Tennessee Chapter American Fisheries Society Winter 2022-2023 Newsletter

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Officers

President— Justin Wolbert
President-Elect—Meredith Harris
Treasurer/Secretary—Shawna Fix
Past President— Cole Harty

HYPERLINK "https://units.fisheries.org/tn/" https://units.fisheries.org/tn/

Presidents Message

Howdy fish nerds!

As 2022 comes to a close, it's always satisfying to look back over the past year and reflect on all of the accomplishments and events that have occurred over the past year. One of the most exciting and gratifying events this year was the Federal delisting of the Snail Darter by the U.S. Fish & Wildlife Service! This was the first time a fish from east of the Mississippi River has been delisted and only the fifth fish ever to receive that action. At the delisting ceremony, the USFWS also presented a lifetime achievement award to Dr. David Etnier for his career contributions to aquatic ecology and conservation.

We are ecstatic to be hosting the Southern Division AFS meeting in 2024 in Chattanooga! Before that happens, we are looking forward to everyone getting together in March 2023 for our Tennessee AFS meeting at Henry Horton State Park in Chapel Hill, TN. This unique State Park is situated on the Duck River and has plenty of outdoor activities for all. Our annual meetings have been held in East Tennessee for the last several years and it will be great for our members to travel to Middle Tennessee and see more of this beautiful state. We are excited to celebrate the successes of this past year and catch up on what students and professionals have been up to in the aquatic world. I am looking forward to our second in-person meeting after a few years of cancelled and virtual meetings.

Some of the great things that happened for the Chapter this year include Dennis Baxter and Mike "Stump" Smith were awarded the Lifetime Achievement Award for their contributions to fisheries over their 35-year and 46-year careers, respectively. Earl & Margit Worsham received the Friends of Fisheries Award for their long-term dedication and partnerships for Brook Trout conservation. Our meeting showcased five student and five professional symposia talks focused on the topic "Habitat – The good, the bad, and the ugly." We also hosted nine contributed presentations from students and professionals. We had one student poster by Jack Fetters (presented by Dr. Amanda Rosenberger) and Jack took home the best poster award. The best symposia talk awards were presented to Josh Cary in the student category for his talk "Habitat associations of Blotchside Logperch (Percina burtoni) in the Little River, Tennessee and the suitability of Abrams Creek for reintroduction" and Bernie Kuhajda in the professional category for his talk titled "Habitat of the Blue Shiner (Cyprinella caerulea) in the Mobile Basin: the Good, the Bad, and the Changing."

Our meeting in Gatlinburg was very successful and we had a solid turnout with around 77 attendees. We were able to raise over $3000 from the auction. Through the funds raised from the meeting and auction, this Chapter was able to donate $1150 to support 9 kids fishing events across Tennessee, $500 to the Virginia Chapter to support their hosting of the 2023 SDAFS meeting, and present $250 in awards to best student presentation and poster winners.

We hope you can attend the meeting and workshops this year. Please consider nominating your colleagues for an award as there are always reasons to celebrate the great work for fisheries being done across the state. Thanks to everybody for another great year and I hope everyone has a Merry "Fish"mas and a Happy New Year!

--Justin Wolbert

Annual Chapter Meeting:
March 7-9, 2023 –Chapel Hill, TN
The Lodge at Henry Horton State Park

The Tennessee Chapter of the American Fisheries Society will hold its 2023 annual meeting March 7-9, 2023 at The Lodge at Henry Horton State Park, Chapel Hill, TN. Information about lodging, workshops, and how to get registered will be posted on the Tennessee Chapter website https://units.fisheries.org/tn/ .

REGISTRATION

Please visit our Square Store to register. The store works best when you copy and paste the link into Google Chrome https://tnafs.square.site/ If you are paying check send check with TN AFS Meeting Reg. in the subject line along with the registration form to:

Shawna Fix
1031 Tiberius Way
Murfreesboro, TN 37128

Registration rates:

Professional: $70 through February 10, $85 thereafter, $85 **day of** meeting.
Student and Retiree: $40 through February 10, $45 thereafter.

If anyone has registration questions or issues paying/registering through square store, or financial concerns (especially students) email shawna@southeastaquatics.net .

LODGING

A rate of $86.40 per standard double room (government rate), $90.90 per motel room, and $99.90 per suite has been negotiated with The Lodge at Henry Horton State Park when you mention the reference below. You MUST make a phone reservation as they do not have reservations using the negotiated rate set up through their website for this meeting. Please call the following number:

Phone: (931)364-2222 or 1-888-TN-PARKS
Reference: TN Chapter of the American Fisheries Society 2023 or use code 4717
Address: 4201 Nashville Highway, Chapel Hill, TN 37034

HOTEL RESERVATION CUTOFF is Friday, January 20th, 2023

2023 TNAFS TENTATIVE MEETING SCHEDULE

Monday, March 6

There is a block of rooms set aside for members on March 6th attending workshops on Tuesday morning.

Tuesday, March 7

7:30 – 5:30	Registration open
8:00 – 12:00	Workshop I: Mussel Identification
1:00 – 4:30	Workshop II: Fish Photography
6:00 – TBD	Informal Social (invasive carp fish fry at Cabin #5 in the park)

Wednesday, March 8

7:30 – 5:00	Registration open
8:00 – 11:30	Workshop III: Microsoft Excel for Fisheries Professionals
8:00 – 11:30	Workshop IV: Student Professional Development Workshop
1:00 – 6:30	Oral and Poster Presentations, Business Meeting
6:30 – 10:00	Banquet, Auction, Awards

Thursday, March 9

9:00 - 3:00	Oral Presentations Continued
3:00	Meeting Adjourned

CONTINUING EDUCATION WORKSHOPS

TNAFS is proud to offer four continuing education courses at our annual meeting this year! Courses can be signed up for at our Square Store https://tnafs.square.site/
Please see the below options:

• Tuesday morning	8:00am - 12:00pm	Mussel Identification ($25)
• Tuesday afternoon	1:00 - 4:30pm	Fish Photography ($25)
• Wednesday morning	8:00 - 11:30am	Microsoft Excel for Fisheries Professionals ($25)
• Wednesday morning	8:00 - 11:30am	Student Professional Development (FREE)

Mussel Identification (Tuesday 8:00am-12:00pm)

Instructor: Amanda Rosenberger, Gerry Dinkins, Kristin Womble

This course will focus on both the ecology and identification of Tennessee freshwater mussels. The first portion of the workshop will be in the classroom, and the last hour will be an excursion to a field site located within the park to find and identify shells, weather-permitting. ***Please email Amanda Rosenberger at arosenberger@tntech.edu if you plan to attend and what region you expect to work in so that the workshop may highlight those species.***

Fish Photography (Tuesday 1:00-4:30pm)

Instructor: Todd Amacker, Jon Michael Mollish

Are you interested in using photography as a conservation tool? With the challenges facing aquatic biodiversity in the American Southeast, it's important that biologists engage the public regarding aquatic species that deserve attention and protection. Attendees will learn techniques for how to photograph fish using a 'field studio' technique. They will also learn about what gear works best to attain the most impactful images, what camera settings to utilize, and tips for

using software for post-processing. For best results, attendees are strongly encouraged to bring a digital camera. If possible, participants should bring a laptop with image editing software (Photoshop,LightRoom, GIMP). Learn how to put the spotlight on aquatic species and their habitats on the Duck River!

