



# Abernathy Fish Technology Center Newsletter

Volume 8, Number 4 , July/August 2016



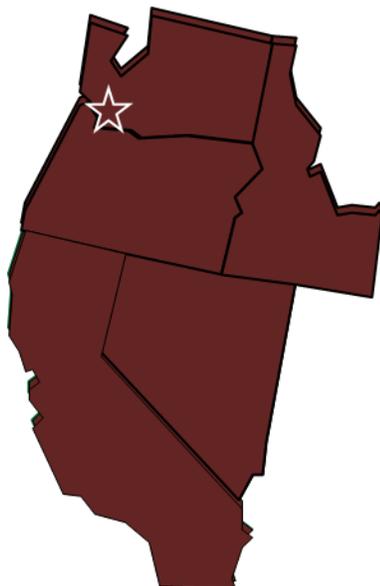
## In this issue:

AFTC Farewell	1
Program Highlights	3-6
Publications	4
Meetings & Conferences	5
Outreach	6
Ongoing Projects	7-8

## AFTC Bids Farewell



Left to right Michaela Brinkmeyer, Patrick DeHann, Kieslana Wing. Photo: AFTC



Serving the Pacific and Pacific Southwest Regions

AFTC lost experienced technical staff this summer with the transfer of geneticist Pat DeHaan to a position as Deputy at the Western WA FWCO, the resignation of genetics lab technician Michaela Brinkmeyer, and the end of contract for Kieslana Wing. Several people came to AFTC to see them off including Judy Gordon and Don Campton. Pat will was presented with three bound volumes of his scientific papers, a physical representation of his scientific contributions. He will be missed at AFTC, especially by the Conservation Genetics Program. Mikki and Kieslana left to pursue advanced degrees in the field of Genetics.

## AFTC Program Highlights

### Administration/Facilities

Youth Conservation Corps (YCC) workers from the Julia Butler Han-

sen Refuge helped to protect ponds at AFTC by planting wetland bushes and conifers for shade and spreading mulch. They learned about habitat restoration from Eli Asher, the Cowlitz Indian Tribe's restoration biologist



YCC group at AFTC. Photo: Steven Dyer



YCC group at AFTC. Photo: Steven Dyer

and attended a lunch seminar by Justin Bohling about his just published red wolf conservation work .

AFTC's bridge over Abernathy Creek was inspected this week, and the rip rap put in the creek a few years ago was found to be insufficient. A forthcoming report will recommend that the rip rap be extended. FAC facilities

## Staff:

### *Administration & Facilities*

Center Director, Vacant  
Patty Crandell, Acting Center Director  
Vince Bocci, Administrative Officer  
Steve Dyer, Administrative Assistant  
Mark Hack, IT Specialist  
Facilities Operations Specialist, Vacant  
Jeff Poole, Water Treatment Plant Operator  
Jim Lowell, Maintenance Worker

### *Conservation Genetics*

Christian Smith, Regional Geneticist  
Conservation Geneticist, Vacant  
Matt Smith, Conservation Geneticist  
Justin Bohling, Conservation Geneticist  
Jennifer Von Barga, Lab Geneticist  
Brice Adams, Conservation Geneticist  
Biological Science Technician, Vacant  
Ben M. Prom, Biological Science Technician

### *Physiology & Nutrition*

Kyle Hanson, Regional Physiologist  
Ann Gannam, Regional Nutritionist  
Richard Glenn, Microbiologist  
John Holmes, Fish Biologist  
Ron Twibell, Fish Nutritionist  
James Barron, Fish Biologist  
Kelli Hawke, Biological Science Technician  
Rachel Headley, SCA

### *Quantitative Ecology & Technology*

Doug Peterson, Senior Scientist  
Ben Kennedy, Fish Ecologist  
Will Simpson, Fish Ecologist  
Kurt Steinke, Electronics Engineer  
Margot Cumming, SCA  
Paul Kieras, SCA

## Program Highlights— continued

professionals are working with us to come up with a strategy for making sure our bridge stays whole, safe, and meets all requirements summarized in the inspection report.

