

American Currents

Publication of the North American Native Fishes Association

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ENJOYING NATIVE FISHES, ONE BEER AT A TIME

GEORGE MAIER FUND 2024 GRANT CYCLE ANNOUNCEMENT

The North American Native Fishes Association

Est. 1972 — John Bondhus, founder

Mission: The North American Native Fishes Association (NANFA) is dedicated to the appreciation, study and conservation of the continent's native fishes. NANFA is a 501(c)(3) not-for-profit, tax-exempt corporation chartered in the State of Maryland. The purposes of the organization are: • to increase and disseminate knowledge about native North American fishes; • to promote practical programs for their conservation and the protection/restoration of their natural habitats; • to advance the educational, scientific and conservation benefits of captive maintenance and husbandry; • to encourage the legal, environmentally responsible collection of native fishes for private aquaria as a valid use of a natural resource; and • to provide a forum for fellowship and camaraderie among its members.

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American Currents

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Volume 49  Number 4  Fall (October) 2024

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FRONT COVER: Orangebelly Darters *Etheostoma radiosum* from the Oklahoma convention. (Photo by Scott Smith)

BACK COVER: Banded Sculpin *Cottus carolinae* and Current Darter *Etheostoma uniporum* “interacting” in home aquarium. (Photo by Tyler Goodale)

AN ARCHIVE OF SELECT AMERICAN CURRENTS ARTICLES FROM 1972 THROUGH THE
CURRENT YEAR CAN BE FOUND AT [HTTP://WWW.NANFA.ORG/AC2.SHTML](http://www.nanfa.org/ac2.shtml)

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TOM WATSON

1949-2024

It is with great sadness that we inform the membership that our long-time Treasurer and Membership Coordinator, Tom Watson, passed away on October 21, 2024, from cancer. For many years he was the glue that held NANFA together and he will be greatly missed. The news of Tom's passing reached us too close to our printing deadline to give him the attention he deserves. We will have more on Tom in the next issue.



NANFA News

MEMBERS, EVENTS, ACCOMPLISHMENTS, AND ADMINSTRIVIA

NANFA NEEDS YOU!

Tom Watson, our Treasurer and Membership Coordinator for 17 years stepped down recently for health reason. The fact that he held both positions for so long is a testament to his dedication to NANFA. That is why he was elected a NANFA Fellow in 2022.

While Tom could handle both positions, we do not expect to find another “Tom” in our membership who can take on that much responsibility—it can be time consuming. We are hoping to make it less burdensome by involving more people.

Treasurer: Per the NANFA Constitution, the Treasurer does not have to be a member of the Board of Directors but can be from the membership at large. Duties will be typical of such positions: paying bills, depositing membership dues and other income, such as from conventions, managing the PayPal account, and coordinating orders from the NANFA cart on the website. Access to a Chase Bank would be beneficial. We are seeking two people to fill this position; one as the Primary Treasurer and the other as a back-up to handle the duties as needed. The Treasurer(s) should be willing to serve for an unspecified number of years to ensure continuity and will work closely with the Membership Coordinator.

If you are interested in volunteering for the Treasurer position, please contact Board Chair **Michael Wolfe** at michael.wolfe@nanfa.org.

Membership Coordinator: We are pleased to announce that this position has been filled! **Jake Wade**, NANFA’s Coastal South Carolina Rep, has volunteered. Jake has a degree in Fisheries from the University of Tennessee and is currently a deputy with the Berkeley County Sheriff’s Department. The Membership Coordinator maintains the membership database, updating it in a timely manner. Other duties involve sending the welcome package to new members, notifying members when their memberships are expiring, providing the *American Currents* mailing list to the printer, and working closely with the Treasurer. All members send a big thank you to Jake for stepping up!

A REQUEST FROM THE NANFA NEWS EDITOR

I want to apologize one more time that NANFA News has been mostly beat reporting from the Upper Midwest. My regional network of members is always abuzz, and I have no shortage of material to choose from including way too much exposure of my own “dastardly deeds.” I very much want to be inclusive and emphasize our members are from all over North America. Once again, I am begging, pleading, and groveling for items from new horizons to mix things up. Please don’t be shy about blowing your own horn! Events, regional rep reports, and personal achievements barely scratch the surface of possibilities. Submissions are typically short and very often a single paragraph. Images are also welcome. News items can be emailed to Konrad Schmidt: ssminnow@usfamily.net

BOARD OF DIRECTORS UPDATE

As announced on the NANFA Forum on August 19, 2024, the two-year terms of **Josh Blaylock**, **Scott Schlueter**, and **Tom Watson** have expired. Both Josh and Scott have agreed to serve for the 2025–2026 term, but Tom decided to step down after 19 years on the Board. As was announced in the Forum, nominations were accepted until October 1. Long-time member **Jenny Kruckenberg** was nominated and accepted the nomination. Jenny is the NANFA representative for Minnesota, served as co-host of the 2022 Minnesota Convention, and faithfully transcribes talks by convention speakers. In addition, she has led Darter Hunts for the Minnesota Aquarium Society for many years. Thank you, Jenny, for agreeing to be nominated.

