AMERICAN FISHERIES SOCIETY

June 2013 NEWSLETTER

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President's Message

Since the publication of our last newsletter, we have transitioned into our busy spring and early summer field seasons. The relatively cool air and water temperatures, along with the large amount of rain and associated high water levels, have hampered many of us from completing our field projects in a timely manner, but not so in the progress of the Chapter. We are continuing to refine and update the Chapter web site (with many thanks to Kim Sparks) and we now have a new and active Facebook page thanks to Jennifer Archambault. Please see Jennifer's brief article in this issue to find out how you can "Find and Like" our Chapter Facebook page. Efforts like these will greatly enhance our internal and external communications, especially in our visibility and relevance to public constituents.

Speaking of public constituents, summer in North Carolina also coincides with "Legislative Season" and the actions of the state legislature have the potential to impact our aquatic natural resources, our agency budgets, and even our jobs. Therefore, as Chapter members and as individual citizens, we must remain vigilant, speak up and get involved in the process. This is often difficult for introverted scientist types (talking about me here), but the times in which we live necessitate our action. In that vein, I am extremely happy to report that Ben Ricks has volunteered to serve as our eyes, ears, and voice on many of these matters by graciously serving as the Chair

President's Message (continued)

of our Environmental Concern Committee. Please contact Ben (find his contact information on the Committee web page), if you identify issues affecting our aquatic resources that need to be addressed. In his short tenure, he has already led efforts for the Chapter to weigh in on proposed federal legislation regarding invasive species.

Of major note are also several news items from the Southern Division. First, you will notice on page 7 of the Summer 2013 Newsletter at http://sdafs.org/wp-content/uploads/2013/06/Summer-2013-SDAFS-newsletter4-wt-boxes.pdf that our very own Chapter Member and Past-NC AFS President Dave Coughlin is a candidate for Vice President of the Southern Division. Many thanks to Dave for his continued service to the Chapter and to the Division—please be sure to vote in the election when prompted to do so. Second, the announcement of the 2014 Southern Division Spring Meeting in Charleston, South Carolina is out and will be held from January 22-26, 2014. Additional information, as well as the first call for Workshops, Symposia, and Papers can be found at: http://sdafs.org/meeting2014/. Finally, President-Elect Brena Jones has already begun to scope out and secure the location for our 2014 Annual Meeting, so stay tuned for a save-the-date message and location for the meeting from her in the near future.

Have a safe and productive field season.

Greg Cope

Awards Committee

We are pleased to report that John Crutchfield has agreed to serve another term as the chair of the Awards Committee. John can be reached at (919) 881-3719, or at john.crutchfield@pgnmail.com

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NCSU Student Subunit Report

It has been a busy semester for the NCSU Student Subunit! At February's NC Chapter meeting in Burlington, NC we had numerous attendees and presenters, including Bryn Tracy and students Jennifer Archambault, Joshua Raabe, and Kelsey Lincoln. It was a big meeting for one of our members, Bryn Tracy, who won the W. Don Baker Memorial Award as well as the NC Student Subunit's Lifetime Service Award. Bryn Tracy has been one of our most active members and has certainly been a great asset to not only

our subunit, but to our scientific community. Our annual raffle was a huge success, raising over $1000 to help fund student travel awards and club activities. We cannot thank everyone enough for their support and contributions that made the raffle a great success. We look forward to seeing everyone at the next NC Chapter meeting and hope to have an even larger raffle next year!

We have also been active within the Biology Department here at NCSU. In March, NCSU's Biology Department held its annual Graduate Research Symposium, this year in conjunction with the Statistics Department. Two of our members, Dan Brown and Kelsey Lincoln, presented their current M.S. research. Dan Brown won one of the best student paper awards on his research regarding the movement of coastal largemouth bass in response to hypoxic water conditions during hurricane season.

The NCSU Student Subunit has also been involved in a variety of volunteering events this spring. Earlier in the year, we held a meeting to create hundreds of questions for the 2013 Southeastern Wildlife Conclave Quiz Bowl hosted by the NCSU Leopold Wildlife Club held in Southern Pines. In March, we also had the opportunity to create a fisheries station as part of the field competition where natural resource students from multiple southeastern universities competed in a series of stations designed to test them physically and academically in various fisheries and wildlife concepts. Our station included fish, macroinvertebrate, and technology identification as well our very own Backyard Bass Competition, which proved plastic fish can be harder to catch than real fish.

Pictured above are two separate teams working to identify the various fish and macroinvertebrates included in our field station at the Southeastern Wildlife Conclave.

We also had the opportunity to provide a fisheries station for the NCSU Boy Scouts Merit Badge Program this April. Scouts were taught how to age otoliths and were put to the test aging over five species of fish. As many of us know, aging otoliths can be a

daunting task, however, the scouts had no problem and even accurately counted an otolith with daily rings. Along the lines of teaching young future scientists, we also participated in the Shad in the Classroom Program in May. One of our members, Dan Brown, educated students at South Iredell High School and Forest Pines Elementary School on the anatomy and reproduction of fish.

