Warm Springs Fish Technology Center

September 2008 Activity Report

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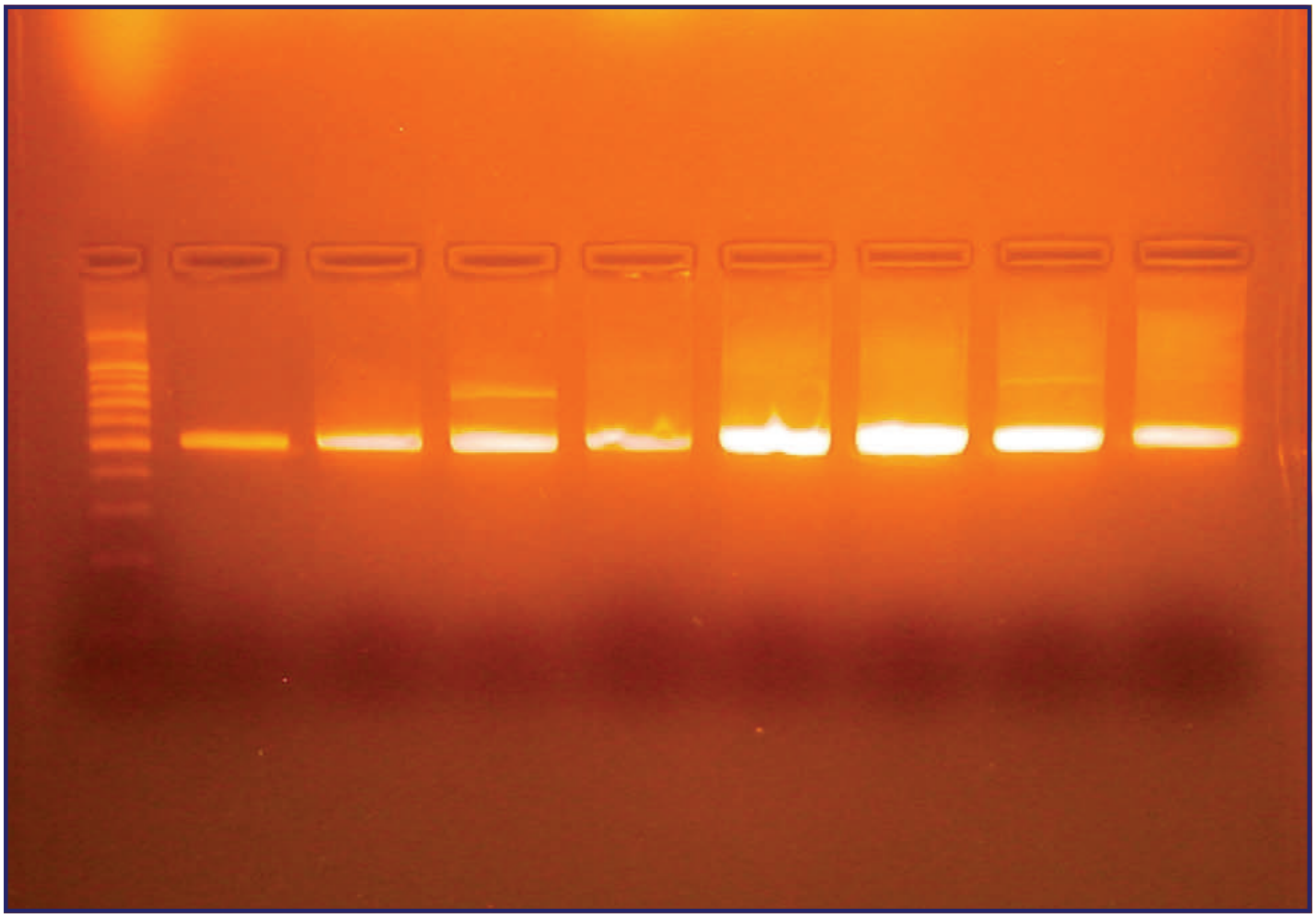

Agarose gel image of mtDNA 16SrRNA PCR product from elephant-ear mussels. First lane is a size standard. Lanes 2-5 are DNA isolated from swabs and 6-9 are from mussel tissue samples. Credit: USFWS Photo.

