

Forest Aquatic Restoration Project NEPA Compliance and Implementation Checklist

Scotty Creek Water Developments

Project Number: 01022018 **Date:** 2/15/2017 **Location:** T. 17 S., R. 30 E., secs. 1, 3, 4, 9, 10, 11, and 15-17; includes the 3 northeast most pastures of Scotty Creek Allotment

Category: Category 2: Large wood, boulder, and gravel placement (including tree removal for large wood)
Category 9: Livestock fencing, stream crossings and off-channel livestock watering

Project Description: 11 off-channel water developments and 2 stream crossings at a total of 12 locations

Heritage (to be completed by heritage specialist)

Y N Initial
 KW Specific PDC for Heritage addressed (Heritage Surveys; Avoidance areas).

Botany (to be completed by botany specialist)

Y N Initial
 AV Specific PDC for Botany addressed (Sensitive Plant Surveys).
 AV Specific PDC for Nox. Weeds addressed.

Land Management Consistency (is the proposed project within the management area? Check yes or no. If yes, comments should indicate whether proposed actions are consistent with the standards for the management area.)

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

Comments:

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

I have reviewed this project and have determined it is compliant with the Forest Plan and Aquatic EA Project Design Criteria identified for my resource.			
Resource	Signature	Date	Comments (additional PDCs may be noted if necessary)
Heritage	<u>Kate Withee</u>	<u>04/25/2018</u>	<u>Cultural resource inventory prior to implementation</u>
Botany	<u>Jennifer Johnson</u>	<u>2/28/2018</u>	
Invasive Plants	<u>Amanda Iron</u>	<u>2/28/2018</u>	
Wildlife	<u>Kevin Johnson</u>	<u>3/7/2018</u>	<u>consistent w/ Aquatic EA PDCs, additional PDCs included in Implementation plan</u>
Fish* <u>DA 2-22</u>	<u>Randy Bz</u>	<u>2/15/18</u>	<u>CONSISTENT w/ ABBOT & Aquatic EA PDCs</u>
Hydrology*	<u>NRS</u>	<u>2/28/18</u>	<u>will improve riparian areas through increasing disturbance</u>
Range	<u>NRS</u>	<u>2-26-18</u>	
Soils	<u>Andy M. Van</u>	<u>3-6-18</u>	<u>SPINGER SAYS 2 SPRING SOURCES DISTURBED, BUT NOT SURROUNDING SOIL</u>
Recreation	<u>Wendy Hall</u>	<u>13 Mar 18</u>	<u>No adjacent rec sites or infrastructure. No special mgmt areas present.</u>
Special Uses	<u>Stacy</u>	<u>2/27/18</u>	<u>NO lands sups identified!</u>
lands / Mining	<u>Henry</u>	<u>3/5/18</u>	<u>No mine claims present.</u>
Engineering	<u>Michael Montgomery</u>	<u>4/17/18</u>	<u>No engineering issues identified</u>
Fuels / Fire	<u>Wendy</u>	<u>3/1/18</u>	<u>increase in fuels may create high fire behaviors. Can be mitigated</u>
Silviculture	<u>Amanda</u>	<u>2/27/18</u>	<u>prioritize felling of grand fir, Douglas fir, and juniper first.</u>

* 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.

District Environmental Coordinator: Katherine L. Cuervo Date: 5/3/2018

Line Officer Signature: Wendy Holman Date: 5/7/2018

See
ATTN

Implementation Description:

Scotty Creek Water Developments Project

Category 2: Large wood, boulder, and gravel placement (including tree removal for large wood) Category 9: Livestock fencing, stream crossings and off-channel livestock watering	Lead Preparers: Nick Stiner
Applicant: Blue Mountain Range	NEPA Reference: DN For Aquatic Restoration EA http://www.fs.usda.gov/detailfull/malheur/landmanagement/?cid=STELPRD3817723&width=full
Location: T. 17 S., R. 30 E., secs. 1, 3, 4, 9, 10, 11, and 15-17 USGS Quad: Rail Creek Butte, Five Hundred Flat, Logdell and Scotty Creek	Lease/ /Case File/ Serial #: n/a (Reference #): n/a
Begin Date: 10/5/2017	Due Date: 3/15/2018

Purpose/Need:

There is a need to decrease livestock pressure and use along streams and protect habitat for Interior redband trout, a sensitive species on the Malheur National Forest, within the Scotty Creek Allotment. The purpose of this project is to better distribute cattle within the Little Scotty Creek, Little Damon Riparian, and Damon Creek pastures within the Scotty Creek Allotment, minimize riparian impacts to the 8.3 miles of perennial stream that runs through the pastures (Little Scotty and Damon creeks), and improve existing stream crossings on Scotty Creek.

