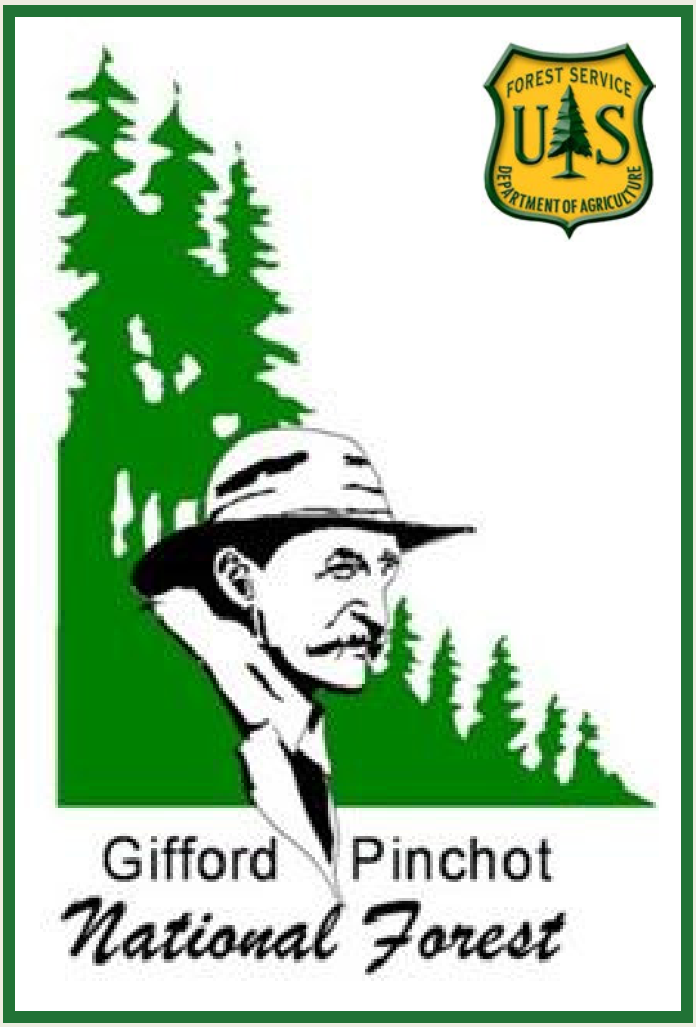
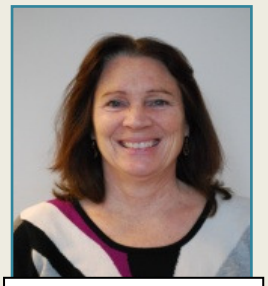
GIFFORD PINCHOT NATIONAL FOREST

AQUATICS PROGRAM

FY11 HIGHLIGHTS

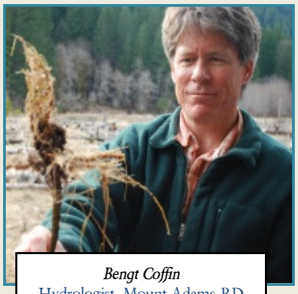


2011 AQUATICS PROGRAM TEAM



Ruth Tracy
Soil and Water Program Manager

Dave Hu
Fish Program Manager



Bengt Coffin
Hydrologist, Mount Adams RD

Stephanie Caballero
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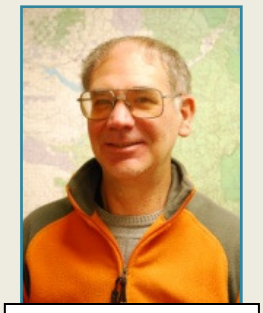

Kenneth Meyer
Natural Resources Data Steward

Mike McConnell
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Paul Smale
Hydrology Technician, Cowlitz Valley RD

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Marie Tompkins
Biological Technician, Cowlitz Valley RD

Bryce Michaelis
Fishery Technician, Mount St Helens NVM

OUTREACH AND EDUCATION

TROUT LAKE FISH DERBY

Mount Adams Ranger District

The Mt. Adams Ranger District hosted the annual Fish Education Day event on June 18th at the Guler-Mt. Adams County Park in Trout Lake, Washington. Washington Department of Fish and Wildlife and its Goldendale Fish Hatchery again donated over 1000 rainbow trout to this event, and the Klickitat County Parks and Recreation Department again allowed the use of this park for this large event. There were over 300 children aged 12 and under, approximately 300 youth aged 13-18, as well as many family members who enjoyed a morning of free fishing, fish fry, storytelling, children's costume parades, face-painting, fish printing, boat safety lessons in the Skamania County Sheriff's boat, visits with Smokey Bear and Frank Fish, and many other fun educational games.

PARTNERS: Washington Department of Fish and Wildlife, White Salmon Steelheaders, US Fish and Wildlife Service, Underwood Conservation District, Skamania County Sheriff's Department, Skamania County Noxious Weed Program, Klickitat County Parks and Recreation Department, Northwest Service Academy, Trout Lake School, Trout Lake Grocery, US Army Corps of Engineers, Andy's Valley Service, Franz Bakery, Les Schwab Tires, Little Mountain Hardware, Angel's Bakery, Beneventi's Pizza, Eagles Club of Bingen, McDonalds, Subway, Hi-School Pharmacy, Thriftways Grocery, Gorge Fly Shop, Miller's Sport Shop, and 14 local residents.

LAKE MERWIN FISH DERBY

Mount St. Helens National Volcanic Monument

On June 11th with the Forest Service as the lead, WDFW stocked 1500 large rainbow trout in a netted off section of Lake Merwin at Aerial Park. Groups such as Fish First and Trout Unlimited taught kids how to fish, provided bait, and loaned fishing rods to kids. Other groups provided educational opportunities such as stream simulation, fish identification, and habitat protection. Arts and crafts booths provided fun activities for kids. The salmon tent provided a storyteller the opportunity to promote good stream and ecosystem ethics. 321 children learned about fish, fish habitat and environmental ethics, and had a good time. Adults enjoyed the opportunity to fish with their families.

