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Protect and Restore the Upper Lochsa

Annual Progress Report

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1.0 INTRODUCTION

The Upper Lochsa watersheds included in the project contain critical spawning and rearing habitat for anadromous and resident fish (Clearwater National Forest 1999). Species that depend on the tributary habitat include spring chinook salmon (*Oncorhynchus tshawytscha*), Snake River summer steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentes*), and westslope cutthroat trout (*Oncorhynchus clarki lewisi*). Steelhead and bull trout populations are currently listed as Threatened under the Endangered Species Act (ESA), and westslope cutthroat trout has been petitioned for listing. Both out-of-basin and in-basin factors threaten fish populations in the Lochsa Drainage (Clearwater Subbasin Plan 2003). Out-of-basin factors include the hydroelectric system and ocean conditions, while in-basin factors include a variety of management activities leading to habitat degradation. This project is implemented under Bonneville Power Administration's Fish and Wildlife program in order to meet National Marine Fisheries Service requirements to offset losses caused by the operation of the hydrosystem by improving tributary habitats to promote increased productivity of salmon and steelhead. The Clearwater Subbasin Plan (2003) defines limiting factors to fisheries in the area as watershed disturbances, habitat degradation, sediment, temperature, and connectivity.

Figure 1. Location of Project Work 2008.

Upper Lochsa Project Contract:

The Upper Lochsa project represents a merger of two pre-existing BPA projects covering adjacent watersheds with the addition of drainages in the middle Lochsa, an adjacent downstream watershed. The Middle Lochsa project area now included in the Upper Lochsa was a successfully proposed new project in the 2007-2009 Provincial Review and was rolled together with the other two projects for greater contracting and implementation efficiency.

The existing projects and their plan of work that were rolled into one contract this year are as follows:

Table 1. Characteristics of the Project Area

Project	2008 BPA Approved Funding	Project Area in Acres	Project Focal Species	Limiting Factors	Proposed Work with (WE#)
Protect and Restore Upper Lochsa	\$595,965	370,660	spring Chinook salmon, Snake River steelhead, fluvial bull trout, west slope cutthroat trout, all other resident fish, all wildlife	Sediment, Habitat Connectivity, Temperature, Riparian Condition	Improve road (38), Decommission Road (33), Erosion Control on Decom Roads (55), Revegetation (47) Replace culvert (85) Nonnative Invasive Plant Treatment (53)

2008 Project Focus

This year restoration projects focused on improving in-stream habitat conditions by addressing legacy management impacts associated with timber harvest and road systems. Roads built to support timber harvest and other management needs have many impacts to watershed condition. The most significant impacts to aquatic resources are sedimentation of fisheries streams, passage barriers, and corridors for invasion of non-native plants (also referred to as noxious weeds or non-native invasive plants).

Our implementation this year included 8.45 miles of road removal, erosion control and revegetation of these removed roads, two culvert replacements for aquatic species passage, 4 miles of road improvement (including 15 culvert replacement), 260 acres of invasive plant treatment, and concentrated in-stream habitat work and vegetation work on culvert replacements at Bridge Creek, Cabin Creek, East Fork Indian Graves Creek, Indian Graves, and the FS road #108. In addition this year we completed monitoring of past road and culvert projects and initiated research level monitoring of road removal and completed weed treatment implementation monitoring.

Table 2. Summary of all Work Accomplished in 2008

Work Element	Location	Description
Road Removal	Saddle Camp	8.45 miles recontoured
Revegetation	Saddle Camp Roads, Bridge Creek, Cabin Creek, Indian Graves, and North Fork Spruce.	Seeding, Brush planted with Excavator, and hand transplanting/ sprigging. Estimated total of 58 acres.
Weed Treatment	NPT Crew	260 Acres: Including campgrounds, administrative sites, new invaders, and previous restoration work areas.
	USFS Contract	Spraying along System road corridors. 115 acres
Culvert Survey/Design	Haskell Creek, Wendover Campground	Replacements proposed in out-years.
Culvert Replacement	North Fork Spruce	64' span bridge; 3 miles of habitat.
	Bridge Creek	41' span bridge; about 2.5 miles of habitat.
Road Improvement	Doe Creek	Four miles with 15 culvert replacements.
Weed Treatment Aquatic Monitoring	Riparian Sites along FS Roads #108,	Monitoring to determine compliance with NOAA and USFWS biological opinion.
Road and Culvert Monitoring		Implementation and Technique Effectiveness Monitoring at past restoration sites.