This project will authorize 11 off-channel water developments and 2 stream crossings at a total of 12 locations in the Little Scotty Creek, Little Damon Riparian, and Damon Creek pastures within the Scotty Creek Allotment. This will facilitate the establishment of a high intensity – short duration management style that will provide better options for resting pastures to improve forage plants, minimize impacts to stream banks, and reduce sediment inputs to streams. The proposed water developments will additionally help decrease livestock pressure and use along streams and riparian habitat conservation areas (RHCAs), including habitat for the Interior redband trout, a sensitive species.

Land Use Plan Conformance:

The project is located in the Headwaters Silvies River, Upper Silvies River, and the Middle Silvies River watersheds of the Silvies sub-basin (see map 1). The Little Scotty Creek, Little Damon Riparian, and Damon Creek pastures fall within Malheur National Forest Management Areas (MAs): 1 and 2 - General Forest and Rangeland, 3A - Riparian Conservation Habitat Area, 14 - Old Growth, and 14M - Middle Ground Visual Corridor. This project is consistent with the Malheur National Forest Land and Resource Management Plan Forest-wide standard #88: “Design and implement structural and nonstructural range improvements to maintain productivity and range condition in addition to benefiting both wildlife and

livestock. Locate range structural and nonstructural improvements to encourage livestock movement away from riparian areas” (USDA Forest Service 1990, page IV-34).

Little Damon Riparian Pasture has 5 springs total: 1 proposed for development, 3 developed and 1 spring retained in existing condition as an undisturbed spring. Little Scotty Creek Pasture has 18 springs total: 5 proposed for development, 5 developed and 8 retained in existing condition as an undisturbed spring. Damon Creek Pasture has 20 springs total: 5 springs proposed, 7 developed, and 8 retained in existing condition as an undisturbed spring.

Proposed Action / Implementation Plan:

The Scotty Creek Water Developments Project consists of 11 off-channel water developments and 2 stream crossings at a total of 12 locations (Figure 2). The project will be implemented in a two-phase approach. Half of the developments will be implemented starting in the summer of 2018, including developments 10, 13, 14, 33, 38, and 39. The remaining developments will be implemented starting in the spring of 2019, including developments 4, 6, 7, 8, 9, and 11. Within one year of spring development, Forest Service crews will complete tree felling or fencing to protect spring sources and overflow areas as described below in “tree-felling for resource protection” and in Table 1. If the pasture will be utilized between spring development and tree-felling or fencing, the Forest Service will provide temporary resource protection of the spring source from ungulate trampling and grazing until crews can complete resource protection activities.

The permittee will be responsible for the installation of stream crossings, spring developments, and water troughs. Stream crossings will be installed with on-site guidance from a Forest Service fisheries biologist or hydrologist. The Forest Service will be responsible for temporary resource protection measures, tree felling and installing fencing resource protection measures. The permittee will inform the Forest Service of any damages to or repairs needed for resource protection measures.

Spring developments and water troughs

Springs will be developed and water troughs installed following the general parameters described in the supplementary document “SpringDevelopment_Description.” Where feasible, spring developments should not disturb the spring source. Spring boxes will not be placed directly at the source for developments 4, 33, 38 and 39 to reduce the total water volume being removed from spring. Spring boxes should be placed in a location that will prevent excessive water loss, and minimize disturbance to wetland soils and groundwater-dependent ecosystem (GDE) vegetation. Preferable locations for all spring boxes should be in an established channel downstream from the source or a location where flowing water becomes subsurface.

The integrity of groundwater-dependent ecosystems (GDE) will be maintained. Spring developments will not dewater GDEs, and will be constructed in a manner that will provide water of sufficient quantity and quality to support the GDE and downstream aquatic ecosystems (aspen stands, fish habitat, etc.). Collect no more water than is sufficient to meet the intended purpose of the spring development, and not more than 10 percent of total spring discharge. Maintain the integrity of riparian areas to filter water, sediment and nutrients before flowing into the stream network.

When developing springs, place troughs far enough away from GDEs, wetlands, and other sensitive or unique habitats to prevent erosion, compaction, or degradation to sensitive soils and vegetation due to

livestock congregation. Place troughs at least 50 feet away from intermittent (category 4) streams. Use suitable measures to avoid or minimize erosion at the trough and overflow outlet. Avoid or minimize failure of infrastructure causing concentrated runoff and erosion.

Spring developments will have a return flow system to minimize the diversion of surface and subsurface water from the catchment area. When feasible, place trough and run-off drainage piping in a manner that allows excess water to flow back into the original spring or as close as possible. When this is not feasible, use tree-felling or fencing of overflow areas to protect soil and vegetation, as described below in “tree-felling for resource protection.”

