

2000 Report of Region 1 - Northeast

Bob Jenkins (Roanoke College) is still a sucker, oops, still studying suckers. In summer 1999 he finished major report to USFWS on description, life history, spawning behavior, habitat, distribution and population status of the undescribed sicklefin redhorse. A major survey for this species will occur in March 2000 (with Bob involved) relative to re-licensing dams that are in, or blocking the range of, the sicklefin in the Hiwassee and Little Tennessee systems. A Redhorse sucker spawning-behavior study, with Mark Clements and Bud Freeman, has year 2000 as its fourth and final year of observations. Meanwhile, analysis of about 40 h of videotape continues. Excerpts can be viewed on the Playboy Channel. A major feature is seeing *Moxostoma carinatum* and *M. erythrurum* spawning as interspecies trios, in varied combinations of species' positions (right, left of female), and species of the female. Interspecies acts were observed in S. Fk. Holston River, VA, Valley River, NC, and Brasstown Creek, GA. Folks better be pulling more pharyngeal arches.....

Mike Pinder (Virginia Game and Inland Fisheries) completed a survey for *Enneacanthus chaetodon*, a state endangered species in VA. It was found at eight sites in the Blackwater and Nottoway systems, three of which represent new populations. His department is funding Paul Angermeir (VPI) in a study of *Percina rex* and habitat use. Depending on funding success, he hopes to fund a genetic study of the spotted form of *Noturus insignis* and a basin-wide survey for *Etheostoma osburni*.

Gene Maurakis (Science Museum of Virginia) has teamed up with Ray Katula and Bill Roston to describe breeding behaviors in *Hemitremia flammea* from field and laboratory studies. A publication is in review on comparisons of spawning and non-spawning substrates in nests of species of *Exoglossum* and *Nocomis*. Gene will be wrapping up field studies on attraction of nest associates to nests of pebble nest-building fishes in spring 2000. Gene and Dave Grimes (VA DEQ) have completed Phase I studies on methodology development for use of wedge clam (*Rangia cuneata*) in biomonitoring studies.

The North Carolina State Museum is, for the most part, consumed in efforts to get the main museum open on 7 April 2000. It will be the largest natural history museum in the South; y'all come. Another major effort has been to finalize the data base structure for computerization of all natural history collections, including fishes. With the combined holdings comprising the core NCSM collection and those of Duke University, UNC Institute of Marine Science, NCSU, the Wildlife Commission surveys, Wayne Starnes' personal collection, and several other sizeable acquisitions, this data base is anticipated to contain data on between 80,000 and 100,000 lots. The data structure is Access-based and employs the basic structure acquired from the Florida State Museum, with several modifications to accommodate NCSM's needs. One feature being added is a large database, compiled by Wayne Starnes, Art Bogan, and Wendy Gotch, containing a hierarchical tabulation of drainage basins for much of North America. It includes all of the United States and much of Canada, and a framework for the remainder of Canada plus Mexico, with plans to expand beyond as needed. This table, linked to the catalog database to have an

oversight function, facilitates standardized entry and retrieval of drainage information in hierarchical fashion down to seven levels. It presently contains over four thousand records. Also linked to the database is a taxonomic and spell-check table based on the long, long in-press USGS checklist of vertebrates, with a fish list authored by Wayne Starnes. Goals are to have substantial portions of the database available on the NCSM web site in 3-4 years. The collections and backlog holdings are now well organized and stabilized in the new Research and Collections Facility to which they were moved in 1998.

Morgan Raley, who recently completed a Ph.D. with Rob Wood at St. Louis University, has joined Gabriela Hogue (erstwhile Mottes, married off since last report) and Lynn Fullbright on the fish heads staff at NCSM for the time being. He and Rob's molecular treatment of *Crystallaria* recently appeared in *Copeia* and his dissertation topic, a phylogenetic analysis of the *Notropis dorsalis* group, is not far behind. Lynn is revisiting the *Etheostoma nigrum-olmstedii* problem in the Tar and Neuse systems as a master's thesis topic at NCSU where she is enrolled in graduate school. Gabriela and Wayne can only wish at this time that they could return to some research, though Wayne gets in a few late night efforts at completing an historical analysis and IBI study of lower Potomac fishes yet remaining from his Smithsonian days and a few efforts with Bob Jenkins on the undescribed "Carolina redhorse". West Pacific and West Atlantic priacanthid manuscripts for FAO are in press and methods for non-lethal tissue sampling in endangered fishes (*Gila*) recently appeared in *North American Journal of Fisheries Management*. Gabriela hopes to embark on studies of the biology of *Chologaster* soon and publish her master's thesis on unionid mussel glochidia and fish hosts. Spurred mainly by needs for exhibits, Wayne Starnes, Dick Bryant, et al. collected and obtained excellent photographs of a substantial portion of North Carolina fish species in 1999. Finally, it appears that IBIs and other studies have drawn agency, public utility, and similar sorts of biologists more and more back into the world of little nongame fishes. It has created a need and desire for instruction on identification of same in those circles. The NCSM contingent was requested to provide large workshop on identification of regional minnows, suckers, and darters at the NC AFS conference and did so, with a healthy attendance of 43 members. Such efforts are looked upon as an opportunity to build mutually beneficial alliances between taxonomists and fisheries scientists, as well as benefit the resource we treasure, southeastern fishes.

Fritz Rohde (NC Marine Fisheries), Rudy Arndt (Richard Stockton College) and Jeff Foltz (Clemson University) are still plodding away on their studies of South Carolina's freshwater fishes. Rohde is working with Joe Quattro (University of South Carolina) and students on various studies of the genetics of southeastern fishes, primarily *Elassoma*, *Noturus*, *Fundulus*, and *Hybopsis/Cyprinella*.

Jan Hoover reports that the Waterways Experiment Station Fish Team, part of the U.S. Engineer Research and Development Center at Vicksburg, MS consists of seven individuals: Jack Killgore, Jan Hoover, Phil Kirk, Steven George, and Bradley Lewis. They are assisted by Neil Douglas and William Lancaster (a commercial fisherman). Ongoing projects include a grass carp population study in the Santee-Cooper River system. Fish are collected by bow fishermen and

otoliths extracted. Age and growth data are collected and used to develop population models that estimate mortality and stocking requirements to control aquatic vegetation in Lake Marion, SC. Streams in Fort Gordon, GA were sampled for invertebrates and fishes to identify nursery and feeding grounds. Noteworthy was the discovery of several populations of *Elassoma okatie*. In a previous study (18 stations sampled quarterly), the bluebarred pygmy sunfish was documented only at a single location in Boggy Gut Creek. In the current study, it was observed at several locations and is now documented from four of the five principal streams on the army installation. Habitat models are being developed for this and other aquatic species. Finally, the Ogeechee River of Fort Stewart, GA was sampled last year for shortnose sturgeon. Fish are being tagged and fin clips taken for ageing. Mark and recapture data and age and growth data will be used to create population models, assess populations status, and develop management protocols.

F. Rohde

2000 Report of Region 2 - Southeast

Conservation Notes

Paraphrasing a "*Tale of Two Cities*," the future conservation status of southeastern fishes teeters between: "the worst of times, the less worst of times." Looming before us are perhaps the most serious threats to southeastern fishes and stream habitats. Yet, seemingly poised to counteract at least some of effects of population growth is a remarkable document: "Strategy for the Conservation and Recovery of Southeastern Imperiled Fishes." The final version will be available by the publication time of this issue. This document, a true consensus strategy, is the product of an October 1999 workshop in Chattanooga among 11 southeastern states and eight federal agencies. Even more remarkable is the likely availability of funding (billions of dollars) through the Conservation and Reinvestment Act (CARA), which seems certain to pass both houses and be signed by President Clinton. Without the consensus document and funding, the future of many southeastern fishes and habitats would be bleak. These are discussed in detail.