2025 CONVENTION UPDATE: IT’S KENTUCKY!

We know everyone has been eagerly waiting for the announcement of the location of the 2025 NANFA Convention. As you may already have heard via email, we will gather at Kentucky Dam Village State Park in Gilbertsville, KY, from May 29–June 1. We will have more details in the next *American Currents*.

AMERICAN CURRENTS UPDATE

Konrad Schmidt, **Fritz Rohde**, and **Olaf Nelson** have been providing you, the NANFA membership, with quality issues of *American Currents* for the past 12 years. Issues had been sporadic for several years prior to their taking over. They pride themselves on consistently producing four issues per year, every year, so if you aren’t getting that many, you might want to see if your postal carrier is a fish lover. If they aren’t the problem, then notify us about it by emailing americancurrents@nanfa.org.

For many years, the back cover has read “This is your FINAL ISSUE of *American Currents* if the date above your name is: [followed by three dates]. Please renew your membership today!” This was done to make up for the missed issues over 12 years ago. Over the years this may have created some confusion as to when to renew. Starting with this issue, we will be changing everyone’s expiration date to align with actual dates joined and paid.

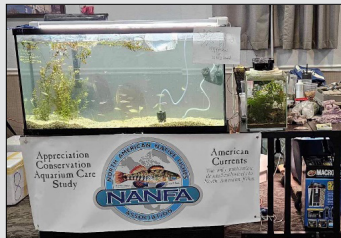
BURBOT TISSUES REQUESTED FOR A RANGE-WIDE BIOGEOGRAPY STUDY

Esme MacPherson (University of Toronto) contacted **Matt Kvam** and **Konrad Schmidt** about acquiring tissues from Burbot *Lota lota* from Minnesota populations for her graduate research project. Both members were happy to help her out. She would appreciate getting as many samples as possible from across the species’ range. In order to finish her project and graduate on time, she will need to receive samples by the end of April 2025. She can

provide instructions and supplies upon request. Contact her via email at esme.macpherson@mail.utoronto.ca.

OUTREACH AT FINDIG

Phil Farrell is NANFA's California regional representative. In June 2024 (on his birthday, so this was extra special), he went to FINDIG, a big show and auction held by his local club, the Sacramento Aquarium Society. With help from a bunch of people who he can't thank enough, it was a huge success.



(Photo by Phil Farrell)

He set up a 70-gallon tank, several nano tanks, and gave natives to some fellow vendors who had tanks on display but no fish. Special thanks go out to Sam Scälz and ZooMed for their support and for the use of some of their tank space! They have a new line of nano tanks

that are perfect for pygmy sunfish and were happy to house Banded Pygmy Sunfish *Elassoma zonatum* for him. Phil also thanks Jonah's Aquarium for supplying some of the fish in his tanks.

The show was in a really nice hotel meeting room, the speakers were fantastic, and the topics—covering everything from a native species (Black Chin Livebearer *Girardinus metallicus*) to DIY tank projects—were varied enough to appeal to anyone, from novice to advanced. There were several native tables besides Phil's, including some that also had pygmy sunfish. Feather River Hatchery was there with a fantastic display of trout in a chilled tank, as well as hatchery-raised Sacramento Perch *Archoplites interruptus*, an endangered species that is more common in Arizona, where they are planted as game fish, than in California.

Phil's fully planted 70 tall (the 48x13-inch footprint of a 55 but much taller: 32 inches) held a mix of Sailfin Mollies *Poecilia latipinna*, melanistic Gambusia, Golden Topminnows *Fundulus chrysotus*, some minnows, and a nice Orangespotted Sunfish *Lepomis humilis*.

Phil's team had a micro rod made by ProFISHency with just a soft pink bobber and a weight on it. Anyone who stopped by could try to cast the bobber into a blue bucket at 25 feet for a prize: their choice of different pairs of native fishes. Phil hit the target about two-thirds of the time, but he didn't give away a single pair of fish!

They gave the tank (with stand, lights, filters, and substrate) away. The winner—a fish-loving biology major in college—was so excited she was literally jumping up and down.

NANFA CONVENTIONS ARE A GOOD THING!

At the 2023 South Carolina convention, Scott Smith and Bryn Tracy demonstrated a simple way to photograph large species on an acrylic board elevated over a background. Photo subjects were amazingly docile and cooperative during the process. Konrad Schmidt realized that this would be an excellent hands- and fingers-free alternative to scores of photos he had shot for *The Fishes of Minnesota* and great additions to his NANFA Photo Gallery. Fisheries biologists from both the Minnesota and Wis-

consin Departments of Natural Resources graciously agreed to catch species for the effort during scheduled surveys, and Jenny Kruckenberg did an excellent job making the subjects look their best. One modification was using a sun shade for bright days. Some joked about its appearance, but it greatly helped reduce glare from scales and fins. It is amazing what you can learn at NANFA conventions!