Microsoft Excel for Fisheries Professionals (Wednesday 8-11:30am)

Instructor: Jack Van Deventer

Fisheries data is complex and cumulative, and reporting needs are constantly changing. The good news is that Microsoft Excel is enormously powerful, and Microsoft is adding impressive functionality each year. How can you leverage Excel's power to save you valuable time and expand your research findings? That's what this workshop is all about. We'll review fundamentals of Excel, show how to overcome common challenges in fisheries analytics, and provide exposure for advanced techniques.

Student Professional Development (FREE) (Wednesday morning 8:00-11:30am)

This FREE course will allow students to meet with professionals to learn about different aspects of fisheries employment in the state of Tennessee. Various, state, federal and non-profit organizations will be present to answer any questions and help give guidance on how to obtain future employment. Please sign up for this course in the Square store if you plan on attending so that we can get an accurate head count, and plan to bring a draft resume/CV if you wish to receive feedback from the instructors.

SYMPOSIUM

The Tennessee Chapter of the American Fisheries Society will be hosting a special symposium session with select talks focusing on "Fish Health – The Big Picture". The 2023 symposium talks will focus on all aspects of fish health at all levels, from the individual to the population to the health of the habitat or environment. A broad range of presentations concerning or affecting fish health are encouraged, such as disease treatment and control in hatcheries or the wild, case studies of fish health issues, impacts on populations from invasive species, conservation genetics, and managing "sick" habitats. We hope for a diversity of submissions from agency, NGO, and university members.

We strongly encourage submissions to be included in this symposium, but the meeting will also feature presentations outside the scope of the symposium topic.

Presentation Details

Oral Presentations – Speakers will be given 15 minutes for talks (including time for questions and/or discussion).

Poster Presentations – The poster session will be held after the business meeting on Wednesday March 8th. Presenters will be provided with tacks or tape in which to hang their posters.

Abstracts

Deadline to submit abstracts is February 10, 2023. We are accepting abstracts for both oral and poster presentations. Oral presentations should be no more than 15 minutes total, including 5 minutes for questions.

- Student presenters are invited to compete for the Best Student Paper and Poster Awards (1st and 2nd prizes for both)
- Professional presenters are invited to compete for the 4th annual Best Symposium Paper and Poster Awards (bragging rights and resume boosters for both winners)

Award Nominations!

Our membership is full of dedicated professionals, and it's time to recognize them for their efforts. Please review the award criteria below and send nominations to Kristin Irwin kirwin@tntech.edu by **January 27, 2023.** Applications should be limited to one page.

Lifetime Achievement Award
Nominee should either be retired or within five years of retirement and have had a long history of significant contributions.

Distinguished Service Award
To be bestowed on individuals that served as a Chapter officer for more than five years or served the chapter as chair of a long-standing Chapter committee for more than five years.

Outstanding Fisheries Scientist
To be bestowed on the biologist in their early to mid-career for making significant contributions in the past year or over several years.

Friends of Fisheries Award
This award shall be made to non-Chapter member(s) who have distinguished themselves by service or commitment to the Chapter or the fisheries resources of Tennessee.

The Tennessee Chapter of the American Fisheries Society is soliciting nominations for the following Chapter officer positions:

President-elect

Send nominations to Justin Wolbert
jrwolbert@tva.gov

by February 10, 2023

Student Updates

University of Tennessee-Knoxville Student Sub-Unit

By: Devin Hevener, Jimmy Collins and Wilson Xiong; UTK Student Subunit Student Representatives

The **University of Tennessee, Knoxville (UTK) AFS student subunit** is in a joint organization with the UTK Wildlife Society student chapter. Together, this organization is referred to as the UTK Wildlife and Fisheries Society (UTKWFS).

We started off the year by attending the SDAFS conference in Charleston, South Carolina in January 2022, giving society members the opportunity to meet with professionals, students were able to attend numerous workshops and seminars regarding the most pressing conservation topics in the southeast.

In February society members were able to get fisheries sampling experience by assisting TWRA Region 4 reservoirs crew with habit addition and restoration by adding concrete reef balls and submerging tree structures for habitat improvement to enhance fisheries available habitat on Douglas Lake. The society also held a professional mixer consisting of TVA, USFWS, TWRA, GSMNP, and various other wildlife and fisheries agencies and professionals to speak with society members about career goals and enhance members knowledge of the profession, some members were able to receive a summer internship working with some of the professionals they were able to meet during the professional mixer.

In March several members attended the TN AFS conference in Gatlinburg, TN. Our members took this conference as an opportunity to learn about relevant research that is happening across the state. We also assisted Tennessee Tech Graduate student Connor Ballard with trout fin clippings at the Buffalo Springs Fish Hatchery for mark recapture techniques with his rainbow trout project.

In April members assisted TWRA with gamefish electrofishing surveys with TWRA Region 4 Reservoir Crew sampling Black Bass, Crappie and other game fish on Ft. Loudoun reservoir. Members also participated in our first education and outreach event for the year at William Blount High School in Maryville TN, teaching students seine netting techniques and d- net sampling techniques and educating the students with Tennessee fish and macroinvertebrate identification.

Our guest speaker for the month of April was Shawna Fix from the TN Aquarium with her "getting hired" workshop. Shawna shared valuable information and resources on what it takes to become a competitive hire and what present day fisheries professionals are looking for in a new hire and the steps she took to get to her position being a fisheries professional. Members benefited immensely from the workshop and broadened their knowledge of fisheries professionals and what it takes to become one.

