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**Director's Greeting...**

In 1871, Congress created the U. S. Fish Commission which would ultimately lead to the creation of the U. S. Fish and Wildlife Service and its Fisheries and Habitat Conservation Program. Today the FWS continues its role in stepping up to face the challenges impacting our aquatic resources nationwide. Now 140 years later, we here at Abernathy Fish Technology Center are pleased to be a part of this proud tradition.

**Staff:**

**Administration:**

Judy Gordon, Center Director  
Patty Crandell, Deputy Center Director  
Vince Bocci, Administrative Officer  
Toni Scholder, Administrative Assistant  
Mark Hack, IT Specialist  
Jim Lowell, Maintenance Worker  
John Holmes, Fish Biologist  
Jeff McLaren, Biological Technician  
Scott Gronbach, Facilities Op Specialist

**Nutrition:**

Ann Gannam, Regional Nutritionist  
Ron Twibell, Fish Nutritionist  
Jeff Poole, Extruder Operator  
Nathan Hyde, Biological Technician  
Heidi Lewis, Fish Nutritionist  
James Barron, SCEP Employee

**Conservation Genetics:**

Denise Hawkins, Regional Geneticist  
Christian Smith, Conservation Geneticist  
Pat DeHaan, Conservation Geneticist  
Brice Adams, Biological Technician  
Molly McGlaufflin, Fish Geneticist  
Matt Smith, Fish Geneticist  
Jennifer Von Bargaen, Lab Geneticist

**Ecological Physiology:**

Ken Ostrand, Regional Eco-Physiologist  
Kyle Hanson, Fish Physiologist  
Ben Kennedy, Fish Ecologist  
Richard Glenn, Microbiologist  
Will Simpson, Fish Ecologist  
Kurt Steinke, Electronics Engineer  
Jerone Anderson, Electronics Technician  
James Samagaio, Biological Technician  
Ashley McNamee, STEP Employee

**Modeling and Management Decision:**

Doug Peterson, Senior Scientist

## New ARD Visits AFTC



USFWS: Michael Carrier

The new Pacific Region Assistant Regional Director (ARD) for Fishery Resources, Michael Carrier, visited AFTC on Friday June 10, 2011. He was given a tour of the facility and had an opportunity to meet with each of the Applied Research Programs. Many Program staff had the opportunity to speak one on one with our new ARD. He enjoyed the warm welcome and was impressed by the dedication and professionalism of the staff. We look forward to working with him.

## ***Program Highlights....***

### **Nutrition**

Nutrition laboratory work that is ongoing includes analysis of sturgeon for the U.S. Geological Survey (USGS) Columbia River Research Laboratory (CRRl) to determine lipid content of the fish held at different water temperatures; Gila trout whole body proximate composition (protein, lipid, moisture and ash) for the phosphorus requirement study done at Mora NFH and TC; analysis of steelhead from the egg analog study for proximate composition; and analysis of steelhead from the phosphorus/alternative lipid study for fatty acid composition.

Heidi Lewis presented a brown bag seminar "Fish are what they eat but, what food should they resemble?" about her recent work at Southern Illinois University concerning lipid nutrition in hybrid striped bass.

James Barron, as part of his Student Career Employment Program (SCEP) experience, worked with the Columbia River FPO (CRFPO) at the Julia Butler Hansen Refuge for the Columbian White-tailed Deer inventorying fish species to determine usage in improved aquatic habitat on the refuge.

The phosphorus and proximate composition of the Gila trout from the study with the Mora NFH and TC was completed by Nathan Hyde and Ron Twibell.

James Barron, SCEP student, returned to school (University of Idaho) this month to finish his degree work and graduate. He will return to work at AFTC in October. He completed a draft report on the egg analog research study before leaving.

### **Conservation Genetics**

Conservation Genetics staff spent a day in the lab preparing sample collection kits for distribution to our partners and collaborators. Bring on the fin clips!

Rapid response season is in full swing in the Conservation Genetics Program with Brice Adams and Jennifer Von Barga producing genetic population and run-type assignments for Clark Fork River, ID bull trout; Hood River, OR steelhead; and Sacramento River, CA Chinook. Results are provided to our partners generally within 6 hours after receipt of the samples.

Samples from the FWS Pacific Region genetic sample repository were provided to our partners at NOAA Fisheries for an analysis of population structure in Chinook salmon, and to the Columbia River Inter-Tribal Fish Commission for a study of historical introgression among Chinook salmon lineages.

Christian Smith completed Role-Based Security Training, which will allow the Applied Program in Conservation Genetics to use IT resources to increase the efficiency of genetic analyses.

