Warm Springs Fish Technology Center

January 2009 Activity Report

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Cory Gullett at Private John Allen National Fish Hatchery holding an alligator gar. Alligator gar eggs were collected to evaluate three chemical de-adhesion methods. Credit: USFWS Photo.

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Warm Springs Fish Technology Center

The Fish Technology Center (FTC) is a component of the Warm Springs Regional Fisheries Center (RFC) and was developed to improve and enhance fisheries management. We provide consolidated technical operational support to regional fisheries operations and technical assistance to the public. The Fish Technology Center is comprised of a cryopreservation laboratory, conservation genetics laboratory, and the National Fish Strain Registry at Warm Springs, Georgia, and a field station in Wadmalaw Island, South Carolina.

Goals:

- Provide management support of interjurisdictional coastal and riverine fishes such as robust redhorse, shortnose sturgeon, Gulf sturgeon, and Gulf striped bass.
- Provide conservation genetics support for regional fishery programs.
- Maintain the National Fish Strain Registry for dissemination of information and support of private, State and Federal broodstocks.
- Develop cryopreservation techniques for imperiled fish and mussels.
- Develop hatchery product evaluation techniques.

Cryopreservation

Cryopreservation is a process in which a living cell is frozen, stored, and thawed and remains viable. Cryopreserved sperm assists reproductive efforts by allowing spawning to take place whenever females are ready, reduces the need to hold males, and can increase flexibility and genetic diversity in spawning protocols.

Currently, the Warm Springs FTC is working on numerous species of fish, including threatened or endangered species. In the near future, the FTC will expand cryopreservation research to include other aquatic species (e.g., freshwater mussels, amphibians) for conservation efforts.

Striped bass, *Morone saxatilis*
Credit: Chester Figiel, USFWS.

Conservation Genetics

The Conservation Genetics lab primarily works with biologists and managers of the region to design and implement genetic research on imperiled aquatic organisms.

Current Projects include estimating genetic diversity from: alligator gar, Gulf Coast striped bass, robust redhorse, freshwater mussels, and threatened and endangered species such as spotfin chub.

National Fish Strain Registry

The National Fish Strain Registry is an internet-based program that assembles performance information on over 1100 strains of wild populations and domestic broodstock. These strains are managed by state and federal agencies and cultured by private growers. The database enables fishery leaders and producers to make sound decisions regarding management and culture of species. The goals of the NFSR are: 1) to protect the nation's aquatic resources through information management, 2) to promote responsible use of fish strains for recreational opportunities, 3) to advance scientific knowledge, and 4) to be accountable, functionally integrated, and result-oriented.

Partnerships and Accountability

FWS and USGS Offer Conservation Genetics Workshop to Midwest Region

Greg Moyer was contacted through the Genetics Community of Practices (http://www.fws.gov/ConservationGeneticsCOP/) to assist in teaching a two day seminar on conservation genetics, with an emphasis on endangered species issues, to Midwest Region Ecological Services staff. Instructors Greg Moyer and Brian Sloss (from the U.S. Geological Survey Cooperative Unit, University of Wisconsin – Stevens Point) discussed topics such as effective population size, metapopulations and fragmentation, landscape genetics, units of conservation hybridization, and conservation breeding and restoration. Regional staff also participated by asking more detailed questions concerning conservation genetics and ongoing threatened and endangered species plans. The meeting was held January 14 – 15, 2009 in Chicago, IL.

Aquatic Species Conservation and Management

Mussel Collection for In-vitro Transformation Study

Bill Wayman and Greg Moyer spent a morning on West Point Lake, Georgia collecting freshwater mussels for use in in-vitro transformation experiments. Three eastern floater mussels (*Pyganodon cataracta*) and numerous relict shells were collected and brought back to the FTC. The eastern floater mussels were placed in the hatchery's mussel quarantine building for later use in the in-vitro transformation experiments, and the relict shells will be thin-sectioned to determine age. The in-vitro transformation research is being conducted for two reasons: 1) to help refine glochidial cryopreservation techniques by reducing the need for fish host transformations (an extremely labor intensive process), and 2) to develop a method to propagate the purple bankclimber (*Elliptoideus sloatianus),* an endangered species for which a suitable host fish has not been identified.

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Greg Moyer collecting mussels.
Credit: USFWS Photo.

Mollusk and Crayfish Conservation Meeting

Pyganodon grandis (top) and
P. cataracta (bottom).
Credit: USFWS Photo.

Bill Bouthillier and Nicole Rankin attended the Alabama Department of Conservation and Natural Resources Annual Alabama Mollusk and Crayfish Meeting in conjunction with the First Biennial Eastern Gulf Slope Mollusk and Crayfish Meeting in Spanish Fort, Alabama on January 20 – 22, 2009. This informal meeting was a gathering of researchers, students, volunteers and agency personnel from Louisiana, Mississippi, Alabama, Florida and Georgia. The meeting served as a review and update of mollusk and crayfish conservation and research activities for the Gulf of Mexico drainages. Both Nicole and Bill gave a brief description of studies each is or will be conducting in regards to freshwater mussels in the ACF.

