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Regional Reports

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Regional Reports

Regional Reports

REGION I—NORTHEAST

Beginning in the north, even though the drainages of West Virginia clearly show on the SFS logo map, it seems that no one is quite sure which SFC region the mountaineers fall into nor has stepped up to claim them. While, except for a bit of western North Carolina and Virginia, Region I comprises Atlantic Slope drainages, and much of West Virginia drains to the Ohio River basin, we are nevertheless happy to claim these orphan mountain people, along with Maryland, as a northern outpost of our region and their report is included herein.

Stuart Welsh and Dan Cincotta report that they have synthesized and compiled data on historic and recent fish collections in West Virginia. These data will be used to produce a spatial and temporal atlas of fish distributions (expected publication in 2008), and currently includes over 9,000 site records from fish collections during 1853 to 2005. Over 2000 of the 9,000 site records are represented at museums, and Stuart and Dan have verified species identifications of most of the individual lots of these records at Cornell University, University of Michigan Museum of Zoology, American Museum of Natural History, North Carolina State Museum, United States National Museum, and Ohio State University Museum. Additionally, the atlas will include dichotomous keys (with illustrations) for identification of families, genera, and species. The general format highlights and illustrations of this atlas will be presented in poster format at the upcoming SDAFS meeting in Memphis and the ASB meeting in Columbia.

Moving on to the “other Virginia”, we have a brief dispatch from John Copeland and Brian Watson of Virginia Division of Game and Inland Fisheries who report some results of gillnetting in Claytor Lake, an impoundment of the New River. Among the catches in October, 2006 were one adult quillback (*Carpoides cyprinus*) and three white perch (*Morone americana*), neither native nor previously reported from the New River basin. The white perch were all in the 200 to 230 mm size range. They will be doing additional sampling this fall and next spring to determine whether any reproduction has occurred. The source of the introductions likely will never be known but the potential for explosion of white perch populations in the system is a real concern. They also reported the presence of the non-native and invasive crayfish, *Orconectes virilis*, in the nets.

There is various and sundry sucker news from Bob Jenkins of Roanoke College. Bob received a major grant from the North Carolina Wildlife Resources Commission for work on the sicklefin redhorse (*Moxostoma* sp.) in 2006-07. Steve Fraley of the NCWRC initiated and solidly supported making the grant. Bob has been aiding the

North Carolina State University study of sicklefin biology since it was begun in 2006 by a very enthusiastic and able graduate student, Scott Favrot, under the direction of NCSU Cooperative Unit Leader Tom Kwak and committee members Wayne Starnes and Ken Pollock. Bob perceives that folks want to see him “turn the corner” on sucker studies, from data-taking phase to completing manuscripts for publication, and he’s long recognized this need. Hence the grant from the NCWRC includes page costs for a monographic treatment of systematics and much of the life history and ecology of the fish. Bob heard that some folks think he won’t get the job done, but he counters that the long-term, huge project on freshwater fishes of Virginia got finished and published, and so will the sicklefin study.

Bob’s determination of age from scales of the robust redhorse (*M. robustum*) from the Pee Dee River has been ongoing since 2000. Results from 2006 sampling indicate that the breeding population, although maybe small, includes a “good” percentage of recently matured fish. Bob plans to complete also in 2007 a study of the “Carolina redhorse” including formal description, distribution, and certain life history aspects.

A spin-off of the “Carolina redhorse” study by Bob and Wayne Starnes is written review and analysis of NCWRC reports and preserved specimens at the North Carolina State Museum of Natural Sciences (NCSM) from the NC Statewide Stream Survey made by the NCWRC in the 1960s, as exemplified by tidbits and sometimes more of the suckers preserved from the Cape Fear and Pee Dee drainages. This further led to description of evidence of two geographically much separated introductions of striped jumprock (*M. rupiscartes*) into the Yadkin system of the Pee Dee and their spreading in the system.

Jenkins retires from teaching at Roanoke College on May 1st, 2007 to become a fulltime suckerologist, retaining his office and fish collection there. In the possible eventual absence of an ichthyologist at the college the collection is destined for the NCSM.

Mark Cantrell (FWS—Asheville) reported the U.S. Fish and Wildlife Service completed an extensive status review of the American eel (*Anguilla rostrata*), and concluded that protecting the eel as an endangered or threatened species under the Endangered Species Act is not warranted. Mark thanks all of those who supplied data, specimens, and literature for the review. In the review, FWS examined all available information about the American eel population from Greenland south along the North American coast to Brazil in South America and as far inland as the Great Lakes and the Mississippi River drainage. While the eel population has declined in some areas, the species’ overall population is not in danger of extinction or likely to become so in the foreseeable future, FWS decided.

Overfishing and hydropower turbines continue to impact eels in some regions. Several actions have been taken in an effort to conserve eel populations including installation of eel ladders for upstream passage at hydropower projects, implementation of state harvest restrictions, and dam removals that open historic eel habitat. Canadian resource agencies have closed the harvest of eels in the Canadian portion of Lake Ontario. The Committee on the Status of Endangered Wildlife in Canada is considering designating the American eel a “species of special concern.” The FWS initiated the status review in 2004 at the request of the Atlantic States Marine Fisheries Commission. Following that request, they were petitioned to list the eel. The FWS determined in 2005 that substantial biological information existed to warrant a more thorough examination and began a comprehensive review of all the available scientific and commercial information. They hosted two workshops to discuss threats and vulnerabilities with eel experts from federal and state agencies, non-profit organizations, private industry, Native American tribes, academia, the ASMFC, the Great Lakes Fishery Commission, Canada, England and Japan. The “Federal Register” notice with the status review on American Eels was published Feb. 2, 2007.

Moving on southward into North Carolina, Bryn Tracy of the North Carolina Division of Water Quality reports on the following activities:

Reclassification Studies

Three reclassification studies were conducted since late 2005 – the Deep Creek watershed (Neuse River Basin, Outstanding Resource Waters) and the Fines Creek and upper Boylston Creek watersheds (French Broad River Basin, Trout Waters). A fact sheet on the DWQ methods for reclassifying a stream segment to trout waters was developed and is available from Bryn Tracy (bryn.tracy@ncmail.net).

The March 2005 proposal for the North Fork First Broad River watershed (Broad River Basin, Outstanding Resource Waters) went before a public hearing in September 2006 and is progressing through the reclassification process. Nine watersheds in the Yadkin River Basin are eligible for petitioning to High Quality Waters because of their consistently rated excellent fish assemblages. The reclassification process for these watersheds will be initiated in 2007.

Basinwide Monitoring

Between early April and early August 2006, the stream fish assemblage assessment program sampled 96 basinwide sites. Eighty-three of these sites were in the Yadkin-Pee Dee River Basin and stretched from headwaters in Watauga County to the extreme southern border of Anson County (South Carolina state line). The remaining

13 sites were in the Sand Hills region of the Lumber River Basin. The complete data, ratings, and analyses for all sites will be available on the Biological Assessment Unit's web page (<http://www.esb.enr.state.nc.us/BAU.html>) beginning in early 2007. Preliminary results show some lingering drought impacts in the lower part of the basin, especially in some of the smaller streams draining the Carolina Slate Belt ecoregion. Encouragingly, good and excellent biological sites still existed throughout the Yadkin River Basin.