Matt Smith gave a brown bag seminar for AFTC staff titled: "Genetics provide historical sockeye salmon harvest compositions in Bristol Bay, AK", detailing the results of his Master's work at University of Washington.

Pat DeHaan attended a course titled: "Markov Chain Monte Carlo for Genetics at the Summer Institute in Statistical Genetics" at the University of Washington.

## Program Highlights cont....

### Conservation Genetics cont....

Denise Hawkins participated with Pacific and Mountain Prarie Regional Aquatic Invasive Species Coordinators Paul Heimowitz and Joanne Grady, and Adam Sepulveda and Andrew Ray (USGS, Northern Rocky Mountain Science Center) in a conference call to discuss newly proposed work on New Zealand mudsnail (aquatic invasive) and bull trout (Endangered Species Act threatened species) using eDNA (environmental DNA) technology.



New Zealand mud snail with a dime as a size reference.

USGS



Raceways at Quilcene NFH.

USFWS

Patterns of genetic variation in coho salmon raised at this NFH are helping us understand the importance of incorporating precocious males ("jacks") in hatchery broodstocks.

### Ecological Physiology

Kyle Hanson, Richard Glenn, and Ashley McNamee completed analysis of egg and blood samples from adult steelhead returning to AFTC as part of a project looking at the effects of handling stress on female salmon in culture facilities.

Kyle Hanson and Ashley McNamee completed electrolyte analysis of plasma samples as part of a study looking at the differences in osmoregulatory capacity between hatchery and wild juvenile steelhead released from AFTC.

## Ecological Physiology cont....

Will Simpson, Kyle Hanson, Richard Glenn, and James Samagaio deployed caged juvenile Chinook salmon in the Columbia River estuary at restored and non-restored habitats. These fish will be monitored in an effort to quantify growth and physiological benefits of habitat restoration activities on fish in the estuary.

Kurt Steinke and Jerone Anderson completed a new SOP for constructing passive integrated transponder (PIT) tag interrogation systems. This document includes step-by-step instructions for construction as well as parts lists for obtaining the necessary components. The new document includes antenna designs that are simpler and more economical than those defined in previous SOPs for PIT tag interrogation.

Jerone Anderson built two new PIT tag antennas for a project monitoring Columbia Spotted Frog. The project is directed by Michael Cotter of the FWS Nevada FWO. Cotter and staff visited AFTC to learn about basic antenna construction techniques and the returned the Upper Reese River basin near Reno, NV to install the antennas.



Columbia Spotted Frog within the Upper Reese River Basin, NV. The frogs are being monitored using PIT tag interrogation system. *USFWS*

## Modeling/Management Decision Support

Doug Peterson traveled to ID and MT to set up a field study to measure aquatic organism passage through culverts at road crossings in the Clearwater and Lolo National Forests (NF). The study is part of an effort to develop protocols to assess the biological effectiveness of remediated culverts, and to compare genetic vs. non-genetic methods to estimate movement. The research is funded by the US Forest Service's San Dimas Technology Center and the Lolo NF and is led jointly by the FWS and Trout Unlimited.

Doug Peterson (Modeling), Jerone Anderson (Ecological Physiology), and Helen Neville (Trout Unlimited) installed several half duplex PIT interrogation systems in and adjacent to a remediated culvert on an unnamed tributary to the East Fork Lolo Creek, Lolo NF. A total of four antennas were installed at this site – two inside the culvert and two outside the culvert – and the interrogation station is one of several different methods used to detect the movement of tagged brook trout and westslope cutthroat trout. Similar PIT interrogation systems will be installed in three additional streams. Additional research at these sites will examine active detection of tagged fish using mobile antennas and genetic markers to estimate fish movement through the remediated crossings.



Jerone Anderson wires a half-duplex PIT tag antenna inside a culvert. *USFWS: D. Peterson*

## Program Highlights cont....

### Modeling/Management Decision Support cont....



Helen Neville and Doug Peterson installing a half-duplex PIT tag antenna inside a culvert to monitor the movement of tagged brook trout and cutthroat trout in an unnamed tributary to East Fork Lolo Creek, MT. *USFWS: J. Anderson*



Half-duplex PIT interrogation antenna used to monitor movements of brook trout and westslope cutthroat trout in an unnamed tributary to East Fork Lolo Creek, MT. The approximate antenna dimensions are 3.0 m long by 0.75 m tall, and the lower portion of the antenna is buried in the stream gravel. *USFWS: D. Peterson*

### Administration/Facilities

The last adult steelhead entered the trap in mid-May for the Bonneville Power Administration funded project “Natural Reproductive Success and Demographic Effect of Hatchery-Origin Steelhead in Abernathy Creek, Washington”. A total of 557 adult steelhead were captured, 88 natural-origin, 420 AFTC-origin, and 49 out-of-basin strays. From these returns, 60 natural-origin and 25 AFTC steelhead were released upstream, and 75 AFTC adults and 25 natural-origin adults were spawned at the hatchery; 20,000 fry are being reared for release in spring 2012.