1. Tri-State Water Project: Perhaps the apocalyptic predictions of the new millennium were true. Instead of famine and pestilence, instead of bizarre collection permit requirements, instead of data mongers, lapping at the door is water wars-eastern style. This project centers around the future water needs of three states, Alabama, Florida, and Georgia, specifically involving interbasin transfer between the Apalachicola, Chattahoochee, and Flint rivers (ACF,) and the Alabama, Coosa, and Tallapoosa rivers (ACT). Of the three states, Georgia has the most to gain relative to long-term water supply for Atlanta. The multiple agencies involved in the project are unable to agree on how much water should be withdrawn from what, to where, and when (allocation formulas). There also is no consensus on potential deleterious biological effects, and on where and when to conduct monitoring. A federal mediator may have to intervene and make decisions for all parties involved if no consensus is reached. From all non-Atlanta positions, the project appears to be a no-win situation. In fairness, the federal mediator seems cognizant of environmental concerns. However, given the hackneyed call-to-arms, "it's either the economy or the environment" (read my lips), well, we know who wins. A copy of the most recent draft agreement may be obtained from: Heather Hallows, Assistant to the Federal Commissioner, ACT/ACF River Basin Commissions, Atlanta office phone (404) 223-2264x307; Ft. Benning office phone (706) 689-2254, cell phone (706) 575-8435.

Whatever agreement is finally reached, it will set an uneasy precedent. Interbasin transfers will likely become a reoccurring theme as southeastern metropolises grow beyond their immediate carrying capacity and vie for neighboring resources. This phenomena is happening across the South. For example, Tampa, Florida, is hunting for additional sources of freshwater and has floated a proposition to pipe water south from the Suwannee River. To date, this proposal has been successfully opposed. Because coastal cities are rapidly expanding, urban planners will increasingly look to inland freshwater sources for future supply. Engineers will undoubtedly view every drop above the 7Q10 in flowing rivers as "excess water." For inland cities, off-river or headwater water-supply impoundments are the current cure for water shortages. Atlanta plans

to encircle itself with a ring of such impoundments. Besides fragmenting rivers, these small impoundments could impact headwater species with limited ranges. In the case of Atlanta, small adjacent towns such as Canton are under pressure to plan their own off-river impoundments. The adjacent large-small city pattern could result in a cascade of river fragmentation and direct habitat loss for listed or imperiled fishes.

2. *The 100-year Southeastern Timber Stand*: Another large-scale, serious threat to fishes and habitats is the tremendous economic attractiveness of the hundred-year stand of southeastern forests. Eighty-nine percent of southeastern forests are in private ownership (20% owned by timber companies; 69% by individuals and non-timber companies). Only 11% of forests are on federal lands (6% national forests; 7% other federal ownership). Projected harvest rates predict logging in Tennessee alone will increase by 100% in the next decade. Although logging on private lands is supposed to follow established Best Management Practices, apparently that rarely happens. In fact, timber rustling (surreptitious logging of somebody else's land), is becoming more common due to the big bucks for lumber-grade timber, especially hardwoods. With so little southeastern forest land owned by the USDA National Forest Service, it does not seem very prudent to harvest timber from these lands.

Massive logging across the southeast is very likely in the next two decades. The size of the operations will range from immense chip mills to individual operations. Proposals to develop several large chip mill plants in Tennessee and north Alabama were recently denied, but it is just a matter of time before permits are given. We know logging the last 100-year stand in the southeast caused tremendous erosional problems in creeks and rivers, but at that time there was no such thing as Best Management Practices. The ensuing erosion was tremendous, particularly in the upper Piedmont where soils are generally very erodible (actually, channelization was, in part, a "solution" to the "sediment" problem). While modern operations do not use splash dams or cut down every tree, the sheer scope of operations and rate of timber removal will create tremendous stressors on fishes and habitats.

Given the array of threats that are reasonably anticipated, levels of imperilment in southeastern fishes will significantly increase without significant efforts to recover habitats and establish connected river refugia. The cumulative effects of human population growth may push many southeastern fishes to levels of imperilment currently experienced by freshwater mussels. Southeastern fishes have endured previous episodes of persistence-threatening, large scale events (e.g., pervasive water pollution prior to the Clean Water Act, era of high dam construction). It is remarkable that some species have even persisted this long. However, the rate, magnitude, and permanence of change across the southeastern landscape has never been greater: more change will occur in the next two decades than during the entire history of European colonization. That unprecedented level of pervasive stressors will undoubtedly force marginally persisting fishes closer to extinction.

The good news is there is the chance for an equally unprecedented level of conservation work on southeastern fishes and habitats. In October 1999, the U.S. Fish and Wildlife Service brought

together three representatives from 11 southeastern states (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia), representatives from eight federal agencies (Army Corps of Engineers, Environmental Protection Agency, U.S. Fish and Wildlife Service, Federal Energy Regulatory Commission, U.S. Forest Service, Natural Resource Conservation Service (formerly Soil Conservation Service), U.S. Geological Survey, and the Tennessee Valley Authority), and representatives from academia. The goal of the three-day facilitated workshop was to produce a consensus agreement on what actions were needed to address, slow, abate, and correct the increasing levels of imperilment in southeastern freshwater fishes. For the 60+ participants, the workshop was a wringing, exhaustive experience. The document resulting from the workshop, "Strategy for the Conservation and Recovery of Southeastern Imperiled Fishes" by Dick Biggins and Vince Mudrak, is in the third draft at this writing. This document was modeled after the strategic plan for the recovery of mussels, which already has fostered a significant increase in the conservation research and stream restoration work.

I believe this document may be the single most important effort to date towards the conservation and restoration of southeastern imperiled fishes. Researchers from academia and governments will be able to use the document to support need and justification of proposed work on southeastern imperiled fishes. No longer will protection of brook trout habitat be the primary objective in studies of upland, nongame fishes. While many have talked and written about the cooperation needed to effect change in patterns of decline, this document is an example of, and a vehicle for cooperative efforts. As bleak as the potential future is for imperiled southeastern fishes, this document offers a mechanism to begin counteracting the forces of degradation.

The strategic plan also has the support of conservation organizations, the Tennessee Aquarium, and the National Fish and Wildlife Foundation. While the strategic plan alone is just another unfunded federal mandate, serendipity strikes: the Conservation and Reinvestment Act (CARA, H.R. 701), a bipartisan bill with strong support, may literally bring billions of new dollars to states for a variety of conservation and environmental projects. In my opinion, this is a bona fide miracle! Areas and levels of funding that could benefit southeastern freshwater fishes are: 1) Impact Assistance and Coastal Conservation - \$1 billion; 2) Wildlife Conservation and Restoration Fund - \$350 million; 3) Conservation Easements and Species Recovery - \$150 million. This act is supported by diverse, multiple groups who recognize the economic importance of viable natural resources. Some of these groups are: U.S. Conference of Mayors, International Association of Fish and Wildlife Agencies, The Wildlife Society, Americans for Our Heritage and Recreation, The Wilderness Society, National Wildlife Federation, Sporting Goods Manufacturers Association, National Recreation and Park Association, Izaak Walton League of America, Outdoor Recreation Coalition of America, The National Wild Turkey Foundation, Rocky Mountain Elk Foundation, Wildlife Management Institute, Association for Biodiversity Information, Bass Anglers Sportsman Society, and many more.

Research Notes

Georgia: Steve Vives (Georgia Southern University), and his student William Tate are looking at the effect of pH on habitat choice in sunfishes. A new student, Joel Fleming, is interested in the study of movements by shortnose sturgeon. This work is sponsored by Ft. Stewart Military Reservation.

The folks from the Army Corps of Engineers Waterways Experimental Station, Vicksburg - Jan Hoover (JJH), Jack Killgore (KJK), Jan Hoover, Phil Kirk (JPK), Steven George (SGG), and Bradley Lewis (BRL) - are working on multiple projects in the southeast. In addition, the ardent collector, Neil Douglas (NHD), Professor Emeritus, University of Louisiana (Monroe) and William Lancaster (WEL), a commercial fisherman, are working on some of the projects. Distilled from the 17-page list sent by Jan are notes on the following projects. Savannah River Drainage - Faunal survey of streams on military lands (JJH, KJK, SGG, BRL, NHD)- Streams in Fort Gordon (Georgia) were sampled for invertebrates and fishes to identify nursery and feeding grounds. Noteworthy was the discovery of several populations of Bluebarred Pygmy Sunfish (*Elassoma okatie*). In a previous study (18 stations sampled quarterly), the bluebarred pygmy sunfish was documented only at a single location at one stream: Boggy Gut Creek. In this study, it was observed at several locations and is now documented from four of the five principal streams on the army installation. Habitat models are being developed for this and other aquatic species.