Based upon a cursory examination of the data, unusual or new DWQ distributional records (i.e., those not shown in Menhinick, 1991, *The Freshwater Fishes of North Carolina*, and collected for the first time by DWQ staff from a particular county in the Yadkin River Basin) have been recorded for the following species in these counties:

- sea lamprey (*Petromyzon marinus*): Anson
- gizzard shad (*Dorosoma cepedianum*): Caldwell
- threadfin shad (*D. petenense*): Cabarrus and Davie (lotic populations)
- central stoneroller (*Camptostoma anomalum*): Wilkes and Surry (wider distributions)
- eastern silvery minnow (*Hybognathus regius*): Forsyth
- highback chub (*Hybopsis hypsinotus*): Anson
- warpaint shiner (*Luxilus coccogenis*): Watauga
- golden shiner (*Notemigonus crysoleucas*): Surry
- sandbar shiner (*Notropis scepticus*): Union
- fathead minnow (*Pimephales promelas*): Surry, Wilkes, and Iredell
- notchlip redhorse (*Moxostoma collapsum*): Watauga
- striped jumprock (*Moxostoma rupiscartes*): most tributaries in Wilkes and Surry
- flat bullhead (*Ameiurus platycephalus*): Caldwell
- channel catfish (*Ictalurus punctatus*): Forsyth
- speckled killifish (*Fundulus rathbuni*): Caldwell
- eastern mosquitofish (*Gambusia holbrooki*): Randolph and Yadkin
- Roanoke bass (*Ambloplites cavifrons*): Richmond
- spotted sunfish, (*Lepomis punctatus*): Anson
- spotted bass, (*Micropterus punctulatus*): Davie
- fantail darter (*Etheostoma flabellare*): Yadkin
- Piedmont darter (*Percina crassa*): Stanly

Sand Hills streams, such as those in the Lumber, Cape Fear, and Yadkin River basins are ecologically and geologically unique. The waters can be very tannin-stained with low specific conductance and pH, white sand and gravel bottomed, and with an abundance of coarse woody debris. The fish assemblages are usually in low abundance, but include such species as sandhills chub (*Semotilus lumbee*), pinewoods darter (*Etheostoma mariae*), dusky shiner (*Notopris cummingsae*), dollar sunfish (*Lepomis marginatus*), and mud sunfish (*Acantharchus pomotis*). IBI type metrics and criteria

for assessing these unusual streams and communities are still under development. This fall, Ernie Hain (M.Sc. graduate student at NCSU) began developing a research project that would use DWQ's fish community data to develop an IBI method for assessing Sand Hills streams.

Miscellaneous Projects

Five Special Studies were conducted this field season—three for DENR's Ecosystem Enhancement Program (EEP) and two for the Modeling and Total Maximum Daily Load (TMDL) Unit. The EEP's mission is: "to restore, enhance, preserve, and protect the functions associated with wetlands, streams and riparian areas" (<http://www.nceep.net/>). Watersheds targeted for restoration or enhancement included those of Martin and Peachtree Creek in the Hiwassee River Basin, the Fishing Creek watershed (Granville County) in the Tar River Basin, and the upper Uwharrie River watershed in the Yadkin River Basin. The stressor studies conducted for the TMDL Unit focused on the Abbotts Creek watershed in Davidson County and several watersheds in Gaston and Lincoln counties in the Catawba River Basin.

Staff also continued to participate in the Pigeon River Fish Re-Introduction Project (French Broad River basin, Haywood County, NC and Cocke County, TN). The project was described in an article (*Pigeon River Revival*) in the December 2004 issue of *Wildlife in North Carolina*. Further information on this project may be found at: <http://web.utk.edu/~mjwilson/index.php>.

One of the taxonomically challenging species encountered this year included the fantail darter (*E. flabellare*). Several undescribed species, currently lumped under *E. flabellare*, may be lurking in the state. Rebecca Blanton Johansen of Tulane University (currently at Florida Museum Natural History) is attempting to unravel this mystery, the subject of a portion of her dissertation studies. As an aid to her research and working with Dr. Wayne Starnes, NCSM, 178 specimens from 42 sites were preserved for future genetic analyses along with 552 specimens from 48 sites which were preserved for morphological analyses from several key drainages within the Yadkin River Basin.

For further information on the Division's on-going fish studies, please visit the Biological Assessment Unit's web site <http://www.esb.enr.state.nc.us/BAU.html> or contact Bryn Tracy (bryn.tracy@ncmail.net).

In other North Carolina area news, members of the Robust Redhorse Conservation Committee, Technical Working Group for the Pee Dee River, continue to pursue knowledge of this large but rare and elusive fish. Recent participants have been personnel from the NCWRC (Ryan Heise, Rob Nichols, Brena Jones), Progress Energy (John Crutchfield, Mike Swing), NCSM (Wayne Starnes, Morgan Raley), and the South Carolina Aquarium (David Wilkins). Spring survey efforts on the Pee Dee in the reach below

Blewett Falls Dam have met with much greater success in the past two years. Recent efforts have usually involved three electroshocking boats simultaneously sampling on nine days spread over three weeks in late April-early May in attempts to catch Robust Redhorse on the spawning shoals. After similar or even much greater efforts yielded on average barely more than one fish per season in previous years, the take has significantly increased. Eight redhorse were captured in 2005 of which six were not recaptures of prior years' fish. Several of these were implanted with transmitters to study movements and to possibly serve as sentinel fish to locate any aggregations of additional redhorse. In 2006 a whopping 17 individuals were captured of which 15 were first time captures. Ten of these were implanted with transmitters to add to the potential of gathering movement data. Among these were two fish over 18 lbs. that Wayne Starnes of NCSM was fortunate enough to snag. The largest, a female weighing 18.6 lbs., is the largest recorded redhorse of any species!

The above mentioned NCWRC personnel have made several tracking forays on the Pee Dee over the last two seasons to ascertain the whereabouts of transmitter-implanted redhorse and found that some are moving distances of over 50 river miles back and forth between North and South Carolina while others may be less migratory. Since the beginning of intensive spring (and a couple of fall) surveys in 2000, there have been a total of 31 captures with four recaptures (27 individuals). An additional specimen was taken in routine gill net sampling by Progress Energy in 2001 near Cheraw, SC, yielding a total of 28 known captures since the prior take of a single specimen by a consulting firm in 1985, which represented the first documented capture in the Pee Dee basin since the 19th century. Some apparent spawning shoal areas, generally associated with braided island channels, have been located, including an important one near Jones Creek a few miles southwest of Rockingham. The RRCC TWG team will be returning to the Pee Dee in a few weeks and hope to have continued success in learning more about this truly awesome fish. The Pee Dee is a greatly altered habitat with tremendous flow fluctuations due to dam releases and a huge biomass of non-native species. Included in these are highly predatory flathead catfish (*Pylodictis olivaris*), blue catfish (*Ictalurus furcatus*), and incredibly abundant smallmouth buffalo (*Ictiobus bubalus*) which very likely directly compete with redhorses for food and other resources. The future existence of the robust redhorse is doubtless in considerable jeopardy and knowledge of its habits and critical habitat will be crucial to conservation planning.

Wayne Starnes and Morgan Raley of NCSM, with the assistance of Ryan Heise, Rob Nichols, and Brena Jones of NCWRC and Bryn Tracy of NCDWQ, have continued to try to learn more of the current distribution and status of the undescribed "Carolina Redhorse" (CRH) and to study its genetic relationships to other species as well as inter-

and intrapopulation genetic structuring. Currently, the known extant range extends, in the Cape Fear basin, on the lower piedmont, from near the confluence of the Deep and Haw rivers (very rare, last collected in 1997) upstream in the Deep to at least Randolph County, NC, with the stronghold perhaps being in the, until recently, impounded reach near Carbonton (see dam removal study below) in eastern Moore County. Prior to removal of the small dam at Carbonton, this species was common in the 12-mile long impoundment above and apparently migrated to shoal areas further upstream to spawn. A survey of the former impounded reach in fall of 2006 revealed that CRH are still hunkering down in whatever deeper pools remain in the area. Plans are to survey more thoroughly in reaches below the former dam site in the coming year to determine how far down river a significant CRH population extends. Several past efforts in two limited reaches downstream of Carbonton have failed to yield any specimens. Use of tributary creeks by young of the year CRH has been documented, as well as by young of other riverine redhorse species, extending over a mile upstream in one case. This is quite surprising as, thus far, there is no knowledge of spawning migrations into these streams and it seems a very long way, through long deep pool reaches, for young of year redhorse to traverse; this phenomenon will be studied further. Elsewhere in the Cape Fear, several surveys of the Haw River, which, while much improved, has had a history of very poor water quality, have failed to demonstrate the persistence of CRH.

