2015 Aquatic and Riparian Restoration Annual Report

USDA Forest Service
Pacific Northwest Region

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The Pacific Northwest has world class and extremely valuable water and fisheries resources, so aquatic and riparian restoration are priorities for the Pacific Northwest Region of the USDA Forest Service. Restoration is being implemented in a prioritized and integrated fashion to restore watershed and stream structure and function at a whole watershed scale. Aquatic and riparian restoration benefits aquatic and terrestrial wildlife and fish populations, including federally listed and Sensitive species. It also improves recreation opportunities and provides reliable, clean water for downstream use. Our Forest and District Fisheries and Hydrology personnel are leaders in the design, planning, implementation, and monitoring of restoration projects. In addition, our Regional Restoration Assistance Team provides assistance on especially complex projects and helps field personnel maintain and improve their skills. An emphasis is placed on partnerships, with internal and external collaboration occurring on each Forest and Region-wide, including through the Regional Challenge Cost Share and Drinking Water Providers partnership programs.

This annual report features one of many restoration projects occurring on each Forest in the Region, providing a glimpse of the breadth and depth of this work and its outcomes. We thank our many internal and external partners contributing to the success of these projects and look forward to continue to work with you, achieving mutual conservation goals.

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For a complete directory of Forest and District Fisheries and Watershed personnel, please visit:
http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5446396.pdf

COLVILLE NATIONAL FOREST

Fourth of July Creek Road Decommissioning

Road decommissioning and removal of fish passage barriers are highlighted in this project on Fourth of July Creek.

he goals of the project were to reestablish connectivity of existing habitat for native bull trout and westslope cutthroat trout in Fourth of July Creek. By removing unnecessary, undersized culverts, we eliminate the risk of sediment delivery from road failure at the crossing and reestablish the natural surface and subsurface hydrology of Fourth of July Creek.

The pictures below show how the undersized culverts were velocity barriers in the spring, due to high flows, and connectivity barriers in the fall, due to lack of surface flows.

Other accomplishments of this project included re-contouring and de-compacting 2.5 miles of road to a minimum depth of 18", removing 7 culverts and numerous cross drains, reshaping over 200 feet of stream channel to mimic the natural surrounding channel morphology, and planting a total of 1600 alder and Douglas hawthorn bare root shrubs, 130 bare root mixed conifers, and some lupine, Rocky Mountain maple, and ocean spray seeds.

For more information on this project and other restoration projects on the Colville National Forest, contact Karen Honeycutt, Natural Resources Program Manager (Fisheries, Wildlife, TES, Soil and Water) at 509-684-7224

Spring Flow in Fourth of July Creek at undersized crossing

Re-contoured 2.5 miles of the old road prism

Fall Flow in Fourth of July Creek at same location

Culvert removed – Fourth of July Creek

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA

Thousand Acre Habitat Restoration Project

The USDA Forest Service Columbia River Gorge National Scenic Area (CRGNSA) partnered with the Lower Columbia River Estuary Partnership (LCEP) to enhance habitat on seasonal wetlands and channels within the Thousand Acres area (i.e. the eastern portion of the Sandy River Delta, just east of Troutdale, Oregon). The project area is located on approximately 140 acres of Columbia River floodplain, on National Forest System lands within the Columbia River Gorge National Scenic Area. There, the historic, healthy aquatic/riparian landscape had been negatively impacted by clearing vegetation, hydrologic manipulation, exotic species invasion, and other historic land use practices.

North Channel of the Thousand Acres project before restoration.

The Thousand Acres Habitat Restoration Project improves aquatic organism passage and hydraulic connectivity between the Columbia River and wetlands by removing a tide gate and water control structure. Approximately 100 pieces of large wood were added to the channel and floodplains, 15 acres of degraded seasonal wetlands were re-contoured, invasive weed species were controlled, and 75 acres of wetland and riparian forest were replanted.

The Thousand Acres wetlands are seasonal, and are typically dry during the late summer through fall. Channel/pond work was done above the water levels of the Columbia River during that period. Restoration work in channels and ponds occurred in 2014, with native planting occurring in 2013 and 2015, and potentially later.

Federally listed species like Pacific eulachon and yellow-billed cuckoo, and Forest sensitive species like Pacific lamprey and painted turtle, are examples of other species in addition to salmon and steelhead that have the potential to benefit from this project.

North Channel of the Thousand Acres project after construction.

CRGNSA has successfully partnered with LCEP in the past to restore floodplain habitat at Horsetail/Oneonta Creeks (just east of Multnomah Falls). Other partners that contributed to this Thousand Acres project include the East Multnomah Soil and Water Conservation District, the National Forest Foundation, the Oregon Watershed Enhancement Board, and the Penstemon Fund.

For more information, please contact CRGNSA Ecologist Robin Dobson at 541-308-1717, or CRGNSA Wildlife and Fish Biologist Brett Carré at 541-308-1718

Horseshoe Pond in the Thousand Acres project after restoration.

DESCHUTES NATIONAL FOREST

Whychus Creek Floodplain Restoration Project

Whychus Creek is a flashy, cobble bed stream that originates at the foot of the Three Sisters Mountains. Historically, the stream was considered a flood hazard to the downstream town of Sisters. Following the 1964 flood, the creek was channelized through much of the productive, low gradient reaches. These efforts increased the danger of harmful flooding, causing the stream to down cut and abandon the side channels that helped to naturally dissipate the flood energy.

In 2015, the USDA Forest Service and Upper Deschutes Watershed Council removed constraining berms, providing access to 7 miles of historic channels for fish rearing and high flow refuge habitat in Whychus Creek. These side channels are important habitat for juvenile steelhead, Chinook salmon, and redband trout during high flow events and will help increase productivity.

