U.S. Fish & Wildlife Service – Pacific Region

Abernathy Fish Technology Center Newsletter

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In this Issue:

Director's Greeting….

While there is a lot of good science being conducted by FWS employees, we often don't do a good job of sharing this information. Here at Abernathy Fish Technology Center, we share our study results through various methods: peer reviewed publications, internal reports, web sites, technical presentations at workshops and professional meetings, participation in multi-stakeholder groups, and of course our newsletter. In this issue you'll hear about the Pacific Region's Fisheries Program's annual Hatchery Management Workshop (HMW), hosted by Deputy Center Director, Patty Crandell. This workshop is a forum to present technical/scientific information, from both within the Fisheries Program and from our external partners, of particular interest to NFH Managers and their staffs. The highly successful 2010 HMW focused on genetics and fishery resources. Outreach and in-reach can take many forms and the HMW is just one way to spread the word about the science produced by the FWS and its partners in support of FWS activities.

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Patty Crandell, Deputy Center Director
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Jim Lowell, Maintenance Worker
John Holmes, Fish Biologist
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Nutrition:
Ann Gannam, Regional Nutritionist
Ron Twibell, Fish Nutritionist
Jeff Poole, Extruder Operator
Nathan Hyde, Biological Technician
Heidi Lewis, Fish Nutritionist

Conservation Genetics:
Denise Hawkins, Regional Geneticist
Christian Smith, Conservation Geneticist
Pat DeHaan, Fish Geneticist
Brice Adams, Biological Technician
Molly McGlauflin, Fish Geneticist
Matt Smith, Fish Geneticist
Jennifer Von Bargen, 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

Fourteenth Annual Pacific Region Hatchery Management Workshop in Richland, WA

AFTC geneticists and partners at the Hatchery Management Workshop. *USFWS: P. Crandell*

The Hatchery Management Workshop is designed to help identify aquatic resource management problems, explore new opportunities, maintain productive working relationships, and share information regarding application of state-of-the-art technologies to hatchery management. The 2010 Workshop focused on Genetics and included 19 Genetics presentations, including: 9 by AFTC staff, 3 by other FWS staff (1 Pacific Regional Office, 2 Southwest Region Tech Center), 2 by other federal agency staff (1 NOAA-Fisheries Southwest Fisheries Science Center, 1 NOAA-Fisheries Salmon Management Division), 1 by tribal agency staff (Columbia River Intertribal Fish Commission), 2 by state agency staff (2 Washington Department of Fish and Wildlife), and 2 by university staff (1 Washington State University, 1 Humboldt State University). Four other presentations focused on outreach and partnerships (with Friends of Northwest Hatcheries), NFH history, and NFH innovation.

Program Highlights….

Nutrition

Over concern about phosphorus loads in their effluent and health of their fish, Mora NFH & TC contacted AFTC about developing a low phosphorus feed for Gila trout. The phosphorus requirement for Gila trout is not known so a feeding trial was developed to test graded levels of phosphorus in the feed. Six diets were made for Mora NFH & TC.

Working with Alec Maule, U.S. Geological Survey, and Jay Davis, Environmental Contaminants, Washington FWO, we are organizing two years of contaminants data for the "Off Refuge" funds final report and three publications. Ann Gannam, Ron Twibell and Heidi Lewis, took part in two conference calls about the data and Heidi Lewis has been busy providing descriptive statistics and graphs.

Nathan Hyde and Ron Twibell analyzed 16 NFH feed samples for Fish Feed Quality Control. As part of the routine analyses, all feeds from the NFHs were checked for rancidity. Ann Gannam wrote the feed memos and contacted the feed mills when necessary. AFTC's feeds and the 6 experimental diets for the Mora NFH & TC were also analyzed.

Heidi Lewis and Ron Twibell have developed a proposal titled "Hatchery Nutrition: Feeding Fish for Tomorrow's Changing World" for a symposium at the 141st annual AFS meeting in Seattle, September 4-8, 2011.

We are three weeks into the steelhead phosphorus/lipid trial that Ron Twibell is conducting.

Conservation Genetics

Molly McGlauflin provided responses to Independent Scientific Review Panel (ISRP) questions posed after the recent review of our Bonneville Power Administration (BPA) funded assessment of relative reproductive success and demographic effect of hatchery origin steelhead spawning naturally in Abernathy Creek.

Conservation Genetics cont….