Left: sun shroud. Right: Blue Sucker *Cycleptus elongatus*. (Photos by Jenny Kruckenberg and Konrad Schmidt, respectively)

RETIRE? WHY? FISH BIOLOGIST REFUSES TO HANG UP HIS NETS



Starhead Topminnow (left) and Orangethroat Darter (right). (Photos by John Olson)

John Olson retired from the Iowa DNR years ago, but he has continued contributing knowledge about his state's fish distribution. He has been part of the Multiple Species Inventory Monitoring (MSIM) project, focusing on fish surveys in parks, nature preserves, and wildlife areas. In June 2024, some of his colleagues found Starhead Topminnows *Fundulus dispar*—last reported in Iowa in 1938—in the Turkey River (Clayton County). In September, he returned with the MSIM crew to collect specimens and tissues for a museum collection and estimates they sampled over 100 individuals in half an hour. John has also been monitoring populations of the state-threatened Orangethroat Darter *Etheostoma spectabile*. In April 2024, he found them doing well in Dry and Wanatee creeks of the Cedar River drainage (Linn County). Again, a few specimens and tissues were preserved for a museum collection.

VERY GRATIFYING NEWS FROM GLACIAL LAKES STATE PARK

Since 2020, Jenny Kruckenberg and Konrad Schmidt, with the assistance of Minnesota DNR Parks and Trails Resource Management staff, have been translocating five sensitive fishes to Signalness Lake, which supported at least three of the five species before being treated with rotenone in the 1960s to eliminate competition for game fish. In September 2024, all five, including the state-threatened Pugnose Shiner *Miniellus anogenus* and special concern Least Darter *Etheostoma microperca*, were found with little effort. MDNR will continue monitoring the populations along with aquatic plant community surveys and water chemistry analysis.

NANFA News, continued



Left: Jeff Marjamaa (DNR) and Konrad Schmidt seining Signalness Lake. Right: Least Darter. (Photos by Jenny Kruckenberg)

MICROFISHING WEBINAR

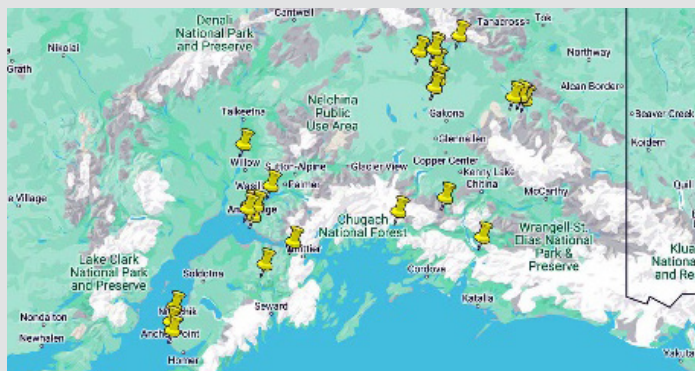
A Micro Fish....?

- Well, isn't that just bait?
- Debatable definition....
 - Smaller than panfish (i.e. sunfish)
 - Max size of up to 8 inches
 - Realistically...too small to target with recreational tackle (including young of the year game fish)

Images shown: Banded Killifish, Johnny Darter, and two images of fish (Bass and Sunfish) with red 'X' marks over them, indicating they are not microfish.

Minnesota DNR Fish Biologist **Tony Long** gave a comprehensive 43-minute online presentation on microfishing in July 2024. It was geared toward beginners and people thinking about trying something different, but had plenty of info for seasoned micro anglers. After the presentation, viewers asked questions. The presentation is on YouTube: <https://youtu.be/IQZAVa4Njb8>.

ALASKA FRESHWATER FISH INVENTORY



Konrad's sample stations

It took Nate Cathcart, a Department of Fish and Game (ADF&G) biologist heading the Inventory program, almost no effort to "recruit" **Konrad Schmidt** to volunteer for a survey of the Copper River basin in July 2024. Even though this was Konrad's fourth trip to Alaska, he was again in awe of the vast and pristine landscape in the Wrangell-St. Elias National Park and Preserve. Alaska may not have a huge diversity of fishes, but there are a

number of unique species that Konrad gladly added to his life list: Sockeye Salmon *Oncorhynchus nerka*, Humpback Whitefish *Coregonus pidschian*, and Pacific Lamprey *Entosphenus tridentatus*. At the end of Konrad's "indentured servitude," Nate began a 10-day raft survey down the Copper River with several long-time friends he also recruits annually as volunteers. Konrad, with the generous loan of Duncan Green's (FGD) personal pickup, tore up south central Alaska fish collecting and found his Holy Grail: Alaska Blackfish *Dallia pectoralis*.

2025 MINNESOTA DNR NATIVE FISH CALENDAR SHOWCASES MANY NON-GAME SPECIES

In its ongoing effort to promote native non-game fishes (now classified legally in the state as "native rough fish" and able to be managed with the same mechanisms as game fish), MDNR has released a 2025 calendar. NANFA members donated several images, including Corey Geving's Greater Redhorse *Moxostoma valenciennesi* (April) and Freshwater Drum *Aplodinotus grunniens* (July); **Drew Geving's** White Sucker *Catostomus commersonii* (February); and **Tony Long's** Emerald Bowfin *Amia ocellicauda* (March), Shorthead Redhorse *M. macrolepidotum* (September), and Mooneye *Hiodon tergisus* (December). The calendars were distributed for free at the Minnesota State Fair. There may be a limited number calendars still available. Please send inquiries to Minnesota DNR 500 Lafayette Road, St. Paul, MN 55155-4040, call (888) 646-6367, or email: info.dnr@state.mn.us.