AFTC hatchery-origin female. Age 3 salt, weight 5.3 kg. *USFWS*

Scott Gronbach organized fork lift, excavator and backhoe training at AFTC for facilities, Nutrition Program, and culture staff.

Scott Gronbach organized First Aid/CPR training for all AFTC staff. Twenty-two staff members were able to attend.

Patty Crandell and Judy Gordon participated in an FTC conference call. The purpose of the call was to discuss the upcoming Fisheries Management Team / Science Support meeting scheduled for October.

Scott Gronbach and Jim Lowell embarked on a renovation project to provide additional office space.

## Nutrition

Twibell, R. G., A. L. Gannam, S. L. Ostrand, J. S. A. Holmes and J. B. Poole. 2011. Altered growth rates, carcass fatty acid concentrations, and tissue histology in first-feeding steelhead fed a fish-meal- and fish-oil-free diet. *North American Journal of Aquaculture* 73: 230-238.

Trushenski, J. T., B. Gause and H. A. Lewis. 2011. Selective fatty acid metabolism, not the sequence of dietary fish oil intake, prevails in fillet fatty acid profile change in sunshine bass. *North American Journal of Aquaculture* 73: 204-211.

Lewis, H. A., J. T. Trushenski, R. L. Lane and C. C. Kohler. 2011. Differential incorporation of dietary fatty acids from flax and fish oils into lipid classes of white bass ova. *North American Journal of Aquaculture* 73: 212-220.

Trushenski, J., J. Laporte, H. Lewis, M. Schwarz, B. Delbos, R. Takeuchi and L. A. Sampaio. 2011. Fish meal replacement with soy-derived protein in feeds for juvenile cobia: influence of replacement level and attractant supplementation *Journal of the World Aquaculture Society* 42:435-443.

Rawles, S. D., K. R. Thompson, Y. J. Brady, L. S. Metts, M. Y. Akosoy, A. L. Gannam, R. G. Twibell, S. Ostrand and C. D. Webster. 2011. Effects of replacing fish meal with poultry by-product and soybean and reduced protein level on the performance and immune status of pond-grown sunshine bass (*Morone chrysops* x *Morone saxatilis*). *Aquaculture Nutrition* 17: 708-721.

## Conservation Genetics

Smith, M. J., C. E. Pascal, Z. A. C. Grauvogel, C. Habicht, J. E. Seeb, and L. W. Seeb. 2011. Multiplex preamplification PCR and microsatellite validation enables accurate single nucleotide polymorphism genotyping of historical fish scales. *Molecular Ecology Resources* 11:268-277.

## Conservation Genetics cont....

Gomez-Uchida, D., J. E. Seeb, M. J. Smith, C. Habicht, T. P. Quinn, and L. W. Seeb. Single nucleotide polymorphisms unravel hierarchical divergence and signatures of selection among Alaskan sockeye salmon (*Oncorhynchus nerka*) populations. *BMC Evolutionary Biology* 11.

Smith, C. T., S. B. Reid, L. Godfrey, and W. R. Ardren. 2011. Gene Flow Among Modoc Sucker and Sacramento Sucker Populations in the Upper Pit River, California and Oregon. *Journal of Fish and Wildlife Management*. 2. Available: <http://www.fwspubs.org/doi/pdf/10.3996/022010-JFWM-003>.

Hawkins, D. and B. Adams. 2011. Genetic determination of stock of origin of *Oncorhynchus mykiss* collected in the Crooked River. *Abernathy Fish Technology Center Report*.

Smith, C.T., and R. Engle. 2011. Persistent reproductive isolation between sympatric lineages of fall Chinook salmon in White Salmon River, Washington. *Transactions of the American Fisheries Society* 140: 699 – 715.

DeHaan, P. and B. Adams. 2011. Genetic Analysis of Kootenai River Bull Trout 2009-2010 Report. *Abernathy Fish Technology Center Final report to MT Fish, Wildlife and Parks*.