PARTNERS: Corwin Beverage, Washington Department of Fish and Wildlife, City of Vancouver, Washington, Fisherman's Marine Supply, PacifiCorp, Cowlitz County Fire District #1, Trout Unlimited-Clark County, WA, Camas Moose Lodge #1042, Mount St. Helens Institute, Broken T Guide Service, Fish First, Watershed Stewards, Woodland High School.11, Vancouver Branch NAACP, USDA Coalition of Minority Employees

LAKE SCANEWA FISH DERBY

Cowlitz Valley Ranger District

The Cowlitz Valley Fish Education Day is a popular annual event that attracts young anglers from all over the county. The Cowlitz Valley Ranger District and partners hosted about 200 children ages 5-14 years of age who participate. The half day event had eleven ongoing interactive presentations. The objective is to provide youth exposure to the National Forest, an opportunity to catch fish and participation in a variety of educational opportunities while having fun. The Lewis County Public Utility District planted approximately 500 rainbow trout in a two acre accessible backwater area off of Lake Scanewa of which more than 300 were caught. Young anglers fulfill a dream of a lifetime when they land their first fish. The Girl Scouts help prepare several interactive educational activities for participates to enjoy. The popular Fish Jeopardy game allows kids to test their knowledge of fish, habitat, angling and life history of salmon. Children express their artistic talents while practicing the ancient oriental art of "Gyotaku" which literally means fish rubbing and participants take home a colorful reminder of a free fishing event. There are devoted Forest employees who teach fishing skills like casting lures, cleaning fish, and knot tying. There is a lot of excitement when life-size Smokey Bear makes his rounds through the crowd encouraging kids to be responsible Forest visitor. Every child is rewarded for their participation with a prizes donated from generous sponsors. This is a day that kids don't soon forget!

PARTNERS: Girl Scouts of America Troop #40337, Lewis County Public Utility District, Lewis County Weed Board, Washington Department of Fish and Wildlife, Fish Country

NATIONAL GET OUTDOORS DAY FISH DERBY

On June 13th, 2011 GP Aquatics was proud to partner with our Recreation program and the City of Vancouver's Water Resources Education Center to co-host the second National Get Outdoors Day (GO Day) event in the Portland-Vancouver Area. GO Day is an annual nationwide event co-sponsored by the Forest Service and the American Recreation Coalition. GO Day events support the Forest Service's ongoing effort to get More Kids in the Woods. Over 800 people came to participate in this youth-focused event. GP Aquatics constructed a fishing tank and loaned fishing gear, providing a unique experience to engage the public and increase and expand the understanding and appreciation of fishery resources and watershed health. Information and presentations on wildlife, recreation and invasive species were also provided throughout the event.

PARTNERS: GPNF Recreation Program, City of Vancouver Water Resources Center, Vancouver Parks and Recreation, Washington DNR, GPNF Invasive Species and Urban Youth Programs, Vancouver Branch NAACP, USDA Coalition of Minority Employees

2011 STURGEON FESTIVAL

On September 17th, GP Aquatics partnered with the City of Vancouver-Water Resources Education Center and Washington Department of Fish and Wildlife for the 14th annual Sturgeon Festival. The 2011 Sturgeon Festival event encouraged people of all ages to discover the many facets of the Columbia River ecosystems in which they live. This annual free family event brought in over 400 to learn about sturgeon and entire Columbia River Ecosystems. The GP Aquatics, Wildlife and Invasive Species Programs teamed up to provide hand-on aquatic invasives activities and also presented and distributed information on other invasive plants, invasive animals and a new invasive species reporting tool.

PARTNERS: City of Vancouver-Water Resources Education Center, Washington Department of Fish and Wildlife, GPNF Wildlife and Invasive Species Programs

OLD APPLE TREE FESTIVAL

The annual Old Apple Tree Festival is a celebration centered on the oldest living apple tree in the Northwest, planted at Fort Vancouver in 1826. Providing family fun, food and history of Vancouver's Old Apple Tree, the festival celebrates our community's legacy. On October 1, the Urban Forestry Commissioners gave away limited cuttings from the Old Apple Tree throughout the day. This free, family friendly event included activities for children, fruit tree pruning workshops, food, live music, apple cider pressing, and tours of Fort Vancouver NP. GP Aquatics again teamed up with our Wildlife and Invasives programs to provide outreach activities and information at this event. As an urban forest, GP Aquatics participation in this community event contributes to enhancing the quality of life in the Vancouver area by providing active engagement, awareness and appreciation of forest resources and programs and their environmental, social and economic benefits.

PARTNERS: City of Vancouver Urban Forestry Commission, GP Invasives and Wildlife

2011 PACIFIC NORTHWEST SPORTSMEN'S SHOW

GP Aquatics, Public Affairs and Invasives programs combined forces to design and create display materials and staff a USFS booth for the 36th annual Sportsmen's Show in Portland, OR. This year's show drew about 60,000 people over five days between February 9-13. Display panels on aquatic and terrestrial invasives provided information, handouts and brochures were given out, and an interactive invasive species game was developed for the event.

PARTNERS: GPNF Public Affairs and Invasives Progams, USFS Region 6 Fire, Mount Hood NF

2011 COLUMBIA RIVER GORGE WATER JAM AT MID-COLUMBIA RIVER GORGE

Mount Adams Ranger District

The Forest Service, including GPNF Aquatics provided support and staffing to this environmental education event held annually in the gorge. Water Jam is hosted each year by approximately fifteen federal, state, tribal, county, and non-profit organizations who use games and storytelling to teach kids about salmonids, wildlife, Native American culture, and more. In May, approximately 400 4th, 5th, and 6th grade students, along with 25 teachers and parent chaperones from schools in the mid-Columbia River Gorge area (Washington state side) participated in an indoor/outdoor event in Underwood, Washington. Various federal, state, tribal, county, and non-profit agencies spent a total of two days hosting 10 schools and teaching wildlife behavior and biology, recycling and water quality, macroinvertebrate species and distribution, salmon migration and habitat requirements, Yakama Nation culture, riparian and old-growth dependent plant species, and more. This experience reinforced aquatic, riparian, and healthy forest ecosystem lessons the students had learned during the past school year. This event provides the agencies and school teachers an opportunity to learn environmental education methods and resources. It also enables the involved agencies to reach several hundred area youth with their environmental message at the same time.