Aquatic Species Conservation and Management

GA Chapter AFS Annual Meeting in Perry, GA

Bill Bouthillier gave a presentation on the *Ecological Considerations for the Design of Stream Crossings* at the Georgia Chapter of the American Fisheries Society Annual Meeting in Perry, Georgia. The presentation was an overview of stream fragmentation, the ecological importance of stream continuity, and mechanisms and affects of fragmentation both physical and biological. Over 75 attendees had the opportunity to hear the important take home messages, which were :1) Connectivity is critical to the physical and biological functioning of flowing water ecosystems, 2) Given the large number of stream crossings and substantial "failure"-rate, fragmentation poses a significant ecological threat in GA, and 3) In addition to fish, a number of amphibious and terrestrial species are also impacted by stream fragmentation.

Southern Division AFS Annual Meeting in New Orleans, LA

Bill Wayman, Chester Figiel, and Nicole Rankin attended the Southern Division of the American Fisheries Society Annual Meeting in New Orleans, LA on January 16 – 18, 2009. Bill Wayman gave an oral presentation on the *Chemical De-adhesion of Alligator Gar Eggs* in the Gar Symposium. He highlighted a de-adhesion method that produced higher fertilization and hatch rates for alligator gar eggs than the current method. Bill also attended the Asian Carp: Ploidy Determination and Need Workshop. Chester Figiel presented a poster on *The Piedmont Blue Burrower, Cambarus harti*. Chester provided preliminary data on life history for this crayfish species, which is listed as endangered by the state of Georgia. Nicole gave an oral presentation on the *National Fish Strain Registry: A Management Tool* in the Fisheries Management contributed paper session. Nicole presented information about the database and how this tool can be used to assist fishery resource managers and producers with making fisheries conservation decisions. Bill, Chester, and Nicole also volunteered to judge student presentations and be mentors to students at the meeting.
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Leadership in Science and Technology

Regional Geneticist Presents at Annual Lake Sturgeon Meeting

Lake Sturgeon Credit: USFWS Photo.

Greg Moyer presented preliminary findings of the utility of molecular tags for lake sturgeon mark/recapture studies at the annual Tennessee's lake sturgeon meeting held January 7th in Chattanooga, TN. The annual meeting is comprised of various state, federal, and university scientists that are united under one goal – successful restoration of lake sturgeon to the Tennessee River. Molecular tags may be useful as an alternative or in conjunction with standard external or internal tags and offer the advantage of permanency (they do not fall off or diminish over time). The major drawback to using molecular tags is the number of molecular markers necessary to allocate progeny to parents. Simulations were performed on a suite of eleven microsatellite markers used in lake sturgeon. Results indicate that six markers are necessary for accurate allocation of closely related progeny (brothers and sisters) to their respective parents. These data highlight the potential utility of molecular tags to accurately perform mark/recapture studies for estimation of survival and census size of lake sturgeon in the Tennessee River.

Public Use

Lagrange College Students Learn How Science is Applied to the Endangered Species Act

A Lagrange College biology class visited the Warm Springs Regional Fisheries Center (RFC) on January 9, 2009 to discuss and gain perspectives of how science is being applied to assist in the preservation of species inhabiting the Apalachicola, Chattahoochee, Flint River system. The class, taught by Dr. Melinda Black, is learning about all perspectives of water issues enveloping the region and visited the RFC to hear what scientists are doing to assist in the recovery of threatened and endangered species. Students learned about cryopreservation and the conservation of genetic diversity, the importance of maintaining genetic diversity in threatened and endangered organisms, and the utility of conservation hatchery programs for threatened and endangered species. At the end of the day, students expressed appreciation and renewed interest in how science and technology shapes Endangered Species Act actions.

Partnering for Education and Outreach

Father and son at the Kids' Fish for Fun event at the Warm Springs NFH. Credit: USFWS Photo.

Nicole Rankin and Rosla Plant met with staff from the Franklin D. Roosevelt State Park and Roosevelt's Little White House Historic Site on January 15, 2009 to coordinate on environmental and historical outreach opportunities in the Warm Springs and Pine Mountain, GA area. We discussed upcoming projects and events at the three facilities and how to work together to achieve education and outreach goals. Upcoming events include the Warm Springs National Fish Hatchery Kids' Fish for Fun on June 6, 2009 and the Georgia State Parks and Historic Sites Junior Ranger Camps on July 7 – 9 and July 21 – 23, 2009. All three facilities are participating in the Junior Ranger Camps, and participants will spend one day at each facility. The Warm Springs RFC will be offering the Biologist in Training (BiT) program as well as other activities for the Junior Rangers.

Career Day at Rosemont Elementary

Chester R. Figiel, Jr. participated in career day activities at the Rosemont Elementary School, Troup County Georgia on January 21, 2009. Chester took this opportunity to highlight the recreational, economic, health, and quality-of-life benefits from fishing and promoted conservation-based activities with the educators at this school. Ninety-six elementary students participated and learned about being a fishery biologist in the U.S. Fish and Wildlife Service.

NFSR Article in Hatchery International

An article was published in the January/February 2009 issue of *Hatchery International* entitled "US fish strain registry documents key characteristics of wild and domestic populations". This article described the National Fish Strain Registry (NFSR) database and how it can be used by producers, culturists and resource conservation managers to document how strains are affected by differing environmental changes. The NFSR is available for use by public and private producers and federal, state, and tribal governments. This article also told users how to request access to the NFSR. As of January 31, seven users have contacted us requesting more information about the NFSR through reading Hatchery International and articles in other publications.