Three interns were hired through Student Conservation Association (SCA) to support research in QET and Physiology/Nutrition. They are recent graduates in biology or fisheries from: Univ. Wisconsin-Madison, Univ. of Massachusetts-Amherst, and New Mexico State Univ. The interns started working in August and are completing paperwork and seeking suitable housing in Longview .

Doug Peterson and Mara Zimmerman Washington Department of Fish & Wildlife (WDFW) organized a workshop to exchange information with Abernathy Creek related partners. Participants included AFTC (Doug, Patty Crandell, Ron Twibell, and Brice Adams), staff from the fisheries management and research branches of WDFW, and staff from Lower Columbia Fish Recovery Board. The objective of the workshop was to exchange information on current fish and habitat research in the Mill, Abernathy, and Germany creek watersheds, increase efficiency in data sharing/collection efforts, and discuss future research and collaborations.

Ron Twibell presented preliminary lipid feed trial results for the Bonneville Power Administration (BPA) funded Abernathy Creek

steelhead project at the workshop.

### **Conservation Genetics**

Jennifer Von Barga, Mikki Brinkmeyer and Ben Prom completed weekly rapid-response genetic analysis events for three different projects aimed at recovering ESA-listed species. The first was working with Pacificorp to facilitate passage of bull trout in the Lewis River, WA, the second was working with Avista Power to facilitate passage of bull trout in the Clark Fork River, MT, and the third was working with Livingston Stone NFH to select broodstock for the Sacramento River Winter-Run Chinook salmon program.

Justin Bohling worked with the WDFW and the Columbia River Inter-Tribal Commission to analyze RAD sequencing data in bull trout. The objective of this work is to develop a range-wide panel of single nucleotide polymorphism markers to use in this species, which will be used by all three agencies to monitor this species.

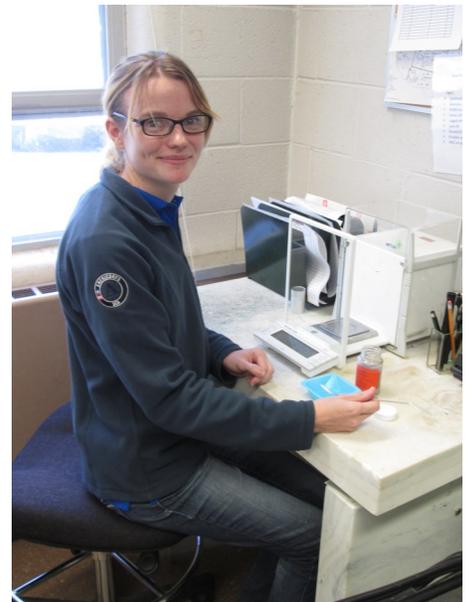
Brice Adams assisted biologists with Montana Fish, Wildlife and Parks, and the Montana ES Field Office to develop a study plan to evaluate passage and hybrid status of Bull Trout in Warm Springs Creek, MT.

Ben Prom and Jennifer Von Barga organized and began extraction of 260 bull trout as part of a project with the Mid-Columbia Fish and Wildlife Conservation Office (FWCO). The study examines the fine scale population structure of bull trout in the Licle Creek drainage as well as assign

the population of origin for bull trout entrained in the Leavenworth NFH water supply system.

Matt Smith provided information on coho salmon population structure in the Willamette River to our partners at NOAA Fisheries to help with species management.

Jennifer Von Barga visited the Northeast Fisheries Science Center in Lamar, PA. She received training on two new instruments (MiSeq and BioAnalyzer) and delivered a seminar to share some of the laboratory methods developed by staff at AFTC.



