenched Rosgen G gully channel (Rosgen 1994).

**Headcut and Grade Stabilization – Key ACOE and ODSL Requirements:**

i. **Key Coordination Requirements and More**

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Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

ii. **Excluded Projects** – Actions that include complete fill of degraded/downcut stream channel; projects that use gabion baskets, sheet pile, concrete, articulated concrete block, and/or cable anchors, straight weirs that disperse flows and cause channel widening and structure flanking (erosion around the structure).

iii. **Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. Rock and Organic Material Headcut Armoring projects
  - (i) One project is equal to the stabilization of one headcut project and associated fish passage structures. Project length, from the headcut to the last downstream weir, shall not exceed 500 feet.
  - (ii) No more than 2,000 cubic yards of material will be placed within a stream channel with no more than 150 cubic yards to be used for an individual structure, such as a checkdam or headcut armor.
  - (iii) Fill to armor a headcut may extend into wetland areas immediately above the headcut.
  - (iv) Removal and fill associated with streambank excavation sites to key-in check dams will be commensurate with structure size. The width of a single excavation trench will not exceed 2x the structure width, and trench length will not exceed 10 feet on either side of a stream.

- i. **Stabilize Headcuts**
    - (a) Armor headcut with sufficiently sized and amounts of material to prevent continued up-stream migration of the headcut. Materials can include both rock and organic materials which are native to the area. Material shall not contain gabion baskets, sheet pile, concrete, articulated concrete block, and cable anchors.
    - (b) Focus stabilization efforts in the plunge pool, the headcut, as well as a short distance of stream above the headcut.
    - (c) Minimize lateral migration of channel around headcut (“flanking”) by placing rocks and organic material at a lower elevation in the center of the channel cross section to direct flows to the middle of channel.
    - (d) In streams with current or historic fish presence, provide fish passage over stabilized headcut through constructed riffles for pool/riffle streams or a series of log or rock weir structures for step/pool channels as described in part ii below.
    - (e) Short-term headcut stabilization (including emergency stabilization projects) may occur without associated fish passage measures. However, fish passage must be incorporated into the final headcut stabilization action and be completed during the first subsequent in-water work period.
    - (f) In streams without current or historic fish presence, it is recommended to construct a series of downstream log or rock weirs as described in part ii below to expedite channel aggradation.
  - ii. **Grade Stabilization to promote Fish Passage associated with Headcut Stabilization**
    - (a) **Design Review**
      - (i) **NMFS Hydro Fish Passage Review and Approve** – If headcut stabilization and channel spanning non-porous weirs create discrete longitudinal drops > 6”, the BLM and FS will ensure that the action is individually reviewed by the Portland office of the NMFS’ Habitat Conservation Division for consistency with criteria in *NOAA Fisheries Anadromous Salmonid Passage Facility Design* (NMFS 2011), located at: <http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf>
      - (ii) **ODFW Fish Passage Review** – All projects shall meet ODFW fish passage criteria as defined in OAR 635-412-0035. If headcut stabilization and channel spanning non-porous weirs create discrete longitudinal drops > 6”, the BLM and FS will ensure that design review of this action is coordinated through the ODFW Fish Passage Program (ORS Chapter 509), located in the Salem Office.
    - (b) Provide fish passage over stabilized headcut through constructed riffles for pool/riffle streams or a series of log or rock weir structures for step/pool channels. If large wood and boulder placement will be used for headcut stabilization, refer to activity category 2. Large Wood, Boulder, and Gravel Placement.
    - (c) Construct weirs in a ‘V’ shape, oriented with the apex upstream, and lower in the center to direct flows to the middle of channel.
    - (d) Key weirs into the stream bed to minimize structure undermining due to scour, preferably at least 2.5x their exposure height. The weir should also be keyed into both banks—if feasible greater than 8 feet.
    - (e) If several structures will be used in series, space the weirs at the appropriate distances to promote fish passage of all life stages of native fish. Incorporate state fish passage criteria (jump height, pool depth, etc.) in the design of weir structures. Recommended weir spacing should be no closer than the net drop divided by the channel slope (for example, a one-foot high weir in a stream with a two-percent gradient will have a minimum spacing of 50-feet [1/0.02]).
    - (f) Include fine material in the weir material mix to help seal the weir/channel bed, thereby preventing subsurface flow and ensuring fish passage immediately following construction if natural flows are sufficient.
    - (g) If a project involves the removal of multiple barriers on one stream or in one watershed over the course of a work season, remove the most upstream barrier first if possible.
- 2. Large Wood, Boulder, and Gravel Placement** includes large wood (LW) and boulder placement, porous boulder weirs and vanes, gravel placement, and tree removal for LW projects. Such activities will occur in

areas where channel structure is lacking due to past stream cleaning (LW removal), riparian timber harvest, and in areas where natural gravel supplies are low due to anthropogenic disruptions. These projects will occur in stream channels and adjacent floodplains to increase channel stability, rearing habitat, pool formation, spawning gravel deposition, channel complexity, hiding cover, low velocity areas, and floodplain function. Equipment such as helicopters, excavators, dump trucks, front-end loaders, full-suspension yarders, and similar equipment may be used to implement projects.

