Warm Springs Fish Technology Center

March/April 2009 Activity Report

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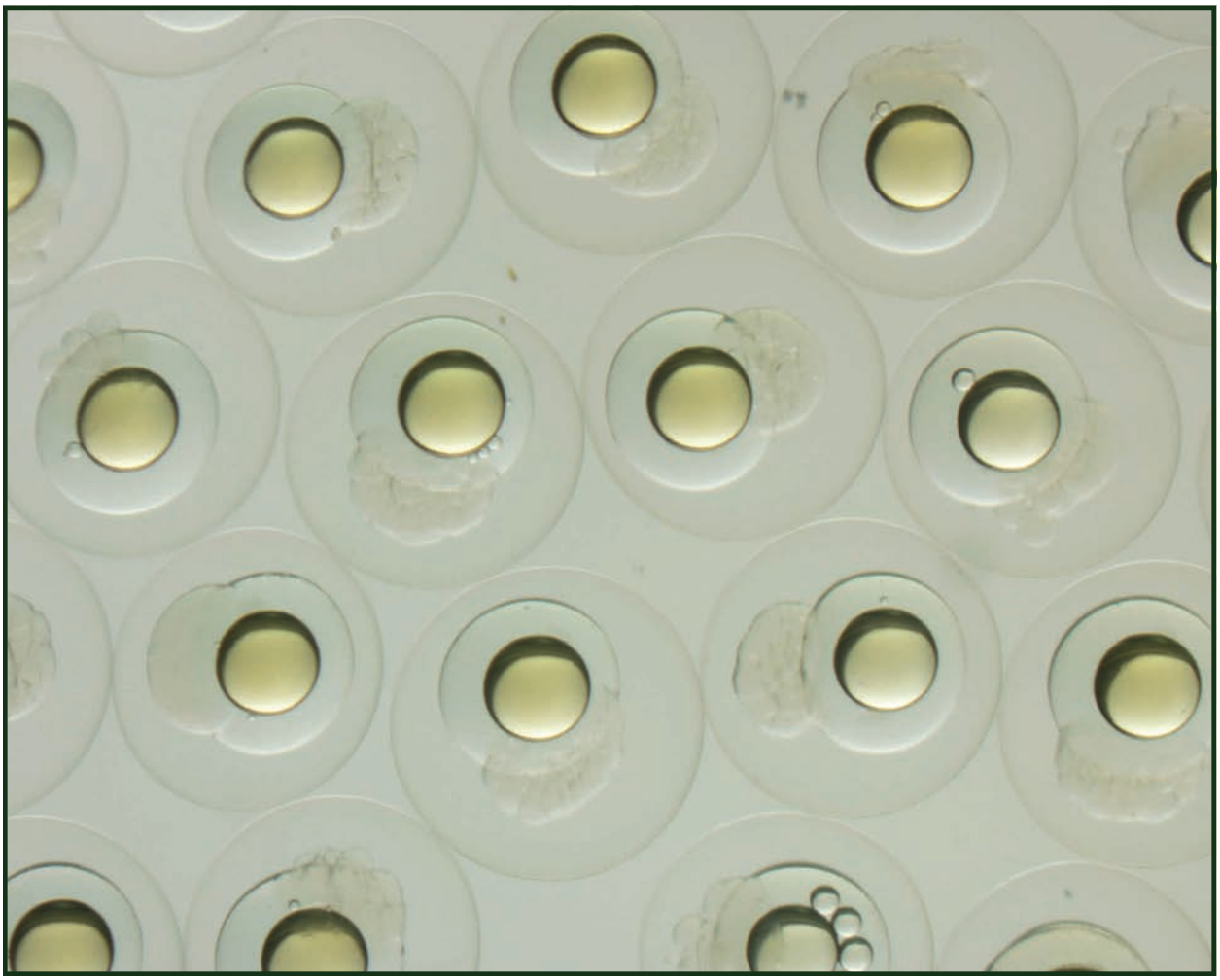

Close-up of striped bass eggs with cell division. Credit: USFWS Photo.

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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.