In May student members also had the opportunity to help in harvesting Asian carp, working with Tanner Cox, and other Tennessee Tech Graduate Students with his project on determining the current abundance and distribution in our TVA Western Tennessean Reservoirs that are being invaded by Asian carp. While out on the job our student members learned how to properly set and pull gill nets, and how to take necessary biometric data from Asian carp such as measuring the fish, weighing out egg masses, taking otolith samples and learning other useful information such as smooth vs rough fin Asian carps and how to quickly determine the sex, taking place in Pickwick Reservoir.

During the Summer some society members completed various fisheries internships and gained valuable fisheries experience working in the field with fisheries professionals learning techniques and procedures these future fisheries professionals will utilize throughout their career. Some of the various fisheries internships our society members served as this summer are TWRA Mussel Intern, Gatlinburg Trout Hatchery Intern, TWRA Stream Ecology Intern, GSMNP Fisheries Intern and many more internships out of state and private management internships.

After returning to campus for the Fall semester our members jumped right back into great fisheries opportunities. Our student members first had the opportunity to begin volunteering with our fisheries PHD candidate, Jeronimo Silva, doing mussel sampling along the Clinch River. Sampling began in August and carried through the end of the year and will go into the spring semester. Students help Jeronimo in the Upper Clinch coming in from Virginia to Kyles Ford. Students worked with Jeronimo and USFWS personnel looking for the pheasant shell mussel that are having a hard time in the Clinch. Recent die offs of mussels in the Clinch have gained attention from our researchers and we have the best in the country on the job. Students helped Jeronimo with mussel silos and monitoring the health/ growth of small pheasant shell mussels being researched. Students learned multiple identification of mussel species in the Clinch and learned about issues going on and how monitoring the river can help. Students learned a lot about our mussels in the Clinch from the USFWS personnel and Jeronimo on mussel sampling operations. Members also assisted UTK Masters Student Winston Clark with his Research Project on Mercury contamination levels in GSMNP. Members assisted by collecting stonerollers and various macroinvertebrates to be sent off and tested for mercury contamination levels compared to other creeks in GSMNP.

In September several of our society members joined Graduate student Connor Ballard from Tennessee Tech and

Tennessee Wildlife Resource Agency to sample for Rainbow Trout in part of an ongoing project analyzing prevalence through PIT tagging starting in September and running through November. Students learned how to sample with backpack shocker, assess good trout habitat, taking biometrics, and the insertion and activation of PIT tags used in fish over 65 mm. During one of the first Society Meetings of the semester members learned proper implementation of trotline techniques by taking members out and setting trotlines, we also held a fishing workshop at the meeting teaching society members that were new to fishing how to fish and assisting them with buying fishing license to get them to fish for the first time.

Student members also attended SEAFWA in Charleston, West Virginia in October, Students were able to attend numerous workshops and seminars regarding the most pressing conservation topics in the southeast regarding top agencies in the Southeast.

In November members assisted with the last education and outreach event of the year attending the MT Olive Elementary School STEM night teaching kids native fish identification and a game where kids could go “fishing” and then identify the fish “caught.” Preserved specimens were also there to help teach the kids about TN fishes.

To wrap up in December, some of our members will work with people from TWRA and USFWS to help conduct Lake Sturgeon sampling along Ft. Loudoun reservoir. Members will help over the course of 4 days in baiting and setting trotlines as well as pulling lines and working up any sturgeon caught.

Tennessee Tech University Student Sub-Unit

By: Joelle Ciriacy; TN Tech University Representative

Tennessee Tech's Student Fisheries Association (SFA) has experienced encouraging growth in membership and engagement during 2022. Throughout the year, SFA members participated in exciting field trips, discussions with aquatic professionals, volunteer activities, social events, and SFA elections.

Eduardo Toala-Hidalgo (President) with Southern Appalachian Brook Trout that were backpacked into the Citico Creek Wilderness and released.

In February, we were kindly joined by two speakers from the Tennessee Wildlife Resources Agency (TWRA). Will Collier, a fisheries biologist, shared his experiences as a biologist, offered valuable career advice, and presented volunteer opportunities to members. Jason Wisniewski, a malacologist, described the freshwater mussel conservation crisis, explained how his work with research collaborators and mussel hatcheries responds to this crisis, and challenged members to become lifelong learners. In March, we were led in a resume workshop by a graduate member, Josh Cary.

In April, SFA elected new officers. Our current officers are Eduardo Toala-Hidalgo (President), Joelle Ciriacy (Vice President), Connor Ballard (Treasurer), and Noah Uptegraw (Undergraduate Representative).

Connor Ballard (Treasurer) volunteers to release Southern Appalachian Brook Trout with TWRA.

Our first social event and field trip of the year, a visit to Conservation Fisheries Inc (CFI), afforded members a unique look at fish husbandry and conservation of rare fishes. We received a tour of the facility and were exposed to the important work of non-game fish hatcheries and viewed rare fishes.

Throughout the spring, SFA members volunteered in a variety of capacities. In March, volunteers marked hatchery trout for multiple projects in partnership with TWRA and the Tennessee Cooperative Fishery Research Unit. We also prepared for the 2022 Kids Fishing Derby at Cane Creek Park. Our chapter sadly had to cancel the event due to unexpected repair work and low water levels at the park, but we have plans to continue this event in 2023.

Over the summer, SFA members assisted TWRA with restocking Southern Appalachian Brook Trout in the Cherokee National Forest. We backpacked Brook Trout from the Tennessee Aquarium Conservation Institute into the Citico Creek Wilderness to augment native populations. SFA members also assisted with graduate research over the summer. This included River Chub research in North Carolina and Norris tailwater trout research.

SFA's booth welcoming new Golden Eagles (Wings UP!) at Tennessee Tech's Annual Mix and Mingle.

We kicked off the fall semester by meeting new TN Tech students at the annual Mix and Mingle in August. For our first meeting, we hosted a joint meeting with Tennessee Tech's Wildlife Society to welcome students interested in biology, wildlife, fisheries, ecology, and natural resources. In September, we met to discuss club goals, get to know new members, and arrange for volunteer opportunities. SFA members surveyed wild trout populations in the Cherokee National Forest with TWRA on multiple days. Finally, SFA members helped one of our graduate members backpack electrofish on Norris tailwater.

In October, SFA held a resume and cover letter writing workshop. Our graduate members made a detailed guide to writing resumes & cover letters to be shared with our membership and introduced several fisheries job boards. A social event was held later that month at a nearby river; members fished, mingled, and learned to seine.

SFA members learn to seine during an October social event by Roaring River.

In November, several SFA members attended the Southeastern Fisheries Council meeting to present their work. We would like to congratulate our member Ryan Hudson, who received second place for his oral presentation "*Can migratory suckers subsidize their spawning streams?"* at this meeting.