Racheal Headley. Photo: James Barron

### **Physiology & Nutrition**

Five feed samples were received from the hatcheries in August, for fish feed quality control (FFQC) 4th quarter sampling. As part of the routine analyses, feeds from the hatcheries were

## Program Highlights— continued

checked for rancidity. Ann Gannam wrote the feed memos which are sent to the hatchery and the feed mill.

Racheal Headley, a SCA intern, has started work at Abernathy helping in Physiology & Nutrition. Racheal has been learning the ropes, running FFQC samples and learning lamprey care. She will also lend a hand in the electrofishing. She recently completed a Bachelor's of Science in Biology at New Mexico State University after receiving an Associate's degree in Natural Resources from Eastern New Mexico University. Racheal comes to us from the USGS Co-op unit at New Mexico State University .

James Barron, Ron Twibell, Ann Gannam and Racheal completed the fish culture portion of the FONS project, "Rearing Larval Pacific Lamprey in Poly-culture using the Effluent from Tribal Hatcheries" this month. The project involved the poly-culture of lamprey and steelhead using the effluent

from cultured steelhead as a nutrient base for the lamprey. The hypothesis was that nutrients in the steelhead tanks' effluent could be used to supplement feed and nutrients for the lamprey and would be removed from the discharge in the hatchery effluent stream. Water quality testing was done as well as evaluation of the lamprey grown (lengths and weights) in the study. Proximate composition (protein, lipid, moisture and ash) as well as fatty acid composition of the fish will be assessed

Kyle Hanson participated in a project to develop a model to assess the vulnerability of 'constructed real property assets' on NWRs and NFHs R1 coordinated by Steve Suder, National Coordinator, Refuge Roads Program, and funded through USDOT. The project will mine the SAMMS database for records, apply data from climate change models to analyze hazards, and give each asset a vulnerability score.



Lamprey . Photo: James Barron



2016 Steelhead smolt. Photo: James Barron

### Publications

Twibell, G. R., J. M. Barron and A. L. Gannam. 2016. Evaluation of dietary lipid sources for the juvenile Lost River sucker. *North American Journal of Aquaculture* 78: 234-242.

Smith C.T., B. Adams B, M. Bartron, M.K. Burnham-Curtis, E. Monroe, J.B. Olsen, W.D. Wilson, A. Williams, M.J. Millard, M.A.H. Webb, and J.K. Wenburg. 2016. Comment on Haig et al. (2016): the conservation genetics juggling act: integrating genetics and ecology, science and policy. *Evolutionary Applications* 9: 635-637.

Bohling, J. H., J. Dellinger, J. M. McVey, D. T. Cobb, C. E. Moorman and L. P. Waits. 2016. Describing a developing hybrid zone between red wolves and coyotes in eastern North Carolina, USA. *Evolutionary Applications*, 9: 791-804.

Sağlam, İ. K., J. Baumsteiger, M. J. Smith, J. Linares-Casenave, A. L. Nichols, S. M. O'Rourke, and M.R. Miller, In press. Phylogenetic supports an ancient common origin of two scientific icons: Devils Hole and Devils Hole pupfish. *Molecular Ecology*.

## Program Highlights — continued

The effort may provide critical components for understanding specific asset vulnerability. FAC leadership



Kelli Hawke and Richard Glenn.  
Photo : AFTC

will be called upon to help select an appropriate pilot NFH.

Richard Glenn and Kelli Hawke ran gill ATPase assays to determine smolt status for spring Chinook recirculating aquaculture system (RAS) study . Kelli is a Bio Tech with fish culture expertise who is happy to assist with lab work when the need arises.

Richard Glenn is developing a proposal with Oregon Health and Science University (OHSU) for a USDA grant to: explore the effect of antibiotics on fish gut microflora, restore microflora after drug treatment, and determine a beneficial probiotic that can be used to reduce the use of antibiotics in fish.