The entire staff of AFTC's Conservation Genetics Program attended and presented information at the annual Pacific Region Hatchery Management Workshop held in Richland, WA. We presented talks on a few specific projects as well as providing information on our capabilities, types of markers and analyses carried out, guidelines for sampling, types of questions that can be answered using genetic data, project organization, and rapid response genetic analyses.

Participants at the Pacific Region Hatchery Management Workshop. *USFWS: P.Crandell*

Christian Smith enjoying the Pacific Region Hatchery Management Workshop. *USFWS: P.Crandell*

In addition to the presentations at the Hatchery Management Workshop, Brice Adams organized an educational game titled 'Everybody Scores' that presented participants with the opportunity to see how we score microsatellites and use these scores to determine the hatchery of origin and the parents of individuals.

Program Highlights cont….

Conservation Genetics cont….

Molly McGlauflin completed the genetics portion of the annual report to BPA for our Abernathy Creek steelhead reproductive success and demographic effect project. Molly compared the reproductive success of hatchery and natural origin steelhead spawning naturally in Abernathy Creek.

Christian Smith presented a talk entitled "Persistent reproductive isolation between sympatric lineages of fall Chinook salmon in the White Salmon River" to our partners in the Washington Department of Fish and Wildlife (WDFW) as part of the State's Fish Science Seminar Series.

Carlos Garza, head of the genetics program at the NOAA Southwest Fisheries Science Center (SWFSC) in Santa Cruz, CA, visited AFTC. During the visit, Dr. Garza received a tour of the facility, and we discussed our recent collaborative work using Single Nucleotide Polymorphisms (SNPs) developed at SWFSC to assess spring Chinook in the upper Sacramento River, CA and our marker assessment project for the on-going winter Chinook work at Livingston Stone NFH.

Carlos Garza and Denise Hawkins at AFTC.
USFWS: C. Smith

Ecological Physiology

Will Simpson, James Samagaio, Ben Kennedy, Ashley McNamee, and Richard Glenn sampled fish around Cottonwood Island in the Columbia River by beach seining with research partners from Pacific Northwest National Laboratory. This project is part of an ongoing study designed to determine sampling protocols that incorporate physiological variables to guide future estuary restoration activities in the lower Columbia River.

Will Simpson and Kurt Steinke began operating Passive Integrated Transponder (PIT) tag antenna arrays at irrigation canals on the Umatilla River, OR. The antenna arrays are used to determine entrainment and survival of PIT tagged ESA listed juvenile mid Columbia steelhead diverted into irrigation canals.

Richard Glenn and Ashley McNamee have been extracting DNA from steelhead stomach samples to determine gut microflora community structure for a collaborative project with the AFTC Nutrition Program.

Jerone Anderson and Kurt Steinke visited Catherine Creek near LaGrande, OR, to take final measurements to allow construction of antennas and cables for four PIT tag sites for Oregon Department of Fish and Wildlife (ODFW). The equipment will be used to try to determine the cause(s) of low returns of hatchery steelhead.

Scot Favrot, ODFW, and Kurt Steinke measuring Elmer Dam on Catherine Creek. *USFWS: J.Anderson*

Program Highlights cont….

Ecological Physiology cont….

Kurt Steinke preparing to take measurements at the Johnson site on Catherine Creek. *USFWS: J.Anderson*

Kurt Steinke and Scot Favrot, ODFW, setting up equipment at Yearagin Bridge on Catherine Creek. *USFWS: J.Anderson*

The Catherine Creek project is to monitor juvenile Chinook salmon and is a joint effort between private landowners, ODFW, Bureau of Reclamation and FWS.

Administration/Facilities

Ken Ostrand, Denise Hawkins, and Patty Crandell led an effort to respond to ISRP comments regarding their proposal to renew AFTC's largest and most integrated research project, the BPA funded Abernathy Creek steelhead study. After receiving the response from AFTC, the ISRP found the proposal met the necessary scientific criteria and was eligible to receive funding from 2012 through 2016 from BPA.

As part of the BPA funded Abernathy Creek steelhead project, Patty Crandell, Denise Hawkins, and Ken Ostrand finalized a statement of work and budget for calendar year 2011.

As part of the BPA funded Abernathy Creek steelhead project, 21,000 brood year 2010 steelhead juveniles were adipose fin clipped and coded wire tagged. These juveniles will be released in the spring of 2011.

Since the AFTC's electric barrier weir was activated, 7 cutthroat trout and 212 coho salmon have been captured and transported upstream. In addition, 56 steelhead have been captured including 7 natural origin, 27 AFTC hatchery origin, and 22 out of basin strays. Five natural origin and two AFTC hatchery origin steelhead were transported upstream to spawn as part of the BPA funded Abernathy Creek steelhead project. Capture of returning adult steelhead will continue until June.

