Warm Springs Fish Technology Center

January/February 2010 Activity Report

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Sectioning *Elliptoideus sloatianus* using a low-speed saw. 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.

Smith-Root PES Unit. Credit: USFWS Photo.

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 (NFSR) is an internet -based program that assembles information on life history, genetics, reproduction, and behavior of wild populations and domestic fish strains throughout the United States. The NFSR database is available for use by public and private producers as well as resource managers of federal, state, and tribal governments through a registration process. Once registered, users are able to search, create new records, edit records, and request information. The NFSR's vision is to provide a broad collaborative program that provides access to data and information on our Nation's aquatic resources. You must be a registered user to access the NFSR website; please contact chester_figiel@fws.gov or nicole_rankin@fws.gov to become a registered user.

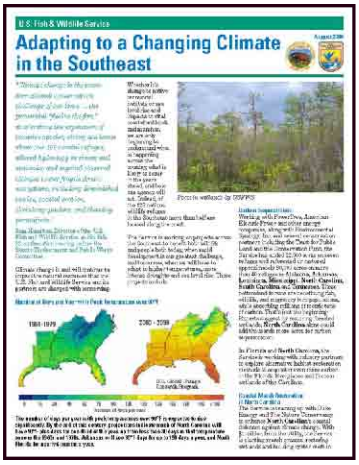
Partnerships and Accountability

Mollusk and Crayfish Conservation Meeting

Bill Bouthillier attended the Alabama Department of Conservation and Natural Resources Annual Alabama Mollusk and Crayfish Meeting in Decatur, Alabama on January 20 and 21, 2010. Over 75 people attended this meeting that focused on prioritizing needs for conservation and recovery of freshwater mussels and crayfish in Alabama. Bill gave a brief update on studies that the FTC will be conducting on freshwater mussels in the Apalachicola, Chattahoochee, Flint river basin. This meeting brings together leading mussel researchers from federal and state agencies, non-government organizations, and universities.

Climate Change Action Priorities

Hayley Dikeman, from the USFWS Ecological Services office in Oklahoma, visited the Warm Springs FTC to work with Chester Figiel, Jr. on the Service's Climate Change Action Priorities. These priorities instruct the Fisheries and Habitat Conservation Program to develop and test risk and vulnerability methodologies for hatcheries, including vulnerabilities to climate-driven water shortages and excesses, to identify units that are most vulnerable to climate change, and to prioritize adaptations. From February 16 – 26, 2010, Hayley and Chester developed a quantitative climate change risk assessment matrix that will provide resource managers the ability to prioritize actions needed to address climate change impacts. Comparability among hatcheries also provides the USFWS Washington and Regional Offices a mechanism for identifying needs and prioritizing funding.



Adapting to Climate Change. Credit: USFWS Photo.

Leadership in Science and Technology

Spreading the Word about Conservation Genetics

Juvenile lake sturgeon. Credit: USFWS Photo.

Ashantye' Williams attended the Annual Tennessee River Lake Sturgeon Reintroduction Working Group Meeting held in Chattanooga, TN on January 13, 2010. The meeting was comprised of various state, federal, and university scientists. Ashantye' discussed the importance of genetics in the management plan for restoration of the upper Tennessee River lake sturgeon population. In terms of genetics, one of the main goals is to create and maintain genetic diversity in stocked populations. Ashantye' reminded the group about the importance of sampling procedures when collecting tissue samples that being used to determine the genetic characteristics of the adult broodfish. At this meeting, Ashantye' established a working relationship with the Kentucky Department of Fish and Wildlife Resources and will be collaborating to determine the genetic diversity in their lake sturgeon population.

