Little Sagehen Spring & South Little Sagehen Spring Development Restoration 2022

Aquatic Restoration Checklist

USDA Forest Service

Emigrant Creek Ranger District, Malheur National Forest

Harney County, Oregon

Implementation Description

Project Information

Project Information (select the + on right of selection to add additional categories)	
Category 9: Livestock Fencing, Stream Crossings and Off-Channel Livestock Watering	
Lead Preparer: Lisa Grant	
Location: T19S, R30E, Sec 23 SESE and Sec 25 NWNW. 171200 Oregon Closed Basins Shapefiles found in: T:\FS\NFS\Malheur\Program\Range-2200\GIS\ECRD\AllotmentMap_Template\Myrtle\Projects\LittleSagehen_Springs\Layer.shp. Please refer to the attribute tables for Points and Linear Features to find notes on what is existing and what is proposed.	
Lease/ Case File/ Serial number: 12112 (Little Sagehen Spring) and 12145 (S. Little Sagehen Spring)	
Begin Date: 8/25/2022	Due Date: 9/30/2022

Please see http://www.fs.usda.gov/detailfull/malheur/landmanagement/?cid=STELPRD3817723&width=full.

Purpose and Need

Within the Little Sagehen Flat Pasture of the Myrtle Allotment there are two, non-functioning spring developments that need restoration to a functioning condition. See the attached Maps 1, 2, 3 & 4. Redeveloping and protecting these two spring sources will provide reliable water for livestock grazing management; reliable water for wildlife; and protect the spring source and associated riparian habitat for various other species.

Livestock grazing management typically runs in a south to north direction, starting in Gravel Ridge Pasture, moving to the Silvies (River) pasture, then up to the Little Sagehen Flat pasture, and on to the large Little Sagehen/Crane Flat pasture. Cattle move home in a reverse direction in a short 1–2-week period of gathering in mid-September. After the Silvies pasture is used earlier in the growing season, cattle are pushed up Little Sagehen Creek drainage from the Silvies River into Little Sagehen Flat. This pasture is grazed for a short period then gates are opened up so cattle can move into the much larger Little Sagehen Flat/Crane Creek pasture. The gates are left open into Little Sagehen Flat to allow cattle back in to access water for the first portion of the time they are in the bigger pasture. This helps keep cattle at the higher elevations longer, so they don't fall down into the steep canyon of Myrtle Creek. Prior to use

standards being achieved in Little Sagehen Flat, gates are closed. This pasture is later used as an overnight holding pasture when cattle are being gathered from the allotment in September.

Project Description

Two spring developments are proposed to be redeveloped to provide reliable water sources and protect the spring sources and associated riparian habitat. The spring drainages both run into Little Sagehen Creek which is listed as a Category 1 stream, but the fish distribution layer (S_R06.FishDistribution) shows fish distribution stopping over one mile downstream of Little Sagehen Flat Pasture (See Map 1).

1. **12112 (Little Sagehen Spring)**

Project files are minimal on this spring, but they note that it was developed in 1934, "rebuilt later", and "reworked in 1987 by permittees". The development has an existing protection fence around the headbox area but little water is currently being captured and transported to the existing trough. There is an overflow pipe heading east toward the Little Sagehen Creek tributary from the trough. Just to the north of the headbox exclosure is a sunken, circular wet spot covered in hydric herbaceous species that the permittee says was at one time a dugout pond, but there are no notes about this in the minimal project file. There are also remnants of a disintegrating log trough adjacent to the old dugout.

Figure 1, Headbox exclosure fence around Little Sagehen Spring

Figure 2 Existing trough at Little Sagehen Spring with spring exclosure fence in background

Figure 3 Existing/Potential dugout below Little Sagehen Spring with old log trough.

The proposed action on this spring would be to find the original headbox using a backhoe and carefully digging a 15–20-foot strip at the upper portion of the sunken area (just below person on right) in the photo below (see Figure 4). If the headbox/water isn't found in the first location, then they would go about 5 feet downslope (to the left in the photo) and dig another trench across the greener, sunken area, and so on until water is found. A headbox with a shutoff valve accessible from the surface would then be installed.

Figure 4 Existing headbox area in spring exclosure fence.

A trencher would be used to trench a new 1.5" poly pipe (approximately 180 feet) to the existing trough location. If the new headbox is in a location that the existing, old pipeline trench could be used, then that location would be used again for the new pipe to minimize new ground disturbance.

A new trough would be installed to replace the old trough, two wildlife escape ramps would be installed in opposite corners of the trough.

An overflow pipe (1.5" poly pipe, approximately 120 feet) would be buried from the new trough to the Little Sagehen Creek tributary, potentially in the same trench as the existing overflow pipe to minimize ground disturbance. This work would also be done with a trencher.

A fence would be constructed around the wet area (old dugout) to keep livestock out of the site and prevent them from bogging down (several have died in this boggy area in previous years). The new fenced area would be approximately 100 feet by 100 feet with the wet area centered in the middle (approximately 400 feet of new fence). It would be constructed of 4-wires with steel posts at 12 foot spacing or with buck-n-pole fencing.

2. 12145 (S. Little Sagehen Spring)

Minimal project file notes indicate that the original development included a headbox, about 200 feet of 1" plastic pipe to a trough with overflow. Notes on the file also say, "Rebuilt pond sort of 1988".