a. **Large Wood and Boulder Projects**

<b>Large Wood – Key ACOE and ODSL Requirements:</b>	
<b>i. Key Coordination Requirements and More</b>	
<b>Key Requirements</b>	<b>Appendix II page #</b>
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ODFW Coordination via scoping and notification	2
Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA
<b>ii. Excluded Projects –</b>	
<b>iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4</b>	
a. One project is equal to LW placement within a 6th HUC during a field season, regardless of placement method and project length.	
b. No more than 400 logs (key and non-key logs) per mile will be placed within the Ordinary High Water (OHW). Additional logs can be placed in the floodplain (above OHW) and associated wetlands as long as wetland functions and values are not impaired. The number of logs placed in a stream shall be commensurate with stream size, type, and local geomorphology and in a manner that does not impede fish passage.	
c. Placement of boulders to stabilize large wood may be used.	
d. Removal and fill associated with streambank excavation sites to anchor log structures into stream banks will be commensurate with structure size. In general, the width of excavation trenches will not exceed 2x the structure or log width, and trench length will not exceed ¾ the structure or log length.	

i. **Project Design Criteria**

- (a) Place LW and boulders in areas where they would naturally occur and in a manner that closely mimic natural accumulations for that particular stream type. For example, boulder placement may not be appropriate in low-gradient meadow streams.
- (b) Structure types shall simulate disturbance events—debris flows, rock slides, wind-throw, tree breakage, etc.—to the greatest degree possible.
- (c) No limits are to be placed on the size or shape of structures as long as such structures are within the range of natural variability of a given location and do not block fish passage.
- (d) Projects can include grade control and bank stabilization structures, while size and configuration of such structures will be commensurate with scale of project site and hydraulic forces.
- (e) The partial burial of LW and boulders is permitted and may constitute the dominant means of placement. This applies to all stream systems but more so for larger stream systems where use of adjacent riparian trees or channel features is not feasible or does not provide the full stability desired.

- (f) LW includes whole conifer and hardwood trees, logs, and rootwads. LW size (diameter and length) should account for bankfull width and stream discharge rates. When available, trees with rootwads should be a minimum of 1.5x bankfull channel width, while logs without rootwads should be a minimum of 2.0 x bankfull width.
- (g) Structures may partially or completely span stream channels or be positioned along stream banks.
- (h) Stabilizing or key pieces of LW must be intact, hard, with little decay, and if possible have root wads (untrimmed) to provide functional refugia habitat for fish. Consider orienting key pieces such that the hydraulic forces upon the large wood increases stability
- (i) Anchoring Large Wood – Anchoring alternatives may be used in preferential order:
  - (i) use of adequate sized wood sufficient for stability
  - (ii) orient and place wood in such a way that movement is limited
  - (iii) ballast (gravel and/or rock) to increase the mass of the structure to resist movement.
  - (iv) use of large boulders as anchor points for the LW.

**b. Porous Boulder Weirs and Vanes**

**Porous Boulder Weirs and Vanes – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
Wyden Projects	1
ODFW Coordination via scoping and notification	2
Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects** – Channel-spanning weirs that are perpendicular to stream flow; downstream pointed U or V style weirs.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to boulder placement within a 6th HUC during a field season, regardless of placement method and project length.
- b. Natural/random boulder placement
  - (i) No more than 2,500 cubic yards of boulders will be placed within the OHW per mile. No more than 250 cubic yards of material will be placed at one site.
  - (ii) Boulders should be placed in patterns of natural deposition that are found in the area.
- c. Boulder weirs in bedrock systems.
  - (i) For boulder weirs in bedrock streams, projects are limited to streams <80’ bankfull width and <5% slope, and such weirs shall not fill more than 50% of the bankfull cross-sectional area.
  - (ii) No more than 3,000 cubic yards of boulders will be placed within the OHW per mile, an upper limit that will accommodate severely degraded coastal basins.
  - (iii) No more than 350 cubic yards of material will be used to construct a single weir.
  - (iv) Natural boulder placement may be implemented upstream and downstream of a weir.
- d. Removal and fill associated with streambank excavation sites to anchor boulder structures into stream banks will be commensurate with structure size. In general, the width of excavation trenches will not exceed 2x the structure or boulder width, and trench length will not exceed 20’ on a single side of the stream. Slight amounts of bank armoring (up to 25% of the bankfull width in length up- and downstream of the excavation site) can be used to prevent bank scour.