Table 3. Cost Share on Project Work

Project	USFS \$	Other \$
Road Removal and Revegetation		
Weed Treatment	\$14,000	RAC to NPT \$17,650, and \$18,000
Culvert Survey/Design	\$30,000	
Bridge Creek, Culvert Replacement	RAC: \$90,000 BAER: \$5,000 CNF: \$10,000	
North Fk. Spruce	CMLG: \$60,000 CMRD: \$22,192	
Road Improvement	CMLG: \$10,000	
Weed Treatment Monitoring	\$9,500	
TOTALS	\$250,692	\$35,650

BPA/NPT: \$595,965 Cost Share: \$286,342 (48%)

2.0 METHODS

2.1 Reducing Road Related Sedimentation

The project work this year continues implementation work started in 1997. After the flood events of 1995-96, the Nez Perce Tribe Department of Fisheries and Resource Management-Watershed Division (NPT-DFRM-Watershed) and the Clearwater National Forest (CNF) developed a watershed analysis and transportation plan during the first phase of project work. These documents identified over three hundred miles of unneeded roads in the Analysis Area and prioritized areas for road removal. Most of these three hundred miles of road were built on landslide prone slopes; data collected during road survey revealed them to be sediment sources, which if not mitigated would continue to degrade aquatic habitat.

Reducing road associated sedimentation involves a four step integrated implementation approach: removing unnecessary roads, improving roads identified as important for management, revegetating disturbed sites, and treating invasions of non-native plants.

2.1.1. Road Removal Methods

Using the information available from other road stabilization/removal programs and anecdotal evidence from the Clearwater's fledgling road removal work in the early 1990's, the Clearwater National Forest/Nez Perce Tribe Partnership determined the most cost-effective and functional way to prevent continued erosion from these unneeded roads was by a prescription of removing the road prism from the hillside either by outsloping or recontouring the fillslope¹. Implementation is a multi-step process beginning with transportation planning logistics planning, field surveys, contractor solicitations and selection, NEPA, and finally implementation. Prior to 2008, our prescriptions were developed on site during intensive pre-work road survey and refined or adjusted during contract inspection. This year surveys were used to develop plans for fixed price construction contracts for road removal. Collecting data during survey generally takes the entire field season for projects greater than 20 miles. Most of the roads removed during the 2008 field season were surveyed in 2007.

We prescribe the level of treatment required to reduce or eliminate mass failure risk, restore watershed hydrology, and restore land productivity. The Clearwater National Forest defines levels of road treatment as the following:

- Level 1: Recontour road entrance to restrict vehicle access.
- Level 2: Some work required along the road to address mass failure or erosion risk factors.
- Level 3: Substantial work required along the full length of the road.
- Level 4: Recontour of most of the road.

¹ Definitions follow at end of section.

Because of the instability of roads in the Analysis Area, stabilization generally requires Level 3 or Level 4 treatment. The following kinds of work are involved in these levels of treatment. All culverts are removed. Fills are removed in the area around live streams and stream channels are restored to original grade. Ditches are eliminated and road surfaces are strongly outsloped or recontoured to provide continuous drainage. Road surfaces may be decompacted prior to outslope or recontoured to promote tree growth. Disturbed areas are mulched with native woody debris, or a scattering of logs and stumps. Native shrubs and sod excavated during outsloping or recontouring are transplanted into disturbed areas and the area is seeded with a native grass mix. At completion, the area will no longer convey vehicle traffic, and requires no maintenance. Successfully completing road treatments requires the use of excavators and in some cases, bulldozers.

Definitions for stabilization techniques:

Full recontour

A full recontour involves reestablishing the natural contours of the hillside, restoring the original topography. In full recontour sections, we pull up the entire fill, place it on the decompacted cut bench, and blend to the top of the cut slope.

Partial recontour/Outslope

A partial recontour involves removing fill and replacing cut material while leaving a flat or sloped section of the traveled way intact, usually for use as a trail (USFS, 1996). Sometimes the term "partial recontour" is used to mean pulling some fill (usually that which can be easily reached) and placing in on the cut bench, creating a strong outslope.

Figure 2. Full recontour. Before recontour on left; after work on right.