In the Pee Dee basin a stronghold of CRH has been located in upper Blewett Falls Reservoir on the Pee Dee River represented by both adult and juvenile specimens. These are generally taken in the shallow upper few miles of the impoundment, especially around an island complex known as Grassy Islands and the adjacent lower Mountain Creek. It is suspected that this population is associated with Little River which enters the Pee Dee upstream of this area and harbors several populations that are effectively isolated above small dams on that river. A few CRH have been captured in lower Little River in spring but thus far no spawning areas have been documented despite investigations of some very promising looking gravel shoal areas. It is hoped to learn more about the relationship of Little River and the upper Blewett population in future work. A few CRH are found in the Pee Dee each year in the course of robust redhorse surveys below Blewett Falls dam. Whether these represent trickle down from above the dam or perhaps a small amount of reproduction downstream of it is unknown. Except for a single specimen recorded from the head of Tillery Reservoir (next above Blewett Falls) on the Pee Dee, all Pee Dee basin records thus far are from the Blewett Falls Reservoir or tailwater and Little River. CRH were doubtless formerly more widespread, especially in tributaries such as Rocky River which enters the same reach of the Pee Dee, but may now be extirpated. Efforts

to find new populations will continue.

Microsatellite primers are currently being developed to further probe the genetic structuring of CRH populations as, thus far, investigations of large samples using cytochrome-b and S7 intron sequence data have yielded amazingly invariant results, not only within populations but between the Cape Fear and Pee Dee basins populations. It is assumed that this species, not recognized until 1995, has occupied both of these basins for a very long time and thus the lack of differentiation is remarkable minus any translocation scenarios. Perhaps the most significant findings thus far are strong implications of introgressive hybridization of CRH ancestral stock with the sympatric but morphologically very different notchlip redhorse (*M. collapsum*). Hopefully further investigations utilizing microsatellites will provide some resolution and enable estimates of effective population size and other information critical to conservation.

In SFC Proceedings 48 the impending removal of Carbonton Dam on Deep River in North Carolina was reported along with the initiation of a before/after study of fish communities. This is a combined effort by NCWRC, NCSU Coop Unit, NCSM, and NCDWQ. Pre-removal seasonal (spring/fall) sampling was conducted for two years in the impoundment and tailwater of the dam as well as control sites well above and below this reach. The ~7 m high dam was removed in late fall of 2005 and spring and fall sampling of these sites continues. A tremendous amount of fish data, generated from both backpack and boat electroshocking efforts, has been garnered, including species and size composition. A couple more years of data will be gathered before analyses begin to assess short term effects of the removal and hopefully the current investigators and some successors can conduct periodic sampling in the future to look at longer term trends. The removal of the dam revealed a number of beautiful gravel shoal areas, as well as an intact Native American or European settler rock fish weir, which had been inundated for the better part of a century. The shoal areas have reconstituted themselves into clean swept gravel reaches with surprising rapidity. One major curiosity is what effect the removal of the impoundment will have on the overall population levels of "Carolina redhorse" which were relatively common in this reach to the exclusion of all others. The species appears to have a definite affinity for the deeper portions of rivers for most of the year and the impoundment may have bolstered available habitat. As mentioned above, the remaining CRH were found sequestered in some deep pools post dam removal. Unfortunately, they are sharing these pools with large numbers of large flathead catfish (*P. olivaris*) which may take a toll. Only time will tell. Theoretically, returning this reach to riverine conditions will reestablish connectivity between populations of the endangered Cape Fear shiner (*Notropis mekistocholas*) which may have been effectively fragmented by this impoundment for much of a century.

The Scientific Council on Fishes, advisory group to the NCWRC's Non-game Committee, has made several recommendations for status changes of listed species in North Carolina. The Council is chaired by Wayne Starnes and several biologists with connections to SFC, including Gabriela Hogue (NCSM), Fritz Rohde (NCDMF), Bryn Tracy (NCDWQ), Steve Fraley and Ryan Heise (WRC) and Tom Kwak (NCSU) sit on the council; other members are Angeline Rodgers and Sarah McRae (NC Natural Heritage), and Gerald Pottern (Goldstein & Associates). Two species, the robust redhorse (*M. robustum*) and the rediscovered bridle shiner (*Notropis bifrenatus*), were recommended for state Endangered status. The turquoise darter (*Etheostoma inscriptum*), the undescribed "Carolina" and "sicklefin" redhorses, Carolina madtom (*Noturus furiosus*), and blackbanded darter (*Percina nigrofasciata*) were recommended as Threatened due to both limited overall ranges and impending threats or have peripheral occurrences in North Carolina that are effectively cut off from recolonization due to downstream impoundments. The freshwater drum (*Aplodinotus grunniens*), cutlip minnow (*Exoglossum maxillingua*), and striped shiner (*Luxilus chrysocephalus*) were down-listed from higher categories to Special Concern; these are peripheral species but may have ample opportunity for recolonization from populations in adjacent states. The recently described Blue Ridge sculpin (*Cottus caeruleomentum*), which occurs in a few miles of the Dan River in North Carolina, was also added to this category. All of the Council's recommendations were adopted by the Non-game Committee and currently are undergoing the Commission and legislative approval process.

At NCSM the great push to database and provide online access to the collections continues. The fishes and aquatic invertebrate efforts are much aided by an NSF grant awarded in 2004 which will hopefully be extended until at least mid 2008. Collection manager Gabriela Hogue has directed a diverse and ever evolving team of technicians and data entry personnel over the last 2.5 or more years and has accomplished much toward the goal of databasing the entire fish collection. Currently, nearly 40,000 of the estimated 100,000-110,000 lots on hand are fully databased and locale information sufficient to support the rapid databasing of several thousand more is fully upgraded, GIS-linked, and entered. Wayne Starnes has tried to assure that species identifications and current taxonomy and nomenclature are up to standards as data are entered. Lots databased thus far mostly represent the original core NCSM collection plus most routine accessions over the past five years, including great numbers of NCDWQ IBI voucher series, a large collection of West Virginia material stemming from WVDNR and NAWQA surveys, and several deep water marine collections from off North Carolina, including a valuable collection of 630 lots of fully identified eel larvae. Other large collections assimilated at NCSM, such as the UNC IMS, Duke University, NCSU, Stockton State (NJ), some of the

NCWRC 1960s basins surveys collections, W.C. Starnes collection, and a variety of other U.S. and foreign collections remain. A contractor is currently in the latter stages of development of the NCSM collections website and it is expected that a significant portion of holdings of the fishes, aquatic invertebrates, and reptile and amphibian units will be accessible on-line before the end of 2007 (available as a link from NCSM's main website: <http://www.naturalsciences.org/>). Gabriela Hogue and Jonathan Raine recently published a detailed article on the evolution of the databasing effort at NCSM entitled "From the Ledger to the Web: Setting 21st Century Documentation Standards for the Collections of the North Carolina State Museum of Natural Sciences" published in the journal of the Society for the Preservation of Natural History Collections (Collection Forum 2006; 21(1):175-191). They also presented this information at the annual SPNHC meeting in London in 2005.

Some proud accomplishments at NCSM involved special collections. The entire collection of 1,829 larger tank and vat specimens was completely renovated in 2006 with all specimens inventoried, cleaned up, reidentified, databased, and transferred to new 70% ethanol in stainless steel tanks and vats. Many of the largest specimens were inherited from the UNC IMS collection amassed by Frank Schwartz over several decades. Much of the material, including many sharks, sturgeons, and other larger species, had been in rusted steel vats and required extensive cleaning. Also databased were all holdings of smaller tank materials, such as clupeids, catostomids, catfishes, and various percoid groups. Complete locale and size data, thermal printed on resilient plastic tags, is attached to each specimen in addition to the catalog. This has greatly increased the utility of this collection by facilitating quick location and assessment of specimens. The collection of ~800+ dry fish skeletons has been recently curated in new boxes and renovated museum cases and databasing has begun. And the vouchered DNA tissue collection, preserved in 95% ethanol, has expanded in taxonomic and geographic scope and now numbers over 1750 lots.