This summer the NCSU Student Subunit is helping out with the Historic Yates Mill County Park's Family Fishing Fun events educating kids in our community about the importance of aquatic systems and fisheries management, while teaching them how to cane pole fish.

If you have any questions or know of any volunteer events you think our subunit could help out with, please don't hesitate to contact Jared Flowers or Kelsey Lincoln (hjflower@ncsu.edu, kjlincol@ncsu.edu). Also, stop by our website for future events and additional information on our subunit (SFS Website). We hope everyone has a good summer!

Submitted by Kelsey Lincoln, SFS co-president

NCAFS Has a New Facebook Page

Our Chapter has launched into social media with a new Facebook page! The page went live on May 6, and we already have 64 Likes! For folks that are new to or unfamiliar with Facebook, that means 64 people have decided they want our updates to show up in their News Feed. Most of our fans so far are fisheries/natural resource professionals. With the way Facebook operates, when our fans interact with our page by Liking, Sharing, or Commenting on the stories we post, we have the potential to reach many, many more people. In fact, our friends of fans currently number 15,655 – that's a lot of potential for educational outreach and a huge pool of potential fans to keep growing our reach! Reach is defined as the number of unique people who have seen any content associated with our page; our weekly reach has been over 100 people since we launched the page, and our maximum reach for any one week so far was 685 people (even someone as far away as Brazil!), meaning we are already reaching beyond our fisheries community!

Thanks to all those members who have already Liked our Chapter Page. If you haven't already found our page, you can navigate to http://www.facebook.com/NCAFS or click the Facebook icon found on the Chapter website: http://www.sdafs.org/ncafs/ (see photo inset below). Here are a couple interesting notes on the demographics of our current fans – 62.5% are between ages 25 and 44; nearly 8% are over 65 (I think this means we have a tech savvy bunch!); and almost 41% are female. One surprising note is that only ~15% of our fans are under 24; we still have a lot of work to do to reach the college-aged folks from the many institutions around our state! While NCSU is the only university with an official student subunit of AFS, many other institutions have wildlife/fisheries related programs (e.g., Haywood CC, Western Carolina, ECU, UNC), and Facebook may be a viable way to reach out to them and foster their involvement in our state Chapter.

The NCAFS Facebook page is for communication among Chapter members as well as public outreach. Want to let other members know what you've been up to this season? Post it to the page and we'll share it. Do you have a fabulous photo that would make a good cover photo for the page? Please share! Scenery, fish, mussels, crayfish, and critters are great; and pictures with people doing the good work of fisheries are especially welcome. To be sure you're getting the most out of NCAFS on Facebook,

make sure you're seeing all of our posts by clicking the little gear icon (for settings) and choosing the "Add to Interest Lists" option. Facebook may not show you every post without selecting this option (this is true for all pages you like).

Finally, here are a few things you can do to help us satisfy the mission of public outreach through Facebook:

- If you haven't yet, Like our page and Share it with friends. And if you've shared before, please share again!
- Share content to the page that you would like us to post – especially great photos or ads for outreach events. Include an interesting note, too (e.g., location, fact about the species pictured, etc). More information = more outreach!
- Interact with stories on the page by Liking, Sharing, or Commenting. This grows our reach.
- Even if you are not on Facebook, you can share our page address with friends, family, teachers, and colleagues who may be interested by sending a link to them via email.

We are proud to have a public presence in social media now, and hope to reach many more people in serving part of the Chapter mission of "exchange of information among Chapter members and with the general public."

Submitted by Jennifer Archambault

North Carolina's Imperiled Fish Fauna, Part XI

Submitted by Bryn H. Tracy and Wayne C. Starnes on behalf of the NCWRC's Scientific Council of Fishes

As mentioned in the Chapter's 2010-2012 newsletters, there are approximately 215 indigenous, described, and undescribed species of strictly freshwater fishes in North Carolina. Of these, 26% are considered imperiled as state or federally listed: Endangered (17), Threatened (17), or Special Concern (22) (Harris et al. 2010). It is the responsibility of the 15 member Scientific Council on Freshwater Fishes to submit its recommendations to the Nongame Advisory Committee of the North Carolina Wildlife Resources Commission (NCWRC) if changes in imperilment classifications for any species are warranted. To communicate our findings with the chapter membership, this is the 11th of 16 planned articles on the species that the Council believes have become more imperiled since the last listing in 2006. Thus acquainted, it is hoped that chapter

members can serve as additional “eyes and ears” to expand our vigilance for these rare or highly localized fishes.

Mimic Shiner, *Notropis volucellus* (Cope)
Current Status: None, Proposed Status: Special Concern

Photograph courtesy of Southeastern Fishes Council, courtesy of Ul and Thomas NANFA, http://www.sefishescouncil.org/.