If bare ground is exposed during the installation of the spring box, use suitable species and establishment techniques to cover or revegetate disturbed areas near springs. This will help prevent the spread of invasive plant species to disturbed areas. Comply with local direction and requirements, including Forest Service Manual 2070 (USDA 2008) for vegetation ecology and Forest Service Manual 2080 (USDA 2001) for prevention and control of invasive species.

Utilize water development guidelines from *Water for Wildlife: a Handbook for Ranchers and Range Managers* (Taylor and Tuttle 2007). This methodology will ensure that native species utilizing water developments as drinking sources, such as bats and birds, will not incur injury. All troughs must include an adequate wildlife safety ramp to allow for escape by all species of wildlife that may become trapped. Specifications for each trough type can be found in Taylor and Tuttle (2007). Water developments should be fully functional and provide available surface water for wildlife across all seasons with the exception of winter months (November – March).

Tree-felling for resource protection

Resource protection measures for the spring will be taken at all spring development sites. Where adequate conifer trees exist, tree-felling will be utilized to protect the spring and riparian vegetation. Where tree-felling is not feasible, the spring will be fenced for resource protection, as described below. Existing conifer trees (preference for minimum 8 inches diameter at breast height [DBH]) on site must be directionally felled in a manner that creates a natural barrier to cattle around the entire perimeter of riparian vegetation. Trees should be felled a minimum 10 feet from the edge of existing riparian vegetation with preference of 30 feet or greater in order to allow big game to easily jump over logs to access water, wallow, etc. Trees should not be felled across the entire spring because this would block wildlife use. Downed trees should either rest on the ground or on other fallen logs and not reach greater than 30 inches in height to allow big game access into spring area. See Figure 6 and Figure 7 as examples. Tree-felling for resource protection is particularly critical for developments 4, 33, and 38 (if adequate conifers exist for tree-felling), but will be applied to all springs.

For all spring developments within Riparian Habitat Conservation Areas (RHCAs): 4, 8, 9, 11, and 39; 5 to 10 trees will be felled perpendicular to the slope between the trough and stream channels. Limb the branches off the bottom of the tree so it lays flat with the ground. The intent is to develop sediment sink areas with felled trees that will capture materials coming from the bare ground around the trough to the stream channels for those located in RHCAs. At these sites, larger conifer trees (minimum 8 inches DBH) will also be felled across any downslope or downstream riparian or overflow areas, in order to protect moistened soils and prevent soil compaction in sensitive soils from trampling and allow for the potential expansion of riparian vegetation into a new area downslope. Tree-felling resource protection measures in RHCAs will be directed by a Forest Service hydrologist.

If inadequate material is available for tree felling, a Forest Service wildlife biologist will determine if fencing is necessary and provide site-specific design criteria. Wildlife friendly measures may include, but are not limited to, the use of lay-down fences, drop down fences, openings and crossing structures, and may need to be constructed far enough away from spring source that big game movements in and out of the enclosure are not restricted or deterred by fencing.

Stream crossings

Developments 13 and 39 include hardened stream crossings and will be implemented with on-site guidance from a Forest Service fisheries biologist or hydrologist. Development of livestock stream crossings will maintain the integrity of the stream channel and will not create vertical instability or a headcut lowering the depth of the water table to the floodplain surface. The crossing shall be stabilized with aggregate rock:

- The surfacing material should consist of 0.5 to 2 inch rock with a minimum 2 to 3 inch thick layer, where the diameter of the median sized rock of the crossing is greater than 1 inch. The minimum thickness of rock protection should be the greater of 6 inches or twice the median sized rock size. See [https://www.blm.gov/or/programs/nrst/files/tneng14\(rev1\).pdf](https://www.blm.gov/or/programs/nrst/files/tneng14(rev1).pdf) (USDA 2001) for more rock sizing information.
- The final elevation of the surfacing stone in the bottom of the stream should be no higher than the original stream bottom on both the upstream and downstream edges of the crossing or access point. This eliminates any possible scour problems.
- Do not disturb the stream channel upstream or downstream of the crossing during installation of a stream crossing.
- Consider fine sediment inputs to the stream from higher streambanks. Consider adjusting the stream bank angle to the floodplain one that is gentle for low stress stockmanship practices.

Aspen stands

Aspen stands with spring developments will be protected with fences or tree-felling (if inadequate conifers exist). This will provide protection of the spring source and surrounding riparian vegetation. Fencing of the aspen stand surrounding spring development 38 was authorized in the Damon Project EA (Damon south stand 22). Repair of the buck and pole fence around the aspen stand at development 39 will be completed following spring development to protect the aspen and ground water dependent ecosystem (GDE).

Monitoring

Because individuals of the rare plant *Pyrola dentata* were found on the hillside adjacent to development 11, a Forest Service botanist will conduct annual rare plant surveys for three years following spring development. If trampling or other negative impacts occur, plants may be fenced or spring development use may be halted.