NCSM is currently undergoing an expansion and is in later planning stages for the construction of a "nature research center" to adjoin the main museum located in downtown Raleigh. This large facility, yet to be formally named, will be modeled somewhat on the new Darwin Center at the British Museum and will provide a forum whereby the public is brought up close and personal to interact with researchers in a variety of environmental/natural science fields, including collection based research on biodiversity and conservation genetics, regional and global environmental issues, and others. Hopefully it will garner an increased appreciation and support by the public and political establishment (conveniently located just across the street) for the kinds and importance of research conducted at institutions such as NCSM, biologists from companion agencies, nearby uni-

versities, and further afield. Also, hopefully, the planning and manning of this facility will not dominate the remainder of the careers of the curatorial staff! In addition to the nature research center, as part of the expansion, the Research and Collections facility hopes to construct a companion building to the present facility which is located several miles from the main museum and houses all alcoholic collections and associated curatorial staff. Attempts are currently being made to gain approval of this expansion from the legislature and, if funded, it would double the current fish collection range space to over 10,000 square feet and that of aquatic invertebrates to 7,000.

Moving finally to South Carolina, Mark Scott reports that biologists with SCDNR and Clemson University have been steadily working on stream assessments across the state. Efforts in 2006 concentrated in the coastal plain of the Santee and Pee Dee River drainages, with the Ashepoo-Combahee-Edisto River drainages next on the list. Sites are surveyed for fish and invertebrate assemblage structure, water quality and contaminants, and habitat measures including channel geomorphology, bed particle size distributions, depth, and flow heterogeneity. Land use and point source discharges are tabulated for each watershed. The information from the program will help SCDNR understand status and trends of stream resources in the state, evaluate threats to resource integrity, and guide design of management actions under the Comprehensive Wildlife Conservation Strategy. The goal is to establish the environmental conditions necessary to sustain the species listed as sensitive in the Strategy so actions can be taken to ensure those conditions are not degraded.

Mark also reports that baseline data were collected in 2006 on fishes, invertebrates, water quality, and channel geomorphology on Twelve-Mile Creek, an upper Savannah River tributary slated for removal of a series of dams. Plans are to follow ecological changes in the creek associated with dam removal for a period of five years, longer if support is forthcoming.

And last but not least, Fritz Rohde, Rudy Arndt, Joe Quattro, and Jeff Foltz are frantically trying to get the manuscript for the new fishes of South Carolina book to press within the next month or so. When completed this will be a much needed and welcome regional faunal guide to an area that has been lacking in such for a very long time and will fill in one of the last gaps that remains for such books in the Southeast (but Georgia and Florida better get busy, not to mention a certain someone needs to get started on a more comprehensive reference to North Carolina!).

– Wayne Starnes

REGION II—SOUTHEAST

In cooperation with Jim Peterson, Deb Weiler, Bud Freeman and many field hands, Brett Albanese of the Georgia Department of Natural Resources just finished up

a survey and sampling efficiency study for the bluenose shiner (*Pteronotropis welaka*). This species is currently known from nine sites within the Flint River system of southwest Georgia. Compared to other coastal plain minnow species, the probability of detecting *P. welaka* during a seining survey is very low. Carrie Straight, Bud, and Brett are still working on an Atlas of Freshwater Fishes for Georgia. Most of the progress to date has involved the compilation of fish distribution records from many sources. Brett recently coordinated the first update of Georgia's Protected Species list since 1992. Nine fish species were added to the list, seven were deleted, and the status of 20 species already listed was changed. For the first time ever, crayfishes and dragonflies were added to the state list and the freshwater mussel list now reflects true imperilment of this group rather than a mirroring of the federal list. Finally, Chris Skelton and Brett just completed a *Field Guide to Fishes of the Conasauga River*. This guide should be a handy field reference for biologists, but is also being used as an outreach tool targeted toward citizens within the watershed. Jason Wisniewski, the state mussel biologist, has been conducting and coordinating surveys and research on mussels throughout the state. One of his biggest projects right now is a collaborative effort with Jim Peterson and Jason Meador to develop a long-term monitoring program for Altamaha basin mussels. Chris Skelton at Georgia College & State University has two new graduate students working in the Oconee River system. Hank Forehand is working on a "fishes of" the Oconee River system from Sinclair dam downstream to its confluence with the Ocmulgee River. Thanks to those of you that have already provided historical records. Judit Varga is working on the distribution and life history of the state threatened Oconee burrowing crayfish. This rare primary burrower is currently known from about 10 locations in the Oconee system north of Dublin, GA.

– Brett Albanese and Chris Skelton

REGION III—NORTH CENTRAL

David Eisenhour at Morehead State University reports that the taillight shiner (*Notropis maculatus*) seems to be more common in Kentucky than previously thought. David and Ron Cicerello independently collected large series from separate locations in the Obion Creek drainage in 2003, which represented the first collections from this system since 1890. In July 2004 Brooks Burr and David collected an additional series from Clarks River, Kentucky, representing the first record of this species from the Tennessee River drainage. David wants all to know that Matt Thomas and Brooks Burr recently published the description of *Noturus gladiator*, the piebald madtom (Ichthyological Explorations of Freshwaters 15:351-368). *Noturus gladiator* includes populations from eastern tributaries to the Mississippi River in Tennessee and

Mississippi that were formerly assigned to the northern madtom (*N. stigmatosus*). The range of this species has declined, primarily because of channelization, and stable populations only remain in the upper Hatchie, Obion, and Wolf River drainages. Lastly, David indicates that Paul Rister reported that gill netting efforts in the Mississippi River at Wolf Island (RM 935) by KDFWR and a collaborating commercial fisherman yielded 341 shovelnose sturgeon (*Scaphirhynchus platorhynchus*) and 7 pallid sturgeon (*S. albus*). One of the shovelnose sturgeon recovered was originally tagged at RM 71.

Mark Cantrell (FWS) reported the Tallassee Fund awarded several grants for rare fishes work in the Lower Little Tennessee River area. The Tallassee Fund was established as part of a settlement agreement and a requirement of the new hydroelectric license issued to Alcoa Power Generating, Inc., and will provide for conservation activities in the Lower Little Tennessee River Valley in the vicinity of the Chilhowee and Calderwood reservoir developments.

In December 2006, the Tallassee Fund agreed to support six (6) projects, including three that will further the purposes of the Fund by helping to recover imperiled aquatic fish and mussel species:

1. Calderwood Bypass mussel reintroduction and fish host community description (\$29,360 to Jim Layzer, Tennessee Tech);
2. Recovery status of 2 federally protected extirpated fish species in Abrams Creek, Great Smoky Mountains National Park (\$38,869 to Matt Kulp, GSMNP); and
3. Re-establishment of blotchside logperch (*Percina burtoni*) into Tellico River and Citico Creek (\$20,000 to Rakes and Shute, CFI).

Other projects will restore extirpated plant and animal populations, protect riparian corridors and habitat, and control invasive exotic species.

The Tallassee Fund provides \$100,000 annually for the 40 year term of the FERC license. The geographic scope of Tallassee Fund includes the Lower Little Tennessee Valley in the vicinity of the Calderwood and Chilhowee developments. For information about how to apply for a grant, contact Mark Cantrell (mark_a_cantrell@fws.gov), currently the Chair of the Board. The Tallassee Fund is maintained in an account administered by David McKinney of the Tennessee Wildlife Resources Agency.

Joyce Coombs and J. Larry Wilson report the release of the first propagated tangerine darters (*Percina aurantiaca*) into the Pigeon River as part of an attempt by Conservation Fisheries, Inc. (CFI) to propagate the species for the Pigeon River Recovery Project. *Percina aurantiaca* was one of the species missing from the Pigeon River that cannot be found in large enough num-

bers to collect and release. CFI and a graduate student at UT conducted the research and their efforts spawned the first captive propagation of *P. aurantiaca*.

