

Implementation Description:

Big Mosquito Fish Passage Restoration 2015

Category 1: Fish Passage Restoration, and Category 14: Riparian Vegetation Planting	Lead Preparer: Allen Taylor
Applicant: Blue Mountain Aquatics	NEPA Reference: DN For Aquatic Restoration EA http://www.fs.usda.gov/detailfull/malheur/landmanagement/?cid=STELPRD3817723&width=full
Location: (T/R, sec., ¼, ¼) T9S, R33E, sec. 18, SW ¼ of SW 1/4 T9S, R33E, sec. 19, SW ¼ of SE 1/4 USGS Quad: Sharps Ridge	Lease/ /Case File/ Serial #: na (Reference #):na
Begin Date: 09/01/2014	Due Date: 05/15/2015

Purpose/Need:

Please refer to the Aquatic Restoration EA¹ for the Purpose and Need of these actions. Photos of the existing condition are attached.

Land Use Plan Conformance:

The project falls under Management Area (MA) 3B “Anadromous Riparian Areas” of the Malheur National Forest Land and Resource Management Plan (LRMP). The goal of MA3B is to “Manage riparian areas to protect and enhance their value for wildlife, anadromous fish habitat and water quality... Design and conduct management in all riparian areas to maintain or improve water quality and beneficial uses” (USDA Forest Service, 1990). East Fork Big Creek and Deadwood Creek are within a category 1 Riparian Habitat Conservation Area (fish-bearing stream) as designated by PACFISH/INFISH and are listed as designated critical habitat for Mid-Columbia River steelhead by the National Marine Fisheries Service (NMFS). Deadwood Creek is also designated critical habitat for Columbia River Bull Trout by the United States Fish and Wildlife Service (USFWS).

Project activities are located in the Big Creek (HUC 170702030302) subwatershed in the Big Creek – Middle Fork John Day River (HUC 1707020303) watershed. The Blue Mountain Ranger District was tasked with identifying essential projects that would increase resilience within the Big Mosquito Project Area. These projects would improve aquatic organism habitat connectivity and stream channel processes and functions.

Implementation Plan:

Eleven culverts in the Big Mosquito project planning area do not meet the current guidance for properly designed stream crossings; these culverts are barriers to fish

¹ The Aquatic Restoration EA is available online at <http://www.fs.usda.gov/detailfull/malheur/landmanagement/?cid=STELPRD3817723&width=full>

passage and/or are unable to dissipate excess stream energy. The desired condition is to replace these culverts with structures of a proper size and alignment to increase natural movement of fish, gravel, and wood and decrease the need for road maintenance. The desired condition is a state that would provide ecological resiliency in the face of a changing climate. Replacing these culverts would primarily benefit stream channel function and increase aquatic habitat connectivity. By allowing high flows and material to pass through these crossings, the integrity of both the stream channel and the road would be protected. Obtaining the desired condition requires phased implementation occurring over multiple years; this project proposal focuses on two of the eleven culverts that are proposed for treatment in 2015. Subsequent phases will involve subsequent project proposals. To accomplish objectives, the following activities are proposed:

- Replace existing fish passage barrier culvert on East Fork Big Creek at Forest Service Road (FSR) 2090-199 crossing with an Aquatic Organism Passage (AOP) structure that would restore MCR Steelhead and redband trout access to 1.3 miles of habitat upstream of the existing crossing.
- Replace existing fish passage barrier culvert on Deadwood Creek at the FSR 4560-621 crossing with an AOP structure to improve or restore MCR Steelhead, CR Bull Trout, and redband trout access to 1.1 miles of habitat upstream to the next fish passage barrier culvert (scheduled for replacement in 2016 to restore access to an additional 4.1 miles of Deadwood Creek).
- Revegetate areas disturbed during culvert replacement with native riparian species that would occur under natural disturbance regimes. Work would include seeding as well as planting riparian hardwoods including willow, dogwood, and/or cottonwood. Conifers felled during culvert replacement and associated slash material may be used as a natural barrier, where appropriate, to reduce access by ungulates. Exclosure fencing may be considered if slash and trees provide insufficient protection. Seeding with

In-channel work would occur during the in-stream work window from July 15 to Aug 15. Minor changes in road elevation or alignment near the crossings may also be necessary.