SFA volunteers Sample Bald River with TWRA.

As we prepare for 2023, we hope to foster new relationships between our members, provide regular volunteer opportunities, and support undergraduate conference attendance. Finally, we look forward to serving our community by hosting our annual Fish Fry and Kid's Fishing Derby to encourage a new generation of anglers to support fisheries management and conservation.

Professional Updates

Conservation Fisheries, Inc. (CFI)

By: Shannon Murphy; Conservation Biologist and Volunteer Coordinator

Biologists at Conservation Fisheries have been hard at work both in and out of the hatchery. In 2022 we released ~7,500 Spotfin Chubs, ~1,600 Tennessee Dace, ~1,300 Boulder Darters, and a few hundred Blotchside Logperch and Buck Darters into their respective ranges. Other releases include Smoky Madtoms, Yellowfin Madtoms, and Citico Darters into the Tellico River. In addition to releases we've transferred several hundred Roanoke Logperch, Carolina Madtoms, Blotched Chubs, Crystal Darters, Pygmy Sculpin, and Barrens Topminnows to our partners. Our newest partnership is with the Cook Museum of Natural Science in Decatur, AL who are creating an outreach exhibit for Spring Pygmy Sunfish that we propagate in the hatchery.

Our most exciting release of the year was our first reintroduction efforts of expanding the Yellowfin Madtom's range into the French Broad River. This effort will continue for several years, and, if the population is successful, we hope to see the Yellowfin Madtom petitioned for delisting from the Endangered Species List in the near future.

We are very excited to have started a propagation project working with the Leopard Darter. This is the first time we'll be working with this species, and it is our first species from Oklahoma.

USFWS Director Martha Williams and a young friend releasing Yellowfin Madtoms into the French Broad River on 10/4/2022

This year also brought in additional funding for our facility expansion. These funds have brought us closer to being able to break ground on this expansion, and we are hoping to see that happen within the next calendar year. For more information about our Facility Expansion or to contribute to our Expansion Fund, please scan our QR code.

Pat Rakes, J.R. Shute, and Bo Baxter

While the news about our fish and facility are very exciting, our biggest transition this year was the Semi-Retirement announcement of our Co-Founders J.R. Shute and Pat Rakes. Bo Baxter was elected as our next Director and President by the Board, in addition to Missy Petty being elected as the Board Vice President and Secretary. We're all extremely grateful to both J.R. and Pat for the incredible foundation that they have built for us to continue to do the important work of preserving freshwater biodiversity through conservation aquaculture. J.R. and Pat will continue to be involved in our work so that we can continue to benefit from their knowledge and experience.

To follow along with our work throughout the year please like our Facebook Page or follow us on instagram at @conservation.fisheries

Tennessee Aquarium Conservation Institute (TNACI)

By: Adam Kennon; Conservation Manager

Reintroduction Program

TNACI had great success spawning Brook Trout this year– over 4000 eggs were produced last fall! 1,250 fingerlings were released in May into three streams in the Tellico River watershed. A new tank was added to the trout system to accommodate the large number of fish, as well as allow for separating family units to ensure the genetic diversity of the reintroduced fish has been equalized as much as possible. In May, TNACI scientists hiked into Cherokee National Forest to release over 800 brook trout fry into North Fork Citico and Ike Camp Branch. Our partners at TWRA and Trout Unlimited also released another 300 brook trout fry from TNACI into Sugar Cove Creek.

Reintroduction assistant Kaylee Clayton (left) and Reintroduction Biologist Sarah Kate Bailey release Southern Appalachian Brook Trout into the Cherokee National Forest.

Reintroduction Biologists Teresa Israel and Sarah Kate Bailey release lake sturgeon into the Tennessee River in Chattanooga, TN.

TNACI celebrated another Earth Day with the release of 65 lake sturgeon from our 2021-year class into the Tennessee River at Coolidge Park. Students from Calvin Donaldson Elementary School, along with Aquarium board members and friends, were there to help. We released over 1,200 Lake Sturgeon into the Tennessee River this year from our 2022-year class.

TNACI had 40 juvenile Tangerine Darters that contributed to propagation of endangered mussels. In September, scientists from Cumberland River Aquatic Center (CRAC) In preparation for next year's spawning season, we collected fifteen more tangerine darters from the Tellico River to add to our current broodstock. Next spring, we will have two spawning groups to propagate more juveniles for CRAC.

TNACI staff and student catch Tangerine darters in the Tellico River for propagation at the Conservation Institute.

Biodiversity Research

The Natural Resources Conservation Service announced that the Tennessee Aquarium's "Ridges to Rivers" Regional Conservation Partnership Program proposal was accepted and would be fully funded for $10 million over 5 years, pending a signed Programmatic Partnership Agreement. This program will

focus on helping farmers make agricultural improvements to protect river health in a six-county region spanning the Sequatchie River Valley and Walden Ridge. While the Tennessee Aquarium served as the lead applicant, this federal funding is directed toward landowners. This funding from the U.S. Department of Agriculture matches $11.8 million already being invested in the region by more than a dozen local partnering organizations that applied to receive this funding.

Reintroduction Biologists Teresa Israel and Sarah Kate Bailey measure culverts near Spring City, TN.

TNACI has been hard at work assessing culverts for fish passage in both Laurel Dace and Blue Shiner watersheds for two different grants we have received. We are using the Southeast Aquatic Conservation Partnership's (SARP) protocol to rapidly assess culverts to determine how much of a barrier each culvert is for fish passage. Our goal is to take this list and start working with local governments and other non-profits to replace the barriers with more fish friendly.

In February, TNACI joined Georgia DNR and USFWS to sample for Trispot Darters in Georgia. These partners are using advanced modeling and eDNA techniques to detect spawning populations of Trispot Darters. They then ground truth this work by sampling the sites for Trispot Darters during their breeding season in mid to late winter. TNACI has secured a grant with GADNR and USFW to complete survey work for the Trispot darter in 2023.

TNACI started up a new project with collaborators from Auburn University, as well as the Aquarium's vet staff, to learn more about fish diseases in the range of Laurel Dace (Walden Ridge). Currently, USFWS policy deems propagated fish unable to be released if mycobacteria can be detected in them. This information will help guide propagation protocols for possible future reintroductions of the critically endangered Laurel Dace, and possibly other endangered fishes.

George Benz fellow Spencer Trimpe takes eDNA samples for bridle darter in the Conasauga River.

