



AMERICAN FISHERIES
SOCIETY

Spring 2017 NEWSLETTER

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President's Message

It was a cool, sunny day this past February while we were working on Lake Norman. The wind was strong as we came back to the ramp not long after lunch. While standing on the dock, a man stiffly walked down the hill towards the dock. I made a comment about how strongly the wind was blowing and he made a quick comment that he had almost died at the dock not 30 minutes earlier. I inquired as to what happened and he explained that he tried to jump onto his boat that was tied to the dock but the wind blew it away from the dock. He missed the boat and fell backwards hitting his back on the dock as he went into the water. As he hit the water, the cold water shocked his body and he was unable to swim well. He stated to me that if others had not been near to save him he would have likely drowned.

The account above is a reminder that accidents happen quickly and we need to be prepared. I encourage all of you as the spring approaches and we come out of our caves to begin field seasons again, to take time to make sure that you are being safe. Take time to prepare your equipment to make sure it is in proper condition. When going out in the field, always wear safety gear, make sure your lights work, and file float plans with someone who will contact emergency personnel if you do not respond in a timely manner. We all know that accidents will occur. Those accidents have injured and even killed biologists in the past. We only have one life so as we go out on boats, canoes, kayaks or wade into streams let us be careful to protect it.

Finally, I want to personally thank all of you for making the annual chapter meeting a rousing success. I hope you all enjoyed it as much as I did. The mussel identification workshop was well received. I thought the presentations were again exceptional from our members. As I go to other AFS meetings, I always think that our chapter members have the best presentations. I think it speaks to the high level of professionalism of both our students and professionals. Congratulations to all award winners. Once again thanks to everyone who had a part! Happy Spring Everyone!

See you on the water!

N. Corey Oakley

Submitted by Corey Oakley, NCAFS President

2017 North Carolina Chapter of the American Fisheries Society Annual Meeting Summary

New Bern Riverfront Convention Center, New Bern, NC, February 14-16, 2017.

As I approached the preparation for the 2017 meeting, I had a strong desire to bring the meeting to my hometown in New Bern, NC. I wanted our membership to experience a little of the culture of a small

NC coastal town. We had great participation by our membership over three days in New Bern. Ninety-three attendees (from as far away as Pennsylvania) enjoyed an amazing program including a workshop, presentations, and posters. The meeting began Tuesday, with a gathering of the NC Freshwater Mollusk Workgroup spearheaded by Rachael Hoch. The Tuesday night social was a highlight of the meeting. Members enjoyed an oyster roast that included steamed oysters cooked by Ben Ricks and Jeremy McCargo, as well as an Eastern NC fish stew cooked by my dad, Richard Oakley. The weather was perfect as we got to network and eat while overlooking the New Bern waterfront.



New Bern Riverfront Convention Center, New Bern

The Chapter meeting began Wednesday with an excellent mussel identification workshop (47 participants) presented by Tim Savidge from Three Oaks Engineering and prepared by Rachael Hoch and Tyler Black from the NC Wildlife Resources Commission. Our thanks to all three for providing great information to use in the field for the identification of these often hard to identify animals. Formal talks began in the afternoon and for the second year we offered lightning talks, brief 8-minute talks that were more popular than ever. Their popularity has made the chapter consider giving a lightning talk award at future meetings. Once again, our sincere thanks to Chris Wood for loading all talks and recording those talks for podcasts to be uploaded onto the [meeting website](#). Please take advantage of the podcasts to review what you saw, see talks you haven't seen, and to share information among your fellow biologists. Wednesday night included an excellent dinner and another money raising raffle by the NC State University Student Fisheries Subunit. Funds from the raffle will be used to support travel to regional and national meetings. Thanks to all who contributed to this worthy cause.



Members of the NC State University Student Fisheries Subunit accept the Southern Division's outstanding subunit award (once again!!!) from SDAFS Past President Dave Coughlan.

The final day of the meeting began with additional informative and thought provoking presentations. The day concluded with our annual business meeting. We had several lengthy discussions that included becoming an affiliate of the NC Wildlife Federation and increasing our dues from \$7 to \$15. After much discussion both measures passed. Awards were also distributed during the business meeting. Brendan Runde won the Richard L. Noble Best Student Paper Award for his presentation on estimating delayed mortality of Gray Triggerfish using surface and bottom tagging. Clint Morgeson won the W. Don Baker Memorial Award for his presentation on Striped Bass (*Morone saxatilis*)

and American Shad (*Alosa sapidissima*) spawning distribution in the Cape Fear River. Also, David Yow was awarded the Jerry R. Finke Memorial Distinguished Service Award for his tireless efforts working for NCAFS as well as SDAFS. Finally, the Fred A. Harris Fisheries Conservation Award went to the Lake Norman Wildlife Conservationists who have diligently worked to protect both aquatic and terrestrial wildlife resources in an increasingly urban environment. Congratulations to all winners. Michael Gangloff's last act as President was to install new officers and relieve Kim Sparks as Past President and Bryn Tracy as Secretary/Treasurer from their duties. Please join me in welcoming Tyler Black as your President Elect and Kelsey Lincoln as your new Secretary/Treasurer.