Figures

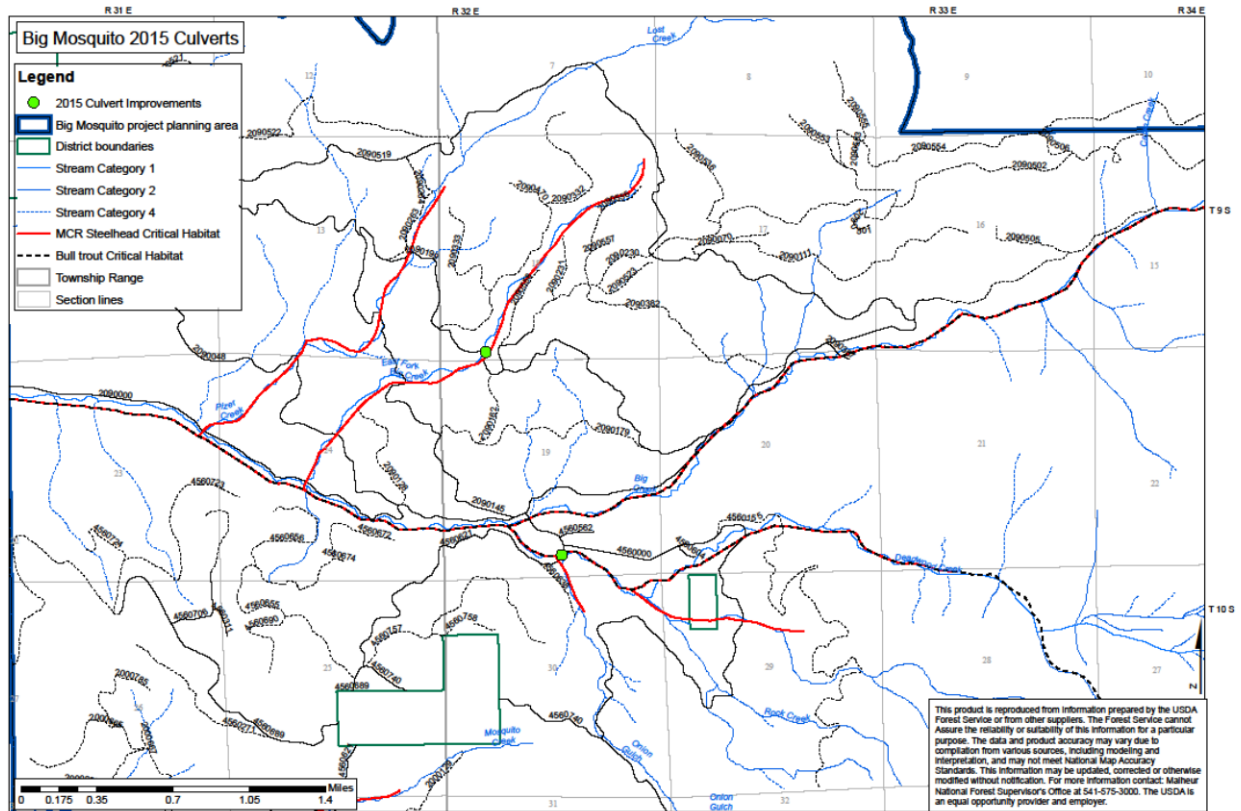


Figure 1. Big Mosquito 2015 Culverts for Replacement.



Figure 2. Deadwood Creek existing culvert outlet showing large scour pool formed by excessive stream energy concentrated by undersized culvert.



Figure 3. Deadwood Creek existing culvert inlet showing active erosion around inlet from undersized culvert.



Figure 4. East Fork Big Creek existing culvert outlet showing perched outfall, no jump pool for fish passage, and streambed scouring from stream flow concentrated by undersized culvert.



Figure 5. Sediment delta formed above East Fork Big Creek existing culvert inlet indicative of an undersized culvert with reduced capacity to transport sediment through the crossing.

Appendix to the Aquatic Restoration EA Implementation Description

Project Title: Big Mosquito Fish Passage Restoration 2015

Project Number: 0105-2015

Category 1: Fish Passage Restoration

Category 14: Riparian Vegetation Planting

The following information will guide actions for this project that is taking place within the bounds of the Decision Notice for the 2014 Malheur National Forest Aquatic Restoration Environmental Analysis to maintain that all conservation measures, guidelines and project design criteria (PDCs) are met under this guiding document.

