



**In this Issue:**

<b>Habitat Restoration</b>	<b>1</b>
<b>Program Highlights</b>	<b>2</b>
<b>Meetings and Training</b>	<b>6</b>
<b>Report and Publications</b>	<b>7</b>
<b>Ongoing Projects</b>	<b>8</b>

## FWS Supporting Habitat Restoration in Abernathy Creek



Newly restored side channel at AFTC before and after becoming filled with water. USFWS

**Staff:**

**Administration & Facilities:**

Judy Gordon, Center Director  
 Patty Crandell, Deputy Center Director  
 Vince Bocci, Administrative Officer  
 Toni Scholder, Administrative Assistant  
 Mark Hack, IT Specialist  
 Scott Gronbach, Facilities Op Specialist  
 Jeff Poole, Water Treatment Plant Operator  
 Jim Lowell, Maintenance Worker

**Conservation Genetics:**

Christian Smith, Regional Geneticist  
 Pat DeHaan, Conservation Geneticist  
 Matt Smith, Conservation Geneticist  
 Jennifer Von Bargaen, Lab Geneticist  
 Brice Adams, Fish Geneticist

**Physiology & Nutrition:**

Kyle Hanson, Acting Regional Physiologist  
 Richard Glenn, Microbiologist  
 John Holmes, Fish Biologist  
 Ann Gannam, Regional Nutritionist  
 Ron Twibell, Fish Nutritionist  
 James Barron, Fish Biologist  
 Kelli Hawke, Biological Science Tech

**Quantitative Ecology & Technology:**

Doug Peterson, Senior Scientist  
 Ben Kennedy, Fish Ecologist  
 Will Simpson, Fish Ecologist  
 Kurt Steinke, Electronics Engineer

AFTC doesn't often get the opportunity to directly influence on-the-ground habitat restoration activities. However, this fall AFTC supported the Cowlitz Indian Tribe's restoration activities in Abernathy Creek. The Tribe restored a 600-foot historical side channel of the creek on AFTC property that had become filled with debris. The Tribe removed sand and rocks, restored access to the main channel of Abernathy Creek and strategically placed engineered log jams to create pools and resting areas. The restored channel will provide rearing habitat for coho, chinook and winter steelhead. The work was led by the Tribe, funded through the Lower Columbia Fish Recovery Board and WA State Recreation and Conservation Office with WA State Salmon Recovery Funding.

## Program Highlights....

### Physiology & Nutrition

As part of the Bonneville Power Administration (BPA) funded project "Natural reproductive success and demographic effects of hatchery-origin steelhead in Abernathy Creek, Washington", the 2014 production of 15,200 juvenile steelhead were moved from rearing tanks in the hatchery building to three raceways. All steelhead will receive coded wire tags and adipose fin clips prior to being released in the spring of 2015.

Trapping of returning adult salmon started on October 14th and will continue into June. Currently one hatchery-origin steelhead, one natural-origin chinook jack, one natural-origin chum salmon, 3 natural-origin cutthroat trout, and 236 coho salmon have been captured. The coho run has been made up of 180 natural-origin (63 females, 80 males, 37 jacks) and 56 hatchery-origin (9 females, 18 males, 29 jacks).



Steelhead

USFWS



Cutthroat Trout

USFWS

### Physiology & Nutrition cont....



Chinook

USFWS

For fish feed quality control, two feed samples were analyzed in September and five samples were analyzed in October. As part of the routine analyses, the feeds from the hatcheries were checked for rancidity and results were sent to the hatcheries and the feed mills.

Richard Glenn finished conducting ATPase assays on 217 gills samples collected from juvenile Chinook salmon at Carson NFH. Kyle Hanson analyzed plasma samples from the same fish to determine 11-ketotestosterone concentrations. This data will be used to determine if an alternative feeding regime can be used to minimize precocial maturation and mini-jack rates in Chinook salmon.

Richard Glenn finished conducting ATPase assays on 331 steelhead gill samples collected from the AFTC and the screwtrap on Abernathy Creek as part of an ongoing study of the BPA funded relative reproductive success of hatchery and wild steelhead in Abernathy Creek.