Log jams and side channels of the restored reach of Whychus Creek. Scott Nelsen photo.

To restore the habitat in the 7 miles of historic channels, 34 acres of adjacent forests were thinned to create over 220 log jams, comprised of over 2,250 trees. Whole trees were placed instream to create pools and scattered on floodplains to slow water during floods. A total of 170 acres of floodplain habitat was improved though the project. After most of the work was completed, 0.8 mile of road was decommissioned, with another 2 miles to be decommissioned after the planting of riparian vegetation is completed.

Whychus Creek side channel before restoration.

Whychus Creek side channel after restoration project November, 2015.

The design of the project works with the natural depositional process inherent to the landform- an alluvial glacial outwash fan. Through the capture of gravels in the multiple side channels, the project will increase salmonid spawning and rearing habitat. Floodplain deposition of fine sediments from the recent Pole Creek Burn Area is already occurring. These deposits will aid the establishment of the willow and cottonwood dominated riparian vegetation. In future years, the area will be planted with 30 acres of riparian vegetation in the floodplains created by the project.

In addition to the restoration activities, the project has an active monitoring program. Project effects related to channel function, stream temperature, shade, invertebrate production, ground water depth, fish habitat and populations will be measured in the years following the restoration activities. Ground water monitoring wells have shown that the project has elevated groundwater levels by as much as 4-5 ft.

This project was made possible through a partnership between the Deschutes National Forest, Upper Deschutes Watershed Council, Deschutes River Conservancy, and the Sokol family. Funding was provided by the Forest Service through the Deschutes Skyline Collaborative Forest Landscape Restoration Project, Oregon Watershed Enhancement Board, Pelton Round Butte General Fund, National Fish and Wildlife Foundation, National Forest Foundation, The Nature Conservancy, The Reser Family Foundation, and Patagonia.

For more information about this project, please contact: Michael Riehle, District Fish Biologist, Sisters Ranger District, 541-549-7702

Whychus Creek, upper central channel berm before restoration.

Whychus Creek, upper central channel after restoration November, 2015.

Whychus Creek during a high flow event in November, 2015. Log jams are stable and creating habitat for trout and salmon.

FREMONT-WINEMA NATIONAL FOREST

Threemile Creek Bull Trout Restoration Project

Threemile Creek, located on Klamath Ranger District on the Fremont-Winema National Forest, is a priority watershed in the Klamath River Core Area for federally listed bull trout. Threemile Creek supports the only bull trout population on the west side of the Forest.

In 2015, the Forest partnered with Klamath Basin Rangeland Trust (KBRT) to enhance a section of Threemile Creek by adding large woody debris, creating more habitat complexity for native bull trout. The project added nearly 150 pieces of large wood to the stream. The large wood structures also help to dissipate the energy of high flows, collect and sort spawning gravels, collect and hold smaller wood and fine organics to increase nutrients, and provide cover and anchoring sites for aquatic organisms. The overall cost to place the large wood instream was approximately $65,000.

In the past, nonnative brook trout have been introduced into Threemile Creek, negatively affecting the native bull trout population through interbreeding and aggressive displacement. In this project, the Fremont-Winema also partnered with local landowners and KBRT to install brook trout barriers downstream of National Forest Lands. These man-made barriers prevent nonnative brook trout from inhabiting streams where bull trout once thrived, in an effort to recover bull trout populations in the Klamath Basin.

A portion of this project was to replace an old barrier that was beginning to fail. In 2012, the barrier was retrofitted to help prevent the sheet pilings from washing away.

Designs for the original barrier lacked the strength needed to handle the sheer stress put on the infrastructure during annual high flows. The project replaced the old structure with a more stable structure reinforced with steel rebar and was back filled with large boulders. With this recent upgrade of the barrier structure to prevent migration of non-native brook trout, more focus can be put towards the restoration of Threemile Creek upstream.

The overall cost of the barrier was approximately $60,000. The total costs of the project were approximately $125,000. The USFS used approximately $58,000 of funds to help finance the overall project. The Klamath Ranger District thanks KBRT for being a great partner in helping us achieve these very important restoration projects.

For more information, please contact:
Phillip Gaines, Forest Fisheries Program Manager, at 541-947-6258 or phillipgaines@fs.fed.us .

Large wood complex placed by helicopter in Threemile Creek in partnership with KBRT.
Picture Credit: Tony La Greca, KBRT

Replaced brook trout barrier on Threemile Creek.

GIFFORD PINCHOT NATIONAL FOREST

Lower Cispus River Side Channels Restoration Project

Side channel rearing habitat is important for early life development of coho salmon and other salmonids. The Salmon Recovery Plan (2006) has identified off channels habitat as a limiting factor to salmon recovery in the Upper Cowlitz basin. Winter juvenile coho salmon, in particular, utilize side channel at high densities and depend upon it for survival.

The Lower Cispus River subwatershed fails to provide natural sources of off channel habitat for several reasons. Factors contributing to the reduced connectivity and side channel habitat effectiveness include: forest road construction has intersected the river terrace and has modified the hydraulic connectivity; dike construction has confined the Cispus River resulting in channel incision and reduced side channel connectivity; bridges on both Yellowjacket Creek and Cispus River have confined the stream and resulted in channel entrenchment below the bridge; and channels lack lateral stability, due to insufficient large wood, tending to shift excessively, often abandoning side channel habitat.

The goal of the project is to restore flow to stable off channel areas, providing rearing habitat for federally listed coho and Chinook salmon. The objective is to restore perennial flow in two abandoned relief channels and thereby restore hydrological connectivity along approximately 2500 feet of side channels in the Lower Cispus subwatershed.

The work conducted in 2015 resulted in two off channel groundwater-fed channels totaling approximately 3000 feet long and covered approximately one acre. Log control weirs were installed to retain channel depth and provide fish passage. Gravel and cobble were used to backfill the log controls and enhance channel substrate.

