Warm Springs Fish Technology Center

February 2009 Activity Report

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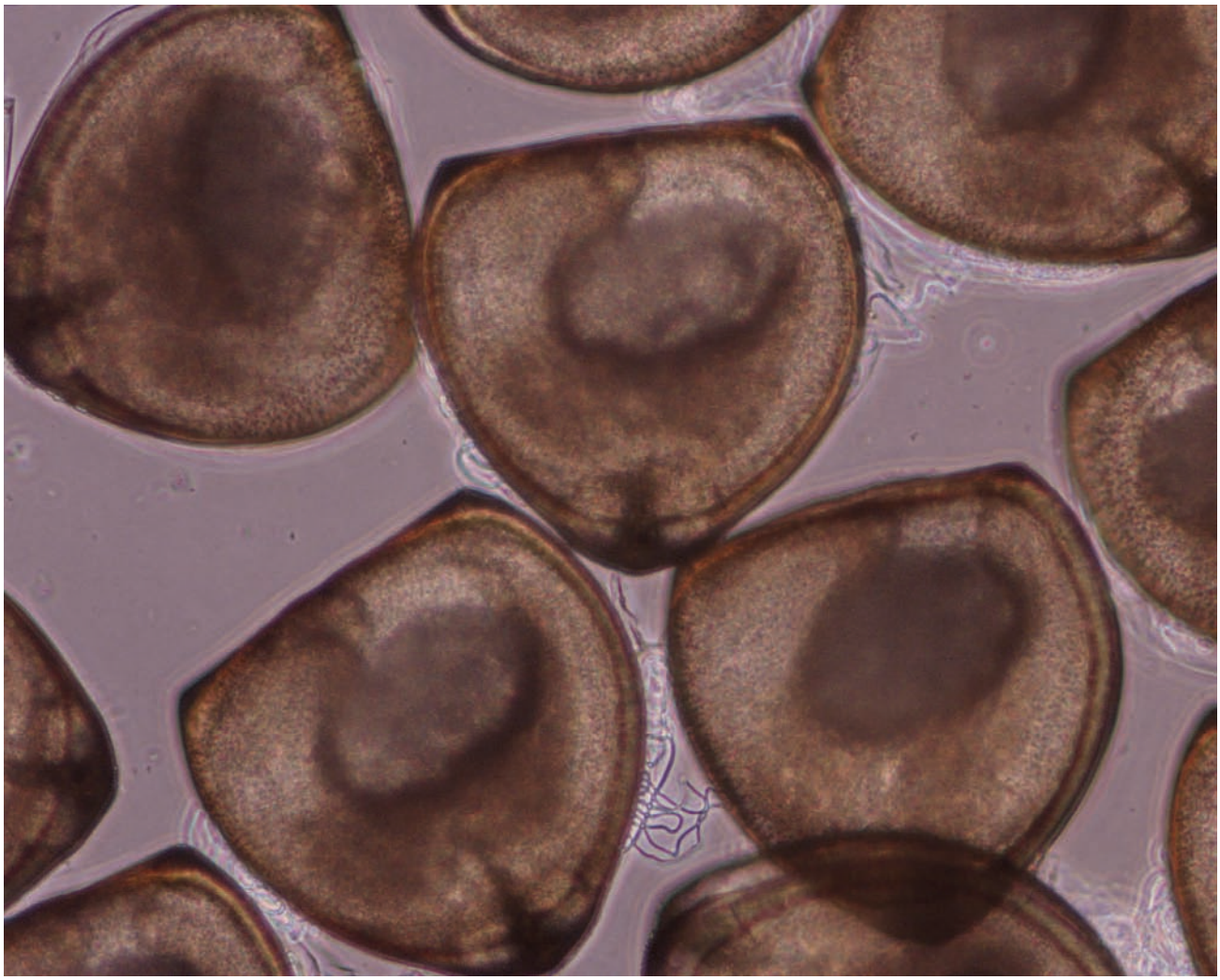

Glochidia collected from a female paper pondshell (*Utterbackia imbecillis*), Credit: USFWS Photo.

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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.