### **Quantitative Ecology & Technology**

Will Simpson and Doug Peterson had meeting with collaborators in Bureau of Reclamation (BOR), NOAA Fisheries, and Confederated Tribes of Umatilla Indian Reservation (CTUIR). They discussed experimental design and PIT tag antenna placement for a study to measure entrainment of juvenile Pacific lamprey in the Umatilla River and decided to have AFTC construct and in-

stall an array upstream from Three Mill Falls dam.

Ben Kennedy participated in the Lower Columbia River Intensively Monitored Watershed's Technical Oversight Group with biologists from the Lower Columbia Fish Recovery Board, WDFW, Washington Department of Natural Resources (WDNR), the Cowlitz Indian Tribe, and a private consultant. They reviewed conceptual designs for a proposed culvert replacement in Abernathy Creek to increase fish passage and continued progress on an updated habitat treatment plan for Abernathy Creek.

Since 2005 AFTC has been helping BOR to evaluate the impact of irrigation diversions (Feed and Maxwell Canals) as part of BOR's terms of their BiOp using PIT tag monitoring technology. The assessment has provided a lot of information to BOR concerning

### **Meetings and Conferences**

Ron Twibell, James Barron and Ann Gannam prepared for the nutrition and fish health workshops presented August 16-17 at Coleman NFH and the FWS Reno Office.

Christian Smith participated in the monthly FWS Nevada FWO Genetics Community of Practice teleconferences.

Justin Bohling delivered a lunch-time seminar presentation of his recently published paper on red wolf x coyote hybridization to AFTC staff and a group of Youth Conservation Corps volunteers.

Justin Bohling represented AFTC at the Quilcene NFH co-manager meeting. While there he worked with staff from the WWFWCO to develop a genetic sampling plan for coho salmon spawning this fall.

Brice Adams and Christian Smith participated in the interagency Aquatic Implementation Team (AIT) Meeting between federal, state, tribal, and private sector partners interested in conserving bull trout and cutthroat trout in the Clark Fork River, MT.

Doug Peterson and Brice Adams attended the *Salvelinus confluentus* Curiosity Society meeting in Sula, MT.

Christian Smith and Brice Adams participated in a meeting at the Pacific RO with ES and a group of visiting scientists from the Republic of Korea

## Program Highlights — continued

the timing and extent of entrainment and ability of salmon to navigate through bypass channels, but the BiOp has expired and the project will be dramatically scaled back or ended next year. One AFTC term employee has been supported by this project for seven years.

Will Simpson completed the second draft of a manuscript on the use of electricity to reduce recruitment of common carp in Lake Malheur.

Kurt Steinke tested the performance of a figure-8-shaped PIT tag antenna relative to different levels of ambient electrical noise. This was the final in a series of tests with differently-shaped antennas. The objective was to determine the best antenna shape for when the antenna installation site is close to a source of electrical noise, such as a power line or building.

Surveys to PIT tag and estimate population size of juvenile steelhead salmon in Abernathy Creek began and will continue through September. This component of the BPA-funded steelhead reproductive success study focuses on interactions between and behavior of wild and hatchery steelhead.

The antenna cables from the PIT tag array at the mouth of

Abernathy Creek were stolen and the theft was reported to the Cowlitz County Sheriff's Department. The antenna array was removed for the season.

Doug Peterson was invited by the Laos government to participate in and give a presentation at the Lower Mekong Fish Passage scheduled for November 2016, in Laos. He is in the process of requesting approval for international travel.

### Outreach

Kyle Hanson is working with Longview Parks and Rec to provide presenters from AFTC for summer youth programs. The theme is wildlife and conservation.

Ann Gannam and Kelli Hawke set up the AFTC booth at the Cowlitz Co. Fair. Information provided will inform the public about FWS' mission.