TNACI snorkeled for Bridled Darters at in Georgia this Summer. Along with looking for Bridled Darter we are taking eDNA (environmental DNA) samples to see if we can detect Bridled Darters where they are below detectible limits. In June, we sampled for Blue Shiners at Turniptown Creek in Georgia and Minnewauga Creek in Tennessee. After sampling for the fish, we measured microhabitat in the 30 pools that were sampled.

Finally, TNACI field staff assisted TVA in the Sequatchie River with their standardized sampling. We are actively trying to increase our partnership work in this drainage right now because of the habitat improvement we are undertaking here in our RCPP program.

Trutta Environmental Solutions LLC

By: James Parahm, Ph.D

We are excited to announce that Trutta Environmental Solutions, LLC has received both the SBA 8(a) and Economically Disadvantaged Woman Owned Small Business (EDWOSB) designations through the Small Business Administration. These designations will help us to continue to expand our High Definition Stream Surveys (HDSS) services to even more partners and organizations. We were also selected into the Nashville Business Incubation Center as a potential high-growth, technology company and they are helping with improving overall business efficiency. With almost 1,000 miles of HDSS throughout the US, we look forward to adding more mileage this year in Tennessee.

We recently completed an HDSS project on the Harpeth River that is being used to run a Qual2K model on 50 miles of river to help with permitting. Continuous surface water elevation, substrate elevation, cross sections, and discharge measurements, water quality and algae samples were collected. In addition to the project specific data requirements, we ran a complete HDSS setup and now have both the 2016 and 2022 stream corridor data for comparison for any organizations in need. The most recent project area starts upstream of HWY 65 and ends near the Hwy 249 Canoe Launch approximately 50 miles downstream.

Cross-sectional discharge measurements on the Harpeth River, TN.

Trutta applied our High Definition Fish Survey (HDFS) and HDSS methods to document biota in the survey segments and classify stream corridor data along Shehawken and Equinunk Creeks in Pennsylvania for Trout Unlimited. HDFS is a no-touch and no-take, low-impact survey method and does not require species collection permits. HDFS utilizes pole-mounted, high-definition, underwater video cameras to capture images of fish or other aquatic animals at a specific location. The underwater cameras are geo-referenced so that specific time and place information is recorded in conjunction with all video observations. The HDSS approach follows a standardized series of steps which rapidly and systematically collects and processes large amounts of river condition and physical habitat information. The longitudinal HDSS survey collected information on streambed, streambank, riparian, and discrete point features to allow for a Stream Corridor Assessment (SCA) and the development of suitability models throughout the survey area.

Example High Definition Fish Survey imagery with different species circled for identification.

For more specifics on any projects, please visit our website at www.TruttaSolutions.com or email Jim.Parham@truttasolutions.com

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Southeast Aquatic Resources Partnership (SARP)

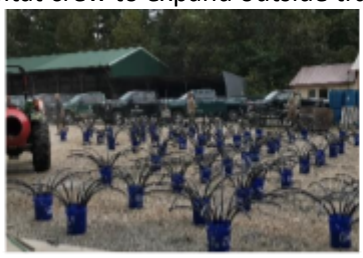
By: Shawna Fix; Aquatic Connectivity Team Facilitator

Your Secretary-Treasurer, Shawna Fix, is now working with SARP as their aquatic connectivity team facilitator. SARP has 8 aquatic connectivity teams throughout the Southeast who work together to remove barriers to aquatic organism passage in their states. Most of these barriers are in the form of lowhead dams, dammed ponds, and culverts. Now obviously big river locks and dams are not the target of these groups, but there are literally thousands of other barriers to fish passage throughout the Southeast. The Tennessee Aquatic Connectivity Team meets regularly and will be meeting in person in Nashville Thursday, January 26th. If you are interested in joining this meeting, please email shawna@southeastaquatics.net and she can send you the registration form. All are welcome to the meeting, even if you are just getting started or are vaguely interested in aquatic organism passage work. SARP has a barrier inventory and prioritization tool with data collected through both GIS and our partners in the field. Check it out here, https://connectivity.sarpdata.com/.

Tennessee Wildlife Resources Agency—Region I

By: Tim Broadbent; Region I Fisheries Program Manager

TWRA Region I has continued maintenance of deep-water fish attractors and established additional shallow water fish attractors throughout the year. Although work continued with wooden structures, artificial structures were being tested in various designs. These artificial structures required less maintenance and allowed the habitat crew to expand outside traditional sites and reservoirs.


Deep-water fish attractors in TWRA Region 1

The Agency acquired Lake Halford, a 1,000 acre lake in Carroll County. Region I Fisheries is responsible for managing the fisheries, swim beaches, marina, and RV park that are associated with the lake. Three new employees were hired to conduct these duties and during October, the Agency partnered with the Tennessee High School BASS Nation to establish habitat that would concentrate fish and anglers in the same area. Over 50 structures were concentrated in two different locations that will provide much needed habitat. In addition to the habitat, Lake Halford has been stocked with over 50,000 Threadfin.


50 habitat structures built and placed on Lake Halford.

Shad and 72,000 Golden Shiners in 2022 to improve forage. These stockings were a proactive approach to improve predator food availability.

The Bill Dance Signature Lake Program has gained momentum in 2022 and design and fishery improvements have been partially developed. Region I has five small lakes (Herb Parsons, Travis McNatt, Browns Creek, Lake Halford, Pin Oak lake) and two large reservoirs included in the program (Kentucky and Pickwick reservoirs). Herb Parsons, Lake Halford, and Browns Creek are managed by TWRA and the other two by TDEC. The reservoir improvements will focus around access improvements while the state lake improvements will include infrastructure improvements, forage stockings, fisheries evaluations, and angler regulation reviews.

Improvements on Bill Dance Signature Lakes.

As noted above, Herb Parsons Lake is part of the Bill Dance Signature Lake Program. Work has begun developing improved bank fishing access, infrastructure development, an improved boat ramp, and additional fishing piers/satellite platforms along

with improvement in pavilions to improve the family atmosphere. Herb Parsons Lake is in Mr. Dance's "backyard" and will be a five-star Signature Lake.

Nearly 1.3 million FLMB fingerlings have been stocked from 2015 – 2022 in Harmon Creek, Blue Creek, and Eagle Creek. Future sampling efforts in these embayments will focus on growth rates within each stocked embayment and percent FLMB allele present compared to baseline data.

Due to continued low Sauger population numbers and low catch by anglers, Walleye stocking was initiated in 2021 and will continue. TWRA Region III has had good success with stocking Walleye in Watts Bar Reservoir.