2.1.2. Weed Inventory Methods

The Clearwater National Forest and Nez Perce Tribe adapted inventory protocols from the United States Department of Agriculture-United States Forest Service Invasive Species Mobile which is a national protocol for inventorying invasive species on all USFS managed lands with data tracked in a national database. In order to map populations of invasive plants or weeds, inventories are organized around a map feature (line, point, or polygon). Inventories in 2008 focused on past road removal projects and sites previously identified as new having new invaders.

Isolated populations and large areas of weed invasion are mapped on the PDR with GPS capability. Populations are mapped using the ArcPad program, and are catalogued in Invasive Species Mobile. All inventories are also recorded in field notebooks.

Data is downloaded each week into the USDA TERRA/FACTS database. The Nez Perce Tribe has also developed a geo-referenced database and processes spatial information for weed infestations for the Clearwater National Forest at the end of each field season. A spatial layer is available with weed species, road, and size of infestation.

2.1.3. Weed Treatment Methods

The Nez Perce Tribe proposed an integrated treatment of noxious weeds (non-native invasive plants) beginning in 2005. Integrated treatment includes mechanical grubbing or mowing of isolated populations, pulling some species where it is effective, chemical treatment, and use of biological control and prescription grazing. In 2008, treatment consisted of mechanical and chemical control. The Clearwater National Forest completed an Environmental Assessment (EA) for the entire Lochsa Drainage, (Lochsa Weeds EA) in late 2007. The EA includes a suite of recommendations for integrated treatment and sets allowable amounts of herbicide use per 7th order stream drainage with special parameters for riparian areas and restrictions according to weather conditions (wind and rain). Data for weed treatment is reported in the USFS National Invasive Species Mobile database as well as reported to NOAA and USFWS and BPA for compliance with permitting.

Figure 3. Invasive species mobile interface as it looks on the PDR/GPS for field data collection.

2.1.4. Road Improvement Implementation

Roads that will remain on the Clearwater National Forest transportation system may be chronic sources of sedimentation into streams and, because of location and design, may also be at risk of failure. Road improvement techniques focus on road upgrades of problem areas identified during surveys. Upgrades decrease surface erosion and reduce the risk of road failure. Methods may include road surfacing, changing road grade (inslope vs. outslope), installing or upgrading drainage structures, constructing driveable drainage “dips”, revegetating cutslopes and fillslopes, and road re-location. Levels of sedimentation from open roads will be evaluated using the USFS GRAIP model; protocols are available online (<http://www.fs.fed.us/GRAIP/index.shtml>).

2.2 Restoring Stream Habitat Connectivity

2.2.1. Culvert Survey for Fish Passage

The Nez Perce Tribe follows the national United States Forest Service protocol for surveying and determining aquatic passage at road crossings. The protocol, titled Passage through Road/Stream Crossings Inventory, requires geomorphologic surveys of the stream at each crossing. Once the general stream crossing field data have been collected, a passage assessment is made, if possible in the field. This methodology uses a tiered approach. First, we determine whether the crossing simulates stream conditions (thereby passing most organisms). If the crossing does not simulate the stream channel, a regionally developed, species and life stage-specific criterion is used to determine whether the structure is a total barrier for the species/life stage, passable, or passage is indeterminate.

If it is not readily apparent whether a structure is a barrier to fish, hydraulic analysis can be performed in the office using FishXing. The FishXing software is available on the web at: <http://www.stream.fs.fed.us/fishxing>.

2.2.2. Fish Passage Structures

We replace culverts following the USFS protocol for Stream Simulation Criteria, with the goal of passing all life stages of all aquatic species. Installed culverts are designed for and sized for the active channel and will accommodate a 100 – year flood event. All culverts are installed below stream grade to allow natural substrate colonization. In addition, natural channel features are often constructed within the structure and outside of the structure at the time of installation. Features include low flow channels, vortex rock weirs, and vanes.

