



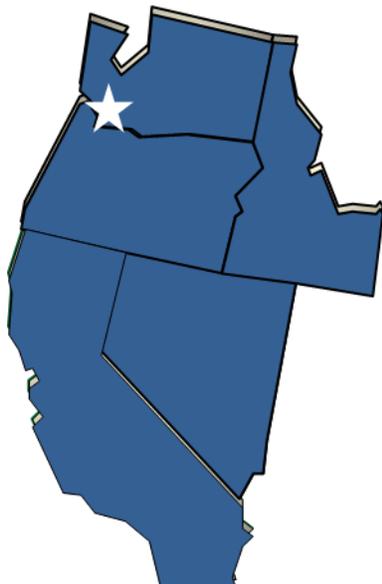
In this issue:

2015 HMT	1-2
Outreach	3
Program Highlights	4-5
Publications	6
Meetings & Conferences	7
Ongoing Projects	8
New Face	9

2015 Hatchery Management Training



Anna King, Richland Correspondent, NW News Network.
Photo:FWS



The annual 2015 Hatchery Management Training (HMT) was held once again in Richland, WA. Over 65 FWS employees attended including five from the Pacific Southwest Region. Ten AFTC staff attended; Steve Dyer managed the electronic presentations and Patty Crandell was moderator. The objective of this annual training is to provide information relating to hatchery and aquatic resource management as well as EEO and management training adapted to the needs of Fisheries managers. Registration for the training was made available through DOI Learn. The EEO Diversity Training titled, *Daughters of Hanford: Spotlighting Women’s Work to Clean up Our Nuclear Legacy* was very well received. Anna Lin King from Northwest News Network and Zelma Maine-Jackson, a Hydro Geologist with the Washington State Department of Ecology, Nuclear Waste Program, spoke about the role of women and Hanford,

2015 Hatchery Management Training—continued

the massive nuclear reservation in southeast Washington. A full day of training on the topic of *Preparing for Climate Change Emergencies* involved all NFH, FRO, FHC, RO, and AFTC staff. In the morning, each facility manager was given time to describe the impact of climate over the past year on their particular hatchery, office, or center, and Bob Clarke, ARD—FAC, presented information about climate issues from the Pacific Southwest Region. Panels from three of this year’s most impacted facilities, Warm Springs, Makah, and Leavenworth NFHs were given more time to discuss the process they went through to deal with water and temperature related climate emergencies. Later, Doug Peterson presented *A Gentle Introduction to Decision Analysis* and attendees were divided into groups. Each group was given a climate related emergency scenario for a particular NFH and asked to answer set questions to help begin a decision process. On the last day, Nate Mantua from NOAA’s Southwest Fisheries Science Center in Santa Cruz presented information about



Hanford Reach Museum, Richland, WA. Photo: FWS

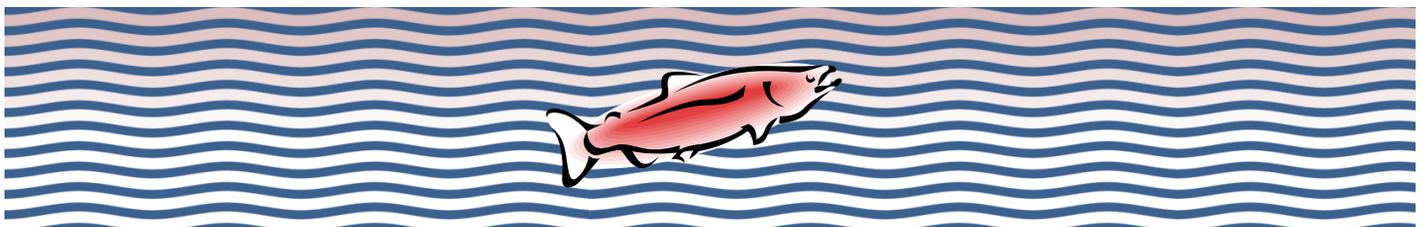
climates, *The Blob*, *Current Ocean Conditions*, *Climate Change*, and *Expectations of the Future*. Dave Clark and Robert Gregori from HR kept everyone’s attention by providing training on *Working Effectively with HR and Retirement*.



Zelma Maine-Jackson, Hydro Geologist. Photo: FWS



Housing at Hanford. Photo :Hanford Reach Museum.