Silver Carp have been collected in all Mississippi River tributaries, all Region I reservoirs, and at Reelfoot Lake. Although both Kentucky and Barkley reservoirs continued to get bad press related to the fishery, data collected since 2018 has shown increased recruitment of both bass and crappie, increased densities of crappie and Largemouth Bass greater than 10- and 15-inches, respectively, and good densities of shad and other prey fish. The Region is working to provide media releases throughout the State that both reservoirs provide quality fishing experiences.

TWRA Region 1 Invasive Carp electrofishing boat (top), crew gill netting (middle), and cautionary sign (bottom).

The ACHIP program will be recognized as TCHIP in the future and TWRA has adopted invasive carp nomenclature when identifying Asian carp. The TCHIP program has contributed to the price/pound of invasive carp harvested by commercial fishers and has continued to provide increased incentives for commercial fishers to harvest invasive carp. Federal grants have also been obtained to assist the wholesale fish markets with improvements including building walk-in freezers, storage buildings, improved road surfaces and loading docks for delivery trucks, and purchasing large ice machines, storage totes, forklifts, and pallet jacks. The total harvest of invasive carp from Kentucky and Barkley reservoirs in the states of TN and KY has exceeded 25 million pounds.

Region I obtained funding from the USFWS to hire two interns to conduct larval light trap surveys, larval egg tows, and mini-fyke net sampling on Kentucky and Barkley reservoirs in 2017 - 2022. These sampling efforts have <u>not</u> documented invasive carp reproduction in either reservoir.

Three new full time Region I positions were hired for the invasive carp crew and the crew has conducted gill net surveys, electrofishing surveys, and dozer trawl collections to gather data related to recruitment, growth, and mortality of invasive carp in Kentucky, Barkley, Pickwick, Cheatham, Old Hickory reservoirs and Reelfoot Lake. In addition to the standardized sport fish sampling in Region I waters, the invasive carp crew has developed standardized sampling protocols to monitor carp densities over time. Since the management of Kentucky and Barkley reservoirs was shared by the states of TN and KY, similar standardized sampling protocols were developed by each state. Although Silver Carp from the 2015 year

class have continued to dominate the population, collections have revealed continued migration of Silver Carp thru the locks. The locks at Kentucky and Barkley dams experience over 6,500 lock openings per year. During these lock cycles, carp swim upstream into Kentucky and Barkley reservoirs. As previously mentioned the percentage of younger carp collected during surveys has increased. Invasive carp continued to be our biggest management issue.

The invasive carp crew has also tagged Silver Carp above and below the spillway at Reelfoot Lake. Receivers have been placed in the Obion River, above and below the spillway, and in Reelfoot Lake to monitor Silver carp movement.

TWRA Region 1 Invasive Carp crew tagging fish acoustic tags (left) and tagging incision site (right).

The Biological Acoustic Fish Fence (BAFF) has been installed at Barkley Lock since November 2019. The BAFF utilized sound, light, and bubbles as a barrier and results have been promising in restricting invasive carp movement through the lock chambers into Barkley Reservoir. Fish tagging and receiver deployment continued throughout both Kentucky and Barkley reservoirs (main lake and tailwater) to determine movements of invasive carp. Several state and federal agencies have been developing plans to establish additional BAFF systems throughout the Tennessee and Cumberland river systems.

The reservoir crew conducted spring and fall electrofishing surveys for sport fish and prey fish, fall trap netting, temperature-DO profile measurements, and creel surveys on Kentucky, Barkley, Pickwick reservoirs and Reelfoot Lake. Largemouth Bass and crappie length at age data were collected at Reelfoot Lake and Barkley Reservoir during spring and fall sampling surveys. The crew also continued collection of Spotted Bass and Smallmouth Bass to determine presence of Alabama Bass alleles in the population on Pickwick and Kentucky reservoirs.

The stream crews completed assigned surveys (sampled 30 streams and small rivers) and have established the “leading edge” of Silver Carp distribution in the major rivers, creeks, and streams feeding Kentucky Reservoir. The stream survey crew has also collected Skipjack Herring the last three years to determine length at age and abundance estimates and partnered with NRCS to conduct surveys to evaluate the success of stream and riparian restoration efforts.

TWRA Region 1 partnering with NRCS (left). Scarlet Shiner captured in stream sample (right).

The Stream and Reservoir crews participated in several Outreach and Communication activities involving 4H camps and school programs. These R3 efforts have contributed to the education and understanding of the fisheries resources and will hopefully attract more individuals to the outdoors.

The state lakes and hatchery crews have worked to improve state lake facilities and evaluate fish populations

thru spring and fall electrofishing surveys on 11 Agency lakes. The Humboldt Hatchery is the largest in Tennessee and has produced over one million Florida LMB fry in 2020 - 2022. Walleye, catfish, Blacknose Black Crappie, sunfish, and Florida LMB were the primary species raised at Humboldt and trout were also received and stocked from the hatchery. The small impoundments crew has been conducting surveys related to catfish abundance to evaluate catfish stocking rates in several small lakes in west Tennessee. New stocking strategies may allow the hatchery to raise fewer catfish which will clear pond space for other fish species. The state lakes crew also stocked over 12,500 catfish for the 27 fishing rodeos held during 2022.

The winter trout program has also been a success in Region I and the Agency stocked 14 small ponds in both December and January throughout Region I with over 12,000 Rainbow Trout. Stocking strategies and fishing pressure have been monitored utilizing trail cameras to evaluate usage.

