



# Warm Springs Fish Technology Center

## January/February 2012 Activity Report

Dr. William Wayman, Center Director

Dr. Chester Figiel Jr., Supervisory Fish Biologist

Dr. Gregory Moyer, Regional Geneticist

Jaclyn Zelko, Fish Biologist

Ashantyé S. Williams, Geneticist

Gregory Scull, Biologist

Dr. Edgardo Diaz-Ferguson, postdoctoral researcher

Dr. John Robinson, postdoctoral researcher

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The Alabama state listed holiday darter (*Etheostoma brevirostrum*) was one of many aquatic species discussed at the 2012 Alabama Fish/Mollusk/Crayfish meeting. Credit: Jacksonville State University

# 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, Atlantic sturgeon, Gulf sturgeon, American shad, 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, freshwater mussels, and amphibians.
- Develop hatchery product evaluation techniques.

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## 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. The program has expanded to include other aquatic species such as freshwater mussels and amphibians for conservation efforts.



Bill Wayman thawing straws containing cryopreserved rainbow trout sperm at Erwin NFH, TN. Credit: 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 (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](mailto:chester_figiel@fws.gov) or [gregory\\_scull@fws.gov](mailto:gregory_scull@fws.gov) to become a registered user.

# Leadership in Science and Technology

## Rainbow Trout Fertilization Trials

William Wayman and Jaci Zelko returned to Erwin National Fish Hatchery on February 14<sup>th</sup> to perform a fertilization trial with cryopreserved sperm. The trial was done to determine if cryopreserved sperm could be used for production of future broodstock for the station. Sperm that were cryopreserved in February of 2011 were thawed and used to fertilize batches of eggs. The eggs were then combined for disinfection, water hardening, and incubation. Eggs fertilized with cryopreserved sperm produced a 41% eye-up, as compared to 62% for fresh sperm controls. Hatch rates for these eggs are currently being determined. Although the current protocol will meet the needs of the hatchery, it is believed that increasing the cryopreserved sperm:egg ratio will increase the eye-up and hatch rates in future efforts.



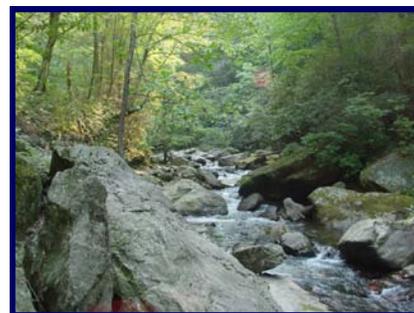
(L) Biologists at Erwin NFH strip eggs from a female rainbow trout for use in fertilization trials.  
(R) Frozen sperm is thawed and placed on a small aliquot of eggs for the trial. Credit USFWS

## Environmental DNA (eDNA) Protocol Enhancements

A preservation method for environmental water samples using sodium acetate and 95% ethanol was successfully tested. This method allows the preservation of water samples collected from local ponds for more than 15 days. This is a key step towards the final goal of detecting genetic material from natural systems. We also tested our designed primers and probes for *H. letourneuxi* (African jewel fish) and set up new reaction conditions for quantitative PCR analysis using the 7500 Fast Real-Time PCR system. This new qPCR analysis allows us to run a preliminary standard curve for the detection of our probes.

## *Batrachochytrium dendrobatidis* “Chytrid” Surveys

Chester R. Figiel, Jr. surveyed multiple streams in the Southern Appalachians to compare chytrid prevalence in water and salamanders in low- and high-order streams. The chytrid fungus has been implicated in amphibian declines and caused death in close to 100 amphibian species. This ongoing monitoring and research is funded through the Regional Office’s Aquatic Invasive Species Program.