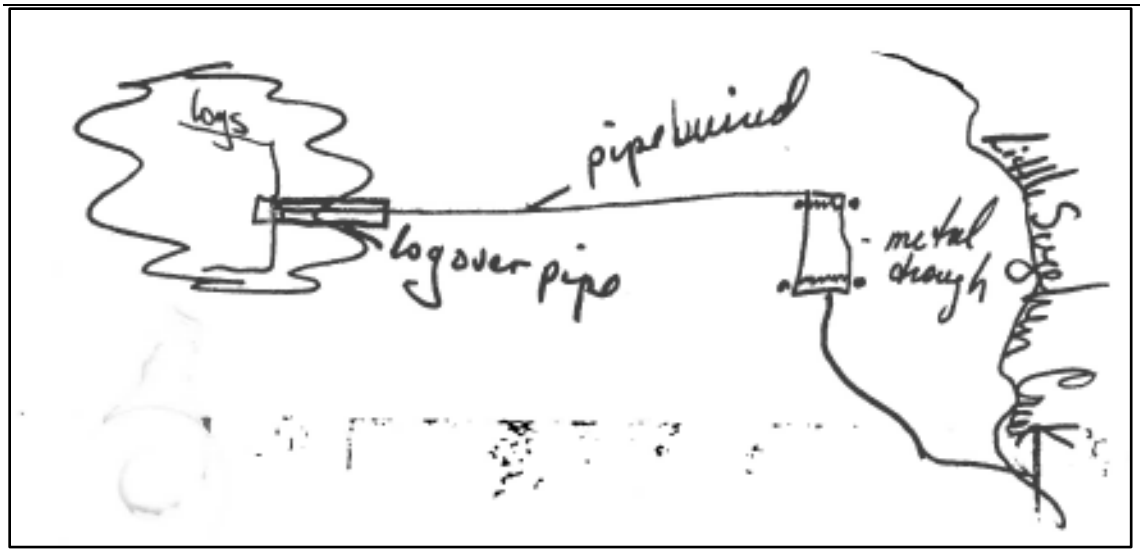


Figure 5, Sketch of "Rebuild" in 1988 from project file.

Figure 6, Spring headbox location. Project file has no notes about this ever being fenced for protection. Permittee put panels up this year to keep cows from bogging down.

Figure 7, End of pipe in center of photo. Note logs placed as indicated in project file sketch.

Figure 8, Looking upstream toward spring source from existing trough. The area where the new pipeline would be trenched under the spring drainage is the small green area in the foreground of this photo.

The proposed action at South Little Sagehen Spring is to use a backhoe to install a new spring headbox with a shutoff valve accessible from the surface. A trencher would be used to bury approximately 350 feet of 1.5" poly pipe to a new trough location. If the angle of the existing pipeline is appropriate to attach the new headbox and trough together, then the trench of the existing pipeline would be used to bury the new pipe and minimize new ground disturbance.

The new trough location was chosen to move the trough further from the riparian area of this tributary creek, although it would require burying the pipe under the tributary. This disturbed area of the trench across the tributary would be less than a 2 by 5-foot area (see Figure 8). Once the pipe is buried, the surface within the streambed will be recontoured to match the undisturbed streambed surface. Sedge mats would be taken from the spring source riparian area and planted over the trenched area within the streambed to help heal the small riparian area disturbed by the trenching and prevent erosion. 1 to 2 small juniper trees would be placed over the sedge matted area to discourage hooved animals from accessing the site.

A new trough would be installed at approximately 43.900609/-119.073308 with approximately 60 feet of 1.5" poly pipe buried as an overflow back into the spring channel. Two wildlife escape ramps would be installed in opposite corners of the trough.

Figure 9, Looking downstream toward proposed new trough location (where person is standing) further away from riparian area.

A four-wire fence or buck-n-pole fence would be constructed around the spring source and headbox to protect the riparian area and investment. The new fenced area would be approximately 100 feet by 100 feet with the spring source centered in the middle (approximately 400 feet of new fence).

Project-Specific Project Design Criteria

The following project-specific project design criteria apply to this proposal:

- Follow wildlife-friendly fencing design and consult with the wildlife biologist.
- If during project activities cultural material is encountered, all work will cease immediately, and a Forest Service archaeologist will be contacted to evaluate the inadvertent discovery.
- Old troughs, exposed pipes, old headboxes, and old or unused fenced material will be removed from Forest Service managed lands once the projects are complete.
- New troughs should be placed on timbers on top of a 6" bed of crushed rock and be properly braced.
- Metal pipe is required for all above ground use.
- Rock should be placed at the outlet pipe for protection from trampling and clogging by fine sediments between maintenance checks. Ensure that return flow outlet does not create erosion/downcutting by placing rock and/or woody material.

MAINTENANCE

- Maintenance of the entire project shall become the responsibility of the livestock grazing permittees.

Desired Conditions

Ecologically sustainable spring developments (Gurrieri 2020):

- Soils of springs and wetlands are intact and functional; erosion and deposition are within the natural range.
- Livestock herbivory and trampling are not adversely affecting springs and wetlands.
- Groundwater systems function under normal patterns of recharge, flow, and discharge and are free of contamination. Groundwater-dependent ecosystems (e.g., springs) have the water sources and hydrologic processes (e.g., water-table elevations) necessary to persist and to sustain associated plant and animal species.
- The ecological structure, diversity, and function of springs and wetlands are maintained or restored.
- Livestock and wildlife have clean water available that comes from a sustainable source.