2.3 Project Monitoring

2.3.1 Road Removal Monitoring

The goal of road decommissioning on the Clearwater National Forest is to reduce watershed impacts by reclaiming roads that are no longer a necessary part of the Forest's transportation system. The primary objectives are:

1. *Reduce erosion from road surfaces and slopes and related sedimentation of streams.*
2. *Reduce the risk of mass failures and subsequent impact on streams.*
3. *Restore natural surface and subsurface drainage patterns.*
4. *Restore vegetation and site productivity.*
5. *Restore stream channels at road crossings and where roads run adjacent to channels.*
6. *Use road maintenance funds more effectively-concentrate the available funds on road that are needed for long-term access.*
7. *Protect and restore fish habitat.*

Our monitoring program is designed to evaluate how well our road removal techniques achieve objectives 1-5. Field methods include both qualitative assessments and quantitative measurements on selected ¼ mile segments of decommissioned roads. Approximately one monitoring segment is set up for every 10 miles of road decommissioned. These segments are established in the year they were decommissioned (year 0). Data is collected along the segments in the first year after decommissioning (year 1), the second year after decommissioning (year 2), and the fifth year after decommissioning (year 5). Current plans also call for us to revisit these sites in the tenth year (year 10) after decommissioning.

2.3.1.1 Specific Parameters Evaluated Include the Following

a. Surface Erosion: Any surface 'rilling' or 'gully' or 'sheet erosion' occurring in the transect is noted and dimensions are recorded. Prior to 2002, the monitoring crew made qualitative observations of "significant" or "insignificant". "Significant" was defined as highly visible and likely to get worse while "insignificant" was defined as visible but minor. In 2002, protocol was changed to a more quantitative method of estimating the percent of surface area of a feature affected by surface erosion. Mass failures less than 10 cubic yards are tracked as surface erosion.

b. Mass Failures: For monitoring purposes, any slide, slump or debris flow larger than ten cubic yards that initiates on a road after it has been decommissioned is monitored as a mass failure. An attempt is made to identify the cause of the failure, the feature it is associated with, and the likelihood of it continuing or becoming larger. Decommissioned road segments with known mass failures are designated as monitoring segments or noted as sites to visit annually.

c. Cross Drain Channels: Cross drain channels promote the drainage of saturated hillsides, seeps, natural swales, subsurface water, and other areas that may accumulate water. When monitoring cross drain channels, we note whether they lie in a natural topographic feature such as a draw or swale, we determine whether they primarily drain surface water or intercepted subsurface water (such as wet ditches) and we note any surface erosion or mass wasting associated with the channel. In addition, we note any other problems observed.

d. Revegetation: Revegetation goals are twofold: Short-term erosion prevention and long-term conversion to the native vegetation of the slope. The road decommissioning seed mixture was initially designed to be aggressive in the short term and less persistent over time, promoting native species succession. In 2005 we converted to a seed mix of 100% native grasses and forbs.

Methods for monitoring vegetation and ground cover are borrowed from ECODATA (USDA Forest Service, 1992). The point cover method is used to measure the amount of ground cover after decommissioning. Ground cover is important in controlling surface erosion. Most ground cover is in the form of mulch or planted vegetation.

e. Stream Grade Channels: Stream grade channels are restored live water crossings, usually where a culvert (metal, log, or slash) was removed. Restoration of channels includes: removal of structure, removal of fill to grade, recontour of adjacent slopes, installation of channel stabilization structures (weirs and bank armor) and revegetation of the area. In order to track channel stability and channel adjustment over time, we collect the following information:

- Channel cross-sections
- Longitudinal surveys
- Wolman pebble counts (Wolman, 1954)

3.0 RESULTS

3.1 Road Decommissioning

We decommissioned 8.45 miles of failing roads in the Saddle Camp Area, Grave Creek Drainage. Roads were decommissioned by a prescription of outslope or recontour, save for a portion of a landing which was decompacted.

We completed erosion control and revegetation on all 8.45 miles of road. Erosion control/revegetation prescriptions vary slightly by road; however all roads are seeded with a native grass seed mix. Our seed mix composition is 20% Annual Ryegrass, 25%

Idaho Fescue, 35% Mountain brome, and 20% Bluebunch Wheatgrass. Our revegetation goals are to seed enough to provide short-term erosion control and long term conversion to the more diverse native plant communities. In addition to seeding by hand, we use the excavator to complete erosion control and revegetation by “clump planting” live shrub and small tree species, and by dragging duff, (soil, needle litter and organic matter) from the adjacent cut slope down onto the recontoured surface. The excavator operator also pulls native ‘slash’ over the bare soil. The native slash is created when the operator “eats in” to access the overgrown road, and is used as a mulch.