Approximately 60-80 pieces of large wood were placed in each channel and floodplain to increase habitat complexity, dissipate stream energy, and provide cover for aquatic and riparian species.

This project followed a rather novel approach to side channel development choosing to tap into groundwater in lieu of reconnecting to the river's surface flow. Our aim was to provide a more dependable and lower risk source of water. Among our incentives was to reduce the threats of channel inundation such as deposition and scour and rafting large wood. Intercepting cold groundwater was also intended to improve water quality in a system which is sensitive to climate change and currently exceeds state water quality standards (16^0 C). Plentiful, cold groundwater filled one of the sites as anticipated and was immediately occupied by juvenile salmonids.

Longitudinal profile of proposed Cispus River side channel at Yellowjacket Creek.

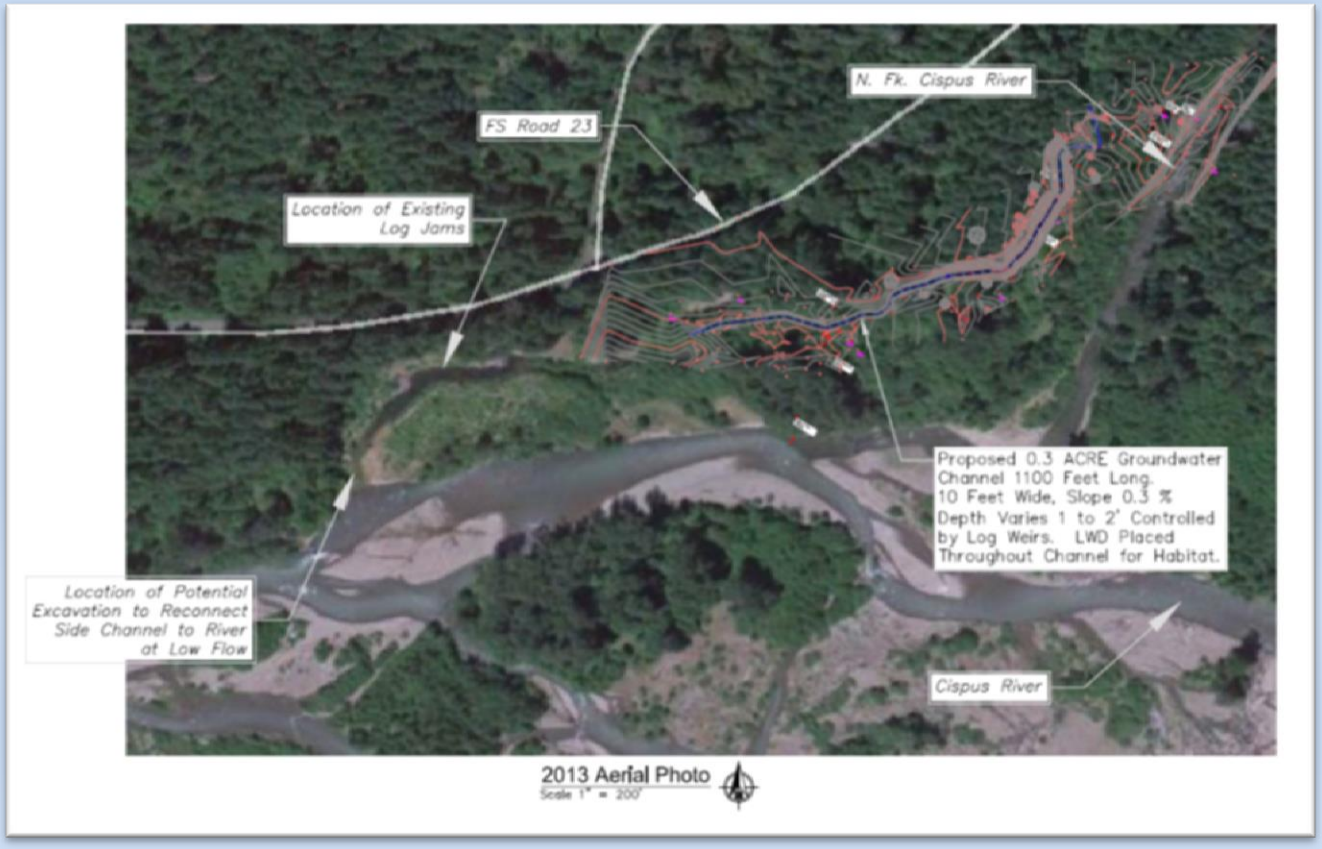
Cispus side channel project site at North Fork Cispus River (Sept 2015).

The project was completed with several key partners and an innovative approach for implementation. One primary partner, the Cowlitz Indian Tribe, was delegated the lead role in project solicitation, contract award, and administration, increasing efficiency and project effectiveness.

Other project partners included the Lower Columbia Fish Enhancement Group, Salmon Recovery Funding Board, Cispus Learning Center , Waterfall Engineering, and Otak.

For more information about this project, please contact: Ken Wieman, District Fish Biologist, Cowlitz Valley Ranger District, 360-497-1141

Large wood placed in the Cispus river side channel (Aug 2015).



Cispus side channel project site at North Fork Cispus River (Sept 2015).

MALHEUR NATIONAL FOREST

Squaw Creek Restoration Project

East of the mountain outpost at Austin Junction, two small tributaries come together to form the Middle Fork John Day River. One of these tributaries is Squaw Creek, listed as Mid-Columbia Steelhead critical habitat. Squaw Creek struggles to provide aquatic habitat as a result of decades of grazing, timber harvest, wildfire suppression, railroad construction and legacy restoration structures. By improving floodplain connectivity, the riparian hardwood community, in-stream habitat, and juvenile and adult passage we hope to start tipping the scales of Squaw Creek back towards a functioning, headwater tributary.