– Mark Cantrell

REGION IV—SOUTH CENTRAL

Noel Burkhead of the US Geological Survey in Gainesville, Florida has been studying the behavior of spawning *Cyprinella*, primarily related to hybrid swarms precipitated by introduced populations of the red shiner (*C. lutrensis*). Noel has worked the past two years with EPA scientists Dave Walters (fish ecologist) and Mike Blum (geneticist), focusing on the swarm in the upper Coosa River with blacktail shiners *C. venusta stigmatura*. Noel's part of this collaborative effort was to conduct multiple controlled crosses in the lab between the two species, plus conduct female mate selection experiments. Unfortunately, the experiments did not go as planned because Noel failed to appreciate how important interactions were relative to experimental design. The genetics protocol required single parent mating (one of each sex). Although it was possible to produce replicate broods of the super generalist red shiner, the blacktail shiner intraspecific crosses were much less successful, even with varying tank sizes, lighting, and introducing turbidity. On the positive note, work on data from prior interaction experiments between red shiners and blue shiners (*C. caerulea*) stimulated by observations of other *Cyprinella* species spawning, plus information about other red shiner hybrid swarms (with different *venusta* "subspecies" and *C. spiloptera*), helped Noel formulate a testable hypothesis that may explain the behavioral component underlying hybrid swarms precipitated by red shiners. Noel is open to suggestions as how one might obtain funding for an anonymous hypothesis. Noel is also busy with efforts of the American Fisheries Society Endangered Species Committee (AFS ESC). They are currently revising and updating the AFS list of imperiled North American freshwater fishes, last published in 1989. Noel is chairing a 16 member committee of ichthyologists from Canada, Mexico, and the US, with Howard Jelks and Steve Walsh, USGS colleagues in Gainesville, as Committee Vice-Chairs. The near finalized list, expected to be completed later in 2007, more than doubles the taxa in the 1989 list, with the final number close to 750 taxa. For the first time, following relatively recent listings of western anadromous salmonids populations under the Endangered Species Act, Noel and colleagues have similarly apply status to declining populations. Taxa include nominate species, infraspecific taxa (nominate and undescribed subspecies; discrete populations of nominate species), and undescribed taxa. Analyses will dissect changes in the list and differentiate

between process-related increases and actual trends in faunal decline. Two other subcommittees of the ESC are also revising their lists (crayfishes and mussels) and one subcommittee is preparing the first AFS list of imperiled freshwater snails for Canada and the US. The provisional findings of these committees also disclose trends of biodiversity loss and decline in these groups.

George Burgess at the University of Florida in Gainesville has been busy with the federally endangered smalltooth sawfish *Pristis pectinata*. He has served on the Smalltooth Sawfish Listing and Recovery teams, and will be on the upcoming monitoring/implementation team. The last US stronghold for the smalltooth sawfish is in southern Florida; its former distribution ranged from New York to Texas. It is also disappearing throughout its natural range in Central and South America and Africa.

Frank Parauka reports that USFWS biologists at the Panama City Field Office along with 39 very enthusiastic volunteers conducted a Gulf sturgeon (*Acipenser oxyrinchus desotoi*) survey in the Escambia River from 10 October through 5 November 2006 to coincide with the sturgeons fall migration from freshwater to the marine environment. Four to six stationary gill nets of various sizes, covering about 80% of the river from bank to bank, were fished from daylight to early evening. One hundred and thirty fish were collected during the study. Over forty of the fish had been previously tagged, with some of these fish coming from the Blackwater, Yellow and Choctawhatchee rivers. The fish ranged in weight from 0.5 to 66.5 kg (mean 17.6 kg) and measured in total length from 61 to 221 cm (mean 137 cm). Large fish (>45.3 kg) accounted for 10% of the catch. In 2003, fish in excess of 45.3 kg represented 19% of the catch. The Gulf sturgeon population (2006) in the Escambia River is estimated at 451 fish (338-656 fish at 95% confidence interval) using a modified Schnabel mark-recapture program. The numbers are down from the 2003 survey which estimated the population at 554 fish (373-735 fish) using the same methods. The decrease in the Gulf sturgeon population and lack of larger fish collected during the 2006 could be a consequence of the degraded water quality caused by Hurricane Ivan in 2004 which led to massive fish kills in the lower Escambia River.

Anna George at the Tennessee Aquarium Research Institute in Chattanooga is finishing her population genetics study on the endangered *Percina jenkinsi* in the Conasauga watershed. She is also wrapping up a genetics project on the threatened *Cyprinella caerulea*. Anna is leading efforts to expand the current Research Institute into the Tennessee Aquarium Freshwater Institute for Conservation, Research, and Education Leadership, with the objective to conserve and recover freshwater species through research, restoration, education, and outreach.

Scott Mettee reports that sampling by Geological Survey of Alabama (GSA) biologists for Gulf sturgeon in Mobile and Perdido bays began in December 2006 and will

continue until mid-March 2007. Sampling has been adversely affected by a brown tide outbreak that began near Weeks Bay Sanctuary in early February and extended northward to near the southern end of the Mobile-Tensaw River Delta. Expected numbers of marine and freshwater species were collected in the area prior to the brown tide, but almost no fishes have been collected in mid- to late-February. Sampling for sturgeon eggs and inland gill netting for adult fish will begin in the Alabama and Tombigbee Rivers in late March. This study is funded by the State Wildlife Grants (SWG) program of the Alabama DCNR.

Stuart McGregor (GSA) reports snorkeling at 21 stations in selected tributaries of the Chattahoochee River in Alabama in the spring and summer of 2006 for mussels, with 523 specimens and 15 species collected, including 6 species of highest or high conservation concern in Alabama and one endangered species (*Hamiota subangulata*). Most stations had poor habitat and very few mussels, but one station in Uchee Creek yielded a diverse and abundant mussel fauna. Mussel sampling by diving with a boat-mounted air source was conducted at 19 stations in the tailwaters of Claiborne Lock and Dam (about 33 river miles) on the Alabama River in August and September 2006 (14.4 hours of bottom time yielded 3,054 mussels among 19 species.) No federally-listed species were encountered and only one species of highest conservation concern in Alabama was collected (*Elliptio arctata*). These studies were funded by the Wildlife and Freshwater Fisheries Division (WFFD) of the ADCNR.

Pat O'Neil (GSA) reports completion of a three-year survey for species of conservation concern in selected Alabama coastal drainages which resulted in updated information for several species of high and highest conservation concern in the state. This project was funded by WFFD. One small individual of the Gulf sturgeon was captured in the Perdido River in 2004, a river system not listed as critical habitat for the species. Alabama shad (*Alosa alabamae*) were collected in the Conecuh River near Brewton in 2006. The ironcolor shiner (*Notropis chalybaeus*), not collected in Alabama since 1983, was rediscovered in 2006 at Franklin Creek (34 individuals) in southwest Mobile County; sampling at 13 other historical locations failed to produce individuals. The blackmouth shiner (*N. melanostomus*) was unknown in Alabama until its discovery in 2003 by Jim Williams in Bay Minette Creek. It was found at three locations in this system with 132 individuals taken over a three-year period in 2004-06. New records for other species whose distributions are poorly known in coastal Alabama were also documented in 2004-06 including paddlefish (*Polyodon spathula*), coastal shiner (*N. petersoni*), taillight shiner (*N. maculatus*), flathead catfish (*Pylodictis olivaris*), freckled madtom (*Noturus nocturnus*), golden topminnow (*Fundulus chrysotus*), banded topminnow (*F. cingulatus*), banded sculpin (*Cottus carolinae*), least killifish (*Heterandria formosa*), bluespotted sunfish (*Enneacanthus gloriosus*), and yel-

low perch (*Perca flavescens*). Pat also reports completion of a study in 2006 to standardize a sampling methodology for wadeable streams for use with the index of biotic integrity (IBI) funded by WFFD. Biologists from three State agencies involved in stream monitoring and assessment work (The Alabama Department of Environmental Management-ADEM, WFFD, and GSA) will use this methodology for future stream assessments. The IBI metrics and scoring criteria were calibrated for the Coosa and Tallapoosa River systems upstream of the Fall Line as part of this study.