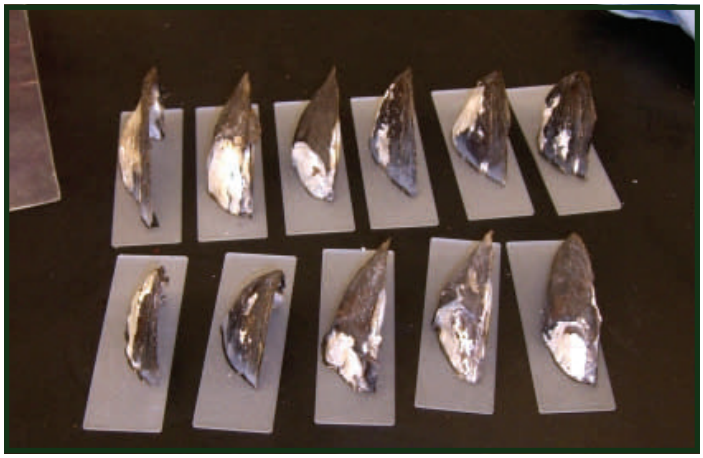
Goals:

- 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.



Elephantear mussel shells mounted to microscope slides for sectioning and aging. 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

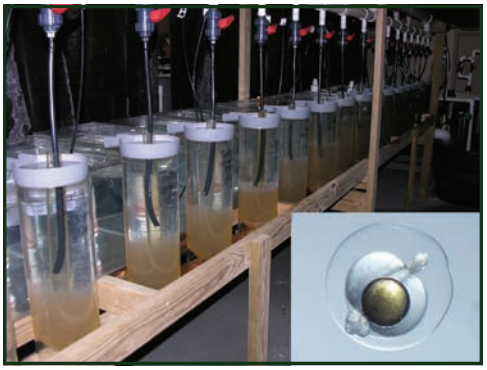
Fish Passage Seminar at Columbus State

Bill Bouthillier conducted a short seminar on fish passage and stream fragmentation for a graduate special topics class at Columbus State University on April 16, 2009. The seminar was shaped to give an overview of stream fragmentation and ecological importance of stream continuity. Topics covered were specific mechanisms and affects of fragmentation both physical and biological. Poorly designed stream crossings are one factor that can lead to fragmented habitats and isolation of aquatic species.

Leadership in Science and Technology

Tank Spawning of Domestic Striped Bass

The FTC has been tank spawning domestic striped bass broodstock in an effort to develop a technique for a reliable supply of striped bass fry during years when wild striped bass brood stock are in short supply. Using a method developed at North Carolina State University, the broodstock have been raised in captivity their entire lives and require a different spawning protocol than has been develop for wild broodstock. The females are implanted with slow-release hormone pellets when their oocytes reach a certain size. The females are paired with 2 to 3 males and allowed to spawn volitionally within the tank. If the females do not spawn within a few days, their eggs are biopsied, and if her oocytes have reached a certain stage of maturation, the female will receive an injection of another hormone to initiate spawning. The FTC spawned striped bass for three weeks and produced over 2.25 million fry. Some of the fry were stocked into ponds for further growout.



Striped bass eggs rolling in McDonald-type hatching jars and close-up image of striped bass embryo. Credit: USFWS Photo.

Amphibian Ark Articles

Chester Figiel, Jr. coauthored four articles published on the Amphibian Ark website (http://www.amphibianark.org/science_research.htm) regarding amphibian reproductive technologies.

Browne, R. K. and C. R. Figiel, Jr. 2009. Amphibian Reproduction Hormone Cycle. *In* Amphibian Ark Science and Research. Antwerp, Belgium. http://www.amphibianark.org

Browne, R. K. and C. R. Figiel, Jr. 2009. Reproduction Technology Key Document. *In* Amphibian Ark Science and Research. Antwerp, Belgium. http://www.amphibianark.org

Browne, R. K. and C. R. Figiel, Jr. 2009. Hormone Preparation and Use. *In* Amphibian Ark Science and Research. Antwerp, Belgium. http://www.amphibianark.org

Browne, R. K. and C. R. Figiel, Jr. 2009. Gel Removal and Gel Extract. *In* Amphibian Ark Science and Research. Antwerp, Belgium. http://www.amphibianark.org

amphibian ark

Leadership in Science and Technology

Article Published in Crayfish News

An article authored by Chester Figiel, Jr. was published in the March 2009 issue of *Crayfish News* entitled "Notes on the Piedmont Blue Burrower, *Cambarus harti*". This article described recent sampling efforts and the need to study basic ecology and behavior, estimate population size, and determine habitat requirements of the Piedmont Blue Burrower to continue conservation efforts.