Type Specimen and Type Locality – The Mimic Shiner was described by Edward Drinker Cope in 1865 based upon specimen(s) from the Detroit River at Grosse Isle, Wayne County, Michigan (Cope 1865). The type specimen has not been located (Gilbert 1978).

Description – The Mimic Shiner is a small and relatively non-descript minnow reaching a maximum total length of 65 mm, although most individuals encountered are smaller. Based on Etnier and Starnes (1993), color in life is translucent silvery on the sides and gray to faintly amber on the back; the dorsolateral scales are edged with black pigment and a faint triangular caudal spot is often present. Preserved specimens have a dusky midlateral stripe extending from the caudal base to about midbody and a preorbital bar on either side of the snout. The snout is shorter than the eye diameter and the mouth is nearly horizontal. Anal-fin rays are 8, pectoral-fin rays 13-17, pelvic-fin rays 8, and pharyngeal teeth are 4-4. Scales are most often lacking on the breast, occasionally present.

A primary diagnostic trait of Mimic Shiner is the markedly elevated anterior lateral line scales, best seen in the 3rd to the 7th scales from the head (Jenkins and Burkhead 1994). Another feature of Mimic Shiner is the extensive development of neuromasts-tiny pitlike sensory structures. Neuromasts are best developed on the anterior half of the head dorsum, snout, subnasal area, around the orbit, particularly on the cheek, and on the anterior portion of lateral line scales (Jenkins and Burkhead

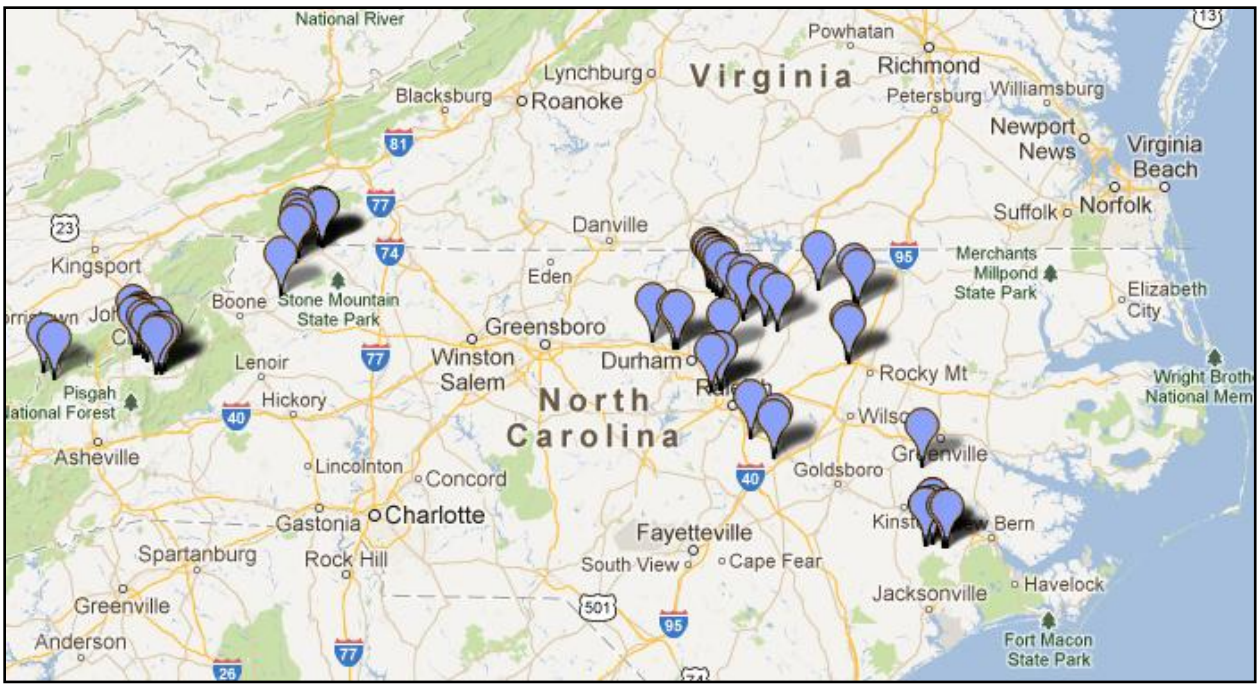
1994). The New River Shiner, *Notropis scabriceps*, is superficially quite similar to, and often collected with, Mimic Shiner. Characters distinguishing the two species may be found in Jenkins and Burkhead (1994). Similar looking species that may be encountered in the Neuse and Tar River drainages and possibly confused with Mimic Shiner include Spottail Shiner, *N. hudsonius*, Swallowtail Shiner, *N. procne*, Ironcolor Shiner, *N. chalybaeus*, and the extremely rare and state endangered Bridle Shiner, *N. bifrenatus*. Likewise, similar looking species that may be encountered in the Roanoke River drainage and possibly confused with Mimic Shiner include Spottail Shiner, Swallowtail Shiner, and Whitemouth Shiner, *N. alborus*. These species may be separated from one another using the key couplets in Menhinick (1991).