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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.

Pair of bullfrogs, *Rana catesbeiana*. 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.

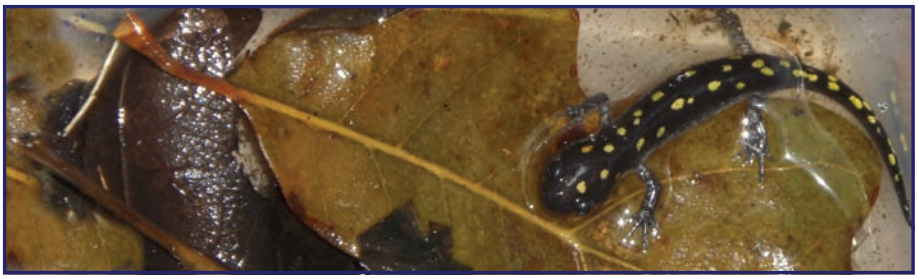
National Fish Strain Registry

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

Amphibian Education Partnership

The FTC provided salamanders to the Williams H. Reynolds Memorial Nature Preserve for their nature center located in Clayton County, Georgia. This partnership provides an opportunity to educate the more than 35,000 visitors annually about the amphibian extinction crisis and biodiversity conservation. For example, did you know that 50% of the world's 6,000 amphibians are in decline and approximately 500 endangered species require *ex situ* programs for their survival?



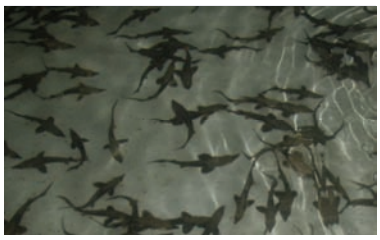
Spotted salamander, *Ambystoma maculatum*. Credit: USFWS Photo.

Collaboration for Mussel Recovery

Currently, there are approximately 70 freshwater mussel species listed as threatened or endangered in the United States. The continuing drought throughout the southeastern U.S. has only exacerbated this situation, greatly increasing the risk of extirpation of many populations. The FTC has entered into a collaborative effort to develop cryopreservation procedures for freshwater mussel sperm and glochidia. Research will be conducted at Warm Springs and the Virginia Polytechnic Institute and State University's Freshwater Mollusk Conservation Center. Both facilities are conducting initial stages of their research, and expect that through combining information and efforts, the time table for development of these techniques will be reduced. Leroy Koch of the Kentucky Ecological Services Field Office was instrumental in establishing this partnership.

Different species of mussels from Spring Creek. Credit: USFWS Photo.

Lake Sturgeon Restoration



Juvenile lake sturgeon. Credit: USFWS Photo.

FTC staff assisted the Warm Springs National Fish Hatchery with marking juvenile (15-20 cm) lake sturgeon, *Acipenser fulvescens*. Fish were marked in two ways: 1) scute removal and 2) coded wire tags. These fish will be stocked as part of restoration efforts in the Tennessee River watershed in collaboration with the Tennessee Wildlife Resources Agency.

Leadership in Science and Technology

Noninvasive Tissue Sampling of Freshwater Mussels

A noninvasive tissue sampling technique, developed by the Conservation Genetics Lab (CGL), is being employed by USFWS biologists to study population structure and estimate genetic diversity for threatened and endangered (T & E) mussels of the Apalachicola-Chattahoochee-Flint river system. Over the month, CGL has participated in sample collection, tissue swabbing and lab work to refine existing protocols for the extraction of DNA from T & E freshwater mussels. Recently, CGL confirmed that DNA from the elephant-ear mussel, *Elliptio crassidens*, tissue swabs was indeed mussel DNA by sequencing a small portion of the genome and comparing the sequence to known exemplars.