MINNESOTA NATIVE FISH CALENDAR 2025



NANFA RECEIVES \$1500 DONATION FROM THE CELANESE FOUNDATION

Ray Katula works for the Celanese Corporation, a global chemical and materials manufacturer with many locations, including Winona, MN. Their foundation annually asks employees to nominate charity and non-profit organizations for consideration. Kudos to Ray for submitting NANFA as a candidate—this gift is greatly appreciated! In 2022, the foundation donated \$500 to NANFA, crediting Ray for his time spent preparing for the Winona convention.

NANFA News, continued

WISCONSIN EXOTIC FISH SURVEY



Freshwater Tubenose Goby. (Photo by Konrad Schmidt)

The Duluth-Superior Harbor is a hotbed for non-indigenous fishes established via the discharge of ballast water from commercial shipping. John Lyons, Curator of Fishes at the University of Wisconsin Zoological Museum in Madison, had not checked sites where he had previously found the Freshwater Tubenose Goby *Proterorhinus semilunaris* for a number of years. In September 2024, he and Konrad Schmidt unfortunately found the species doing well in the harbor and the mouth of Dutchman Creek east of Superior, Wisconsin. Other exotics found included Alewife *Alosa pseudoharengus*, White Perch *Morone americana*, and Round Goby *Neogobius melanostomus*. Exotics that are known to occur in the area but not found include Ruffe *Gymnocephalus cernuus* and Threespine Stickleback *Gasterosteus aculeatus*.

WILDERNESS EXPEDITION FINDS DEEPWATER SCULPIN IN FOUR NEW LAKES



Left: The motley crew of sculpin chasers. Right: Deepwater Sculpin from Amoeber Lake. (Photo by Matt Kvam)

For eight days in August 2024, Jeff Eibler, Bob Hrabik, Matt Kvam, Konrad Schmidt, and Carla Hanson paddled and portaged 92 miles through the Boundary Waters Canoe Area Wilderness in Superior National Forest in northeastern Minnesota. This included 33 lakes (78 miles) and 41 portages (14 miles). The grand effort using deep-set minnow traps baited with glow sticks found new localities for Deepwater Sculpin *Myoxocephalus thompsonii* in Kek, Amoeber, Hanson, and Rabbit lakes. New localities for the lake form of Slimy Sculpin *Cottus cognatus* include Jasper, Kek, Fraser, Amoeber, Cherry, Clouds, and Rabbit lakes. Jeff Eibler (Minnesota DNR retired) additionally conducted dissolved oxygen profiles in 10 lakes and collected otoliths and other data from a suspected dwarf-form population of Lake Whitefish in Spoon Lake.

STONECAT HUNT IN WESTERN NORTH CAROLINA

North Carolina Wildlife Resources Commission (NCWRC) non-game biologist Luke Etchison organized a snorkel/microfishing/

photography/camping trip at the Little Tennessee River in early September. Ostensibly, the purpose of the trip was for Scott Smith and Fritz Rohde to photograph a Stonecat *Noturus flavus*, a form distinct from those found in central North America, from North Carolina waters for the NCFishes website. Jumping at the chance for some fun in the sun and water, the three were joined by Ryan Sonier, Nick Anderson, Tim Boyer (a recent convert to microfishing), and Josh Rains (a promising young fish photographer). Luke successfully snorkel-dipped several Stonecats and the microfishers also caught one. Other notable sightings were Spotfin Chub *Erimonax monachus*, Wounded Darter *Etheostoma vulneratum*, and Tangerine Darter *Percina aurantiaca*.



Top: Scott and Fritz photographing a Stonecat. Fritz is holding the fish motionless by its pectoral spine and wearing a black latex glove (photo by Timothy Boyer). Bottom: a NC Stonecat.

FISHES OF THE WISSAHICKON CREEK BOOK AVAILABLE

FISHES OF THE WISSAHICKON CREEK

R. BRUCE GEBHARDT

INCLUDING FISH PHOTOGRAPHY BY R. BRUCE GEBHARDT



THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA
SPECIAL PUBLICATION 26
2024

The late Bruce Gebhardt was a past President of NANFA as well as an editor for *American Currents*. His sister, Carol, submitted his manuscript on the fishes of Wissahickon Creek in Pennsylvania to Philadelphia's Academy of Natural Sciences. Bruce's expertise on fishes and their behavior is crammed into this slim volume (98 pages and 61 color photos), and his passion for conservation is evident throughout. It only costs \$10 and can be ordered through the following link:

https://secure.touchnet.com/C20688_ustores/web/store_cat.jsp?STOREID=73&CATID=514&SINGLESTORE=true

A RECAP OF PRESENTATIONS AT THE 2024 NANFA CONVENTION IN OKLAHOMA

Jenny Kruckenberg

Our host, Brandon Brown, welcomed us to Oklahoma and to Broken Bow, saying while there had recently been over five inches of rain, that was actually much less than what flooded out the NANFA convention that was scheduled to occur there in 2015.