Range – Mimic Shiner, as currently regarded, has a wide distribution over much of the eastern United States (Gilbert and Burgess 1980), including some geographically disjunct populations in Atlantic coastal drainages (Etnier and Starnes 1993). As such, pending revisionary studies, it may well represent a complex of two or more species. Jeremy Wright, New York State Museum, is currently launching a study of the complex. Forms of this shiner occur widely in Gulf of Mexico drainages from the Mississippi River and Mobile Bay drainages west to the Nueces River of Texas and, to the north, in the Great Lakes, St. Lawrence, and Hudson Bay drainages, with introductions in New England. On the mid-Atlantic Slope, native populations are known from the James River of Virginia south to the Neuse River of North Carolina. In North Carolina (North Carolina State Museum of Natural Sciences collection records [http://collections.naturalsciences.org/searchFishes.aspx]; FishNet2 [http://www.fishnet2.net/], NC DWQ database [http://portal.ncdenr.org/web/wq/ess/bau/ncibi-data]; NCWRC aquatics database; Menhinick 1991; Starnes and Hogue 2011), disparate populations are known in the Tar and Neuse rivers and their larger tributaries on the Atlantic Slope, the New River of the Ohio River drainage, and in the French Broad portion of the upper Tennessee River drainage, including the French Broad River proper and the Nolichucky River subbasin, mainly Cane and Toe river systems. Menhinick, et al. (1974) reported Mimic Shiner as common in the New River basin, although none were reported by Richardson and Carnes (1964) or vouchered from this drainage (Starnes and Hogue 2011). Menhinick (1991) also plotted a single questionable record from the Little Tennessee River system in the southwestern portion of the state. Much sampling in the Little Tennessee River system since then has failed to detect any Mimic Shiners (North Carolina Wildlife Resources Commission Aquatics Database, 2009). To the north, Virginia populations on the Atlantic Slope are curiously sequestered into widely separated headwater portions of the Roanoke and James drainages and the Coastal Plain portions of the Chowan and Meherrin drainages (Jenkins and Burkhead 1994).

There is one lot (at the University of Michigan Museum of Zoology Catalogue No. UMMZ 177032) collected on November 28, 1963 by Smith, Woodbourne, and Anderson from the Grassy Creek system of the Roanoke River drainage in Granville County. Originally identified by Reeve Bailey and C. Lavett Smith, re-examined in April 2013 by Doug Nelson (University of Michigan), and verified in May 2013 by Wayne Starnes and Bryn Tracy, this lot represents the the only known record from the Roanoke River drainage, including the Dan River, in North Carolina and from the entire Roanoke River drainage downstream from its headwaters in Virginia. The six specimens are 37-50 mm total length (31-40 standard length) and are readily recognizable as Mimic Shiner. The examination of Smith's field notes, including a list of other species collected from the stream within Grassy Creek subsystem (sent as a pdf file courtesy of Scott Schaefer, American Natural History Museum, NY to Wayne Starnes on May 21, 2013), did not disprove that the collection was not made from the Grassy Creek subsystem. As such, it constitutes the only known record from the North Carolina portion of the greater Albemarle Sound basin. Similar looking Whitemouth Shiner and Swallowtail Shiner in the North Carolina State Museum of Natural Sciences and Division of Water Quality collections from the Grassy Creek and nearby tributaries to the Roanoke River were re-examined for possible misidentifications. None were mis-identified.

Mimic Shiner was reported by Carnes (1965) from six sites in the Roanoke River basin (Roanoke River below Plymouth, Roanoke River near Hamilton, Roanoke River near Weldon, Gardner Creek, Cashie River near Sans Souci Ferry, and Cashie River near Windsor), but vouchers specimens were retained from only one site and these were re-identified as Spottail Shiner (Starnes and Hogue 2011). The un-vouchered material were likely misidentified Spottail Shiner because at one site (Roanoke River below Weldon), 370 specimens were collected from this large river where Spottail Shiner are known to be common.

Uncatalogued, but identified, lots at the North Carolina State Museum of Natural Sciences include additional specimens from the Tar, upper Neuse, and New River drainages.



Distribution of Mimic Shiner in the North Carolina. Map is based upon material vouchered and databased at the North Carolina State Museum of Natural Sciences; the database was queried May 21, 2013. Not shown is a 1997 record from Little Fishing Creek, Halifax County, that is vouchered with the DWQ fish collection.

Habitat - Mimic Shiners typically inhabit rivers and larger creeks where they are most frequently encountered in pool areas or runs with minimal to moderate current.

Life History and Ecology - The biology of this shiner has not been studied extensively but, based on Midwestern populations of the Mimic Shiner complex (Moyle 1973, Etnier and Starnes 1993, Jenkins and Burkhead 1994), this minnow has a lifespan of 2-3 years and feeds principally on microcrustaceans, midge larvae, and fallen terrestrial insects. Diurnal migrations have been documented with movement to deeper waters at night. Based on breeding tubercle development, a protracted spawning season is indicated over the summer months.