**i. Project Design Criteria**

- (a) Full channel spanning boulder weirs are to be installed only in highly uniform, incised, bedrock-dominated channels to enhance or provide fish habitat in stream reaches where log placements are not practicable due to channel conditions (not feasible to place logs of sufficient length, bedrock dominated channels, deeply incised channels, artificially constrained reaches, etc.), where damage to infrastructure on public or private lands is of concern, or where private landowners will not allow log placements due to concerns about damage to their streambanks or property.
- (b) Install boulder weirs low in relation to channel dimensions so that they are completely overtopped during channel-forming flow events (approximately a 1.5-year flow event).
- (c) Boulder weirs are to be placed diagonally across the channel or in more traditional upstream pointing “V” or “U” configurations with the apex oriented upstream.
- (d) Boulder weirs are to be constructed to allow upstream and downstream passage of all native fish species and life stages that occur in the stream. Plunges shall be kept less than 6” in height.
- (e) The use of gabions, cable, or other means to prevent the movement of individual boulders in a boulder weir is not allowed.
- (f) Rock for boulder weirs shall be durable and of suitable quality to assure long-term stability in the climate in which it is to be used. Rock sizing depends on the size of the stream, maximum depth of flow, planform, entrenchment, and ice and debris loading.
- (g) The project designer or an inspector experienced in these structures should be present during installation.
- (h) Full spanning boulder weir placement should be coupled with measures to improve habitat complexity and protection of riparian areas to provide long-term inputs of LW.

**Gravel Placement – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

Key Requirements	Appendix II page #
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ODFW Coordination via scoping and notification	2
Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects –**

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to gravel placement within a 6th HUC during a field season, regardless of placement method and project length.
- b. No more 2,000 cubic yards of material will be placed within the OHW per mile and shall be in association with instream structures. The amount of gravel placed shall be commensurate with stream size and geomorphology and in a manner that does not impede fish passage. Spawning gravel will be comprised of clean, rounded river rock and its size determined by the need of fish species (typically 0.25 - 6 inches). No more than 250 cubic yards of material can be placed at one site.

**i. Project Design Criteria**

- (a) Gravel can be placed directly into the stream channel, at tributary junctions, or other areas in a manner that mimics natural debris flows and erosion.

- (b) Augmentation will only occur in areas where the natural supply has been eliminated, significantly reduced through anthropogenic disruptions, or used to initiate gravel accumulations in conjunction with other projects, such as simulated log jams and debris flows.
- (c) Gravel to be placed in streams shall be a properly sized gradation for that stream, clean, and non-angular. When possible use gravel of the same lithology as found in the watershed. Reference the *Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings* (USFS 2008) to determine gravel sizes appropriate for the stream. This manual can be found at the following location: [http://stream.fs.fed.us/fishxing/aop\\_pdfs.html](http://stream.fs.fed.us/fishxing/aop_pdfs.html)
- (d) Gravel can be mined from the floodplain at elevations above bankfull. Crushed rock is not permitted.
- (e) After gravel placement in areas accessible to higher stream flow, allow the stream to naturally sort and distribute the material.
- (f) Do not place gravel directly on bars and riffles that are known spawning areas, which may cause fish to spawn on the unsorted and unstable gravel, thus potentially resulting in redd destruction.
- (g) Imported gravel must be free of invasive species and non-native seeds. If necessary, wash gravel prior to placement,

d. **Tree Removal for LW Projects – Project Design Criteria**

- i. Live conifers and other trees can be felled or pulled/pushed over in the RR, RHCAs, and upland areas (e.g., LSR, AMA, NSO/MaMu CH) for in-channel large wood placement only when conifers and trees are fully stocked. Tree felling shall not create excessive stream bank erosion or increase the likelihood of channel avulsion during high flows.
- ii. Danger trees and trees killed through fire, insects, disease, blow-down and other means can be felled and used for in-channel placement regardless of live-tree stocking levels.
- iii. Trees may be removed by cable, ground-based equipment, horses or helicopters.
- iv. Trees may be felled or pushed/pulled directly into a stream and/or floodplain.
- v. Trees may be stock piled for future instream restoration projects.
- vi. The project manager for an aquatic restoration action under PERMIT will coordinate with an action-agency wildlife biologist in tree-removal planning efforts.

**3. Legacy Structure Removal** include actions that to remove large wood, boulders, rock gabions, and other in-channel structures that were constructed to improve fish habitat but were installed in a manner that was and continues to be inappropriate for the given stream type. During the 1980s and early 1990s, many habitat-forming structures, such as log weirs, boulder weirs, and gabions, were placed in an effort to create pool habitat. Many of these structures were placed in a manner that interfered with natural stream function, and therefore have been continually degrading stream habitat since their installation (USFWS 2007). For instance, these legacy structures typically resulted in widened stream channels, increased width/depth ratios, decreased sinuosity, and increased stream exposure to solar radiation. Removal of legacy structures would include the use of excavator-type machinery, spiders, backhoes, and dump trucks.

**Legacy Structure Removal – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
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Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

ii. **Excluded Projects** –Removal of dams and diversions.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to removal of legacy structures within a 6th HUC during a field season, regardless of removal method and project length.
- b. For large wood legacy structures, up to 600 logs may be removed or altered/stream mile with no more than 100 logs at any given site within a one-mile length.
- c. For boulder and gabion projects, removal will not exceed 3,500 cubic yards/stream mile with no more than 300 cubic yards at any given site, such as a single weir or a 100’ stream section that was treated with integrated boulders. Legacy boulder structures may be altered to better accommodate natural conditions.