Tallulah River in Northeast Georgia.  
Credit USDA Forest Service

# Leadership in Science and Technology

## Lake Sturgeon Molecular Tagging Study

The Tennessee River Lake Sturgeon Reintroduction Working Group (TRLSRWG) has been working towards the goal of restoring lake sturgeon. The plan called for the marking or tagging of all individuals to track success of restoration. Conventional tags for long-lived species are prone to failure because of battery life, tissue regeneration or loss of external tag. The Tennessee Wildlife Resource Agency contacted the Conservation Genetics Laboratory (CGL) to explore the utility of molecular tags, which do not suffer from the inadequacies of conventional tags and are a part of the fish until death. Ashantye' Williams attended the annual TRLSRWG Meeting held in Chattanooga, TN on January 17-18, 2012. She presented the importance of molecular tags for the lake sturgeon mark/recapture study and reminded the group about the importance of sampling procedures when collecting tissue samples used to determine the genetic characteristics of the adult broodfish. A preliminary study was conducted using simulations on a suite of eleven microsatellite markers used in sturgeon. Results indicate that six markers are necessary for accurate allocation of closely related progeny (brothers and sisters) to their respective parents. When developed, molecular tags can be used to accurately perform mark/recapture studies for estimation of survival and census size of lake sturgeon in the Tennessee River.

## Workforce Management

### Warm Springs FTC Welcomes New Biologist!

Gregory Scull joined the staff of the FTC on February 13, 2012 as a biologist for the National Fish Strain Registry. Greg brings valued federal experience from working with the USDA Forest Service as the district Wildlife Biologist at the Kootenai National Forest (Montana) where he performed duties related to the protection and improvement of habitat within the framework of landscape level processes. Greg completed his masters degree at Jacksonville State University (Jacksonville, AL) where he worked on fish assemblages of the Choccolocco Creek watershed (northeast Alabama). We are happy to have his service.



Gregory Scull Credit: USFWS

### Welcome Summer!

The Tech Center has welcomed a new intern, Summer Molnar. Summer is a senior at Harris County High School in Hamilton, GA. Her internship is part of an honors internship class. She is interested in DNA and genetics and hopes this experience will help prepare her for college. Summer will be working in the Conservation Genetics Lab.

“Working as a volunteer at the Warm Springs has been an exciting experience so far. I have learned many things that have prepared me for my future career. My main focus of work takes place in the genetics lab. There I use the centrifuge, NanoDrop, electrophoresis equipment, and various other pieces of equipment. This opportunity has advanced my understanding of science and has allowed me to grow as an individual. It has been a pleasure interning at the Warm Springs Fish Technology Center. – Summer Molnar”

# Partnerships and Accountability

## Annual Morone Meeting

Greg Moyer and Ashantye' Williams attended the annual *Morone* meeting held February 8 – 10, 2012 in Crawfordville, FL. The ACF Striped Bass Restoration and Evaluation Plan was developed to restore and maintain a self-sustaining population of native Gulf Coast striped bass. Ashantye' presented results of Gulf coast striped bass broodstock screening and assessed the genetic status of broodstock lakes. The ACF river system has continually supported a naturally reproducing population of striped bass (*Morone saxatilis*) of the Gulf of Mexico lineage. Smith Lake (Alabama), and Lake Talquin (Florida) have been designated as suitable broodstock repositories for the Gulf Coast strain of striped bass. Genetic monitoring of the stocking strategies of the broodstock lakes is crucial for the successful reestablishment of striped bass and the maintenance of its genetic integrity. Using microsatellites, results indicate that while there is ample genetic diversity in the broodstock lakes, the variation differs significantly among lakes. Ashantye' recommended hatchery managers create more unique crosses of striped bass and stock their progeny throughout ACF river system.

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## Alabama Annual Fish/Mollusk/Crayfish Meeting

Jaci Zelko attended the Alabama Division of Wildlife and Freshwater Fisheries annual non-game fish, mollusk, and crayfish meeting January 17-19, 2012 at Guntersville State Park, Guntersville, Alabama. The meeting is held for managers, academics, public utilities, consultants, and other researchers to discuss ongoing projects and activities related to non-game freshwater species in Alabama. Jaci gave a quick update on the current activities at the Tech Center including freshwater mussel studies involving cryopreservation and in vitro techniques.

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## F.I.S.H. Friends Group Meeting

Jaci Zelko and Greg Scull attended the March F.I.S.H. Friends group meeting. Greg, who will be conducting outreach for the Tech Center, was introduced to the members. Topics of discussion included staffing of upcoming large outreach events, membership drives, and assisting the hatchery with various projects.