Tennessee Wildlife Resources Agency—Region II

By: Ted Alfermann; Region 2 Wildlife Manager 3

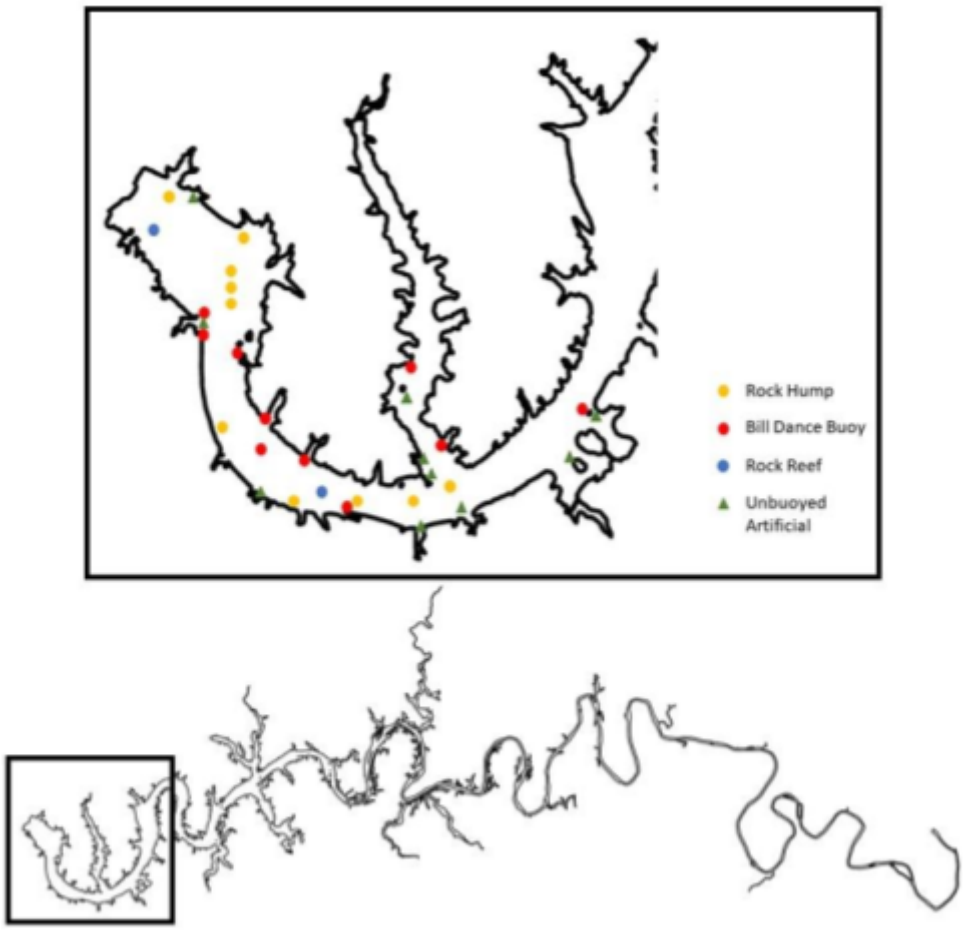
Grant to Improve Fish Habitat on Old Hickory Reservoir

Recently TWRA's Region 2 north reservoir crew was awarded a grant from Bass Pro Shops to fund a fish habitat improvement project scheduled to take place on Old Hickory Reservoir in 2023. The grant money ($121,100) will be used to create 32 new natural and artificial fish habitat sites at the downstream end of the reservoir near Drakes Creek.

Ten artificial sites were selected to be part of the new Bill Dance Signature Lakes (BDSL) program and will receive a new fish attractor buoy that includes a special BDSL logo. These sites will contain 40 structures each for a total of 400 structures. Ten additional artificial structure sites will be unbuoyed, but GPS coordinates will be provided to the public. These unmarked sites will receive two to three new experimental fish habitat structures each.

Natural structures will be made from large (1-4' diameter) rock and consist of ten rock humps and two rock reefs totaling 1300 tons of material. Approximately 750 tons of rock will be donated by Grade-A Construction while the remaining 550 tons will be purchased with grant funds. Rock humps will each contain approximately 75-100 tons of rock in a single location, while the two rock reefs will each contain 125-150 tons of rock and be placed along a transect line approximately 30 yards long. A large rock barge owned by Weaver's Incorporated from Tipton, Iowa will be used to deploy the rock within a two-week duration. All rock sites will be located from the mouth of Drakes Creek to Old Hickory Dam.

This project will bring together anglers, volunteers, TWRA, and the USACE to improve fish habitat on Old Hickory Reservoir and benefit aquatic life for many years to come. The habitat structures proposed for this project were carefully chosen based on previous research, longevity, and fishability, and an enhanced outdoor experience is expected for anglers.



Structure type and location in downstream portion of Old Hickory Reservoir.

Tennessee Wildlife Resources Agency—Region III Reservoir Crew Accomplishments 2022

By: Mike Jolley; Region III Reservoir Manager

Data surveys:

We completed our spring black bass electrofishing surveys on the Tennessee River reservoirs (Head waters of Guntersville, Nickajack, Chickamauga, Watts Bar, and Parksville) this year. All black bass populations looked satisfactory regarding individual assessments (WRs') as well as community assessments (CPUE, year class strength, etc.). Forage bases, consisting of shad, looked to be abundant as also observed in fall observations. Spring electrofishing surveys on our Cumberland River reservoirs will be conducted in the spring of 2023.

Two current projects worth mentioning are a yellow perch data collection from Ocoee #1 (Parksville) and Ocoee #3 impoundments and a targeted survey of the smallmouth bass at Watts Bar. The yellow perch study on the Ocoee impoundments will evaluate their age and growth as well as abundance of yellow perch to evaluate size and harvest concerns while also evaluating new creel limits on Parksville regarding yellow perch. The targeted smallmouth bass study on Watts Bar will further evaluate the influence of the invasive Alabama bass on our state fish, the smallmouth bass. Unfortunately, the smallmouth bass population at Watts Bar Reservoir is being negatively influenced by Alabama bass through hybridization and competition for food and habitat by Alabama bass. Alabama bass entered Watts Bar by illegal introductions and were first confirmed by TWRA reservoir biologists in 2014 through genetic testing from fish collected in the White's Creek embayment. Photos of fish collected this year were joined with genetic confirmation of those specimens. Hybridization with Alabama bass have produced fish that are not identifiable by eyesight only.

Alabama bass continue to expand and impact black bass populations in Region 3, as well as other areas of the state, and they have also doubled their native range which was located mostly in the Mobile basin area. Alabama bass are now present in systems as far north as Virginia. We are currently involved in several campaigns to bring public awareness about the ramifications of Alabama bass to our state as well as others. There is ongoing work to document and research the advancement of Alabama bass in our reservoirs as well as the impacts within regarding impacts to other black bass species, especially smallmouth bass. Several genetic tests of spotted bass/Alabama bass have been collected in recent years to document the advancement and hybridization of Alabama bass in

Yellow Perch representative size distribution during age/growth study (top); Joey Root (TWRA Reservoir Biologist) holding Yellow Perch (bottom).

our reservoirs. Also, we are currently part of a multi-state effort, composed of fisheries biologists, to showcase this information to other fisheries biologists nationally through scientific papers, publications, and other outreach venues. Parksville Reservoir, located in the SE portion of Tennessee in Polk County, is the epicenter for Alabama bass in Tennessee and information documented there will be invaluable regarding this research. Alabama bass were first discovered in Parksville in 2001 and now make up the largest composition (~60%) of black bass there according to TWRA's electrofishing surveys.

