

12-1-2009

State Reports

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Recommended Citation

Southeastern Fishes Council (2009) "State Reports," *Southeastern Fishes Council Proceedings*: No. 51.
<https://doi.org/10.7290/sfcp51zsn8>
Available at: <https://trace.tennessee.edu/sfcproceedings/vol1/iss51/6>

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State Reports

STATE REPORTS

ALABAMA

The Alabama Division of Wildlife and Freshwater Fisheries (ADWFF), Aquatic Resources Program hired Andrew Henderson into the newly created Stream Fish Biologist position in January 2009. Andrew is responsible for implementation of the statewide stream sampling program and assisting District personnel with stream sampling. After nearly 2 years of tracking the sonic tagged Alabama sturgeon (*Scaphirhynchus suttkusi*) collected in April 2007, the tag battery died. However, the effort produced a wealth of information on movement and habitat, including additional areas to target for sampling. High spring flows precluded sampling this past spring, however, while electrofishing for Alabama shad below the Robert F. Henry Lock and Dam on 23 April 2009 an Alabama sturgeon was sighted but not captured. The USFWS was criticized for including the upper Alabama River in the critical habitat designation because it was argued Alabama sturgeon were extirpated from the upper reaches; this sighting confirms the USFWS was correct in its assessment. Since 2005, ADWFF has been assessing the status of the southern walleye (*Sander* sp. cf. *vitreus*) and attempting to develop a broodstock for recovery efforts in Alabama. We have sampled all historic sites. Of the 52 specimens collected, only 39 have been southern walleye, the remaining specimens have either been northern x southern hybrids, northern walleye, or saugeye. ADWFF has begun a 3-5 year project assessing the status of Alabama shad in Alabama. The Alabama River was the only river sampled in 2009. No Alabama shad were collected. Sampling will be concentrated in the Conecuh River in 2010. ADWFF recently completed a 2 year project examining the distribution of the saltmarsh topminnow (*Fundulus jenkinsi*) in the Mobile Delta. This data combined with sampling from Auburn University indicate saltmarsh topminnows are found in the mid Mobile Delta region and may be more numerous than once thought.

The Geological Survey of Alabama (GSA) is conducting a status survey for fish species of conservation concern in the Bear Creek system (Tennessee Drainage) in north-west Alabama. There are ten species of moderate, high, and highest conservation concern historically known to occur there. Thus far, the project has produced new records of six of these species, *N. miurus*, *E. zonistium*, *E. sp. cf. zonistium*, *P. evides*, *L. appendix*, and *N. micropteryx*. The trispot darter (*Etheostoma trisella*), was recently rediscovered in Alabama after an absence for more than 50 years from fish collections in the state. While conducting a biological assessment of selected sites in the

Big Canoe Creek system, biologists with the GSA and USFWS collected three trispot darters in Little Canoe Creek near Springville, St. Clair County, on October 30, 2008. Over 5 months of sampling, 228 trispot darters were found at 13 out of 22 sites sampled. Two active breeding sites were discovered and sampling data suggest that *E. trisella* is likely more widespread in the Little Canoe Creek system. The GSA is working in cooperation with the USFWS, the Alabama Aquatic Biodiversity Center (AABC) of the ADCNR, and the Alabama Clean Water Partnership (ACWP) to create new opportunities for imperiled aquatic species recovery and restoration through a concept called Strategic Habitat Units (SHU). Designated SHUs currently encompass designated critical habitat for listed mussels species in Alabama and also include much of the critical habitat for listed fish species as well. The Alabama Cooperative IBI (Index of Biotic Integrity) Project between GSA, ADCNR, and the Alabama Department of Environmental Management (ADEM) is completing its third year of work calibrating the IBI to Alabama's unique physiography and biologically diverse fish communities. To date, a standardized fish community sampling protocol has been established, the state has been regionalized into five ichthyoregions, and IBI metrics and criteria have been established for the Ridge and Valley/Piedmont and Southern Plains ichthyoregions and are currently under construction for the Tennessee Valley.

Carol Johnston (Auburn University, Fish Biodiversity Lab) reports that they are documenting the distribution of red shiners in the Coosa system, paying particular attention to potential areas of overlap with blue shiners. They are also investigating predation potential and habitat overlap of banded and pygmy sculpins in Coldwater Spring (yes, they do eat them!). As part of a larger project documenting biodiversity of selected state lands, they have collected 52 fishes sampling in the Sipsey bottoms. Graduate students Patty Speares, Dan Holt and Nicole Kierl continue to work on various projects related to sound production and sensory reception in fishes. Dan is especially interested in how high levels of ambient noise (including noise pollution) affect fish reproductive behavior, using *Cyprinella venusta* as a model. Patty is examining the effect of acoustic signals produced by male darters (*Etheostoma crossotum*) on hormone levels in conspecific males and females. Patty has also completed a project investigating the potential for barcheck darters (*Catnotus*) to use UV perception. Nicole Kierl has completed her work documenting sound production in pygmy sculpin, and is finishing up a study investigating male color and reproductive

success. Working with Dave Mann, they have initiated a pilot project on cavefish sound production using a remote recorder in an Alabama cave. On the systematic front, Carol is working with Alexis Janosik to describe species in the *Etheostoma rupestre* complex; a paper on the phylogeography of this complex is in the works. Carol continues to work with Winston Baker on documenting his findings on systematics of the *Micropterus coosae* complex.

Graduate students at the University of Alabama Ichthyological Collection are using sequence and microsatellite data to examine relationships and population genetics of *Elassoma* species including the imperiled *E. alabamiae* (Mike Sandel), *Pteronotropis* species (Gray Hubbard), and darters associated with spring and spring seeps, including the imperiled species *Etheostoma boschungii*, *E. ditrema*, *E. nuchale*, *E. phytophilum*, and *E. tuscumbia* (Brook Fluker). While collecting tissues for *E. boschungii*, Brook rediscovered this species in Swan Creek (Tennessee River), including a new spawning site, after more than a decade of unsuccessful collecting efforts by others. Brook is working with Bernie Kuhajda monitoring the population of *E. nuchale* at Roebuck Springs (Black Warrior River) that was decimated after the city of Birmingham removed a dam that had created a large spring pool last September. More than half the population was wiped out due to dewatering and crayfish predation, and reproduction has been depressed, likely due to a reduced food supply. Bernie and Brook have also been surveying Key Cave (Tennessee River) for the endangered *Speoplatyrhinus poulsoni*, where numerous specimens of different size classes have been observed. During this survey a new population of cave shrimp was discovered, which is likely an undescribed species. Surveys of Shades Creek (Cahaba River) continue to find specimens of the endangered *Notropis cahabae* and threatened *Percina aurolineata*, which is surprising given that this stream drains the western Birmingham metropolitan area.

Pat Rakes and JR Shute (CFI) continue to work with captive propagation of several Alabama species of fishes, including spawning and establishing ark populations of rush darter and spring pygmy sunfish.

Chris Taylor (Illinois Natural History Survey) and Guenter Schuster (Eastern Kentucky University) are continuing with their efforts to study the crayfishes of Alabama. This work will lead to the publication of an atlas of Alabama crayfishes, including distribution maps of each species. As spin off projects, Taylor and Schuster have been tackling taxonomic problems (e.g., various species complexes such as *Cambarus miltus* and the subgenus *Orconectes* [*Trisellestensis*]).

Jeff Powell and Eric Spadgenske (Alabama Field Office, USFWS) report that in coordination with ADCNR and the Alabama Power Company (APC), baseline mollusk

surveys were conducted in the Alabama River. These efforts reported three new locations for tulotoma snail in the Alabama River. In coordination with the Geological Survey of Alabama (GSA), a map was published in June 2008 designating critical habitat units for freshwater mollusks in the Mobile Basin. In Birmingham, the USFWS continues to work with various parties on watercress darter issues resulting from last year's Roebuck Spring event. As a result of this event, a new water control structure has been installed that will establish and new and permanent pool elevation. The USFWS's Partners for Fish and Wildlife Program continue to work with landowners in Blount County to identify habitats for the rush darter in known and new locations. In June 2009, the USFWS published a final rule that designated critical habitat for the Alabama sturgeon (*Scaphirhynchus suttkusi*). The USFWS also published a proposed rule in July 2009 to list and designate critical habitat for the interrupted rocksnail, rough horn-snail, and Georgia pigtoe. The Service continues to work with the APC and Federal Energy Regulatory Commission (FERC) to make final provisions on the operations of the hydropower projects along the Coosa River. Results from this effort will lead to improved water quality conditions below several dams and a seasonally variable flow below Weiss Dam. Daniel Drennen (Jackson Field Office, USFWS) is writing the proposed critical habitat for the vermilion darter (*Etheostoma chermocki*). The proposed listing of the Rush Darter (*Etheostoma phytophyllum*) as endangered is being reviewed at the Washington level.

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ARKANSAS

Brian Wagner (AGFC) joined biologists from USFWS, Arkansas Natural Heritage Commission, and The Nature Conservancy to conduct Ozark cavefish monitoring at Cave Springs Cave (home to most of the observed individuals of this threatened species).

Arkansas Game and Fish Commission funded an eradication attempt on an established population of northern snakeheads from the Big Piney watershed in east central Arkansas. The effort was executed March 19- 27, 2009, involving a combined effort of approximately 90 people from AGFC, USFWS, Tennessee Wildlife Resources Agency, National Park Service, and the University of Central Arkansas (UCA). The effort included assessment crews following one-to-two days post-rotenone application to assure that an effective kill was achieved in all areas. Assessment crews picked up over 800 snakeheads from locations throughout the basin. The University of Central Arkansas (Ginny Adams, Reid Adams and Sally Entrekin)

involved over 30 students in the assessment and are currently researching life history and habitat associations of the northern snakehead and other target species collected during the rotenone and examining food web dynamics. Clint Johnson will conduct his MS thesis on the re-colonization of native fishes to the Big Piney system.

As part of the U.S. Geological Survey's National Water-Quality Assessment Program (NAWQA), periphyton, macroinvertebrate, and fish communities were sampled in 2006 at 30 sites in the Ozark Highlands of Arkansas, Missouri, and Oklahoma (a subset of these sites were sampled again in 2007). Two of these sites in northern Arkansas have been sampled every one to two years since 1993. The 2006 data from the 30 sites has been analyzed to evaluate usefulness of the three communities to describe the effect of elevated nutrient concentrations on aquatic biota of small Ozark streams. The 2007 data are being analyzed along with data from other parts of the country to compare seasonal variations in communities in response to nutrients. Additional information about NAWQA activities in the Ozark Highlands can be found at <http://ar.water.usgs.gov/nawqa/ozark/index.html>.