**a. Project Design Criteria**

- i. If the structure being removed contains material (i.e., large wood, boulders, concrete, etc.) not typically found within the stream or floodplain at that site, remove material from the 100-year floodplain.
- ii. If the structure being removed contains material (i.e., large wood, boulders, etc.) that is typically found within the stream or floodplain at that site, the material can be reused to implement habitat improvements described under Large Wood, Boulder, and Gravel Placement activity category in this PERMIT.
- iii. If the structure being removed is keyed into the bank, fill in “key” holes with native materials to restore contours of stream bank and floodplain. Compact the fill material adequately to prevent washing out of the soil during over-bank flooding. Do not mine material from the stream channel to fill in “key” holes.
- iv. When removal of buried log structures may result in significant disruption to riparian vegetation and/or the floodplain, consider using a chainsaw to extract the portion of log within the channel and leaving the buried sections within the streambank.
- v. If a project involves the removal of multiple barriers on one stream or in one watershed over the course of a work season, remove the most upstream barrier first if possible.
- vi. If the legacy structures (log, rock, or gabion weirs) were placed to provide grade control, evaluate the site for potential headcutting and incision due to structure removal. If headcutting and channel incision are likely to occur due to structure removal, additional measures must be taken to reduce these impacts.
- vii. If the structure is being removed because it has caused an over-widening of the channel, consider implementing other ARBAII restoration categories to decrease the width to depth ratio of the stream to a level commensurate with the geomorphic setting.

**4. Off- and Side-Channel Habitat Restoration** projects will be implemented to reconnect historic side-channels with floodplains by removing off-channel fill and plugs. Furthermore, new side-channels and alcoves can be constructed in geomorphic settings that will accommodate such features. This activity category typically applies to areas where side channels, alcoves, and other backwater habitats have been filled or blocked from the main

channel, disconnecting them from most if not all flow events. These project types will increase habitat diversity and complexity, improve flow heterogeneity, provide long-term nutrient storage and substrate for aquatic macroinvertebrates, moderate flow disturbances, increase retention of leaf litter, and provide refuge for fish during high flows. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects

**Off and Side-channel Habitat Restoration Projects – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
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Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects** – Reconnection of main stem river oxbows.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to one side channel or alcove project. This does not include abandoned river channels.
- b. No more than 750 cubic yards of material will be removed below the existing OHW and from wetlands (within historic side channels or alcoves to be reconnected) from one project. Removal is limited to the inlet, outlet, and other filled portions of a side channel or within an alcove area.
- c. When constructing log or boulder structures in the main channel to restore side channel flow, fill shall not exceed 150 cubic yards for small streams (bankfull <40’) and 450 cubic yards for larger streams or main-stem rivers (bankfull >40’). Boulder weir construction will follow project design criteria provided in the Large Wood, Boulder, and Gravel Placement category.
- d. Disposal of excavated material from project sites shall not be placed in wetlands.

**a. Project Design Criteria**

- i. **NMFS Hydro Fish Passage Review and Approve** – When a proposed side channel will contain >20% of the bankfull flow, the BLM and FS will ensure that the action is individually reviewed by the Portland office of the NMFS’ Habitat Conservation Division for consistency with criteria in NMFS (2011). Refer to section C. 3. of this appendix.
- ii. **Data Requirements** – Data requirements and analysis for off- and side-channel habitat restoration include evidence of historical channel location, such as land use surveys, historical photographs, topographic maps, remote sensing information, or personal observation.
- iii. **Allowable Excavation** – Off- and side-channel improvements can include minor excavation ( $\leq$  10% of volume) of naturally accumulated sediment within historical channels. Except for projects implemented under a GP-42104-RF and RGP-4, there is no limit as to the amount of excavation of anthropogenic fill within historic side channels as long as such channels can be clearly identified through field and/or aerial photographs. Excavation depth will not exceed the maximum thalweg depth in the main channel. Excavated material removed from off- or side-channels shall be hauled to an upland site or spread across the adjacent floodplain in a manner that does not restrict floodplain capacity.

5. **Streambank Restoration** will be implemented through bank shaping and installation of coir logs or other soil reinforcements as necessary to support riparian vegetation; planting or installing large wood, trees, shrubs, and herbaceous cover as necessary to restore ecological function in riparian and floodplain habitats; or a combination of the above methods. Such actions are intended to restore banks that have been altered through road construction, improper grazing, invasive plants, and more. Benefits include increased amounts of riparian vegetation and associated shading, bank stability, and reduced sedimentation into stream channels and spawning gravels. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

**Streambank Restoration Projects – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

Key Requirements	Appendix II page #
Wyden Projects	1
ODFW Coordination via scoping and notification	2
Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

- ii. **Excluded Projects** – Use of dikes, groins, buried groins, drop structures, rip-rap, rock-toes, when such material does not naturally occur in the stream, and similar structures to stabilize streambanks. Projects that use instream rock to stabilize banks. For actions not associated with protection of infrastructure (e.g. roads and buildings), projects that harden the streambanks in a manner that severely restricts channel forming processes.