Ogeeche River System - Shortnose sturgeon study (JPK) - The portion of the Ogeeche River in Fort Stewart (Georgia) was sampled last year for shortnose sturgeon. Fish are being tagged (externally and with PIT tags) and fin clips are taken for aging. Mark/recapture and age/growth data will be used to create population models, assess population status, and develop management protocols.

Three of four symposia, conferences, or workshops on stream restoration and conservation of southeastern imperiled aquatic species have occurred, and the fourth (EEEE, see below) will be held in May, all within one year. A conference on "Stream Restoration and Protection" was held in Asheville, NC on 17-20 August 1999. Like so many workshops, biologists, hydrologists, and urban planners were in different concurrent sessions. At the conference I heard new terms: "training" or "re-training" streams. Immediately one thinks, "Bad creek, how many times have I told you not to jump your banks?" Seriously, consulting firms see restoration as the next economic bandwagon, but what they view as restoration is a different concept than that of most aquatic ecologists.

The Southern Division of the American Fisheries Society and the Southeastern Fishes Council had a joint meeting in Savannah on 3 to 6 February 2000. The SDAFS/SFC Symposium on "Conservation of Freshwater Nongame Aquatic Fauna in the Southeast - Challenges for a New Millennium", was the most-attended symposium or session at the meeting. SFC members were the majority of speakers. Peggy Shute, (TVA) winner of the first ASIH Carter Gilbert Decorum award, retook her claim to the award barely one minute into her talk.

A symposium, hosted by Gene Helfman (University of Georgia) and Steve Vives, entitled "Ethology, Evolutionary Ecology, and Conservation of Fishes (EEEF?) will be held at the University of Georgia, Athens during 20-24 May 2000. DarterFest will be held in conjunction with the symposium on 24-25 May. For further information, see the meeting website: <http://sparc.ecology.uga.edu/~helfman/eef.html>.

Mark Scott, a Ph.D. student working with Gene, plans to conduct a study of (as part of the Coweeta LTER site) the relation of stream physical and chemical habitats, and an analysis of spatial and temporal scale influences of landscape use on fish assemblages in 36 subbasins in the upper Tennessee drainage of western NC.

Bud Freeman (also UGA) is his usual frenzied self, simultaneously handling multiple Section Six contracts on listed fishes, while being an active member of Robust Redhorse recovery team. Bud is one of the authors contributing to the comprehensive list and conservation status of southern fishes, an effort led by Mel Warren (USDA Forest Service Hydrology Research Laboratory, Oxford, Mississippi) and other SFC members. The list probably will be published in a forthcoming issue of *Fisheries*. Also, Bud is part of the Jenkinsonian redhorse saga, now spanning decades, and only two decades to go before eclipsing the pre-publication wait for the *Fishes of Virginia*. Mary Freeman (Patuxent Wildlife Research Center, Athens Laboratory) has been active in the study of the effects of regulated river reaches on fish community persistence and composition. Some of Mary's work suggest that the general philosophy of mediating for the highest possible discharges (as run-of-river flows) from high dams may not be the best long term approach. She has interesting data showing the "little fishes" benefit from periods of low flow, possibly due to increased spawning success. Mary has been plugging away at the Halloween Darter description; this spring I will assist Mary in photographing the cryptic darter. Mary and Bud were participants in the aforementioned U.S. Fish and Wildlife Workshop on imperiled fishes. Dean Fletcher (Savannah River Ecological Laboratory) published several interesting contributions to the life history of *Pteronotropis hypselopterus* (with David Wilins and *P. welaka* in *Copeia* (1999 Number 2).

Florida: I'll state it right out front: Jim Williams (USGS Florida Caribbean Science Center) out-published everybody in the state. The single fish paper of significance (with George Burgess, Florida Museum of Natural History), is the description the shoal bass *Micropterus cataractae*, a fish so well-known that it may not have needed formal description (long known common name and binomen). In fact, the shoal bass has been known since Carl Hubb's time and would have been described by Rafinesque, had he visited the area. Jim also published a name correction for the pygmy sculpin, *Cottus palus* [seems *pygmaeus* was occupied by a Russian sculpin]. Additionally, Jim published several clam papers, which I correctly noted would be of little interest to SFC members.

Other ichthyologists at the FCSC did not fair as well as Jim (except Bill Smith-Vaniz, who published a book on Bermuda fishes, but that doesn't count because it covers marine species). Steve Walsh and I will try to complete the ms on patterns of imperilment in southern

Appalachian fishes this year, and Howard Jelks and I have completed revision of a manuscript examining the effects of suspended sediment on the reproductive success of the Tricolor Shiner *Cyprinella trichroistia*. Steve Walsh is also one of the authors on the Warren et al. manuscript on the conservation status of southern fishes. Steve is the liaison between the FCSC and the Mobile River National Water Quality Assessment (NAWQA) study (Montgomery, AL office of USGS Water Resources Division). Leo Nico and Jeff Herod are working on several aspects of nonindigenous fish biology in South Florida (community interactions, age and growth, and dietary studies). The Asian swamp eel (*Monopterus albus*) has caught the public's attention, most recently by *Life* magazine. Howard Jelks and Frank Jordan (Loyola University, New Orleans) are in the sixth year of monitoring the endangered Okaloosa darter on Eglin Air Force Base, western Florida. Howard and Frank are reviewing the first five years of data to determine if any changes are needed in the protocol. Howard and I are also working on a handbook of the fishes of Eglin Air Force Base. Each of the 63 species found on the base will have a species account with a color picture, a dot distribution map, and biological information. Howard, Steve Walsh, and myself are funded to examine the spread of the introduced red shiner (*Cyprinella lutrensis*) in the upper Coosa River system, Georgia. If the red shiner is spreading, we plan to conduct experiments examining the reproductive interactions between the threatened blues shiner (*C. caerulea*) and the red shiner. Pam Fuller indicated that the Nonindigenous Database for fishes now has 17,000+ records. Please contact Pam (352.378.8181, ex312; pam_fuller@usgs.gov) if you have any records of nonindigenous fishes from your areas of study. The database is at the center's website: <http://nas.er.usgs.gov/fishes/fishes.htm>.

Carter Gilbert, University of Florida (ret.) emeritus professor, who shies away from me for some reason, admitted he was only retired in stature, not in activity. Work on the *Macrhybopsis aestivalis* complex continues as is the gestating Florida fishes book. Indeed, I've observed Carter at our lab visiting Jim Williams more times this year than all previous years of my tenure. Perhaps he is learning clams or is subconsciously drawn by some sort of glabrous cephalic synapomorphy. Gray Bass, Florida Department of Conservation, is nearing completion of a fishes of Florida book that will be oriented towards anglers and amateur naturalists. Steve Bortone, now at Florida Center for Environmental Studies, Ft. Myers, is working on the life history of *Pteronotropis signipinnis* and *P. welaka*. Steve received funding from the nongame program of the Florida Department of Conservation to conduct this work.

If you wish to have your conservation or research activities for Region II published in a future issue, please contact me (noel_burkhead@usgs.gov).

Noel Burkhead

2000 Report of Region 3 - North-Central

Status surveys and other interesting finds

Ed Scott (TVA) reported that snail darter (*Percina tanasi*) distribution and abundance continue to improve in the Douglas tailwaters in the lower French Broad River. Adults were found at all sites sampled from French Broad River mile 8 to mile 29.8, almost to Douglas Dam. The tailwater community is also improving in other ways, as tangerine and bluebreast darters (*Percina aurantiaca*, and *Etheostoma camurum*) were collected there for the first time in 1999. In addition, two blue suckers (*Cycleptus elongatus*) were also collected by students at Tennessee Tech. in this stretch of river. Speaking of the French Broad River, Etnier (University of Tennessee) also commented on the continued improvement of the Douglas and Cherokee tailwaters, and reports the collection of wounded darters (*Etheostoma vulneratum*) for the first time in the Little Pigeon River about two miles downstream of Sevierville (Sevier Co., TN).