Brandon said that he is looking for help finding the Ironcolor Shiner *Alburnops chalybaeus*, a Species of Greatest Conservation Need (SGCN) that hasn't been seen in Oklahoma for 30 years. He also encouraged us to take photographs, on a black background if possible, for the Fishes of Oklahoma poster series.



NONGAME FISH REGULATIONS: WHAT DO WE KNOW AND WHAT DO WE NEED TO KNOW?

Doug Zetner, Fisheries Research Supervisor,
Oklahoma Department of Wildlife Conservation

The fisheries management triangle is made up of three corners: people, fish, and environment (habitat). In terms of environment, the Habitat Suitability Index began as early as the 1950s and gained steam in the 1970s, and has become more sophisticated. It now incorporates climate change. On the subject of fishes, he said that we are learning more and more about them. He cited recent papers where improved age analysis has found Bigmouth Buffalo *Ictiobus cyprinellus* living more than 100 years and recent advances in the use of DNA, allowing us to discover unknown species diversity in Bowfins *Amia* spp. Finally, there is the issue of people (and management of them). One issue to consider on this front is the many different types of fishing gear that are being employed now: gigging, spearing, microfishing, bowfishing, etc. He talked about the recent interest in microfishing and whether hooking mortality should be studied. There is a lot of scrutiny on bowfishing tournaments and the question of whether some species are being overharvested. Doug also talked about funding and federally awarded dollars. For years,

money has come from fishing licenses and taxes on fishing gear, but it is often earmarked for sport fish. Should some of this money be allocated towards nongame fish? While some sportfishers have objected, there seems to be a paradigm shift in terms of understanding of what is important, even for "rough fish." For successful management, agencies need to find the balance between their constituents and the resources. There is still much to learn.

ODWC HATCHERY RESEARCH AND SGCN PROPAGATION

Brooke Beverly, Fisheries Biologist, Oklahoma
Department of Wildlife Conservation

According to the National Heritage Global Rank, there are 55 species in Oklahoma designated as Species of Greatest Conservation Need (SGCN). ODWC has hatchery facilities at Byron, Durant, Holdenville, and Manning.

At the Durant Hatchery, they are working with Florida Bass *Micropterus salmoides*. On the SGCN production side, the US Fish and Wildlife Service is working collaboratively with ODWC on propagating Blue Sucker *Cycleptus elongatus*. For brood stock collection they established that electrofishing was better than gill-netting. They found that some times of the year were better for collecting than others in terms of maximizing success; at certain times of the year, blood work revealed that all the fish collected were males. They will continue production research with Blue Suckers and may start new SGCN programs.



Beverly and crew barge electrofishing for Blue Suckers on the Red River. (Photo by ODWC)

BLUE SUCKERS IN THE RED RIVER SYSTEM Joseph Dyer, Oklahoma Conservation Commission

Fresh water is only about one percent of the Earth's surface water, but it is home to 48% of all fishes. Big river migratory fishes (like

the Blue Sucker) are less than 10% of imperiled species. Other important Oklahoma migratory big river fishes that are of concern include Shovelnose Sturgeon *Scaphirhynchus platyrhynchus*, Alligator Gar *Atractosteus spatula*, and Paddlefish *Polyodon spathula*. The Blue Sucker was described in 1817 and was considered fine dining in the 19th century. By 1920, it was almost fished to extinction, and in 1999 there was consideration of placing it on the federal Threatened and Endangered list, which resulted in an interest in these fish. A publication in 1999 suggested that the perceived decline was due to misunderstanding their seasonal migration patterns.

To understand the species better, Oklahoma researchers studied the Blue Suckers in a specific study area, which included the tailwater of the Lower Red, Blue, and Kiamichi rivers, and Muddy Boggy Creek, all in southernmost Oklahoma. All of these locations were utilized (sometimes by the exact same fish) as part of their seasonal movements. By attaching acoustic tags, biologists were able to watch particular fish go back to their birthplace to spawn. In all systems except Muddy Boggy Creek, almost 100% of the suckers returned to where they were tagged. Joseph tracked the movements of one female fish, “Tina,” from 2015 to 2017; she traveled from the tailwater of the Red River (2015) to Muddy Boggy Creek, the Kiamichi River, and Red River tailwater (2016), then back to Muddy Boggy in 2017. Spawning is opportunistic with an early pulse related to river discharge and water temperature. Young of the year recruitment is strong in the Red River. Threats to big river fishes include habitat loss by non-source pollution (sediments), fragmentation from dams, and flow regime alteration.