I want to personally thank all of those who had a part in the meeting including the moderators, presenters, and organizers. I want to especially thank my committee members including co-chair Ben Ricks, Kelsey Lincoln, Tom Fox and Jeremy McCargo. I look forward to the 2018 meeting!

Submitted by Corey Oakley, NCAFS President

NC Chapter of the American Fisheries Society 2017 Business Meeting and Treasury Report

<https://nc.fisheries.org/wp-content/uploads/2017/03/2017-NC-AFS-Business-Mtg-Minutes.pdf>



Submitted by Bryn H. Tracy, NCAFS Secretary/Treasurer

2017 Awards Committee Report

The NCAFS Chapter established the Student Travel Award Program in 2005 for the specific purpose of encouraging professional growth of students and maximal participation of undergraduate and graduate students at the annual AFS meeting. Monetary support is provided to qualifying students via a travel award of \$200 to \$400 to help defer the cost of meeting travel, registration, and accommodations. The 2016 award was presented to three students for the 146th Annual AFS meeting held August 21-25 in Kansas City, MO. The 2016 award winners were Tiffany Penland, Anakela Popp, and Brendan Runde, all graduate students from NC State University. Each recipient received a cash award of \$400 from the Chapter's Ichthus Fund account, which was established specifically to foster student involvement. Interested individuals

should see the Awards Committee web site at <https://nc.fisheries.org/awards/forms-applications/> for more details.

The Committee recruited judges and conducted the judging for the Richard L. Noble Best Student Paper Award and the W. Don Baker Memorial Best Professional Paper Award at the 2017 meeting. There were 8 presentations by students and 12 presentations by professionals. Additionally, there were 11 lightning talks presented at the meeting. Student papers were judged by Tyler Black, Tom Fox, Brena Jones, and Bryn Tracy. The professional papers were judged by Dave Coughlan, Greg Cope, John Crutchfield, and Mike Swing. The Awards Committee will evaluate whether lightning talks should have a separate award category and will provide recommendations to EXCOM in 2017.

The Award Committee solicited nominations for the Chapter's Fred A. Harris Fisheries Conservation Award and Jerry R. Finke Distinguished Service Award in the December 2016 Chapter newsletter. One nomination was received for the Fisheries Conservation Award, and one individual was nominated for the Distinguished Service Award. These nominations were reviewed and endorsed by the Awards Committee and forwarded to the EXCOM for approval. Both nominees received the awards. These awards were presented to these well-deserving nominees at the Chapter annual business meeting held in New Bern, NC, on February 16, 2017.

The Distinguished Service Award recognizes Chapter members who have distinguished themselves by service to the Chapter, AFS, or the fisheries profession. In 2015, a recommendation was made to the Awards Committee and unanimously passed by Chapter EXCOM and Membership to rename the Award to the Jerry R. Finke Distinguished Service Award. Jerry, who passed away due to cancer during 2013, epitomized selfless dedicated service to NCAFS and SDAFS. The Chapter will remain forever indebted for his volunteer service.

The 2017 Jerry R. Finke Distinguished Service Award was presented to Mr. David Yow for his dedicated service to the Chapter and SDAFS over the course of his 30-year career. The Chapter recognizes David's service as a past NCAFS President and as a member of the Environmental Concerns Committee. David



Mr. David Yow, the 2017 Jerry R. Finke Memorial Distinguished Service Award Recipient receiving his award from Dr. Mike Gangloff, NCAFS Chapter President.

also frequently attended annual Chapter meetings and has been a co-author on many presentations. In addition, David always was willing to help and volunteered numerous times to assist on audiovisual and local arrangements committees as well as moderating numerous technical sessions over the years.

The Fred A. Harris Fisheries Conservation Award recognizes non-Chapter members who have distinguished themselves by service or commitment to the Chapter or to the NC fisheries resources. The 2017 award was presented to the Lake Norman Wildlife Conservationists (LNWC) and accepted by Billy Wilson, Conservationist's President and Gene Vaughan, Conservationist's Board Member.

The LNWC were recognized for their significant contributions to protect and enhance the natural resources and wildlife habitats of the greater Lake Norman area.

The Chapter applauds the LNWC's unwavering commitment to environmental education, appreciation of wildlife and natural history, and conservation of wildlife habitat and natural resources.

The 2017 Richard L. Noble Best Student Paper Award was awarded to Brendan Runde for the paper entitled "Estimating Delayed Mortality of Gray Triggerfish Using Surface and Bottom Tagging". Brendan will receive a monetary award of up to \$600 from the Chapter's Ichthus fund for travel to present the paper at the 2017 parent society meeting in Tampa, FL.