Etnier also remembered some interesting accidental introductions into the French Broad and Nolichucky rivers in western NC that we forgot to mention in earlier reports (he is getting on in years!). He said "it looks like someone got a truck full of fishes from the Piedmont and dumped them in the French Broad! Charlie (Saylor) thinks they might be getting flushed out of the big pond at the Biltmore estate." These include chain pickerel and flat bullhead (UT 38.180 and 48.966, respectively), French Broad River Miles 145 & 150, Buncombe Co. NC, July 1997; two additional localities for *Ameiurus platcephalus*, Newfound Creek and Swannanoa River, added to 48.966; *Nocomis leptocephalus*, from Cane Cr., Mitchell Co. NC, June 1977 (UT 44.8552); *Gambusia holbrooki*, Mud Cr., Henderson Co. NC, April 1997 (UT 61.236); and *Lepomis gibbosus*, French Broad River Mile 150 and Hobson Cr. of Ivy Cr., Buncombe Co. NC, June/July '97 (UT 90.2531). In the Nolichucky system, he noted the following introductions: *Ameiurus platycephalus* from two localities in the Cane River, Yancey Co. (UT 48.981); *Clinostomus f. funduloides*, North Toe River, Yancey Co. (U.T.44.8555).

Ed Scott also reported some interesting finds from the Duck and Buffalo rivers: abundant coppercheek darters and a lone ashy darter (*Etheostoma aquali*, and *E. cinereum*) in Flat Creek, near Shelbyville, Bedford Co., TN; several coppercheek darters in the Normandy Dam tailwaters of the Duck River where only a single individual was collected in 1998; slenderhead darters (*Percina phoxocephala*) also still present in the Duck River at Williamsport (Maury Co., TN); and blotchside logperch (*Percina burtoni*) and ashy darters in the Buffalo River near Flatwoods, TN (Perry Co., TN). Also, although Citico Creek (Monroe Co., TN) seems to have been well studied, Ed also reported the first record of wounded darters (*Etheostoma vulneratum*, UT 91.5566) from upper portions of the stream.

Charlie Saylor (TVA) reported that his crews sampled fish from close to 200 stream sites during the 1999 field season as part of TVA's watershed monitoring program. One of the most interesting finds was the first record of slackwater darter (*Etheostoma boshungi*) in Limestone Creek watershed in Alabama. Charlie also reported that Chris Underwood collected an American

eel (*Anguilla rostrata*) in the Nolichucky River in North Carolina, which was probably a bait bucket introduction.

Ramon Martin and Jim Layzer (Tennessee Technological University) reported results of a biotelemetry study of lake sturgeon as part of a multi-agency partnership to reestablish a reproductively viable lake sturgeon population in the lower French Broad River and in the mainstem Tennessee River near Knoxville, Tennessee. In August 1999, they released six radio-tagged (external) lake sturgeon that had been reared at Warm Springs National Fish Hatchery, Warm Springs GA. The externally-tagged fish were detected 9-24 days after release. One internally tagged individual was still detected 159 days after release. Net downstream movement averaged nearly 40 km, and all but one of these fish were known to have migrated out of the French Broad River, and into Fort Loudoun Reservoir.

R. Shute, Pat Rakes, Bo Baxter (CFI) surveyed the Elk River system looking for boulder darters (*Etheostoma wapiti*). They found boulder darters in a few new localities in the mainstem Elk River where appropriate habitat was present, but did not find any new tributary populations. They did rediscover boulder darters in lower Richland Creek. None were found above Harms Mill dam, a significant barrier a few miles below Fayetteville, suggesting they may have been extirpated from the reach of the Elk River upstream of the dam and are unable to recolonize.

Following up on reports that consultants had turned up specimens of an unidentified *Phoxinus* in a tributary to the Clinch River (Tazewell County, VA) in February 1999, Chris Skelton and Steve Holdeman surveyed a Clinch River tributary in Russell County in September 1999. The stream where the *Phoxinus* were originally reported is on coal mine property, and not easily accessible. Live individuals of this dace are in aquaria at CFI. Chris has determined that the fish are either the undescribed "laurel dace" or something very close. He will be looking for breeding individuals in spring 2000.

Chris also followed a tip provided by Steve Fraley, at TVA, that *P. tennesseensis* had been collected in a Powell River tributary in Lee County, VA in 1995 by TVA surveyors. No specimens were retained, so Chris re-visited the site in fall 1999. The species turned out to be *P. cumberlandensis*, which had been previously known only from the Cumberland River drainage. Leroy Koch of the USFWS is trying to organize a status survey for the species in southwestern Virginia.

CFI's surveys of the Little River, Blount County, TN revealed that tangerine darters (*Percina aurantiaca*) are abundant, blotchside logperch and longhead darters (*P. burtoni* and *P. macrocephala*, respectively) are still "relatively common", but ashy darters (*Etheostoma cinereum*) are very rare. Duskytail darters (*E. percnum*) were found to be still hanging on at the TN Hwy 33 bridge and a single individual, the first seen in over a decade, was observed upstream at the U.S. 411 bridge. Additional surveys will be conducted to determine this species' status in the nearly 10-mile reach between the two sites (lack of access requires fishing, oops!, floating).

Bernie Kuhajda (University of Alabama) reported that he and Kevin Roe, a new post-doc in Rick Mayden's lab, recently completed a survey for additional populations of the Alabama cavefish (*Speoplatyrhinus poulsoni*) in caves along the Tennessee River in northern Alabama. Jim Godwin of the Alabama Natural Heritage Program combined some of his surveys of caves for the Tennessee cave salamander with these fish surveys. This survey was inspired by their discovery of southern cavefish (*Typhlichthys subterraneus*) sympatric with Alabama cavefish, as reported last year. They found several populations of southern cavefish, but no *Speoplatyrhinus*. However, they did discover what appears to be a new species of cave shrimp in two caves just west of Tuscumbia.

Scott Mettee, of Geological Survey of Alabama (GSA) reported that his crew is finishing for GSA publication a manuscript on Tennessee River fishes in north Alabama and northeast Mississippi. This report, containing records from 1,188 fish samples collected at 761 stations from 1845 through 1998, will add some interesting new distribution records to Mettee et al. (1996). The TVA/GSA sample team collected the most species ever taken from the TVA Bear Creek site on the Natchez Trace. He also reported that although they didn't get another *Cycleptus elongatus*, the electroboat team, composed of Captain Ed Scott and deck swabber Scott Mettee, did collect several interesting species during the sample, among which were *Carpiodes carpio*, *C. velifer*, and *Percina phoxocephala*. Shoal Creek will be a priority sampling area for the GSA's TVA work in spring 2000.

Lastly, if the "creek don't rise" a host of North American ichthyologists will descend on the lower Duck River to set a record for the most fish species collected in a short river reach in North America. Dates are slated for 3 and 4 June. Bob Jenkins has volunteered to be the principal contact, just in case you are interested and have been able to thus far avoid the reams of e-mails cluttering cyberspace.

Mussels & other aquatic critters of interest

Dick Neves (Virginia Tech.) reported that the techniques and technology for mussel propagation has been worked out over the last 10 years, funded cooperatively by the States of Tennessee and Virginia, U. S. Fish and Wildlife Service, and Biological Resources Division of the U. S. Geological Survey. The Freshwater Mollusk Conservation Center at Virginia Tech is a prototype facility, with a holding room for adult mussels and host fish research, a room for production of juveniles, an algae culture room, and a greenhouse for rearing of juvenile mussels. Juveniles are usually reared for several weeks before being released to sites approved by TWRA and USFWS. The Buller Fish Hatchery in Marion, VA has recently come on board as a cooperator to provide raceway facilities for grow-out of mussel species state-listed in Virginia.