Program Administration

1. Integration of project design criteria and conservation measures and terms and conditions into project design and contract language
 - a. This document is to outline the conservation measures and PDCs that will be used during project implementation to remain compliant with the aquatic restoration BA as well as ARBO II.
2. Project notification: The following information will be provided to the NMFS Level 1 Aquatics members 30 days prior to implementation as a Project Notification Form 7.
 - a. Action identifier- 01052015
 - b. Project name- Big Mosquito Fish Passage Restoration 2015
 - c. Location-

Project	Big Mosquito Fish Passage Restoration 2015
Stream Name	East Fork Big Creek and Deadwood Creek
6 th field HUC	170702030302
Latitude (Decimal Degrees)	-118.791
Longitude (Decimal Degrees)	44.774

- d. Agency contact- Allen Taylor, Forest Service, allentaylor@fs.fed.us, 541-575-3394
- e. Timing- Work will occur during 2015, with in-stream work happening between July 15 to August 15. Meadow work on ephemeral channels may occur before or after instream window.
- f. Activity category-
Category 1: Fish Passage Restoration
Category 14: Riparian Vegetation Planting
- g. Project description- Project description is available in the Implementation Description under the section “Implementation Plan” above.
- h. Extent- Work will occur within 300 feet upstream and downstream from stream crossings on East Fork Big Creek at the FSR 2090-199 road and

Deadwood Creek at the FSR 4560-621 road in the Middle Fork John Day River watershed.

- i. Species affected-
 - i. Listed species: Mid-Columbia River steelhead and Columbia River Bull Trout
 - ii. Critical Habitat: Portions of Steelhead and Bull Trout critical habitat
 - iii. MIS Species: Steelhead, Bull Trout, and Redband trout
 - j. Date of submittal- To be completed in Spring of 2015, at least 30 day prior to implementation
 - k. Site assessments- Assessment for contaminants is not required at these locations.
 - l. Review- NMFS fish passage review and Restoration Review Team review are not required.
 - m. Verification- _____
 - n. SOD project notification- _____
3. Minor Variance: No variances from the criteria specified in the aquatic restoration document are being considered.
 4. NMFS Fish Passage Review and Approval: This work does not require review by the NFMS level 1 team member.
 5. Restoration Review Team: This work does not require review by the restoration review team.
 6. Project Completion Report: To be completed after implementation
 7. Annual Program Report: This project will be completed within one year, completion and annual reporting will occur in the winter of FY16 before February 15th.

General Aquatic Conservation Measures

8. Technical Skill and Planning Requirements:
 - a. An appropriately qualified fisheries biologist or hydrologist will be involved in the design of this project.
 - b. The scope of this project is limited in both space and context. Field evaluations and site-specific surveys will require little work. Appropriate time will be allotted for these actions, prior to implementation. Planning and design will involve appropriate expertise.
 - c. The assigned fisheries biologist or hydrologist will make sure that any applicable conservation measures and project design criteria are met through the contracting process.
9. Climate Change: due to the small scale of this work, future climate changes impacts will not have dramatic effects on this work
10. In-Water Work Period: In-stream activities will occur between July 15th and August 15th.
11. Fish passage: Not applicable.
12. 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, 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

13. Pollution and Erosion Control Measures: Implement the following pollution and erosion control measures:

- a. Project Contact: Identify a project contact (name, phone number, an address) that will be responsible for implementing pollution and erosion control measures.
- 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.

14. Site Preparation

- a. Flagging sensitive areas –Prior to construction, clearly mark 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) 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 when they pose a safety risk. If possible, fell hazard trees within riparian areas towards a stream. Keep felled trees on site when needed to meet coarse large wood objectives.
15. 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), 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 will be used whenever possible. Minimize the number of temporary access roads and travel paths 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 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
- e. Work from top of bank – To the extent feasible, heavy equipment will work from the top of the bank, unless work instream would result in less damage to the aquatic ecosystem.
- 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.

16. 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, 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 reestablishment 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 – Decompact soil by scarifying the soil surface of roads and paths, stream crossings, staging, and stockpile areas so that seeds and plantings can root.

17. Monitoring

Monitoring will be conducted by Action Agency staff, as appropriate for that project, during and after a project to track effects and compliance with this opinion.

- 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 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 following: Oregon Department of Environmental Quality (Oregon BLM, Forest Service, and BIA); Washington Department of Ecology (Washington BLM); and the Memorandum of Understanding between the Washington Department of Fish and Wildlife and Forest Service regarding Hydraulic Projects Conducted by Forest Service, Pacific Northwest Region (WDFW and USDA-Forest Service 2012); California, Idaho, or Nevada 401 Certification protocols (BLM and Forest Service).
- 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:
 - ii. Fish Passage Projects – Note any problems with channel scour or bedload deposition, substrate, discontinuous flow, vegetation establishment, or invasive plant infestation.
 - iii. Revegetation – For all plant treatment projects, including site restoration, monitor for and remove invasive plants until native plants become established.
 - iv. In cases where remedial action is required, such actions are permitted without additional consultation if they use relevant PDC

and aquatic conservation measures and the effects of the action categories are not exceeded.