Blue Sucker. (Photo by Joseph Dyer)

CONSERVATION OF GLACIAL LAKE AND WETLAND FISHES IN OHIO Brian Zimmerman, The Ohio State University



Brian is interested in the distribution of Ohio fishes and compiled historical data complemented with surveys between 2011 and 2015.

He found a data gap for glacial lake and wetland fishes in Ohio, which were last surveyed in 1980s-90s. He looked at 152 locations to address gaps in the data. Brian found this group of fishes to be Ohio's most imperiled. He began a captive breeding program focused on 10 state-listed fishes, ranging from Spotted Gar *Lepisosteus oculatus* to Least Darter *Etheostoma microperca*. In 2016 he built six ponds (15 feet x 15 feet) at his home. He has since been able to successfully propagate eight of the species. To date he has produced over 9,000 fish, which have been stocked into 15 locations since 2016.

OKLAHOMA FISHES: A REGIONAL APPROACH

Dr. Bill Matthews and Dr. Edie Marsh-Matthews

This book is overdue but is coming soon. It is not a revision of *The Fishes of Oklahoma* by Miller and Robison (2004). It is also not a typical “Fishes of” book. It has no dichotomous keys, identifications rely on external characteristics only—no dissections. This regional approach limits the number of comparisons with other species. They will not compare species found only in Ozark streams to fishes found only in southwestern Oklahoma.

There are 12 chapters: 1. Oklahoma's Fishes; 2. Fish Regions of Oklahoma; 3. Fish Families of Oklahoma; 4. Widespread Species; 5–11 (example below). Fishes of Individual Regions; and 12. Oklahoma Fishes: Past, Present, and the Future? There are about 180 species, but that varies with new descriptions, extirpations, and invasions. Data are from their own 1200+ collections in Oklahoma, as well as additions from museums, published papers, and agency reports. The target date for publication by Texas A&M University Press is autumn 2025.

Chapter 4 – Widespread Species 70 species

Species known from at least five of our seven fish regions.

Species description
Photograph
Distribution in Oklahoma
Typical habitat



Red Shiner (*Cyprinella lutrensis*)
Photo by Brandon Brown



Above: Gizzard Shad (*Dorosoma cepedianum*).
Below: Threadfin Shad (*Dorosoma petenense*).
Photos by Brandon Brown

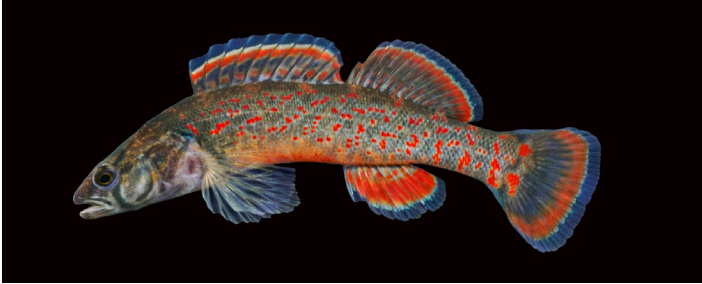


River Carpsucker (*Carpiodes carpio*)
Photo by Brandon Brown

WHERE THE REDFIN GROWS! Drew Wallace, Oklahoma Department of Wildlife Conservation

The Redfin Darter *Etheostoma whipplei* in Oklahoma is a Tier 2 SGCN. Studies are underway to evaluate historical collections to determine potential changes in occurrence and to identify stream characteristics that may influence Redfin Darter occupancy. Over 5,500 surveys were analyzed: historical ones from 1905–1999 and contemporary ones from 2000–2023. Occupancy Modeling Analyses consists of two processes: Occupancy and Detection. Sites were looked at for a single species and also for a complete fish assemblage comparing where they were found between 1905–1999

to 2000–2023. The Occupancy percentages were between 1% and 75% in various regions. The highest detection of Redfin Darter (62–65%) was in streams with a slightly warmer temperature and a little bit more turbidity. They also seem to prefer gravel over sand/silt in smaller, low-flow streams. In streams where conductivity was higher, there were less Redfin Darters. He finished by concluding that Redfin Darters could possibly be downgraded to Tier III status, because they appear to be more abundant and have a greater distribution than what was seen in past sampling.



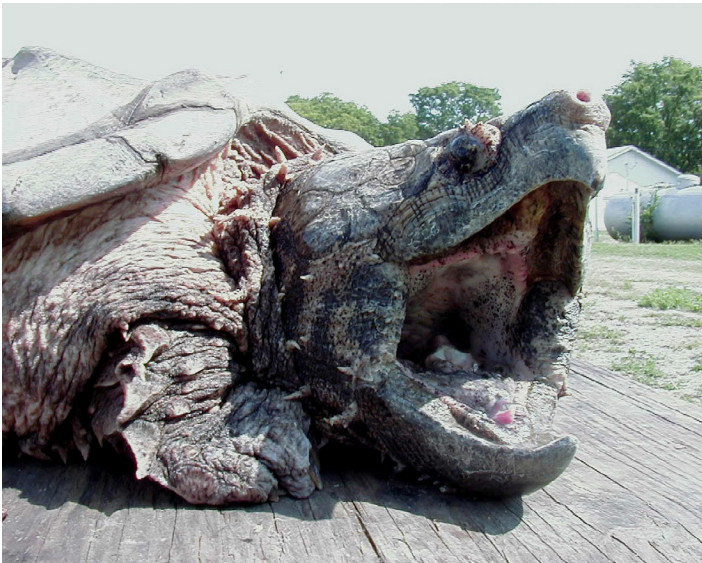
Redfin Darter. (Photo by Brandon Brown)