Of importance to the Southeastern Fishes Council, Neves noted that, after years of host fish identifications for a suite of endangered mussels, it has become evident that darters, minnows, and sculpins are what sustain most of the reproduction of these endangered species. For example,

glochidia of riffleshell species (*Epioblasma* spp.) such as the oystermussel and Cumberlandian combshell transform best on banded and black sculpins, and redline darters. Similarly, glochidia of the fanshell transform most successfully on greenside darters and *Percina* spp. (logperch, tangerine darter, blotchside logperch). Other mussel species that spawn only in summer such as pigtoes (*Fusconaia* spp.) tend to use various species of cyprinids almost exclusively. All of their host fish research makes it evident that the world class diversity of freshwater mussels in the Tennessee River system is sustained by the high diversity of the indigenous fish fauna, or what non-biologists and fishers would consider inconsequential, nongame species. Recovery of these federally listed mussels cannot occur without the healthy and diverse assemblage of these fish species. In 1998, Neves' lab produced, cultured, and released roughly 35,000 endangered juveniles of 6 federally listed mussels, produced from induced infestations of glochidia on host fishes. In 1999, they released nearly 135,000 endangered juveniles of eight species, from literally hundreds of infested host fishes, into the Clinch, Powell, and Hiwassee rivers in eastern Tennessee. They hope to be able to release approximately 100,000 juveniles of various endangered mussel species each year, if they are able to collect the gravid females of target species. Evaluations of the success of this release program will begin in summer 2001.

David Withers (TN Heritage Program) reported that his work with many partners (Sequatchie & Marion County governments, a local quarry, TDOT, a barge company, a crane company, cement company, and more) to enhance habitat of the endangered royal snail (*Pyrgulopsis ogmorhappe*) continues in Sequatchie and Jasper, Marion Co., TN. At Sequatchie, this work has included installation of a cable fence to keep ATV's out of Owen Spring in Sequatchie, and replacing the exotic chine privet with native vegetation (or attempting to!). This is also the area where the recently described caddisfly (*Glyphopsyche sequatchie*, Etnier & Hix) is found. At Jasper, the work has included trapping beavers to maintain the spring-run habitat required by the snail.

David also reported surveys for several rare crayfishes. These surveys include surveying new and historic sites for *Cambarus williamsi*, (known only from Brawley's Fork, Cannon Co., TN) in fall 1999. He and April Hannah have also done surveys for a rare, troglobitic crayfish, *Orconectes incomptus*, and have found it still present at one of the historic locales - Haile Cave, Jackson Co., TN. David plans to continue surveys for both of these crayfish in 2000. He is also planning to re-survey the more headwater streams reported on O'bara's 1985 *Orconectes shoupi* survey, Mill Creek drainage, Davidson Co., as these headwater areas in the metropolitan Nashville area are being rapidly developed.

Captive propagation, reintroduction, and other management activities

Pat Rakes and J. R. Shute (Conservation Fisheries, Inc., CFI) report that they still maintain captive populations of: *Cyprinella caerulea*; *C. monacha*; *Notropis mekistocholas*; *N. cahabae*; *Phoxinus cumberlandensis*; (*gone*); *Fundulus julisia*; *Noturus baileyi*; *N. miurus*; *N. flavipinnis*; *Elassoma alabamiae*; *E. boehlkei*; *Etheostoma wapiti*; *E. percunurum*; *E. luteovinctum*; *Percina copelandi*; and *P. aurolineata*. In addition to those reported last year, recent successful captive spawnings include *Notrops cahabae*, *Noturus miurus*, and *Elassoma boehlkei*.

As previously reported, spotfin chubs, smoky and yellowfin madtoms, and duskytail darters (*C. monacha*, *N. baileyi*, *N. flavipinnis*, and *E. percunurum*), were again captively propagated and reintroduced into Abrams Creek in the Great Smoky Mountains National Park, (Blount County, TN). For the fifth consecutive year, reproduction was documented for *E. percunurum* and *N. baileyi*, and individuals of all four reintroduced populations were observed on most monitoring surveys. Etnier reported that during the Park Service's annual 3-pass depletion study in Abrams last fall they got several individuals of *C. monacha* and two *E. percunurum*; in 1998 they got *C. monacha* and a lone *N. baileyi*.

Pat & J.R. report that the status of *Fundulus julisia*, Barrens topminnow continues to be tenuous. For two consecutive years, droughts have stressed the population at the type locality (near McMinnville, Coffee Co., TN) to the point that rescue has been necessary. In fall 1999 the type locality pond dried up completely, and Pat & J.R. rescued about 100 Barrens topminnows which are currently in captivity at CFI's hatchery. These will be restocked in the pond when conditions are better.

Dick Biggins (U.S. Fish & Wildlife Service, Asheville, NC) reported that he has written three proposals to reintroduce listed fishes. These include a stretch of the Tellico River (Monroe Co., TN), where he proposes to reintroduce smoky and yellowfin madtoms, spotfin chub, and duskytail darter. The spotfin chub, slender chub, pygmy and yellowfin madtoms, and duskytail darter are proposed for reintroduction into the Douglas Reservoir tailwaters of the French Broad River. And, spotfin chub and boulder darter are proposed for reintroduction into Shoal Creek (Lawrence Co., TN & Lauderdale? Co., AL). Public comments have been received on all these proposals, but none have been finalized yet. The Tellico River proposal is currently being reviewed in the Washington, D. C. office, the French Broad proposal is in review in Atlanta, and the Shoal Creek proposal is being reviewed in the Asheville office of Fish & Wildlife Service.

Dick also reported that a draft document which outlines a coordinated strategy for the conservation and recovery of southeastern imperiled fishes has been prepared by himself and Vince Mudrak (U.S. Fish & Wildlife Service, Warm Springs, GA). This document was compiled with input from over 60 fish and aquatic ecology experts who attended a workshop in Chattanooga, TN in October 1999. The goal of this document is to identify the problems faced by southeastern imperiled fishes, to summarize the suggestions of the workshop attendees as to specific goals and tasks needed to reverse the declines, and to help agencies, organizations, and individuals identify the types of conservation and recovery tasks that they could implement in order to assist in the momentous task of conserving the Southeast's imperiled fishes. This regional strategy, when finalized will probably be available on the web, and a separate document, for more general consumption, may also be produced.

Peggy W. Shute and David A. Etnier

2000 Report of Region 4 - South Central

Steve Walsh at the U.S. Geological Survey in Gainesville, Florida reports that he, along with Noel Burkhead, Howard Jelks, and Jim Williams, provided expertise in identifications of fishes collected as part of the Mobile River study unit of the USGS National Water Quality Assessment (NAWQA) program, in coordination with personnel at the Water Resources Division in Montgomery. These samples consisted of a small number of synoptic sites scattered around the Mobile Basin (Tombigbee, Black Warrior, Cahaba, Alabama/Coosa) where quantitative water quality and habitat parameters and fish and invertebrate samples were taken. No new or unexpected records were revealed in the first of this three-year study. Further collaboration with the NAWQA project is anticipated this year as the Mobile River unit was selected as one of three watersheds nationwide for a pilot study to examine the effects of urbanization on water quality parameters (including fish diversity and abundance) across a land-use gradient. This effort will be concentrated in the Valley and Ridge province across a swath that encompasses the greater Birmingham area, and will focus on small-order, wadeable tributaries at approximately 30 stations. Fish collections will be archived at UAIC and FLMNH.

