

# ENTIAT WATERSHED

Vol. II: 2012

ANNUAL REPORT

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## ENTIAT RIVER APPRECIATION A COMMUNITY CLEAN UP EVENT

**"I think the Entiat River Appreciation was very important because it helped the town and got everyone together to clean, plant trees, and enjoy food & games. I think everyone left feeling good about helping out." ~ Entiat 4-H group chairperson Allison Haines."**

For the past two years, on a Saturday in August, the Entiat community has come together to pick up trash, pull weeds and plant trees on public and private land along and in the Entiat River. Groups of volunteers met up at the future site of the Entiaqua Park where they then dispersed to various sites.

In 2010, over 63 participants gathered to remove approximately 3 tons of metal and trash from the riverbanks. Participants focused their cleanup efforts at public access points at Entiaqua Park, Mad River, and Entiat National Fish Hatchery. In addition, volunteers floated five one mile reaches of the river to remove garbage from the shoreline.

On August 6, 2011, over 100 volunteers, including the Forest Service Initial Attack crews from Entiat and Chelan, from the Entiat area and elsewhere filled two 20-yard roll-off bins with metal, trash and noxious weeds removed from the banks of Entiat River. Clean up efforts took place at Entiaqua Park, Mad River, a private property on Bortz Road and the Entiat National Fish Hatchery. Volunteers at the Hatchery also planted 100 native trees and shrubs. The first 50 participants planted a "legacy tree," a single Ponderosa Pine. These "legacy trees" will be mapped by GPS and receive a name plaque so that participants can watch them grow and change with time.

Family of volunteers at 2010 clean-up.



Group at the Entiat Hatchery in 2011.



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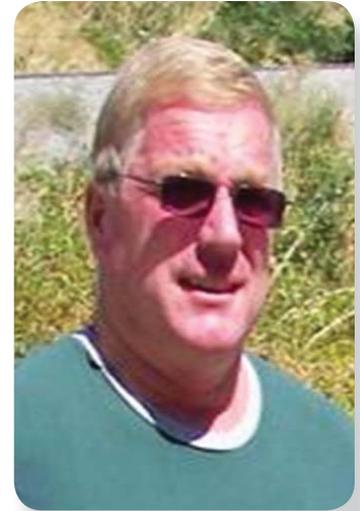


## BOB WHITEHALL

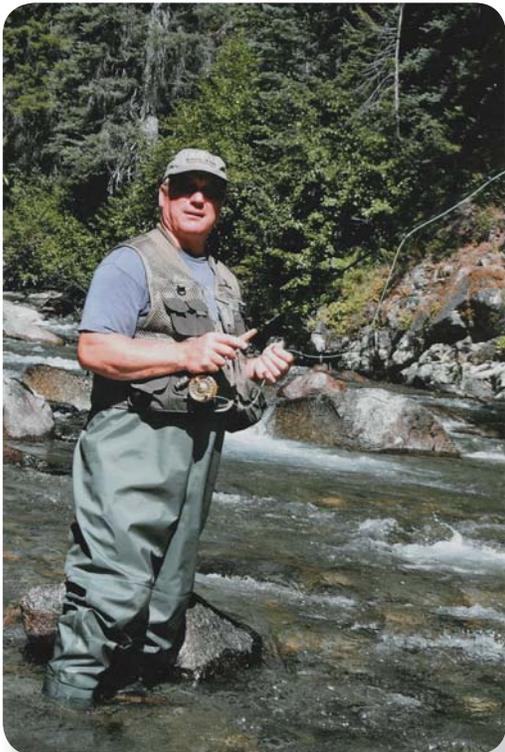
City of Entiat Public Works, landowner and fisherman

Bob Whitehall a fourth generation Entiat local is a passionate fisherman. So much so in fact, that he currently co-chairs of the Columbia River Salmon and Steelhead Recreational Angler board, is a member of the local ad hoc Fishery Advisory Committee as well as participating on the Entiat Watershed Planning Unit and a dedicated landowner steering committee member. Bob's involvement in the Entiat Watershed planning efforts began in the early 1990's as both a representative of the City of Entiat and a private landowner. Bob continues in both those roles to this day providing valuable insight into the importance of opening the Entiat to recreational fishing and reminding us all, that this is the ultimate goal of salmon habitat restoration efforts: to provide for the return of enough salmon to remove them from listing as an Endangered Species and a return to unrestricted fishing on the Entiat River.