Tom Shepard (GSA) reports that in the past year GSA completed a DVD-based geographic information system (GIS) presentation of biological, habitat, water-quality, and other natural resource information compiled for use in management activities in the Locust, Mulberry, and Sipsey Forks of the Black Warrior River drainage. Interactive watershed visualizations are also presented on the DVD. The visualizations allow the user to explore conditions throughout the watersheds with natural resource maps, accounts and photographs of sampling stations, fish distribution maps, and color photographs of the fish species found in these river systems. A limited watershed information library is also included which provides recent reports on Locust, and Mulberry Forks by GSA. Sandy Ebersole designed and created the interactive project, the GIS products were developed by Anne Wynn and Sandy Ebersole, and Ruth Collier designed the DVD layout. The project was funded through the Alabama SWG program. A limited number of the DVD reports are available through the GSA Publication Sales Office (pubsales@gsa.state.al.us).

Todd Slack and Mark Dugo from the Mississippi Museum of Natural Science completed their 26-month project on movement of Nile tilapia in coastal waterways of Mississippi in 2006. MMNS collaborated with Mark Peterson at the Gulf Coast Research Lab and Pam Schofield, USGS-Gainesville, to conduct a post-Hurricane Katrina assessment of Nile tilapia populations in coastal Mississippi. As part of that scope of work, the group facilitated eradication efforts of Nile tilapia at an aquaculture facility abandoned after Hurricane Katrina resulting in over 9,000 Nile tilapia removed during a 3-day period. Brian Kreiser, Mark Dugo, and Todd continue to make progress in the systematic project addressing the *Fundulus notatus* species group in Mississippi. In addition, Mark has been reexamining museum material of *F. blairae*, *F. dispar* and *F. nottii* from Mississippi, Louisiana and Alabama in order to more fully resolve the distributional aspect of these species in Mississippi. Mark has generated a preliminary cytochrome *b* phylogeny for *F. dispar* and *F. blairae* to aid in resolving longstanding taxonomic issues between these species. The history of these species appears complex and may involve secondary contact, as previously reported by Bob Casher and students. Future molecular work will include sequence and microsatellite datasets to address patterns and processes at the popula-

tion level. Progress towards phylogenetic resolution of *Cottogaster* to aid biologists working on this endangered clade of darters has begun with funding through 2007. Todd and Mark Peterson will also begin a Gulf sturgeon project during 2007 focusing on movement and habitat association of juvenile Gulf sturgeon within coastal areas of Mississippi. Lastly, the Museum is currently developing plans for additions to the Research and Collections Wing, a larger hall for traveling exhibits, and additional classrooms for the on-site Education Program. Plans for the Research and Collections Wing include a new Wet Collection Range, a new Wet Collection Laboratory, a dedicated Molecular Laboratory along with 11 additional offices and cubicle work spaces. The existing collection area will be reconfigured to provide space for the growing Mussel and Paleontology Collections. The MMNS Ichthyology Collection continues to grow and now contains over 49,500 catalogued lots. Nearly 90% of the records have been computerized and the database can be searched online through the Museum's webpage (<http://www.mdwfp.com/museum/html/research/index.html>).

Mark Peterson at the Gulf Coast Research Lab in Ocean Springs, Mississippi, is starting an acoustic tagging study on juvenile Gulf Sturgeon this year in Mississippi Sound with Todd Slack. Mark, Todd, and Pam Schofield just completed an eradication project of Nile tilapia in aquaculture ponds in coastal MS and have a paper in construction on their efforts and results for SFC. They effectively eliminated a vector for future introductions into the Pascagoula River. Mark and Rich Fulford have been funded to continue work on mapping water quality and habitat in the lower Pascagoula and model nursery habitat for estuarine-dependent fishes. Mark and colleagues at the Grand Bay National Estuarine Research Reserve are initiating a five year study on *Fundulus jenkinsi* across the north-central Gulf of Mexico from Louisiana thru Florida and are continuing work on comparing natural and constructed intertidal oyster reefs in terms of community dynamics and food web (stable isotopes) development over two years. Research on mapping estuary reed habitat, reducing effects of dredged material levees on estuaries, and life history aspects of sciaenids and tilapia have recently been published.

Steve Rider and Travis Powell of the Alabama DCNR captured a male Alabama sturgeon (*Scaphirhynchus suttkusi*) below Claiborne Lock and Dam on the Alabama River on 3 April 2007. Steve and Travis were capturing paddlefish with a 200x12 ft 3-6 inch mesh multifilament gillnet when they found the sturgeon entangled in 5 inch mesh. Depth was 10.5 ft and water temperature was 69.5 F. Internal examination of the gonads at the Marion Fish Hatchery indicated that the 3.7 lb, 31 inch male was not in reproductive condition this year. The specimen was implanted with a four-year sonic tag and released on 17 April 2007. He traveled downstream 6 miles the first three

days, then 25 miles downstream over the next two days. Boat monitoring and use of stationary receivers will continue to determine preferred habitat and movement, which may lead to the capture of additional specimens. This was the first Alabama sturgeon captured by biologists in eight years.

Phil Harris at the University of Alabama continues his research in an international project examining the relationships of Cypriniformes, which will include North American minnows and suckers. Graduate students are using microsatellite data to examine population genetics of the endangered *Etheostoma chermocki* and its surrogate species *E. bellator* (Jenjit Khudamrongsawat), *Elassoma zonatum* and *E. alabamae* (Mike Sandel), *Pteronotropis* species (Gray Hubbard), and the endangered *E. nuchale* (Brook Fluker). Projects by undergraduates include life histories of *Noturus funebris*, *N. minutus* (Micah Bennett), *Notropis chrosomus*, and *E. ramseyi* (Heath Howell), and a project recording the use of new habitat by riffle fishes in the Cahaba River after the removal of a low-head dam (Heath and Micah).

– *Bernie Kuhajda*

REGION V AND VI— NORTHWEST AND SOUTHWEST

In the Northwest and Southwest regions conservation-oriented research is being conducted on a wide variety of large, imperiled (and charismatic) species, including cooperative and collaborative studies with alligator gar (*Atractosteus spatula*) and pallid sturgeon (*Scaphirhynchus albus*). Also, several groups are working to describe and quantify effects of Hurricanes Katrina and Rita on aquatic ecosystems. Agencies and contributors have provided the following reports.

Ricky Campbell reports that the Private John Allen National Fish Hatchery continues to create recreational fishing opportunities by producing and stocking: i) walleye (*Sander vitreus*) in the Tennessee-Tombigbee Waterway; ii) striped bass (*Morone saxatilis*) in Mississippi, Alabama, Florida, Georgia, and Louisiana; iii) bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), largemouth bass (*Micropterus salmoides*), and channel catfish (*Ictalurus punctatus*) in National Wildlife Refuges and tribal lands throughout the southeast United States. The hatchery is also involved in Hurricane Katrina fishery recovery throughout affected areas of Mississippi. Private John Allen NFH continues to develop strong partnerships with state natural resource agencies, academic institutions, and other non-governmental organizations to restore paddlefish (*Polyodon spathula*), lake sturgeon (*Acipenser fulvescens*), and alligator gar (*Atractosteus spatula*) populations.

Alligator gar production has been a particularly important focus of the hatchery in recent years. Primary objective of this work now is to restore populations in the Mississippi drainages of western Tennessee. Collaborating with other agencies and with support from the Bowfishing Association of America, hatchery personnel collected broodstock from waters managed by the USFWS in the lower Mississippi River. Fish were transported to the hatchery, induced to spawn, and the young raised for subsequent release. During the 2006 production season a total of three females and eight male fish were spawned, producing 251,598 eggs, yielding 140,565 fry. These fry were sent to five partner hatcheries for grow out and research. Additional fry were also sent to universities for research purposes. The Private John Allen NFH produced 2,056 fish weighing 330 pounds for stocking for 2006. When alligator gar were approximately 10 inches in length, they were given a health screening, tagged, and released in pre-selected management areas. Private John Allen NFH is also collaborating with Warm Springs Regional Fishery Center staff on cryopreservation of gar sperm.

As a result of the successful propagation of this species, in Feb 2007, a planning session was held for an alligator gar working group. Meeting was organized by Ricky and hosted by the hatchery. Participants included representatives from USFWS, Tennessee Wildlife Resource Agency, Warm Springs Regional Fishery Center, Arkansas Game and Fish Commission, Missouri Department of Conservation, Nichols State University, and the University of Southern Mississippi. Topics included propagation techniques, ecology, and management of gar species, and public perception of alligator gar reintroduction programs.