This work is the first installment of restoration operating under two very exciting new initiatives. First, the Forest completed NEPA covering a wide variety of aquatic restoration activities to streamline the Forest's ability to implement projects. Second, Oregon Department of Fish and Wildlife (ODFW) and the forests within the Blue Mountains signed an agreement that allows ODFW staff to complete in-stream restoration work that is tied to anadromous fish passage. With these two documents in hand, a highly motivated interdisciplinary team and an exciting new partnership with Oregon Natural Desert Association, staff were able to begin restoration in 2015.

Road crossing and passage barrier, before and during project implementation.

2015 restoration actions in Squaw Creek included removing 14 legacy log weirs that were passage barriers to juvenile fish, removing one culvert that was a fish passage barrier at the upper extent of critical habitat for steelhead, removing 1800 yards of road fill from the floodplain, thinning 8 acres of floodplain vegetation, improving one mile of stream habitat with the addition of large woody material, reconnecting 1.3 million gallons of floodplain storage potential, and planting 6 acres with hardwoods. Twenty volunteers were used during project implementation.

Restoration of Squaw Creek will be a multi-year restoration project with numerous partners from both inside and outside the agency. Moving forward, the Forest Service has recently partnered with the Confederated Tribes of the Warm Springs and current project partners to continue this work, including the reconnection of 3 miles of stream and 60 acres of meadow in 2016.

For more information about this project, please contact: Kate Olsen, Fisheries Biologist, Prairie City Ranger District, 541-820-3818

Site following removal of road and stream crossing.

MT. BAKER-SNOQUALMIE NATIONAL FOREST

Upper South Fork Skykomish Road Decommissioning Project

The Upper South Fork Skykomish River Watershed is a Key Watershed under the Northwest Forest Plan and has been identified as a Priority Watershed under the Forest Service's Watershed Condition Framework. The watershed provides crucial habitat for several federally listed populations of fish including Puget Sound Chinook salmon, bull trout, and steelhead. In addition, the watershed also provides Essential Fish Habitat for coho and pink salmon, which are the species managed through the Pacific Coast Salmon Plan by the Pacific Fishery Management Council.

Federal Watershed and Forest roads analysis in the 1990s and again in 2002 identified the road system as the greatest concern (risk) to instream habitat. Degradation of fish habitat within tributaries to the South Fork Skykomish River primarily occurred due to a combination of mass failures and chronic surface erosion associated with Forest roads. The Watershed Restoration Action Plan developed for the Upper South Fork Skykomish included two large projects; first, the cleanup of the hazardous materials in the town of Skykomish and second, the South Fork Skykomish Roads project.

In accordance with the National Environmental Policy Act (NEPA), an interdisciplinary team of resource specialists conducted analysis of the South Fork Skykomish Roads Project. The Team performed the necessary field reconnaissance, conducted an assessment of the project's purpose and need, sought public involvement, considered alternatives to the proposed action, and determined the site-specific environmental effects of implementing the project. The implementation was funded through the Forest Service's Legacy Roads program and closed 8 miles of road and decommissioned 5 miles of road. Road closure removed all crossing structures and greatly lowered the risk of surface erosion as well as crossing failure. Decommissioning removed all structures as well as the road prism.

The road closure and decommissioning project was the final project necessary for the completion of all priority projects identified in the action plan. The results of this restoration are likely to improve the instream habitat conditions within the watershed and result in increased populations and security of anadromous fish in the area.

First segment of culvert being removed, intlet section.

Culvert removal, looking upstream from the outlet. Water diversion on the left with straw bale for sediment retention.

Culvert removal complete, looking upstream.

For more information about this project, please contact: Loren Everest, Forest Fisheries Program Manager, Mt. Baker Snoqualmie NF, (425) 783-6040

MT. HOOD NATIONAL FOREST

North Fork Instream Fish Habitat Large Wood Project

The North Fork project is located in a reach of the Clackamas River immediately upstream of Portland General Electric's (PGE) North Fork Reservoir. One and a half miles upstream of the reservoir, the river widens and slows, allowing the river bedload consisting of fine material and gravel (the size ideal for salmon spawning) to accumulate. Late run Clackamas River Coho salmon utilize this gravel wherever there is cover, which is limited to the immediate river bank.

Project reach looking downstream before implementation

For this reach of river, cover is a limiting factor for coho adults looking for areas to spawn and also for juvenile coho, Chinook, and steelhead trout found in the Clackamas. This section of the Clackamas River is over 250 feet wide, almost uniformly shallow, and exists as a wide, featureless stream with hardly a boulder or piece of wood in tens of thousands of square feet of river bottom. It is bordered by State Highway 224 and the cleared highway corridor on river-right bank for many miles. This section of river is also bordered by PGE's high voltage powerline corridor and adjacent clearing width, with reduced opportunity of large wood recruitment for cover because of the overlapping clearing corridors.

The Forest worked cooperatively with the Oregon Department of Fish and Wildlife (ODFW), the Bureau of Land Management (BLM) and PGE to strategize ways to add instream complexity to this highly modified but important stretch of the Clackamas River. Funding from the Eugene Water and Electric Board (EWEB) and Stone Creek Hydro Project Protection and Improvement Plan (PIP) funds were reserved for the 2015 project. Work implemented in 2015 was completed with EWEB PIP funds ($32,260).