FTC Directors' Meeting

William Wayman and Greg Moyer attended the annual Fish Technology Centers Directors' Meeting in Minneapolis, MN during April 28 – 30, 2009. The meeting is used to discuss Fish Technology Centers' (FTCs) current roles and responsibilities in meeting the needs of the National Fish Hatchery System, and to identify how to position the FTCs for alignment with future directions of the USFWS. The meeting also brings together working groups of biologists to further enhance relationships and inter-Regional collaboration. The groups typically discuss current research projects, problems encountered, and research ideas that are multi-Regional in scope. This year's meeting, FTC personnel presented information to the Fisheries and Ecological Services Assistant Regional Directors that focused on: 1) an overview of the current capabilities of FTCs; 2) how these capabilities can and will be used as the USFWS begins to cope with climate change and it's new conservation model of Strategic Habitat Conservation; and 3) how increased capacity in our current disciplines combined with additional capabilities could complimentarily benefit the long-term goals of the USFWS.

Aquatic Species Conservation and Management

Freshwater Mussel Thin-Sectioning

Nicole Rankin visited the USDA Forest Service Center for Bottomland Hardwoods Research office in Oxford, MS to receive mussel thin-sectioning and age interpretation training from Wendell Hagg and Mickey Bland. On April 14 – 16, 2009, she learned to section mussel shells using an Isomet low-speed saw, polish shell halves using a series of four sandpapers, and interpret mussel age using thin sections. The FTC is conducting an age, growth, and validation study on two freshwater mussels, *Elliptio crassidens* and *Amblema neislerii*, from the Apalachicola-Chattahoochee-Flint River Basins. To date, we have sectioned 75 *A. neislerii* and 40 *E. crassidens*, and we will continue sectioning mussel shells throughout the year. This training helped Nicole become more effective and efficient at sectioning and aging mussel shells, and this project will lead to an increase in our understanding of basic mussel biology. Thanks Mickey and Wendell for your help!

Mickey Bland making first cut through the umbo of mussel shell.
Credit: CBHR Photo.

Amblema neislerii thin section.
Credit: USFWS Photo.

Mickey Bland mounting mussel shell halve to microscope slide with epoxy.
Credit: CBHR Photo.

Public Use

Big Green Festival at Columbus State University

Bill Bouthillier explaining the STEP program to interested students. Credit: USFWS Photo.

Bill Bouthillier and Nicole Rankin from the FTC and Sandra Nipper from the Fort Benning Ecological Services Field Office participated in the First Annual Environmental Awareness Day at Columbus State University on March 26, 2009. They manned a booth that illustrated each station's research and regulatory programs. The trio advised students on employment opportunities the USFWS offers in regards to the Student Temporary Employment Program (STEP) and Student Career Experience Program (SCEP) and offered information and material about endangered species, fish passage, freshwater mussel conservation and aquatic nuisance species. Despite the heavy rain, twenty other organizations participated in the event and over 150 students were enlightened to the USFWS mission of working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

Go Green! Earth Day Festival at FDR State Park

Kids looking for aquatic critters to touch. Credit: USFWS Photo.

Go Green! Earth Day Festival was celebrated by the FTC in partnership with F.D. Roosevelt State Park on Saturday, April 18, 2009. This three-day event focused on promoting environmental awareness and conservation, eco-friendly alternatives, and ways to reduce your environmental footprint by reducing, reusing, and recycling. Allison Fritts-Penniman, Chester Figiel, Jr., and Nicole Rankin provided information and activities on the USFWS and aquatic species and habitat conservation. A live touch tank with crayfish, salamanders, and tad poles; a dissecting microscope with live macroinvertebrates; and a juvenile American alligator were the major attractions for more than 30 children and adults. Several other organizations provided activities to encourage participants to enjoy the outdoors.

Chester Figiel, Jr. presented an American alligator program to 120 elementary school students at the Rosemont Elementary School, Troup County Georgia on April 3, 2009.

Nicole Rankin, Chester Figiel, Jr., and Rosla Plant gave tours of the aquarium and wetland boardwalk to more than 80 children and parents from Noah's Ark Preschool class on April 23, 2009.

Workforce Management

Earth Hour 2009

The Fish Technology Center observed Earth Hour 2009 by switching off all lights and non-essential electrical equipment between 11:30 am and 12:30 pm on Friday, March 27, 2009. This event brought attention to the need to increase our energy efficient behavior and will lead us to redouble our efforts in tackling the management of our resources. See www.earthhour.org for details.

Nicole Rankin attended the Public Outreach and Education: Overview and Program Planning training at the National Conservation Training Center on March 30 – April 3, 2009.