Outreach

Kurt Steinke, Electronics Engineer, visited Cedar River Montessori School in Renton, WA. The school raises and releases some coho salmon every year, and every third year they present a program studying salmon. This was a “third year” and he presented to fifteen 3rd to 6th grade students and 18 preschool students. He covered the five species of salmon in the Pacific Northwest, their characteristics, ranges, migrations, and life cycles. He covered coded-wire tagging and PIT tags, and mentioned acoustic tracking, sonar, and radio tags. He discussed the reasons for tagging as well as the advantages and disadvantages of the different tagging/tracking methods. He took several keychain “fish” with PIT tags that Biomark provided and a PIT tag reader. Playing “Find The Fish” with the tags and reader was an enormous hit! He left them electronic copies of the materials and the tagged keychain “fish”.



Kurt Steinke Cedar River Montessori School. Photo: Kendra Peterson Facebook page.

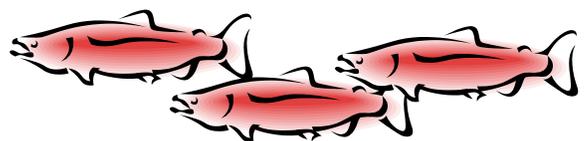
In appreciation Rebecca Smith, Teacher, Cedar River Montessori School, sent the following letter.

“Your presentation was a huge hit! You had something for the animal lovers and technology lovers alike. We have had the opportunity to discuss much of the information you shared with us Friday afternoon and again this week and it’s been great. Your knowledge and point of view really broadened our



School Kids playing Find the Fish. Photo: Kendra Peterson’s Facebook page.

understanding of the whole salmon story. I am so thankful for all the pictures, maps, and written info you left as well. Not only have we added it to our salmon life cycle/migration box for future years but it has been used heavily by kids doing research. The kids who were researching and writing reports on some of the subjects you touched upon spent time Friday afternoon and Monday revising parts of their reports too. They did it confidently and independently and showed me their revisions proudly. That is a very good sign that they were excited about the new information and had listened carefully. Your work is not only fascinating in its own right but it gives the kids a better understanding of how and why scientists use technology and of professions that are new to the kids and not stereotyped. That kind of learning is more rare than I wish it was!”

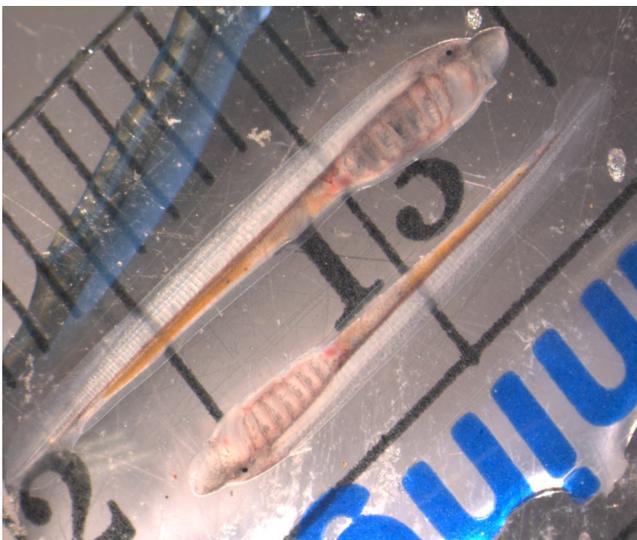


AFTC Program Highlights

Physiology & Nutrition

For the Fish Feed Quality Control Program 2015 4th quarter sampling 17 feeds were received from the hatcheries in September. An additional two feeds were received in October for the start of the 2016 1st quarter sampling. As part of the routine analyses, all feeds from the NFHs were checked for rancidity. Additional feeds from two of the NFHs were analyzed due to concerns about rancidity. Ann Gannam wrote the feed memos which were sent to the NFHs and the feed mills. Ann Gannam and Ron Twibell also provided assistance to the Northwest Indian Fish Commission Fish Health Program concerning a possible nutritional issue with a feed at one of the Nisqually Tribal hatcheries.

The Lost River Sucker diet study concluded in October. James Barron, Ron Twibell, and Ann Gannam conducted the final sampling for fish sizes, skeletal deformities, and histological biopsies. Ron Twibell is in the process of analyzing suckers for proximate composition and fatty acid profiles. Genetic samples were also taken by Brice Adams and Jennifer Von Bargaen.



Pacific lamprey. Photo: James Barron

Staff:

Administration & Facilities

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

Conservation Genetics

Christian Smith, Regional Geneticist & Program Head
Pat DeHaan, Conservation Geneticist
Matt Smith, Conservation Geneticist
Justin Bohling, Conservation Geneticist
Jennifer Von Bargaen, Lab Geneticist
Brice Adams, Conservation Geneticist
Mikki Brinkmeyer, Biological Science Technician

Physiology & Nutrition

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

Quantitative Ecology & Technology

Doug Peterson, Senior Scientist & Program Head
Ben Kennedy, Fish Ecologist
Will Simpson, Fish Ecologist
Kurt Steinke, Electronics Engineer
Kieslana Wing, Contractor

AFTC Program Highlights— continued

James Barron and Kyle Hanson completed sampling for the lamprey tagging study. Ammocoetes were tagged with either coded wire tags, visual implant elastomer, or PIT tags and monitored for four months. At the end of the study, survival, growth, and behavioral impacts to swimming and burrowing were measured.