Bob Hrabik of the Missouri Department of Conservation reports that staff members from the Open Rivers and Wetlands Field Station (ORWFS, Missouri Department of Conservation) in cooperation with the USFWS Mingo NWR, and Southeast Missouri State University, have received approval to reintroduce alligator gar to the refuge. The gar will be stocked in May 2007 at a rate of 1 fish/3 acres of surface water. They will be radio tagged and movements monitored for one year. Two graduate students from the University will conduct the telemetry work, as well as studies on habitat use and food habits. In addition to the tracking and habitat studies, staff will also monitor fish assemblage changes, crappie (*Pomoxis* spp.) population dynamics, and creel surveys to evaluate possible impacts of alligator gar in Mingo NWR. This is a long-term study led by Chris Kennedy, MDC Fisheries Division, with scientific support by the Resource Science Division and ORWFS staff. Alligator gar are already being stocked in Tennessee and Arkansas and recently the Illinois DNR has announced that they will also investigate the feasibility of stocking this species in southern Illinois.

Through a cooperative effort between the U.S. Army Corps of Engineers (St. Louis District), Southern Illinois University-Carbondale (SIUC), and the ORWFS, a series of

remote ultrasonic telemetry receivers (Vemco VR-2) are being established in the entire Upper Mississippi River bordering Missouri (from the Iowa state line to the confluence of the Ohio River). Future plans are to expand the telemetry array into the Lower Missouri River (in cooperation with the USGS-Columbia), the Lower Ohio River (USFWS-Marion, IL), and the Lower Mississippi River (various agencies). The VR-2 array is now being used to track movement of lake (A. fulvescens), pallid (Scaphirhynchus albus), and shovelnose (S. platyrhynchus) sturgeons in the Mississippi River. In addition to remote receivers, crews from SIUC and the ORWFS are tracking male and female pallid sturgeons in an attempt to document reproduction sites. At present, four black-egged female pallid sturgeon have been tagged in the Middle Mississippi River (MMR) and crews are engaged in tracking these fish 24 hours a day using multiple crews, seven days a week. As of this writing, pallid sturgeon are now beginning to move after being sedentary throughout much of April. In the past, sturgeon have spawned in mid-April to mid-May in the MMR and larval sturgeons (including pallid sturgeon) have been collected from mid-May to mid-June, with peak periods of collection during the last week of May and first week of June.

Ron Nassar of the Lower Mississippi River Conservation Committee reports that from 2001 to 2004 the LMRCC conducted state-level planning meetings that resulted in the identification of 239 projects designed to increase productivity in the LMR leveed floodplain ecosystem and provide outdoor recreation opportunities. One project identified as a high priority was restoration of flow in the Chute of Island 63 at River Mile 639 (Coahoma County, Mississippi) by notching a rock dike installed in 1973. Aquatic habitat upstream of the dike had been lost due to more than 20' of accretion that had occurred since the dike was built and dissolved oxygen levels downstream of the dike were poor during periods of low river flow. Personnel of the U. S. Army Corps of Engineers Memphis District and Mississippi Valley Division designed a dike notch with top and bottom width dimensions of 300' and 200', respectively, and ranging in depth from 14 - 19' that would restore flow within the channel. The project was constructed in December 2006 at a cost of \$36,000 by using a barge-mounted dragline to pull 10,000 tons of stone downstream. The project was made possible by a partnership consisting of the U. S. Fish and Wildlife Service Southeast Region (Fish Passage Project Program), U. S. Army Corps of Engineers, Mississippi Wildlife, Fisheries & Parks (LMRCC), Wildlife Mississippi, American Land Conservancy, Quapaw Canoe Company, and Wildlife Forever. The Island 63 project is important to the local economy because the channel has an all-weather, public boat launch that provides access not only to the 5.47 mile long Island 63 Chute but to the Mississippi River via its downstream connection at all but the lowest river stages. The permanent regional forum provided by the LMRCC

supports a critical federal-state-nongovernmental organization partnership that ensures restoration of the LMR's nationally significant natural resources as well as consistently providing benefits to the outdoor recreational community.

Jan Hoover of the U.S. Army Engineer Research and Development Center reports that the ERDC Fish Team continues its 10-year program of pallid sturgeon (*S. albus*) and shovelnose sturgeon (*S. platyrhynchus*) research in the free-flowing Mississippi River. Recently completed field studies include geographic variation in relative abundance and size, morphological variation, relative frequency of injuries and anomalies, diet, and age structure and mortality. Also completed recently was an assessment of entrainment risk for pallid sturgeon in the vicinity of the proposed water diversion structure that would restore flow to the wetlands surrounding Lake Maurepas. Ongoing projects include: determination of sex ratios and delineation of spawning season based on gonadal condition; refinement of laparoscopic technique to determine sex and reproductive stage; implantation of telemetry tags as part of the system-wide tracking effort by state agencies and USFWS; identification and monitoring of pallid sturgeon spawning and rearing grounds (larvae were collected and identifications confirmed last year). Sturgeon populations are also monitored in conjunction with studies of fish assemblages occupying habitats created by notched dikes (including habitats created by the notched dike at Island 63).

ERDC students completed several laboratory studies designed to assess the risk of entrainment for juvenile sturgeon. Heather Smith (St. Andrews Episcopal School) compared swimming performance of lake sturgeon (*A. fulvescens*) from the Wisconsin River with those from Lake Winnebago (fish were provided by Ricky Campbell at Private John Allen NFH). Heather was one of three finalists in the national Stockholm Junior Water Prize competition. Krista Varble (Mississippi College) compared swimming performance of naïve and flow-trained white sturgeon (*A. transmontanus*) from the Sacramento-San Joaquin River system as part of her thesis research. Joseph Beard (University of Louisiana at Monroe) conducted a comparative study of responses to environmental noise by pallid sturgeon, lake sturgeon, and white sturgeon. Ellen Wakeley (Bowling Green University) developed swimming endurance models and Kate McGrath (North Carolina State University) studied responses to noise by Atlantic sturgeon (*A. oxyrinchus*).

In addition to their work with sturgeon, ERDC biologists are conducting other studies of native and introduced species. Fish assemblages and physical habitat in Mississippi delta streams are being surveyed to establish sensitivity of a delta-specific Index of Biotic Integrity (IBI) to various stressors and to establish thresholds for listing (or de-listing) impaired water bodies. Paddlefish (*P. spathula*) size and abundance were described for portions of the White River, AR. Collections of silver carp

(*Hypophthalmichthys molitrix*) and bighead carp (*H. nobilis*) in floodplain wetlands of the Mississippi River were used to develop an empirically based conceptual model describing movements of the invasive fishes to and from floodplain habitats. ERDC also sponsored and participated in a workshop in Gainesville, Florida on sucker-mouth catfishes (Loricariidae) in North America and is preparing a report summarizing the environmental impacts of these tropical invaders. ERDC also re-sampled some historically sampled sites in the Mississippi delta to determine effects of hurricanes on stream fishes. Despite pervasive “black water” and fish kills immediately following Hurricane Rita, and short term reductions in species diversity, commercial fishing had resumed and high species diversity was documented just ten months later.

Jim Franks of the Gulf Coast Research Laboratory reports that GCRL was hard hit by Hurricane Katrina. According to Executive Director William E. Hawkins, buildings, contents, collections, and intellectual property sustained approximately \$50 million in damage from the 20-ft storm surge and accompanying winds. Some research was shut down for several months during clean-up and recovery, but due to the heroic efforts of researchers, some fieldwork continued on schedule. Boats were undamaged and Harriet Perry reports that a line of stations extending from Bayou Bernard to Horn Island, monitored regularly since the early 1970s, were sampled on schedule in Sep 2005 and that the samples were successfully processed in makeshift open-air labs. This long-term database will enable GCRL biologists to identify and measure effects of the storm on the coastal ecosystem.