The 2017 W. Don Baker Memorial Best Professional Award was awarded to Clint Morgeson for the paper entitled "Striped Bass (*Morone saxatilis*) and American Shad (*Alosa sapidissima*) Spawning Distribution in the Cape Fear River".



Mr. Fred Harris (left) and Dr. Mike Gangloff (right), NCAFS Chapter President, present the 2017 Fred A. Harris Fisheries Conservation Award to The Lake Norman Wildlife Conservationists. The award was accepted by Board Member Mr. Gene Vaughan (center left) and President Mr. Billy Wilson (center right).



Brendan Runde, recipient of the 2017 Richard L. Noble Best Student Paper, receiving his award from Dr. Mike Gangloff, NCAFS Chapter President.



Clint Morgeson, recipient of the 2017 W. Don Baker Memorial Best Professional Paper, receiving his award from Dr. Mike Gangloff, NCAFS Chapter President.

Finally, the Chapter recognized outgoing president, Dr. Michael Gangloff for his hard work, dedicated efforts, and outstanding leadership to the Chapter with his Chapter Past President Service Award. A big thanks to Mike for his outstanding leadership to the Chapter during 2016!

Submitted by John Crutchfield, NCAFS Awards Committee Chair



Incoming NCAFS Chapter President, Mr. Corey Oakley, presenting Past President Service Award to Outgoing Chapter President, Dr. Mike Gangloff.

2017 Environmental Concerns Committee Report

Mission

To promote the conservation and responsible management of aquatic species and their habitat, to identify actions that may harm or benefit an aquatic resource, to consider a position when deemed necessary, and to provide a forum for the exchange of ideas,

information, and concerns through committee meetings, the NCAFS newsletter, and other correspondence.

Last July (2016), former Chair Ben Ricks asked if I would be interested in Chairing the [Environmental Concerns Committee](#). Once I agreed, we began communicating to facilitate the transition, including consultation with the Chapter's EXCOM. I have reviewed the NCAFS Procedures Manual and will be at the service of the Chapter President to draft position statements or resolutions regarding environmental issues in North Carolina. Currently, committee members include Ben Ricks, Marla Chambers, Kyle Rachels, and the standing EXCOM, and we would be happy to deepen our ranks.

Looking to guidance from the AFS, while there is no Environmental Concerns Committee at the Parent Society level per se, the mission of their External Affairs Committee, in part, is to: "promote activism for aquatic habitat and water quality issues." On Policy, the mission of the AFS is to provide "science-based advice on fisheries related issues." Regarding position statements, letters, resolutions, and the like, "The AFS strives to be the objective voice for fisheries science, with its statements reflecting the most current knowledge available for decision-making. The AFS is careful to follow strict guidelines to ensure its advocacy is ethically and professionally sound, as well as supported widely across Society membership."

I recently familiarized myself with [AFS policy guidelines](#), which include a guide for Chapters and Subunits taking up policy issues. Some of their suggestions may be worth consideration of adding to the NCAFS Procedures Manual as a way of formalizing our actions, and I plan to work with the EXCOM and other committee members in the coming year to determine if there is such a need.

I hope to help our Chapter continue to strive to follow our Parent Society's leadership example in actively advocating for Policy decisions that address NC fisheries issues. Chapter members are welcome to contact me or the EXCOM with environmental issues they feel NCAFS should address. In doing so, consider whether the voice of NCAFS would be effective in addressing the issue. In closing, our Procedures Manual indicates members of this committee should represent the diverse interests of the Chapter membership, so please let me know if you're interested in joining the committee. Contact: jennifer.m.archambault@gmail.com; (919) 306-5107.

Submitted by Jennifer Archambault, NCAFS Environmental Concerns Committee Chair

2017 Communications Committee Report

The Communications Committee (composed of Brena Jones, Jennifer Archambault, Kelsey Lincoln and Kevin Hining) made frequent submissions to the Chapter's Facebook page <https://www.facebook.com/NCAFS>, website <https://nc.fisheries.org/>, and newsletter. A special thanks goes out to all the Chapter members that made

submissions and provided ideas for these endeavors. We can't thank you enough for all the great material!

Just a reminder that anyone with a Facebook account can post photos or news directly to the chapter Facebook page. We look forward to seeing your meeting photos and news items throughout the year!

The Chapter website continues to grow, with 7,075 page views by 2,644 users in the past year. Thanks to everyone who has contributed content, including additional programs and photos from past chapter meetings, to help fill out our archives (<https://nc.fisheries.org/meetings/past-ncafs-meetings/past-meeting-archives/>). Our contact page has also helped field inquiries from members, students, and several questions from the general public about NCAFS activities and fisheries in NC. The listserv distributes information reaching as far as the West coast of the US and even a member in Australia. If you have events, news, or announcements to share, or resources/suggestions for improvement, you may email the Chapter webmaster, Brena Jones, at brena.jones@ncwildlife.org.