Frank Parauka of the U.S. Fish and Wildlife Service (USFWS) in Panama City, Florida reports that his office has conducted a number of Gulf sturgeon investigations. One hundred and three *Acipenser oxyrinchus desotoi* were collected and tagged (Floy T-Bar and PIT tags) in the Apalachicola River below the Jim Woodruff Lock and Dam. Fish were collected from June through September 1999 using sinking gill nets of various meshes set in random locations below the dam. The fish ranged in total length from 63 to 244 cm and weighed from 1 to 81 kg. The number of sub adults (fish weighing less than 18 kg) was slightly higher than in 1998, and the number of large fish (over 45 kg in weight) was slightly lower. This population was estimated at 321 individuals using a modified Schnabel mark-recapture method. During the same time period, the Brothers River, a tributary to the Apalachicola River, was sampled seven times with sinking gill nets of various mesh sizes. Seventy one Gulf sturgeon ranging in length from 60 to 237 cm and weighing from 2 to 84 kg were collected and tagged during the period. Thirty-two subadult and adult sturgeon collected at the above two sites were equipped with external sonic tags to document migration patterns and habitat use in Apalachicola Bay. Additionally, a total of 450 subadult and adult Gulf sturgeon were collected and tagged during a 17-day gill netting study conducted in the lower Choctawhatchee River in October and November. Subadults represented 46% of the sample while fish weighing over 45 kg accounted for 8.5% of the catch. Based on these data, the population is estimated at 3,000 fish. Lastly, the lower Apalachicola River was stocked with 150,000 Phase II *Morone saxatilis*. This was the third year in a row that the stocking goal of 100,000 had been exceeded. The program is part of a cooperative agreement between the Fish and Wildlife Service and Florida, Georgia and Alabama to restore striped bass in the Apalachicola-Chattahoochee-Flint river system.

Bob Butler of the USFWS in Asheville, North Carolina reports that numerous Federal and State agencies and local partners are collaborating on riparian habitat restoration projects on the Conasauga and Etowah rivers. These two rivers contain endangered (*Percina antesella*, *P.*

jenkinsi and *Etheostoma etowahae*) and threatened (*Cyprinella caerulea*, *Etheostoma scotti*) fishes, as well as numerous protected mussels. The Conasauga River Alliance and Upper Etowah River Alliance were formed to address water quality concerns in their respective watersheds. Both projects have two major "drivers" spearheading on-the-ground efforts: the Limestone Valley Resource Conservation and Development Council and The Nature Conservancy (TNC). TNC has hired two full-time representatives to coordinate basin-wide activities in the Conasauga, and will soon hire a field rep to work in the Etowah. Field reps work closely with riparian landowners to effect Best Management Practices, sponsor "field days" to discuss and exhibit environmentally sound farming and forestry practices, and coordinate other restoration and outreach activities with the Alliance. Primary partners in these projects include the USFWS, USDA's Natural Resources Conservation Service and Forest Service, University of Georgia Institute of Ecology, EPA, Georgia Dept. of Natural Resources, Tennessee Wildlife Resources Agency, Southeast Aquatic Research Institute, and several other agencies, organizations, and local citizens and landowners. Federal seed money has been leveraged by these organizations into hundreds of thousands of dollars to protect these globally significant centers of aquatic biodiversity.

Malcolm Pierson at Alabama Power Company completed a status survey of *Etheostoma chuckwachatte* and the undescribed muscadine darter, *Percina (Alvordius)* sp. in the upper Tallapoosa River system in Alabama and Georgia. The U.S. Fish and Wildlife Service funded this survey. Lipstick darters were found at 65% of all sample sites and muscadine darters were present at 95% of the sites. Based on earlier collections in the upper Tallapoosa system, it appears that most known populations of both species are stable. Potential threats these species include increased sedimentation to the Tallapoosa main channel above Harris Reservoir, the scouring of the stream bottom by peaking hydroelectric discharges the dam, and the proposed West Georgia Regional Water Supply Project in Haralson County, Georgia. This proposed reservoir would impound up to 15 miles of the main channel of the Tallapoosa and five miles of lower Beach Creek. Malcolm also reports that Alabama Power Company and the U.S. Geological Survey, Biological Resources Division in Gainesville, Florida will begin a more intensive study of the endangered southern clubshell (*Pleurobema decisum*) in the old bypassed Coosa River channel (known as the Dead River by locals) upstream of the Weiss Hydroelectric Dam. They will attempt to determine the present distribution, density and relative health of this newly rediscovered mussel population in northeastern Alabama.

Scott Mettee reports that biologists with the Geological Survey of Alabama were busy last year. Section 6 status surveys were completed on *Alosa alabamae* in the Choctawhatchee River and *Percina lenticula* and *Crystallaria asprella* in several Mobile Basin rivers. Mussel faunas were surveyed in the Conecuh, Choctawhatchee/Pea, and upper Tombigbee rivers. Efforts to gather data on the biology, population structure, and movements of *Cycleptus meridionalis* in the Alabama, Mobile, and Tombigbee rivers are continuing. Sonic tagging and tracking efforts have yielded some particularly interesting life history data for this species. To date, they have confirmed that individuals move up to 350 miles and cross over or through Claiborne Lock and Dam twice during a single spawning run. This suggests southeastern blue suckers inhabiting the

Alabama River may complete one of the longest spawning runs of any freshwater fish species in North America. Of additional interest, many individuals return to the same stretch of river, even the same submerged log, for consecutive summers. Additional sonic tags will be implanted in more *C. meridionalis* and in two or three other species; likely candidates include *Polyodon spathula*, *Moxostoma carinatum*, and *Morone saxatilis*. Several reports have been published or are in progress. Pat O'Neil and Tom Shepard authored a summary report on several years of biological and water-quality work in the Cahaba River system. Stuart McGregor and Jeff Garner of the Alabama Wildlife and Freshwater Fisheries will soon publish a report on mussels in the Tennessee River proper. Lastly, preparation of a publication on Tennessee River fishes in north Alabama and northeast Mississippi is almost complete. The report includes new collection data and localities and expands species distributions given in *Fishes of Alabama and the Mobile Basin*.

Bob Stiles at Samford University reports that he has just completed a study for the city of Hoover on the upstream distribution of *Notropis cahabae*. He found specimens seven river miles above Piper Bridge, which is upstream of the recent distribution, but far below the historic upstream distribution in 1982 (first shoal below Booths Ford). Bob is also finishing his study on population estimates and habitat use by *Cottus paulus* in Coldwater Spring. Bob reports that he and Paul Blanchard are searching the upper Coosa for a spring that would be appropriate to transplant pygmy sculpins into. They have also finished a study for USFWS on the historic distribution of *Cyprinella caerulea* within the Cahaba River system. This species was abundant throughout the Cahaba above the Fall line until the early 1960's, and was completely extirpated after 1983. Lastly, Paul is expanding his study for the USFWS using GIS to analyze habitat structure of *Etheostoma chermocki* and water quality at six sites in the Turkey Creek watershed.

J.R. Shute reports that Conservation Fisheries is currently propagating *Notropis cahabae* and *Percina aurolineata* from stock from the mainstem of the Cahaba River. These fishes are to be used for toxicity studies being conducted by EPA. So far they have produced nearly a thousand Cahaba shiners and around 40 goldline darters. The shiners lay their eggs in a gelatinous mass; this has not been seen this in any other minnow. The larvae are extremely tiny and require a considerable amount of care initially. Excess fish could conceivably be used to augment populations in the Cahaba River. They only had a couple of pairs of goldline darters to start with, and *Percina* in general are very difficult to raise, but they hope to be able to produce good numbers this spring. These techniques will be published at some point in the near future. Additional work includes the possibility of reintroducing *Cyprinella caerulea* into the Cahaba; Conservation Fisheries have propagated blue shiners in the past. Another possible reintroduction of *Etheostoma wapiti* and *Erimonax monacha* into Shoal Creek in northern Alabama is in the works. Both species have been propagated and could be produced in large numbers.

Mark Peterson at the Gulf Coast Research Lab in Ocean Springs, Mississippi was elected as the secretary/treasurer of the Southeastern Division of ASIH and president-elect of the Gulf Estuarine Research Society. Mark has co-authored three marine papers this last year on sampling marsh nekton, ontogenetic standardization of estuarine fishes, and spatio-temporal distribution of

larval *Gobiosoma bosc* adjacent to natural and altered marsh-edge habitats. He has also two papers on *Cycleptus meridionalis*, including its growth, spawning preparedness and diet as well as the its catch-per-unit-effort, environmental conditions and spawning migration.