Bill Matthews, Edie Marsh-Matthews (University of Oklahoma) and Ginny Adams (University of Central Arkansas) conducted sampling in the Piney Creek drainage in summer 2008 as part of the long-term dataset began by Bill during his MS degree. A subset of the established long-term sites was sampled to examine effects of near record flooding on the system that had occurred in spring 2008.

ADEQ will be sampling approximately 30 sites the next few months for fish and macroinvertebrate community analysis. These sites are located in the Boston Mountains and Ozark Highlands. There are another 10 sites in the Saline River watershed.

Art Brown, University of Arkansas, Fayetteville, is conducting bioassessment work. They have 2 years of spring and fall fish electrofishing data from 10 sites in the upper Illinois River drainage.

The Ouachita National Forest (ONF) has an on-going research project with Dr. Tony Echelle (Oklahoma State University) to look at the genetics of leopard darters range wide in AR and OK. They have also provided him a number of logperch for his work on their genetics. ONF, along with Dr. Charles Gagen (Arkansas Tech University) and his graduate student, Jade Ryles, are in the second year of assessing fish passage at a number of crossings in the Long Creek drainage, a tributary of the Little Missouri River. Two of nine crossings have been replaced with box culverts designed for fish passage to assess whether the box culvert designs do allow passage or not as well as testing a prototype fish movement sensor. ONF is working with Dr. Joe Stoeckel (Arkansas Tech University) and a new graduate student to relocate a former population of stargazing

darters in the Ouachita River above Lake Ouachita. They are also looking at the range and distribution of the Ouachita darter, an undescribed species formally thought to be longnose darters. ONF is also working with Ginny Adams, Reid Adams, and Sally Entrekin and graduate students Richard Walker and Evan Soper from UCA to assess the effect of wood addition to headwater streams in the Sylamore District on fish and crayfish assemblages.

A reproducing population of alligator gar was recently discovered on the Fourche LaFave River. Tommy Inebnit, Ed Kluender, Lindsey Lewis (USFWS), and Reid Adams (UCA) have collected data relating hydrology and temperature regimes to reproductive success and have made observations of spawning and early life stages. In addition to reproduction, we are studying movement and habitat use with radio telemetry techniques. Lindsey Lewis also developed a website for Alligator Gar conservation and status assessment: http://www.fws.gov/arkansas-es/A_Gar/index.html

Chris Davidson with USFWS developed BMPs for a natural gas pipeline in Arkansas (<http://www.fws.gov/arkansas-es/wn.htm>). Sites on Gulf Mountain Wildlife Management Area will be monitored to examine the effectiveness of the BMPs starting fall 2009 by researchers from the University of Central Arkansas (Sally Entrekin, Ginny Adams, Reid Adams), the University of Arkansas (Michelle Evans-White) and The Nature Conservancy (Ethan Inlander and Daniel Miliken).

Baseline data were collected by the University of Central Arkansas (Ginny Adams and Sally Entrekin) on the Middle Fork Saline River to allow for assessment of restoration activities planned by The Nature Conservancy (Joy DeClerk) in late summer 2009.

Rich Grippo (Arkansas State University) is studying the effects of stream bank stabilization on benthic macroinvertebrate and fish assemblages in the South Fork of the Spring River, near Salem, AR.

Submitted by Ginny Adams (gadams@uca.edu)

FLORIDA

Debra Murie (University of Florida), D. C. Parkyn (UF), Leo G. Nico (United States Geological Survey), Jeff Herod (United States Fish and Wildlife Service), and Bill Loftus (USGS, ret.; Volunteer) just published on the age, growth and mortality of the Florida gar *Lepisosteus platyrhincus* in the Florida Everglades. Leo Nico, William Loftus, and James Reid (USGS) recently published two articles on Florida populations of invasive armored suckermouth catfishes. The most recent is one is entitled "Interactions between non-native armored suckermouth catfish (Loricariidae: *Pterygoplichthys*) and native Florida manatee (*Trichechus manatus latirostris*)

in artesian springs.” Similarly, Leo Nico, Howard Jelks (USGS) and Travis Tuten (Florida Fish and Wildlife Conservation Commission) published a paper describing nest burrows of the invasive catfish, comparing their burrows to those of other burrowing animals; the paper also assesses the effects of catfish burrow colonies on shoreline erosion and stability. It is available at [http://fl.biology.usgs.gov/pdf/ansrp-v09-1\(LR\).pdf](http://fl.biology.usgs.gov/pdf/ansrp-v09-1(LR).pdf). Pam Schofield (USGS) and Leo Nico published on their laboratory study comparing the salinity tolerances of different populations of Asian swamp eels (Synbranchidae, genus *Monopterus*) established in peninsular Florida. Steve Walsh (USGS), Elissa N. Buttermore, Towns Burgess, and William E. Pine, III (UF) recently published a summary report of aspects of their studies on larval fishes in the Apalachicola River floodplain (<http://pubs.usgs.gov/of/2009/1145/>). In addition, Steve Walsh published results of a multi-year study of aquatic communities in selected springs of the St. Johns River drainage, emphasizing macroinvertebrates, with limited surveys of fishes (<http://pubs.usgs.gov/sir/2009/5046/>). Steve Walsh, Howard Jelks, and Noel Burkhead (USGS) recently published “The decline of North American freshwater fishes at: <http://www.actionbioscience.org/biodiversity/walsh.html>. The article, written for the public, is a general summary of the AFS list revision published in 2008 and contains relevant links to other sources of information on aquatic fauna in peril.

Osvaldo Sepulveda-Villet (University of Toledo), Alexander Ford (Cleveland State University), James D. Williams (Florida Museum of Natural History), and Carol Stepien (University of Toledo) recently published an article on population genetic diversity and phylogeography of the yellow perch *Perca flavescens*. The study sampled populations from the Great Lakes, Lake Winnipeg, the upper Mississippi basin, northeast and southeast Atlantic slope, and Gulf of Mexico, including Chattahoochee and Apalachicola rivers in Florida and Mobile River, Alabama.

Franklin (Buck) Snelson, Jr., (Florida Museum of Natural History), stated that his last official act as an ichthyologist is the description of the “Apalachicolan pygmy sunfish” *Elassoma* sp. cf. *okefenokee*, along with Trevor J. Krabbenhoft (University of Mexico), and Joseph M. Quattro (Rutgers University). The new pygmy sunfish patronym honors Carter Gilbert, University of Florida (ret). The species ranges from tributaries of the Choctawhatchee Bay to the Suwannee River, where both species occur, and *E. okefenokee* occurs northeast of the Suwannee and south in the Florida peninsula. Buck states his new aspiration is to become a rock star.

Bill Loftus has been working with Fairchild Tropical Botanical Garden in Miami, FL to remove African jewelfish *Hemichromis letourneuxi* from 11 lakes on their property,

and to increase the diversity of the lakes by stocking native fishes.

Since 2004, the Florida Chapter of the Nature Conservancy (Conservancy) has coordinated local, state, and federal partner input and recommendations to the U.S. Army Corps of Engineers (ACOE) for providing fish passage at Jim Woodruff Lock and Dam on The Apalachicola River. After several years of study, the ACOE agreed to include operation of the existing lock at Jim Woodruff Lock and Dam in their interim fish spawning operations. The Nature Conservancy is working with the ACOE for similar fish passages in other Gulf drainages. In 2007, the Conservancy teamed with The E.O. Dun Foundation, the U.S. Fish and Wildlife Service (USFWS), and the Florida Fish and Wildlife Conservation Commission (FFWCC) for removal of a small dam and poorly designed road culverts and stream restoration of Kelley Branch, a globally rare steephead stream located in Bristol, FL. The Conservancy is completing a second year of assemblage monitoring in Kelly Branch to understand how the fish assemblage is responding to renovation efforts and the findings should be published in Fiscal Year 2010. The Conservancy is cooperating in a dam removal and stream restoration project of another steephead stream in Fred Gannon Rocky Bayou State Park in Florida. The Conservancy is currently completing an assessment of riparian corridors and road crossings in the Yellow River drainage in Alabama and Florida. The Conservancy has coordinated a similar, partner-led effort for the St. Mary's River in northeastern Florida.

Frank Parauka, USFWS Panama City Field Office, has been monitoring the Gulf sturgeon. The 2007 and 2008 annual population census suggests that the Choctawhatchee population is doing well; the annual census will be conducted in the Apalachicola River in 2009. Jerry Ziewitz completed the 5-year status review for Gulf sturgeon, which is currently out for peer-review. Karen Herrington and Sandy Pursifull are working on population biology and life history of imperiled mussels in the Apalachicola, Chattahoochee, Flint, Ochlocknee, and Suwannee rivers. Chris Metcalf is working with multiple partners on several stream restoration projects in the Ochlockonee River (and Spring Creek in Georgia). Chris Metcalf and Bill Tate are working with the Conservancy and FFWCC to assess threats and restoration needs in the Ochlockonee and Yellow rivers of Florida, Alabama, and Georgia. Bill Tate is working with Eglin Air Force Base and other partners to manage and conserve aquatic resources on military lands. This year, the FWS staff at Eglin has grown, with the addition of Channing St. Aubin and Jeff Van Vrancken. Chan's work is primarily aquatic macroinvertebrates but he will be assisting with stream restoration and fish projects. On Eglin AFB, seven stream restoration projects were completed in 2009, including the removal of four impoundments and the

elimination of three fish passage barriers associated with road crossing structures. Two large stream restorations are currently being designed or permitted and construction should begin in early 2010.

Bill and his staff will continue to work with Howard Jelks (USGS) and Frank Jordan (Loyola University, New Orleans) to assess Okaloosa darter response to restored stream habitat. Other ongoing Eglin projects include: assessing physiological effects of sprayfield effluent on stream fishes, population genetics for the Okaloosa darter, movement of Gulf sturgeon in nearshore coastal waters, development of GIS models that predict aquatic habitat condition from landuse characteristics, changes in stream channel geomorphology resulting from erosion control activities, faunal composition of Ephemeroptera, Plecoptera, and Trichoptera (EPT) fauna in steephead streams, stream restoration planning, design, and monitoring, as well as the ongoing recovery activities concerning the Okaloosa darter *Etheostoma okaloosae*.

Walt Courtenay (Florida Atlantic University, and USGS volunteer) was senior author of a paper entitled "Risks of Introductions of Marine Fishes: Reply to Briggs." He was joined in this effort by several others including Bill Smith-Vaniz (USGS volunteer). Walt was also involved with many other coauthors from Canada and Mexico in a publication entitled "Trinational Risk Assessment Guidelines for Aquatic Alien Invasive Species", published by the Commission for Environmental Cooperation, a unit of the North American Free Trade Agreement, in April 2009. He, and senior author Cindy Kolar (USGS, Reston, VA) and Leo Nico, have a book chapter (Managing Undesired or Invading Species) in press for the third edition of Inland Fisheries Management in North America, published by the American Fisheries Society.