Finally, a special thanks goes out to our newsletter review team, comprised of Brena Jones, Bryn Tracy, Dave Coughlan, and Ben Ricks. The newsletter staff put out 4 quarterly newsletters during 2016, comprised of 70 pages, and containing 51 articles. While the newsletter editor (Kevin Hining) compiles the information, the newsletter review team members are instrumental in reviewing and editing the newsletter!

Any Chapter members with submissions, ideas, or just wishing to get involved with the Communications Committee can contact the following team leaders:

Facebook Page - Jennifer Archambault jennifer.m.archambault@gmail.com

Website - Brena Jones brena.jones@ncwildlife.org

Newsletter - Kevin Hining kevin.hining@ncwildlife.org

Submitted by Brena Jones and Kevin Hining, NCAFS Communication Committee Chairs

Thank You from the Southern Division Past President

As most of you know the SDAFS Annual Meeting was held in Oklahoma City at the beginning of February. Being the President, I had the honor of running the Executive Committee and Business meetings for the Division . . . no stress there! While my two terms as SDAFS Secretary-Treasurer and the run-up years to my term as SDAFS President gave me at least seven years to sit at the 'front' table, there is still no pressure like being the 'person in charge' at any fisheries annual meeting! Luckily John Boreman

(NCAFS member, NC State University faculty member, AFS Past-President, and AFS Constitutional Consultant) has made that all somewhat less stressful. John has produced a primer on Robert's Rules of Order for AFS leaders that condenses the Rules to those typically used at fishery meetings. You can read them here (<https://fisheries.org/about/units/guidelines/conducting-unit-business/roberts-rules-of-order/>) or hear about them during the many AFS Leadership Training sessions that occur at most division and society meetings. Thanks John, you made my time 'in charge' far more bearable!

While at the Oklahoma City Meeting I had a pleasant and somewhat unexpected surprise. It related to the very generous donation that the NCAFS Chapter made to the Warmwater Streams Technical Committee (WWSTC) in honor of my late wife, Melissa, who lost her battle with colon cancer in April of 2016. I'm guessing that her love of the New River near her native Ashe County home and her stream sampling skills(?) helped to direct the donation to the WWSTC.

At the EXCOM Meeting, Dr. Brian Alford, Chair, of the WWSTC noted the very thoughtful donation from the NCAFS in Melissa's name and said the money would go to support their time-honored Jimmie Pigg Memorial Outstanding Student Achievement Award. Then Brian asked for the EXCOM's blessing if the Award was temporarily renamed the Jimmie Pigg/Melissa Coughlan Memorial Outstanding Student Achievement Award? Being a longstanding and National Board Certified teacher, Melissa would have loved that the money was going to help a student! With quavering voice and watery eyes, I agreed to the change. So, I would like to extend my sincerest thanks to my NCAFS colleagues and the NCAFS EXCOM for this generous and very apt donation and also to Dr. Alford and the WWSTC for honoring Melissa so kindly!



Melissa Ashley Coughlan directs stream sampling on the North Fork of the New River near Crumpler, NC. Photo courtesy of Bryn Tracy.

Respectfully submitted by Dave Coughlan, SDAFS Past President

Bryn Tracy Retires from the NC Department of Water Resources



There's no way we could put out a newsletter without highlighting the retirement of one of the most influential figures in our NCAFS family - and staunch supporter of the Chapter's newsletter! But, since he is a member of the newsletter review team, the problem was going to be how to highlight this special occasion without him seeing it first... Lucky for us, he picked the perfect time for knee surgery (assuming there is ever a perfect time for knee surgery), so we were able to sneak the newsletter by him - just this once!

You see, Bryn supports numerous aspects of NCAFS, but he has always been an integral part of the newsletter. If the newsletter were to be compared to an ecosystem, you would have to describe his role as a "keystone species". Quite frankly, without his assistance, the newsletter would be a shell of what it is.

While we wanted to take this opportunity to congratulate him on his retirement, it also seemed like a great time to reflect on the numerous high quality articles and newsletter materials (> 45 articles, > 150 pages) he has contributed so far. A perfect example of his many contributions follows this article, in a piece he wrote about the Red Shiner in the Yadkin-Pee Dee River. All of this, and he still manages to provide editorial assistance for each and every newsletter issue. Luckily, no one said he was retiring

from the newsletter team (Bryn – please say you aren’t retiring from the newsletter team☺).

Anytime someone retires from work, it seems fitting to mention some of their accomplishments. The hard part is often how to best do that. Knowing Bryn, he is not one to sit comfortably while you point out great deeds and shower him with gratitude. As an alternative, we’d like to remind folks that Bryn was our Chapter’s 2015 receipt of the Jerry R. Finke Distinguished Service Award, and we’ve included [a link to his nomination letter](#). If you have time, take a look at it. It’s pretty neat, and inspiring!