Stuart Poss, also at the Gulf Coast Research Lab, has authored a paper on how coastal fish distribution and diversity in the southeastern United States is changing. He has also co-authored guidelines for the application of IUCN Red List criteria at national and regional levels. Stuart continues to make progress on the website dealing with non-indigenous species in the Gulf of Mexico ecosystem and associated coastal area. A new web server was installed to expedite the delivery of this information: <http://lionfish.ims.usm.edu/~musweb/invaders.html>. He is looking for input and collaborators to extend information available on non-indigenous species in the region. The web server also hosts the website for the XVIIIth International Congress of Zoology: http://lionfish.ims.usm.edu/~musweb/icz_xviii/icz_home.html. Lastly, Stuart reports that about 3,000 lots have been added to the GCRL Collection and the museum is in its second year of grant support from the National Science Foundation.

Todd Slack of the Mississippi Museum of Natural Science in Jackson reports that the museum is scheduled to open its new facilities to the public in March 2000. Most of the work on the exhibits, dioramas, aquaria and outdoor landscape has been completed, and most of the collections have been unpacked. However, the majority of the Ichthyology Collection is still boxed up and virtually inaccessible. The process of unpacking is slow as Todd is taking the opportunity to inventory all catalogued lots and conduct routine curatorial maintenance. The Museum staff continues to grow. Roy Weitzell joined the Museum last year as a Fish Biologist. Roy received his master's degree from Southern Illinois University for his taxonomic revision on a genus of South American thorny catfish, *Acanthodoras*. While at SIU, Roy also worked on status and life history aspects of *Lampetra aepyptera* in Illinois. Scott Peyton recently joined the Museum staff as the Collections Manager. Scott received his master's degree at the University of Southern Mississippi for his work on habitat partitioning between *Etheostoma lynceum* and *E. histrio* in the Bayou Pierre system. Scott has spent the last several years at Auburn working with the Alabama Cooperative Fish and Wildlife Research Unit.

Jan Hoover at the Corps of Engineers Waterways Experiment Station (WES) in Vicksburg, Mississippi reports that he, along with fellow staff members Jack Killgore, Steven George, and Bradley Lewis are continuing to sample a gravel bar constructed in 1988 in a cutoff of the Tenn-Tom waterway. Neil Douglas (Professor Emeritus at University of Louisiana at Monroe) is also involved in this project. The gravel bar is maintained by flow diverted from the locking operation. One specimen of *Crystallaria asprella* was collected in 1989, indicating that the constructed bar could provide habitat for this rare species. To date 17 crystal darters have been collected. Another flow restoration project is underway in a cutoff of the upper Little Tallahatchie River (Yazoo River). The cutoff was a flood control measure in the 1930's and 1940's. Restoration of the now-degraded channel by re-diverting water into it is being considered. Data on fish communities and physical habitat were collected in 1998, and empirical fish-habitat models were developed last year. These were used in conjunction with hydraulic

simulations to estimate restoration benefits to lotic minnow assemblages. The WES crew is also sampling fishes and physical habitat at very low flows in the upper reaches of the Big Sunflower River in autumn and early winter. Augmentation of flow via groundwater pumping is planned for the near future and these data will be used to develop empirical fish-habitat models to estimate any benefits produced. One other project in the Yazoo River Basin is the evaluation of the effects of dredging and snagging on littoral and demersal fishes. The principal streams are the Tallahatchie, Yalobusha, and Yazoo rivers. Baseline (pre- project) data were collected in 1989-1990, by electrofishing and hoopnets. These data will be compared with post-project data collected in 1999-2000 at identical sites using identical methodology. Jack, Jan, Dr. Douglas, and William Lancaster (a commercial fisherman) are involved in this years efforts. Lastly, two *Ictiobus bubalus* and two *I. cyprinellus* recently collected from the Big Sunflower River had severe deformations of the face and mouth. These fish were x-rayed this year for skeletal description to determine if deformations are developmental or traumatic in origin.

Melvin Warren of the USDA Forest Service, Southern Research Station, Oxford, Mississippi is pleased to announce the addition of a new stream ecologist to his staff. Susie Adams, who received her doctorate from the University of Montana in 1999, joined the staff in February. Susie brings expertise in fish population dynamics, fish movement, fish-habitat interrelationships, and species interactions. She has already joined Mel and Wendell Haag in wading through fish and fish habitat data compiled from over 70 sites in the Little Tallahatchie, Tippah, Yocona, upper Wolf, and upper Hatchie river systems. That survey was conducted last summer and yielded interesting finds, given the degraded condition of many of these systems (e.g., *Percina shumardi*, *Hybognathus hayi*, *Erimyzon sucetta*, *Noturus hildebrandi*). Wendell and Mel have also been surveying the mussel fauna in the Sardis Reservoir tailwater (Little Tallahatchie River drainage), Sipsey River, and Buttahatchie River. The mussel community in each of these systems is dense, and most species show strong patterns of recruitment. The Sipsey River mussel fauna is doing extraordinarily well, and it is perhaps the only river in the Southeast in which federally listed species are among the dominant members of the community (e.g., southern clubshell, *Pleurobema decisum*). The study is aimed at describing population dynamics by estimating annual recruitment, mortality, and age and length specific fecundity. Mel also reports that the Technical Advisory Committee of SFC submitted the southern fishes distribution and conservation status paper to Fisheries, where it is undergoing peer-review.

Hank Bart at Tulane University reports that he, along with graduate students Kyle Piller, Jason Tipton, Nakia Jackson, and interns from the New Orleans Science and Math High School, conducted surveys in Bowie River and Okatoma Creek in 1999 looking for *Percina aurora*. The surveys failed to turn up specimens. Hank is presently surveying the Chickasawhay River. Steve Ross collected the species at the confluence of the Bowie and Leaf rivers in 1999, and Todd Slack collected young in the Pascagoula River. Hank and Kyle Piller surveyed sites on the Blackburn Fork of the Little Warrior River and the Cahaba in 1999 looking for the *Percina brevicauda*. The number of specimens taken in both systems was very small. Tom Shepard of the Alabama Geological Survey reported higher numbers of specimens collected in about 60 river miles of the Locust Fork of the Black Warrior River between 1997 and 1998. Tom reported

limited success collecting the species in number in the Cahaba River from 1992 to 1996. The last time the species was collected in the Coosa River system (Hatchet Creek) was by Malcolm Pierson in 1995. Malcolm failed to collect the species on a return visit to Hatchet Creek in 1999, and Hank, Carol Johnston, Jon Armbruster, Kyle Piller and a large party of graduate students from Auburn failed to collect the species on a visit in 2000. Hank is of the opinion that federal protective status is warranted for this species. Now that the rush darter (*Etheostoma phytophilum*) is described, Hank is planning field work to assess the status of known populations of this species. Sporadic checks of the type locality in Pinson, AL have failed to turn up specimens since 1994. Localities in the Clear Creek system have not been surveyed since 1993. Hank is also recommending federal protective status for the rush darter. Lastly, Kyle Piller and Jason Tipton conducted a status survey *Noturus munitus* in the Pearl River. They collected the species in low numbers at five sites. Abundance of the species in the Pearl River has declined considerably in the last two decades, and Kyle and Jason believe this is related to geomorphic instability in the river.

Matt Thomas at Eastern Kentucky University in Richmond has been successful in diagnosing differences between *Noturus stigmosus* and *N. eleutherus* in the Ohio River drainage, where both species can be associated and are often difficult to separate using available keys. He is also examining morphological variation throughout the range of the *N. stigmosus*. Preliminary data analysis indicates that populations in Coastal Plain streams of western Tennessee and Mississippi are distinct in body shape and pigmentation, when compared to populations in the Ohio River and western Lake Erie drainages. An assessment of the taxonomic status of *N. stigmosus* is currently underway.

Rick Mayden at the University of Alabama, along with Dave Neely, finished a survey for *Etheostoma trisella* in the upper Coosa in Alabama. No specimens were found. Dave continues his work on sculpins and plans to have two species descriptions out this year; the Tallapoosa sculpin with Rick and Jim Williams, and *Noturus* sp. cf. *munitus* with Rick and Phil Harris. Rick and Bernie Kuhajda are finishing a survey of *Etheostoma ditrema* from throughout its range in Alabama, Georgia, and Tennessee. Results from another survey, the blueface darter, *Etheostoma* sp. cf. *zonistium*, indicate that the Bear Creek population is shrinking and the stronghold for this species is the population in the upper Sipsey Fork. A more detailed study of this healthier population in the Bankhead National Forest will commence this year.