Work at GCRL continues to focus on age, growth, reproduction, and habitat requirements of coastal and large pelagic fishes in the northern Gulf of Mexico. Current research includes studies on the biology and life history of cobia (*Rachycentron canadum*), Atlantic triple-tail (*Lobotes surinamensis*), wahoo (*Acanthocybium solandri*), and various shark species. Jim is currently the primary investigator on a study to document the timing and location of blue marlin (*Makaira nigricans*) spawning in the north-central Gulf of Mexico, as well as identify possible nursery areas through investigations of adult and larval specimens. He and colleagues recently completed a six-year study of larval and juvenile pelagic fishes, with particular emphasis on billfishes, tunas, amberjacks, and dolphinfishes. These fishes are associated with pelagic Sargassum in the Gulf of Mexico and the team documented this unique pelagic alga as essential fish habitat, providing shelter and food resources for early life stages of more than 135 species of fishes. Current research also includes investigations of the occurrence and movements of whale sharks (*Rhinocodon typus*) in the northern Gulf, as well as assessment of pelagic fishes as potential aquaculture candidates. Jim was a member of the organizing committee for the *Symposium on Large Pelagic Fishes in the*

Caribbean Sea and Gulf of Mexico: Status and Integrated Management which was convened in conjunction with the November 2006 annual meeting of the Gulf and Caribbean Fisheries Institute, Belize C.A.

Bobby Reed of the Louisiana Department of Wildlife and Fisheries reports that the LDWF Inland Fish Division, District 5, has been monitoring the streams and rivers of SW Louisiana for water quality and fisheries resources since Hurricane Rita impacted the area. Massive fish kills were widespread in the coastal plain marshes and in local rivers from three to five days following the storm. Water quality stations were set up on the Calcasieu, Mermentau, and Sabine rivers and standard parameters measured weekly from 12 October 2005 through January 2006. Some stations were slower to return to “normal” than others, however, all of the 21 stations were reporting good values by January 2006.

Twelve fisheries sampling stations (all heavily impacted) had been established in area rivers some 20 years before and baseline data existed that described fisheries resources before the storm. Initial post-hurricane samples were dismal with October and November 2005 samples exhibiting impacts that were far worse than originally expected. There were no centrarchids, clupeids, or cyprinids collected in more than three hours of electrofishing for the three local rivers. Water quality samples indicated that streams were less impacted further inland than reaches closer to the coast. April 2006 samples brought a little good news — one 11 inch largemouth bass (*M. salmoides*), one 5 inch bluegill (*L. macrochirus*), and one 12 inch channel catfish (*I. punctatus*), all from the Calcasieu River. A few gar (various species) and bowfin (*Amia calva*) were observed but there were still no centrarchids found in either the Mermentau or the Sabine rivers. October 2006 samples, however, demonstrated the resiliency of these aquatic ecosystems. Fisheries were expected to rebound but LDWF biologists were not prepared for what was found just one short year later. The summer spawn of surviving centrarchids was extraordinary: largemouth bass production on the Calcasieu and Sabine rivers not only exceeded records for the 20 previous years, but were twice the catch-per-unit-effort of the “best” years. The Mermentau River samples also indicated a good rebound. So far this spring fishermen are reporting good catches of 8 - 12” bass that are in excellent condition. Most of the smaller fishes are being released, according to LDWF creel survey clerks that are monitoring the river fisheries this year.

Bob Curry of the Southern Division of the American Fisheries Society reports that the organization was instrumental in assisting Louisiana and Mississippi Chapter members impacted by the hurricanes. Hurricane relief efforts by the SDAFS included dispersal of books and journals, replacement of field and laboratory gear, deferral of membership dues, implementation of complimentary subscriptions to AFS journals, and funding travel to AFS meet-

ings. It also included financial support to the Louisiana and Mississippi Chapters for their annual meetings in 2006 and in 2007. The generous and timely assistance of SDAFS helped many members maintain connections to the society and re-establish their research programs.

Henry Robison reports that he and Tom Buchanan are working hard to finish a draft of the manuscript for the second edition of the *Fishes of Arkansas* which will be published by the University of Arkansas Press. They have been hard at work updating species accounts and keys. Henry and Tom are also developing a computerized database of the fishes which will produce updated distribution maps for all Arkansas species. If all goes well, they are hopeful of going to the Press this fall with a final manuscript.

Marty O'Connell at the University of New Orleans reports that despite hurricanes and levee failures that destroyed homes, offices, and sampling equipment, members of the Nekton Research Laboratory (NRL) at the Pontchartrain Institute for Environmental Sciences have continued on with their research in fish conservation research in southeastern Louisiana. Marty along with Bob Cashner, continues to manage a team of expert fish biologists, ecologists, and graduate students to address numerous fish and fishery issues in the valuable aquatic environments of coastal Louisiana. O'Connell, Cashner, and senior biologist Chris S. Schieble recently (December 2006) published a book chapter on fish assemblage instability and hydrologic influences in Lake Pontchartrain. One of the interesting relationships identified by this research was how assemblage instability was associated with the presence of an artificial waterway (the Mississippi River Gulf Outlet). This artificial waterway was also one of the leading causes of the levee failures and the subsequent flooding of New Orleans. Schieble also continues to lead a team of NRL biologists working on the Chandeleur Islands, Louisiana's oldest barrier island chain. These unique islands were severely impacted by Hurricane Katrina. Another storm of similar magnitude could destroy them altogether. One of the goals of Schieble's team is to catalog the fish species found on the island using multiple gear types (gillnets, beach seines, trawls, light traps) such that conservation efforts can focus on those species most at risk. Senior biologist and database manager Meg Uzee O'Connell has teamed with Canadian scientists from Dalhousie University (and Marty) to analyze long-term declines in two apex predators, bull sharks (*Carcharhinus leucas*) and alligator gar (*A. spatula*), in

Lake Pontchartrain. A manuscript is currently in review and the findings provide insights on how the two species (one freshwater, one marine) have both been impacted by their use of degraded estuarine habitats over the last half-century. Both O'Connells have also begun a status survey for the rare blackmouth shiner (*Notropis melanostomus*) in southern Mississippi. This effort will be the first complete survey for the species in Mississippi since 1995.

Much of the research conducted by the NRL is carried out by graduate students who have remained with their studies in spite of the recent disasters. Tom Lorenz (Ph.D. student) is continuing his work on the invasive Rio Grande cichlid (*Herichthys cyanoguttatus*). Lorenz has conducted extensive behavioral trials to measure aggressive behavior between *H. cyanoguttatus* and native bluegill (*L. macrochirus*). Preliminary data show that both species exhibit aggression as residents, but only *H. cyanoguttatus* exhibits aggression as an invader. These results fall into clear game theory categories of "bourgeois" (only defending territory) and "hawk" (attacking for and defending territory) and may help explain the current invasive success of *H. cyanoguttatus* in southeastern Louisiana. Jeff Van Vrancken (M.Sc.) has worked extensively on freshwater fish assemblage dynamics in streams and rivers of the Pontchartrain Basin. His research recently confirmed the extirpation of the once common blacktail shiner (*Cyprinella venusta*) from Bayou Lacombe, a small stream that flows into Lake Pontchartrain. Currently Van Vrancken is leading a team to survey these same rivers and streams to determine the conservation status of four rare anadromous species. Molly Dillender (M.Sc.) is completing her research on potential differences in feeding habits of spotted seatrout (*Cynoscion nebulosus*) among Louisiana coastal region. Preliminary results suggest that *C. nebulosus* from the Barataria Basin may not be eating the same prey items as individuals from Lake Pontchartrain or Calcasieu Lake. Chad Ellinwood (M.Sc.) is assisting Chris Schieble with the Chandeleur Islands research and plans to assess how fishes use wash-over channels. These corridors were created by recent hurricanes and may allow large fish predators from high-energy beach habitats to access previously protected back-bay habitats. Scott Eustis (M.Sc.) is studying the trophic impacts of bycatch on coastal fish assemblages. He is especially interested in recent changes in gear types by commercial fishermen and the increased exploitation of shallower habitats.

– Jan Hoover