Jim Williams (USGS, ret.), along with coauthors Art Bogan (North Carolina State Museum) and Jeff Garner (Alabama Division of Wildlife and Freshwater Fisheries), described a new species of freshwater mussel from the Gulf Drainages of Alabama, Florida, Louisiana and Mississippi. The new mussel *Anodonta hartfieldorum* is named in honor of Paul Hartfield (USFWS) and Libby Hartfield, Director of the Mississippi Museum of Natural Science, Jackson.

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GEORGIA

Gary Beisser and crew (GADNR) have continued work on the Lake Sturgeon reintroduction project, which has involved stocking juveniles throughout the Coosa system since 2002. Using side scan sonar, DNR recently began mapping the Coosa River to identify important habitat features

for lake sturgeon. Tim Barrett and Elizabeth Colvin (GADNR) have been working on striped bass restoration in coastal Georgia. Since 2000, an average of 33,000 striped bass has been stocked annually into the Savannah and Altamaha rivers. Population samples indicate that striped bass numbers in both rivers have increased dramatically, especially in the Savannah River. Joe Rydell (GADNR) is managing Ocmulgee Public Fishing Area (PFA) for trophy largemouth bass (LMB). They have stocked only female LMB at low density (no males) and the lake has produced several 8 to 9 lb stout bass. Brian Estes (Jordan Jones and Goulding) and Kevin Thomas (Edwards-Pitman) have been working on rare fish surveys for transportation projects throughout Georgia. In an effort to improve reproductive success of the State Endangered robust redhorse, Jimmy Evans (GADNR) has been working on an Oconee River gravel augmentation project. To date a single site has been augmented with 370 tons of gravel and a total of 1,400 tons of gravel will be utilized at this and two other high priority sites. As part of a GADNR project, Steve Sammons (Auburn University) is presently conducting a comprehensive study of relations between shoal bass and sympatric congeneric black bass species on the Flint River, Georgia. Preliminary results include documentation of long migrations during spring flooding to find suitable spawning grounds and relatively high angler catch rates combined with high release rates.

Brett Albanese (GADNR) and crew have been working on a spring restoration project for the Coldwater darter (collaborative project with the Anna George and Dave Neely, Tennessee Aquarium, and the Conasauga River Alliance), a survey for the goldline darter in the Coosawattee system, and on species accounts for Georgia's state protected fishes. He hopes to help Bud Freeman and Carrie Straight put some finishing touches on the Fishes of Georgia Atlas this fall. As part of a GADNR project, Dave Neely is revising Georgia sculpin taxonomy, including a key to described and undescribed species of sculpin in the state.

Cecil Jennings and crew (USGS) have been working on a radio telemetry study of adult robust redhorse in the Oconee River, GA. To date, they have found evidence that of a new spawning site located upstream of the current only confirmed spawning site at Avant Mine; they also tracked a single individual from the Oconee River into the Ocmulgee River and back. Finally, this research team documented consistently high usage newly a formed oxbow on the Oconee River. Jim Peterson is not doing any fish work in Georgia right now, but he has an army of students working on endangered Georgia mussels.

Gary Grossman's research group (University of Georgia) is continuing to conduct long-term studies on fish assemblages in southern Appalachian streams as well as assess the relative importance of density-dependent and

density-independent factors on these populations. Peter Hazelton has finished studies of the impacts of turbidity and competition on yellowfin shiners and rosyside dace. Duncan Elkins is finishing up his dissertation on the effects of rainbow trout stocking on assemblage structure and microhabitat use on native fishes. Collaborative work includes an assessment of whether yellowfin shiners are native to the Tennessee drainage with John Wares at UGA.

Bud Freeman (UGA) has been focusing on *Micropterus* taxonomy and amber darter genetics (with Brady Porter). Carrie Straight is assessing spawning habitat and recruitment of robust redhorse in the Broad River system. Megan Hagler is coordinating Section 6 projects in the Etowah and Conasauga Rivers, including an assessment of factors that may be causing the apparent decline of Conasauga River mainstem fishes (e.g., the undescribed Coosa madtoms and Coosa chubs). Greg Anderson just completed his thesis research on reproductive biology of the Etowah darter, holiday darter, and bridled darter. Mary Freeman is working on models to predict the persistence of imperiled stream fishes in the Coosa system and on water availability for ecological needs in the Flint system. Doug Peterson has several ongoing sturgeon projects.

Chris Skelton's graduate student Meiko Camp is conducting a life history study of the striped crayfish, *Cambarus (D.) striatus* in a small seepage area near Milledgeville, Georgia. Meiko began capturing and tagging *C. striatus* with visual alphanumeric internal tags in April. Ten adult *Cambarus* spp. were tagged and held in the laboratory to assess tagging mortality and tag retention. To date, there has been no mortality (except for an escapee) and in two individuals that molted, the tags were retained and readable.

Bill Ensign, Thom McElroy and Scott Reese at Kennesaw State's Biology Department are exploring the life and times of *Campostoma oligolepis* in the middle and lower Etowah River basin. McElroy and Ensign have been collecting *C. oligolepis* from a number of watersheds to determine if dam building, road crossings and the other various impediments to fish movements have affected stoneroller population genetic structure. Reese is gearing up to look at thermal preferences in stonerollers from urban, suburban and rural watersheds in conjunction with age and growth work by Ensign.

A survey of the fishes of the Withlacoochee River is being conducted from January 2009 to June 2010 by Matt Cannister and David Bechler (Valdosta State University). To date, they have documented range extensions for Alabama shad and brown darter.

Conservation Fisheries saw above average numbers of Etowah, holiday, and bridled darters at the GA 52 and Hightower Church Rd Bridges in the Etowah River system. In the upper Conasauga, CFI saw far above average num-

bers of blue shiners and bridled darters and average holiday numbers, but did not observe Conasauga logperch in any portions of the upper Conasauga (US Forest Service lands).

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KENTUCKY

Matt Thomas (Kentucky Department of Fish and Wildlife Resources, KDFWR) completed status surveys for two "species of concern" in Kentucky. *Etheostoma susanae* (Cumberland darter), an upper Cumberland basin endemic, was collected at 50% of known historic localities, with a current distribution contained within six minor tributaries of the Cumberland River immediately above Cumberland Falls. *Etheostoma sagitta spilatum* (arrow darter), an endemic of the upper Kentucky River drainage, was collected at 58% of known historic localities visited, with strongest populations persisting in streams within the Daniel Boone National Forest and Robinson Forest (UK).

Matt Thomas and Rebecca Blanton-Johansen (Austin Peay State University) are collaborating on a paper addressing the taxonomic status and population genetics of *Etheostoma sagitta*. Rex Strange (University of Southern Indiana) is analyzing genetic variation within *E. susanae*. Pat Rakes and J.R. Shute (Conservation Fisheries, Inc., CFI) have successfully developed captive spawning protocols for *E. s. spilatum* and *E. susanae*. In July 2009, 110 captive spawned *E. s. spilatum* were injected with visible implant elastomer tags and released into a small tributary of the Red Bird River (upper Kentucky basin) for careful follow-up monitoring. A similar release is being planned for *E. susanae* within its known historic range in the upper Cumberland drainage. Michael Floyd (U.S. Fish and Wildlife Service, USFWS) has prepared a draft proposed listing rule for *E. susanae* (to be listed as Endangered) and a candidate assessment for *E. s. spilatum* (soon to be elevated to species rank by Matt and Rebecca).

The KDFWR has initiated long-term projects, funded through SWG, to restore populations of *Acipenser fulvescens* (lake sturgeon) and *Atractosteus spatula* (alligator gar) through captive propagation and reintroduction into suitable habitat where they occurred historically in Kentucky. Between 2007 and 2009, 1,675 lake sturgeon have been released into the Cumberland River between Lake Cumberland and Cumberland Falls, and in lower Big South Fork. An initial release of 4,300 young-of-year alligator gar was accomplished at 11 localities in western Kentucky in July 2009.

Michael Compton (Texas Tech University) is conducting an analysis of environmental requirements for

Etheostoma cinereum (ashy darter) and *Percina squamata* (olive darter) in the Rockcastle River system. His primary objective is to document occurrences of those target species within the Rockcastle system and characterize stream reaches (where present) based on environmental variables to construct models for occupancy estimation.

Michael Floyd (U.S. Fish and Wildlife Service, USFWS) has completed draft 5-year reviews for *Phoxinus phoxinus* (blackside dace) and *Notropis albizonatus* (palezone shiner). Michael has also been actively involved with monitoring Mill Branch, an approximately 2,300-ft Priority I stream restoration for blackside dace in Knox County, southeastern KY. The National Park Service (NPS), USFWS, KDFWR, and others are working to restore another blackside dace population in Davis Branch at Cumberland Gap NHP through a beaver eradication/control program combined with stream restoration. Other habitat restoration and improvement projects in the upper Cumberland Basin are being funded through the USFWS Partners for Fish and Wildlife Program, aimed chiefly at blackside dace, palezone shiner, and Cumberland darter habitats.

Rob Hopkins and Brooks Burr (Southern Illinois University, Carbondale, SIUC) have digitized over 50,000 specimen based records for fishes in Kentucky, dating from the 1890s to the present. Rob just completed his Ph.D. dissertation investigating relationships between distributions of rare fishes and landscape composition at multiple spatial scales in the upper Green River basin. Bob Gerwig (SIUC) has completed the life history of *Moxostoma poecilurum* (blacktail redhorse) in Terrapin Creek, western KY. Bob's work began in March 2007 to document spawning activity and habitat use, and to estimate population size and demography.

David Eisenhour (Morehead State University) with graduate students Josh Schiering and Audrey Richter, completed a status survey and habitat assessment of *Percina macrocephala* (longhead darter) in Kinniconick Creek, northeastern KY. They found the species at 15 of 55 reaches sampled, with a total of 104 individuals over a 50 km stretch. Also noteworthy is that they were fairly easy to find snorkeling, but very difficult to capture by seine or electrofishing! David and Lynn, along with Audrey, have begun examining the life history of *Percina stictogaster* (frecklebelly darter). David, along with Brooks Burr and Matt Thomas, is still "plodding" along on the Kentucky Fish Book.

Sherry Harrel (Eastern Kentucky University) and graduate student, Stephanie Brandt, are nearing completion of an ichthyofaunal survey of Rock Creek, Big South Fork drainage. Stephanie's objectives are to evaluate changes in species composition and distribution relative to previous collection data and to address predation potential of stocked Rainbow Trout on rare native fishes throughout

the system. A particularly noteworthy record encountered during her research is a single *Notropis albizonatus* in a 2008 collection from lower Rock Creek. Aside from the Paint Rock River, AL, this represents the first record outside of the Little South Fork Cumberland River in more than 60 years! Sherry and another graduate student, Garrett Stillings, have begun a distributional and habitat assessment of *Thoburnia atripinnis* (Blackfin Sucker) in the Barren River system.