Electric weir on Abernathy Creek at AFTC
USFWS

Program Highlights cont….

Reports and Publications

Nutrition

Rawles, S. D., K. R. Thompson, Y. J. Brady, L. S. Metts, M. Y. Aksoy, A. L. Gannam, R. G. Twibell, S. Ostrand and C. D. Webster. 2010. Effects of replacing fish meal with poultry by-product meal and soybean meal and reduced protein level on the performance and immune status of pond-grown sunshine bass (*Morone chrysops* × *M. saxatilis*). Aquaculture Nutrition. Article first published online : 4 NOV 2010, DOI: 10.1111/j.1365-2095.2010.00831.x

Conservation Genetics

DeHaan, P. and B. Adams. 2010. Genetic Population Structure of Redband Trout in the Malheur River Basin, Oregon. Abernathy Fish Technology Center Report.

DeHaan, P., L. Godfrey, D. Peterson, and D. Brewer. 2010. Bull Trout Population Genetic Structure and Entrainment in Warm Springs Creek, Montana. Abernathy Fish Technology Center Report.

Smith, C. 2010. Genetic characterization of spring run Chinook salmon in the upper Sacramento River. Final Abernathy Fish Technology Center Report for Interagency Agreement 08AA200014 between the Bureau of Reclamation and the U.S. Fish & Wildlife Service.

Smith, C., D. Hawkins, and J. C. Garza. 2010. Summary of genetic data collected for rapid response Chinook salmon assignment, and evaluation of new markers and assignment tools. Final Abernathy Fish Technology Center Report.

Ecological Physiology

Ostrand K. G., and W. G. Simpson. 2010. Fisheries monitoring system: Umatilla project facilities. Final Abernathy Fish Technology Report for the Bureau of Reclamation.

Hanson K. C, K. G. Ostrand, R. A. Glenn, and A. S. McNamee. 2010. Physiological correlates of habitat utilization by juvenile Chinook salmon in the lower Columbia River estuary. Final Abernathy Fish Technology Center Report for the U. S. Army Corps of Engineers.

Reports and Publications cont….

Ecological Physiology cont….

Crandell P, J. Holmes, J. McLaren, J. Poole, D. Hawkins, M. McGlauflin, A. Gannam, R. Twibell, W. Simpson, B. Kennedy, K. Steinke, K. Hanson, R. Glenn, J. Anderson, J. Samagaio, A. McNamee, and K. Ostrand. 2010. Natural reproductive success and demographic effects of hatchery-origin steelhead in Abernathy Creek, Washington. Final Abernathy Fish Technology Center Report for the United States Department of Energy, Bonneville Power Administration, Division of Fish and Wildlife.

O'Toole, A.C., K.J. Murchie, C. Pullen, K.C. Hanson, C.D. Suski, A.J. Danylchuk, and S.J. Cooke. 2010. Locomotory activity and depth distribution of adult great barracuda (*Sphyraena barracuda*) in Bahamian coastal habitats determined using accelerometer biotelemetry transmitters. Marine and Freshwater Research. 61:1446-1456.

Hanson, K.C., and K.G. Ostrand. 2010. Potential effects of global climate change on National Fish Hatchery operations in the Pacific Northwest. Aquaculture Environment Interactions. 00:000-000 (In Press)

Ostrand K. G., G. B. Zydlewski, W. L. Gale, and J. D. Zydlewski. 2009. Long term retention, survival, growth, and physiological indicators of salmonids marked with passive integrated transponder tags. *In*: Symposium Proceedings Advances in Fish Tagging and Marking Technology. American Fisheries Society, Bethesda, Maryland. (In Press).

Hanson, K.C., W.L. Gale, W.G. Simpson, B.M. Kennedy, and K.G. Ostrand. Physiological characterization of hatchery origin juvenile steelhead (*Oncorhynchus mykiss*) adopting divergent life history strategies. Journal of Fish and Wildlife Management. 00:00-00. (In Press)

Siepker M. J., K. G. Ostrand, E. L. Ball, and D. H. Wahl. 2010. Electrofishing practices affect largemouth bass feeding behaviour. North American Journal of Fisheries Management 00:00-00. (In Press).

Workshops, Conferences, and Meetings….

Nutrition:

- Ann Gannam attended the Pacific Region Hatchery Management Workshop.
- Ron Twibell attended the HET meeting at Warm Springs NFH.