18. Work Area Isolation, Surface Water Withdrawals, and 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.

- a. Isolate capture area – Install block nets at up and downstream locations outside of the construction zone 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.
- b. 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 in the best manner to minimize potential stranding and stress by seine or dip nets as the area is slowly dewatered, baited minnow traps placed overnight, or electrofishing (if other options are ineffective). 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, 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.
- c. 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’s electrofishing guidelines will be followed (NMFS 2000).
 - i. 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.

- ii. If fish are observed spawning during the in-water work period, electrofishing shall not be conducted in the vicinity of spawning fish or active redds.
 - iii. Only Direct Current (DC) or Pulsed Direct Current shall be used.
 - iv. 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.
 - v. 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.
 - vi. 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 above (PDC 20b). Dark bands on the fish indicate injury, suggesting a reduction in voltage and pulse width and longer recovery time.
 - vi. 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.
- d. Dewater construction site –When dewatering is necessary to protect species or critical habitat, divert flow around the construction site with a coffer dam (built with non-erosive materials), taking care to not dewater downstream channels during dewatering. Pass flow and fish downstream with 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. If ESA listed-fish may be present and pumps are required to dewater, the intake must have a fish screen(s) and be operated in accordance with NMFS fish screen criteria described below (in part e.iv) 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. 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.
- e. Surface water withdrawals
 - i. Surface water may be diverted to meet construction needs, but only if developed sources are unavailable or inadequate. Where ESA-listed fish may be present, diversions may not exceed 10% of the available flow and fish screen(s) will be installed, operated, and maintained according to NMFS’s fish screen criteria (NMFS 2011e).

- ii. For the dewatering of a work site to remove or install culverts, bridge abutments etc., if ESA-listed fish may be present, a fish screen that meets criteria specified by NMFS (2011e) must be used on the intake to avoid juvenile fish entrainment. If ESA-listed salmon, steelhead, eulachon, or green sturgeon may be present, the Action Agencies will ensure that the fish screen design is reviewed and approved by NMFS for consistency with NMFS (2011e) criteria if the diversion (gravity or pump) is at a rate greater than 3 cfs. NMFS approved fish screens have 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 inches) in the narrow dimension, or any other shape that is no larger than 1.75 mm (0.069 inches) in the narrow dimension.
- f. 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 release of suspended sediment. Monitor downstream during re-watering to prevent stranding of aquatic organisms below the construction site.

Applicable Project Design Criteria

Project Design Criteria for Aquatic Restoration Activity Categories

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; stabilizing and providing passage over headcuts; removing, constructing (including relocations), repairing, or maintaining fish ladders; and constructing or replacing fish screens for irrigation diversions. Such projects will take place where fish passage has been partially or completely eliminated through road construction, stream degradation, creation of small dams and weirs, and irrigation diversions. 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* (USDA-Forest Service 2008), located at: http://stream.fs.fed.us/fishxing/aop_pdfs.html
 - 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):

1. 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 *Anadromous Salmonid Passage Facility Design* (section 7.4.2 “Stream Simulation Design”) (NMFS 2011e). 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.
2. 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 width is the width measured at twice the maximum bankfull depth (Rosgen 1996).

14. 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.
 - a. Experienced silviculturists, botanists, ecologists, or associated technicians shall be involved in designing vegetation treatments.
 - b. Species to be planted will be of the same species that naturally occur in the project area. Acquire native seed or plant sources as close to the watershed as possible.
 - c. 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.
 - d. Sedge and rush mats should be sized to prevent their movement during high flow events.
 - e. Concentrate plantings above the bankfull elevation.
 - f. Removal of native and non-native vegetation that will compete with plantings is permitted.

- g. Exclosure fencing to prevent utilization of plantings by deer, elk, and livestock is permitted.

Project Design Criteria by Resource

Fisheries and Hydrology

Fisheries and Hydrology resources will follow all mitigation measures and project design criteria for aquatic restoration activities as shown in the ‘Aquatic Restoration Project Categories, Program Administration, General Aquatic Conservation Measures, and Project Design Criteria for Aquatic Restoration Activity Categories on the Malheur National Forest.’

Additional Aquatic project design criteria were developed for the following elements: Tree Tipping and Felling, Juniper Treatments, Tree Hauling, and Prescribed Burning.

General For Inside Riparian Habitat Conservation Areas

- All snags will be maintained within the RHCA unless deemed a hazard to the restoration activity.

Tree Tipping and Tree Felling for Large Wood Projects

- Source trees being extracted (either by tipping and or falling) as part of this project for instream restoration will not be harvested from within the primary shade zone.

Table 35 Primary shade zone width, based on adjacent hill slope.

	Hill Slope less than 30%	Hill Slope 30% to 60%	Hill Slope greater than 30%
Primary Shade Zone Width (slope distance)	50 ft.	55 ft.	60 ft.