iii. **Maximum Removal and Fill Limits for GP-42104 and RGP-4**

- a. One project is equal to stabilization of eroding banks within a 6th HUC during a field season, regardless of project length.
- b. No more 2,000 feet of stream bank will be excavated and sloped per 0.5 miles within a single year.
- c. Individual stream banks to be excavated and sloped shall not exceed 600 feet in length and 8 feet in height.
- d. Banks will be excavated in the following manner: at bankfull elevation excavate horizontally (terrace/bench) followed by sloping (up to 3:1 [h/v] slope); sloping from channel edge up to a 3:1 slope. Excavation can begin from the slope toe (under OHW) to better connect channel and newly constructed streambank.
- e. When using sedge or rush mats, no more than 600 mats (3'x 6'x 1') shall be used to stabilize banks. Mat placement can extend below the OHW but most will occur above the OHW. To minimize potential effects to wetlands, harvest of mats shall be distributed across the project area and not from a single location. At harvest sites, no more than 25% of the vegetation shall be removed and mats will be taken in such a manner as to leave undisturbed vegetation of equal size or greater between each excavated mat. Plant sedge or rush plugs and/or seeds throughout excavated area to promote regrowth. Monitor for project related spread of noxious plants and apply eradication measures upon detection of such plants.

**a. Project Design Criteria**

- i. Without changing the location of the bank toe, restore damaged streambanks to a natural slope and profile suitable for establishment of riparian vegetation. This may include sloping of unconsolidated bank material to a stable angle of repose or the use of benches in consolidated, cohesive soils.
- ii. Complete all soil reinforcement earthwork and excavation in the dry. When necessary, use soil layers or lifts that are strengthened with biodegradable fabrics and penetrable by plant roots.

- iii. Include large wood to the extent it would naturally occur. If possible, large wood should have untrimmed root wads to provide functional refugia habitat for fish. Wood that is already within the stream or suspended over the stream may be repositioned to allow for greater interaction with the stream.
- iv. Rock will not be used for streambank restoration, except as ballast to stabilize large wood.
- v. Use a diverse assemblage of vegetation species native to the action area or region, including trees, shrubs, and herbaceous species. Vegetation, such as willow, sedge and rush mats, may be gathered from abandoned floodplains, stream channels, etc.
- vi. Do not apply surface fertilizer within 50 feet of any stream channel.
- vii. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
- viii. Conduct post-construction monitoring and treatment or removal of invasive plants until native plant species are well established.

**6. Set-back or Removal of Existing Berms, Dikes, and Levees** will be conducted to reconnect historic fresh-water deltas to inundation, stream channels with floodplains, and historic estuaries to tidal influence as a means to increase habitat diversity and complexity, moderate flow disturbances, and provide refuge for fish during high flows. Other restored ecological functions include overland flow during flood events, dissipation of flood energy, increased water storage to augment low flows, sediment and debris deposition, growth of riparian vegetation, nutrient cycling, and development of side channels and alcoves. Such projects will take place where estuaries and floodplains have been disconnected from adjacent rivers through drain pipes and anthropogenic fill. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

**Set-back or Removal of Existing Berms, Dikes, and Levees –Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
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Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects –**

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to overburden removal within a 6th HUC during a field season, regardless of project length. This includes floodplains, delta, or estuary on both sides of stream.
- b. Removal amounts associated with overburden removal will be commensurate with that required to recreate more natural floodplain, estuary, or delta dimensions.
- c. Overburden material will be removed or redistributed above the OHW and minor amounts can be removed/recontoured below OHW to better connect the stream and reconstructed floodplain, delta, or estuary. The horizontal extension into the stream channel shall not exceed 1/3 of the bankfull width or 10', whichever is less.
- d. Removal amounts associated with restoration of tributary and/or side channels, which were blocked and covered by overburden material, will be commensurate with natural channel dimensions.
- v. Disposal of excavated material from project sites shall not be placed in wetlands unless it is used to recreate natural topography of the impacted area.

**a. Floodplains and Freshwater Deltas – Project Design Criteria**

- i. Design actions to restore floodplain characteristics—elevation, width, gradient, length, and roughness—in a manner that closely mimics, to the extent possible, those that would naturally occur at that stream and valley type.
- ii. Remove drain pipes, fences, and other capital projects to the extent possible.
- iii. To the extent possible, remove nonnative fill material from the floodplain to an upland site.
- iv. Where it is not possible to remove or set-back all portions of dikes and berms, or in areas where existing berms, dikes, and levees support abundant riparian vegetation, openings will be created with breaches. Breaches shall be equal to or greater than the active channel width to reduce the potential for channel avulsion during flood events. In addition to other breaches, the berm, dike, or levee shall always be breached at the downstream end of the project and/or at the lowest elevation of the floodplain to ensure the flows will naturally recede back into the main channel thus minimizing fish entrapment.
- v. Elevations of dike/levee setbacks shall not exceed the elevation of removed structures
- vi. When necessary, loosen compacted soils once overburden material is removed. Overburden or fill comprised of native materials, which originated from the project area, may be used within the floodplain to create set-back dikes and fill anthropogenic holes provided that floodplain function is not impeded.