Rationale for Designation - The oddly distributed Mimic Shiner, or forms thereof, may represent two, possibly three, cryptic taxa or evolutionarily significant units in North Carolina. This species has relatively localized distributions in the state and the river systems inhabited by its various forms have been subjected to increasing pressure from development in recent decades, particularly the Neuse, Tar, and New rivers basins. Given this situation, it may become vulnerable to extirpation from one or more of these river systems in the future. A State Special Concern status is recommended.

Recommendations - Molecular studies are needed to determine the degree of genetic variation among the various populations in the region and a more concerted effort should be made to assess the status of this species in each river system in which it occurs. Nondescript as it is, this species can be easily overlooked and may or may not have more robust populations than currently available voucher collections would indicate.

Literature Cited and Recommended Readings

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North Carolina Division of Water Quality News

Basinwide Monitoring (submitted by Bryn H. Tracy)

Fish community monitoring activities in 2012 focused on the Tar, Catawba, and French Broad River systems (85 sites total). Field assistance was provided by 20 staff from the Intensive Survey and Ecosystems Unit and the Asheville, Mooresville, and Winston-Salem Regional Offices; additional assistance was provided by the NC Natural Heritage Program and the NC Wildlife Resources Commission. The complete data and ratings for these river basins, along with that from North Carolina's other 14 river basins are available at: http://portal.ncdenr.org/web/wq/ess/bau/ncibi-data (including a Google fusion table and showing the location of all the fish community assessment sites) and http://portal.ncdenr.org/web/wq/ess/bau/ncibi-scores. Files of the indigenous and nonindigenous fauna for North Carolina, updated every spring, may be found at: http://portal.ncdenr.org/web/wq/ess/bau/nativefish

Work-up sites along a creek don't get any better than this! DWQ's Winston-Salem Regional Office staff provided valuable field assistance in 2012. Does anyone recognize the person on the left? Hint: Kin Hodges has his brother's job now.

Use Attainability Studies (submitted by Bryn H. Tracy)

Winding down the Use Attainability Study program (the reclassification of a waterbody to Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Trout waters (Tr)) only one such study (a trout reclassification study on the Stony Fork watershed in Wilkes County) was conducted in 2012. Following a review of trout data collected by the North Carolina Wildlife Resources Commission (NCWRC), the North Carolina Chapter of the American Fisheries Society requested the Division of Water Quality conduct a study to reclassify Stony Fork and all of its named and unnamed tributaries from Wilkes County SR 1168 to the Yadkin River as Trout waters (Tr). Stony Fork and all of its named and unnamed tributaries from source to SR 1168 in Wilkes County are currently classified as C;Tr. Results showed that in the Stony Fork watershed downstream from SR 1168, none of the tributary streams or the mainstem qualified for supplemental Tr reclassification. All of the named tributaries and the mainstem of Stony Fork from its source to the Yadkin River did qualify for consideration to be supplementally classified as HQW based upon the Excellent benthic macroinvertebrate assessments. None of the streams qualified as ORW because no imperiled aquatic species were collected or were known from the watershed. Reclassification memoranda for studies conducted in 2010 and 2011 were completed for the Tuskeegee Creek, Little Tennessee River, and Watauga River watersheds to ORW, HQW, and Tr.

New DWQ Distributional Records for 2012 (i.e., those not shown in Menhinick (1991) and collected for the first time by DWQ staff from a particular county in the Catawba and French Broad River systems) **(submitted by Bryn H. Tracy)**

- **Catawba River System**
  - *Campostoma anomalum,* Central Stoneroller, Pott Creek, Lincoln County
  - *Chrosomus oreas*, Mountain Redbelly Dace, Glade Creek, Alexander County
  - *Moxostoma pappillosum,* V-lip Redhorse, Mulberry Creek, Caldwell County
  - *Lepomis microlophus*, Redear Sunfish, North Muddy Creek, McDowell County
- **French Broad River System**
  - *Esox niger*, Chain Pickerel, Bent Creek, Buncombe County
  - *Lepomis gibbosus*, Pumpkinseed, Boylston Creek, Henderson County

Photograph courtesy of Southeastern Fishes Council, courtesy N. Burkhead & R. Jenkins, courtesy Virginia Division of Game and Inland Fisheries, http://www.sefishescouncil.org/

2012 Fish Tissue Contaminant Studies (submitted by Jeff DeBerardinis)

In 2012, the DWQ fish tissue contaminant program continued to monitor commonly harvested fresh water fish species of the Piedmont. The primary focuses of the program were on mercury evaluations intended for long-term trend analyses and polychlorinated biphenyls (PCBs) evaluations intended for human risk assessments through the North Carolina Division of Health and Human Services (NCDHHS).