Submitted by Matt Thomas (matt.thomas@ky.gov)

LOUISIANA

Marty O'Connell with the Nekton Research Laboratory (NRL) at the University of New Orleans (UNO) reports that another invasive fish has been found in southeastern Louisiana. In December 2008, specimens of a yet to be determined strain of *Oreochromis* were collected in the vicinity of Port Sulphur, which is located on the Mississippi River south and downstream of New Orleans. The Louisiana Department of Wildlife and Fisheries (LDWF) responded quickly and aggressively to wipe out this potential threat to native fishes. The area was closed off to all fishing and rotenone was applied by LDWF personnel to all infested water bodies. Melissa Kaintz of LDWF and Dr. Tom Lorenz (former NRL student) participated in these efforts and developed an on-site experiment to test effective rotenone concentrations for tilapia in brackish waters. Tom estimates that up to 95% of the fish biomass killed by the rotenone treatment consisted of tilapia. A post-treatment monitoring effort is being planned to assess the overall effectiveness of the response. Specimens of the Rio Grande cichlid (*Herichthys cyanoguttatus*) were collected with the tilapia around Port Sulphur. This invasive species has been studied by NRL personnel for over ten years and it continues to expand in southeastern Louisiana in both freshwater and estuarine habitats. Recent preliminary analyses conducted by Senior Biologist and Database Manager Meg Uzee O'Connell suggest that where *H. cyanoguttatus* have become established in New Orleans, they negatively impact native poeciliids. As part of her dissertation research, new Ph.D. student Celeste Espinedo will be studying behavioral interactions between *H. cyanoguttatus* and livebearers.

Other NRL projects include continuing research led by Senior Biologist Chris Schieble on the pupping activity of lemon sharks (*Negaprion brevirostris*) at the Chandeleur Islands, Louisiana's oldest and most remote barrier island chain. These essential reproductive habitats are being threatened by increasing storm activity and sea level rise. Chris is being assisted by graduate students Jonathan McKenzie (Ph.D.) who is tracking the lemon sharks using

satellite tags to determine their habitat use and Chris Davis (M.Sc.) who is examining lemon shark diet and prey availability. Graduate student Sunny Brogan (M.Sc.) and undergraduate student worker Jenny Wolff continue their work with restoring native red drum (*Sciaenops ocellatus*) to an urban fishery in New Orleans. Both students also participated in an LDWF project which is testing the possibility of using native largemouth bass (*Micropterus salmoides*) to control numbers of *H. cyanoguttatus* in New Orleans' City Park. Tagged *M. salmoides* were introduced to cichlid infested habitats this spring and Sunny and Jenny are assessing any changes in numbers of *H. cyanoguttatus*.

Dr. Brian Alford of LDWF has been studying changes in fish assemblages following a freshwater diversion of the Mississippi River to the Davis Pond area of southeastern Louisiana. Electrofishing, gill net, and seine samples were collected quarterly from 1998-2001 (pre-diversion period) and 2002-2008 (post-diversion period) by the LDWF. After accounting for natural physicochemical variation (e.g., salinity, water temperature, turbidity) among sample sites, seasons, and years, there was a significant change in fish assemblages following the diversion among all sampling gears (partial Canonical Correspondence Analysis, CANOCO® software). In the electrofishing samples, the freshwater diversion had a positive effect on numerical abundances (fish/hour) of Gulf killifish (*Fundulus grandis*), striped mullet (*Mugil cephalus*), and inland silverside (*Menidia beryllina*), whereas diversion negatively affected golden shiner (*Notemigonus crysoleucas*), white crappie (*Pomoxis annularis*) and southern flounder (*Paralichthys lethostigma*). From the gill net samples, the diversion positively affected abundances (kg/net-night) of freshwater drum (*Aplodinotus grunniens*) and negatively influenced black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), and Atlantic croaker (*Micropogonias undulatus*). Seine sampling revealed that the diversion positively influenced abundances (fish per haul) of banded drum (*Larimus fasciatus*), Spanish mackerel (*Scomberomorus maculatus*), rainwater killifish (*Lucania parva*), guaguanche (*Sphyræna guachancho*), and *M. beryllina*. Conversely, the freshwater diversion had a negative influence on Gulf menhaden (*Brevoortia patronus*), *S. ocellatus*, and *C. nebulosus* from seine samples.

Eric Shanks, the LDWF Inland Fisheries Supervisor for District 5, is testing the use of the antibiotic oxytetracycline (OTC) for mass marking of fingerlings to determine the recruitment success of individual stockings of largemouth bass (*Micropterus salmoides*). These studies will be conducted at the Fort Polk Joint Readiness Training Center, a 100,000 acre military installation located in Vernon Parish, Louisiana. Several impoundments ranging in size from 3 to 5 acres are located on the installation. The results of this study will provide LDWF with information

on supplemental stocking success in small impoundments.

Bobby Reed with LDWF Inland Fisheries District 5 along with Jan Dean from the USFWS Natchitoches National Fish Hatchery are working with a team of fisheries biologists on a research project to better understand river sturgeon populations at the Old River Control Structure (ORCS) in Concordia Parish, Louisiana. This team includes personnel from LDWF, USFWS, Mississippi State University (MSU), and the Lower Basin Pallid Sturgeon workgroup. The channels around and below the structures are habitat for the largest concentrations of pallid sturgeon (*Scaphirhynchus albus*) found in the U.S. Captured fish are scanned for marks (PIT tags), photographed, morphometric measurements taken, and tissue and blood samples were taken for sex recognition and maturation, disease diagnosis, and species determination. All fish are being marked with PIT tags and released back to the river at ORCS. In 2008-2009 a total of 50 adult *S. albus* were implanted with sonic tags and released in the Atchafalaya River. Researchers at MSU are tracking the fish weekly to determine movements and habitat.

Billy Justus and James Wallace of the USGS Arkansas Water Science Center report that from 2005 to 2007, the USGS sampled fishes and invertebrate assemblages and monitored dissolved oxygen during critical summer conditions at 35 stream sites in southern Louisiana. The purpose of the study was to assess relations between fishes and invertebrate assemblages and dissolved oxygen, and to provide information that could be used to validate or refine existing aquatic life use categories and dissolved-oxygen criteria (5 milligrams per liter) for streams in southern Louisiana. Preliminary data indicate a biological threshold exists between 2 and 3 milligrams per liter of dissolved oxygen. This finding indicates that fishes and invertebrate assemblages in low-gradient streams have adaptations that enable them to withstand low dissolved-oxygen concentrations.

Todd Slack reports that the Fish Ecology Team at the US Army Engineer Research and Development Center (ERDC) is studying the effects of existing and proposed water diversion structures in south Louisiana. Surveys of sturgeon entrained during the 2008 opening of the Bonnet Carre spillway were used to develop protocols for estimating "take" of entrained pallid sturgeon. Impacts of these estimates on population viability will be modeled by ERDC and Nick Friendenberg, Applied Biomathematics. Field surveys, conducted by ERDC and by Dave Schultz and Clint Troxler, Nicholls State University, will be used to describe fish assemblages in the river and outflows and, eventually, assess risk of entrainment. Tissue samples collected from sturgeon will be sent to Rob Wood, St. Louis University, to provide genetic characteristics of pallid and shovelnose sturgeon at the southern limits of their geographic range. The Team is also investigating the feasibility

ty of retrofitting an existing earthen dam in the Bayou Bodcau Wildlife Management Area with control gates to reduce downstream flooding. Field surveys within the project area will address impacts and benefits to fish habitat for the identified project alternatives. Lastly, the Team is participating in restoration efforts for the Spring Bayou Ecosystem Area located in central Louisiana.

Tim Bonner (TSU) is working in collaboration with Northwestern State University of Louisiana assessing changes in fish assemblage structure in Kistachie Bayou, a component of the state Natural and Scenic Rivers System.

Submitted by Marty O'Connell (moconnel@uno.edu)

MARYLAND

Biologists at the Maryland Biological Stream Survey (MD DNR) and Frostburg State University are working to establish the current status of blackbanded sunfish (*Enneacanthus chaetodon*) in the state. Blackbanded sunfish were found in three small ponds in Caroline County in 2006 and two additional ponds were located this summer (2009). Kilian et al. found that pH of the ponds where *E. chaetodon* was captured in 2006 was < 4.6 and non-native predators (e.g., largemouth bass, black crappie) were rare or absent. Surveys conducted during 2008 in collaboration with biologists from the Delaware Department of Natural Resources and Environmental Control found that blackbanded sunfish were extirpated from all historical localities in the Nanticoke River drainage of that state. The species was found at a single locality in the Delaware River drainage this summer. Tissue has been collected from specimens in the Nanticoke River drainage of Maryland and the Delaware River drainage of Delaware for genetic analysis (to be done in collaboration with South Carolina DNR).

The Maryland DNR Fisheries Service is funding a project to study brook trout (*Salvelinus fontinalis*) movements in the Savage River drainage of western Maryland. The Maryland DNR Fisheries Service has determined that brook trout currently occupy only 38% of their historic range in Maryland. Biologists at the University of Maryland Appalachian Laboratory are using PIT tags to examine movements. Tagging will begin in August 2009 with a goal of implanting 1,500-2,000 tags before December and an additional 2,000-2,500 tags in early 2010.

The Maryland DNR Natural Heritage Program and the U.S. Fish and Wildlife Service are funding a two-year study to determine the status of the federally-endangered Maryland darter (*Etheostoma sellare*). The species was last seen in 1987 and may be extinct, although there have previously been large periods of time during which the Maryland darter was not found. The species is known from only three streams in the lower Susquehanna River

drainage in Maryland. Biologists from Frostburg State University, the Maryland Biological Stream Survey (Maryland DNR), and Marshall University (WV) are collaborating on this project, which will begin in September 2009. In addition to sampling the historic localities in Swan Creek, Deer Creek, and Gashey's Run, surveys will be conducted in the mainstem Susquehanna River in the vicinity of these streams using electric trawls and SCUBA (not at the same time/location, in case you wondered).

