



# Warm Springs Fish Technology Center

## November/December 2011 Activity Report

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**All Warm Springs Regional Fisheries Staff participated in the Annual Holiday Party in December. This is fun time for all the staff to get together and eat good food! Credit: USFWS Photos**

# 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.



Ashanty  is preparing samples to be included into the tissue database. 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) to become a registered user.

# Leadership in Science & Technology

## Environmental DNA (eDNA) as a Detection Technique for Invasive Species

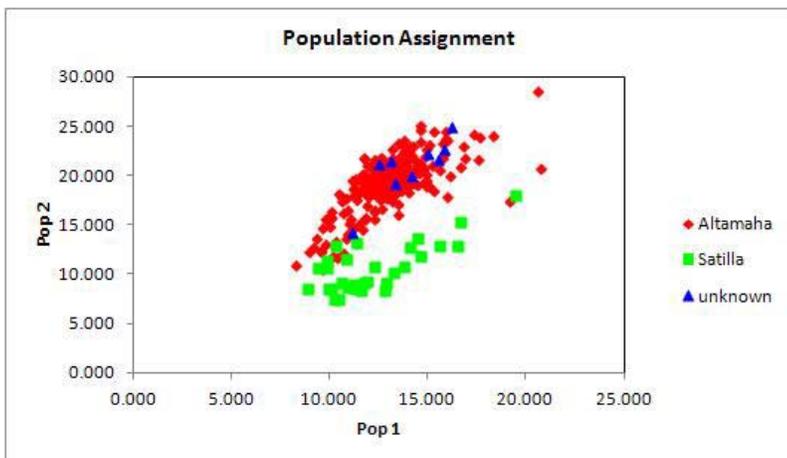
CGL is collaborating with Dr. Edgardo Diaz-Ferguson, UGA postdoctoral researcher, on the application of molecular techniques to detect rare and invasive species. A filtration system was set up to successfully extract DNA from water samples. This step is critical to reaching our final goal of detecting genetic material of invasive species from water samples of natural systems in Florida and Georgia.

## Making Strategic Habitat Conservation (SHC) and Landscape Conservation Cooperatives (LCC) a Priority

The CGL has continued its efforts surveying published genetic datasets to help identify patterns of genetic diversity and divergence across the SALCC. To this end, John Robinson has compiled datasets from a total of 28 species, including fish, amphibians, insects, and mollusks. We calculated genetic diversity and pairwise divergence for the populations sampled within the SALCC study region from each of these datasets. This information will be used, along with the geographical locations of the samples, to generate a GIS layer depicting hotspots of genetic diversity and genetic divergence in the region. These data will allow us to assess how well presently defined conservation areas protect genetic diversity, and to identify new areas of importance across the southeastern United States.

## Genetic Identification of Atlantic Sturgeon Origins in the Altamaha River

There has been interest in the restoration of Atlantic Sturgeon in South Carolina and other states in the southeastern US. As a result, the St. Mary's Fishery Restoration Committee (SMFRC) was formed. Bears Bluff National Fish Hatchery (BBNFH) plays a key role in stocking enhancement to re-introduce Atlantic sturgeon from the Altamaha River into the St. Mary's River. To determine the origin of the species, the Conservation Genetics Lab (CGL) was asked to provide genetic identification of 9 broodstock Atlantic sturgeon that are said to be from the Altamaha River. A multiplex of 10 microsatellite markers known to amplify in Atlantic sturgeon (Henderson-Arzapalo and King, 2002; King et al., 2001) and lake sturgeon (May et al., 1997) were used to identify the origin of the species. CGL has created a baseline of genetic data from juveniles captured in the Satilla and Altamaha Rivers. Based on genetic analysis, the broodstock fish were identified as originating from the Altamaha River.