The Temperature Implementation Strategies allow the distances in the above table to be less (but not less than 25 ft.) if any of the following conditions applies:

- The trees are located on a south facing slope (175-185 degree azimuth) and therefore do not provide stream shade;
- An appropriate level of analysis is completed and documented, such as shade modeling, using site-specific characteristics to determine the primary shade tree width; and or
- Field monitoring or measurements are completed to determine the width where optimum Angular Canopy Density (65% or greater) is achieved (see TMDL Implementation Strategies).
- If trees are being felled for safety reasons they can be felled towards the stream.
- Source trees should come from but are not limited to: over or fully stocked upland and riparian stands, hazard trees, trees generated from administrative sites (maintenance, expansion, or new construction), and hardwood restoration.

There is no DBH (diameter at breast height) restriction for large wood, but consider the following before removing and placing trees:

Diameter

The key to establishing a logjam is utilizing larger diameter wood that resists decay. These pieces of wood are often called “key pieces,” and serve as the anchors for the logjam structure. Wood can improve fish habitat only if the wood is large enough to stay, influence flow patterns, and sediment sorting. Larger diameter wood retains its size longer as abrasion and decay occurs over the years. Larger diameter wood is more effective in creating pools and complex channels that improve fish populations. The minimum diameter required for a key piece of wood depends on the bankfull width of the stream is found in the following table.

Table 36 Bankfull widths and minimum diameter of logs to be considered key pieces.

Bankfull Width* - Feet	Minimum Diameter* - Inches
0 to 10	10
10 to 20	16
20 to 30	18
Over 30	22

*This table was taken from '1995 A Guide to Placement of Large Wood in Streams.

Length

- The length of the wood is also important to stability. To be considered a key piece a log with a rootwad still attached should be at least one and one-half times (1.5X) the bankfull or a log without a rootwad should be twice (2X) the length of the stream’s bankfull width. As the best fish habitat is formed around jams composed of 3 to 7 logs, at least 2 key pieces should be used at each structure.
- Mimic natural accumulations of large woody debris based on stream type, valley setting, and community type and ensure future large woody debris recruitment
- Tailholds as part of tree tipping operations are permitted across perennial, intermittent and ephemeral streams but the use of protective straps will be required to prevent tree damage.

Tree and Boulder Hauling

- Apply mitigation and best management practices for dust abatement (water, lignosulfonate, Calcium and Magnesium Chlorides) dry conditions, and erosion control as directed by physical scientist or road engineer (See Road Maintenance project design criteria #6 for application).
 - Haul on gravel and native-surface roads will be limited to dry conditions.

Haul Restrictions to Prevent Fine Sediment Delivery to Streams

Haul or maintenance is permitted on roads under the following conditions:

- During haul, weather conditions are monitored daily for the chance of precipitation by the Hydrologist or Fish Biologist.
- No rutting of the road surface is occurring, indicating the subsurface is wet.
- Frozen ground conditions.
- Haul will cease at any time when the travelway of the road is wet and turbid water or fines are observed moving off the road surface to ditchlines that deliver to stream channels regardless of time of year.

Roads Exempt from Haul Restrictions include (Do to no mechanism for sediment delivery):

- Paved roads
- Surfaced Ridge top roads
- Surfaced outloped roads with no ditch or stream crossings

For perennial and fish-bearing stream channels:

- Avoid removing trees along stream banks (e.g. don't cause bank instability or increase erosion)
- Within primary shade zone retain 100% of the over-story canopy closure with the exception of hardwood treatment.

Wildlife

Threatened, Endangered or Sensitive Species

- If wolves become established (denning) while project implementation is occurring, measures will be taken to avoid activity in that vicinity
- If any evidence of wolverines is discovered during project implementation, measures will be taken to provide protection. If a den is found we would protect it from human disturbance.

Raptors

- No activities will occur within currently known goshawk or other raptor nest stands. To conserve nesting habitat and to minimize disturbance to nesting individuals, restrictions would be executed according to the requirements of the species involved.
- With all newly discovered raptor nests, a buffer zone would be established by the wildlife biologist to restrict activities near the nest area during occupancy.
- Where possible, retain trees with inactive nests that may be important to secondary nesters (e.g. Great Gray Owl).
- Any snags in riparian areas or uplands will be protected from disturbance, removal, or use in stream restoration activities unless deemed a safety hazard at a specific work site.

Botany

Note: Pre-implementation planning project design criteria are identified.