Bryn – from the newsletter team, and all of NCAFS, Congratulations!!!!

Submitted by NCAFS Newsletter Review Team, with special thanks to those that provided photos.

The Current Distribution of the Red Shiner in the Yadkin-Pee Dee River Drainage in North Carolina

The Red Shiner, *Cyprinella lutrensis* (Baird and Girard 1853), was first discovered in North Carolina in the Yadkin-Pee Dee River drainage in 1974 by Moore, *et al.* (1976) from Abbotts Creek (Lexington, Davidson County) and from Grants Creek (Spencer, Rowan County). By 1991, it spread to an additional seven sites in the drainage (Menhinick 1991). Since Tracy (2007), the Red Shiner has been found at an additional 16 sites, many of the them in the Rocky River subbasin. By the end of 2016, 42 years after its initial discovery, it is now known to occur at more than 40 separate localities spread across 12 Piedmont counties in the Yadkin-Pee Dee River drainage (Figure 1). [Note: In North Carolina, the Red Shiner is also found in Stokes, Caswell, and Person counties in the Roanoke River drainage and in Guilford County in the Cape Fear River drainage.]

In 2016, it was found at 12 of the 89 sites whose fish communities were assessed by the Division of Water Resources as part of its 5-year Yadkin River basinwide assessment cycle. The number of specimens of Red Shiner collected per site, from a standardized 600 ft. reach, ranged from 1 (Irish Buffalo, Island, and North Second creeks) to 96 (Dutch Buffalo Creek). All Red Shiner specimens collected by the Division of Water Resources have been vouchered at the North Carolina State Museum of Natural Sciences in Raleigh, NC.

Free-flowing streams in the Yadkin-Pee Dee River drainage have been fragmented by many dams (Tracy *et al.* 2013), but the Red Shiner seems to have ignored such barriers. Since 1974, following most likely, multiple, independent human-assisted introductions and natural dispersal across the drainage, the Red Shiner is now found: in the mainstem of the Pee Dee River below Blewett Falls Reservoir; throughout the Rocky River subbasin, as far upstream as Mallard and Clarke creeks; the Uwharrie

River, the Little River, tributaries to the South Yadkin River downstream from the Cooleemee Dam, High Rock Lake; the mainstem of the Yadkin River and several of its tributaries as far upstream as Davie and Forsyth counties, and the mainstem of the Yadkin River near Ronda. Further dispersal in the South Yadkin River subbasin is prevented by the Cooleemee Dam at Cooleemee. It was believed that further dispersal upstream in the Yadkin River subbasin would have been prevented by Idols Dam (a barrier to fish passage since it was constructed in 1898) and by Northwest Filter Plant Dam (built in 2003). The discovery of a specimen at the Ohio State University Museum of Biological Diversity collected in 2009 at Ronda (more than 50 miles upstream from the Northwest Filter Plant Dam) does not portend good news because the Red Shiner could now theoretically colonize any available tributary as far upstream as Kerr Scott Dam, including the Little Yadkin, Ararat, Fisher, and Mitchell rivers watersheds. Fortunately, Red Shiners were not found by Division of Water Resources staff in 2016 in any tributaries upstream from Idols Dam.