OKLAHOMA FISH AND WILDLIFE CONSERVATION OFFICE (OKFWCO)

Brian Fillmore, US Fish and Wildlife Service

The OKFWCO was established in 1992 and is housed on the Tishomingo National Fish Hatchery in Reagan, OK. Their mission is to collaborate with partners to conserve and restore aquatic species in Oklahoma by monitoring fisheries, prescribing management actions, monitoring invasive species, and restoring aquatic connectivity and habitat.

The Office has been active in improving fish passage and provided examples of five successful projects. They have assessed movement, distribution and population demographics, and spawning and recruitment of invasive carp in the Red River. Broodstock collections involve Paddlefish and Alligator Gar as well as post stocking assessments with other agencies. They conduct long-term monitoring on at-risk species such as Arkansas River Shiner *Alburnops girardi*, Peppered Chub *Macrhybopsis tertanema*, and Leopard Darter *Percina pantherina*. Much of their recent work is focused on the Alligator Snapping Turtle *Macrochelys temminckii*.



Alligator Snapping Turtle. (Photo by OKFWCO)

RED SLOUGH WILDLIFE MANAGEMENT AREA

Robert Bastarache, District Biologist, Ouachita National Forest

The Red Slough Wildlife Management Area encompasses 5,814 acres in southeastern Oklahoma. Wildlife is diverse, with 323 species of birds, 91 butterflies, 89 dragonflies/damselflies, 70 fishes, 66 reptiles and amphibians, and 39 mammals. The Slough is a favorite destination of many nature enthusiasts, with visitors from 48 states and 14 foreign countries documented so far. Robert talked about their work with the federally threatened Leopard Darter and their surveys for it since 1998. He showed an example of a barrier that had been replaced with a fish-friendly one.



Before and after. (Photos by USFWS)

NATIVE FISH RAMBLINGS: A QUINTOLOGY

Casper Cox, Chattanooga, Tennessee

Casper gave an entertaining overview of his life and his passion for snorkeling. See his article in this issue.

Born in 1957, he remembered hearing music by Country Joe and the Fish in 1969, who played at Woodstock. By 1988, he was the father of three young kids, all named after blue colors: Cobalt, Cerulean, and Cyan. The Tennessee Aquarium opened in his hometown in 1992, and in 1993 they offered snorkeling on the Conasauga River. He was hooked! In 1998, Casper hosted the NANFA convention in Chattanooga, the same year “Ets” (the late Dr. Dave Etnier) was reporting about the endangered Snail Darter *Percina tanasi*. In 2006, Cobalt decided to do an Eagle Scout project featuring large signs with native fishes from the nearby Chickamauga Creek. Between 2010 and 2019, Casper served as a

snorkel guide at the Cherokee National Forest. In 2019, his *Hidden Rivers* book was released and shortly after that the *Hidden Rivers* film premiered. He became even more well known from the movie. In one scene he exclaims, “Water is Life!” while submerged in a stream

Casper shared his passion for snorkeling and how in the early years he would camp overnight and even go snorkeling in the dark. He would take various groups snorkeling, such as college students from Young Harris College or Boy Scouts. They would observe all kinds of darters. He said it was a rewarding and inexpensive pastime; you just fill up the gas tank and grab a map. He didn’t even have a wet suit at first. Casper became well known in Tennessee and NANFA, and he received several grants for Cobalt’s signs and his book, which has sold over 1,400 copies so far.

Casper also talked about the importance of recycling and leaving the stream as clean as possible, encouraging folks to engage in river cleanups. During the last part of his presentation, Casper spoke of the large cement pond—formerly a swimming pool—at his home. It has a retaining wall, waterfall, riffle run, and a substrate of pea rock and plants. He floats in there for hours observing the many fishes that have adapted to this environment.

NANFA Conasauga River Field Trip 1998



ALLIGATOR GAR AT TNFN Ralph Simmons, Tishomingo National Fish Hatchery Project Leader



The Oklahoma record for Alligator Gar is 254 pounds and the world record is 327 pounds! The next largest gar in Oklahoma

is the Longnose Gar *Lepisosteus osseus* with a state record is 43 pounds. The Alligator Gar is not only the largest but also the longest lived of all the gar species. It is an apex predator in the river ecosystem and is sometimes referred to as “the king of the river.” An ambush predator, it is able to take prey that are 1/3 its body length. Their diet consists of carp, buffalo, drum, or whatever is most abundant around them. They digest their prey for days and expend little energy until they’re ready to feed again.