Rare and Sensitive Plants and Habitats

- *Pre-Implementation:* Proposed restoration projects shall be completely surveyed early in the implementation planning process by a qualified botanist or rare plant technician, to identify and assess any sensitive or rare plant populations or habitats.
- *Pre-Implementation:* Proposed restoration projects shall develop restoration plans for degraded sensitive species habitats and/or mitigation plans in areas where sensitive plant populations are documented. This shall be accomplished by a journey-level Forest Service botanist in collaboration with the interdisciplinary team and other stakeholders.
- Heavy equipment, vehicle operation, road construction, staging areas, stockpile areas, piling of slash, fence construction, recreation sites, prescribed fires, fire lines, and other operational activities shall not be allowed in any documented sensitive plant sites unless it is for the demonstrated benefit or protection of the site. All sensitive plant populations should be buffered 100 ft. from all operational activities where topography does not restrict such a distance. Sensitive plant sites and associated buffers shall be identified as Areas to Protect.

Sensitive and Unique Habitats

- The integrity of unique habitats shall be maintained. Unique habitats [may] include meadows, rimrock, talus slopes, cliffs, animal dens, wallows, bogs [fens], seeps and springs. This shall be accomplished by incorporating cover buffers approximately 100 feet in width.
- Heavy equipment, vehicle operation, road construction, staging areas, stockpile areas, piling of slash, fence construction, recreation sites, prescribed fires, fire lines, and other operational activities shall not occur within, or at the interface of lithosols (scablands).
- Cutting of old-growth juniper shall be prohibited. Old-growth characteristics include: 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.

Groundwater-Dependent Ecosystems

- The integrity of groundwater-dependent ecosystems shall be maintained. Spring developments shall not dewater Groundwater dependent ecosystems. Spring developments shall not be allowed if the spring is occupied by rare or sensitive plant species, or in peatlands, fens, or where histic soils are present. These sites should be buffered 100 ft. from all operational activities where topography does not restrict such a distance, and be identified as Areas to Protect.
- Heavy equipment, vehicle operation, road construction, staging areas, stockpile areas, piling of slash, fence construction, fire lines, and other operational activities shall not be allowed in springs, seeps, or any other groundwater dependent

ecosystem, unless it is for the benefit or protection of the groundwater dependent ecosystems or development of the spring.

- Spring developments should not disturb the spring orifice (point where water emerges). Spring head boxes should be placed in a location that will cause the least amount of disturbance to the soils and vegetation of the groundwater dependent ecosystems. Preferable locations for spring head boxes should be in an established channel downstream from the orifice or a location where flowing water becomes subsurface.
- When necessary, construct fenced enclosures around spring developments to prevent damage from wild ungulates and livestock.
- Spring developments shall have a return flow system to minimize the diversion of surface and subsurface water from the catchment area. Consider using a float valve or similar device to reduce the amount of water withdrawn from the groundwater dependent ecosystems.
- When developing springs, place troughs far enough away from Groundwater dependent ecosystems, wetlands, and other sensitive or unique habitats to prevent erosion, compaction, or degradation to sensitive soils and vegetation due to livestock congregation.

Invasive Plant Species

- *Pre-Implementation:* Proposed restoration projects shall be surveyed for invasive plants early in the implementation planning process by a qualified invasive plant specialist /technician, to identify and assess any undocumented invasive plant infestation.
- *Pre-Implementation:* For project areas that overlap or are adjacent to invasive plant infestations, assure that there is sufficient time prior to develop a long-term site strategy for control, eradication, and revegetation of the site. This shall be accomplished by a qualified invasive plant specialist in collaboration with the interdisciplinary team and other stakeholders.
- All activities shall be conducted in a manner as to minimize or prevent the potential spread or establishment of invasive species.
- Actions conducted on National Forest System Lands that will operate outside the limits of the road prism, require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering the National Forest. Cleaning will be inspected and approved by the forest officer in charge of administering the project.
- Assure that all materials are weed-free. Use weed-free straw and mulch for all projects conducted or authorized by the Forest Service on National Forest System Lands. If State certified straw and/or mulch is not available, individual Forests should require sources certified to be weed-free using the North American Weed Free Forage Program standards or a similar certification process.
- Inspect active gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel, fill, sand, and/or rock that are judged to be weed free by District or Forest weed specialists.

- Prohibit heavy equipment operation, vehicle travel, staging areas, fire-control lines, and any other operational activities in invasive plant infestations, unless the activities are for the express purpose of eradicating the infestation or INV1 and INV2 have been completed.
- Conduct post-implementation monitoring for invasive plants. Continue monitoring, treating, and removing invasive plants until all infestations are eradicated and native plant species are well established.