Mercury Assessments

2012 was the fifth year of a statewide fish tissue monitoring study in collaboration with the NC Division of Air Qualities' (DAQ) mandate to document mercury emission reductions from the state's 14 major coal-fired power plants. Despite considerable mercury emission reductions from NC coal-fired plants, the finding of no significant change in Largemouth Bass mercury concentrations over the period of 1990 to 2011 is consistent with the DAQ deposition modeling results indicating that mercury deposition in NC is largely attributed to mercury emission sources distant from NC.

DWQ also conducted long term fish mercury monitoring in the lower Cape Fear River basin during 2012. Until the late 1990's, the HoltraChem Manufacturing Company in Riegelwood North Carolina represented a substantial regional source of mercury through emissions related to its production of chlorine bleach. The Division has been monitoring fish mercury levels in the vicinity since the plant's conversion, but to date, no discernible reductions in fish mercury concentrations can be attributed to the mercury source removal.

PCBs Assessments

With a third year of analytical funding from Mecklenburg County and field assistance from Duke Energy and the North Carolina Wildlife Resources Commission, 209 PCB congener monitoring efforts were expanded in 2012 within the Catawba River basin to include additional Blue Catfish fillets from Mountain Island Lake and Striped Bass fillets from Lake Norman. Results showed elevated levels of PCBs in fish from both reservoirs and fish consumption advisories were posted in April of 2013 (http://epi.publichealth.nc.gov/oee/programs/fish.html).

Concerns about human exposures to PCB contamination in fish tissues were also addressed in the Yadkin River basin during the summer of 2012. Falls Reservoir, between Badin Lake and Lake Tillery, was evaluated for PCB contamination in fillets from all trophic levels of fish. PCB results (209 congeners) from USEPA Region IV Analytical Laboratory in Athens, GA revealed elevated PCBs in Flathead and Blue catfish and an advisory was issued for Falls Reservoir in March of 2013. NCDHHS also

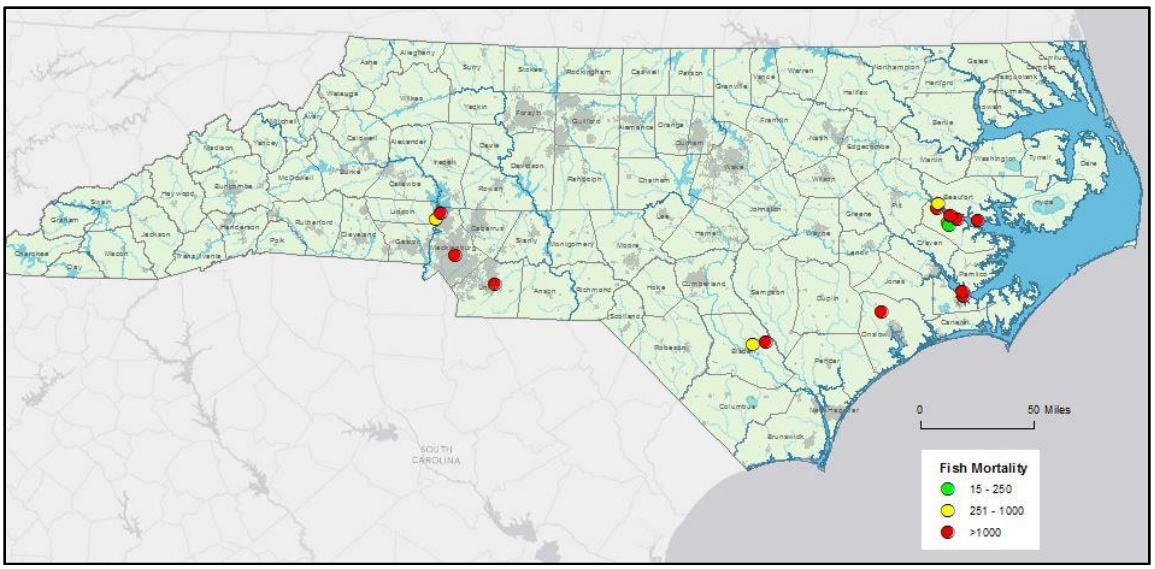
posted PCB fish advisories for High Rock Lake and Lake Tillery in 2013 from EPA data that DWQ collected during the summer of 2011.

All of DWQ's fish tissue data collected from 1990 to 2012 can be found at: http://portal.ncdenr.org/web/wq/ess/bau/fish-tissue-data. Information on fish consumption advisories in North Carolina can be found at: http://epi.publichealth.nc.gov/oee/programs/fish.html. For more information on DWQ's fish tissue contaminant monitoring program, please contact Jeff DeBerardinis (jeff.deberardinis@ncdenr.gov).