One result of Bob's and others tireless campaigning; was the re-opening of the lower Entiat River from 800' south of the Entiat National Fish Hatchery to the Highway 97A Bridge of fishing for spring Chinook in the summer of 2008. This was followed by additional Chinook seasons in 2009 and 2010 and steelhead seasons in 2009, 2010 and 2011. In addition to providing anglers an opportunity to indulge in their favorite pastime, native fishes were helped out by the elimination of some of their hatchery origin competition. Reopening the lower Entiat to fishing helped increase momentum in salmon recovery efforts.



"I figured if I wasn't willing to allow a project on my property, I couldn't very well ask others in the valley to do it"



These seasons were made possible in part by the efforts of the Columbia River Salmon and Steelhead Recreational Angler Board. This group worked with the State Department of Fish and Wildlife to develop a four year pilot program requiring the purchase of salmon stamps in addition to regular fishing licenses. The 1.8 million dollars generated in the first three years of this program have served to fund the state agencies that open and maintain local fisheries, without these funds fishing on the Entiat, would not have opened. The board will be providing the state a final report next year which will include the recommendation that program be continued. The future funding would then be used to expand fishing opportunities in the region, including the Entiat. The board would also like to see slot fishing season expanded above the hatchery for additional species.

In 2006, Bob was one of the first landowners to step forward to allow construction of a rock weir in the river next to his property in order to provide salmon habitat. This project was constructed with a twofold purpose; to create a permanent surface diversion for the Chelan County P.U.D irrigation ditch and to provide fish passage and habitat complexity. "I figured if I wasn't willing to allow a project on my property, I couldn't very well ask others in the valley to do it". Today, the weir is still in place as constructed and is performing as intended. It is the accumulation of this and other projects both big and small which will ultimately make the difference in salmon returning to the Entiat.

## PRESTON/YURT SITE



“The contractors and the Conservation District staff were great to work with and attended to every detail we were concerned about - even now, a year after the river work was done.”

-Bill Gilmartin & Casey Leigh,  
Preston/Yurt Site landowners

In the summer of 2010, Cascadia Conservation District, in partnership with landowners Jeffrey and Jo Frunz and Bill Gilmartin and Casey Jarmin and the US Bureau of Reclamation undertook a salmon habitat restoration project known collectively as the Preston Reach/Yurt Site. This project will not only help salmon recovery, but will also assist the landowners by slowing the accelerated erosion rates they were experiencing along their streambank.

This reach of the Entiat River contains spawning, rearing, and migratory habitat for the Endangered Species Act-Listed Upper Columbia River Spring-run Chinook salmon, Steelhead and migratory populations of Bull trout. One of the biggest factors affecting juvenile fish survival in this stretch of the Entiat River, known as the Stillwater Reach is the lack of large woody debris.

The long term goal of the project is to reestablish woody riparian

vegetation at the site. To achieve this, the project combined the installation of 14 Large Woody Debris structures along 645 linear feet of existing bank, re-contouring the eroded bank and installing riparian vegetation within a 100 foot wide 1.9 acre planting zone located along the bank adjacent to the wood structures.

Prior to restoration, the site was experiencing an accelerated erosion rate, the streambank was vertical, and most of the woody riparian vegetation had been cleared from the area along the river and the adjoining floodplain leaving a grassy meadow vulnerable to erosion.

In order to establish new riparian vegetation, a wet planting bench varying in width from approximately 20 to 30 feet and the depth was cut from 3 to 4 feet then transitioned at a gentle slope to the existing grade. The bench created a narrow, frequently wetted floodplain planted with willows,

dogwoods, and alders. The remaining 100 foot width was planted with Ponderosa Pine and native shrubs and grasses. The theory behind this form of restoration is that the wood structure will hold the bank while allowing the new plantings to mature enough to provide the root structure necessary to stabilize the river bank, slowing erosion to a more natural or normal rate while eventually reintroducing woody debris back into the river.