James Barron has been caring for the Pacific lamprey that are being held for the Chelan PUD project. Lampreys were moved into more tanks to reduce the number of fish in each tank and provide more growing space.

Ron Twibell finished analyzing steelhead from the BPA and steatitis studies for proximate composition and fatty acid profiles. Kieslana Wing has been lending a helping hand and is doing a great job in the laboratory.

Richard Glenn completed analysis of gill biopsies from steelhead captured as part of the Abernathy Creek steelhead study. Gill samples were collected from fish during hatchery rearing, at release, and during migration out of Abernathy Creek.

Conservation Genetics

Jennifer Von Bargaen, Mikki Brinkmeyer and Brice Adams extracted DNA from 1,200 Abernathy Creek steelhead, and analyzed all with a suite of microsatellite loci as part of an ecological genetics study of differences between hatchery-origin and natural-origin fishes.

Brice Adams and Justin Bohling assisted the Western Washington

Fisheries Division with sampling during coho salmon spawning at Quilcene NFH.

Christian Smith, Justin Bohling and



Brice Adams at Makah NFH. Photo: FWS



Justin Bohling at Makah NFH. Photo: FWS

Mikki Brinkmeyer assisted the Quantitative Ecology & Technology program with electrofishing in Abernathy Creek.

Quantitative Ecology & Technology

Will Simpson, Ben Kennedy, and Kurt Steinke performed maintenance on fixed PIT tag arrays in Umatilla River irrigation canals that monitor real-time fish entrainment and screening. They also successfully deployed a newly constructed mobile PIT detec-

tion system used to survey recently dewatered irrigation canal for stranded or dead fish. The system incorporates the newest generation PIT tag readers from Biomark, and they observed triple the number of pit tags usually detected in the canal. This work is part of a Bureau of Reclamation (BOR) funded study to determine the impacts of diversion canals on juvenile steelhead migrating through the Umatilla River near Hermiston, OR.

Field sampling in Abernathy Creek for the BPA-funded study on relative reproductive success of hatchery and wild steelhead was completed in mid-September, following a late start because of high water temperatures. Juvenile steelhead were comparatively more abundant in 2015 than in the previous few years, and we PIT-tagged approximately 1,800 individuals. Movement and out-migration of these fish will be monitored by fixed antenna arrays operated annually or seasonally in Abernathy Creek. Genetic samples from these fish will be used to establish wild or hatchery parentage. The stationary PIT-tag antenna array under the bridge at AFTC was more firmly secured to the streambed in preparation for withstanding high flows and impacts from debris during winter storms. Facilities staff assisted in this effort by custom welding stream anchors. The

Program Highlights— continued

stationary antenna array near the mouth of Abernathy Creek AB3) was operated longer this year to help WDFW detect movement of yearling coho out of the creek during fall; the AB3 antennas were finally removed at the end of October.

Ben Kennedy, Chris Tatar (NOAA-Fisheries) and co-authors submitted a manuscript to the *Canadian Journal of Fisheries and Aquatic Sciences* that described results from a study of downstream migration survival of forced and volitionally-released steelhead from Winthrop NFH.

Joelle Blais, Directorate Resource Fellow, with assistance from Doug Peterson, Ben Kennedy, and Kyle Hanson conducted an experiment to test the effects of temperature, electrofishing, and tagging on juvenile steelhead salmon. Juvenile steelhead were held in water at three different temperatures – ambient creek water and treatments approximately 2°C and 4°C warmer than ambient creek water – then exposed to two different treatments (electrofishing, electrofishing and tagging) and a control (sham electrofishing). The stress hormones glucose and lactate were measured at two time periods following treatments. Joelle will use the data from this study for her senior capstone project at the University of Washington.



Joelle Blais measuring juvenile steelhead blood hormone levels. Photo: FWS



Exposing juvenile steelhead to stresses from electrofishing. Left: Ben Kennedy Right: Joelle Blais. Photo: FWS



Water heating and mixing tanks. Photo: FWS

Administration

Judy Gordon continued her participation in the Fish Health Reorganization Workgroup's efforts to review information and assist Regional FAC leadership in reaching a decision on moving the Pacific Region's Fish Health Program forward.

Judy Gordon participated in a Fish Technology Center project leader conference call to discuss the agenda for the upcoming ARD/FTC/FHC combined visioning meeting in LaCrosse, WI.