Figure 4, recontouring road in Saddle Camp road decommissioning project.

3.2 Weed Inventory and Treatment

Over 250 acres of spot treatments occurred in field season 2008 starting in late June at lower elevation dispersed campsites and continuing through the first week of August at higher elevations. A mix of administrative sites including borrow pits, Powell Ranger Station, and the Lolo Pass visitor center were treated with backpack sprayers for noxious weeds. Additionally, using our prioritization in the Upper Lochsa weed treatment plan, several

nearly weed free road corridors, trailheads, and campgrounds were treated throughout the summer field season. Restoration sites from prior years, including culvert/bridge replacements and road decommissioning corridors were treated from their junctions with maintained forest system roads.

Figure 5, Weed Treatment:spot spraying

3.3. Road Improvement

Based on our road and culvert risk assessments, Forest Road #566, Doe Creek, was identified as a high priority for improvement. The road was surveyed in 2007 and contract work started in the fall of 2007 and was completed in 2008. Improvements include: hydraulically undersized culvert replacements, additional road drainage culverts, perched sediment removed from road fillslopes, and/or rip-rap stabilization, and road regrading. In 2008 we completed the four miles of road improvement on forest road 566 adjacent to Doe Creek. We replaced 15 culverts, constructed 32 drivable dips to direct

water to the ditch, stablized failing fill-slopes, and re-graded and spot surfaced re-graded areas. Some of the culverts were re-located to allow outflow into a vegetated buffer area rather than delivery directly to the stream. Figure X, New culvert on FS Road #566. Installed for fish passage; however, the pipe was prioritized because the old structure was undersized and left the road at risk of failure.

Figure 6, New culvert on FS Road #566.
Installed for fish passage.

Figures 7 and 8. Forest Road #566 before and after improvement project.

3.4. Culvert Surveys and Designs

The Nez Perce Tribe and the Clearwater National Forest surveyed two culverts for possible replacement. The Clearwater National Forest used partnering funds to contract out the designs through a commercial engineering firm. The culverts are on Haskell Creek, on road 5659, and at the crossing of Wendover Creek in the Wendover Campground.

3.4. Culvert Replacements for Fish Passage

Three structures were replaced this year under combined funding from BPA, and USFS.

Table 5. Summary of Culvert Replacements in 2008

Road	M.P.	Stream	Old Size	New Size	Implementation Cost	Funding	Habitat Open	Species
360	11	Bridge	72"x30"	40' Span	\$115,000	NPT/BPA and USFS (RAC/BAER/CNF)	2.5 mi	SH/WCT/BT/SCS
373	14.4	N.Fk. Spruce		64' Span	\$270,000		3 mi	SH/WCT/BT/SCS

Note: The Forest Service has multiple funding sources for these projects, Legacy Roads which is a congressional appropriation (CMLG), deferred maintenance funds (CMRD), and RAC funds which are Title II funds for Idaho County.

Figure 9, North Fork Spruce Creek Bridge passage barrier (before)

Figure 10, North Fork Spruce Creek bridge (after replacement)

Figure 11, Bridge Creek culvert before removal, south grade beam in place

Figure 12, Bridge Creek culvert replacement ,new bridge in place

Road Removal Monitoring-Technique Evaluation

The Clearwater National Forest and Nez Perce Tribe monitoring crew visited nine monitoring segments in the Analysis Area and established two new monitoring segments within the Rock Creek drainage. Results for this year are still being compiled.

4.0 CONCLUSIONS

This year we completed 9 miles of road decommissioning in the Saddle Camp area. For the first time this year the USFS changed our contract method for road decommissioning from an Indefinite Quantity hourly rate to a Fixed Price Contract. In general, the project was successful; however, our price per mile doubled as the result and our overall control of quality was diminished considerably. We hope that in the future we will be able to use the more favorable contract method. We completed the upgrade of four miles of Forest Road #566 (Doe Creek Road). The project started at the end of 2007 and was completed early this summer of 2008. At each of the culvert replacement sites, we revegetated the area by seeding with a native seed mix, and by hand planting native plants and organic material recruited from adjacent undisturbed areas. We replaced thirty seven culverts returning over sixty miles of stream habitat. We treated 5,000 acres of invasive plants. We also hand transplanted 10,000 native plants and spread organic material over a vast area.