Land Use Plan Conformance

This project falls within Management Areas 1 and 2 "General Forest and Rangeland", 3A "Non-Anadromous Riparian Areas", and 4 "Big Game Winter Rnage" of the Malheur National Forest Land and Resource Management Plan (Malheur Forest Plan; USDA Forest Service, 1990).

The goal of MA2 is to emphasize forage production on nonforested areas on a sustainable yield basis while providing for other resources and values (Malheur Forest Plan, IV-53). The project is consistent with MA2 standards to design all structural and non-structural habitat improvement projects to achieve management area objectives; manage allotments to ensure that resource values other than forage are maintained at or above minimum requrements (USDA Forest Service 1990, Management Area 2 standards 2 and 4, page IV-53). The project is consistent with these standards because having reliable water sources allows for greater flexibility in grazing management and more opportuntiy to meet range management objectives. Maintaining these spring sources in a sustainable condition while providing clean water for livestock and wildlife is a benefit to both uses along with the public who regularly camp in a large dispersed camp site within ½ mile of the springs.

The goal of MA3A is to "Manage riparian areas to protect and enhance their value for wildlife, resident fish habitat, and water quality. …Design and conduct management in all riparian areas to maintain or

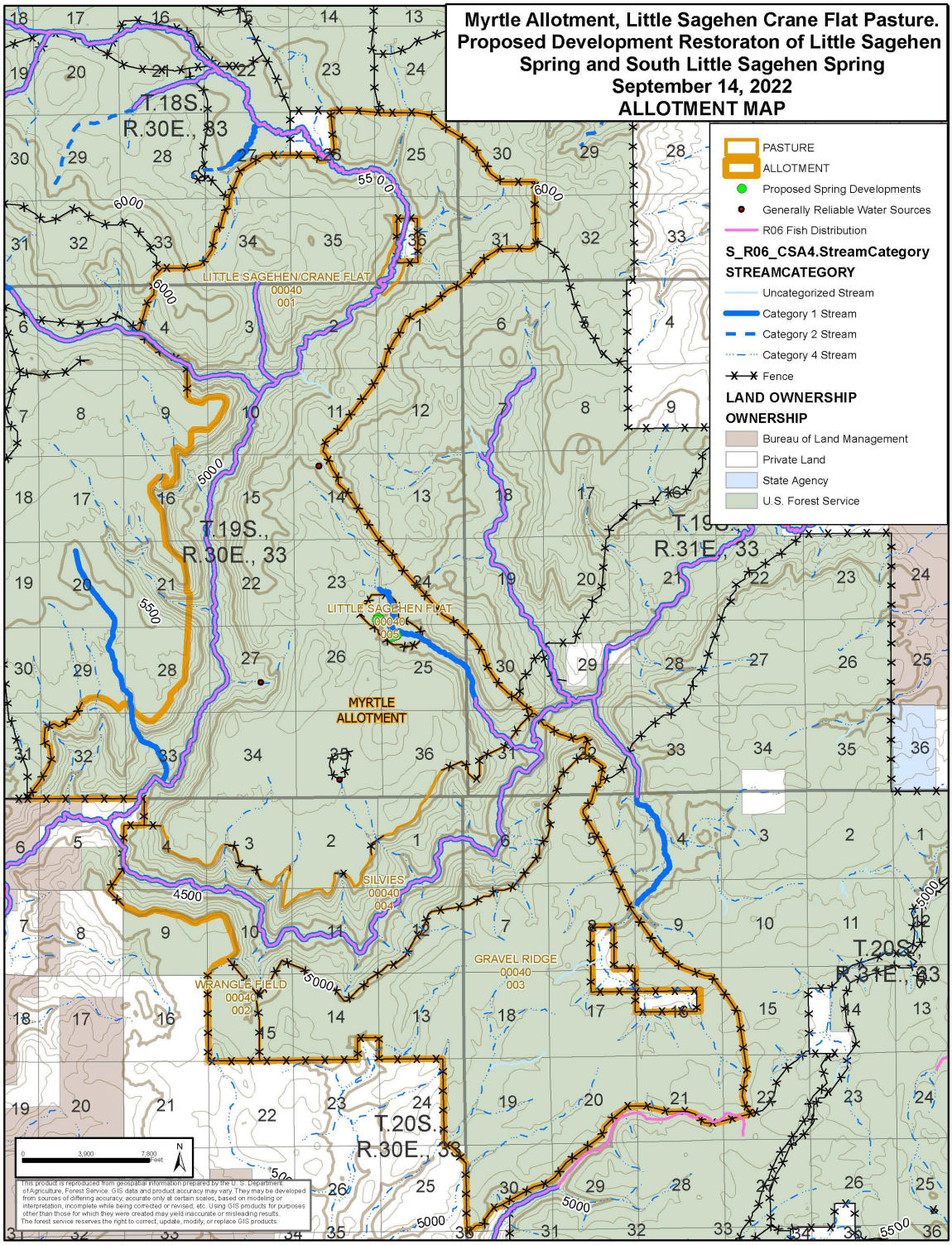
improve water quality and beneficial uses" (Malheur Forest Plan, IV-55). The project is consistent with MA3A standards to plan, design and impliment riparian habitat improvement activies to upgrade riparian areas that are not in a condition to meet management objectives or the desired future condition; improve the rate of recovery in riparian areas that are not in a donciton to meet management objectives by eliminating or reducing the impacts of management activities that may slow riaprian recovery; maintain non-stream associated riparian ares such as seeps, springs, bogs and wallows together with their associated vegetative structure; manage allotments to protect or enhance riparian-dependent resources (USDA Forest Service 1990, Management Area 3A standards 9, 10, 14, and 19, page IV-56 to 58). The project is consistent with these standards because the spring protections fences are proposed to protect riparian resources and water quality.