At spring developments 4, 33, 38, and 39, riparian vegetation communities will be monitored using quantitative methods and photo point monitoring. Monitoring results will inform adaptive management to ensure dewatering of springs does not occur. Potential impacts may include drying of the riparian area or reduced plant vigor (decline in the form of dying or dead plants, or dead aspen that were protected from browse). Monitoring results will also inform an adaptive management process for future spring developments. Maintaining existing vegetation is important to provide food and cover for a variety of

wildlife including small mammals, invertebrates, and larger mammals that may frequent these unique and critical sites.

Heritage Resources

Proposed actions that have the potential to impact known cultural resources include development of spring boxes, trough placement, pipe placement, hardened crossing construction, equipment access, and all other potential ground disturbing activities. If during project activities cultural material is encountered, all work will cease immediately and a Forest Service Archeologist will be contacted to evaluate the inadvertent discovery. A mitigation plan, if needed, will be developed in consultation with the Oregon SHPO. Post-implementation inspection will be conducted by the Forest Heritage program at appropriate development locations.

Table 1. Spring, development, and resource protection descriptions

RHCA = Riparian Habitat Conservation Area

Development number	Spring characteristics	Implementation Phase	Water development description	Resource Protection Summary
4	Located in RHCA, 21 feet from category 4 stream.	Second phase, 2019-20	EZ Flow, spring box, approximately 75 feet of pipe to locate trough away from channel with overflow back to the drainage.	Locate trough greater than 50 feet from channel. Tree-felling for resource protection, including between trough and stream channel. Vegetation monitoring.
6	Seep; 40-50% slope.	Second phase, 2019-20	EZ Flow, spring box, 40-50 feet of pipe to trough with overflow piped back to the natural drainage.	Tree-felling for resource protection.
7	Located in a drainage.	Second phase, 2019-20	EZ Flow, spring box, approximately 75 feet of pipe to locate trough away from channel with overflow back to the drainage.	Tree-felling for resource protection.
8	Located in RHCA, 39 feet from category 4 stream.	Second phase, 2019-20	EZ Flow, spring box, 80-100 feet of pipe to trough due to low gradient, with overflow back to the drainage.	Locate trough greater than 50 feet from channel. Tree-felling for resource protection, including between trough and stream channel.
9	Located in RHCA Seep with surface water flow; 20% slope.	Second phase, 2019-20	EZ Flow, spring box, greater than 50 feet of pipe to locate trough away from channel with overflow back to the drainage.	Locate trough greater than 50 feet from channel. Tree-felling for resource protection, including between trough and stream channel.
10	Located near the top of a drainage.	First phase, 2018-19	EZ Flow, spring box, approximately 75 feet of pipe to locate trough away from channel with overflow back to the drainage.	Tree-felling for resource protection.
11	Located in RHCA, within the channel. Rare plant found on adjacent hillside.	Second phase, 2019-20	EZ Flow, spring box, approximately 75 feet of pipe to locate trough away from channel with overflow back to the drainage.	Monitor rare plant population. Locate trough greater than 50 feet from channel. Tree-felling for resource protection, including between trough and stream channel.
13	Existing stream crossing on category 1 stream, Scotty Creek	First phase, 2018-19	Hardened stream crossing.	In-stream work window Oct 1 – March 31.
14	Seep with low surface water.	First phase, 2018-19	EZ Flow, spring box, approximately 50 feet of pipe to locate trough away from channel with overflow back to the drainage.	Tree-felling for resource protection.

Development number	Spring characteristics	Implementation Phase	Water development description	Resource Protection Summary
33	Adjacent spring sources, one is histic mound. The non-histic mound site will be developed.	First phase, 2018-19	EZ Flow, spring box, approximately 100-150 feet of pipe to trough with overflow back to the existing spring. Locate trough on south or southeast side of spring to route overflow back into existing spring.	Do not disturb histic mound. Tree-felling to protect histic mound, developed spring source, and downstream area. Vegetation monitoring.
38	Aspen stand.	First phase, 2018-19	EZ Flow, spring box, approximately 200 feet of pipe to trough with overflow back to the drainage.	Implement Damon Aspen fencing to protect aspen and source. Vegetation monitoring.
39	Spring source located within aspen stand. Buck and pole fence in disrepair. Located in RHCA, within the channel. Existing stream crossing.	First phase, 2018-19	Hardened stream crossing. EZ Flow, spring box, approximately 300 feet of pipe to trough with overflow back to the drainage. Trough will be placed outside channel.	Repair buck and pole fence around aspen stand following development. Locate trough greater than 50 feet from channel. Tree-felling between trough and stream channel. Vegetation monitoring.