The second Lost River sucker (LRS) trial, which was designed to determine suitable lipid sources for LRS, concluded in September. A preliminary LRS diet trial report has been written and sent to the Klamath Falls FWO.

## Program Highlights cont....

### Physiology & Nutrition cont....

When checking for returning coho and steelhead, John Holmes found a chum female who had entered the holding pond. The last time this occurred was in 1990 when 76 females and 35 males originating from gravel boxes run by Washington Department of Fish & Wildlife (WDFW) were trapped.



Chum Female.

USFWS: J. Holmes

### Conservation Genetics

Jennifer Von Bargaen extracted RNA from 18 samples of liver tissue taken from Chinook salmon at Carson NFH. Expression of several genes was measured in these samples as part of a feeding study on this stock.

Matt Smith and Jennifer Von Bargaen worked with US Geological Survey (USGS) to evaluate single nucleotide polymorphism (SNP) markers for distinguishing among species of suckers in the Klamath Basin. Results of this work will be used to inform species recovery.

Brice Adams analyzed genetic samples from 1,500 Sacramento River Chinook salmon using 96 SNP markers. Results of this work will be used to evaluate natural populations of Chinook in the vicinity of Coleman NFH.

Christian Smith and Jennifer Von Bargaen visited Quilcene NFH during coho salmon spawning to provide hatchery staff with training in genetic sample collection.

### Conservation Genetics cont....

Pat DeHaan analyzed microsatellite data for 13 introduced populations of Oregon chub using correlation analyses and general linear models to explore how different introduction variables influence genetic diversity.



Oregon Chub

USFWS: P. DeHaan



Oregon Chub Habitat

USFWS: P. DeHaan

Brice Adams and Pat DeHaan updated the Clark Fork bull trout genetic baseline to include 200 samples collected in 2014, and the Lewis River bull trout baseline to include 122 samples collected in 2014.

Brice Adams and Pat DeHaan analyzed 64 bull trout from the Wallowa Lake and River system as part of a collaboration with PacifiCorp Energy and Columbia River FPO to evaluate the origin of the Wallowa population.

## Program Highlights cont....

### Quantitative Ecology & Technology

Staff from AFTC and volunteers from Mt. Hood Community College completed the annual electrofishing, tagging, and data collection of steelhead in Abernathy Creek as part of the BPA funded Abernathy Creek steelhead project.

Will Simpson and Kurt Steinke surveyed a dewatered Maxwell irrigation canal for stranded or killed fish using mobile passive integrated transponder (PIT) tag antennas. Maintenance was also performed on canal PIT tag systems that monitor real-time fish entrainment and screening. This work is part of a Bureau of Reclamation (BOR) funded study to determine the impacts of diversion canals on juvenile salmon migrating through the Umatilla River near Hermiston, OR.



Antenna array at the headgate of the Feed Canal, Umatilla River, OR  
USFWS: W. Simpson

Will Simpson and Kurt Steinke designed and constructed a test chamber and electrical delivery system designed to expose common carp eggs and embryos to a variety of electrical waveforms and field intensities. Any vulnerability of embryos to electrical shock will be used to explore potential methods of population control for invasive common carp in Malheur NWR.

### Quantitative Ecology & Technology cont....

Kurt Steinke and Ben Kennedy tested the performance of different antenna wires to detect different sizes and types of PIT tags using Biomark's new IS1001 reader.