Goldline Darter, *Percina aurolineata*. 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

Cahaba River Fish Passage Surveys

USFWS Refuges and Fisheries staff partnered together to conduct fish passage surveys on streams adjacent to the Cahaba River National Wildlife Refuge (NWR). Surveys were conducted to identify any barriers to fish movement. Eva Kristofik and Greg Scull from Mountain Longleaf NWR and Bill Bouthillier from Warm Springs FTC introduced Wheeler NWR staff, Candice Stevenson and Katharine Goodenough, to the assessment protocol used to identify problem road crossings. Along with stream assessments, Wheeler NWR staff were trained in stream ecology and morphology. Two listed fish species, the Cahaba shiner and Goldline darter, will benefit directly from these fish passage surveys.

Refuge staff assess the outlet of a culvert. Credit: USFWS Photo.

Conservation Genetics Workshop

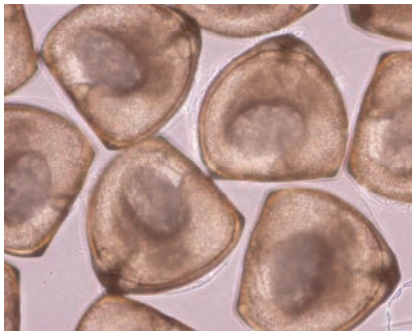
Greg Moyer held a conservation genetics workshop for staff from the USFWS Ecological Services and the Tennessee Wildlife Resource Agency offices on February 3 – 4, 2009 in Cookeville, TN. Greg discussed topics such as effective population size, metapopulations and fragmentation, landscape genetics, units of conservation, hybridization and conservation breeding and restoration.

Leadership in Science and Technology

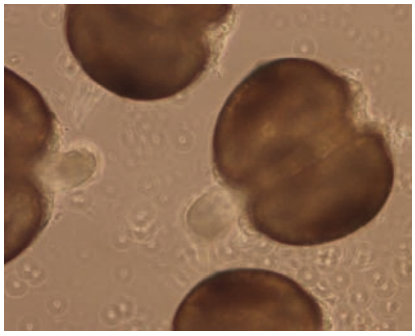
In-Vitro Transformation of Mussel Glochidia

Freshwater mussel glochidia typically need a fish host to transform to the juvenile stage. The glochidia, a parasitic larval stage, attach to a fish for a period of time and then release as transformed juvenile mussels. A suitable fish host for the threatened purple bankclimber mussel (*Elliptoideus sloatianus*) has not yet been identified. In an effort to develop possible propagation techniques for this threatened mussel, the FTC is investigating the use of in-vitro culture techniques. A protocol developed at the University of Louisville uses simple cell culture components to transform mussel glochidia in a Petri dish. The FTC recently used this technique on paper pondshell (*Utterbackia imbecillis*) glochidia to become familiar with the protocol. After 8 days, approximately 74% of the glochidia had transformed into juvenile mussels. This technique will now be tested with purple bankclimber glochidia, and hopefully other endangered mussel species, in an effort to aid in recovery.

Paper pondshell, *Utterbackia imbecillis*. Credit: USFWS Photo.



Paper pondshell glochidia. Credit: USFWS Photo.



Transformed juveniles with extended feet. Credit: USFWS Photo.

Aquatic Species Conservation and Management

Aquatic Restoration and Recovery Conference

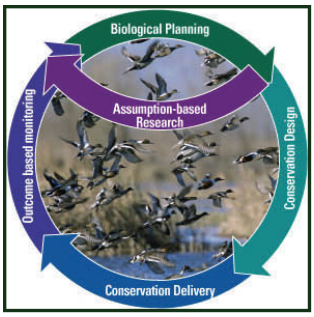
Bill Bouthillier attended the Aquatic Restoration and Recovery Conference hosted by the Mobile River Basin Coalition in Columbiana, Alabama on February 3 – 5, 2009. This informal meeting provided a forum for stakeholders to share information, address issues on imperiled aquatic species, and discuss ongoing restoration projects affecting the Mobile River Basin. Bill was also invited to attend an in-stream flow meeting of USFWS refuge personnel and U.S. Geological Survey researchers conducting a water resources review of water ways adjacent to the Cahaba River National Wildlife Refuge.