**b. Estuary Restoration – Project Design Criteria**

- i. Project implementation shall be conducted in a sequence that will not preclude repairing or restoring estuary functions once dikes/levees are breached and the project area is flooded.
- ii. Culverts and tide gates will be removed using the design criteria and conservation measures, where appropriate, as described in II. C. Work Area Isolation & Fish Capture and Release and under the Fish Passage Restoration category.
- iii. Roads within the project area should be removed to allow free flow of water. Material either will be placed in a stable area above the ordinary high water line or highest measured tide or be used to restore topographic variation in wetlands.
- iv. To the extent possible, remove segmented drain tiles placed to drain wetlands. Fill generated by drain tile removal will be compacted back into the ditch created by removal of the drain tile.
- v. Fill ditches constructed and maintained to drain wetlands. Some points in an open ditch may be over-filled, while other points may be left as low spots to enhance topography and encourage sinuosity of the developing channel.

- 7. Reduction/Relocation of Recreation Impacts** is intended to close, better control, or relocate recreation infrastructure and use along streams and within riparian areas. This includes removal, improvement, or relocation of infrastructure associated with designated campgrounds, dispersed camp sites, day-use sites, foot trails, and off-road vehicle (ORV) roads/trails in riparian areas. The primary purpose is to eliminate or reduce recreational impacts to restore riparian areas and vegetation, improve bank stability, and reduce sedimentation into adjacent streams. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

**Reduction/Relocation of Recreation Impacts – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

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Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects** – Construction of new recreation facilities that are not associated with relocation of existing facilities.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to restoration work conducted at one recreation site.
- b. No more than 1,000 cubic yards of material can be removed or altered below the OHW or in wetlands. Work would involve removal of anthropogenic material along streambanks and in floodplains and wetlands to prepare for stream channel, bank, floodplain, and/or wetland restoration projects.

**a. Project Design Criteria**

- i.** Design remedial actions to restore floodplain characteristics—elevation, width, gradient, length, and roughness—in a manner that closely mimics, to the extent possible, those that would naturally occur at that stream and valley type.
- ii.** To the extent possible, non-native fill material shall be removed from the floodplain to an upland site.
- iii.** Overburden or fill comprised of native materials, which originated from the project area, can be used to reshape the floodplain, placed in small mounds on the floodplain, used to fill anthropogenic holes, buried on site, and/or disposed into upland areas.
- iv.** For recreation relocation projects—such as campgrounds, horse corrals, and ORV trails—move current facilities out of the riparian area or as far away from the stream as possible.
- v.** Consider de-compaction of soils and vegetation planting once overburden material is removed.
- vi.** Place barriers—boulders, fences, gates, etc.—outside of the bankfull width and across traffic routes to prevent ORV access into and across streams.
- b.** For work conducted on ORV roads and trails, follow relevant PDC in the Road and Trail Erosion Control and Decommissioning category.

**8. Livestock Fencing, Stream Crossings and Off-Channel Livestock Watering Facilities** projects will be implemented by constructing fences to exclude riparian grazing, providing controlled access for walkways that livestock use to transit across streams and through riparian areas, and reducing livestock use in riparian areas and stream channels by providing upslope water facilities. Such projects promote a balanced approach to livestock use in riparian areas, reducing livestock impacts to riparian soils and vegetation, streambanks, channel substrates, and water quality. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

**Livestock Fencing, Stream Crossings and Off-Channel Livestock Watering Facilities – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
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Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects** – Livestock fencing to create livestock handling facilities.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to one stream crossing or water gap.
- b. No more than 75 cubic yards of material shall be placed within the OHW to construct a water gap. Minimal channel scraping, smoothing, and removal may occur to prepare foundation for rock placement.

**a. Livestock Stream Crossings – Project Design Criteria**

- i. The number of crossings will be minimized.
- ii. Locate crossings or water gaps where streambanks are naturally low. Livestock crossings or water gaps must not be located in areas where compaction or other damage can occur to sensitive soils and vegetation (e.g., wetlands) due to congregating livestock.
- iii. To the extent possible, crossings will not be placed in areas where ESA-listed species spawn or are suspected of spawning (e.g., pool tailouts where spawning may occur), or within 300-feet upstream of such areas.
- iv. Existing access roads and stream crossings will be used whenever possible, unless new construction would result in less habitat disturbance and the old trail or crossing is retired.
- v. Access roads or trails will be provided with a vegetative buffer that is adequate to avoid or minimize runoff of sediment and other pollutants to surface waters.
- vi. Essential crossings will be designed and constructed or improved to handle reasonably foreseeable flood risks, including associated bedload and debris, and to prevent the diversion of stream flow out of the channel and down the trail if the crossing fails.
- vii. If necessary, the streambank and approach lanes can be stabilized with native vegetation and/or angular rock to reduce chronic sedimentation. The stream crossing or water gap should be armored with sufficient sized rock (e.g., cobble-size rock) and use angular rock if natural substrate is not of adequate size.
- viii. Livestock crossings will not create barriers to the passage of adult and juvenile fish. Whenever a culvert or bridge—including bridges constructed from flatbed railroad cars, boxcars, or truck flatbeds—is used to create the crossing, the structure width will tier to project design criteria listed for Stream Simulation Culvert and Bridge Projects under the Fish Passage Restoration category.
- ix. Stream crossings and water gaps will be designed and constructed to a width of 10 to 15 feet in the upstream-downstream direction to minimize the time livestock will spend in the crossing or riparian area.
- x. When using pressure treated lumber for fence posts, complete all cutting/drilling offsite (to the extent possible) so that treated wood chips and debris do not enter water or flood prone areas.
- xi. Riparian fencing is not to be used to create livestock handling facilities or riparian pastures.