PARTNERS: US Fish and Wildlife Service, US Bureau of Reclamation, Underwood Conservation District, Mid-Columbia Regional Fisheries Enhancement Group, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, Yakama Nation, Skamania County, Klickitat County, Columbia Gorge Ecology Institute, National Marine Fisheries Service, Insitu

AMERICAN FISHERIES SOCIETY 2011 NATIONAL CONFERENCE

For the September 2011th 141st Annual Meeting of the American Fisheries Society (AFS) in Seattle, Aquatics Program staff gave academic presentations, served on AFS committees, conducted a USFS student career fair booth, and helped staff the USFS Agency Trade Show booth. Formal presentations were provided on Hemlock dam fish salvage operations and on our Aquatics program strategy for engaging underserved youth in our forest aquatics program activities.

PARTNERS: USFS Region 6, USFS National Office, Ronaldo Loya-USFS R6 Recruitment Specialist

WIND RIVER MIDDLE SCHOOL MONITORING PROJECT

Mount Adams Ranger District

This ongoing monitoring effort at the site of the Hemlock Dam Removal project is led by the District and supported by many partners. The project involves classroom instruction and fieldwork with science students from the Wind River Middle School. Classes learn about the recent dam removal project and then participate in monitoring of its effects. Many of the students in these classes have been directly impacted by dam removal because they grew up in the community and enjoyed recreating in the reservoir formed by the dam. These same students often come into the class unaware of the importance of Trout Creek to the native steelhead run and the negative impacts the dam had to those fish.

PARTNERS: USFWS-Spring Creek Fish Hatchery, US Bureau of Reclamation, Underwood Conservation District, Mid Columbia Regional Fisheries Enhancement Group, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, Yakama Nation, Skamania County, Columbia Gorge Ecology Institute, AmeriCorps, National Marine Fisheries Service

MOUNT ST HELENS INSTITUTE YOUTH STREAM TEAM

Mount St. Helens National Volcanic Monument

The Stream Team consists of students from diverse backgrounds, some are at risk youth and others are from urban environments, but are all interested in the aquatic environment. This is part of the overall goal of the USFS "Kids Back in the Woods" program. MSHI Stream Team youth implemented project monitoring with USFS oversight. The objective of the project is to have youth aged 10 to 18 monitor streams that have or will have fish habitat restoration projects implemented. The Mount St. Helens Institute developed a program using underprivileged urban youth to monitor streams. They used

survey equipment including flow meters, gravel-o-meters, and studied macro-invertebrates in Lower Clear Creek. A pre-longitudinal survey was completed with photographs. Post monitoring for 2011 is now complete and will be made available. They collected data on temperature, pebble counts, water flows, macroinvertebrates, and water chemistry. Forest Service personnel worked with the group presenting field methodology.

PARTNERS: Mount St. Helens Institute, Vancouver Police Activities League

WORLD WATER MONITORING DAY

On Nov. 8, 2010, GP Aquatics and the Mount St Helens Institute co-hosted World Water Monitoring Day at the Wind River Training Center and Trout Creek with teens from Portland's Rosemary Anderson High School. Although these students were already well-versed in water quality, the activities and settings for these future conservationists addressed some of the perplexing water quality issues facing new generations. We talked about the practical implications of habitat degradation/enhancement and water quality monitoring and led the exercises. Students collected and analyzed water samples and macroinvertebrate samples for the project. After each group presented their findings, time was spent to discuss questions and get a better hold on just what was learned.

PARTNERS: Portland Occupational Industrial Center-Rosemary Anderson High School, Mount St. Helens Institute, GPNF Public Affairs

INSTREAM RESTORATION

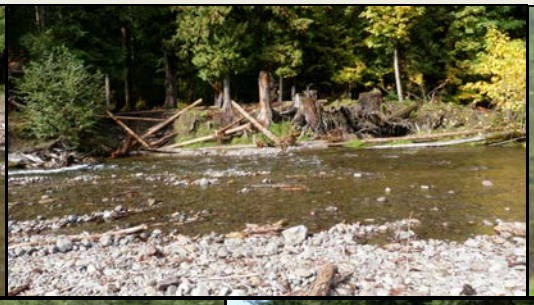
2011 CLEAR CREEK FISH HABITAT RESTORATION

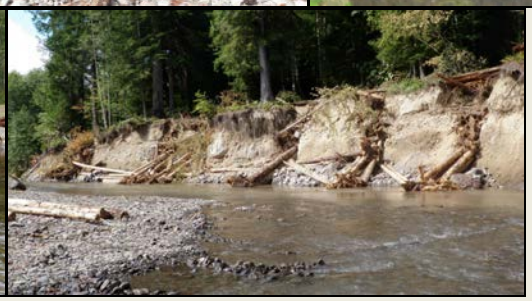
Mount St. Helens National Volcanic Monument

The objective of the project was to create 36 structures to collect and store spawning gravel, create rearing pools, and provide habitat complexity. The lower 1.3 miles of Clear Creek lacks large woody material and provides minimal structure for fish habitat. 953 pieces of large wood material (LWM) was added to create pool habitat and provide complex structure to the stream. The main objectives of this project were to create rearing pools for juvenile Chinook, coho and steelhead, increase the amount and quality of spawning habitat and spawning opportunities for adult fish, and increase the overall habitat complexity in the of the Lower Clear Creek watershed project area for Chinook, coho salmon and steelhead trout. In addition it will improve spawning opportunities for reintroduced adult Chinook and coho salmon and steelhead trout. Wood for this project came from USFS lands. The Gifford Pinchot National Forest used PacifiCorp, Ecotrust and Title II (RAC) funding to supply equipment, operators and labor for construction of habitat restoration structures in the mainstem Lower Clear Creek.

Approximately 25 to 50 pieces of LWM were used at each structure location to form complex habitat. Structures were placed along margins to minimize excessive water shear stress and create a meandering thalweg. Key pieces of wood at each location were anchored into the streambanks. Other pieces of LWM were interwoven into these key pieces and riparian vegetation. The structures were built to address specific needs and improve the conditions at each location. They were built to create pools, capture spawning gravels, reduce pressure on eroding banks, and prevent down-cutting of streambed.