Patty Crandell and Kyle Hanson completed the draft statement of work and budget for the 2016 Bonneville Power Administration (BPA) funded Abernathy Creek steelhead project and engaged in discussions with BPA staff about supplementary paperwork.

John Patterson, Program Support Manager for the Employer Partnership of the Armed Forces presented AFTC with the Seven Seals Award for its support of the men and women serving in the National Guard and Reserves.

Facilities

Some of the noteworthy accomplishments include Jim Lowell installing a roof onto the electrical outpost near the bridge, the installation of hundreds of LED

Report

Von Bargen, J., and C. T. Smith. 2015. Genetic identification of endangered winter-run Chinook salmon in the Sacramento River, CA. AFTC Final Report FY2015

Program Highlights — continued



Left to right: Scott Gronbach, Judy Gordon, John Patterson, Employer Support for the National Guard and Reserves. Photo: FWS.

lights, upgrading each of air compression systems with water removal safety valves, and removing the sediment load at the intake structure.

Jeff Poole located a faulty electrical line which controls the Domestic Water Reservoir pumps, cleaned the flowmeters in the raceways, replaced the entrance hatch on the Reservoir Tank, and upgraded the procedures for Lockout-Tagout within the Extruder Room.

The Main Office and the Middle House both received much needed roof and window replacements. The new windows will assist in energy savings.

AFTC received its five-year Safety Inspection from the Regional Safety Office resulting in a passing grade but with several areas for improvement. Most of the infractions have been mitigated and the remaining issues have received target completion dates.

Jeff Poole and Jim Lowell continue their efforts to address deficiencies in AFTC's alarm system.

Eight personnel completed their annual Hearing Conservation Program testing.

After providing training on the Respiratory Protection Pro-

gram to all personnel in September, AFTC successfully reinstated the Station's Respiratory Protection Program.



Electrical outpost near Bridge. Photo: FWS.



New roof and windows for the Main Office. Photo: FWS.

Meetings and Conferences

- Judy Gordon and Patty Crandell took part in the monthly Pacific Region, Fisheries Program's project leader calls. Meeting 1 topics included: Warm Springs NFH fish relocation to Little White NFH, Fish health news for Klickitat, Deschutes, Willamette, Columbia, and White Salmon rivers, Drano Lake, vacant positions (Makah, Warm Springs, Gorge Complex, Chief of Fisheries etc., American Fisheries Society meeting, and monarch butterflies and pollinators program
- Justing Bohling and Christian Smith participated in a teleconference between Bureau of Reclamation, NOAA Fisheries, and a representative of the Winnemem Wintu Tribe to provide technical advise on a possible investigation of the genetic origins of Chinook salmon in New Zealand.
- Doug Peterson met with Jason Dunham (USGS - Corvallis), Joe Benjamin (USGS - Boise), and Chris Allen (FWS - Oregon FWO) to discuss ongoing and future decision modeling to promote conservation and recovery of bull trout. Meeting in July.
- The Physiology and Nutrition Program hosted a brown bag seminar with an invited speaker from NOAA, Dr. Ron Johnson, on October 21st. His talk was titled: "Alternative Feeds Research at the National Oceanic and Atmospheric Administration (NOAA)".
- Ten personnel from AFTC attended the Hatchery Manager's Training in Richland, WA, on October 27th-29th.
- Doug Peterson gave a presentation on his trip to Laos.

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 the 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.

Development of genetic markers associated with smoltification in steelhead and salmon. *Management Need:* Identify genetic markers associated with downstream migration to provide managers with information to proactively manage early onset smolting levels. *Partners:* 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 re-

Ongoing Projects—continued

ducing biologist time spent in design and troubleshooting. Partner: NOAA Fisheries, USFWS Green Bay.

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

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 mainstem Mekong River. Partners: USGS, US DOI International Technical Assistance Program (ITAP)

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 FRO 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 FRO

New Face at AFTC



Justin Bohling is a new conservation geneticist at AFTC. He has been involved in research concerning fish and wildlife biology and conservation throughout the US and internationally. In 2007 he received his BS in conservation biology from the SUNY College of Environmental Science and Forestry, NY. After graduating he served as an intern at the International Wolf Center in Ely, MN and then entered graduate school at the University of Idaho. He conducted research concerning the conservation of the endangered red wolf for his PhD and received his degree in 2011. Afterwards he conducted research at Disney's Animal Kingdom and Penn State University. Before coming to AFTC he was a postdoctoral research assistant at the Universite de Montpellier in France and conducted research on the impacts of fish stocking on native brown trout populations. Outside of work, he enjoys traveling, fishing, hiking, spending time outdoors.