The goal of MA4 is to "Maintain or enhance the quality of the winter range habitat for deer and elk through timber harvesting, prescribed burning, and other management practices" (Malheur Forest Plan, IV-69). The project is consistent with MA4 standards to restrict activities that disturb wintering big game in a significant and prolonged manner from December 1 to April 1 (USDA Forest Service 1990, Management Area 4 standards 7, page IV-70) because project work would not occur during this timeframe.

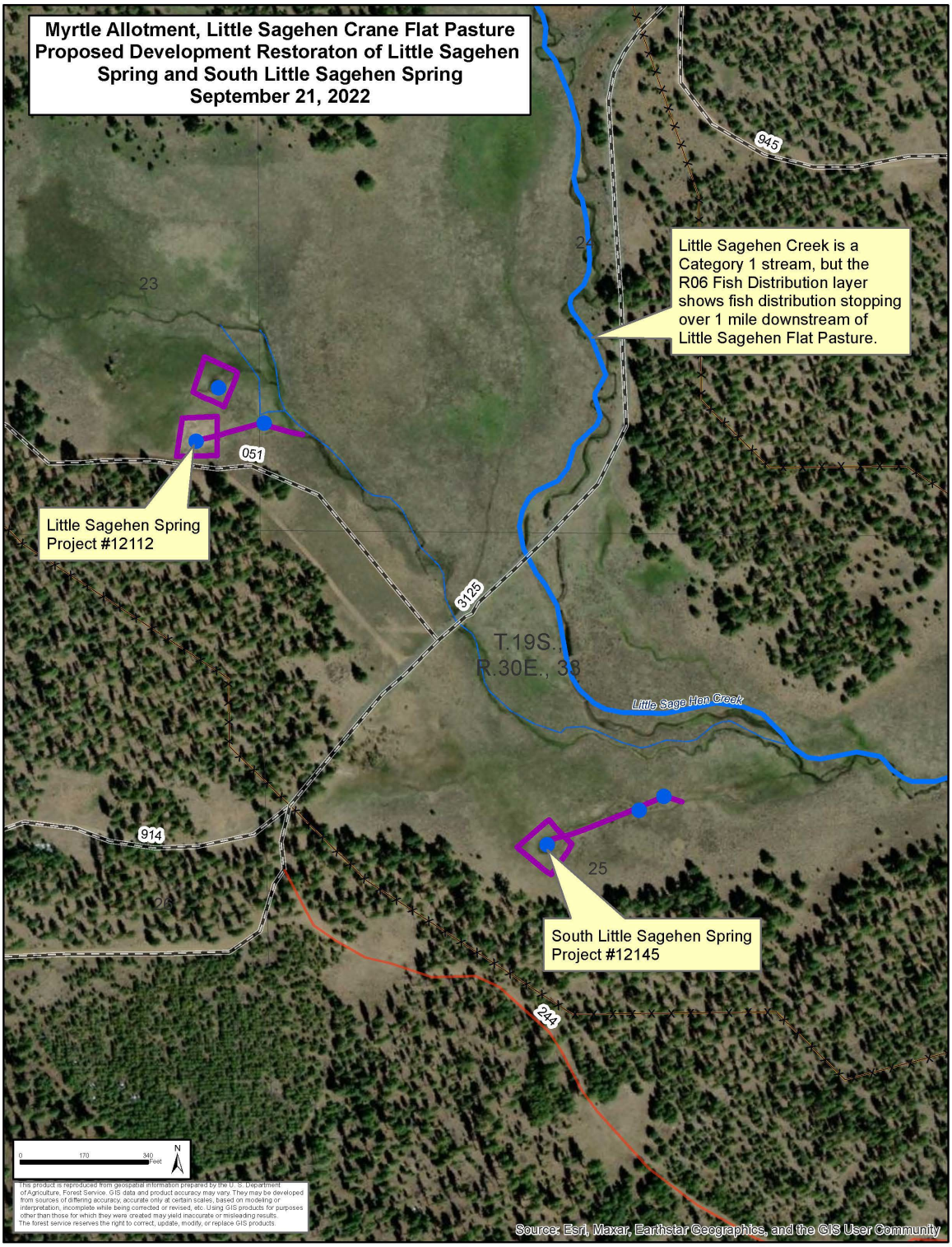
This project is also consistent with Forest-wide standard 88: "Design and implement structural and nonstructural range improvements to maintain productivity and range condition in addition to benefiting both wildlife and livestock. Locate range structural and nonstructural improvements to encourage livestock movement away from riparian areas," (USDA Forest Service 1990, page IV-34). This project is consistent with this standard because fences are proposed to protect riparian resources and critical habitat.