PARTNERS: Mount St. Helens Institute, PacifiCorp; Swift Community Action Team; Ecotrust





2011 EAST FORK LEWIS RIVER FISH HABITAT RESTORATION BY HELICOPTER

Mount St. Helens National Volcanic Monument

The objective of the project was to restore large woody material to the East Fork Lewis River. 260 full length trees were placed in 11 log jam structures and 8 rootwad deflectors using a vertol helicopter from Columbia Helicopters. The objective of this project was to create structures to collect and store spawning gravel, create rearing pools, and provide habitat complexity. Structures were built to mimic natural log jams and treefall to collect spawning gravel, provide rearing habitat and create overall habitat complexity. Trees were cut full length and flown by helicopter to the project site. No artificial anchoring means were used and the trees were placed so the riparian vegetation was interwoven with them and locking them in place.

PARTNERS: Lower Columbia Fish Recovery Board, Ecotrust, Mount St. Helens Institute

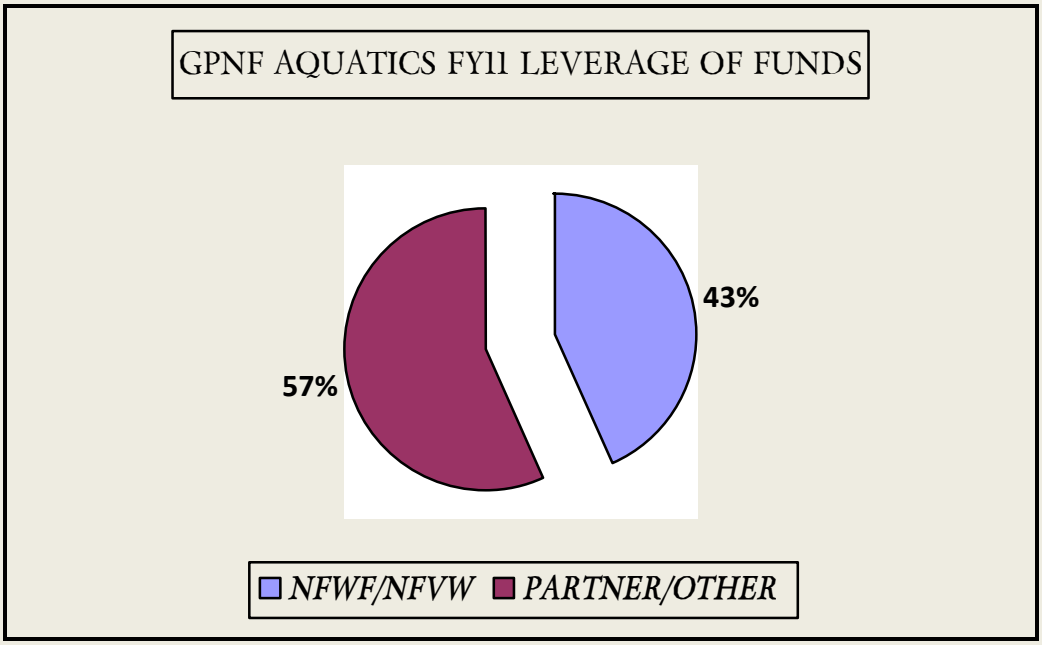
2011 PEPPER LEWIS SIDE CHANNEL FISH HABITAT RESTORATION

Mount St. Helens National Volcanic Monument

The objective of the project was to create 15 structures over a quarter mile on the margins of the side channel to collect gravel, create rearing pools, provide habitat complexity, and create spawning opportunities. This side channel is associated with Pepper Creek, a tributary to the North Fork Lewis River, which keeps cool water flowing throughout it when the mainstem Lewis River water levels drop during summer months. Rearing habitat for coho is believed to be limited in the Upper Lewis River system. Approximately 161 pieces of LWM were used to create 15 structures in the side channel to maximize natural channel characteristics while providing structure stability. Trees were cut 60 feet in length and trucked to an access point on the Lewis River. A secondary, minor component of this project was to remove 10 pieces of creosote treated timbers 20' long from an existing logjam near the downstream edge of the side channel. A rubber tired skidder moved the trees near structure locations and a large 45,000lb excavator dug trenches and placed logs to form complex structures. A dump truck load of creosote timbers were removed from the log jam and disposed of at a waste facility.

PARTNERS: Mount St. Helens Institute, PacifiCorp, Fish First

Martha Creek Dam, Mount Adams Ranger District



ROAD DECOMMISIONS

2011 ROAD DECOMMISSION

Mount St. Helens National Volcanic Monument

The US Forest Service used ACC funding to supply equipment, operators, and labor for closure and/or decommissioning of 6.75 miles of road in the Lewis River/Muddy River and Clear Creek watersheds. This project included decompaction of roads to a depth of at least 12" to improve infiltration, installation of water bars to improve drainage, construction of 6' tall road closure berms to block road and camp site access, and placing one cubic yard or larger boulders to reinforce the berms. Trash and debris were removed from the forest and properly disposed. Excavated areas were seeded with native seed and mulched with wood straw. Seedlings, shrubs and native grass were planted to restore riparian areas. Camping sites associated with roads and riparian areas were restored by removing trash, decompacting the surface and planting native trees, shrubs and grass. Signs describing fishing regulations were placed strategically along FS Road 90, 93, 25, and other locations. Approximately 24 informational signs with bull trout pictures were also created and posted. Clark Skamania Flyfishers identified specific locations for placement of signs, and assisted the Forest Service with installation of signs. They helped identify campsite locations, and clean up campsite areas. Mount. St. Helens Institute helped with monitoring and campsite cleanup. Washington Department of Fish Wildlife and Oregon Department of Fish and Wildlife helped with design of informational signs. Fitzgeralds General Contracting decommissioned 4.6 miles of road in the Middle Lewis and Muddy River watersheds in 2011. Roads were closed and scarified, and trash and campsites were cleaned up. O'Malley Brothers Corp decommissioned 1.4 miles of road in 2011. Roads were closed, scarified and trash and campsites were cleaned up.