Submitted by Rich Raesly (rraesly@frostburg.edu)

MISSISSIPPI

Jake Schaefer, Brian Kreiser (The University of Southern Mississippi-Hattiesburg) and Dave Duvernell (Southern Illinois University Edwardsville) have been studying contact zones among species in the *Fundulus notatus* species complex. The team is interested in the implications of different contact zone structure on the ecology and evolution of the populations in these systems. The phylogeographic component of the project is being tackled by Brian Kreiser. Students at the University of Southern Mississippi are perusing a number of questions regarding the contact zone work. Charles Champagne (MS) is studying the diet and feeding morphology of the two species across the contact zone. Melissa Gutierrez (MS) is studying mate choice dynamics, asking if females prefer males based on body size or spot density. Melissa and Wilfredo Matamoros (PhD) have also undertaken a mark-recapture study to estimate movement dynamics, population size and habitat use of *F. olivaceus* in a local creek. Other students not working with the *Fundulus* include Scott Clark (feeding ecology of *Esox niger* and *Esox americanus*), Paul Mickle (ecology of *Alosa alabamiae*), Wilfredo Matamoros (biogeography of Honduran fishes) and Bjorn Schmidt (project undefined).

Mel Warren reports on the fish, crayfish and mussel research activities in Mississippi by the staff at the USDA Forest Service Center for Bottomland Hardwoods Research, located in Oxford, Mississippi. The group (Susan Adams, Mickey Bland, Mason Bryant, Amy Commens, Gordon McWhirter, Andrew Rypel (post-doc, University of Mississippi), Ken Sterling (M.S. student at University of Mississippi), Wendell Haag, and Mel) has been working on a diverse array of projects which includes the following highlights: (1) Continued periodic sampling of fishes in flooded bottomland forests and other wetland habitats at high and low water periods, Delta National Forest, Little and Big Sunflower River system (Yazoo River basin) (Warren and Bryant). Last year was a Spotted Gar (*Lepisosteus oculatus*) and Shortnose Gar (*L. platostomus*) boom; this year was a Silver Carp

(*Hypophthalmichthys molitrix*) and Bighead Carp (*H. nobilis*) bonanza. (2) Initiated six research projects focused on the Yazoo Darter (*Etheostoma raneyi*) (Warren): collected tissues (non-destructively) for microsatellite assessment of population differentiation, particularly the effects of barriers on genetic structure (Warren with Ken Sterling, David Reed, and Bryce Noonan, University of Mississippi); surveyed non-historical sites for the darter; re-surveyed randomly selected historical sites to evaluate changes in abundance across the range of the species; initiated seasonal comparisons of microhabitat use; initiated a field study of effects of installed natural spawning substrates on darter density (Warren with Ken Sterling, David Reed, and Bryce Noonan, University of Mississippi); and initiated a mark-recapture pilot study of darter movement and the use of constructed woody bundles for establishing the darter in a non-occupied small tributary (within an occupied stream system). (3) Continued evaluation of spawning, recruitment, and population demographics of the Alabama Shad (*Alosa alabamae*), Pascagoula River system (Adams with Brian Kreiser and Jake Schaefer, University of Southern Mississippi). (4) Re-surveyed 10 randomly selected stream reaches (original surveys 1999-2004) in the Little Tallahatchie and Yocona rivers to help evaluate, in part, temporal changes in fish and habitat in streams of National Forests in Mississippi (Warren with Jake Schaefer, University Southern Mississippi). (5) Initiated genetics studies on *Fallicambarus gordonii* (Adams with Jim Lee, Nature Conservancy, and Jim Fetzner, Carnegie Museum of Natural History). (6) Continued genetic analyses on *Orconectes (Triselleseus)* spp. from multiple drainages in Mississippi (Adams, with Keith Crandall, Brigham Young University). (7) Continued diversity assessment of crayfishes of north-central Mississippi (Adams and Warren, with Chris Taylor, Illinois Natural History Survey). (8) Continued adding records and collections to the in-progress distributional atlas of crayfishes of Mississippi (Adams). In addition, the website "Crayfishes of Mississippi" is active at http://maps.fs.fed.us/crayfish/crayfish_general_info.jsp http://maps.fs.fed.us/crayfish/crayfish_general_info.jsp. The website provides interactive distribution maps of Mississippi's crayfishes (with Chris Lukhaup's photographs) and allows searches by lists of species, county, or HUC code or mapping of distributions of species by county or HUC. (9) Completed 10-year study of mussel population demographics in Sipsey River, AL and Little Tallahatchie River, MS

Mark Peterson, The University of Southern Mississippi-Gulf Coast Research Laboratory reports a very busy year in his lab with most of his time being directed towards the following research projects: (1) Ecosystem-based management: assessing ecosystem services of oyster

reefs using stable isotope signatures. The project is being conducted with Kevin Dillon and Rich Fulford. (2) Participation in the NGI prototype Integrated Ecosystem Assessment for the northern Gulf of Mexico. Rich Fulford and Steve Lohrenz are co-PIs on the project. (3) Habitat characteristics and aspects of the reproductive life history of the saltmarsh topminnow, *Fundulus jenkinsi*, in coastal Mississippi watersheds, with the production of a comparative diagnostic key for young stages of select members of the genus *Fundulus*, Todd Slack as a co-PI. (4) Gulf sturgeon, *Acipenser oxyrinchus desotoi*, in the Pascagoula drainage, Mississippi: post-Hurricane Katrina assessment of habitat and movement of the juvenile cohort. This project is being conducted with Todd Slack. (5) Ecosystem-based management - ecosystem models - years 1 - 3, with Rich Fulford as co-PI. (6) *Fundulus jenkinsi*, Saltmarsh Topminnow: Conservation Planning and Implementation. Development of this management plan is a collaborative effort including Dave Ruple, Rafael Calderon, Mark Woodrey and Gretchen Grammer.

Larry Pugh, Assistant Chief of Fisheries for the Mississippi Department of Wildlife, Fisheries and Parks, commented that the agency was supporting a number of fisheries related research projects. Don Jackson (MSU) is studying the recovery of river fisheries on the Pascagoula River following Hurricane Katrina. This work was prompted by reports of massive fish kills occurring on the lower reaches of the river after Hurricane Katrina made landfall. Eric Dibble (MSU) has been funded to develop management practices regarding chemical and biological aquatic plant control methods to restore habitat and facilitate fishery management goals in Mississippi Delta lakes. Lastly, Steve Miranda (MSU) and Glen Parson (UM) are determining habitat used for spawning by adult crappie in four large flood control reservoirs of northwest Mississippi. These data will be utilized to explore flexibility in the reservoir operational rule curves that would allow crappie-friendly adjustments to water levels.

The Fish Ecology Team (Jack Killgore, Jan Hoover, Steven George, Phil Kirk, Todd Slack, Bradley Lewis, Jay Collins, Bill Lancaster, Krista Boysen, Alan Katzenmeyer, Larry Southern and Kathie Eagles) at the US Army Engineer Research and Development Center (ERDC) continues its 20-year program of sampling the Mississippi delta and the mainstem Mississippi River. Delta work includes evaluations of the biotic integrity of streams and rivers and descriptions of the impacts and benefits of water control structures. River projects include assessments of dike-notching and dredging on fish assemblages, and ongoing population studies of pallid and shovelnose sturgeon. ERDC is also working with the Lower Mississippi River Conservation Committee to prioritize secondary channels for restoration. Surveys of Asian carp continue in Forest

Home Chute with new collaborative studies of plankton and carp diets by Cliff Ochs and Orathai Pongruktham, University of Mississippi. Completion of a new Brett swim tunnel and two smaller Blazka tunnels have provided swimming performance data on juvenile Asian carp and adult shovelnose sturgeon. Juvenile silver carp swimming performance studies were completed by student researcher Larry Southern, Hinds Community College, and by National Great Rivers Research and Education Center (NGRREC) summer intern Rachel Schmidt, Southern Illinois University. Swimming performance of juvenile big-head and grass carps are underway by student researcher Alan Katzenmeyer, Louisiana Tech University.

*Submitted by Jan Hoover (hooverj@wes.army.mil)
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MISSOURI

Alligator gar (*Atractosteus spatula*) were reintroduced into the Mingo Basin of southeastern Missouri in Mingo National Wildlife Refuge (NWR). In May 2007, 19 radio-tagged juvenile *A. spatula* were released into 1,214-ha Monopoly Marsh and were tracked by Southeast Missouri State University graduate student (and Open Rivers and Wetlands Field Station employee), Levi Solomon. An internal MDC missive was published detailing the study. To determine the possible effects of introduced *A. spatula* on the unique fish community, a survey was designed to document changes to species richness in the basin that could be attributed to introducing *A. spatula*. After three years of conducting surveys using this design in Mingo NWR, we have decided to stop sampling for the next three years, give the gar time to grow, and then measure the possible effects of the gar on species richness in Mingo NWR for the ensuing three years.

Open Rivers and Wetlands Field Station (ORWFS) staff was involved in a two-day meeting to determine the status of and to evaluate the need for listing stargazing darter (*Percina uranidea*). The impetus for the meeting was, in part, the result of many new locality records collected by staff using the Mini-Missouri Trawl, which was developed by ORWFS staff. The species has a wider distribution and seems more abundant in Arkansas than Missouri. Missouri's locality records have been greatly increased because of ORWFS trawling in the Black River. Prior to 2006, there were only eight records of *P. uranidea*; we have since added 21 records. Many of these records resulted from the experimental work of Joe Ridings (ORWFS), who has developed a new trawl named the "brail trawl." The brail trawl is a modification of the Mini-Missouri Trawl whereby mussel brail hooks are towed immediately in front of the opening of the trawl. The hooks flip over small

rocks and debris forcing fish into the water column and are intercepted by the trawl. Ridings's data shows significant increases in catch of madtoms (*Noturus*), sculpins (*Cottus*), and darters (*Etheostoma* and *Percina*) over the Mini-Missouri Trawl without a significant increase in snagging. An underwater video is available as well showing how the brail trawl scours the bottom releasing fish that were hiding under cover.

The Missouri Trawl was also the primary reason Dave Knuth (Missouri Department of Conservation-West Plains) decided to survey the Gasconade River for crystal darters (*Crystallaria asprella*). In 8 days of sampling, he captured 13 *C. asprella* from 7 locations in two counties. Prior to these collections, *C. asprella* had not been collected from the Gasconade River since 1990. Enticed by these results, focus shifted to the Meramec River. Jeff Ray from the University of Northern Alabama used the Mini-Missouri Trawl with help from Knuth and ORWFS staff to survey parts of the Meramec River this summer. At this writing, 6 *C. asprella* were captured from different locations in the river; more surveys are being planned.

A new darter species was described by John Switzer and Rob Wood (St. Louis University): *Etheostoma erythronotum* (Meramec saddled darter). It is the first known fish species endemic to the Meramec Basin. It differs morphologically and genetically from its sister species *E. tetrazonum* from the Gasconade, Osage, and Moreau River basins.