Maps

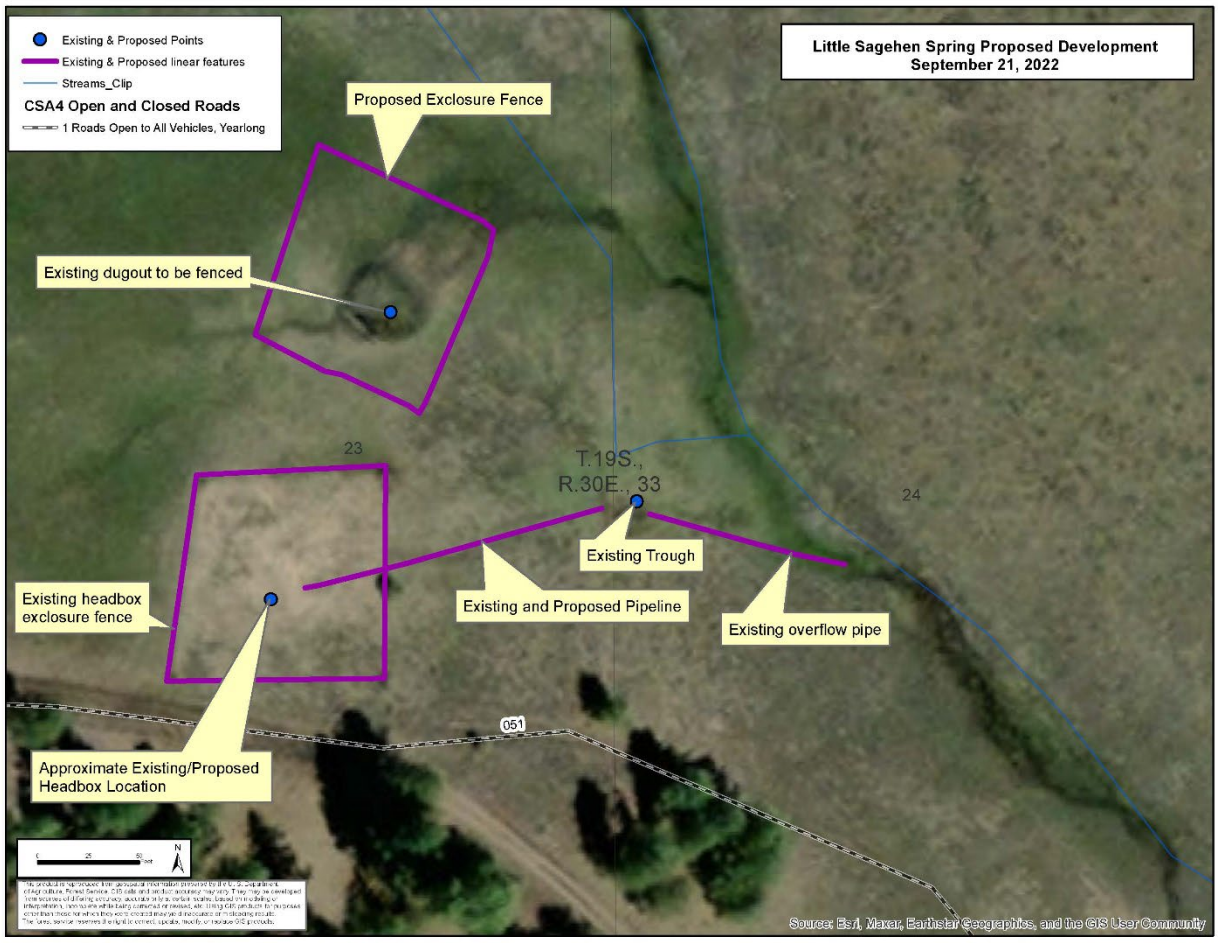
Map 1: Myrtle Allotment Map



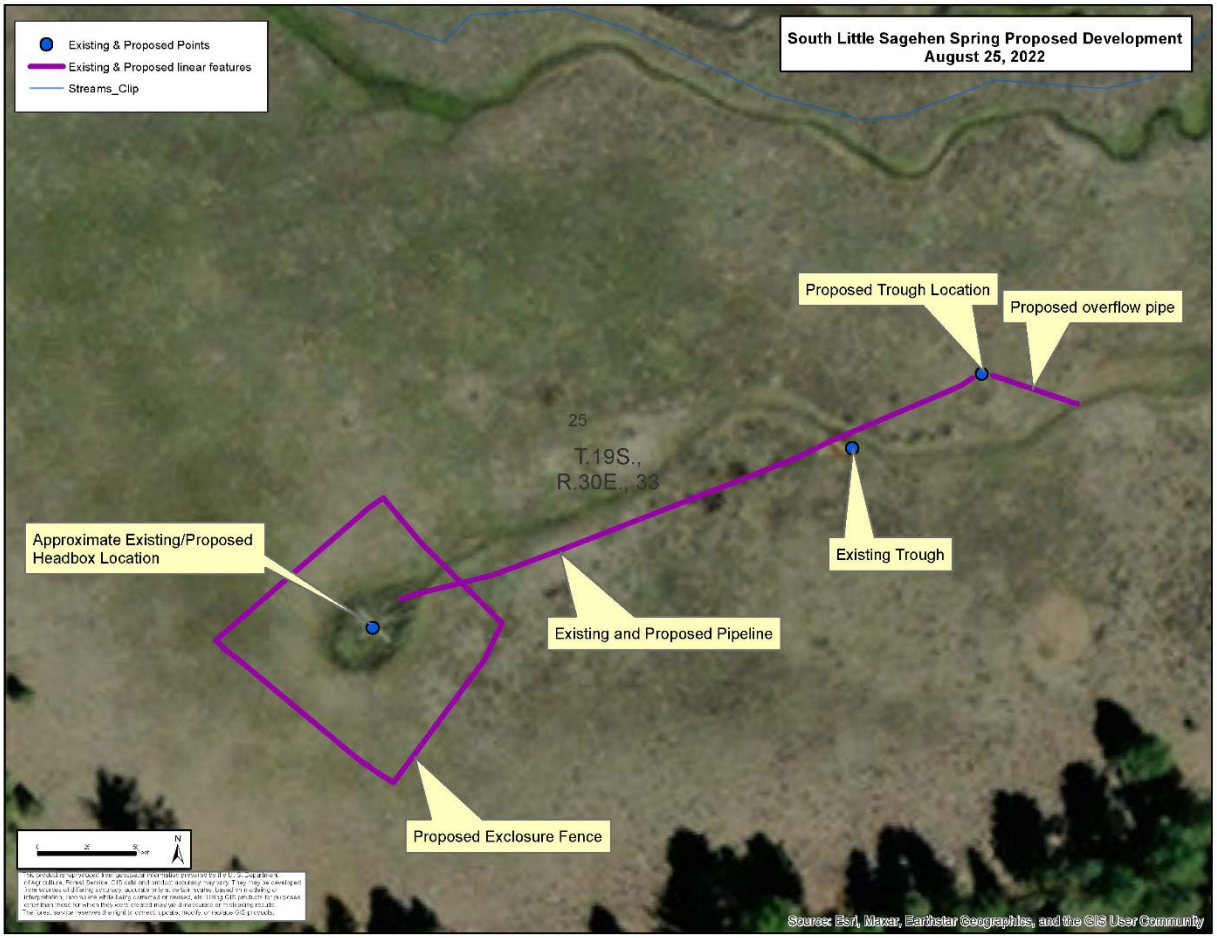
Map 2: Little Sagehen Spring Developments – Main Map