PARTNERS: Clark Skamania Flyfishers, Mount. St. Helens Institute, Washington Department of Fish Wildlife, Oregon Department of Fish and Wildlife

UPPER WIND RIVER ROAD DECOMMISSION

Mount Adams Ranger District

This project decommissioned two roads in the vicinity of Oldman Pass in the upper Wind River watershed. Three miles of now-decommissioned road were constructed decades ago to support timber harvest in the area and crossed several tributaries to the Wind River, the largest being Oldman and Youngman Creeks. In sum, 2.9 miles of road were decommissioned, 31 culverts were removed, 4 perennial fish-bearing streams were reconnected and an estimated 5,000 yards of earth fill was removed from active stream areas. Surveys of Oldman and Youngman Creeks in the past identified them as containing Lower Columbia River steelhead in addition to resident rainbow trout. Because we would like to determine the relationship between the sympatric rainbow trout and steelhead trout population within this watershed, we will be exploring the possibility of using otolith microchemistry and/or genetic comparisons in the near future.

Four culvert crossings on these perennial streams were undersized and had elevated outlets limiting upstream passage for steelhead and other native fish in addition to drainage problems that caused large volumes of sediment to be delivered to Oldman and Youngman Creeks through chronic and episodic erosion processes. USFS road survey records indicate that washouts and slumps along this road during the past two decades contributed hundreds of cubic yards of sediment to the aquatic environment. Decommissioning these roads was intended to improve water quality in streams crossed by the roads and to restore upstream migration for fish and other aquatic organisms in Oldman and Youngman Creeks.

Excavators were used to decompact and scarify the entire length of the road surface to encourage water infiltration and revegetation. Waterbars were constructed to ensure road surface water would route downslope and off the road. All culverts were removed to reconnect streams where they cross the road. Streams that had been forced into undersized culverts were re-established to their full width and fish passage barriers that had been created by the culverts were removed. Several thousand yards of earth fill was removed from the stream area and placed in stable locations elsewhere along the roadway where it was blended into the existing topography. Woody debris was added to the reconstructed stream reaches on either side to provide hydraulic diversity in the channels and cover on the slopes. An impassable berm was created at the entrance of each road to prevent vehicular travel on the decommissioned roads. After heavy equipment work was completed the entire project area was seeded using a locally collected and produced grass seed mix and certified weed-free straw and applied to the entire project area. Trees were planted at all major stream crossings to accelerate revegetation and reforestation of those riparian sites. Trees were also planted along other areas of ground-disturbance, such as on the cut-slopes and along the newly-scarified road surface.

Post-project surveys and monitoring have been initiated but not yet completed. In October 2011, the Forest Service re-surveyed the main stream crossing sites to establish "as-built" conditions. These surveys confirm that the fish passage barriers that had been established at the culverts were no longer present, and that the channels were once again continuous and accessible by fish and other aquatic organisms. Topographic surveys of the channels will be repeated in summer 2012 to evaluate the performance of these newly reconstructed stream reaches after they have been exposed to one winter of increased streamflows. Fish identification and abundance monitoring will also be conducted in summer 2012, both upstream and downstream of the main culvert crossings on Youngman Creek and Oldman Creek, in order to measure the success of this fish passage and road decommissioning project.

PARTNERS: Bonneville Power, Ecotrust, NOAA Fish Restoration Center, FS Legacy Roads

NUTRIENT ENHANCEMENT

PINE CREEK NUTRIENT ENHANCEMENT

Mount St. Helens National Volcanic Monument

The purpose of this project was to improve conditions for bull trout and eventually in 2013, all species of introduced anadromous fish (Chinook, coho, steelhead). Three dams on the Lewis River cut off over 170 miles of anadromous fish habitat in the 1930's. As part of the FERC re-licensing procedure anadromous fish will be reintroduced into this habitat. Nutrient enhancement helps to restore, at least temporarily, the nutrient cycle in stream ecosystems that are experiencing declines in productivity due to a variety of factors such as watershed disturbances, and loss of stream channel complexity. When done at the proper time of year, nutrient enhancement helps to stimulate primary and secondary productivity in streams, and leads to increased growth and condition of juvenile fish. After continuing this cycle for a number of years, the need for nutrient enhancement efforts are expected to decrease as salmon runs are reintroduced above Swift Reservoir, become self-sustaining and the ecosystem begins to function naturally. The Nutrient Enhancement Project involved the distribution of adult coho carcasses from Lewis River Hatchery reared and collected fish. The project took place in October and November of 2010. 1200 carcasses were distributed over six miles of Pine Creek. Macroinvertebrate samples were collected prior to project implementation. Samples were collected again in October 2007, October 2009, and October 2010 to see how carcass seeding improved productivity in the system. Results show that areas seeded with carcasses have a greater macroinvertebrate density than unseeded areas.

PARTNERS: Pacific Power, Clark-Skamania Fly Fishers

UPPER COWLITZ RIVER NUTRIENT ENHANCEMENT

Cowlitz Valley Ranger District

The goal of the enrichment project is to restore Upper Cowlitz basin habitat to increase salmon freshwater survival and rejuvenate salmon runs back to historical levels. The project's objective is to place historic numbers of coho carcasses or approximately 300 per river mile back into the stream to increase levels of important limited nitrogen elements along with phosphorus, ammonium and other elements. These increased elements can come directly to pre-smolting salmonids as a food source through the consumption of spawner's flesh or indirectly through the food chain. Stream enhancement though through coho carcass placement has had positive effect on stream-type juvenile salmon carrying capacity by increasing the nutrient status of the stream. Studies suggest that juvenile salmonid density dependence may stem from a shortage of nutrients normally derived from decomposing salmon carcasses. Decaying salmon carcasses have been shown to be an important food source for juvenile salmonids and likely improve over-wintering survival. Priory streams were chosen based historic range, current habitat and road accessibility. A total of 3261 adult and jack carcasses were distributed between four subwatersheds in the in the Upper Cowlitz basin in November 2010. The combined Upper and Lower Cispus watersheds received 1973 carcasses distributed between five different rivers and six different distribution points. The combined Upper and Lower

Cowlitz received 1288 carcasses distributed between five different rivers and seven distribution points. Carcasses were distributed at a rate ranging from 50 to 449 lbs/acre (avg 166) for river systems treated in 2010. Coho adult and jacks carcasses were collected at the Cowlitz River Hatchery and processed (removed wire tages) by WDFW during the the first and second weeks of November 2010. WDFW and volunteer organizations transported whole fresh carcasses and drove by road to at predetermined distribution locations. Fish carcasses were disseminated directly into rivers from access points, typically bridges. Carcasses were allowed redistribute under the influence of the current.