Native Plant Materials and Revegetation

- *Pre-Implementation:* Where the need for native plant materials is anticipated, assure that there is sufficient time for the plant materials specialist to develop a native plant materials plan and/or prescription prior to implementation of planned revegetation, rehabilitation, and restoration projects. This may include allowing for enough time to harvest and store hardwood cuttings, produce suitable quantities of native seed, and/or grow-out container stock.
- Locally adapted, genetically appropriate native plant materials are the first choice for use in revegetation, restoration and rehabilitation, where timely natural regeneration of the native plant community is not likely to occur. Use a diverse assemblage of species that have the potential to naturally occur in the project area. Acquire native seed or plant sources as close to the watershed as possible. Examples of areas that may need treatment include: habitat restoration efforts, log decks, staging areas, landing zones, temporary roads, slash piles, culvert replacements, severely burned areas, skid trails, decommissioned roads, invasive species treatments, and other disturbances.
- Non-native, non-invasive plant species may be used in the following situations: (1) when needed in emergency conditions to protect basic resource values (e.g., soil stability, water quality, and to help prevent the establishment of invasive species), (2) as an interim, non-persistent measure designed to aid in the re-establishment of native plants, (3) if native plant materials are not available and/or are not economically feasible, and (4) in permanently altered plant communities.
- Under no circumstances shall non-native invasive plant species and/or noxious weeds be used for revegetation.
- Development, review and/or approval of revegetation, rehabilitation, and restoration prescriptions, including species selection, genetic heritage, growth stage, seed mixes, sowing guidelines, and any needed site preparation, shall be accomplished by a plant materials specialist who is knowledgeable and trained or certified in the plant community type where the revegetation will occur.
- Concentrate plantings above the bank-full elevation. Sedge and rush mats should be placed and sized to prevent their movement during high flow events.
- Newly planted and/or seeded areas should be protected from animals and activities that may prevent, retard, or slow the establishment and recovery of native vegetation. Site-specific measures may include building fences, piling slash, jackstrawing, closing areas to vehicles, and/or temporarily changing grazing regimes until the desired condition is sufficiently achieved.

Soils

- For projects involving heavy machinery off roads, the project proponents shall inspect the site for existing impacts to the soil. If existing impacts appear to be heavy on the Malheur or moderate on the Ochoco, they shall contact a soil scientist, who shall determine what site specific project design criteria are necessary to meet Forest Plan and Forest Service Manual standards and guidelines. (If a soil scientist is not available, a silviculturist or hydrologist can do the work.) If standards and guidelines cannot be met, heavy machinery shall not be used.
- Erosion would be minimized by following General Aquatic Conservation Measures and by implementing the appropriate project design criteria based on the type of activity (see appendix A).
- Erosion from heavy machinery use would be minimized; by minimizing compaction and puddling, rutting would be minimized.

Heritage Resources

- Compliance with Section 106 of the National Historic Preservation Act for activities authorized under this analysis will be completed and concurred with by the Oregon State Historic Preservation Office before any ground disturbing action takes place. For each potential activity the District or Zone archaeologist will determine which of the criteria in the 2004 Programmatic Agreement with the Oregon State Historic Preservation Office best fit the particular project. This will vary somewhat project to project based on the scale of the particular activity, the location on the landscape, and the nature of associated cultural resources, if any.
- The District or Zone archaeologist will document their findings on a Programmatic Agreement form with a project description, rationale and location map which will be attached to the Forest Service Heritage Event database. The Forest archaeologist will review and sign off on the Programmatic Review form if concurred with. For appendices A, B and C projects as defined in the 2004 Programmatic Agreement, the Forest will retain the documentation and provide the Oregon State Historic Preservation Office with the annual summary of projects as described in the Preservation Act.
- For full inventories the District or Zone archaeologist will complete an inventory report meeting current Oregon State Historic Preservation Office standards which will be reviewed by the Forest archaeologist. The Forest archaeologist will forward the completed inventory report to the Oregon State Historic Preservation Office for review and concurrence signature or further discussion as appropriate.
- Consultation with Native American tribes is conducted under the terms of the Memorandums of Understanding the Forest has with each individual tribe. The Forest regularly consults with the Burns Paiute Tribe, the Confederated Tribes of the Umatilla Indian Reservation and the Confederated Tribes of Warm Springs Reservation.
- For work requiring a full inventory under the terms of the 2004 Programmatic Agreement any identified cultural resources sites will generally be avoided. For cases where site avoidance is impractical mitigation procedures will be developed in consultation with the Oregon SHPO before project work begins.

- If any previously unidentified cultural resources are located during project implementation, ground disturbing work will be halted until the resources are evaluated by the District or Zone archaeologist. If the cultural resources are determined to be potentially eligible for listing on the National Register of Historic Places work will either be permanently halted or a mitigation plan will be developed in consultation with the Oregon SHPO before work continues.

