Warm Springs Fish Technology Center

October 2008 Activity Report

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Biologist tagging endangered Appalachian elktoes, *Alasmidonta raveneliana.* More than 450 mussels were tagged and relocated in the Tuckasegee River. 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.

Atlantic sturgeon, *Acipenser oxyrinchus*. 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 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

ACF River Basin Mussel Meeting

The FTC co-hosted an Apalachicola-Chattahoochee-Flint River Basin Mussel Meeting on October 2-3, 2008. The meeting brought together USFWS Ecological Services and Fisheries personnel to discuss mussel conservation priorities and coordination of efforts on Quick Response and Deferred Allocation projects. The FTC was awarded $99,000 to develop microsatellite markers, define populations, estimate genetic diversity, and prioritize populations for conservation of the purple bankclimber, oval pigtoe, and fat threeridge, $5,000 to initiate research into mussel stress response indicators, and $5,000 to develop glochidia cryopreservation techniques. FTC staff provided a presentation on "Incorporating genetics into Section 7 analyses and recovery actions," detailed the study designs and coordination needs for the funded projects, and gave tours of the Conservation Genetics and Cryopreservation Laboratories. The Friends of the Warm Springs National Fish Hatchery provided a hot dog lunch for meeting attendees. Overall, the meeting was a great success and will be followed by a second meeting on December 2, 2008 to enhance the coordination and interaction developed by Ecological Services and Fisheries staff.

ACF River Basin Meeting attendees and Friends group members. Credit: USFWS Photo.

Help to Relocate Endangered Mussels

Mark Cantrell, Fish and Wildlife Biologist of the Asheville Ecological Services Office, put out a call for all hands to assist with a hydroelectric project that required surveying and relocating endangered Appalachian elktoes, *Alasmidonta raveneliana*, in Dillsboro, North Carolina. Bill Bouthillier from the Warm Springs FTC, along with fisheries biologists from Orangeburg National Fish Hatchery, personnel from Duke Energy, staff from several state agencies, and volunteers, assisted with the project from September 29 – October 1, 2008. Despite the crisp mornings and cool water temperatures, surveyors were able to tag and move more than 450 mussels in the Tuckasegee River. This combined effort was a great success and resulted in partnership building and interagency cooperation between USFWS Ecological Services and Fisheries.

Appalachian elktoes.

Surveyors searching for mussels.

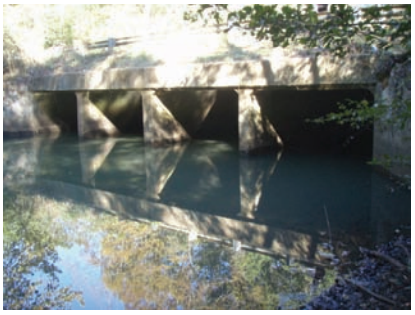
Biologist tagging Appalachian elktoes.

Credit: USFWS Photos.

Aquatic Species Conservation and Management

Fish Passage and Freshwater Mussels Conservation

Bill Bouthillier and Nicole Rankin completed an extensive survey of stream crossings in the Sawhatchee Creek and Kirkland Creek watersheds of southwest Georgia to identify and prioritize barriers to fish passage. Both creeks have been designated as critical habitat by the USFWS for several listed mussels: shinyrayed pocketbook, oval pigtoe and Gulf moccasinshell. One of the primary elements for the critical habitat designation is host fish, which support the larval life stages of mussels. Fish barriers can disrupt fish host movement between the upstream and downstream limits, gamete transport, dispersal into suitable habitats, and food item transport. Approximately 30 road crossing and 35 river miles were assessed during this survey.



A culvert backwatered its entire length. Credit: USFWS Photo.

Leadership in Science and Technology

Warm Springs Showcased in Eddies

The Warm Springs Regional Fisheries Center (RFC) was featured in several articles in this issue of "Eddies: Reflections on Fisheries and Conservation." The RFC is the "Featured Facility", which gives a very brief history of the facility and description of types of work. Bears Bluff National Fish Hatchery's PIT tag research is showcased in the article "Short in size – long on data". An article entitled "Cryogenics for Conservation" describes the FTC's role in using cryopreservation to aid in recovery of the endangered pallid sturgeon. "Fighting the Amphibian Fungus" discusses the FTC's function in conserving declining amphibian populations due to a fungus called *Batrachochytrium dendrobatidis*. "Fishingenuity" focuses on the Conservation Genetics Lab's effort at determining an appropriate broodstock source for possible stocking of Atlantic sturgeon into the St. Mary's River from which it may have been extirpated. Each article describes just some of the work being performed by the RFC.