DeHaan, P. and B. Adams. 2011. Analysis of Genetic Variation and Assessment of Population Assignment Methods for Lewis River Bull Trout. *Abernathy Fish Technology Center Final report to the US Fish and Wildlife Service, Lacey, WA*.

Smith, M., and D. Hawkins. 2011. Genetic analysis of the origin of Chinook salmon in Panther Creek, Idaho. *Abernathy Fish Technology Center Final Report FY2011:27*.

McGlaufflin, M., D. Schindler, L. W. Seeb, C. T. Smith, C. Habicht, and J. E. Seeb. 2011. Spawning habitat and geography influence population structure and juvenile migration timing of sockeye salmon in the Wood River Lakes, Alaska. *Transactions of the American Fisheries Society* 140(3):763-782.

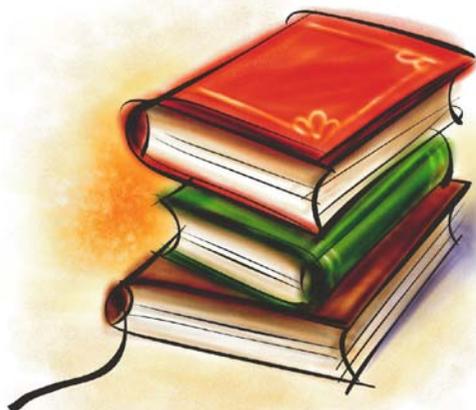
## Ecological Physiology

K. Steinke, J. Anderson, K. Ostrand. 2011. Aquatic PIT Tag Interrogation System Construction & Standard Operating Procedure. Abernathy Fish Technology Center Report.

Pacific Lamprey Artificial Propagation and Rearing Investigations: Rocky Reach Pacific Lamprey Management Plan. 2011. Chelan County PUD Rocky Reach Hydroelectric Project FERC Project No. 2145, Report No. FN 36958.

Ostrand, K. G., M. J. Siepker, and D. H. Wahl. 2011. Effectiveness of livewell Additives for increasing largemouth bass survival. *Journal of Fish and Wildlife Management*. 02(1):22-28.

Hanson, K.C., W.L. Gale, W.G. Simpson, B.M. Kennedy, and K.G. Ostrand. 2011. Physiological characterization of hatchery origin juvenile steelhead (*Oncorhynchus mykiss*) adopting divergent life history strategies. *Journal of Fish and Wildlife Management*. 02(1):61-67.



## Outreach

Ann Gannam attended the Olympic Elementary School Career Day. She set up a booth, provided “goodie” bags for each class and told the children what we do at the AFTC. She talked with the children about the Pacific salmon’s life history and what we can do to help the salmon. They learned the five Pacific salmon species found in the Pacific Northwest using the five digits of their hand as a memory aiding device.



Webelo Scouts from Pack 319 of the Boy Scouts of America came to AFTC as part of their requirements for their Scientist Badge. Boys were introduced to fisheries science methodologies in: DNA analysis, PIT tag detection, bacterial culture, and fish anatomy.

## **Workshops, Conferences, and Meetings....**

### ***Nutrition:***

- Ron Twibell, Heidi Lewis and Nathan Hyde attended the Co-Managers' Conference "Workshop on Age and Size at Maturity of Chinook Salmon and other Pacific Salmonids" in Portland, OR. Ann Gannam co-chaired a session titled "Physiology and Nutrition" with Don Larsen (NOAA Fisheries, Seattle). She presented a talk, "Feed changes over time, ingredients and methods of manufacture, are they having an impact on age/size at maturity of hatchery fish?"
- Ron Twibell attended the WA Science in the Service meeting in Olympia, WA. He presented a talk titled; "Contaminants in hatchery reared salmonids".
- Heidi Lewis and Ann Gannam participated in a conference call with Jay Davis, Environmental Contaminants, Washington FWO, and Alec Maule, CRRL, to discuss progress on reports for the "Investigation of Contaminants in Feeds and Fish at FWS Pacific Region National Fish Hatcheries and the Ramifications to Human and Ecological Health" project.
- Ann Gannam and Heidi Lewis attended the Office of the Science Advisor webinar.
- Ann Gannam attended the Spotlight on Science webinar titled "The Changing Climate of Biological Invasions".
- Ron Twibell, Heidi Lewis, Nathan Hyde and Jeff Poole had CPR training at AFTC.