2012 Fish Kills (submitted by Mark Hale)

The reporting of fish kill activity across North Carolina is based on protocols established by the North Carolina Division of Water Quality (DWQ) in 1996 (http://portal.ncdenr.org/web/wq/ess/fishkillsmain). DWQ's Environmental Sciences Section records fish kill events when at least 25 fish are affected and the event is confirmed by trained investigators from the Division's regional offices and cooperating agencies, such as the North Carolina Wildlife Resources Commission

Investigators reported 16 fish kill events statewide for the 2012 season (http://portal.ncdenr.org/web/wq/ess/fishkills). Kill activity was documented during the year in 6 of the state's 17 river basins. Kill events were reported in coastal waters as well as inland, from Beaufort County westward to Mecklenburg County. Significant events reported from inland waters included kills of Striped Bass and catfish on Lake Norman (Mecklenburg County), and kills involving Yellow Perch in White Lake and Bay Tree Lake (Bladen County). Significant estuarine events included prolonged kills of Atlantic Menhaden reported from the Neuse and Tar-Pamlico estuaries and associated tributaries in late September and early October 2012. After examination of lesioned fish collected at the events, experts from the NOAA's Marine Laboratory in Beaufort reported the water mold *Aphanomyces invadans* as a primary kill factor.



Fish kills and their size reported in North Carolina during 2011.

Fish kill information for the current year is posted weekly from June to November on the DWQ fish kill website (http://portal.ncdenr.org/web/wq/ess/fishkillsmain). For more information on DWQ's fish kill-related activities, please contact Mark Hale (mark.hale@ncdenr.gov).

Spotlight on Students and Young Professionals

Spotlight on Rachael Hoch

Rachael Hoch was raised just south of Raleigh in the town of Fuquay Varina. She has always had a strong connection to the outdoors. As a child, she spent her free time sloshing around in the small creek behind her house, searching for fish and crayfish. During the summers, her family would take week long camping trips up to the Appalachian Mountains where she would spend her time chasing salamanders and bird watching. While taking an A.P. environmental biology course in high school, Rachael developed a new found appreciation for ecology and knew then that she would pursue a career in the field.

After graduating from high school in 2004, Rachael attended Appalachian State University. In 2008, she earned a Bachelor of Science degree in Biology-Ecology, Evolution and Environmental Studies. Rachael's passion for conservation biology began during her undergraduate program. She worked with several graduate students to develop the Collaborative Biodiesel Project which was awarded $75,000 from the EPA's People, Planet, and Prosperity Grant. She served as the lead biologist for the project, researching the potential use of algae as an oilstock for biodiesel production. She was

an active member of the community, serving as President of the Boone Sustainable Transportation Club and holding community based workshops on waste water treatment systems and small-scale biodiesel production. However, her childhood obsession for the freshwater critters caught up with her. After completing her Bachelor's Degree, Rachael decided to switch fields and pursue a career in ecology. In 2008, she joined Dr. Mike Gangloff's lab as a research technician conducting freshwater fish, macroinvertebrate, and mollusk surveys throughout the southeast. In 2010, she entered graduate school at Appalachian State University to pursue a Master's of Science degree. During her master's research, Rachael collaborated on a variety of projects including the North Carolina and Alabama Mill Dam Projects and the Alabama Inventory and Conservation Planning Project. Her MS research examined the effects of mill and beaver dams on the habitat, growth, and survival of freshwater mussels in North Carolina. In February of 2013, she was awarded the Richard L. Noble Best Student Paper at the NCAFS meeting in Burlington, NC. During her MS research, she was exposed to the fascinating world of freshwater mussel propagation. In the final year of her Master's research, she fostered her love for freshwater mussel propagation and conservation based research by working for the NCWRC as a fisheries technician at the Marion Conservation Aquaculture Center.

After graduating in December 2012, she was hired by the NCWRC as the Conservation Aquaculture Center Biologist. Currently, she is working on developing and improving propagation techniques for six of the state's freshwater mussel species, the magnificent ramshorn, and the Spotfin chub. Ironically, she can now be found counting algal cells and larval mussels under a microscope in Marion, North Carolina and loving every minute of it.

Rachael holding a batch of Chameleon Lampmussels, Lampsilis sp. 2, propagated in collaboration with Appalachian State University, NCSU Epidemiology and Conservation Laboratory, and the NCWRC's Conservation Aquaculture Center in Marion, NC.

Submitted by David Deaton

Spotlight on H. Jared Flowers

Jared Flowers made his way to the Atlantic Coast Conference (NCSU) in 2009 after stops at a few SEC football powers. He earned a BS degree in Fisheries from the University of Georgia, then worked as a fisheries technician at UGA, the University of Arkansas, and the University of Florida. (As a Georgia native, he quietly pulled for UGA during all these stops in enemy territory.) Jared earned an MS degree in Fisheries from the University of Florida in 2008. His MS work with Bill Pine (NCSU PhD, 2003) was on ecology and population dynamics of Gulf sturgeon. Along with his technician work on Atlantic and shortnose sturgeon at UGA, Jared's MS research was great preparation for his doctoral work in NC and SC on Atlantic sturgeon, with advisor Joe Hightower.