A Florida largemouth bass project was instituted on Chickamauga Reservoir in the year 2000. This project resulted in a new state record largemouth bass in 2015 due to influence of the Florida genetic influence which promoted faster growth rates. This year largemouth bass were collected from Chickamauga for ongoing genetic studies which will ultimately help determine next steps in this successful project. Within Region 3, FLMB stocking projects were also initiated at Nickajack and Watts Bar reservoirs in 2015 and FLMB fingerlings have been stocked annually in these reservoirs since inception.

Annual roving creel surveys were conducted on Cordell Hull and Nickajack reservoirs in 2022.

Trapnetting was completed on Chickamauga Reservoir which showed an average year for YOY black crappie in most places. White crappie were also represented but at a lower level. YOY bluegill and redear caught in these same surveys pointed to a favorable spawn for those species this year. Trapnetting efforts on Watts Bar Reservoir are not concluded yet due to a delayed winter drawdown. Crappie reproduction on Watts Bar reservoir has been struggling for several years now.

ANS:

Invasive Carp Surveillance took place on the TN River system during the months of late March - September. This involved two electrofishing boats in tandem electrofishing the areas (ascending and descending banks, adjacent areas to dam) below several dams (Melton Hill, Ft. Loudon, Watts Bar, Chickamauga, and Nickajack dams). NO invasive carp were realized during these surveys. Bycatch was also recorded at various times. TWRA also received **NO** confirmations of invasive carp in any Region 3 reservoirs from other sources (ex. angling public, creel surveys, commercial fishing reports, etc.). Zebra mussel traps were also deployed in sections of Watts Bar Reservoir which results are inconclusive at this

time. Additionally, Alabama bass awareness signs have been printed and will be placed at various reservoir access locations.

Stocking:

TWRA continues to stock several species of fish into Region 3 reservoirs:

- Black and blacknose crappie were stocked into Center Hill, Dale Hollow and Watts Bar reservoirs.
- Walleye were stocked into Center Hill, Chickamauga, Dale Hollow, Nickajack, and Watts Bar reservoirs.
- Striped bass were stocked into Chickamauga, Cordell Hull, and Watts Bar reservoirs.
- 300 muskie were stocked into Parksville Reservoir this year. This is the 4th stocking of muskie in Parksville since 2017 when this stocking project was initiated with the stocking of 603 juvenile muskie. An additional 1,000 fish were stocked in 2019 and 300 in 2021. Several reports and photos submitted by anglers show that these muskie are doing well in Parksville and exhibiting favorable growth rates.
- Bluegill and redear sunfish were stocked into Parksville Reservoir for ongoing efforts to enhance forage bases and provide fishing opportunities.
- Florida largemouth bass (FLMB) were stocked into Chickamauga, Nickajack, and Watts Bar reservoirs.

Hatchery (Hiwassee & Sugar Creek facilities):

We have a new hatchery/habitat manager in our crew, his name is **Jacob Mowery**. Jacob is a graduate of UTK and started with us in May. He has been a great addition to our crew and has brought energy, passion, and insight to his areas of responsibility.

Several species of fish were reared at these two facilities this year, including: black crappie, bluegill, redear, FLMB, and walleye. Additionally, the ponds at our Hiwassee fish hatchery now are lined. This will help take care of leaking earthen ponds that were first established there.

Habitat projects:

- Multiple fish attractor units (ex. corrugated pipe in concrete blocks, wooden stakes secured in buckets of concrete) were installed at multiple fish attractor sites on Watts Bar Reservoir. This information (buoy locations) is available on the TWRA website.
- Fish attractor units (Mossback) were installed at Chickamauga Reservoir as part of a joint effort with Major League Fishing (MLF) and Berkley outdoors. This event was also televised on an MLF televised event.

Stake bed (top) and Mossback structures (bottom) getting ready for deployment.

Public Outreach:

- Spring City kid's fishing rodeo
- School programs (education and career days)
- ANS awareness at community events and kiosk updates at access areas.
- Social media posts on TWRA's Facebook regarding fisheries projects and ANS awareness.
- Video of FLMB pond harvest on MLF social outlets and television.

- Reservoir descriptions were created for the TWRA website to aid anglers in species opportunities at each reservoir as well as methods and areas to focus on.
- TWRA “Wildcast” episodes of Alabama bass awareness and invasive carp status.

Tennessee Wildlife Resources Agency—Region III Rivers and Streams

By: Justin Spaulding, Region III Fisheries Biologist

The last year has been very busy for the Region 3 Rivers and Streams office. Our duties cover hundreds of miles of warmwater streams, three major tailwaters, dozens of state or municipal owned lakes, native and wild trout, and seasonally stocked trout fisheries. Working with Fall Creek Falls State Park, Law Enforcement, and Tennessee Tech, we deployed nearly 100 artificial fish habitat structures and 24 tons of gravel to create 15 spawning beds. Our technician, Scotty Webb, received the statewide Technician of the Year award for his diligent work maintaining fish feeders, among other things, as part of the new Bill Dance Signature Lakes. We have also been running a creel survey on Tellico River with Tellico Hatchery. We are also working with Cleveland State to conduct a year-long creel on the Hiwassee River trout fishery. Staff also continued work on describing large predator stomach contents in tailwaters with a non-lethal gastric lavage. Students from TTU also assisted us with fin-clipping trout at Dale Hollow National Fish Hatchery, Southern Appalachian Brook Trout recovery stockings, 3-pass depletion samples, and tailwater sampling. All told, our program has benefited from 850 volunteer hours in 2022. Our federal partners have contributed another 420 hours to the program. If you're reading this and helped, thank you very much, we can't do it without you!

Tennessee Wildlife Resources Agency—Region IV

By: Bart Carter; Region IV Fisheries Program Manager

Sonic tag surgery

On August 2, TWRA personnel and interns participated in a one day “hands on” workshop to get familiar with new sampling equipment and techniques used to monitor invasive carp. The event, conducted on the Duck River near Waverly, was hosted by TWRA’s fisheries staff from Region 1 and the central office in Nashville. Participants spent the day getting familiar with newly acquired equipment (electrified dozer trawl), were introduced to techniques and procedures for implanting sonic tags to monitor carp movement and got experience with extracting otoliths. Although restricted to TWRA’s Region 1 and 2, the workshop benefited personnel in other regions in the event carp expand eastward. Not only was the experience educational for everyone, but it also provided the opportunity to work together and make new connections among professionals and students. TWRA currently manages invasive carp through research, supporting installation of barriers, monitoring, and administering the Tennessee Carp Harvest Incentive Program (TCHIP) which has removed over 18 million pounds of carp from Tennessee waters since 2018.

Dozer trawl

Extracting otoliths