Figures:



Figure 1. Scotty Creek Water Developments project area

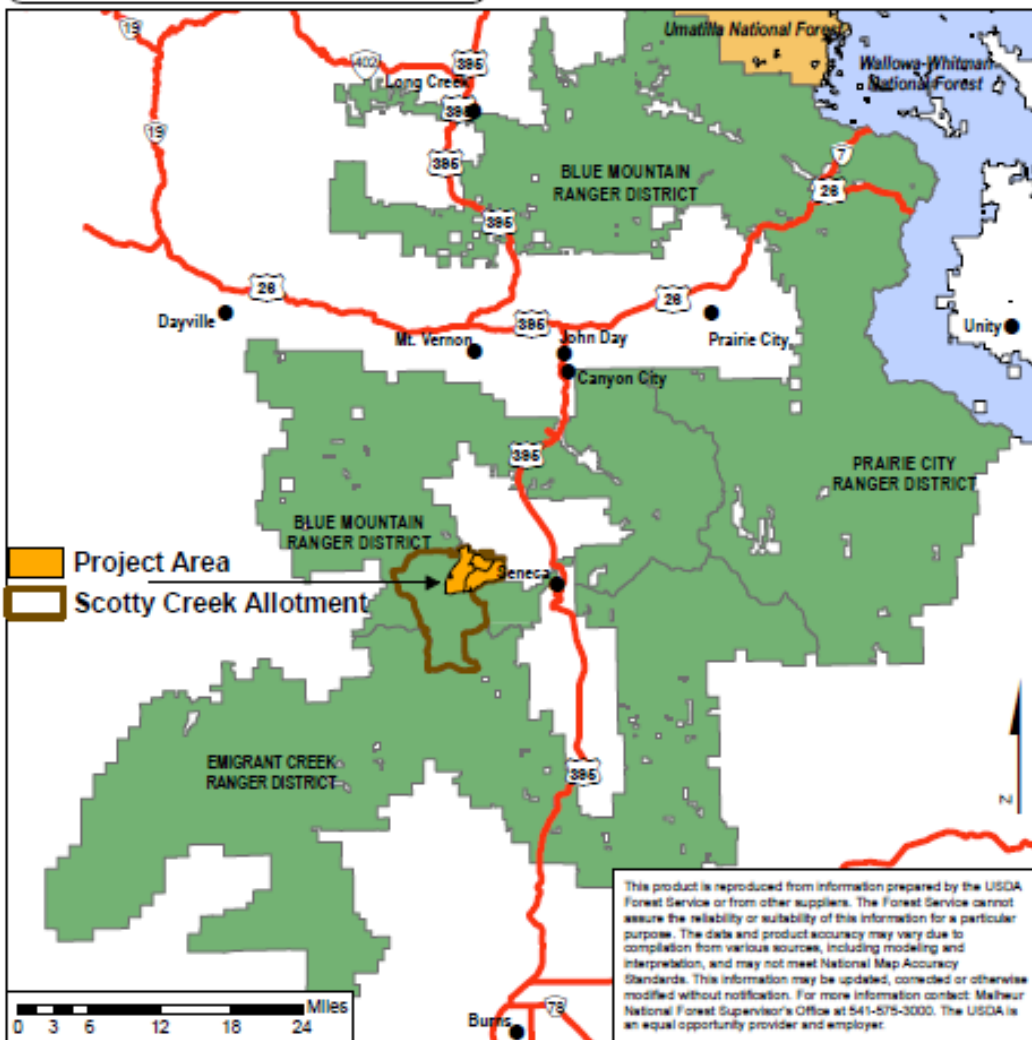


Figure 1. Scotty Creek water developments project area

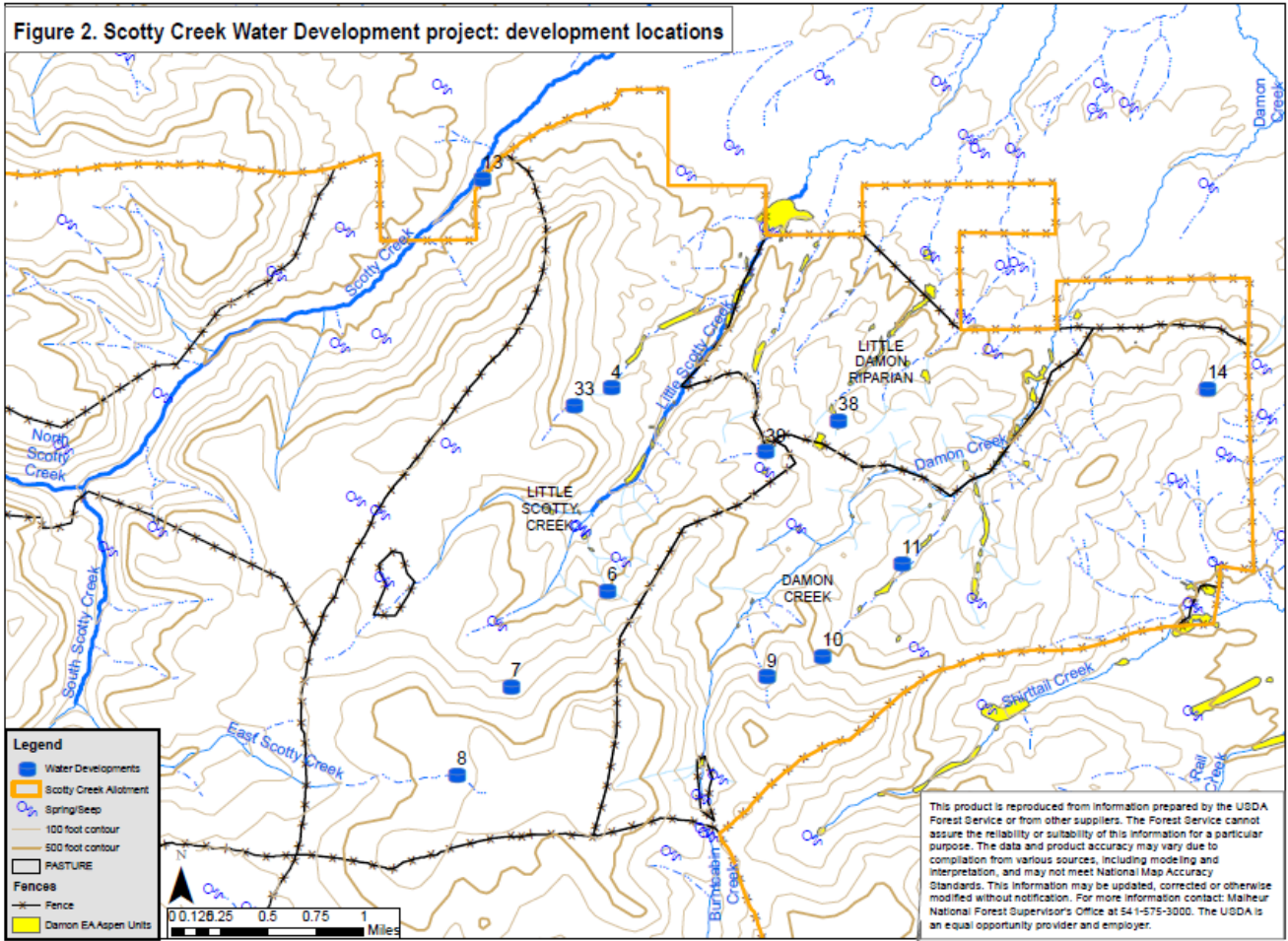


Figure 2. Scotty Creek water development project, development locations



Figure 3. Proposed spring development 10, located near the top of a drainage.



Figure 4. Proposed spring development 6. Tree-felling or fencing needed for protection of riparian shrubs and plants.



Figure 5. Proposed spring development 38, a currently unfenced aspen stand.

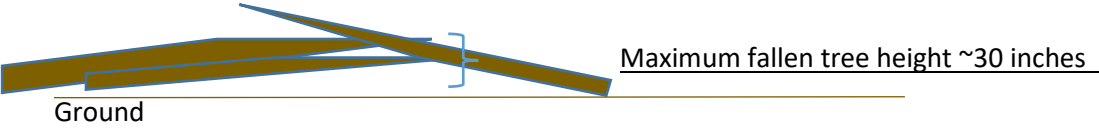


Figure 6. Demonstration of tree-felling resource protection. The height of fallen logs should reach no more than 30 inches to allow big-game to easily jump into spring.