Leadership in Science and Technology

Amblema neislerii Aging

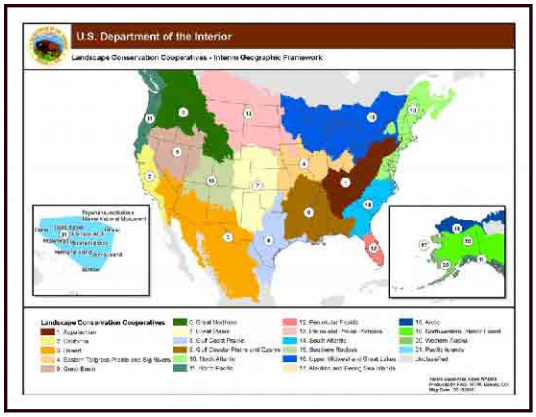
Amblema neislerii.
Credit: USFWS Photo.

In January, Nicole Rankin and Greg Moyer completed sectioning and aging of 168 endangered *Amblema neislerii* (fat threeridge) samples. The mussels were collected dead from the Apalachicola River during the drought of 2006 and 2007. Examinations of sections were made using a dissecting microscope, and all thin sections were read independently by Greg and Nicole. The oldest individual was aged to 24 years, and 83% of the individuals sampled were under age 10. This information was graphed using a logarithmic function in an attempt to correlate length and age (R^2 value = 0.986). This age information was provided to Karen Herrington, from the Panama City Fisheries Resource Office, to be used in a population viability analysis. Population viability analysis can be an extremely useful tool for investigating current and future risks of fat threeridge mussel population decline or extinction. Nicole and Greg will continue to collaborate with Karen and plan to begin an age validation study of fat threeridge this summer.

Mussel Aging at UGA

Nicole Rankin and Jason Wisniewski (state malacologist for GA Department of Natural Resources) visited the University of Georgia in Athens to assist with aging *Villosa vibex* (southern rainbow) samples from the Apalachicola, Chattahoochee, Flint river basin. Nicole and Jason met with Justin Dycus, graduate student in the Warnell School of Forestry and Natural Resources, to age forty-two southern rainbow samples on January 14 and 15, 2010. The group examined sections using a dissecting microscope and identified annuli independently to come up with a consensus. For his thesis work, Justin is evaluating the potential influence of changes to the flow regime on mussel growth by modeling annual growth and stream flow. He hopes to develop tools for assessing the effects of water use on mussel populations in the Flint River.

Appalachian Landscape Conservation Cooperative Workshop



LCC: Geographic Framework.
Credit: USFWS Photo.

William Wayman and Greg Moyer attended the Appalachian Landscape Conservation Cooperative Workshop on January 25 – 29, 2010 in Johnson City, TN. The meeting focused on developing an understanding of Strategic Habitat Conservation (SHC) and Landscape Conservation Cooperatives (LCC) among the project leaders within the geographic area. Presentations were given by numerous USFWS personnel, other Department of Interior agencies, and various partners to help explain the elements of SHC and how the LCCs will be used to apply SHC to meet our conservation goals in a new large, landscape framework. Breakout sessions also gave an opportunity to provide direct interaction and input on each person's understanding of the two concepts. At the end of the meeting, William volunteered to serve on the scoping team for the Appalachian LCC.

Aquatic Species Conservation and Management

Annual *Morone* Meeting in Crawfordville, FL

Tank spawning domestic striped bass. Credit: USFWS Photo.

Greg Moyer, Ashantye' Williams, Bill Wayman, and Nicole Rankin attended the annual *Morone* meeting held February 9 and 10, 2010 in Crawfordville, FL. The meeting was comprised of various state, federal, and university scientists working with striped bass inhabiting the Apalachicola, Chattahoochee, Flint (ACF) river basin. Greg provided an update of the Gulf coast striped bass broodstock screening and the genetic status of broodstock lakes. He also offered guidance in assessing survival of phase I and II striped bass using molecular tags. Brent Hess, Georgia Department of Natural Resources, presented results from a molecular and oxytetracycline (OTC) tagging study of Gulf striped bass in West Point Lake. The FTC collaborated with Brent on this study and estimated levels of genetic diversity, helped estimate age using otoliths (fish ear bones), and helped check for presence of an OTC mark. Results from this study highlight the utility of molecular tags to perform mark/recapture studies for estimation of survival and census size of striped bass in the ACF River Basin. Bill gave an update on the progress of a tank spawning of domestic striped bass study.