Map 3: Little Sagehen Spring – Proposed Development



Map 4: South Little Sagehen Spring – Proposed Development



References Cited

Gurrieri, Joseph T. 2020. Rangeland water developments at springs: best practices for design, rehabilitation, and restoration. Gen. Tech. Rep. RMRS-GTR-405. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 21 p.

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

Project Review

Malheur National Forest Aquatic Restoration Project
NEPA Compliance and Implementation Checklist

Project Number: 12112 &12145 **Date:** 8/26/2022 **Location:**T19S, R30E, Sec 23 SESE and Sec 25 NWNW
Category: 9: Livestock Fencing, Stream Crossings and Off-Channel Livestock Watering
Project Description: Little Sagehen Spring and South Little Sagehen Spring Development Restoration

Heritage (to be completed by heritage specialist)

Y / N	Initial	
Y	*GPC*	Specific PDC for heritage addressed (heritage surveys; avoidance areas).

Botany (to be completed by botany specialist)

Y / N	Initial	
Y	*LF*	Specific PDC for botany addressed (sensitive plant surveys).
Y	*LF*	Specific PDC for noxious 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	
Y	*HDR*	4A big game winter range	(Select)	*Init.*	9 research natural areas
(Select)	*Init.*	6A and 6B wilderness	(Select)	*Init.*	10 semi-primitive non-motorized recreation areas
(Select)	*Init.*	7 scenic area	(Select)	*Init.*	22/22A Wild and Scenic River
(Select)	*Init.*	8 special interest areas	(Select)	*Init.*	Inventoried Roadless Areas

Comments: There will be no modification or degradation of big game winter range by this project. Management objectives for MA4 will be met.

I have reviewed this project and have determined it is compliant with the Malheur Forest Plan and Aquatic Restoration environmental assessment project design criteria identified for my resource.

Table 1. Projects design criteria and Malheur Forest Plan compliance checklist

Resource	Signature	Date	**Comments** (additional PDCs may be noted if necessary) *May continue on next page
Heritage	*/s/G. Pete Cadena*	9/29/2022	During implementation, an archaeological monitor will be present at the Little Sagehen location. If an intact buried deposit is identified, all activity will stop and the OR SHPO and affected Tribes will be consulted. Any gravel, soil or rock needed will be brought in from an approved source.
Botany	*/s/ Lisa Foster*	9/29/2022	Follow PDCs for groundwater-dependent ecosystems, TESP species habitat and Invasive Species prevention. Project would provide long-term beneficial influences on groundwater and TESP habitat. Sites with disturbance would need monitored for invasive plants one year after implementation. Coordinate with botanist for all revegetation implementation.
Invasive Plants	*/s/ Your Name*	*Date*	*Click here to enter comments*
Wildlife	*Howard D Richburg*	9/12/2022	Install at least 2 escape ramps for each rectangular trough, if dug-out is maintained do work after Sept 1st but before March 30th, follow PDC's as described in this document.
Fish*	*/s/ Danielle McCauley*	10/3/2022	Have wildlife or fish biologist inspect spring for Columbia Spotted Frogs prior to work, and follow PDC's as described above
Hydrology*	*/s/ PJ Klavon*	9/29/2022	Follow PDCs for fencing around source and preventing erosion at the return flow pipe.
Range	*/s/ Lisa Grant*	9/29/2022	Follow PDCs and proposed action described above.
Soils	*/s/ Your Name*	*Date*	*Click here to enter comments*
Recreation	*/s/ Your Name*	*Date*	*Click here to enter comments*
Special Uses	*/s/ Your Name*	*Date*	*Click here to enter comments*
Lands	*/s/ Your Name*	*Date*	*Click here to enter comments*
Mining	*Chase Bloom*	9/12/2022	No Effects to Mining
Engineering	*Chase Bloom*	9/12/2022	No Effects to Engineering
Fuels / Fire	*/s/ Toby White*	9/12/2022	No effects to Fire and Fuels
Silviculture	*/s/Angela Yost*	9/13/22	No Effects