FTC Presents at Annual *Morone* Meeting

Greg Moyer, Bill Wayman, and Ashantye' Williams attended the annual *Morone* meeting held February 10 – 11, 2009 in Spanish Fort, AL. The meeting was comprised of various state, federal, and university scientists. Greg Moyer presented three short talks regarding conservation genetics of striped bass inhabiting the Apalachicola, Flint, Chattahoochee (ACF) River Basin. Greg described results of Gulf coast striped bass broodstock screening, assessed the genetic status of broodstock lakes, and offered guidance in assessing survival of phase I and II striped bass using molecular tags. Results indicated that while there is ample genetic diversity in the broodstock lakes, the genetic diversity differs significantly among lakes. Greg also suggested that as few as six microsatellite markers are necessary for accurate allocation of closely related progeny (brothers and sisters) to their respective parents. These data highlight the importance of genetic data in conservation and the utility of molecular tags to accurately perform mark/recapture studies for estimation of survival and census size of striped bass in the ACF River Basin. Bill Wayman gave an update on the progress of research projects being conducted at the FTC. The presentation focused on tank spawning of domestic striped bass and cryopreservation of striped bass sperm.

Southeast Region Biologists' Conference

Nicole Rankin attended the Southeast Region Biologists' Conference in Pine Mountain, GA on February 23 – 27, 2009. The conference theme was "Confronting 21st Century Challenges: Strategic Habitat Conservation." The purpose of the conference was to provide an information and experience exchange forum for implementing resource management and conservation across the Southeast US. Over 300 biologists, foresters, planners, fire management officers, and managers attended the five day conference, listened to presentations, and participated in informal discussions and breakout sessions. Participants learned about the Strategic Habitat Conservation (SHC) technical elements and ways to incorporate SHC into current conservation and management efforts. The conference also provided opportunities for professional networking, resource sharing, and partnership discussions. Other RFC staff, Brian Hickson, Jaci Zelko, and Roman Crumpton, also attended the conference.



SHC Cycle.
Credit: USFWS Photo.

Ronnie Smith, Terry Campbell, Jon Casey, and Brian Hickson socializing at conference. Credit: USFWS Photo.

RFC Staff, Roman Crumpton and Nicole Rankin.
Credit: USFWS Photo.

Aquatic Species Conservation and Management

Strategic Habitat Conservation and Genetics

Greg Moyer.
Credit: USFWS Photo.

Greg Moyer was invited to discuss the role of conservation genetics in Strategic Habitat Conservation at the plenary session of the 2009 Southeast Regional Biologists' Conference at Callaway Gardens on February 24, 2009. He discussed the importance of quantifying and prioritizing units of conservation and how genetic data can help in this regard. He also discussed how landscape genetics can assist in strategic habitat planning and monitoring the effects of climate change.

Southwest Region Fisheries Biologists' Workshop

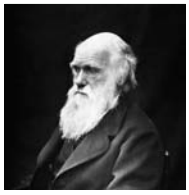
Chester R. Figiel, Jr. gave a presentation on the National Fish Strain Registry to USFWS Southwest Region employees on February 25, 2009. The purpose of the three-day Fishery Biologist Workshop, held at the Dexter National Fish Hatchery and Technology Center, was to familiarize personnel on strategic management tools. Chester discussed how the National Fish Strain Registry can assist resource managers in being more efficient at conserving populations by meeting their information needs.

Georgia DNR Warm Water Hatchery Meeting

Bill Wayman attended the Georgia Department of Natural Resources (GADNR) Warm Water Hatchery Meeting on February 17, 2009 and gave a presentation on the benefits and use of cryopreserved sperm. The presentation also illustrated the capabilities of the FTC and its various research programs. An offer was made to assist GADNR with various projects ranging from cryopreservation to conservation genetics issues.

Workforce Management

Darwin's Birthday



FTC staff celebrated the 200th anniversary of Charles Darwin's birthday on February 12, 2009. This international commemoration of science was held in celebration of the discoveries and life of Charles Darwin -- the man who first described biological evolution via natural selection with scientific rigor. We recognized the enormous contribution to the advancement of humanity that Darwin made and honored him for his efforts.

Training

- Chester R. Figiel, Jr. successfully completed 4 hours of EEO training "Why diversity matters" and "Hostile work environment harassment."
- FTC and Fish Health Center staff received training on using the Applied Biosystems 7500 Real-Time PCR system. Staff will use the machine to analyze gene expression to look at the up-regulation or down-regulation of stress genes in mollusks and to test presence or absence of Bd chytrid in amphibian samples.