Paul Kieras, SCA, E-fishing. Photo: Doug Peterson



Margot Cumming, SCA, E-fishing. Photo: Doug Peterson



Part of eDNA sampling apparatus for the Bitterroot River basin bull trout. Photo: Doug Peterson

# Ongoing Projects

**Water Velocity Effects on Salmon as Reared in Recirculating Systems.** *Management Need:* Determine the effects of water velocity on composition, growth, condition, and performance of juvenile PNW salmon as applied to recirculating systems in support of hatcheries in the Pacific Region considering the use of recirculating systems. *Partners:* Pacific Region National Fish Hatcheries, Fishery Resources Program via Fisheries Operations and Need System (FONS).

**Diet development for Lost River and short nose suckers in the Klamath River Basin.** *Management Need:* Determine dietary needs of listed populations to assist in recovery. *Partners:* Klamath Tribes, Klamath Falls FWO, California/Nevada FHC.

**Development of diets and rearing techniques for the culture of Pacific lamprey, *Entosphenus tridentatus*.** *Management Need:* Assist Tribal partners in developing methods for the artificial propagation of Pacific lamprey, a species of concern. *Partners:* Yakama Nation; Fishery Resources Program via FONS.

**Assessing the effects of multiple tagging methods on Pacific lamprey ammocoetes.** *Management Need:* Assist Tribal partners in developing methods for the monitoring and evaluation of this species of concern. *Partners:* Yakama Nation; Fishery Resources Program via FONS.

**The physiological response of white sturgeon to handling stress in captivity.** *Management Need:* Determine if the stress from catch and release angling is detrimental to survival of white sturgeon, a species of concern. *Partners:* Dalhousie University; Carleton University.

**Pacific Region's Fish Feed Quality Control (FFQC) Program.** *Management Need:* The FFQC Program, the only one of its kind in the FWS, provides quarterly monitoring of the quality of the commercially produced fish feeds used at Pacific and Pacific Southwest Regions' NFHs. Information is compiled on an annual basis and used in the development of the Pacific Region fish feed contract. *Partners:* Pacific and Pacific Southwest Region's NFHs, Oregon, Washington, Idaho, and Tribal fish hatcheries.

**Effects of dietary lipid source and ultraviolet radiation on sunburn and steatitis in Steelhead, *Oncorhynchus mykiss*.** *Management Need:* Provide information regarding the potential relationship between fish nutrition and sunburn in steelhead. *Partners:* Pacific Region National Fish Hatcheries

**Evaluation of thermal exposure of adult Chinook salmon during the migration to Warm Springs National Fish Hatchery.** *Management Need:* Determine if Chinook salmon migrating to

Warm Springs National Fish Hatchery experience thermal stress. *Partners:* Warm Springs National Fish Hatchery, Lower Columbia Fish Health Center, Confederated Tribes of Warm Springs.

**Natural reproductive success and demographic effects of hatchery-origin steelhead in Abernathy Creek, WA.** *Management Need:* Provide information to help managers minimize differences between NOR and HOR fish. *Partners:* Bonneville Power Administration; Washington Department of Fish and Wildlife.

**Climate change vulnerability assessments of Pacific Region National Fish Hatcheries.** *Management Need:* An understanding of the anticipated habitat changes under different climate change scenarios provides managers with information to proactively respond to these conditions and their impact on NFHs. *Partners:* Pacific Region NFHs; Mid-Columbia River FRO; Fishery Resources Program via FONS.

**Fish Suppression of common carp in Malheur Lake using electrofishing to target eggs and embryos.** *Management Need:* Determine the feasibility of using electrofishing to kill eggs and embryos for control of invasive common carp in Malheur Lake. *Partner:* Malheur NWR.

**Antenna design for the Biomark IS1001 PIT tag reader.** *Management Need:* Provide expert level engineering and technical assistance to partners monitoring species of interest using new technologies while reducing biologist time spent in design and troubleshooting. *Partners:* NOAA Fisheries, USFWS Green Bay.