The habitat restoration involved the placement of large wood in the river. The wood was stabilized through keying it into the river bank or attaching to other wood. Where feasible, some vertical pilings were installed in proximity to logs that are horizontally placed for added reinforcement. The uppermost extent of this reach had stream banks that were very close to the highway and composed of small rip rap and very steep fill. In these upstream sections where placement of large wood structures was problematic, we experimentally placed boulder clusters to enhance and improve missing in-stream complexity. All in-stream work was completed with a spyder excavator or superhoe due to the extremely steep banks from Highway 224 to the river. In October of 2015, shortly after the work had been completed, adult spring Chinook were observed spawning near the tips of log structures and hiding under logs near the bank. The structures have continued to function well during November 2015 high water events.

For more information about this project, please contact: Brad Goehring, Forest Fisheries Program Manager, at 503-668-1605 or bgoehring02@fs.fed.us .

Spyder excavator (superhoe) digging logs into trench

New structures looking downstream

OCHOCO NATIONAL FOREST

Deep Creek Restoration Projects

Deep Creek watershed has been identified in both the Watershed Condition Framework and the Terrestrial Restoration and Conservation Strategy as a focus or priority watershed respectively. Deep Creek contains the best, most interconnected, viable populations of genetically pure redband in the Crooked River Basin. Recent work on Deep, Jackson, Crazy and Toggle Creeks aims to improve fish and wildlife habitat, water quality and quantity, native riparian plant communities, range and forest land condition, and forest resiliency. Restoration actions included stream structure/large wood placement, meadow restoration, and riparian vegetation planting of previous restoration areas.

Planting included native riparian trees and shrubs (aspen, cottonwood, willow, alder, dogwood, wild rose, currant, etc.), sedges, and grasses. Plants were locally sourced from a regional stooling bed and planting was accomplished using a combination of forest service personnel, volunteer work parties and youth and contract crews.

Toggle Meadow before work was completed.

Whole trees and native rock and soil were placed in variable sized jams and log complexes to improve habitat, reduce long term erosion, and reconnect floodplains. The projects occurred within a 1.5 mile stretch of Deep Creek and 1 mile of Crazy Creek including areas immediately above and below aquatic organism passage projects (barrier culverts to be replaced in 2016 and are the last two priority barriers within the priority sub-watershed). The project will incrementally reduce stream temperatures, increase water storage capacity, and improve habitat for redband trout and other riparian dependent species, including re-establishing conditions for riparian obligate plant species.

For more information about this project, please contact: Jennifer Mickelson, Acting Forest Fisheries Program Manager, at 541-383-5534 or jmickelson@fs.fed.us .

Toggle Meadow with log jams and plug structures

Planting around log structures in Jackson Creek.

OKANOGAN-WENATCHEE NATIONAL FOREST

Little Rattlesnake FS 1501 Road Decommissioning Project

This project is unique as it is within Washington State Department of Natural Resources (DNR) land, but the Naches Ranger District manages Forest Service Road (FSR) 1501. The road is adjacent to Little Rattlesnake Creek which is nested in the Rattlesnake Creek-Naches River watershed. Rattlesnake Creek is a tributary to the Naches River. Little Rattlesnake Creek supports several listed and unlisted salmonid species including listed steelhead and bull trout. It also provides habitat for redband and cutthroat trout and Chinook salmon.

FSR 1501 at MP 0.5 in 2011

The FSR 1501 sustained significant damage in spring of 2009 and again in 2011. The May 2011 flood event resulted from approximately three to four inches of rainfall occurring within a 24-hour period. The peak stream flow was estimated to be greater than 100 year return interval. Stream bank damage occurred in multiple locations along FSR 1501 and the road was significantly impacted. Damage from those events was consistent with other damage that has been occurring in that drainage along FSR 1501 for decades and resulted in undesirable impacts to watershed and aquatic habitat function, water quality, and fisheries. Therefore, the decision was made to decommission five miles of road as a measure to restore watershed and aquatic resources.

FSR 1501 at MP 0.5, following restoration

FSR 1501 at MP 2.0 in May 2011

A high level of coordination and cooperation occurred between fisheries, engineering, and hydrology specialists on the Okanogan Wenatchee NF. The Forest partnered with Washington Department of Fish and Wildlife, Yakama Nation, Washington State Department of Natural Resources, NOAA Fisheries, US Fish and Wildlife Service and Mid-Columbia Fisheries Enhancement Group to implement restoration of the areas within FSR 1501 easement.

The project objectives were to implement floodplain and streambank restoration along five miles of Little Rattlesnake Creek. The project focused on reducing road density in key areas where roads cause undesired impairment to aquatic ecosystem function, reclaiming 32 acres of floodplain by decommissioning the road coupled with strategic placement of woody material, and improving water quality and geomorphic function by increasing stream shading, decreasing road related sediment input, and decreasing the artificial increase in drainage network associated with FSR 1501. Total Project Cost was $732,500.

FSR 1501 at MP 2.0, following restoration

For more information, please contact Richard Vacirca, Fisheries Program Leader, at 509-664-9361 or rvacirca@fs.fed.us .

OLYMPIC NATIONAL FOREST

Road 2610-010 Maintenance Level Reduction & Aquatic Organism Passage

During a near-record storm in December 2014, Forest Service Roads (FSR) 2610010 and 2610012 on the Olympic National Forest suffered severe damage as a plugged culvert diverted streamflow down the road. The road prism was scoured and gravel and sediment were deposited directly into listed Chinook habitat in the Dosewallips River. Several culverts on FSR 2610010 were also overtopped by flood waters, scouring trenches through the road and making the road impassable. A 5-foot diameter culvert with a substantial outlet drop continued to create a fish passage barrier for anadromous and resident fish just above the Dosewallips River floodplain.