**b. Off-channel livestock watering facilities – Project Design Criteria**

- i. The development of a spring is not allowed if the spring is occupied by ESA-listed species.
- ii. Water withdrawals must not dewater habitats or cause low stream flow conditions that could affect ESA-listed fish. Withdrawals may not exceed 10% of the available flow.
- iii. Troughs or tanks fed from a stream or river must have an existing valid water right. Surface water intakes must be screened to meet the most recent version of NMFS fish screen criteria (*NOAA Fisheries Anadromous Salmonid Passage Facility Design* (NMFS 2011), located at: <http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf>), be self-cleaning, or regularly maintained by removing debris buildup. A responsible party will be designated to conduct regular inspection and as-needed maintenance to ensure pumps and screens are properly functioning.
- iv. Place troughs far enough from a stream or surround with a protective surface to prevent mud and sediment delivery to the stream. Avoid steep slopes and areas where compaction or damage could occur to sensitive soils, slopes, or vegetation due to congregating livestock.
- v. Ensure that each livestock water development has a float valve or similar device, a return flow system, a fenced overflow area, or similar means to minimize water withdrawal and potential runoff and erosion.
- vi. Minimize removal of vegetation around springs, wet areas.
- vii. When necessary, construct a fence around the spring development to prevent livestock damage.

**9. Road and Trail Erosion Control and Decommissioning** includes hydrologically closing or decommissioning roads and trails, including culvert removal in perennial and intermittent streams; removing, installing or upgrading cross-drainage culverts; upgrading culverts on non-fish-bearing streams; constructing water bars and dips; reshaping road prisms; vegetating fill and cut slopes; removing and stabilizing of side-cast materials; grading or resurfacing roads that have been improved for aquatic restoration with gravel, bark chips, or other permeable materials; contour shaping of the road or trail base; removing road fill to native soils; soil stabilization and tilling compacted surfaces to reestablish native vegetation. This category also includes programmatic/public notice road closures under FS and BLM/BIA equivalent Travel and Access Management Plans. Such actions will target priority roads that contribute sediment to streams, block fish passage, and/or disrupt floodplain and riparian functions. Equipment such as excavators, bull dozers, dump trucks, front-end loaders, and similar equipment may be used to implement projects.

**Road and Trail Erosion Control and Decommissioning – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

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Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	10

**ii. Excluded Projects** – Routine road maintenance and new road construction.

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to all road treatments within a 6th HUC where the road-bed is altered with heavy equipment within the OHW, wetlands, or above OHW when high degree of connectivity occurs between road and listed fish stream.
- b. No more than 7,500 cubic yards of material can be removed below the OHW. Material for removal would include road fill (bed and/or fill slopes) and bank-hardening structures, such as rock gabions and rip rap. Such removal would be conducted to prepare for implementation of one or more PERMIT restoration actions (e.g. Large Wood, Boulder, and Gravel placement, Streambank Stabilization, Riparian Planting) to restore stream channels, banks, and associate floodplains impacted by the road.
- c. Disposal of excavated material from project sites shall not be placed in wetlands.
- d. For culvert projects, follow removal & fill estimates described in the Fish Passage Culvert and Bridge Projects category.

- ii. When obliterating or removing segments immediately adjacent to a stream, consider using sediment control barriers between the project and stream.
- iii. Dispose of slide and waste material in stable sites out of the flood-prone area. Native material may be used to restore natural or near-natural contours.
- iv. Drainage features used for stormproofing and treatment projects should be spaced as to hydrologically disconnect road surface runoff from stream channels. If grading and resurfacing is required, use gravel, bark, or other permeable materials for resurfacing.
- v. Minimize disturbance of existing vegetation in ditches and at stream crossings.
- vi. Conduct activities during dry-field conditions (generally May 15 to October 15) when the soil is more resistant to compaction and soil moisture is low.
- vii. When removing a culvert from a first or second order, non-fishing bearing stream, project specialists shall determine if culvert removal should include stream isolation and rerouting in project design. Culvert removal on fish bearing streams shall adhere to the measures described in the Fish Passage Restoration activity category.
- viii. For culvert removal projects, restore natural drainage patterns and channel morphology. Evaluate channel incision risk and construct in-channel grade control structures when necessary.

**10. Juniper Tree Removal** will be conducted in riparian areas and adjoining uplands to help restore plant species composition and structure that would occur under natural fire regimes. Juniper removal will occur in those areas where juniper have encroached into riparian areas as a result of fire exclusion, thereby replacing more desired riparian plant species such as willow, cottonwood, aspen, alder, sedge, and rush. This action will help restore composition and structure of desired riparian species, thereby improving ground cover and water infiltration into soils. Equipment may include chainsaws, pruning shears, winch machinery, feller-bunchers, and slash-buster.