One part of Jared's research has been tracking sonic-tagged Atlantic sturgeon from the Roanoke River. These adult fish have been detected from apparent spawning grounds near Weldon NC to marine waters as far north as Long Island Sound. Jared pioneered the use of side-scan sonar to survey for sturgeon and other large, uniquely shaped critters (tarpon, alligators). An article on the side-scan sturgeon work is in press, following several journal articles on his UF Gulf sturgeon work.

Speaking of uniquely shaped fish, Jared also worked in the Grand Canyon on endangered humpback chubs. He describes this as a unique experience, with potential dangers including rapids, scorpions, rocks and rattlesnakes!

Jared's other professional activities include serving as NCSU Student Fisheries Chapter secretary in 2010, webmaster (2010-present), and co-president in 2013. He also served as interim webmaster for the Southern Division of AFS in the fall of 2012.

When not chasing sturgeon around coastal rivers, Jared likes to hunt and fish and restore antique outboard motors. And to those of you wondering, the antique motors are his personal collection – not the "well used" motors on our NCSU boats! Jared is also an avid digital photographer and has contributed photographs to NCAFS silent auctions, NCSU web sites, and USGS reports. Jared, we're glad you've made your home in the ACC (even if you still root for UGA)!

Jared Flowers prepares side-scan sonar to map the bottom structure of a local lake

Submitted by Joe Hightower

Buncombe County Student Wins Fisheries Scholarship; Assists State and Federal Agencies

Buncombe County native Allison Bryan won a $3,000 scholarship and the privilege to work this summer with fisheries biologists from the N.C. Wildlife Resources Commission and the U.S. Forest Service after being selected to participate in the 2013 Hutton Junior Fisheries Biology Program sponsored by the American Fisheries Society.

Bryan, who recently completed her senior year at North Buncombe High School, is working with mentors Jacob Rash with the Wildlife Commission and Jason Farmer of the U.S. Forest Service to survey trout populations, monitor water quality and propagate freshwater mussels.

She was one of only 25 students selected from across the country, Mexico and Canada to participate in the Hutton Program, a summer mentoring program for high school students. The program's goal is to stimulate interest in careers in fisheries science and management among groups underrepresented in the fisheries professions, such as minorities and women.

As a Hutton Program student, Bryan was awarded a $3,000 scholarship and was matched with Rash and Farmer because of their years of experience working in the field, where they have worked on aquatic systems throughout western North Carolina as fisheries biologists.

“As a fisheries biologist, I have had the opportunity to work in the natural resource field for several years,” Rash said. “Those experiences allow me to share insight with Allison regarding the importance of our fisheries management efforts and the techniques we use to achieve our goals.”

Bryan began work on June 1 and will complete the program on Aug. 16. After her summer stint, Bryan will attend North Carolina State University and major in environmental engineering.

According to AFS, the final reports of students and mentors who have participated in the Hutton Program show that students benefit substantially from their summer mentoring experience. For most students, the Hutton Program is their first exposure to a professional work setting where they learn what qualities are necessary to be successful in that environment and the importance of being able to function well as part of a team. The students gain an awareness of conservation issues and the importance of healthy aquatic systems; participate in projects that benefit habitat restoration, protection, and management; gain an understanding of what is involved in being a fisheries biologist; and learn about career opportunities in the field.

For more information about the Hutton Program, visit the American Fisheries Society webpage, **www.fisheries.org**.

Buncombe County native Allison Bryan is assisting with freshwater mussel propagation as part of her summer work with fisheries biologists with the Wildlife Commission and U.S. Forest Service

Article copied from NCWRC news article, originally compiled by Jodie Owens

Meetings of Interest

2013 NCSU Student Fisheries Society- First Tuesday of each month, Raleigh, NC. http://clubs.ncsu.edu/sfs/

2014 SDAFS Meeting- January 22-26, 2014, Charleston, SC. http://sdafs.org/meeting2014/

143rd Annual Meeting of the American Fisheries Society- September 8-12, 2013, Little Rock, AR. http://afs2013.com/

Wild Trout XI- October 1-4, 2013, Old Faithful Inn, Yellowstone National Park, USA. http://www.wildtroutsymposium.com/wildTroutXI.php

NCSU Stream Restoration Program River Course Workshops and Conference- http://www.bae.ncsu.edu/programs/extension/wqg/srp/

Valuable Links

The American Fisheries Society Home Page offers a wealth of links to assist you in your fishery endeavors. Information on ordering AFS books, public outreach, annual meetings, chapter links and joining the AFS can be found at http://www.fisheries.org/. You can subscribe to the NCAFS list serve at http://lists.fisheries.org/listinfo.cgi/ncafs-fisheries.org and check out the podcasts from the 2013 SDAFS meeting at http://sdafs.org/spring-meeting-2013/podcasts-nashville-tn/