Gulf Coastal Plain and Ozarks LCC

William Wayman represented the Fisheries program as a member of the Gulf Coastal Plain and Ozarks Landscape Conservation Cooperative Workshop planning team. He assisted with the development and review in the planning for the breakout group activities. The workshop was held on March 16 – 18, 2010 in Pearl, MS and focused on developing an understanding of Strategic Habitat Conservation (SHC) and Landscape Conservation Cooperatives (LCC) among the project leaders within the geographic area. William Wayman gave a presentation illustrating the perspective of Fisheries project leaders towards SHC and LCCs prior to the meeting, and showcased the capabilities of the Fisheries program within the geographic area.

Southern Division AFS Meeting in Ashville, NC

Greg Moyer was invited to present two talks at the 18th Annual Meeting of the Southern Division of the American Fisheries Society held in Asheville, North Carolina on February 25 – 28, 2010. The first presentation, which was titled "The Use of Conservation Genetics in Hatchery Management – Addressing Questions with Answers" was part of a genetics workshop held during the annual meeting. The goal of this workshop was to provide further insight to individuals from universities, federal and state agencies, non-governmental organizations on conservation genetics and its application in fisheries science and management. During this workshop, Greg was also part of an expert panel that addressed questions and concerns about the utility of conservation genetics in fisheries management. The second presentation was delivered in the Restoration of Non-game Species Habitats and Populations symposium. Greg presented a summary and provided recommendations for genetic risks for managing or conserving small, isolated populations.

Aquatic Species Conservation and Management

GA Chapter AFS Meeting in Perry, GA

Nicole Rankin and Chester Figiel, Jr. attended the Annual Georgia Chapter of the American Fisheries Society Meeting in Perry, GA on January 26 and 27, 2010. Over 100 people attended the conference, and the first day was filled with student presentations. Chester gave an oral presentation entitled "A Database for the Culture of Imperiled Species." This talk highlighted how the National Fish Strain Registry can be used to assist in developing management strategies for threatened and endangered species.

Public Use

Junior Ranger Camp Coordination

Nicole Rankin and Rosla Plant met with staff from the Roosevelt's Little White House Historic Site on February 17, 2010 to coordinate this year's Junior Ranger Camp program. This year, camps will be held on June 15 – 17 and June 22 – 24, 2010, and junior rangers will spend one day at each facility: FDR State Park, Roosevelt's Little White House, and the Warm Springs RFC. All three sites will offer a birding activity (build a bird feeder, bird hikes, and build a bird house) to emphasize the value of bird and habitat conservation. The RFC will also offer the Biologist in Training (BiT) program, and junior rangers will learn about aquatic food webs and habitats, fish identification and body parts, and aquatic species conservation.

Junior Ranger Camp 2009 learns how to build a fish. Credit: USFWS Photo.

Nicole Rankin gave a presentation titled "Warm Springs Regional Fisheries Center- More Than A Hatchery" to the Thomaston Rotary Club in Thomaston, GA on February 16, 2010.

Workforce Management

Smith-Root PES Demonstration

Smith-Root, Inc. came to the Warm Springs Regional Fisheries Center to give a demonstration of their Portable Electroanesthesia System (PES) on February 24, 2010. The PES is a cooler-based electroanesthesia machine designed to provide rapid anesthesia to cool- and warm-water fishes. One advantage of using such a system to anesthetize fish is the lack of chemicals, which eliminates the required withdrawal period associated with chemical anesthesia. The PES unit was demonstrated on a number of different species, including grass carp, catfish, rainbow trout, striped bass, and sturgeon. Length of time anesthetized, level of anesthesia, and any injuries were noted for each species.

Chester Figiel, Jr. attended the NCTC course "Resource Management Implication of Global Climate Change" on February 8 – 12, 2010.