The Forest utilized grant funding from the U.S. Environmental Protection Agency to convert 0.7 miles of FSR 2610010 adjacent to the Dosewallips River from a drivable Maintenance Level 2 road to a closed Maintenance Level 1 road. Objectives of the project were to control drainage and restore hydrology, restore fish passage in the tributary stream, and improve floodplain conditions. All culverts and their associated fills were removed, including the fish passage barrier culvert. Multiple cross ditches were added to restore natural hydrology in this wet area. Barriers were constructed to prevent access by motorized vehicles but allow walk-in access for kayakers and other recreationists. Disturbed areas were planted with conifers to help re-establish riparian vegetation.

Road treatment

For more information, please contact Bob Metzger, Aquatics Program Manager, at 360-956-2293 or rpmetzger@fs.fed.us .

The excavated fill material from the culvert removals on FSR 2610010 was used to partially fill in the scoured road prism on the adjacent FSR 2610012. The plugged culvert that created most of the damage was permanently removed so that the damage would not reoccur. Rolling dips and waterbars were installed in the road prism to provide additional protection and control drainage. FSR 2610012 is once again drivable by high clearance 4 wheel drive vehicles.

This project is a great example of collaboration in leveraging partnership funding to accomplish restoration objectives and reducing overall project costs by utilizing materials generated by the culvert removals to repair an adjacent road that is needed to maintain access to private lands.

Stream channel following removal of culvert

Road scour from culvert diversion

ROGUE RIVER-SISKIYOU NATIONAL FOREST

Bitter Lick Restoration Project

The High Cascades Ranger District on the Rogue River-Siskiyou National Forest, in partnership with the Rogue River Watershed Council, completed an instream restoration project on Bitter Lick Creek, a tributary to Elk Creek. Elk Creek is a major tributary to the upper Rogue River, near the town of Shady Cove. Bitter Lick Creek provides high quality habitat for federally listed Southern Oregon and Northern California Coasts (SONCC) coho salmon, steelhead, and resident salmonids. Coho salmon within Bitter Lick Creek represent the furthest upstream population within the Rogue River basin, spawning and rearing over 165 miles upstream of the Pacific Ocean.

In the project area, multiple previous attempts to improve instream habitat have been implemented with varying levels of success and effectiveness. These past efforts have included: v-log weirs, log and boulder structures with cable, helicopter log placement, and off-channel pond construction.

Bitter Lick Creek v-log weir

The objective of the 2015 project was to improve the function of an off-channel pond and inlet channel, and to improve habitat complexity (spawning and rearing habitat) within the main channel via installation of large wood jams (30 pieces) and modification of existing v-weirs. Specifically, the existing off-channel pond inlet channel was reconstructed, utilizing a newly constructed boulder grade control and approximately 200 feet of regraded mainstem channel to realign the thalweg and provide a reliable inflow of water to the pond. Additionally, two legacy v-weirs were modified by removing the log along one side of the weir, with the intent to improve aquatic organism passage for all life stages of fish and to increase habitat complexity. All logs used in the project were hazard trees acquired from the Forest.

Bitter Lick Creek channel post construction

Placing logs in Bitter Lick Creek

Project partners include the Rogue River Watershed Council (formerly the Upper Rogue Watershed Association), Rogue-Umpqua Resource Advisory Committee, and Blue Ridge Timber Cutting, Inc. Total project cost was approximately $50,000, with the USFS funding approximately 80% of the cost, and Title II dollars funding the remaining 20%.

For more information, please contact Steve Brazier, Zone Fisheries Biologist, Siskiyou Mountains and High Cascades Ranger Districts, Rogue River-Siskiyou National Forest, 541-471-6766.

SIUSLAW NATIONAL FOREST

Partnerships in Restoration

Fish habitat on the Siuslaw National Forest has been degraded due to a number of factors but mostly through the removal of large wood from the streams and riparian areas. Wood was lost in some streams as early as the 1920s and ‘30s from splash damming but most occurred during the 1960s and ‘70s due to the intentional removal. Removal of the wood set the gravel substrate loose and allowed it to wash downstream. The streambed lowered, often to bedrock. The stream, now flowing in an incised channel, was no longer connected to its floodplain. This caused an increase in water velocity, more erosion of the streambanks, and few places for juvenile fish to hide. The effect was particularly hard on coho salmon juveniles because they prefer slow the moving waters of side-channels, back-eddies, alcoves, and floodplains.

Over the years the Siuslaw National Forest has tried a variety of methods to trap sediment and aggrade the stream channel. The method that has proven most effective has been the addition of complexes of large wood. The complexes consist of 4-7 whole trees placed in the stream just below confluences with small tributaries and other key locations. Placement of these trees, which are 120 feet long and 32”-36” inches in diameter on the butt end, is challenging. The treated areas are generally inaccessible using ground based equipment, so the Forest employs a helicopter to move logs into prime coho habitat.

Last year was a banner year for helicopter placement of large wood on the Siuslaw National Forest with 16 miles of streams treated, including over three miles of stream on private lands adjacent to the Forest. Work occurred in nine different streams and one estuary and involved eight major partners.

The project also benefited through use of the National Fire Helicopter Contract. This and other savings reduced the need to use grant money by nearly 40 percent.

Partners and cooperators include: the Oregon Watershed Enhancement Board, Salmon-Drift Creek Watershed Council, Trout Unlimited, Nestucca-Neskowin Watershed Council, Oregon Department of Fish and Wildlife, Siuslaw Soil and Water Conservation District, Wetlands Conservancy, and the Siuslaw Watershed Council.

For more information about this project, please contact: Christine Hirsch, Forest Fisheries Program Manager, at 541-750-7034 or chirsch@fs.fed.us .

Wood placed on floodplain, Fivemile Creek.

Wood on floodplain during high flows, Fivemile Creek.