**Entrainment and bypass of ESA-listed salmon at irrigation diversions on the Umatilla River.** *Management need:* Determine what environmental factors influence the magnitude of fish entrainment into irrigation canals and if captured fish are successfully screened and returned to the Umatilla River using PIT tag technology. *Partner:* Bureau of Reclamation

**Aquatic organism passage (AOP) at remediated stream road crossings.** *Management Need:* Assess the efficacy of genetic, direct capture, and remote sensing methods to verify fish passage through remediated culverts. *Partners:* US Forest Service, Trout Unlimited.

**Mekong River fish ecology and sustainable development.** *Management Need:* Assess the scientific capacity and data needs for resource managers in Laos and Cambodia to address hydroelectric development on the main stem Mekong River. *Partners:* USGS, US DOI International Technical Assistance Program (ITAP)

# Ongoing Projects—continued

**Effectiveness of transitioning to a locally-sourced steelhead broodstock at Winthrop National Fish Hatchery.** *Management Need:* Determine if hatchery improvement programs and actions are achieving the expected biological performance objectives. *Partners:* USFWS Mid-Columbia WW and NOAA Fisheries.

**Stress response of juvenile steelhead salmon to electrofishing and tagging under different thermal regimes.** *Management need:* To understand how fish respond to capture and handling under conditions experienced in late summer. *Partners:* USFWS Directorate Fellows Program.

**Evaluation of the spatial and temporal distribution of juvenile Chinook Salmon in the Entiat River.** *Management Need:* Use genetic data to improve our understanding of the distribution of spring and summer run Chinook Salmon juveniles and thus improve our ability to prioritize restoration projects targeting spring Chinook Salmon recovery. *Partners:* USFWS Mid-Columbia FWCO

**Design and installation of a PIT tag array to monitor outmigration of juvenile Pacific lamprey in the Umatilla River.** *Management need:* Determine entrainment rates of juvenile lamprey as they move downstream through the Umatilla River. *Partners:* NOAA-Fisheries, US Bureau of Reclamation

**Rapid response genetic analysis of threatened bull trout collected below dams in the Clark Fork River, MT.** *Management Need:* Provide data to inform upstream fish passage decisions for listed bull trout. *Partners:* Avista Corporation; Confederated Salish Kootenai Tribes; Idaho Fish and Game; Kalispel Tribe of Indians; Montana Fish Wildlife & Parks; Montana Ecological Services Field Office; Pend Oreille Public Utility District; Pennsylvania Power & Light, MT.

**Genetic identification of endangered winter-run Chinook salmon in the Sacramento River, CA.** *Management Need:* Rapid response broodstock identification for spawning of listed species. *Partners:* Livingston Stone NFH; Red Bluff FWO; NOAA Fisheries.

**Genetic analysis of bull trout in the Lewis River system.** *Management Need:* Facilitate passage of bull trout past hydroelectric facilities. *Partners:* Washington FWO, Columbia River FPO, PacifiCorp, US Forest Service, Washington Department of Fish and Wildlife.

**Relative reproductive success of hatchery and wild steelhead in the Deschutes River basin.** *Management Need:* Develop genetic markers to monitor genetic diversity of listed populations. *Partners:* Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game, Columbia River Intertribal Fish Commission.

**Genetic needs assessment for endangered Lost River and short nose suckers of the Klamath River Basin, OR.** *Manage-*

*ment Need:* Develop genetic markers to monitor genetic diversity of listed populations. *Partners:* Klamath Falls FWO; U.S. Geological Survey.

**Genetic profiles of broodstock at Pacific Region National Fish Hatcheries.** *Management Need:* Determine impacts of hatchery origin fish (HOR) on naturally occurring fish (NOR) and monitor the effects of aquaculture practices on HOR populations. *Partners:* Pacific Region NFHs; Fishery Resources Program via FONS.

**Genetic run assignment of juvenile Chinook salmon from the American River.** *Management Need:* Assess accuracy of length-at-date method for distinguishing Spring run (ESA listed) from Fall run (unlisted) Chinook salmon smolts. *Partner:* Pacific Southwest Regional Office.