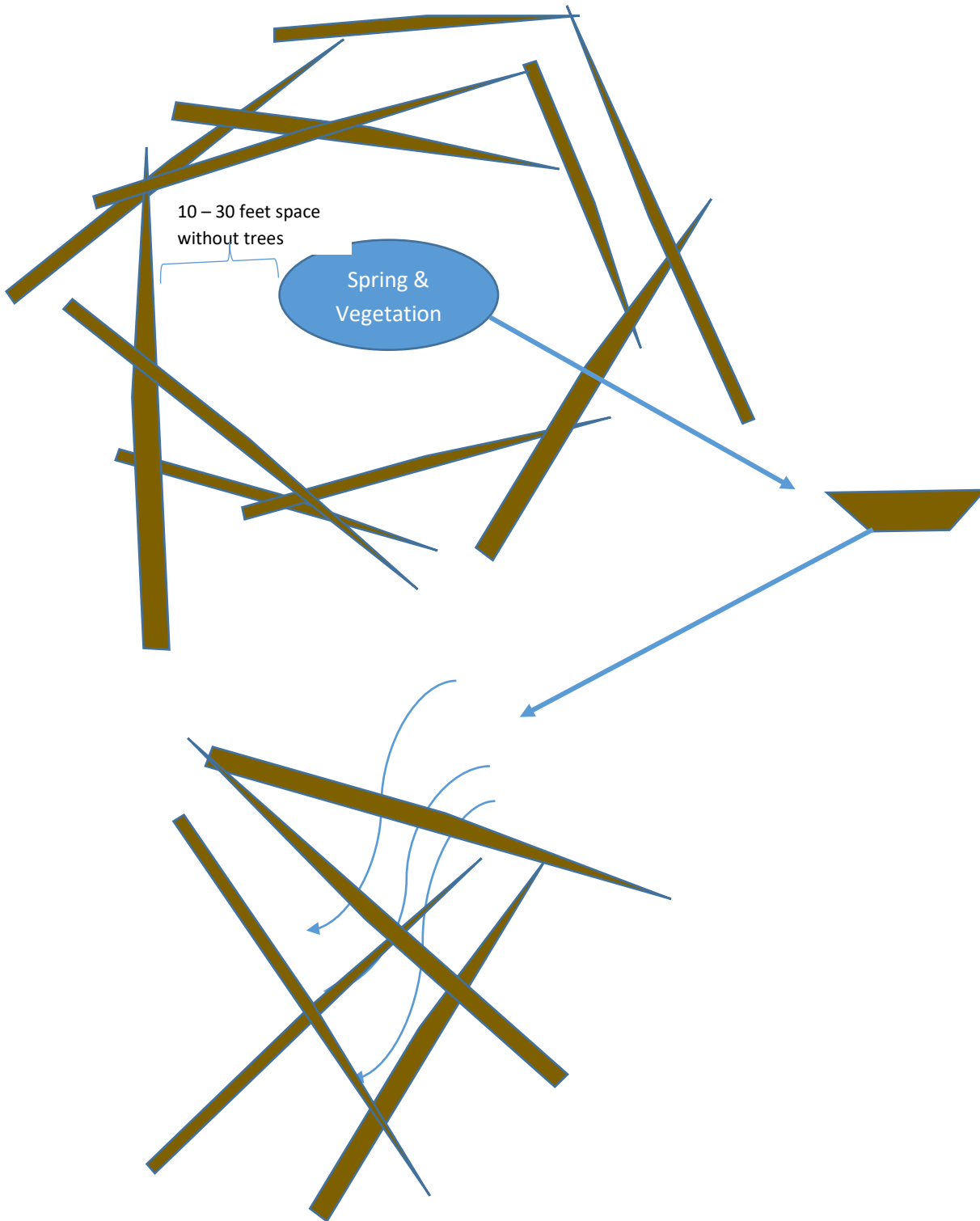


Figure 7. Demonstration of directionally felling trees around the spring and the drainage area for resource protection. Note the original scale of spring has room to allow big game to easily jump and use for a water source, wallows, etc.

References:

USDA Forest Service. 1990. Malheur National Forest Land and Resource Management Plan. USDA Forest Service, Malheur National Forest, John Day, Oregon. Available online at:

<http://www.fs.usda.gov/main/malheur/landmanagement/planning>

USDA Forest Service. 2001. Forest Service Manual 2000 – National Forest Resource Management, Zero Code 2080 – Noxious Weed Management. 10 p. Intermountain Region, Ogden, UT. Available

online at: <https://www.fs.fed.us/im/directives/field/r4/fsm/2000/2080.doc>

USDA Forest Service. 2008. Forest Service Manual 2000 – National Forest Resource Management, Chapter 2070 – Vegetation Ecology. 12 p. USDA Forest Service Headquarters, Washington DC.

Available online at: <https://www.fs.fed.us/im/directives/fsm/2000/2070.doc>

USDA Natural Resources Conservation Service. January 4, 2001. Technical Notes. Bozeman, Montana.

Available online at: [https://www.blm.gov/or/programs/nrst/files/tneng14\(rev1\).pdf](https://www.blm.gov/or/programs/nrst/files/tneng14(rev1).pdf)

Taylor, A.R. M.D. Tuttle. 2007. Water for Wildlife, A Handbook for Ranchers and Range Managers. Bat Conservation International. 17 p.