Other highlights involving the ORWFS include: (1) Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System. We concluded our 17th straight year of monitoring the fish community in a 50-mile stretch of the Middle Mississippi River at Cape Girardeau, Missouri. This summer, our LTRMP crew reports higher than usual catches of the rare Ohio shrimp (*Macrobrachium ohione*), a species we have closely monitored since we rediscovered it in 1991. In August 2009, Tom Jones from Marshall University captured a single specimen of *M. ohione* from the Ohio River just below Smithland Dam; an important new find. (2) Fish community monitoring continues for several side channel restoration projects in the Middle Mississippi River: Schenimann Chute, Establishment Island, and Buffalo Chute. Schenimann Chute and Buffalo Chute are still in the pre-construction monitoring phase, but Establishment Island (which is actually an evaluation of the effects of river training structures on fish communities of a river bend) is now in the post-construction monitoring phase. (3) The Middle Mississippi River pallid sturgeon demographics project, a cooperative effort between Southern Illinois University-Carbondale and the ORWFS continued in 2009, but emphasis is moving away from adult and sub-adult demographics and vital statistics to better understanding larval and juvenile dynamics. (4) ORWFS staff hosted a group of scientists representing the Yangtze

River where we exchanged information about our respective programs on the Yangtze and Mississippi Rivers. Plans are underway to further the exchange with ORWFS staff going back to China to demonstrate the Missouri Trawl and develop holistic restoration projects.

The Missouri Department of Conservation (MDC) has suspended the Resource Assessment and Monitoring (RAM) program while it evaluates the efficacy of the sampling design. Concern about Missouri's ability to track rare and endangered species and communities, and manage for them, has led to a movement led by Bob Hrabik to create a Missouri Biological Survey and establish an accredited systematics research collections for aquatic material in Missouri. The idea was first proposed to the Conservation Division of the Missouri Academy of Sciences (MAS) in 2007. MAS has endorsed the concepts and is planning a survey to determine the extent and status of such collections in the state. In the meantime, the Resource Science Division of the Missouri Department of Conservation conceptually approved the idea as well as the state's herpetologists, a group representing several state organizations and agencies concerned with tracking rare and endangered species and communities.

*Submitted by Bob Hrabik
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NORTH CAROLINA

Fritz Rohde (Habitat Conservation Division, National Marine Fisheries Service) retired from the North Carolina Division of Marine Fisheries in October 2008 but immediately un-retired and accepted a position in the Habitat Conservation Division of the National Marine Fisheries Service in Beaufort, North Carolina. He will be working primarily on fish passage issues at hydroelectric dams on the Roanoke and Pee Dee rivers as well as instream flow issues in other rivers in the state. Since the Freshwater Fishes of South Carolina (by Fred C. Rohde, Rudolf G. Arndt, Jeffrey W. Foltz, and Joseph M. Quattro, <http://www.sc.edu/uscpres>) will appear in April 2009, Fritz plans on returning to his study of the undescribed broadtail madtom, *Noturus* sp. cf. *leptacanthus*.

Wayne Starnes (NC Museum of Natural Sciences) reports that additional strides have been made toward the databasing of fish holdings with nearly 50,000 lots now completely processed at the North Carolina Museum of Natural Sciences (NCSM). This has involved considerable sleuthing of locale information and data upgrades, including complete hierarchical drainage data for freshwater collections, and virtually all collections are georeferenced to facilitate mapping. These data are available on the museum's new collections website (<http://collections.natu>

ralsciences.org/). Within the past year, NCSM has assembled a fully operational molecular lab, an interim facility to serve until such time as the museum's new Nature Research Center is completed (projected 2011) in which a well equipped lab, fully on display to the public and designed to educate visitors on the hows and whys of biodiversity research, will be installed. The interim lab is managed by Morgan Raley (morgan.raleyn@ncmail.net), who is collaborating with Wayne and Arthur Bogan on a number of fish and mollusk studies. Wayne has collaborated with Bryn Tracy and Bob Jenkins on a historic analysis of the Pee Dee-Yadkin River fish fauna in North Carolina with emphasis on invasions of a host of nonnative species and, in particular, a case study on the invasion dynamics of two catostomid species, the striped jumprock and northern hogsucker. Wayne and Morgan have a number of ongoing joint studies employing molecular and morphological techniques, including a joint study with Mollie Cashner on *Hydrophlox* species in the Santee River basin. Other ongoing studies include investigations of southern populations of johnny/tessellated darters on the Atlantic Slope, surveys for bridle shiner, *Notropis bifrenatus*, southern *Notropis procne*, and some enigmatic landlocked populations of river herrings which exhibit ambiguous characteristics between Blueback Herring and Alewife and fully mature at but four inches total length!

The Robust Redhorse Conservation Committee (RRCC) continues its joint efforts to study the rediscovered Pee Dee River population of this extremely rare and charismatic species in North and South Carolina, in the reach beginning below Blewett Falls Dam near Rockingham, NC. Participants include the NCWRC, Progress Energy, SC Department of Natural Resources, NC State University, NCSM, South Carolina Aquarium, and others. Work in 2008 consisted of nine days of boat electrofishing of shoal areas during the late April-early May spawning season in an attempt to capture further specimens for transmitter implantation. A masters student from the NCSU Cooperative Fisheries Unit, Michael Fisk, is currently devoting sustained effort to tracking these large and mobile fish (currently 19 individuals) in the Pee Dee throughout the year, similar to the prior efforts of Tim Grabowski of Clemson University in the Savannah River. For the first time in several years, the RRCC also conducted a fall survey of many miles of the river in the SC portion in an attempt to capture more individuals for tracking. Only a single individual was captured, though high flows thwarted effective electrofishing efforts in the reach that was thought to be most promising. In a related development, though the new licensing agreement for operation of Blewett Falls by Progress Energy has not quite been formalized, that corporation has agreed to go ahead and informally instigate minimum flow requirements to assure ade-

quate watering of spawning shoal areas during the spawning season.

Tom Kwak (USGS NC Cooperative Fish and Wildlife Research Unit at NC State University) advises seven grad students involved with five research initiatives on important nongame fishes in the southeast U.S. Steve Midway (MS student) combined field and laboratory research to investigate habitat use of the Carolina madtom, as well as efficacy of an artificial cover unit. Scott Favrot (MS student) assessed spatial and temporal bounds of spawning migration, quantified seasonal movement patterns, identified microhabitat suitability, and characterized behavior of a population of Sicklefin Redhorse in the Hiwassee River Basin.

Michael Fisk (MS Student) is studying the Robust Redhorse population in the Pee Dee River, North Carolina and South Carolina to examine movement and habitat use between two years of varying regulated flow regimes downstream of Blewett Falls Dam. Dan Weaver (MS student) is conducting research in the North Toe River, North Carolina, to quantify changes in fish density, distribution, and habitat use of nongame fishes as affected by the presence of stocked trout. Tom and his research group are also conducting research in Puerto Rico on stream fish sampling dynamics and protocols, island-wide fish surveys, influential factors on fish distribution and abundance, amphidromous fish ecology, and fish contaminant loads and pathways.

Patrick Rakes (CFI) reports that they assisted Steve Fraley and T. Russ with spotfin chub, (*Cyprinella monacha*) monitoring in the Little Tennessee River below Lake Emory. They also collected sicklefin redhorse (*Moxostoma* sp. cf. *macrolepidotum*) from the Little Tennessee River for eggs and milt in April and attempted to fertilize more than 25,000 eggs. However, viability was low, resulting in ~1,200 larvae. From this, ~680 young juveniles were produced with 230 released in the Tuckasegee River near Cullowhee, NC in September, 450 juveniles transferred to the Eastern Band of the Cherokee Indians in Cherokee to grow out for 2009 release into the Oconaluftee River. Staff also propagated more than 500 wounded darters (*Etheostoma vulneratum*) from captive spawning of Little Tennessee River stock. Of these, ~330 were stocked in the Cheoah River (below Lake Santeetlah) for the first releases of fish to inaugurate the FERC relicensing-mandated restoration efforts of the fish community there. The remainder will be stocked out in early spring 2009. Lastly, they propagated and transferred ~1,000 spotfin chub to the NCWRC's Marion Fish Hatchery to grow out for the first reintroductions of this species to the Cheoah River planned for 2009.

Steve Fraley and T. R. Russ (NCWRC Aquatic Wildlife Diversity Program) report that during 2007 and 2008, NCWRC Aquatic Wildlife Diversity staff sampled fish com-

munities at selected sites throughout the Catawba, French Broad, and New river systems in western North Carolina. In general, results were mixed with a few notable declines in some species. They failed to detect 13 species in the French Broad, seven of which were already presumed to be extirpated; however mooneye (*Hiodon tergisus*) and mountain madtom (*Noturus eleutherus*) were collected for the first time since 1977 and 1888, respectively. Fish densities were notably low in the lower South Fork New and mainstem New rivers, but species richness was generally as expected.

Chris Wood and Rob Nichols (NCWRC Aquatic Wildlife Diversity Program) report that during 2008, 22 sites were surveyed in the upper Dan River and its largest tributaries, the Mayo and Smith Rivers (Roanoke River Basin). Survey results show that most sites which previously harbored state and federally listed species still maintained detectable populations of those species. However, rusty-side sucker were not collected at any site and it is believed that this species may now be extirpated from the state. Bigeye jumprock were not detected at several of its historical occurrence locations and preliminary data suggests this species may be declining. Orange-fin madtom were absent from its most downstream historical occurrence locations. Its distribution in the Dan River appears to be constricting to the upper reaches of the Dan River in North Carolina and Virginia. A highlight of the project was the discovery of two previously unknown populations of the Federally Endangered Roanoke logperch (*Percina rex*), in the Mayo and Smith Rivers. The first North Carolina population discovered in the summer of 2008 was below a hydroelectric dam on the Mayo River. A second population was verified in the Smith River when 10 Roanoke Logperch were captured, ranging in size from 63-159 mm. Further research and surveys are planned for 2009 to investigate population structure of these two populations (e.g., abundance and age classes).

Mike LaVoie (Eastern Band of the Cherokee Indians) reports that he and his staff are completing brook trout distribution and genetic inventories in all tribal streams, as well as conducting habitat assessments (in-stream, riparian, and barriers to non-native trout) to identify and prioritize potential restoration projects. They are also initiating a fish weir project on the upper Oconaluftee River to begin monitoring white sucker (*Catostomus commersonii*) and redhorse (*Moxostoma* spp.). Staff will be looking at assemblage composition, relative abundance, migratory patterns, spawning ecology, etc.

Dave Mathews (TVA) reports that during 2008, Tennessee Valley Authority's Aquatic Monitoring and Management group conducted Index of Biotic Integrity surveys on 18 streams and five tailwaters in the Tennessee River portion of western North Carolina.