PARTNERS: Washington Department of Fish and Wildlife, Coastal Conservation Association

North Fork Cispus, Cowlitz Valley Ranger District

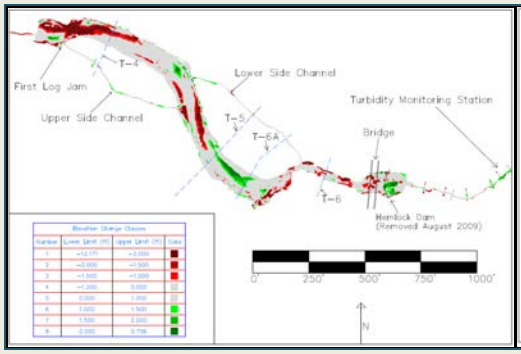
INVENTORY & MONITORING

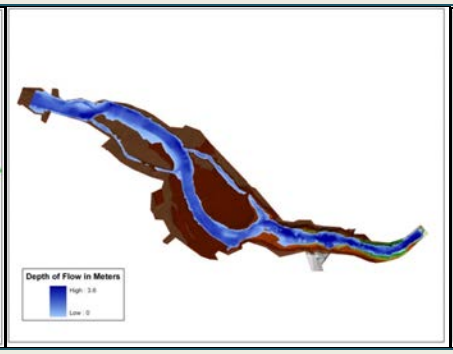
HEMLOCK DAM REMOVAL PROJECT- POST PROJECT MONITORING

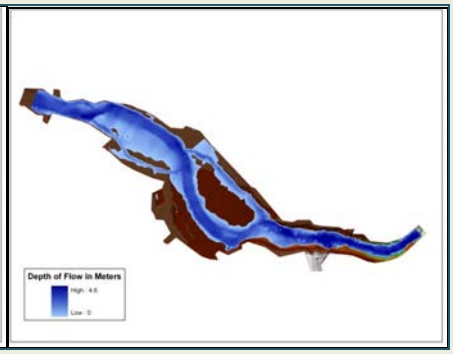
Mount Adams Ranger District

The main objective of the Hemlock Dam Removal Project: Post-Dam Removal Monitoring Project is to ensure that restoration activities that were implemented during the 2009 Hemlock Dam Removal Project are having the desired effect of creating and improving stream habitat for threatened Lower Columbia River steelhead. Instream physical parameters that were measured throughout the restored stream reach of Trout Creek in summer 2010 were: instream large woody material, stream shade, stream temperature, instream substrate, longitudinal profiles, cross-sections, and macroinvertebrates. An important realized result was a data set for 2010 showing changes to salmonid spawning, rearing, migrating, and foraging habitat as a result of large-scale stream and riparian restoration actions.

PARTNERS: Bonneville Power Administration, USFWS







MUDDY FORK COWLITZ CHANNEL AVULSION MONITORING

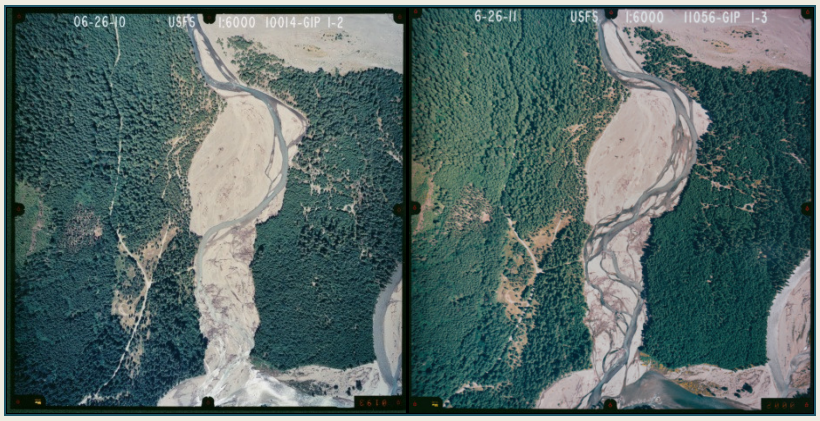
Cowlitz Valley Ranger District

On November 8, 2006 a record-setting peak flow of 42,100 cubic feet per second inundated the upper Cowlitz River valley. The flow measured higher than the previous record peak flow of 36,600 cfs and dramatically shifted the Muddy Fork Cowlitz channel, tumbling mature trees along its newly formed course carved through approximately 40 acres of Gifford Pinchot forest land. Ordinarily this naturally reshaped channel with added habitat complexity would be viewed as a benefit to threatened salmon and steelhead in the upper basin. However, because of severe damage sustained to downstream private property, the Forest was faced with calls for action to address perceived future risk of unabated floods and injurious log jams. An aggressive public campaign ensued to clear the streams of wood, dredge river channels and armor the river banks in an effort to thwart future risks. An interagency review team convened to address public concern and inventory post flood impacts, develop a monitoring plan, and evaluate the potential elevated risks to public safety. County government coordinated the flood response with the Gifford Pinchot National Forest providing technical support.

The objectives of this resulting Muddy Fork monitoring project are to detect and evaluate channel movement which threatens public safety and implement a notification process to county emergency services. A combination of aerial reconnaissance with low elevation photography and channel stability assessment were conducted to evaluate the post flood conditions 2006-2011. In 2011 the Forest Service updated the annual channel surveys to monitor the flood impacted area and evaluate the risk to Forest and downstream private resources. During the 2011 monitoring period the discharge threshold was exceeded on Jan 16,

2011 at which time the Cowlitz River at Packwood exceeded a flood stage elevation of 10.5 ft during one flood event. Peak discharge measurements on the Cowlitz River at Packwood had an adjusted instantaneous peak of 25,700 cfs, which is over the estimated bankfull flow of 16,000 cfs. Air photo interpretation of active floodplain indicates it has measureably widened in three primary areas. Public response to the Muddy Fork channel avulsion has diminished since the catastrophic channel avulsion in 2006. Channel inactivity has undoubtedly served to calm the emotional state. Additionally, the response to interagency involvement has generally been well received and the Forest Service channel geomorphologic monitoring has provided a valuable link to the public, and along with an increasingly stable channel has come an increasingly stable relationship with public stakeholders.