Ongoing monitoring of the constructed project indicates a plant survival rate of approximately 75%, no displacement of any of the log structures and erosion of the bank behind the farthest upstream structure, which has since been repaired. As the plantings continue to grow, less and less of the construction and wood structures will be visible.

One year and several high flows later, the project is performing as designed and is considered a great success by both the landowners and Cascadia.



## KNAPP-WHAM CONSOLIDATION

- ▶ This project involves the consolidation of two irrigation systems: the Knapp-Wham (KW) and the Hanan-Detweiler (HD) canals in the lower Entiat River basin. The overall purpose of the KW-HD consolidation project is to improve fish passage, conserve water, and minimize diversion operation and maintenance in the Entiat River.
- ▶ January 2007 - June 2010
- ▶ Sponsored by and the Cascadia Conservation District and U.S. Bureau of Reclamation
- ▶ Cost: \$552,912



## PRESTON/YURT SITE

- ▶ The long term goal of the project is to reestablish woody vegetation at the site. The Large Woody Debris structures installed at the site will hold the bank so the plantings mature enough to stabilize the banks with their roots.
- ▶ August 2010 - May 2011
- ▶ Sponsored by and Cascadia Conservation District and U.S. Bureau of Reclamation
- ▶ Cost: \$



## LANDOWNER ASSISTANCE PROGRAM: IRRIGATION SYSTEM UPGRADES

- ▶ Installation of more efficient irrigation systems, which result in reduced erosion and leaching of chemicals and nutrients into the Entiat River and groundwater.
- ▶ June 2009
- ▶ Sponsored by Cascadia Conservation District and landowners through cost-share
- ▶ Cost \$30,470



## SURFACE TO WELLS CONVERSIONS

- ▶ Replacing the surface water diversions will avoid fish entrainment and mortality, as well as provide water savings through higher delivery efficiencies.
- ▶ January 2010 - October 2011
- ▶ Sponsored by Cascadia Conservation District, Washington Department of Ecology, and US Bureau of Reclamation
- ▶ Cost \$



## BELOW KEYSTONE BRIDGE

- ▶ This project addresses the lack of habitat diversity by installing several instream structures and by planting/under planting riparian zone vegetation.
- ▶ April 2009 - June 2010
- ▶ Sponsored by Cascadia Conservation District, Integrated and Status Effectiveness Monitoring Program, U.S. Bureau of Reclamation, and U.S. Forest Service
- ▶ Cost: \$594,000



### ENTIAT NATIONAL FISH HATCHERY

- ▶ This project reconnected a disconnected floodplain by breaching a levee, excavating several small off-channel areas to provide high-water refugia for salmonids, and implementing upland and riparian vegetation restoration.
- ▶ February 2009 - June 2011
- ▶ Sponsored by Cascadia Conservation District and U.S. Fish & Wildlife Service
- ▶ Cost \$312,940



### 2010 RIPARIAN RESTORATION

- ▶ The purpose of the project was to restore, enhance, and protect 4.3 acres and/or 3,560 linear feet (0.65 miles) of riparian habitat directly adjacent the Entiat River.
- ▶ March 2010 - November 2010
- ▶ Sponsored by Cascadia Conservation District
- ▶ Cost: \$112,832



### ENTIAT NATIONAL FISH HATCHERY KIDS FISHING POND

- ▶ Local Entiat volunteer groups and individuals contributed labor, material and equipment to pond construction. On June 11, 2011, the first annual event was held. About 300 people attended and 300 fish were caught.
- ▶ Fall 2010 - May 2011
- ▶ Sponsored by Cascadia Conservation District and U.S. Fish & Wildlife Service
- ▶ Cost: \$



### 2011 RIPARIAN RESTORATION

- ▶ This project consisted of restoration, enhancement, and protection of 4.2 acres and/or 5,675 linear feet (1.1 miles) of riparian habitat directly adjacent the Entiat River.
- ▶ September 2010 - November 2011
- ▶ Sponsored by Cascadia Conservation District
- ▶ Cost: \$85,590