Appendix to the Aquatic Restoration EA

Implementation Description

Project Title: Scotty Creek Water Developments Project

Project Number: 01022018

Category 2: Large wood, boulder, and gravel placement (including tree removal for large wood)

Category 9: Livestock fencing, stream crossings and off-channel livestock watering

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 – 01022018
 - b. Project name – Scotty Creek Water Developments Project
 - c. Location –

Stream Name	Little Scotty Creek, Damon Creek, Scotty Creek
6 th field HUC	Subwatersheds: 171200020104, 171200020105, and 171200020301

<u>Development Number</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Description</u>
4	-119.124069	44.126196	Spring development
6	-119.124729	44.11099	Spring development
7	-119.134883	44.103827	Spring development
8	-119.140662	44.097242	Spring development
9	-119.108147	44.104382	Spring development
10	-119.102319	44.105862	Spring development
11	-119.093878	44.112743	Spring development
13	-119.137318	44.14202	Hardened stream crossing
14	-119.061772	44.125677	Spring development
33	-119.127969	44.124962	Spring development
38	-119.100389	44.123547	Spring development
39	-119.108019	44.121281	Spring development and hardened crossing

- d. Agency contact – Nick Stiner, nstiner@fs.fed.us
- e. Timing – This project is proposed to start in the summer of 2018. All in-stream work with equipment would occur from Oct 1 – March 31.

- f. Activity category –
 - Category 9: Livestock fencing, stream crossings and off-channel livestock watering
 - Category 2: Large wood, boulder, and gravel placement (including tree removal for large wood)
 - g. Project description – Project description is available in the Implementation Description under the section “Implementation Plan” above.
 - h. Species affected –
 - i. Listed species: None
 - ii. Critical Habitat: None
 - iii. MIS Species: Interior redband trout (also a Region 6 sensitive species)
 - i. Date of submittal – To be completed in Spring of 2018, at least 30 day prior to implementation
 - j. Site assessments – Assessment for contaminants is not required at these locations.
 - k. Review – NMFS fish passage review and Restoration Review Team review are not required.
 - l. Verification – _____
 - m. SOD project notification – _____
3. Minor Variance: No variances are proposed for this project.
 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 FY19 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 Oct 1st and March 31st.
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. Decomcompact soils – Decomcompact 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.
 - vii. 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

2. Large Wood, Boulder, and Gravel Placement includes large wood and boulder placement, engineered log jams, porous boulder structures and vanes, gravel placement, and tree removal for large wood projects. Such activities will occur in areas where channel structure is lacking due to past stream cleaning (large wood 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 Projects

- i. Place large wood 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.
- ii. Structure types shall simulate disturbance events to the greatest degree possible and include, but are not limited to, log jams, debris flows, windthrow, and tree breakage.
- iii. 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.
- iv. 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.
- v. The partial burial of large wood 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.
- vi. Large wood includes whole conifer and hardwood trees, logs, and rootwads. Large wood 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 2.0x bankfull width.
- vii. Structures may partially or completely span stream channels or be positioned along stream banks.
- viii. Stabilizing or key pieces of large wood 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
- ix. Anchoring large wood – Anchoring alternatives may be used in preferential order:
 1. Use of adequate sized wood sufficient for stability
 2. Orient and place wood in such a way that movement is limited
 3. Ballast (gravel or rock) to increase the mass of the structure to resist movement
 4. Use of large boulders as anchor points for the large wood
 5. Pin large wood with rebar to large rock to increase its weight. For streams that are entrenched (Rosgen F, G, A, and potentially B) or for other streams with very low width to depth ratios (<12) an additional 60% ballast weight may be necessary due to greater flow depths and higher velocities.

e. Tree Removal for Large Wood Projects

- i. Live conifers and other trees can be felled or pulled/pushed over in a Northwest Forest Plan (USDA and USDI 1994a) Riparian Reserve or PACFISH/INFISH (USDA-Forest Service 1995 ; USDA and USDI 1994b) riparian habitat conservation areas (RHCA), and upland areas (e.g., late successional reserves or adaptive management areas for northern spotted owl and marbled murrelet critical habitat) 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 or floodplain.
- v. Trees may be stock piled for future instream restoration projects.
- vi. The project manager for an aquatic restoration action will coordinate with an action-agency wildlife biologist in tree-removal planning efforts.

9. 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.

a. Livestock Fencing

- i. Fence placement must allow for lateral movement of a stream and to allow establishment of riparian plant species. To the extent possible, fences will be placed outside the channel migration zone.
- ii. Minimize vegetation removal, especially potential large wood recruitment sources, when constructing fence lines.
- iii. Where appropriate, construct fences at water gaps in a manner that allows passage of large wood and other debris.

b. Livestock Stream Crossings

- 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-foot 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 streamflow 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 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 Fish Passage Restoration (PDC 21).
- 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.

c. Off-channel Livestock Watering Facilities

- 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

(NMFS 2011e)(NMFS 2011e)(NMFS 2011e)(NMFS 2011e)(NMFS 2011e)(NMFS 2011e)(NMFS 2011e), 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.

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 exclosures 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.

Scotty Creek Water Development

Fire Fuels concern:

The felling and leaving of large trees will increase fire behavior. Wildfires that burn through the areas with down wood obstructions may have higher soil sterility and residual tree mortality. During prescribed fire evolutions these large wood areas can be mitigated with firing techniques but there still is a slight potential for decrease in these wood structures.