PARTNERS: Lewis County, Washington Dept of Fish and Wildlife, Washington Department of Ecology, NRCS



HEMLOCK DAM SITE HABITAT RESTORATION

Mount Adams Ranger District

Hemlock Dam Removal monitoring completed year two of post-project monitoring for a range of biological and physical parameters. The site is performing well and riparian vegetation is growing rapidly. Natural escapement of summer steelhead to the Wind River and Trout Creek in 2011 was the highest on record since monitoring this data began in 1989. Hemlock Dam was a 26-foot tall concrete dam located on Trout Creek in the Wind River watershed. The Forest Service-owned dam was built in 1935 for hydropower production, was later retrofitted to provide irrigation storage, and by 1997 no longer served either purpose. Because the dam continued to affect water quality, habitat and passage for Lower Columbia River steelhead, the Mt Adams Ranger District removed the dam in 2009.

The Mt Adams District and Pacific Northwest Research Station began monitoring physical habitat parameters and macroinvertebrates in the vicinity of the dam prior to its removal, and are scheduled to continue annual monitoring through 2012, after which monitoring will be reduced to occur at 3-5 year intervals. Washington Department of Fish and Wildlife and US Geological Survey have been monitoring adult steelhead returns to Trout Creek since the mid 1990's and have continued this work after dam removal. Monitoring parameters include topographic surveys of the channel and floodplain, assessments of water temperature, turbidity, substrate, pools, instream wood, and macroinvertebrates. Topographic surveys were completed for the entire site including upstream and downstream reaches, and photo points were established around the perimeter to provide a visual representation of the changes during and after the project. As the site changes over the course of the next few years through scour, deposition and accumulation or loss of woody debris, we will monitor how the projected floodable areas adjust.

Instream habitat has also changed as a result of this project. The reservoir was once a large shallow pool with very little woody debris or diversity of habitat. The restoration project brought in a total of 1200 whole trees and logs to construct the channel, and to provide a diversity of hydraulic characteristics and habitats for fish and other aquatic organisms. Since completion of the project, natural processes of woody debris accumulation have begun to operate and further diversify the project providing dynamic and natural adjustments and movement of the channel due to these kinds of stochastic processes.

Following removal of Hemlock Dam and construction of the channel, the entire site was planted with more than 20,000 trees and shrubs to accelerate revegetation and occupy the site with native species before it could become colonized by invasives such as reed canary grass, which was the dominant vegetative cover in much of the area surrounding the former reservoir. The plants were irrigated the first two summers after planting, and since that time have become well established and have grown to in some cases over 7-feet tall. Monitoring at the site continues into 2012, and subsequent reports will include summaries of findings for other monitoring parameters including water temperature, substrate, and macroinvertebrates.

PARTNERS: GP Botany and Invasives Programs, Washington Department of Fish and Wildlife, US Geological Survey

FISH REINTRODUCTIONS ON GIFFORD PINCHOT NF

COWLITZ RIVER SALMON AND STEELHEAD REINTRODUCTION

The Salmon Reintroduction Partnership goal is to restore threatened salmon and steelhead to the Upper Cowlitz River basin. Three downstream Cowlitz River hydroelectric dams blocked the annual upstream migration of tens of thousands of wild salmon and steelhead for more than 37 years. The reintroduction effort, initiated in 1998, uses a trap and haul method to move fish above barrier dams and has made available more than 200 miles of National Forest streams for these Endangered Species Act listed fish. Accessible fish habitat on the Cowlitz Valley Ranger District offer a vital component to the successful recovery of threatened salmon and steelhead in the Lower Columbia River basin. The partnership plays an active role in the revival of a Pacific Northwest iconic fish resource.

The objective of the monitoring effort is to enumerate the distribution and relative abundance of these fish and evaluate their reproductive success (freshwater survival) in the Upper Cowlitz Basin. Evaluation of the Upper Cowlitz salmon reintroduction is an ongoing effort composed of several discrete projects aimed at keeping an attentive eye on the key phases in salmon and steelhead fresh water life history. In 2011 we applied some innovative techniques to monitor the success including the following: 1) adult and juvenile trapping results 2) adult radio tracking and 3) spawning and carcass surveys.

The productivity of the freshwater environment is calibrated by estimating egg to smolt survival. Estimates of egg are based on total females transported and a fecundity rate of 4000 eggs per fish. The number of smolts or juvenile fish moving downstream to the ocean is estimated at the Cowlitz Falls fish collection facility. Diversion screens move fish from the river to holding tank where fish are uniquely marked and biological information is collected. Mark and recapture methods are used to establish trapping efficiency and develop juvenile population estimates by species. An annual estimate of fish distribution (2006-2011) is established using a representative population of approximately 100 adult fish outfitted with radio transmitters. Continuous location data is recorded on automated electronic receivers arrayed throughout the basin. Spawning success is established by conducting periodic aerial, ground and water reconnaissance of more than 100 miles of stream to locate and enumerate spawning sites. The number of returning adult coho, Chinook and steelhead is established at a downstream trap site as they are captured and transported around the dams to three release sites in the upper Cowlitz basin.

We have developed interesting preliminary finding as a result of the monitoring effort. Salmon and steelhead distribution has not yet expanded to its historic range in the upper Cowlitz. There is well suited historic habitat underutilized on the National Forest, most notably in Skate Creek, Iron Creek and North Fork Cispus River. We found that there is substantial random movement and straying of volitionally released salmon and a large proportion of the adult population “falls back” to the reservoir and may not escape to spawn. Adult spawning success in index reaches was near average in the upper Cowlitz. Juvenile fish collection at Cowlitz Falls Dam juvenile bypass facilities are not meeting collection efficiency standards for outmigrating smolts, contributing to very high juvenile mortality rates.