UMATILLA NATIONAL FOREST

Sponge Creek Aquatic Organism Passage Project

Desolation Creek is one of the Umatilla National Forest's highest priority watersheds for fisheries restoration. The 2003 Desolation Watershed Action Plan identified passage barriers inhibiting recovery of bull trout (Salvelinus confluentus) and Mid-Columbia steelhead (Onchorhynchus mykiss). The Sponge Creek project is the fifth passage project to be completed in the watershed since 2003, when the Desolation watershed was first targeted for whole-watershed restoration, with strong support from interagency partners.

The North Fork John Day Ranger District partnered with the Oregon Department of Fish and Wildlife (ODFW) Screen Shop to replace the Sponge Creek culvert. A high restoration priority among all partners, the project re-established passage to 4.1 miles of upstream designated critical habitat for ESA-listed steelhead trout and reduced fine sediment delivery to streams. The Forest Service provided technical and contract support while ODFW provided materials and implementation of the project.

The undersized, corrugated metal pipe culvert was replaced with a new culvert structure (bottom-less arch culvert) with a length of 50', a span of 19', and a rise of 6' 4". The new structure facilitates aquatic organism passage by simulating natural stream conditions. The entire project was completed for less than $80,000.

Cost:
Construction - $63,473.14
Oversight (Admin) - $16,014.75
Total - $79,487.89

For more information about this project, please contact: Hugo Magana, District Fish Biologist, North Fork John Day Ranger District, at 541-427-5305 or hmagana@fs.fed.us .

Existing undersized culvert being removed.

Footers and arches being installed.

Stream simulation through culvert arch.

UMPQUA NATIONAL FOREST

Longs Creek Aquatic Organism Passage Project

This project replaces an undersized perched culvert that is a barrier to upstream migration of anadromous and resident fish populations in Longs Creek, located in the priority Steamboat Creek Watershed. The culvert was replaced with a stream simulation structure to allow for fish passage for all age classes at a wide range of stream flows. The structure is a pipe arch, sized to accommodate greater than bank full flows and was in-filled with stream substrate to create a seamless link between the aquatic habitats downstream of the structure to the stream channel upstream of the structure.

Pre-implementation site photo (December 07, 2012)

The existing structure was undersized, perched, and was a barrier to upstream passage of fish and other aquatic organisms. Steamboat Creek and its major tributaries, including Longs Creek, provide quality habitat and water conditions that help support “the” major stronghold of summer and winter Oregon Coast steelhead trout in the Umpqua Basin. Oregon Coast coho and Chinook salmon, Oregon Coast cutthroat trout, resident cutthroat and rainbow trout, and Pacific and brook lamprey are present in the basin. The new structure provides for passage of these organisms at all stream flows and also allows for natural bedload and large woody material movement. The new structure has stream simulation and is infilled with native streambed materials that mimic a natural streambed and channel.

Restoration activities have been implemented in the Steamboat Watershed and its tributaries beginning in the mid 1980's. Much of this effort has centered on instream large wood projects but has included a wide range of treatments including; road decommissioning, fish passage, vegetation treatments, and road improvements. Restoration to Longs Creek is a continuation of this effort. Large wood placed in Longs Creek in 2010 completed instream habitat improvements in Longs Creek. Providing fish passage will complete identified restoration activities in the Longs Creek subwatershed.

For more information about this project, please contact: Ron McMullin, District Fisheries Biologist, North Umpqua Ranger District, at 541-496-3532 or rgmcmullin@fs.fed.us .

During construction

Post-implementation stream simulation

Post-implementation site photo

WALLOWA-WHITMAN NATIONAL FOREST

Five Points Creek Restoration Project

Five Points Creek is designated critical habitat for bull trout and serves as spawning and rearing habitat for Snake River Basin summer steelhead and redband trout. It has been impacted by a water diversion creating a fish migration barrier, historic timber harvest, ATV trails, and railroad and road construction and maintenance.

The intent of the Five Points Creek Restoration Project is to improve fish habitat and stream function, specifically through increasing fish passage, quantity and quality of pools, fish cover, habitat complexity, forage availability, residual pool depth, large instream wood, spawning gravel recruitment, stream shade, floodplain and riparian function, and riparian vegetation.

Five Points Creek Project components include restoring proper riparian vegetation, addressing the sedimentation from multiple ATV trails, and restoring aquatic organism passage at a water diversion for all life stages of summer steelhead, spring/summer Chinook, and bull trout.

In 2015, the Forest removed a railroad diversion barrier to open 22 miles of fish habitat, constructed eight large wood/boulder structures over a half mile of stream, planted 0.5 miles of stream banks with 3,500 cuttings and native grass/forb seed, hauled in and placed 1,000 pieces of large wood, and flew in and placed 715 pieces of large wood in the stream channel.

The Five Points Creek Restoration Project will take three years to complete. The project will continue into 2016-2017 and additional restoration activities will include fish structure construction, fence construction, ATV trail closure/obliteration, and planting.

For more information about this project, please contact: Joe Vacirca, Forest Aquatics Program Manager, at 541-523-1265 or jvacirca@fs.fed.us .

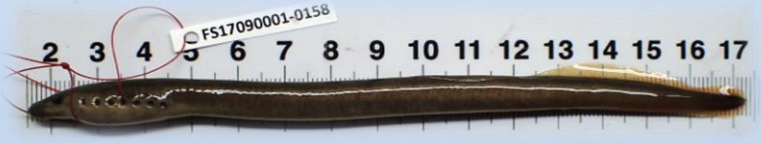
Constructing instream structures

Railroad diversion barrier prior to removal.

Barrier site after removal.

WILLAMETTE NATIONAL FOREST

Middle Fork Ranger District Lamprey Occupancy Survey



Adult Brook Lamprey (Lampetra sp).