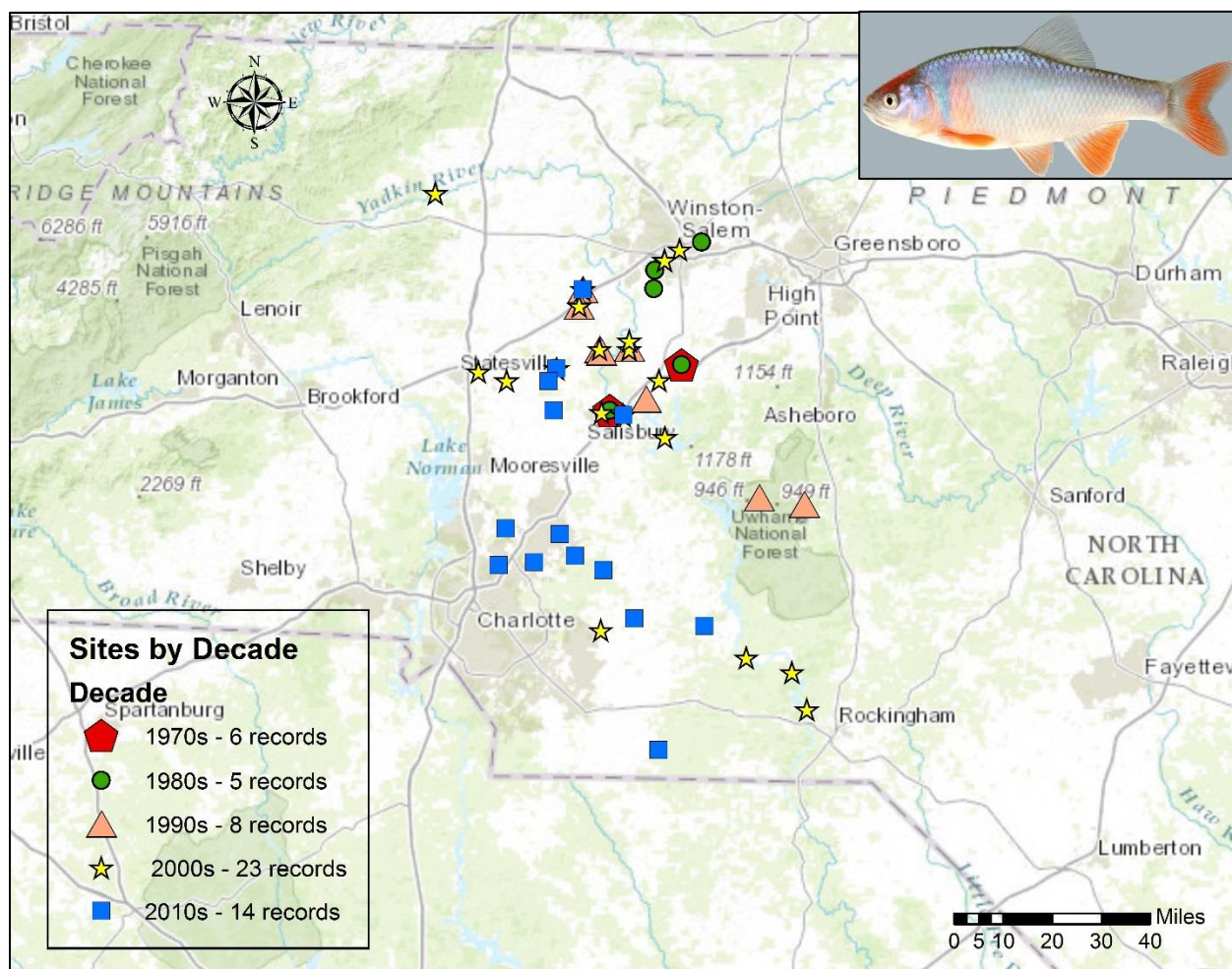


Figure 1. Distribution of the Red Shiner, *Cyprinella lutrensis*, in the Yadkin-Pee Dee River drainage as of December 31, 2016. Photograph courtesy of Uland Thomas of the North American Native Fishes Association (<http://gallery.nanfa.org/v/members/Uland/>).

The Red Shiner is behaviorally aggressive, readily hybridizes with other species of *Cyprinella*, and is tolerant of poor water quality, low flow conditions, low dissolved oxygen concentrations, elevated turbidity, and elevated stream temperatures. It can be abundant in shallow, sandy bottom streams, is commonly used as a bait fish, and was once marketed in the aquarium trade (Fuller, *et al.* 1999; Walters *et al.* 2007). The Red Shiner has been reported to reproduce within its first summer of life and can have a breeding season lasting at least three months (Herrington and DeVries 2008). Since August 2004, it has been unlawful to transport, purchase, possess, sell or stock Red Shiners in public or private waters of North Carolina (North Carolina Administrative Code 15a NCAC 10C .0211; <http://reports.oah.state.nc.us/ncac>) because of its negative invasive attributes including, but not limited to: potentially hybridizing with other species of *Cyprinella* such as Fieryblack, Satinfish, and Whitefin shiners, interspecific competition, and species displacement.

In conclusion, this nonindigenous species introduction has been “very successful” because the Red Shiner has persisted, dispersed, and reproduced throughout its range in the Yadkin-Pee Dee River drainage in North Carolina. Ironically, there are some indications that the potential native source of introductions may have been the Salt River in northeastern Missouri (Glotzbecker, *et al.* 2016) where I worked on a multi-year pre-impoundment study as a graduate student in the mid to late 1970s while at the University of Missouri-Columbia.

Literature Cited and Additional Resources

Databases queried for this article were those of the North Carolina Division of Water Resources, Duke Energy, the North Carolina Wildlife Resources Commission, the North Carolina State Museum of Natural Sciences (<http://collections.naturalsciences.org/searchFishes.aspx>), Global Biodiversity Information Facility (<http://www.gbif.org/>); the USGS Nonindigenous Aquatic Species (<https://nas.er.usgs.gov/>), Tulane University, Georgia Museum of Natural History, the University of Michigan Museum of Zoology (<http://lsa.umich.edu/ummz/fishes/collections.html>), and the Ohio State Museum of Biological Diversity (<https://fish-division.osu.edu/>).