Bryn H. Tracy (NC Division of Water Quality) reports that between March and June 2008, the stream fish community assessment program sampled 71 basinwide sites in the New River, Watauga River, and in the Sand Hills and Coastal Plain region of the Cape Fear River basins. The complete data, ratings, analyses, and reports for these river basins will be available in spring 2009 at <http://www.esb.enr.state.nc.us/BAU.html> and <http://www.esb.enr.state.nc.us/bar.html>.

Carol Johnston and Andrew Henderson (Auburn University MS Student) have completed their work with larval and juvenile habitat use by the Cape Fear Shiner in the Rocky River system of the Cape Fear River drainage. They are now finishing an analysis of population viability of this federally endangered species.

Joyce Coombs (UTK Wildlife and Fisheries) reports on Pigeon River restoration efforts in the Pigeon River: in the North Carolina portion of the drainage, more significant numbers of fish were translocated in 2008 and 2009—gilt darters (214), mirror shiners (601), silver shiners (908), telescope shiners (678), and Tennessee shiners (856); monitoring activities saw a significant decrease (nearly half) in the total densities of fish observed in 2008 relative to 2007, with no gilt darters or mirror shiners observed.

Submitted by Bryn Tracy (bryn.tracy@ncmail.net)

OKLAHOMA

D. B. Fenner, K. Collins, B. Bristow, R. Standage, and R. Bastarache are conducting annual surveys to monitor the status of the federally-threatened leopard darter in southeastern Oklahoma and southwestern Arkansas. Information from the monitoring effort, which began in 1998, has been used to evaluate the species' status as threatened and guide recovery actions for the species. Since 1998, survey results suggest that leopard darter population trends are stable to declining.

A. D. Martinez, D. B. Fenner, and V. M. Tabor are conducting surveys to update the status of the Arkansas darter in Oklahoma. The updated information is needed to support a reevaluation of the species as a federal candidate for listing under the Endangered Species Act. The surveys have confirmed the species' continued existence at many historically-inhabited localities in the state. However, human uses of water, physical stream modifications, water quality degradation, and other factors appear to pose continuing and new threats to the species.

A. A. Echelle, W. L. Fisher, and R. A. Van Den Bussche are investigating levels of genetic divergence between populations of various species (Rocky Shiner, Redspot Chub, Logperch, and Least Darter) in the Ozark/Ouachita region and populations in Blue River, southcentral Oklahoma. The

purpose is to help evaluate the evolutionary distinctiveness of the Blue River ichthyofauna in response to conservation concerns generated by potential over-mining of the Arbuckle-Simpson aquifer in southcentral Oklahoma.

A. A. Echelle, W. L. Fisher, and R. A. Van Den Bussche are studying geographic variation in genetic structure of the Leopard Darter, a federally threatened species endemic to the Ouachita Mountains of southeastern Oklahoma and southwestern Arkansas. The purpose is to provide baseline data on levels and pattern of genetic diversity as a benchmark for future management of the species.

*Submitted by David Martinez
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PENNSYLVANIA

Recent sponsored projects by the Wild Resources Conservation Fund (WRCP) and State Wildlife Grants (SWG) Programs have been assessments by Penn State University in the Pennsylvania section of the Ohio River which revealed range extensions of several benthic species and the development of an electrified benthic trawl and inventories of large-bodied and benthic fishes along over 90 miles of the Allegheny River by researchers at California University of Pennsylvania.

The recent establishment of the Three Rivers Ecological Center in Pittsburgh has led to the development of clearinghouse for information on the Three Rivers (Allegheny, Ohio, and Monongahela) as well as the formation of a Rivers Advisory Board. Of particular concern in the region is the effect that sand and gravel dredging are having on the availability of fish habitat within the Allegheny and Ohio Rivers.

In the Ohio River Basin, the Pennsylvania Department of Environmental Protection (PA DEP), in partnership with the U.S. Environmental Protection Agency (EPA), is conducting a two-year (2008 and 2009) intensive, multi-parameter sampling program on two major tributaries of the Ohio River: the Allegheny and the Monongahela rivers. The purpose of the project is to evaluate the biological conditions of the Monongahela River from river mile 0 in Pittsburgh south to river mile 91 and the Allegheny River from river mile 0 in Pittsburgh north to river mile 75 via probabilistic sampling. During 2008, fish, fish habitat, macroinvertebrates, mussels, water chemistry, plankton and sediment samples were collected at 31 sites on the Monongahela River and 34 sites on the Allegheny River. Fifteen sites were chosen randomly and sampling will be repeated at those sites during summer 2009.

Researchers at California University of Pennsylvania (Drs. Argent and Kimmel) have completed sampling of 40 named tributaries to the Monongahela River

as well as its Pennsylvania mainstem. Systematic sampling every 0.8 miles with gill nets and every mile with benthic trawls yielded over 6,000 individuals and over 50 species.

American Rivers is currently working with the USGS Water Resources Division, DEP, California University of Pennsylvania, US Dept. of Agriculture, and PFBC to develop a plan for removal of two dams along Dunkard Creek, a major Monongahela River tributary. If funding is secured, pre-dam removal assessments will begin in September 2009 with both fish and macroinvertebrate samples. The dam would be removed in early 2010 with follow up assessments during fall.

Reports of glass shrimp (*Palaemonetes kadiakensis*) from the Monongahela River several years ago have been further substantiated by recent sightings by a local angler at Prickett's Fort State Park in Fairmont, WV. This account represents the farthest known southern extent for this aquatic species within the Monongahela River Basin. Additionally, video submitted by an angler near Suttersville, PA appears to show a large (500+ fish) aggregation of paddlefish (*Polyodon spathula*) in mid-April in the Youghiogheny River.

Submitted by David Argent (Argent@cup.edu)

SOUTH CAROLINA

Jeff Foltz's (Clemson University) graduate student Steph Irwin has finished a two year study which examined the population density, time of spawning, fecundity and GSI of turquoise darters which belong to a population that the Foltz lab established in Six Mile Creek within the Clemson Experimental Forest. This species of fish was extirpated from Six Mile Creek in the period 1850-1930.

Bert Ely's group at University of South Carolina demonstrated that the annual effective number of breeders is less than 50 for the Santee Cooper system striped bass population. In 1992, two pairs of fish contributed 25% of a poor year class and in 1993, 13 pairs of fish contributed nearly one third of a very good year class.

The South Carolina Stream Assessment is in its third year of a five year rotation to sample the state's Wadeable streams. The sites are randomly generated and sampled using standardized backpack electrofishing methods by the SC DNR stream team, headed by Kevin Kubach. Habitat, water quality, and geomorphology are measured at each site, and Clemson University researchers are collaborating with DNR to collect macroinvertebrates and toxicological data as well. The focus of 2009 sampling is in the Catawba-Wateree and Pee Dee basins. Two dams are scheduled for removal from Twelve Mile Creek, a large tributary to Lake Hartwell in the upper Savannah River drainage of South Carolina. Mark Scott with SC DNR is

directing a study in collaboration with Clemson University to examine the effects of dam removal on fishes, macroinvertebrates, and physicochemical conditions in the creek. The study is planned for at least five years post-removal.

SC DNR's diadromous fish section (Bill Post) is also completing its first of year experimental stocking of American Shad in the Edisto River, evaluating the use of genetic tags, and genetic characterization of the population. Mark Collins has also recently started a new project on the Santee River in cooperation with NC State (Joe Hightower)/USGS. The focus is on shortnose sturgeon habitat use, abundance, and movements using sidescan sonar, Didson sonar, and traditional gillnet collections. SC DNR's estuarine finfish section (Tanya Darden) is in its third year of an experimental population restoration study of striped bass within the Ashley River system. SC DNR's freshwater fish section (Scott Lamprecht) has completed its 5th year of a population restoration study of robust redhorse in the Santee River system; they continue to study striped bass recruitment and juvenile growth/abundance in the Santee System; and are beginning a dietary overlap study among white perch, striped bass and American shad in this system.

Submitted by Tanya Darden (DardenT@dnr.sc.gov)

TENNESSEE

Mark Cantrell, USFWS Asheville, NC, reports that the madtom condos deployed in Little Chucky Creek have not been successful yet. USFWS intern, Ida Evertjam, assembled the madtom pots from common flowerpot bases and custom-made nest chambers produced by a local potter. A team from CFI, TVA, and USFWS deployed these devices as artificial cover and survey traps in Little Chucky Creek in mid-April 2009, concentrating on the Bible Bridge vicinity to above the last capture locations at RM 5.9. Return checks of the 80 pots caught zero madtoms. Crayfish occupancy rates have been high. The team has also done some additional seining at historic localities and a couple of other good spots without capturing any madtoms.

Mark and Ed Scott braved incredibly cold weather and snow during early February 2009 on Fort Loudon, Watts Barr and Tellico reservoirs in search of stocked lake sturgeon. Because of commercial fishing closures in the upper Tennessee due to fish consumption advisories, the small but elite team deployed multiple trotlines to monitor lake sturgeon numbers. The team noted that chucklehead catfish numbers are booming. Also noteworthy was their catch of hellbenders at upper Tellico Reservoir in the Little Tennessee River near Chilhowee. Lake sturgeon restoration efforts continue in the Upper Tennessee system, with partners including TWRA, USFWS, TTU/Tennessee Cooperative

Fisheries Research Unit, and TVA. Phil Bettoli's lab (TTU) deployed seven sonic receivers in the upper Tennessee system, and 37 tagged fish were released in two groups. TWRA and TN Aquarium have also begun lake sturgeon releases into the Cumberland River in Nashville.

Jim Herrig, Cherokee National Forest has compiled data on the spawning runs of suckers in Citico Creek in Monroe County. Smallmouth buffalo (and a mix of other sucker species) stage at the mouth of Citico Creek in Tellico Reservoir towards the end of March and into early April. The largest run that lasts roughly five days is dominated by smallmouth buffalo, with black buffalo and redhorse also present. After these fish leave a much smaller run follows made up primarily of silver redhorse, with black buffalo and river carpsuckers also present. Jim estimates that at least 50,000 fish continue to participate in this run but a statistical estimate is needed. Public interest in the buffalo run continues to increase each year, and Jim gets many questions that he is unable to answer. Opportunities for research on this ecological phenomenon are broad and he welcomes anyone with interest to contact him.

Nick Lang (Field Museum), reports that in August of 2008, he discovered an *Etheostoma spectabile* species group member in the western Highland Rim portion of the Cumberland River drainage (Sams Creek SSE of Ashland City). Although the range of the undescribed "Mamequit Darter" is geographically closer to the site (upstream through Marrowbone Creek, Cheatham Co.), analysis of mitochondrial DNA indicates that the population is most closely related to a group member further upstream in the Cumberland River drainage (*Etheostoma lawrencei* and the "Ihiyo Darter"), the previously furthest downstream record for which was Goose Creek, Trousdale County. Molecular and morphological studies are ongoing in collaboration with Jeff Ray (UNA). Work also continues on his study of genetic variation in *Etheostoma luteovinctum*. Despite the fact that many previously sampled sites were found to be dry during multiple visits last year, he was able to greatly increase his sample size.