### KEYSTONE LOGJAM PROJECT

- ▶ This project enhances habitat and creates spawning and rearing habitat for salmon through the installation of a large woody debris logjam that is 75 feet long and used 14 logs, 6 with rootwads intact.
- ▶ August 2010
- ▶ Sponsored by Yakama Nation Fisheries and Cascadia Conservation District
- ▶ Cost: \$85,000



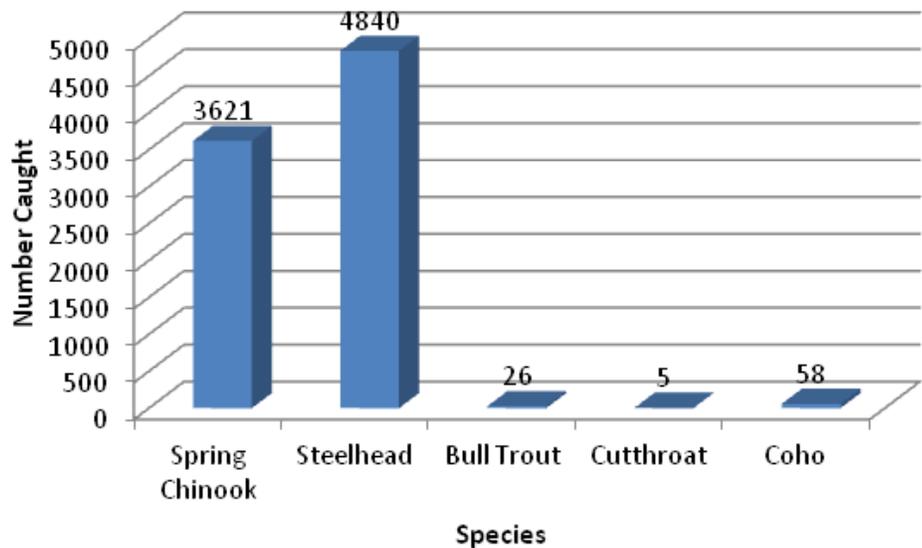
The charts and graphs on pages 6-7 are graphic representations of aquatic biology, water quantity, water quality, and habitat monitoring data collected annually by partner agencies to assess the condition of the environment and track progress toward the implementation of the Entiat Watershed Plan and the recovery of threatened and endangered fish species.

## AQUATIC BIOLOGY MONITORING RESULTS

### SPRING CHINOOK SALMON AND STEELHEAD: JUVENILE ABUNDANCE, GROWTH AND SURVIVAL

To collect data on juvenile spring Chinook salmon and steelhead abundance, growth and survival Integrated Status and Effectiveness Monitoring Protocol (ISEMP), the US Fish and Wildlife Service and the Yakama Nation conduct two fish capture surveys each year. Surveys at 14 sites along the Entiat and Mad River are conducted in August and in February/March. During the summer survey fish are captured during the day using a variety of techniques such as herding the fish into a net with an electric current, but during the winter the cold water temperatures render the fish less active and they are out in the open during the night and they can be caught using dipnets.