USGS Nonindigenous Aquatic Species web pages pertaining to the Red Shiner:

1. Fact sheet -- <https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=518>
2. Animated map -- <https://nas.er.usgs.gov/queries/SpeciesAnimatedMap.aspx?speciesID=518>
3. Point map -- <https://nas.er.usgs.gov/viewer/omap.aspx?SpeciesID=518>
4. Collection info -- <https://nas.er.usgs.gov/queries/CollectionInfo.aspx?SpeciesID=518&State=NC>.

Fuller, P. L., Nico, L. G., and J. D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United states. Special Publication 27. American Fisheries Society. Bethesda, MD.

Glantzbecker, G. J., Alda, F., Broughton, R. E., Neely, D. A., Mayden, R. L., and M. J. Blum. 2016. Geographic independence and phylogenetic diversity of Red Shiner introductions. *Conservation Genetics*. 17:795-809.

Herrington, S. J. and D. R. DeVries. 2008. Reproductive and early life history of nonindigenous Red Shiner in the Chattahoochee River drainage, Georgia. *Southeastern Naturalist*. 7:413-428.

Menhinick, E. F. 1991. The freshwater fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh, NC.

Moore, R. H., Garrett, R. A., and P. J. Wingate. 1976. Occurrence of the Red Shiner, *Notropis lutrensis*, in North Carolina: a probable aquarium release. *Transactions of the American Fisheries Society*. 105:220-221.

Tracy, B. H. 2007. 1 out of 3 ain't bad (the nonindigenous fishes of the Yadkin-Pee Dee River basin). The Virginia and North Carolina Chapters of the American Fisheries Society. 2007 Meeting. February 26-28, 2007. Danville, VA.

Tracy, B. H., Jenkins, R. E., and W. C. Starnes. 2013. History of fish investigations in the Yadkin-Pee Dee River drainage of North Carolina and Virginia with an analysis of nonindigenous species and invasion dynamics of three species of suckers (Catostomidae). *Journal of the North Carolina Academy of science*. 129: 82-106.

Walters, D. M., Blum, M. J. Rashleigh, B., Freeman, B. J., Porter, B. A., and N. M. Burkhead. 2007. Red Shiner invasion and hybridization with Blacktail Shiner in the upper Coosa River, USA. *Biological Invasions*. 10: 1229-1242.

Submitted by Bryn H. Tracy, NC Division of Water Resources

Where Have All The Young Fish Gone? Investigating Mysteries Of Juvenile Robust Redhorse

Robust Redhorse (*Moxostoma robustum*) have been called “mystery fish” in more than one context. Their name was mistakenly applied to another sucker species for over 100 years, until five individuals collected in Georgia in 1991 led to re-examination and correction of taxonomic assignment. Intensive collaborative research projects and surveys across the species’ range in NC, SC, and GA have taught us a great deal about these striking fish, including seasonal movement patterns, genetic diversity among and between populations, spawning locations, and potential contaminant exposure

pathways. Strong partnerships built through [the Robust Redhorse Conservation Committee](#) include state and federal resource agencies, power companies, universities, aquariums, and museums. However, big questions remain.



Pee Dee River Robust Redhorse captured in 2013. Photo by Brena Jones.

It seems improbable for an animal reaching over 790 mm (31") in total length (TL), weighing up to 8.5 kg (18.6 lbs), to still keep so many secrets, but we have yet to discover where juvenile Robust Redhorse live. From the time they hatch in shallow graveled shoals, such as those near the fall line in NC's Pee Dee River below Blewett Falls Dam, to their recruitment to the spawning population roughly five years later (around 450-500 mm or 16-20" TL), these fish are...invisible.

We have shocked, seined, searched, and scratched many creative and experienced heads across habitats in rivers and tributaries. In 2016, members of the Yadkin-Pee Dee Technical Working Group (TWG) decided to employ an approach that may be familiar to many parents: get a sibling to "tattle" on their cohorts.

The lower Pee Dee River has the added benefit of an existing antenna array of sonic receivers installed to monitor sturgeon movement. With the help of Diadromous Fish Program staff in SC, the same network can "watch" for a passing Robust Redhorse outfitted with a matching transmitter, and hopefully offer some clues on juvenile behavior.

Last fall, staff from the NC Wildlife Resources Commission, NC State University, USGS, Duke Energy, and SC Department of Natural Resources implanted a total of 30 Vemco sonic tags in a subset of Phase II Robust Redhorse (averaging 222-266 mm TL), that were produced from spring 2015 propagation efforts. NCWRC's McKinney Lake Fish Hatchery and SCDNR's Dennis Center released 15 tagged individuals each alongside

~1,700 total fish (all of whom received a unique PIT tag), stocked on November 4th, 2016 in Cheraw, SC and at NCWRC's Diggs Tract south of Rockingham, NC.

As of the spring TWG meeting in early March of 2017, 26 of 30 fish had been detected at least once. While many stayed "local," moving upstream towards NC spawning areas below Highway 74 near Rockingham, several swam south, one moving approximately 100 river km into the SC coastal plain below Cheraw.