Anna George (TN Aquarium) is working with Shea Tuberty, Carol Babyak (Appalachian State University) and Donna Lisenby (Watauga Riverkeeper) to monitor the impact of the coal ash spill in Watts Bar Reservoir. The TN Aquarium is still propagating and reintroducing Barrens topminnows with CFI and USFWS. Anna George and Dave Neely are also working on a population genetics study of Tennessee dace. They are also working with CFI on propagation and genetics study of Conasauga logperch; 3 have been collected in Tennessee so far this year.

Joyce Coombs (UTK Wildlife and Fisheries) reports on Pigeon River restoration efforts in the Pigeon River: in the Tennessee portion of the drainage, numbers translocated

in 2008 and 2009 were greatly reduced due to first low, then high water conditions, with the exception of bluebreast darters (166) and mountain madtoms (430); monitoring found total fish densities in 2008 were similar to 2007, with a significant decrease in insectivore species (darters in particular) and a significant increase (more than double) in omnivores. The re-introduced gilt darter numbers dropped from 19 individuals observed at Tannery Island in 2007 to one individual in 2008.

Carol Johnston (Auburn University), reports that she continues to monitor selected streams on the Cherokee National Forest (Tellico, Hiwassee and Ocoee drainages) as part of a long-term dataset looking at fish population trends for the Forest Service (with Jim Herrig).

During 2009, Pat Rakes reports that CFI has been propagating, stocking, and monitoring of smoky and yellowfin madtoms, Citico (formerly duskytail) darters, and spotfin chubs in Tellico River, concurrent with monitoring source populations in Citico Creek. In June, a robust local population of Powell River yellowfin madtoms was discovered above Mulberry Creek, Hancock County during an unbelievably quick collection of nests to rear. Efforts to collect marbled (formerly duskytail) darters in Little River were a wash-out this year, due to constant high waters and captive adults failed to breed in captivity. Similarly, boulder darters and spotfin chubs were stocked to Shoal Creek, but high waters precluded monitoring all spring. Species successfully spawned and/or reared include ashy darter, five slackwater darter populations (all of TN's), >5000 sicklefin redhorse, blotchside logperch, wounded darters (LTNR pop), Roanoke logperch, spotted darters (WV pop), spring pygmy sunfish, rush darter, banded (and Holston sp.) sculpin (for mussel hosts), Kentucky arrow darter, and Cumberland darter. Diamond darters and upper Allegheny R (PA) gilt darters had not spawned by end of July. Number of species spawned and reared to date: 55. For more information, visit: <http://www.conservationfisheries.org>

Rick Bivens (TWRA) reports that their biologists collected *Phoxinus tennesseensis* in Back Creek on the Cherokee National Forest, Greene Co. in 2008. USFS biologists also collected them at the same location in 2009. This makes only the second known locality for *P. tennesseensis* in the Nolichucky River watershed in Greene Co. The other location is an unnamed tributary to Gregg Creek, discovered by TWRA in 2006.

Finally, former students and fellow faculty and ichthyologists assembled November 25, 2008 at the University of Tennessee in Knoxville to witness the long overdue naming and dedication of the "David A. Etnier Ichthyological Collection" (DAEIC). In addition to the accolades for his efforts and contributions to the scientific knowledge of the fishes and aquatic insects of the southeast, fond recollections of past field "experiences" and "Etnierisms" were

shared over appropriate beverages [i.e., “The sleeping dog fears not the chicken”, “You never really know an animal until you’ve eaten it”, “Either way is best”, “Big or small, keep them all”]. A campaign to create an endowment to support and maintain the collection has been initiated. Dr. Gary McCracken, Ecology and Evolutionary Biology (EEB) Department Head, reports that contributions can be made by contacting Randy Atkins within the College of Arts and Sciences Development Department at (865) 974-2131 or matkin11@utk.edu.

The DAEIC represents 40 years of work by Dr. David Etnier. In total species it ranks in the top 25 (or maybe top 20) among North American fish collections. It is the best darter collection in North America based on number of species, number of specimens, and number of lots and specimens of rare species. It is a predominantly eastern US collection, with excellent coverage of freshwater fishes of North America east of the Rocky Mountains. Other strengths include marine fishes of the Gulf of Mexico, North Atlantic, and the Bering Sea. The collection is well known and well used by UT staff and students as well as colleagues from other institutions. Nearly every paper dealing with the systematics of freshwater fishes of the south-eastern US since the early 1970s has utilized specimens from the collection. Since its inception in 1966, we have loaned 2,250 lots of fishes, and have processed 847 loans. It contains roughly 424,002 specimens representing 206 families. There are 2900 paratypes representing about 100 species. Drs. Etnier and Hulsey curate the collection. Jennifer Joice is the collection manager. Jennifer reports that 30,000 of the 35,000 lots have been entered into a relational database using Filemaker Pro and are searchable (as of July 31, 2009). A web site for the collection is planned for the future.

Submitted by Pat Rakes (xenisma@gmail.com) and Jeff Simmons (jwsimmons0@tva.gov)

TEXAS

Tim Bonner (Texas State University) is working on a series of studies in the lower Brazos River examining the reproductive ecology of *Notropis shumardi* (silverband shiner), *N. buechanani* (ghost shiner), and *Macrhybopsis hyostoma* (shoal chub), quantification of larval fish drift densities, and macroinvertebrate and fish assemblage structures and habitat associations within lower Brazos River tributaries. He is also working on life history and habitat associations of *N. atrocaudalis* (the blackspot shiner) in the Neches River basin. Tim and Catherine Phillips (USFWS) are working on a survey evaluating the needs for fish and aquatic organism passage across the state of Texas. This project hopes to identify critical areas of focus for future research and habitat restoration.

Texas Parks and Wildlife Department (TPWD) researchers are examining seasonal movement and habitat use by alligator gar and striped bass in the Trinity River. The TPWD River Studies Program (project leader: Roy Kleinsasser) and the Texas Commission on Environmental Quality (TCEQ) are completing their second year of sampling rivers and streams across the state of Texas as part of the National River and Stream Assessment Survey. The TWPDRiver Studies Program (project leader: Kevin Mayes) is also working with TCEQ, Texas Water Development Board, and the respective river authorities on instream flow studies for the Brazos, Sabine, and San Antonio rivers in an effort to determine the instream flow requirements necessary for supporting an ecologically sound environment.

*Submitted by Catherine Phillips
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VIRGINIA

Steve Powers completed his first year as Bob Jenkins' successor at Roanoke College and began work on updating the RC fish collection. The ultimate goal of this work is a fully georeferenced, computerized, and web-searchable database available to researchers. Work has also begun on assessing genetic diversity of Tennessee/Duck/Cumberland endemics with contrasting population sizes. Systematic study of the *Etheostoma cinereum* (ashy darter) complex continues with some complication due to their welcome rediscovery in the Elk River, TN. Life-history research on *Percina nevisense* (chainback darter) is set to begin pending a student to assist with the research.

Werner Weiland at the University of Mary Washington reports on surveys of American shad (*Alosa sapidissima*) on the Rappahannock River, and their response to the breaching of a dam at Fredericksburg in 2004 and its complete removal in 2005. VDGIF has been stocking shad fry in the upper Rappahannock in hopes of re-establishing a spawning population. In April 2008 VDGIF collected eight adults at Kelly's Ford (~28 miles upstream of former dam). One of these was a wild six year old male presumably spawned below the dam in 2002. In spring 2009 DGIF collected one blueback herring (*Alosa aestivalis*) at Kelly's Ford. It appears that herring will migrate above the falls on the Rappahannock. There has been no stocking of herring by DGIF.

Mike Pinder at the Virginia Department of Game and Inland Fisheries (VDGIF) reports that VDGIF has made a concerted effort towards the recovery of the federally threatened yellowfin madtom (*Noturus flavipinnis*). Over the last 3 years, VDGIF and the USFWS have funded Conservation Fisheries, Inc. (CFI) to propagate the species to reintroduce in the upper reaches of Copper Creek, VA. In 2008, they were able to document their first recaptures from this effort. This year CFI is examining the potential

for yellowfin madtom reintroduction into the upper North Fork Holston River (NFHR). Populations reintroduced into the NFHR would be designated as experimental/nonessential. VDGIF secured funding for Virginia Tech researchers to investigate distribution, habitat use, population/age structure, and genetic distinctiveness/effective population size of the variegate darter (*Etheostoma variatum*). The study will continue through 2012. VDGIF in partnership with the Tennessee Valley Authority has begun an Index of Biotic Integrity study of the fish community in Big Moccasin Creek, Scott and Russell counties, VA. To date, 35 species including *Noturus flavus* and *Percina burtoni* have been collected from 5 sites. Additional sites will be surveyed through the summer. These efforts will help to provide a picture of water quality and species presence in this under-surveyed water body. New contracted projects for 2010 will be a Roanoke logperch (*Percina rex*) mitochondrial DNA study, a survey for bridle shiner (*Notropis bifrenatus*), and life history of the Clinch dace (*Phoxinus* sp. cf. *saylori*).

*Submitted by Steve Powers
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WEST VIRGINIA

Barb Douglas (Senior Endangered Species Biologist, U.S. Fish and Wildlife Service, Elkins, WV) reports that a status assessment for the diamond darter was completed in

May 2009 and has been submitted to the Washington Office for review. The summary and conclusions of that review will be published in the Federal Register as part of the annual Candidate Notice of Review and the public comment will be invited. The full status assessment will also be posted online. If the USFWS determines after public comment and review that the species qualifies for listing under the Endangered Species Act, and the species is determined to be a high priority for listing, then the species will proceed through the formal process.

A study on the spotted darter (*Etheostoma maculatum*) from the Elk River, WV, is a component of graduate research by Crystal Ruble (Hatchery manager, CFI). Captive propagation of this species was successful, and Crystal is also conducting similar research with the diamond darter. Recently completed theses or dissertations at WVU included population status of brook trout (J.W. Clingerman), evaluation of highway construction on benthic macroinvertebrates (L.B. Hedrick), predictive modeling of freshwater mussels (A.R. Mynsberge), and habitat selection and predation risk in larval lampreys (D.M. Smith).

The proceedings of a 2008 crayfish symposium (southern Division AFS, Wheeling, WV) will be published in a special issue of the Southeastern Naturalist. The proceedings include 17 papers, with four relevant to West Virginia.

Submitted by Stuart Welsh (swelsh@wvu.edu)