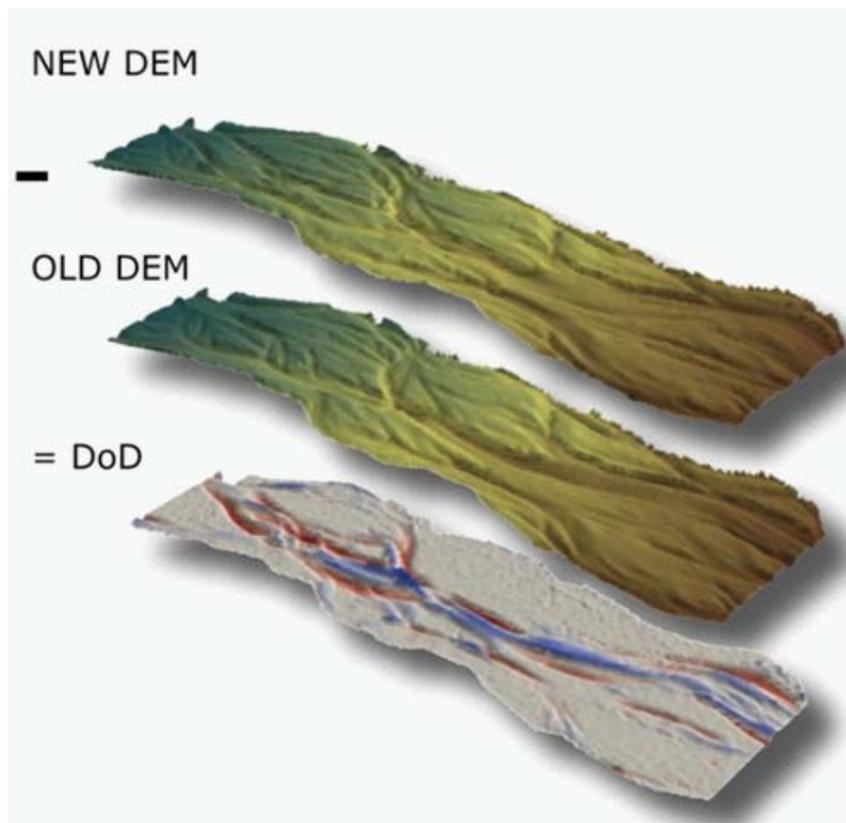
Each site is visited for two days – on day 1 as many fish as possible were captured and those spring Chinook salmon and steelhead large enough to receive PIT tags are implanted (PIT tags are tiny radio transmitters that emit a signal detectable by readers). When we return on day 2 we catch as many juveniles as possible, including tagged fish from the day before. The proportion of tagged to untagged fish caught on day 2 allows us to calculate the abundance of fish at that site.



The chart above shows the total number of fish caught in 2010 and 2011. In 2010 there was only a summer capture period during which 2,690 salmonids were tagged; in 2011 there was a summer and winter capture period and 4,597 salmonids were tagged.



As well as monitoring fish, researchers are monitoring the instream habitat to see how it changes as a result of restoration actions. 2010 and 2011 saw the introduction of new technologies to measure habitat that provide more precise and accurate means to characterize stream morphology. Surveying tools known as total stations were used to collect data that can be used to create detailed topographic maps of the streambed, or Digital Elevation Maps (DEMs). With subsequent annual habitat monitoring, DEMs can be overlaid on each other and the data from the old DEM subtracted from the new DEM. This creates a DEM of Difference (DoD), which highlights specific habitat change, as in the illustration below where red in the DoD means erosion and blue indicates deposition. The use of DEMs provides a great deal of flexibility and the ability to answer a broad sweep of questions. This is a powerful tool that allows us to track habitat change over time and determine if restoration actions are having the desired effect and monitor their longevity.





**CASCADIA**  
CONSERVATION DISTRICT

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Postal Customer

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This report is intended to provide an update on the implementation of actions identified in the Entiat Watershed Plan.

The plan was created by the Entiat Watershed Planning Unit, whose mission is to voluntarily bring people together to improve communication, reduce conflicts, address problems, reach consensus, and implement actions to improve natural resource management on associated private and public lands in the Entiat River watershed.

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## PARTNERS

Bonneville Environmental  
Foundation

Bonneville Power Administration  
Chelan County Natural Resources  
Department

Chelan County Public Utility District  
Chelan-Douglas Land Trust

City of Entiat  
Entiat Irrigation District

GeoEngineers  
Integrated Status and Effectiveness  
Monitoring Program

National Oceanic and Atmospheric  
Administration - Fisheries

Priest Rapids Habitat Committee  
Rocky Reach HCP  
Tributary Committee

Salmon Recovery Funding Board  
Terraqua, Inc.

Upper Columbia Salmon  
Recovery Board

USDA - Forest Service, Entiat  
Ranger District  
USDA - Forest Service, Pacific  
Northwest Research Station

USDA - Natural Resources  
Conservation Service

USDI - Bureau of Land Management

USDI - Bureau of Reclamation

USDI - Fish and Wildlife Service,  
Mid-Columbia Fishery  
Resource Office

Washington Rivers Conservancy

Washington State Department of  
Ecology - Central Regional Office

Washington State Department of  
Fish and Wildlife - Region 2

Yakama Nation