This is just (another) beginning. Hurricane Matthew blew a significant hole in the receiver array in October of 2016, but replacement is underway. With additional detection opportunities and future data downloads, we hope to illuminate more steps (or would that be laps?) in the journey of a young Robust Redhorse to their successful recruitment into the spawning aggregation. With the continued cooperation of our unwitting "informants," we can better target sampling for untagged and wild-spawned juveniles, narrowing our search area down from "somewhere underwater."



Tom Kwak (left; USGS/NC State University) and Ryan Heise (Duke Energy) implant a sonic tag at McKinney Lake Fish Hatchery. Photo by Brena Jones.



Sedated Phase II Robust Redhorse with implant surgery complete. Photo by Brena Jones.

Other plans include possibilities for implanting transmitters into even smaller fish, and using tags with longer battery life, as tag technology continues to progress, widening the window of exploration into the early years of Robust life. Understanding these dynamics helps to identify possible survival bottlenecks due to habitat availability or predation pressures. This in turn allows us as biologists to adapt our management strategy to achieve better conservation of not only the magnificent Robust Redhorse, but the rich beauty and diversity of our southeastern rivers for their entire communities. Humans included!



Robust Redhorse fry making their own beginnings at McKinney Lake Hatchery. Photo by Rick Bradford.

Submitted by Brena Jones, NCWRC, with many thanks to excellent reports and work by Ryan Heise (Duke Energy), Rick Bradford and Doug Hinshaw (NCWRC), Forrest Sessions and Jarrett Gibbons (SCDNR), and the dedicated efforts of the Yadkin-Pee Dee TWG members

Good Work! – Recent Publications by NCAFS Members

Dear NCAFS members, we need your help on a new newsletter section designed to promote and share the great work that you do! The goal is to provide a way for members to share recent publications that they are involved in; including peer-reviewed articles, agency gray literature, dissertations and theses.

For starters, we stumbled across two recent publications by our members;

DeRolph C.R., Nelson S.A., Kwak T.J., Hain E.F. (2014) Predicting fine-scale distributions of peripheral aquatic species in headwater streams. *Ecology and Evolution*, 5, 152-163.

Fisk II J.M., Kwak T.J., Heise R.J. (2015) Effects of regulated river flows on habitat suitability for the robust redhorse. *Transactions of the American Fisheries Society*, 144, 792-806.

To get us caught up to speed on the other great work that our members are doing, we ask members to consider sending in citations for any publications they have helped author between 2014 and 2016. We'll include those in the summer newsletter. For the

fall newsletter, we plan to ask for anything post 2016, and then leave it as a regular section in future newsletters.

Submitted by the NCAFS Newsletter Review Team

Little Tennessee Native Fish Conservation Partnership 2016 Accomplishment Report

2016 was a good year for the Little Tennessee Native Fish Conservation Partnership. This group of non-governmental organizations, state and federal agencies, Eastern Band of Cherokee Indians, and businesses worked to expand educational snorkeling opportunities, a riparian buffer education and restoration



program, and fish and mussel restoration projects. They also launched two big projects that will serve both the partnership and basin stakeholders—development of a set of high quality videos with Freshwaters Illustrated and web-based mappers to house and display data and project priorities. For more information, see their 2016 accomplishments report: <http://www.littlet.org/wp-content/uploads/2015/11/L-TN-NFCP-2016-summary.pdf>

Submitted by Andrea Leslie, Little Tennessee Native Fish Conservation Partnership Executive Committee Chair

Stories of Interest

[High Hickory Shad numbers pleasant surprise after once being nearly absent](#)

NCAFS members and NCWRC District 4 Fisheries staff Clint Morgeson and Kyle Rachels discuss recent shad surveys on the Cape Fear River.

[USGS releases Nonindigenous Aquatic Species Database mobile sighting report app](#)

Note to users - there is no manual entry for coordinates. You will need to have location turned on in your phone before opening the app, otherwise it will not allow you to drag the pointer around to the correct location.

Call to Action!

If you want to contribute, have a story idea or would like us to include something in next quarter's newsletter, e-mail Kevin Hining kevin.hining@ncwildlife.org or give him a call at 336-877-1087. Also, if you want to become more involved with one of the many great NCAFS committees then please check the link below for information about each one, contacts, etc., <http://nc.fisheries.org/who-we-are/committees/>

Valuable Links

The [American Fisheries Society Home Page](#) offers a wealth of links to assist you in your fishy endeavors. Information on ordering AFS books, annual meetings, chapter links and joining the AFS can be found there.

This and [archived NCAFS newsletters](#), along with links, [chapter information](#), and [upcoming meetings](#), can be found on the [NCAFS website](#).

[Click to view dates & deadlines](#)

UPCOMING MEETINGS
In Fisheries & Ecology