* 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: */s/ Your Name*. Date: *Click to enter a date.*

Line Officer Signature: JOSHUA GILES */s/ Your Name* Digitally signed by JOSHUA GILES Date: 2022.10.07 14:55:39 -07'00' Date: *Click to enter a date.*

Appendix to the Aquatic Restoration EA

General Aquatic Conservation Measures

1. **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.
2. **Climate change:** due to the small scale of this work, future climate changes impacts will not have dramatic effects on this work
3. **In-water work period:** In-stream activities will occur between July 15th and August 15th.
4. **Fish passage:** Not applicable.
5. **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 greater than 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 includes an assessment of the likelihood that contaminants are present at site.
6. **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 (for example, 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.

7. **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, 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 (for example, large wood, boulders, and 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.

8. **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 (for example, minimally-sized, low pressure tires, minimal hard turn paths for tracked vehicles, or 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 (for example, generators and canes), and gas-powered equipment with tanks larger than 5 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 crossings will be abandoned and the stream channel and banks restored.
e. **Work from top of bank:** To the extent feasible, heavy equipment will work from the top of the bank, unless work 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.

9. **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 percent 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 Bureau of Land Management (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.

10. **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 (WDFW) 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.

11. **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; and 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 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 ºC 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 less than 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 Endangered Species Act (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 percent 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 cubic feet per second (cfs). NMFS approved fish screens have the following specifications: (1) 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 (2) 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

9. Livestock Fencing, Stream Crossings and Off-Channel Livestock Watering Facilities

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, bulldozers, 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 (for example, 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 (for example, pool tailouts where spawning may occur), or within 300 feet upstream of such areas.

iv. Existing access roads and stream crossings will be used whenever possible, unless new construction would result in less habitat disturbance and the old trail or crossing is retired.

v. Access roads or trails will be provided with a vegetative buffer that is adequate to avoid or minimize runoff of sediment and other pollutants to surface waters.

vi. Essential crossings will be designed and constructed or improved to handle reasonably foreseeable flood risks, including associated bedload and debris, and to prevent the diversion of 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 (for example, 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 or 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 percent 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.

17. Fisheries, Hydrology, Geomorphology, Wildlife, Botany, and Cultural Surveys in Support of Aquatic Restoration

Fisheries, hydrology, geomorphology, wildlife, botany, and cultural surveys in support of aquatic restoration include assessments and monitoring projects that could or are associated with planning, implementation, and monitoring of aquatic restoration projects covered by this opinion. Such support projects may include surveys to document the following aquatic and riparian attributes: fish habitat, hydrology, channel geomorphology, water quality, fish spawning, fish presence, macro invertebrates, riparian vegetation, wildlife, and cultural resources (including excavating test pits less than 1 square meters in size). This also includes effectiveness monitoring associated with projects implemented under ARBO II, provided the effectiveness monitoring is limited to the same survey techniques described in this section.

a. Train personnel in survey methods to prevent or minimize disturbance of fish. Contract specifications should include these methods where appropriate.

b. Avoid impacts to fish redds. When possible, avoid sampling during spawning periods.
c. Coordinate with other local agencies to prevent redundant surveys.
d. Locate excavated material from cultural resource test pits away from stream channels. Replace all material in test pits when survey is completed and stabilize the surface.
e. Does not include research projects that have or should obtain a permit pursuant to section 10(a) of the ESA.

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 or felling) as part of this project for instream restoration will not be harvested from within the primary shade zone.

Table 2. Primary shade zone width slope distance (feet), based on adjacent hillslope (percent)

Hillslope less than 30 percent	Hillslope 30 to 60 percent	Hillslope greater than 30 percent
50 feet	55 feet	60 feet

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

- The trees are located on a south facing slope (175 to 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 percent 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 3. Bankfull widths and minimum diameter of logs to be considered key pieces

Bankfull width* (in 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 1 1/2 times (1.5 times) the bankfull or a log without a rootwad should be twice (2 times) the length of the stream's bankfull width. As the best fish habitat is formed around jams composed of three to seven logs, at least two 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.

Juniper Treatments

The majority of the juniper treatment areas would be within the riparian habitat conservation areas and adjoining uplands. For each area evaluated for juniper treatments, interdisciplinary teams would discuss the following questions in order to identify the attributes of an area and select the appropriate treatments:

- What kind of site (potential natural vegetation, soils)?
- Successional state of site?
- Components that need to be restored?
- How units may fit into the overall landscape mosaic?
- Long-term goals and objectives?

Utilize the "Western Juniper Field Guide: Asking the Right Questions to Select the Appropriate Management Actions (Bates et al. 2007, Circular 1321) (see http://pubs.usgs.gov/circ/l 32 l/pdf/circ l 321.pdf).

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 (Due to No Mechanism for Sediment Delivery):

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

Prescribed Burning and Related Activities

- Mechanical piling and burning of large piles will be restricted to existing roads and landings.
- Include all relevant PDC in silviculture prescriptions and burn plan objectives for all fuel treatment activities within RHCAs.