The Middle Fork Ranger District lamprey occupancy survey was developed in response to the addition of Pacific lamprey to the Interagency Special Status/Sensitive Species Program (ISSSSP) list. Current status of lamprey populations across the Pacific Northwest is largely unknown, making it difficult for resource managers to make informed decisions. Given that prior efforts to characterize the distribution of fishes across the Willamette National Forest (WNF), and the rest of the PNW, were heavily biased towards the detection of salmonids the Forest largely relies on anecdotal reports and professional judgement to inform our understanding of current and historic distribution of "non-game" fishes across our forest.

The lamprey project had several objectives: determine the distribution of lamprey across the Middle Fork Ranger District, describe the type of lamprey detected at each reach, and serve as mentors for selected developing scholars from the American Fisheries Society Hutton Scholars Program. Lamprey distribution was determined by developing a protocol to assess reach level occupancy within sub-watersheds, identifying landscape and reach level variables associated with lamprey occupancy, and developing a landscape-based model to assess lamprey occupancy. Descriptions of the type of lampreys detected were determined using the Rocky Mountain Research Station to characterize the genetic variability of lamprey specimens collected, developing and testing eDNA markers to compare morphological and meristic variability across the range of distribution, and evaluating efficacy of current field guides and documented genetic variation.

Larval lamprey (ammocoete)-specific backpack electrofishing settings were used to assess depositional microhabitat (silty/sandy patches) across the Forest. Target reaches were randomly selected from perennial fish-bearing stream segments (Class 1 and 2) greater than 50 continuous meters with an average slope less than or equal to 2.5% slope. Lamprey occupancy was assessed in three reaches within every sub-watershed. In any sub-watershed in which lamprey are not detected at all three sites, suggests with an 80% probability, that lamprey are not present throughout the sub-watershed. When lamprey(s) were detected, up to 15 specimens were retained from each target reach. A tissue sample was collected from each for genetic analysis and then each specimen was fixed in Formalin before moving to 50% Isopropanol for long-term storage. All whole specimens will be delivered to Oregon State University's Ichthyology Collection upon the completion of analysis.

Interns collecting physical habitat data.

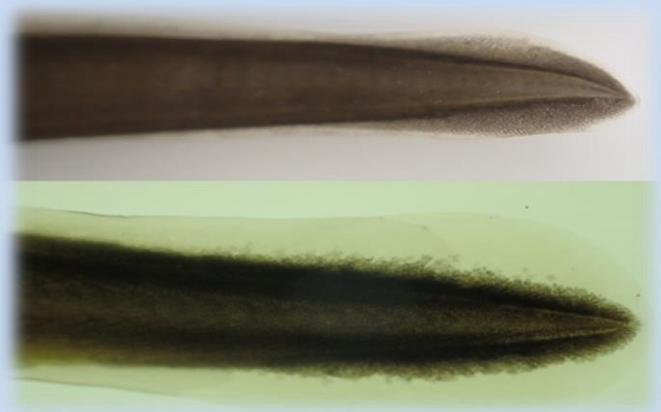
Interns learning how to detect and capture larval lamprey

The protocol was successfully implemented, allowing detection of larval lamprey in wadeable streams. The physical habitat characteristics collected at each target reach will allow habitat attributes that influence lamprey occupancy (e.g. stream slope, floodplain width, valley width, channel complexity, etc.) to be identified. In this preliminary year, the Forest was able to identify the upper extant of lamprey distribution throughout the Middle Fork Ranger District (Upper Middle Fork Willamette Sub-basin) and will extend efforts across the entire Willamette National Forest next year. Testing of eDNA efficacy is anticipated early next year.

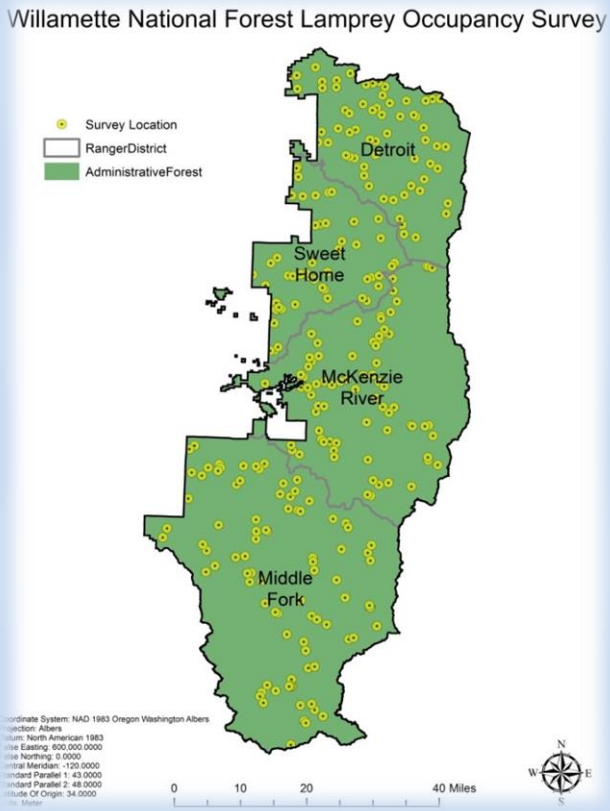
The American Fisheries Society Hutton Scholar Program was also successfully implemented. The students were able to learn adaptive troubleshooting, develop self-confidence in a demanding outdoor work environment, and build upon the foundation for future scientific inquiry.

For more information about this project, please contact: Matt Helstab, District Fish Biologist, Middle Fork Ranger District, at 541-782-5328 or jmhelstab@fs.fed.us .

Interns learning about how large wood creates habitat complexity



Entosphenus tridentatus (Top) and Lampetra sp. (Bottom) possess distinct caudal fin pigmentation.



Primary sites for sub-watershed occupancy evaluation across the Willamette National Forest.

Locations of Forest units in the Pacific Northwest Region of the USDA Forest Service