**Juniper Tree Removal – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
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Oregon State Marine Board Coordination	2
Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

ii. **Excluded Projects** – Placement of juniper in a stream in a manner that will prohibit the stream from attaining its natural sinuosity.

iii. **Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project is equal to juniper thinning within a 6th HUC where felled junipers are placed in the stream channel and associated wetlands during a field season, regardless of project length.
- b. No more than 400 trees shall be placed below OHW/stream mile and associated wetlands.

- i. Remove juniper to natural stocking levels where BLM and FS determines that juniper trees are expanding into neighboring plant communities to the detriment of other native riparian vegetation, soils, or stream flow.
- ii. Do not cut old-growth juniper, which typically has several of the following features: sparse limbs, dead limbed or spiked-tops, deeply furrowed and fibrous bark, branches covered with bright-green arboreal lichens, noticeable decay of cambium layer at base of tree, and limited terminal leader growth in upper branches (Miller *et al.* 2005).

- iii. Felled trees may be left in place, lower limbs may be cut and scattered, or all or part of the trees may be used for streambank or wetland restoration (e.g., manipulated as necessary to protect riparian or wetland shrubs from grazing by livestock or wildlife or otherwise restore ecological function in floodplain, riparian, and wetland habitats).
- iv. Where appropriate, cut juniper may be placed into stream channels and floodplains to provide aquatic benefits. Juniper can be felled or placed into the stream to promote channel aggradation as long as such actions do not obstruct fish movement and use of spawning gravels or increase width to depth ratios.
- v. On steep and/or south-facing slopes, where ground vegetation is sparse, leave felled juniper in sufficient quantities to promote reestablishment of vegetation and prevent erosion.
  - i. If seeding is a part of the action, consider whether seeding would be most appropriate before or after juniper treatment.
  - ii. When using feller-buncher and slash-buster equipment, operate equipment in a manner that minimizes soil compaction and disturbance to soils and native vegetation to the extent possible. Equipment exclusion areas (buffer area along stream channels) should be as wide as the feller-buncher or slash-buster arm.

**11. Riparian Vegetation Planting** includes the planting of native riparian species that would occur under natural disturbance regimes. Activities may include the following: planting conifers, deciduous trees and shrubs; placement of sedge and or rush mats; gathering and planting willow cuttings. The resulting benefits to the aquatic system can include desired levels of stream shade, bank stability, stream nutrients, large wood inputs, increased grasses, forbs, and shrubs, and reduced soil erosion. Equipment may include excavators, backhoes, dump trucks, power augers, chainsaws, and manual tools.

**Riparian Vegetation Planting – Key ACOE and ODSL Requirements:**

**i. Key Coordination Requirements and More**

<b>Key Requirements</b>	<b>Appendix II page #</b>
Wyden Projects	1
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Tribal Coordination	3
Wild and Scenic River Documentation	3
Wetlands Identification	5-6
Fish Passage	6
Scientific Take Permit for Fish Capture and Release	NA

**ii. Excluded Projects**

**iii. Maximum Removal and Fill Limits for GP-42104-RF and RGP-4**

- a. One project equals an action that uses heavy machinery to cross a stream or conduct work activities below the OHW in a 6th HUC during a field season, regardless of project length.
- b. For the planting of mature willow along with sapling cottonwood, alder, and other riparian deciduous vegetation, no more than 1,000 cubic yards will be removed and subsequently refilled for each project. Such material will be a result of excavation and re-filling of transplant holes or trenches.
- c. When using sedge or rush mats, no more than 600 mats (3'x 6'x 1') shall be used to stabilize banks. Mat placement can extend below the OHW but most will occur above the OHW. To minimize potential effects to wetlands, harvest of mats shall be distributed across the project area and not from a single location. At harvest sites, no more than 25% of the vegetation shall be removed and mats will be taken in such a manner as to leave undisturbed vegetation of equal size or greater between each excavated mat. Plant sedge or rush plugs and/or seeds throughout excavated area to promote regrowth. Monitor for project related spread of noxious plants and apply eradication measures upon detection of such plants.

**a. Project Design Criteria**

- i. Experienced silviculturists, botanists, ecologists, or associated technicians shall be involved in designing vegetation treatments.
- ii. Species to be planted will be of the same species that naturally occur in the project area. Acquire native seed and/or plant sources as close to the watershed as possible.
- iii. Tree and shrub species, willow cuttings, as well as sedge and rush mats to be used as transplant material shall come from outside the bankfull width, typically in terraces (abandoned flood plains), or where such plants are abundant.
- iv. Sedge and rush mats should be sized to prevent their movement during high flow events.
- v. Concentrate plantings above the bankfull elevation.
- vi. Removal of native and non-native vegetation that will compete with plantings is permitted.
- vii. Exclosure fencing to prevent utilization of plantings by deer, elk, and livestock is permitted.