### ***Conservation Genetics:***

- Christian Smith participated in the meeting of the interagency White Salmon Working Group.
- Matt Smith met with Doug Olson and Maureen Kavanagh (CRFPO) and with Larry Telles (Eagle Creek NFH) to discuss the first year of results from the Clackamas River coho population structure study.
- Matt Smith participated in a Panther Creek Chinook workgroup conference call to discuss the genetic results of a recently completed analysis of the origins of naturally spawning spring Chinook in Panther Creek, ID.
- Pat DeHaan gave a presentation of an analysis of Olympic Peninsula bull trout with a focus on Elwha bull trout at the WA Science in the Service meeting. The Elwha Dam is scheduled for removal later this year and the data generated by this project will serve as pre-removal baseline data for evaluating recovery of bull trout.
- Christian Smith met with Bill Gale, Matt Cooper, Tom Desgroseillier, RD Nelle, and Robbette Schmit at the Mid-Columbia River FRO to discuss the use of genetic markers for evaluating restoration of spring Chinook salmon in the Entiat River.
- Matt Smith, Molly McGlaufflin, Denise Hawkins, and Christian Smith attended the "Workshop on Age and Size at Maturity of Chinook Salmon and other Pacific Salmonids" sponsored by the FWS and attended by many federal, state and tribal partners. Christian Smith presented results of a genetic analysis of coho salmon from Quilcene NFH.

# Workshops, Conferences, and Meetings....

## ***Ecological Physiology:***

- Richard Glenn attended the American Society for Microbiology general meeting in New Orleans, LA.
- Kenneth Ostrand participated in an Aquatic Conservation Team (ACT) conference call. The team discussed programmatic opportunities, and priorities.
- Kenneth Ostrand met with San Marcos NFH and TC staff in San Marcos, TX to discuss aquatic invasive control measures with particular reference to invasive plant removal and re-vegetation efforts.
- Kenneth Ostrand met with the Southwest RO staff in Albuquerque, NM to discuss collaborative efforts as well FTC programmatic directions and capabilities.
- Ben Kennedy made a presentation at the WA Science in the Service Workshop titled, "Migration dynamics of released hatchery steelhead smolts determine type and magnitude of ecological and genetic risks".

## ***Administration/Facilities:***

- Judy Gordon, Ann Gannam, Denise Hawkins, Ken Ostrand, Kyle Hanson, Scott Gronbach and Vince Bocci attended the Recruiting Diverse Talent training in the RO.
- Denise Hawkins Judy Gordon attended PD Express training in the Regional Office. PD Express is a new on-line method of creating new position descriptions.
- Ken Ostrand, Patty Crandell, and Denise Hawkins met with David Hancock (H. B.Stubbs Companies) and Deb White (Lodestar Studio) to discuss the plans for the informational kiosk in progress at AFTC.
- Scott Gronbach and Richard Glenn met with Jesse Smith of the Cowlitz County Health Department for our Sanitary Survey Inspection for our domestic water system.
- Patty Crandell participated in two Pacific Region Climate Change Board (RCB) meetings at the Pacific Region Office. The meetings included discussion of an all-day meeting to be held in August.
- Patty Crandell, Doug Peterson, and Kyle Hanson participated in a meeting to update the Fisheries Project Leaders and Program staff about RCB activities.
- Patty Crandell, Doug Peterson, and Kyle Hanson participated in five Fisheries Program Climate Change Planning Team meetings via phone. The meetings were held to organize the process of the NFH vulnerability assessments, beginning with Winthrop NFH. The meetings also included planning for an all-day scoping meeting to be held via videoteleconferencing on July 13<sup>th</sup>.
- Rudy Salakory, Restoration Biologist for the Cowlitz Indian Tribe, met with Patty Crandell to discuss opportunities for scientific collaboration and habitat restoration priorities for Abernathy Creek.
- Scott Gronbach attended Contracting Officer's Technical Representative (COTR) training in Billings, MT.
- Judy Gordon attended the quarterly meeting of the Oregon Hatchery Research Center's Advisory Committee as the Federal Representative.

## Employee Spotlight....



### Judy Gordon Center Director

Judy was born in New York City and later moved with her family to New Jersey where she attended high school. Judy graduated from Princeton University with a Bachelor's degree in Biology, and from the Pennsylvania State University with a Master's in Quantitative Ecology with a minor in Statistics.

Her federal career has moved her from Massachusetts to the Mississippi Gulf Coast with NOAA Fisheries and from Alaska to the beautiful Pacific Northwest with the FWS.

Judy lives with her husband Patrick, Bengal cat, Sally, and Aspen, a Bichon Frise, in Vancouver, WA. Her hobbies include cooking, visiting with friends, being outdoors, and quilting.



Bargello Quilt handmade by Judy Gordon  
*Judy Gordon*