Frame test antenna used to examine the performance of different wire types with the Biomark IS1001 PIT tag reader.  
USFWS: K. Steinke

*The Oregonian* ran a feature on Cascades Pika Watch, a citizen science project co-managed by Will Simpson, from AFTC, along with Shankar Shivappa and David Shepardson of the Oregon Zoo, and University of Utah graduate student Johanna Varner. Extirpation of pika from certain parts of their geographic range has been linked to climate change and might be related to their unique physiology. Monitoring pika distributions in the Cascade Mountains, and the Columbia River Gorge specifically is important because here pika inhabit warm sites at unusually low elevations. Pika, once voted North America's second cutest animal, can be easily observed in characteristic rockslide habitats during the day. As a result, pika is an ideal candidate for citizen scientist projects that connect people with nature. See the story at: [http://www.oregonlive.com/environment/index.ssf/2014/07/columbia\\_river\\_gorges\\_tiny\\_pik.html](http://www.oregonlive.com/environment/index.ssf/2014/07/columbia_river_gorges_tiny_pik.html)

### Administration & Facilities

Patty Crandell participated in the Fishery Resources Program's Conservation Propagation Program calls with other PLs. Judy Gordon assigned Framework testing to Ben Kennedy. Ben will be testing the Framework for Lake Ozette Sockeye with results to be discussed at the Hatchery Management Training (HMT).

Patty Crandell and Toni Scholder worked on the logistics, agenda, and speaker summaries for the 2014 HMT.

Patty Crandell, Kyle Hanson, and Doug Peterson met with Bill Gale (Mid-Columbia River FRO), Denise Hawkins (Washington FWO), Dan Magneson and Ron Wong (both from Quilcene NFH) to finalize the sensitivity and exposure sections of the NFH's climate change vulnerability assessment at Quilcene NFH.

Patty Crandell turned in the draft CY15 statement of work and budget for the Abernathy Creek Steelhead to BPA. Kyle Hanson completed the quarterly report for the 3<sup>rd</sup> quarter of 2014.

Scott Gronbach was deployed overseas as part of his duties as a Naval Reservist. We really look forward to having him back with us in FY15!

Cherokee General was on site as the contractor performing the work to restore the riprap around the footing of the bridge crossing Abernathy Creek.

### Administration & Facilities cont....

Judy Gordon, Jeff Poole, John Holmes, Kellie Hawke, and Patty Crandell attended an onsite meeting with contractor MWH to hear their presentation on options for replacing the current electric weir. Also in attendance were Larry Telles, Pacific RO Fisheries Program and John Seals from HQ.



## **Physiology & Nutrition:**

- Ann Gannam attended the International Symposium on Aquatic Animal Health in Portland, OR.
- Ron Twibell attended an extruder operations course offered by Wenger, an extruder manufacturer, at their technical center in Sabetha, KS.
- Kyle Hanson attended the Lower Columbia Estuary Partnership's Science Work Group meeting in to discuss the current regulations concerning the use of unmanned aerial systems for collecting environmental data.

## **Conservation Genetics:**

- Garrett McKinney, a post-doctoral researcher studying salmon genomics at University of Washington, visited AFTC to present results of his recent work on next-generation DNA sequence analysis and the Chinook salmon linkage map.
- Pat DeHaan completed Stepping Up To Leadership training at NCTC.

## **Quantitative Ecology & Technology:**

- Doug Peterson attended the 5<sup>th</sup> Annual Pacific Northwest Climate Science Conference in Seattle, WA.
- Doug Peterson and Kyle Hanson met with Sean Connolly, Rebecca Smith, and Ben Fell at the Pacific RO to discuss the re-design of AFTC's website.

## **Administration & Facilities:**

- Judy Gordon and Patty Crandell took part in the Fishery Resources Program's project leader calls.
- Vince Bocci provided the September Safety training on fire extinguishers and their uses.
- Judy Gordon provided the October Safety training on earthquake preparedness as part of the *Great Shakeout! Washington*.
- Judy Gordon participated in a meeting hosted by the RO on the use of the Washington State Disease Diagnostic Laboratory for the analysis of samples collected by the Pacific Region Fish Health Center staff.
- Judy Gordon participated in a Quilcene NFH Hatchery Evaluation Team (HET) meeting conference call.
- AFTC supervisors participated in the HQ hosted diversity webinar.
- Judy Gordon and Patty Crandell participated in an FTC conference call lead by Linda Andreasen, HQ.