Regional Geneticist, Greg Moyer demonstrates how to swab a mussel. Credit: USFWS Photo.

National Fish Strain Registry is Online

The National Fish Strain Registry (NFSR) is an internet-based program that assembles information on the life history, genetics, reproduction, and behavior of wild populations and domestic broodstock strains. This management tool can assist resource managers with decisions on which populations will be most effective for each production or conservation management application. As of September 25, 2008, the NFSR database is available for use by federal and state governments, private producers, and the general public. In order to access the NFSR website, please submit a request via email to NFSR managers, Chester Figiel (chester_figiel@fws.gov) and Nicole Rankin (nicole_rankin@fws.gov). Once registered, users can access the page at http://sds.fws.gov/nfsr. Over the next several months, NFSR managers will be contacting federal and state hatcheries to input information about fish strains they are currently managing. This database is responsive to the needs of our partners and to the mission of the USFWS (i.e., to conserve and protect aquatic resources) and is available to fisheries managers, fish producers, and researchers throughout the United States.

Workforce Management

Bill Wayman and Chester Figiel completed the required EEO/diversity training for FY2008. This included Department of Interior courses on “Culture and Behavior” and “Section 508 Awareness: Promoting Awareness, Providing Solutions.”

On September, 24, 2008, FTC staff conducted a Safety and Health Awareness meeting to discuss lab safety, fire prevention, first aid equipment, and the USFWS occupant emergency plan.

Thanks to Lawrence Ford and Rosla Plant (both from the Warm Springs Regional Fisheries Center) for their energy and commitment as they persevered over our year-end budget.

Public Use

Boy Scouts Learn about Fish and Wildlife

Sandra Dietz and Friends' member, Frida Powers-Coates, looking at the live working bee hive. Credit: USFWS Photo.

Sandra Dietz, along with Regional Fisheries Center staff and Friends of the Warm Springs National Fish Hatchery, staffed an event at Warm Springs for a Chattahoochee Council of Boy Scouts retreat on September 13, 2008. Over 300 scouts and scout leaders participated and learned about different facets of the Warm Springs Regional Fisheries Center. Stations and activities were provided to display information related to the USFWS including: pollinators, invasive species, confiscated law enforcement items (showcasing illegal importation of threatened and endangered species), knot tying, cleaning/filleting fish, backyard habitats, recycling programs including monofilament, and opportunities for employment and volunteering. The most popular station was Pollinators, which featured a live working bee hive maintained and demonstrated by Sandra.

Warm Springs Open House

On September 20, 2008, the FTC participated in the Warm Springs National Fish Hatchery Open House. This event focused on promoting the USFWS mission of working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. FTC staff set up displays, computers, and a video screen to provide information to more than 90 children and adults about cryopreservation, conservation genetics, freshwater mussels, fish passage, amphibian conservation, and fish spawning techniques. A 50-gallon touch tank with crayfish, bull frogs, salamanders, and musk turtles was a highlight for families with children. Another popular station was the 500-gallon striped bass display tank; attendees were able to learn about striped bass spawning and stocking programs. The FTC egg trailer was the largest display and included a live freshwater mussel tank, live freshwater fish (sunfish, largemouth bass, bullhead catfish) tank, and an egg incubation demonstration. All FTC staff were present and contributed to the success of this event. Other participants in the Open House included staff from the Warm Springs Regional Fisheries Center, Fish Health Center, and National Fish Hatchery, members of the Friends of the Warm Springs National Fish Hatchery, and several other volunteers.

Regional Geneticist, Greg Moyer, talking to a family about conservation genetics. Credit: USFWS Photo.

Fish Biologist, Nicole Rankin, talking to children about striped bass spawning. Credit: USFWS Photo.