Grazing

Protection of Government and Permittee Investments

- All existing structural range improvements (fences, gates, spring developments, etc) and permanent ecological plots would be contractually protected.
- Maintain structural integrity of range improvements.
- If structural improvements are damaged during project operations they would be repaired to Forest Service standards prior to livestock scheduled use by the party responsible for causing the damage. Repairs would be required of the purchaser if damage were done during thinning or fuel treatment contractors or by force account where appropriate.
- Three or more splices to a single wire within a distance of 20 feet will be replaced with a single splice.
- Fence right of ways (6ft either side of fence), trails, other developments and access to them would be cleared of slash produced by project activities.

Notification

- During planning stage of each individual project all potentially impacted grazing permittees will have notice of action and opportunity to provide input that may lessen impacts to their livestock operation well in advance of implementation.
- Prior to implementation all potentially impacted grazing permittees will be given notice of dates when work will start.

Forest Aquatic Restoration Project NEPA Compliance and Implementation Checklist

Project Number: 01052015

Date: 4/27/2015

Title & Category: Fish Passage Restoration – 1; Riparian Vegetation Planting – 14

Location: Big Mosquito – T: 9S R: 33 E, Sec 18 & 19

Project Description: The project will replace two culverts that do not meet the current guidance for properly designed stream crossings; these culverts are barriers to fish passage and are unable to dissipate excess stream energy. The culverts will be replaced with structures that will allow high flows, stream materials, and aquatic organisms to pass through, protecting the integrity of the stream channels and the roads. One existing fish passage barrier culvert on East Fork Big Creek at the FSR 2090-199 crossing and one existing fish passage barrier on Deadwood Creek at the FSR 4560-621 crossing would be replaced. Disturbed areas at the culvert replacement sites would be revegetated by planting native riparian species that would occur under natural disturbance regimes.

Heritage

- Specific PDC for Heritage addressed (Heritage Surveys; Avoidance areas).

Botany

- Specific PDC for Botany addressed (Sensitive Plant Surveys).

- Specific PDC for Nox. Weeds addressed.

Land Management Consistency

- | | | | |
|----------------------------------|------------------------|-----------------------------|---|
| <input type="checkbox"/> 4A | Big Game Winter range | <input type="checkbox"/> 9 | Research Natural Areas |
| <input type="checkbox"/> 6A & 6B | Wilderness | <input type="checkbox"/> 10 | Semi-Primitive Non-Motorized Recreation Areas |
| <input type="checkbox"/> 7 | Scenic Area | <input type="checkbox"/> 22 | Wild and Scenic River |
| <input type="checkbox"/> 8 | Special Interest Areas | <input type="checkbox"/> | Inventoried Roadless Areas |

Comments:

Table 1. Projects Design Criteria and Forest Plan compliance checklist.

I have reviewed this project and have determined it is within the Project Design Criteria identified for my resource.			
Resource	Signature	Date	Comments
Heritage	<i>[Signature]</i>	4/29/2015	NO HISTORIC PROPERTIES AFFECTED
Botany	<i>[Signature]</i>	4/28/15	Give at least 2 weeks notice prior to implementation, to check for weeds
Wildlife	<i>[Signature]</i>	4/27/15	no concerns w/ wildlife resources
Fish*	<i>[Signature]</i>	4/27/15	Consistent w/ PDCs - No issues.
Hydrology*	<i>[Signature]</i>	4/28/15	will improve hydrologic and geomorphic processes and functions
Range	<i>[Signature]</i>	4-28-15	Give 2wk notice please prior to starting work.
Soils	<i>[Signature]</i>	4-28-15	TINY AREA OFF ROADS - NO SIGNIFICANT IMPACT
Recreation	<i>[Signature]</i>	4-28-15	Low recreation use outside of hunting seasons, but let frontliners know when work is going.
Lands and Special Uses <i>minerals</i>	<i>[Signature]</i>	4-28-15	No authorized SUB identified. Contact Minerals Staff for Chainrent notification.
Engineering	<i>[Signature]</i>	4-28-15	Coordinate design w/ Engineering
Fuels / Fire	<i>[Signature]</i>	4-28-15	Give notice to Fire Suppressors 2 wks before Impl.
Silviculture	<i>[Signature]</i>	4/28/15	

* Ensure that an experienced fisheries biologist or hydrologist is involved in the design of all projects covered by Aquatic Restoration Biological Opinion II. The experience should be commensurate with technical requirements of a project.

Line Officer Signature: D. M. Hallowell per dh

Date: 5/6/2015