## **Administration & Facilities cont...**

- Judy Gordon led a RO meeting to discuss the Pacific Region's Fishery Resources Program's participation in PBT. Also in attendance were Julie Collins, DARD, Rich Johnson, Fisheries Supervisor, Denise Hawkins, Washington FWO, Bill Gale, Mid-Columbia River FRO, Steve Haeseker, Columbia River FPO, Chris Peery, Idaho FRO, Christian Smith, AFTC and Patty Crandell, AFTC.
- Judy Gordon and Patty Crandell participated in a regional Project Leader conference call with the new Pacific Region ARD Roy Elicker..

## **Reports and Publications**

DeHaan, P., B. Adams, R. Tabor, D. Hawkins, and B. Thompson. 2014. Historical and contemporary forces shape genetic variation in the Olympic mudminnow (*Novumbra hubbsi*), an endemic fish from Washington State, USA. Conservation Genetics: DOI 10.1007/s10592-014-0627-7.

Smith, M., J. Von Bargen, D. Faber, and W. Wilson. 2014. Investigation of the Relative Reproductive Success of Hatchery and Wild Steelhead in the Deschutes River Basin. AFTC Final Report.

Von Bargen, J., and C. T. Smith. 2014. Genetic identification of endangered winter-run Chinook salmon in the Sacramento River, CA. AFTC Final Report.

Neville, H. M., and D. P. Peterson. 2014. Genetic monitoring of trout movement after culvert remediation: family matters. Canadian Journal of Fisheries and Aquatic Sciences 71(11):1680–1694.

Simpson, W. 2014. Cascades Pika Watch. Connecting People with Nature, Small Project Report. Submitted to USFWS, Portland, OR.

## Ongoing Projects....

Diet development for Lost River and short nose suckers in the Klamath River Basin (Klamath Falls FWO, California/Nevada FHC)

Effects of flow regime on juvenile coho salmon condition (Freshwater Institute, Fishery Resources Program via FONS)

Evaluation of steelhead reared in a reuse aquaculture system at Hagerman NFH (Hagerman NFH)

Fish Feed Quality Control (NFHs)

Climate change vulnerability of Pacific Region National Fish Hatcheries (Mid-Columbia River FRO, Fishery Resources Program)

Feed type comparison at Entiat NFH using summer Chinook salmon (Entiat NFH, Olympia FHC)

Relative reproductive success of hatchery and wild steelhead in the Deschutes River basin (Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game, Columbia River Intertribal Fish Commission).

Population genetic structure of Spalding's catchfly (Idaho FWO).

Genetic needs assessment for endangered Lost River and shortnose suckers of the Klamath River Basin (Klamath Falls FWO, US Geological Survey).

Genetic identification of endangered winter-run Chinook salmon in the Sacramento River, CA (Livingston Stone NFH, Red Bluff FWO, NOAA Fisheries).

Natural reproductive success and demographic effects of hatchery-origin steelhead in Abernathy Creek, WA (Bonneville Power Administration, Washington Department of Fish and Wildlife).

Genetic Species ID and Population Origin Analysis of Wallowa Lake and River Bull Trout (PacifiCorp Energy, Columbia River FPO).

Genetic Evaluation of Introduced Oregon Chub Populations Using the SHC Framework (Oregon Department of Fish & Wildlife).

Genetic profile of Makah NFH coho salmon broodstock updated (Makah NFH, Fishery Resources Program via FONS).

Genetic run assignment of juvenile Chinook Salmon from the American River (Sacramento FWO).

Entrainment and bypass of ESA-listed salmon in irrigation diversions in the Umatilla River (Bureau of Reclamation)

## Ongoing Projects....

Suppression of common carp in Malheur Lake using electrofishing to target eggs and embryos (Malheur NWR)

Strategic modeling of bull trout conservation actions in the lower Clark Fork River (Avista)

Antenna design for the Biomark IS1001 PIT tag reader (NOAA Fisheries)

Development of diets and rearing techniques for the culture of Pacific Lamprey (*Entosphenus tridentatus*) (Fishery Resources Program via FONS)