This graph demonstrates the 9 unknown broodstock are from the Altamaha River. Credit: USFWS

# Leadership in Science & Technology

## Prioritizing Conservation Units for the Federally Endangered Bluemask Darter (*Etheostoma akatulo*)

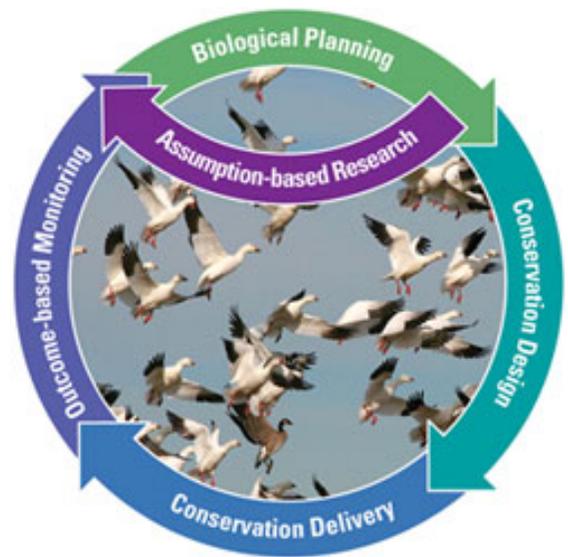
The USFWS has a recovery plan to downlist the bluemask darter once viable populations are restored throughout a portion of its historical range. The plan defines a viable population as a reproducing population large enough to maintain sufficient genetic variation to evolve and respond to natural habitat changes. A joint effort among the CGL, Cookeville Ecological Services, and the Tennessee Valley Authority sought to establish and prioritize units of conservation for this species. A pilot study was initiated using samples from the Caney Fork River system. Tests for the amplification of nineteen microsatellite markers that have been known to amplify in related *Etheostoma* species (Tonnis, 2006; Beneteau et al., 2007; Khudamrongsawat et al., 2007; Gabel et al., 2008) and estimation of general population genetic parameters for this species was conducted. Of the nineteen loci used in this study, seventeen produced reliable PCR products. Ten of seventeen (59%) of the loci were monomorphic with four of seventeen loci deviating from HWE. The average number of alleles and genetic diversity were low (2.29 and 0.20, respectively). Two major conclusions from the study were that existing microsatellite markers can be used to amplify bluemask darter DNA and that the Caney Fork population appears to harbor limited genetic diversity indicative of an event that has bottlenecked the genetic diversity.



A Bluemask Darter. Credit: USFWS

## Appalachian LCC Conservation Science Priorities Workshop

William Wayman participated in the Appalachian Landscape Conservation Cooperative's Conservation Science Priorities Workshop on November 29-30<sup>th</sup>. The workshop gathered scientists and managers from throughout the geographic area to work on determining the science priority needs for addressing the conservation challenges and opportunities across the LCC. The participants discussed and ranked priority science needs based on 5 thematic areas (GIS/Information Management, Climate Change, Human Dimensions, Terrestrial Species, and Aquatic Species). The workshop generated a report that will be used to assist the LCC Steering Committee in determining future conservation and science-support funding opportunities.



SHC Elements: Biological Planning, Conservation Design, Delivery, Monitoring, and Research. Credit: USFWS.

# Public Use

## Bringing the Outdoors to the Rutledge Center

Jaci Zelko visited the Rutledge Center in Newnan, GA on November 1, 2011. Established in 1968, the Rutledge Center is a non-profit organization, and its mission is to serve and promote the general welfare of individuals with developmental disabilities that live in Newnan and Coweta County, GA. Jaci shared information with the clients about the importance of aquatic animal and habitat conservation and the role of the Warm Springs Regional Fisheries Center. They talked about the function of healthy rivers and the importance of the freshwater fish and mussels that live in the rivers. Everyone was given the opportunity to touch turtles, crayfish, and a juvenile American alligator.

Over 70 clients and staff thoroughly enjoyed the visit and have already expressed interest in future events. This is the third year Jaci has visited the Rutledge Center and she hopes this great relationship continues for many years.



Jaci talks about fish and mussels. Seeing an American alligator gets the participants excited! Credit: USFWS Photos



More pictures from our Holiday Party!!!! Credit: USFWS Photos