Front page of Eddies. Credit: Bob Hines.

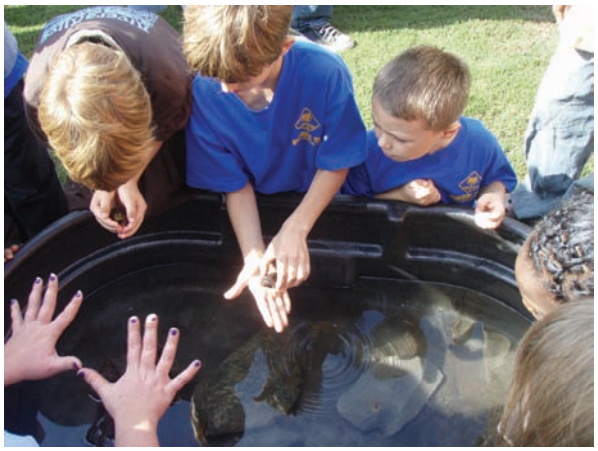
Tissue Swabbing Efficiency for Freshwater Mussels

The Conservation Genetics Lab conducted an experiment to test the effectiveness of two noninvasive mussel tissue sampling methods. The first sampling method uses a small spiral brush, and the second uses a flat cotton swab. We found that both methods are effective at collecting a sufficient amount of DNA, although on average the brush yielded a significantly greater DNA concentration. This was determined by extracting DNA from brush and swab samples and using a spectrophotometer to measure the nucleic acid concentration for each sample. We found significant differences (t stat 2.77, $p < 0.05$) between the mean DNA concentration using the brush (mean = 492.5 ng/ul) versus the swab (mean = 234.6 ng/ul). Even though using the brush resulted in a significantly higher mean DNA concentration, our target concentration for further genetic analysis of these samples is only 50 ng/ul, and both sampling methods consistently produced this concentration or greater. We recommend that either sampling method be used in the field, based on personal preference and convenience.

Public Use

Warm Springs "Helps the Hooch"

Warm Springs RFC staff participated in the 12th Annual Help the Hooch watershed festival in Columbus, Georgia on October 18, 2008. Staff set up a booth with several tanks containing aquatic species from the watershed. The most popular attraction was the touch tank, which contained turtles, frogs, crayfish and tadpoles. Approximately 5,500 children filtered though the booth getting a chance to touch or pick up crayfish and turtles and learn about aquatic species conservation. Prior to the watershed festival, over 10,000 volunteers participated in the Help the Hooch river clean-up to pick up trash along the banks of the Chattahoochee River and some of its tributaries. Volunteers removed over 100,000 pounds of litter!

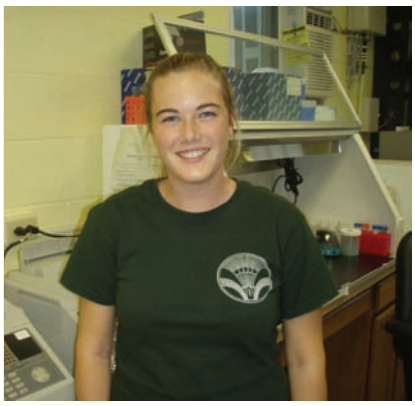


Children around the touch tank learning about aquatic species. Credit: USFWS Photo.

Another popular exhibit was the freshwater mussel table. Credit: USFWS Photo.

Workforce Management

Welcome Allison



Allison Fritts-Penniman.

Allison Fritts-Penniman joined the FTC as a Student Conservation Association intern on October 2, 2008. Her role as intern will mainly focus on genetic research in the Conservation Genetics Lab. Allison is interested in using genetic techniques for the conservation of marine species and communities. She is currently applying to graduate school, with hopes of earning a doctorate in marine biology. She grew up in Trumansburg, NY and recently received her Bachelor of Science degree in natural resources and biology from Cornell University in Ithaca, NY. When she's not performing DNA extractions, amplifying DNA, or feeding fish, Allison enjoys hiking, reading, and singing (which she tends to do while working). She is happy in Warm Springs and would like to thank everyone for a warm welcome!

Training

Bill Bouthillier attended a Road/Stream Crossings - Inventory, Assessment, Design and Construction Workshop in Rhinelander, Wisconsin from October 7-9, 2008.