Conservation Genetics:

- Matt Smith and Denise Hawkins visited Eagle Creek NFH to meet with Larry Telles and see the facility. They discussed plans for an upcoming project in conjunction with Columbia River FPO, which will assess population structure of coho salmon in the Clackamas River. Matt also met with Larry Telles and Doug Olson for further project planning. This project is a FONS funded project.
- Denise Hawkins participated in a conference call with Washington FWO, WDFW, and King County to discuss the application of the spawning protocols and guidance provided by the Lake Sammamish Kokanee Workgroup.
- Pat DeHaan attended a meeting of the Clackamas bull trout reintroduction workgroup in Sandy, OR. This was a joint meeting of the Monitoring and Evaluation Group and the Implementation Group with the objective of making sure that both groups were aware of each group's progress and plans.
- Matt Smith attended the Lower Snake River Compensation Plan spring Chinook Review in Boise, ID. Matt met with collaborators from ODFW and the Shoshone-Bannock Tribes to discuss upcoming project plans.
- Matt Smith visited Idaho Department of Fish & Game's genetics lab in Eagle, ID. He discussed Snake River Chinook and steelhead baselines with Matt Campbell and Mike Ackerman. They also discussed SNP panels and our desire to coordinate efforts to ensure data compatibility between labs.
- Denise Hawkins participated in a Genetic Analysis of Pacific Salmon (GAPS) conference call to discuss the GAPS collaborative microsatellite and SNP Chinook baseline database.
- Kelly Dirkson and Rebecca McCoun from the Confederated Tribes of Grand Ronde met with Molly McGlauflin and Denise Hawkins at AFTC to tour the facility and discuss our on-going and potential projects with coho, lamprey, and steelhead in Agency Creek, OR.

Ecological Physiology:

- Will Simpson was invited to and attended the Northwest Fish Culture Conference, Portland, OR. He gave a presentation titled "W.G. Simpson, B. Kennedy, and K. G. Ostrand. 2010. Rearing Effects on the Seasonal Diet of Steelhead from an Integrated Hatchery Program."
- Ben Kennedy met with staff from Mid-Columbia FRO, Columbia River FPO, Regional Office, and Freshwaters Illustrated to create a plan for 2011 for using electronic video and picture media to increase public awareness of Pacific lamprey.
- Ken Ostrand and Kyle Hanson attended the Pacific Region Hatchery Management Workshop.

Administration/Facilities:

- Patty Crandell participated in a Pacific Region Climate Change Board meeting. The meeting included summaries of topics of action papers and an overview of the Board Charter.
- Toni Scholder and Patty Crandell provided logistical support and attended the Hatchery Management Workshop in Richland, WA. Patty Crandell and Denise Hawkins served as Workshop moderators. The Workshop was attended by FWS employees and partners from regions 1, 2, and 8. Twenty-three presentations were given with 19 of the presentations relating to genetics and the final 4 of the genetics presentations developed to function as a short course.

New Faces….

Heidi Lewis is Nutrition's newest Fish Nutritionist. Heidi grew up on a farm in northeast Missouri. She received her bachelor's degree in Fisheries and Wildlife with minors in Biological and Animal Sciences from the University of Missouri. She earned her Master's and Ph.D. in Zoology from Southern Illinois University. Her research interests include broodstock nutrition and fish oil and fish meal replacement in diets for carnivorous fishes. When she's not designing diets for fish, she enjoys cooking her own meals, camping, hiking, and fishing. Heidi lives in Kelso with her fiancé, Mike, and three kitties.

Jennifer Von Bargen is a native of Washington State. She was born in Olympia and raised in Yakima. She attended Central Washington University where she earned a Bachelor of Science in Biology with a specialization in molecular techniques. While earning her degree, she worked for the biology department in the Media Prep Lab as well as for U.S. Department of Agriculture in Wapato. She worked on several projects to help stop the infestation of the Codling Moth in orchards using molecular techniques. After college and for the last eight years, Jennifer worked for the WDFW Molecular Genetics Laboratory prior to coming to AFTC's Genetics Program as the Lab Geneticist. Jennifer loves most things out doors, including gardening, hiking and camping. She loves spending time with her family and teaching her two boys about the wonders of science. At 5 years of age, her oldest knows about DNA and loves dinosaurs. Her youngest is 3 and can tell you all about how things decay, melt or freeze. Jennifer likes watching sports including football, soccer and baseball and has enjoyed coaching her youngest son's soccer teams. She also enjoys cross stitching and scrapbooking and is a science fiction/fantasy fan and enjoys many movies, books and games.