Scaphirhynchus suttkusi, the Alabama sturgeon, is again in the news. It was proposed for listing for a second time in March 1999. Due to political pressures, the final ruling was postponed until March 2000. The public comment period has been reopened numerous times for various reasons, including the release of a genetics study on sturgeon caviar and a conservation agreement and strategy between the USFWS, the Corps of Engineers, the State of Alabama, and a business coalition. Specimens continue to be captured in the lower Alabama River. In April 1999 a recreational fisherman captured a sturgeon below Claiborne Lock and Dam, which was transported to the Marion Fish Hatchery. In July 1999 a commercial fisherman gillnetted another sturgeon in the Claiborne Pool. It was released and recaptured 19 days later by Alabama Dept. of

Conservation and Natural Resources personnel, transported to the hatchery, and died three days later. Spawning of Alabama sturgeon was attempted at the in March 1999. A male and female sturgeon held in the hatchery since 1997 were induced to spawn. The female produced 4,000 eggs but the male did not produce sperm. Unfortunately, the female died in April 1999. All of the data to date overwhelmingly supports the listing of *Scaphirhynchus suttkusi* as federally endangered.

Bernie Kuhajda

2000 Report of Region 5 - Northwest

Arkansas

The White River Navigation Project was reauthorized by the Water Resources Development Act of 1996 and proposes to construct and maintain a 125-foot wide by nine-foot deep navigation channel from the mouth upstream to Batesville, AR (approximately 255 river miles). A notice of intent to prepare a Supplemental Environmental Impact Statement was published by the Corps of Engineers in the Federal Register (Volume 64, No. 5, p. 1181) on January 8, 1999. Corps Waterways Experiment Station personnel spent several weeks in the field in late 1998 gathering data to assess the possible impacts of the navigation project on littoral and demersal fishes, including paddlefish and sturgeon. Several public and agency meetings regarding the project were held during 1999. WES personnel (Jan Hoover, Jack Killgore) presented preliminary findings of the fish studies to regulatory agencies in October 1999 and a HEP team meeting was held in St. Louis in January 2000. Several irrigation projects have surfaced which will be competing for White River water use. The Grand Prairie Irrigation Project is planned to alleviate pressure on east Arkansas aquifers, which have been severely depleted during the past decade of withdrawals for irrigation. The proposed Grand Prairie Irrigation project will pump water from the White River into a series of canals, natural streams, and holding ponds. Several hundred miles of new canals are planned to distribute water to holding ponds within the Grand Prairie region. Two other similar projects are in the planning stages, and both are also in the White River Basin. The Fish and Wildlife Service and Environmental Protection Agency have called for a "unified assessment" of these development projects to determine potential impacts to the stream biota of the White River basin. A Draft Supplemental EIS for the navigation project was originally scheduled for distribution in early spring 2000. The demand for the unified assessment has delayed the completion of the navigation project Supplemental EIS.

U.S. Army Corps of Engineers Waterways Experiment Station personnel are evaluating the feasibility of diverting water from the Arkansas River near Little Rock into the Bayou Meto drainage for agricultural irrigation, commercial withdrawal, and duck management. WES personnel are determining potential losses of larval fishes from the Arkansas River during water diversion and estimating fish benefits of increased water level in receiving streams and canals.

Henry Robison (Southern Arkansas University) is working on the distribution and life history of *Notropis ortenburgeri* in the Ouachita National Forest. Also, Henry has been working with the Ouachita National Forest, Arkansas Game and Fish Commission, and Arkansas Natural Heritage Commission to digitize and geo-reference all major fish collections in the state.

Charles Gagen (Arkansas Tech University) has been studying fish movements at Forest Road stream crossings on six Ouachita River drainage streams in the Ouachita National Forest. Downstream species numbers averaged 12.3 for the six streams and upstream species numbers averaged 6.3. Three of the crossings have been modified in an attempt to improve fish passage, and the study continues for the next year.

Missouri

Dan Beckman (Southwest Missouri State) has been working on age/growth studies for *Noturus exilis* and *N. albater* in Bull Creek, (White River drainage), MO. They have also been comparing different techniques for aging the madtoms.

Matt Winston (Missouri Dept. Conservation) reports they are continuing their statewide, baseline data surveys with concentration during the past year in the Missouri bootheel. As a result of these surveys, *Fundulus chrysotus*, has been rediscovered in two channelized streams. Also, *Cyrstallaria asprella* was collected at several sites in the Black River. Matt also reports that *Notropis topeka* apparently has disappeared from one of three creeks that it was known from in Missouri.

John L. Harris

2000 Report of Region 6 - Southwest

The following summary of activities of the 'fish team' at the U.S. Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, MS was submitted by Jan Hoover. The WES Fish Team consists of seven individuals. Jack Killgore (KJK), Jan Hoover (JJH), Phil Kirk (JPK), Steven George (SGG), and Bradley Lewis (BRL) are full-time employees at Waterways Experiment Station. Neil Douglas (NHD) is Professor Emeritus at University of Louisiana at Monroe (formerly Northeast Louisiana University). William Lancaster (WEL) is a self-employed commercial fisherman.

Ongoing projects are listed by system or drainage. Personnel associated with each project are indicated parenthetically. Principal investigator of each project is listed first.

Ouachita River Drainage

Floodplain ponds as paddlefish habitat (SGG): Fishes and habitat data collected several years ago from floodplain ponds of the Ouachita River (Louisiana) were analyzed last year. Assemblages and habitat characteristic of ponds with and without paddlefish are being described.

Sulphur River Basin

Preservation of Mercer Bayou (KJK, JJH, NHD, WEL): Mercer Bayou (Arkansas), a tributary of the Sulphur River, is threatened by lateral headcutting from the Sulphur River. Weirs are being considered to prevent the erosion and de-watering of Mercer Bayou. Fishes and invertebrates were sampled in summer 1999. Species richness of fishes, abundance of zooplankton, and abundance of scuds and glass shrimp were all positively associated with stream width, indicating substantial impacts to aquatic communities if headcutting is not stopped.

Red River Drainage

Oxbow Lakes of the Red River (KJK, SGG, BRL, NHD, WEL): During construction of the Red River Waterway, numerous bendways were cut off from the main channel creating a series of oxbow lakes along the river corridor. Upstream closures were constructed in 24 lakes to prevent sedimentation. However, backwater entering the downstream end of the lakes has resulted in sedimentation at the outlet, and some lakes are becoming isolated from the river. We are evaluating the benefits of periodically dredging the access channel of the downstream end of oxbow lakes by comparing fish assemblages among lakes with different geomorphometry and hydrologic connection to the Red River.

Red River Navigation Project (JJH, KJK, SGG, BRL, NHD, WEL): Feasibility of extending the Red River Waterway Navigation Project an additional 84-134 miles is being considered by the Corps of Engineers. Our team is studying fish communities throughout the proposed project area to determine effects to littoral, demersal, and pelagic fish communities.

Hydrology and Spawning (KJK, BRL): Cypress Bayou (Texas), a tributary of the Red River, is a small river dominated by bottomland hardwood wetlands. Flows are controlled by releases from Lake o' the Pines. Effect of adjusting the timing and duration of reservoir releases were evaluated by surveying controlling elevations of backwaters (to determine extent of spawning habitat) and by surveys of larval fishes during three spawning seasons. Each spawning season was characterized by a distinctive hydrography. Reservoir releases may be manipulated to control changes in flood pulse that benefit spawning fishes.

Dr. Neil Douglas, Professor Emeritus, The University of Louisiana at Monroe, was named the W. Frank Blair Eminent Naturalist by the Southwestern Association of Naturalists. The award recognizes "excellence in a lifetime of commitment to outstanding study or conservation of the flora or fauna of the Southwest." Neil accepted the award at the 2000 SWAN meeting in Denton, Texas, April 20-22.

Frank Pezold