PARTNERS: Lewis PUD, Cowlitz Falls Dam Project, Washington Department of Fish and Wildlife Resource Advisory Committee, USGS–Biological Resource Division, Cowlitz Indian Tribe, Energy Northwest

NORTH FORK LEWIS RIVER SALMON AND STEELHEAD REINTRODUCTION

The Lewis River is a huge watershed draining portions of Mount St. Helens and Mt. Adams. PacifiCorp was issued a 50-year federal license in 2008 to operate the three dams on the Lewis. The license issuance completed a 10-year negotiation process with stakeholders in the area, including local, state and federal agencies (including Forest Service), Indian tribes, environmentalists and others. The centerpiece to the settlement is a plan to open up to 174 miles of habitat currently blocked to sea-run fish by construction of Merwin Dam in 1931, Yale Dam built in 1953, and Swift Dam built in 1958, and also flooded fish habitat in the upper North Lewis watershed. Efforts to transport anadromous fish around three high dams have begun to reopen access to large amounts of productive fish habitat. At the same time, scientific examination and coordination has begun to evaluate the maximum extent possible, the success of this reintroduction program. This effort will contribute to the recovery of listed salmon and steelhead in the lower Columbia River. Reintroduction would occur first in the upper Swift reservoir where 117 miles of habitat is available, almost all of it on Gifford Pinchot NF lands

The agreement also includes several specific measures that will protect bull trout, a native fish species listed as threatened under the Federal Endangered Species Act, and support recovery efforts for the species in the basin. Currently, several local populations of bull trout are affected by the projects, which inhibit or prevent migration and genetic interchange, vital factors to the recovery of the species. A specific fund has been established to enhance and restore habitat for anadromous fish and bull trout and continued collaboration and cooperation is a priority for the settlement parties in recognition that that implementation of settlement measures will occur over the long-term. Rigorous scientific monitoring and evaluation are built into the agreement to provide for adaptive management as new data and information become available. GP Aquatics is a key player representing both forest and agency in this technical oversight group.

PARTNERS: Washington Department of Fish and Wildlife, Cowlitz Indian Tribe, PacifiCorp, NOAA, USFWS, Cowlitz PUD, Trout Unlimited, Fish First, Lower Columbia River Fish Recovery Board

TECHNICAL ADVISORY COMMITEES & WORKGROUPS

WHITE SALMON WORKING GROUP – CONDIT DAM REMOVAL

The White Salmon Working Group (WSWG) was formed to create fish salvage and anadromous salmonid restoration plans in preparation for the restoration of fish passage to the White Salmon River, Washington, following the removal of the Condit Dam at river mile 3.2. Members of this collaborative group started meeting in February 2007 and GP Aquatics joined the WSWG in spring 2010 and has since provided support, mainly by assisting with fish monitoring in 2010 and 2011, fish salvage efforts prior to the breaching of the dam in fall 2011, and reviewing and providing input to plans and reports. Fish populations originally considered for the salvage and recolonization efforts associated with the removal of Condit Dam were spring and fall Chinook salmon, summer and winter steelhead, coho salmon, chum salmon, bull trout, and Pacific lamprey. Results of previous collaborative research projects in the White Salmon River were used to guide the recolonization and management plans to meet goals for each of the various species. These projects included fish assessments, fall Chinook escapement estimates, Ecosystem Diagnosis and Treatment modeling, assessments on adult straying, bull trout and lamprey presence-absence surveys, and genetic assessments of salmonid populations from nearby watersheds. As a result of consensus among WSWG members, native fall Chinook salmon were transported upstream of Condit Dam in 2011, which resulted in successful natural spawning prior to the start of Condit Dam removal. A range of management options for each species were considered (i.e. natural recolonization, introduction of a neighboring stock, hatchery production use, monitoring natural recolonization before assessing need for hatchery production). Recommended options for salmonid reintroductions from the WSWG were incorporated into NMFS's Endangered Species Act recovery plans for steelhead, Chinook, coho, and chum salmon. The WSWG is currently evaluating opportunities for monitoring fish response to the dam removal. These will include steelhead spawner and carcass surveys, tule fall Chinook passage and spawning distribution surveys, a continuation of the bathymetry survey measuring changes to fall Chinook spawning habitat, juvenile lamprey presence surveys, creel surveys, spring and fall Chinook spawning surveys, and additional carcass surveys.

PARTNERS: US Geological Survey, Yakama Nation, US Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife, US Forest Service, and PacifiCorp

LOWER COLUMBIA RIVER FISH RECOVERY BOARD-TECHNICAL ADVISORY GROUP

The Lower Columbia River region comprises seven percent of Washington State and supports 72 distinct populations of salmon and steelhead listed as threatened under the federal Endangered Species Act. The Lower Columbia River Fish Recovery Board was established by state law to oversee and coordinate salmon and steelhead recovery efforts in the Lower

Columbia region. The region extends from the mouth of the Columbia River up to and including the Little White Salmon subbasin and as far north as the Upper Cowlitz subbasin. The Board operates under an agreement between the five Southwest Washington counties: Clark, Cowlitz, Lewis, Skamania and Wahkiakum. The LCFRB is one of seven salmon recovery regional organizations in the State of Washington. GP Aquatics serve on a 15-member Technical Advisory Committee comprised of experts in fish biology, natural resource management, and hydrogeology from local, state and federal agencies, and the private sector. The Committee advises the Board on a variety of technical fish recovery issues and recommends projects for funding.

PARTNERS: Lower Columbia River Fish Recovery Board, US Fish and Wildlife Service; National Marine Fisheries Service; Washington Department of Fish and Wildlife; Washington Department of Transportation; Lower Columbia River Estuary Partnership; US Army Corp of Engineers; WSU Clark Cooperative Extension; Cowlitz Tribe; Governor's Salmon Recovery Office; WA Department of Natural Resources; WA Department of Ecology, Governor's Salmon Recovery Office

LEWIS RIVER HYDROELECTRIC PROJECT AQUATICS COORDINATION COMMITEE

In response to the FERC relicensing of the Lewis River hydroelectric projects, interested parties collaborated on establishing a settlement agreement concerning future operations and responsive protection, enhancement and mitigation measures. On November 30, 2004, 26 Parties, including the USFS signed the Lewis River Settlement Agreement. This agreement reflects the interests of all parties, provides significant monetary investments in fish and aquatic resources, includes measures for monitoring, evaluation and adaptive management, and includes ongoing coordination with the Parties through the Aquatics Coordination Committee for the implementation of the aquatic measures and evaluations provided for in the Agreement and oversee and make decisions regarding the project's Yale, Swift, and Lewis River Fund. GP Aquatics continues to serve as a core representative in the ACC.

PARTNERS: US Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Fish and Wildlife, Yakama Nation, Cowlitz Tribe, Lower Columbia River Fish Recovery Board, Fish First

White Salmon River, above former Condit Dam site