Use all available fuel treatments and preparation activities as necessary (for example, multiple entries, slash pull-back, modified ignition methods, locations, timing, and sequence, thinning of small green trees, pruning of green trees and snags, prescribed fire, fire suppression, jack pot burning, etc.) to achieve the specific PDC. Suppression should be used only as a last resort to achieve other PDC.For Perennial and Fish-Bearing Stream Channels:

- Avoid removing trees along stream banks (for example, don't cause bank instability or increase erosion).
- Within primary shade zone retain 100 percent of the overstory canopy closure with the exception of hardwood treatment.
- For intermittent. non-fish-bearing stream channels:
  - Within 50 feet of the stream channel backing fire is preferred.
- For the maintenance and use of water sources and draft sites:
  - Minimize disturbance of existing riparian vegetation to the greatest extent practical; in particular, maintain shade, bank stability, and large woody material recruitment potential.
  - Use sediment control measures such as straw bales, filter cloth, or sediment fences when conditions warrant.
  - Maximize maintenance activities during late summer and early fall to best avoid wet conditions.
  - Do not pump from streams that do not have continuous surface flow. When pumping water in all situations from streams, ensure that at least one-half of the original streamflow remains below the pump site.
  - Refuel power equipment, or use absorbent pads for immobile equipment, and prepare concrete at least 150 feet (or as far as possible from the water body where local site conditions do not allow a 150 foot setback) from water bodies to prevent direct delivery of contaminants into associated water bodies.
  - Fisheries, hydrology or other qualified personnel must work with engineering/fire personnel to review proposed activities to minimize potential effects to fish, stream channel conditions, and water quality.
  - Use and develop off-channel ponds outside of stream channels were feasible and appropriate. Work with fire folks to prioritize and decommission unnecessary in-stream drafting sites.
  - Water withdrawal equipment must have a fish screen installed, operated and maintained in accordance to NOAA Fisheries guidelines.

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 (for example, 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.

Big Game

- Within big game winter range a wildlife biologist will be consulted between December 1 and April 1 to determine if activities should be restricted for big game needs.

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 feet. 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 feet 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 Malheur 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 or mulch is not available, individual national 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, 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 (for example, 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 or not economically feasible, and (4) in permanently altered plant communities.
- Under no circumstances shall non-native invasive plant species 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 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 National Forest or moderate on the Ochoco National Forest, 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 (see section, above) 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.
- For Livestock Stream Crossings and Off-Channel Watering Facilities, out-of-channel erosion would be minimized.
- For Road Erosion Control, erosion would be minimized.
- For Juniper Removal, erosion would be minimized. It is possible that juniper removal would increase ground cover within a few years, and thereby reduce erosion.
- Prescribed fire (including for disposal of slash after juniper removal) can involve only low- and moderate-severity fire, and erosion from fire lines would be minimized, so erosion from prescribed fire would not be significant.

Fire and Fuels

- Mechanical tools may be necessary to prepare fire control lines for these burns, but would be limited, and typically no heavy equipment would be used. Prescribed burns or wildfires could temporarily affect air quality.
- The project design criteria for both Juniper Removal and Riparian Vegetation Treatment (controlled burning) would be followed. National, state, and local policies regarding prescribed fire implementation will be met.
- Activities that are expected to create smoke emissions would follow the State of Oregon Smoke Management Plan. Prior to burning, approval will be obtained from the Oregon Department of Forestry, who determines compliance with the Clean Air Act. State smoke forecasts, which predict wind direction and smoke mixing height, will be obtained prior to all burning to ensure smoke intrusions will not occur in the local smoke sensitive receptor areas.
- Burning will follow the guidance provided by the Oregon Smoke Management Plan (Directive 1-4-1-601, Operational Guidance for the Oregon Smoke Management Program), which is an agreement between federal land management agencies in northeast Oregon and Oregon Department of Forestry limiting smoke emission amounts. Oregon Department of Forestry monitors activity, and if a limit is reached it will shut down prescribed fire activity.

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 (SHPO) 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.

Recreation

- Motorized aquatic restoration methods would not be used within wilderness, wild portions of wild and scenic rivers, and inventoried roadless areas.
- Mechanized aquatic restoration methods would not be used within wilderness or wild portions of wild and scenic rivers.

Grazing

General

- Range and fire specialists and permittees would coordinate activities including scheduling of burning activities in grazing units.
- Utilize the Forest Post-Fire Interim Grazing Guidelines to aid in determining when to resume grazing activities.
- Whenever possible, units to be rested would be burned in the spring of the year to be rested or in the fall prior to the rest year.
- If a rest period is required following a burn the permittee has the option to exclude cattle grazing from those portions of a pasture that were burned through the use of fencing and could continue to graze the unburned areas of a unit.

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 (6 feet either side of fence), trails, other developments and access to them would be cleared of slash produced by project activities.

Aspen Restoration

- New aspen exclosure fences would have gates installed in proper locations to allow for removal of stray livestock. Aspen fences would be maintained each year and repaired whenever necessary. Plans for aspen exclosures will define when restoration of the protected stand has been achieved and who has responsibility for maintenance of the structure. When fences are no longer needed, aspen fences should be removed.
- Alternate livestock water sources to those being used in aspen stands would be developed off-site before fencing aspen or re-evaluate fencing of the aspen site. Coordinate with range specialist and permittee.

Notification

- During the 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.