The species is in decline. Reasons for this include loss of spawning habitat, susceptibility to overfishing, and being considered a “trash fish” for decades. TNFH is raising two strains of Alligator Gar: one from the Red River for reintroduction in Oklahoma and one from Mississippi for reintroduction into Missouri. Even as larval fish, Alligator Gar are not picky eaters and will eat things half their body length. The hatchery feeds them shrimp, krill, and floating catfish pellets. The fry grow very quickly.

In conclusion, Ralph reminded the audience that outreach is extremely important. The public needs to be educated and informed about the importance of the Alligator Gar within the river community, including how Alligator Gar will control other fish, including invasive carp. If your dad taught you to “kill ‘em all,” you shouldn’t listen to your dad! We need to put the KING back into his rightful place.

SKIPJACK HERRING

Donnie King, Fisheries Technician, Oklahoma
Department of Wildlife Conservation

In Oklahoma, Skipjack Herring *Alosa chrysochloris* is restricted to the Arkansas River and Red River drainages. Prized as catfish bait, it is normally a bycatch for anglers. It has never been collected in large numbers by Oklahoma biologists with traditional use of gill nets and electrofishing, so ODWC decided to use rod and reel angling, especially with Sabiki rigs. Success! In four trips in summer 2023 they caught 157 individuals. Ages ranged from 0 to 3 years. Stay tuned for updates.



Several Skipjack Herring caught on a Sabiki rig. (Photo by ODWC)

Table 1. Fishes caught or observed at the 2024 NANFA Convention at Broken Bow, OK

Common Name	Scientific Name	Common Name	Scientific Name
Polyodontidae—Paddlefishes		Fundulidae—Topminnows	
Paddlefish	<i>Polyodon spathula</i>	Western Starhead Topminnow	<i>Fundulus blairae</i>
Lepisosteidae—Gars		Golden Topminnow	<i>Fundulus chrysotus</i>
Spotted Gar	<i>Lepisosteus oculatus</i>	Blackstripe Topminnow	<i>Fundulus notatus</i>
Longnose Gar	<i>Lepisosteus osseus</i>	Blackspotted Topminnow	<i>Fundulus olivaceus</i>
Shortnose Gar	<i>Lepisosteus platostomus</i>	Poeciliidae—Livebearers	
Dorosomatidae—Thread Herrings		Western Mosquitofish	<i>Gambusia affinis</i>
Gizzard Shad	<i>Dorsoma cepedianum</i>	Centrarchidae—Sunfishes	
Threadfin Shad	<i>Dorsoma petenense</i>	Flier	<i>Centrarchus macropterus</i>
Catostomidae—Suckers		Plains Longear Sunfish	<i>Lepomis aquilensis</i>
River Carpsucker	<i>Carpionodes carpio</i>	Green Sunfish	<i>Lepomis cyanellus</i>
Western Creek Chubsucker	<i>Erimyzon claviformis</i>	Warmouth	<i>Lepomis gulosus</i>
Lake Chubsucker	<i>Erimyzon sucetta</i>	Orangespotted Sunfish	<i>Lepomis humilis</i>
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	Bluegill	<i>Lepomis macrochirus</i>
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>	Dollar Sunfish	<i>Lepomis marginatus</i>
Black Redhorse	<i>Moxostoma duquesnei</i>	Redear Sunfish	<i>Lepomis microlophus</i>
Golden Redhorse	<i>Moxostoma erythrurum</i>	Redspotted Sunfish	<i>Lepomis minatus</i>
Leuciscidae—Minnows		Bantam Sunfish	<i>Lepomis symmetricus</i>
Highland Stoneroller	<i>Camptostoma spadiceum</i>	Caddoan Longear Sunfish	<i>Lepomis</i> sp.
Red Shiner	<i>Cyprinella lutrensis</i>	Largemouth Bass	<i>Micropterus nigricans</i>
Blacktail Shiner	<i>Cyprinella venusta</i>	Spotted Bass	<i>Micropterus punctulatus</i>
Steelcolor Shiner	<i>Cyprinella whipplei</i>	“Little River” Smallmouth Bass	<i>Micropterus</i> sp.
Ouachita Shiner	<i>Lythrurus snelsoni</i>	Black Crappie	<i>Pomoxis nigromaculatus</i>
Redfin Shiner	<i>Lythrurus umbratilis</i>	Elassomatidae—Pygmy Sunfishes	
Bigeye Shiner	<i>Miniellus boops</i>	Banded Pygmy Sunfish	<i>Elassoma zonatum</i>
Kiamichi Shiner	<i>Miniellus ortenburgeri</i>	Moronidae—Temperate Basses	
Golden Shiner	<i>Notemigonus crysoleucas</i>		<i>Morone</i> hybrid
Rocky Shiner	<i>Notropis suttkusi</i>	Percidae—Perches and Darters	
Bluntnose Minnow	<i>Pimephales notatus</i>	Scaly Sand Darter	<i>Ammocrypta vivax</i>
Bullhead Minnow	<i>Pimephales vigilax</i>	Slough Darter	<i>Etheostoma gracile</i>
Creek Chub	<i>Semotilus atromaculatus</i>	Blue River Orangebelly Darter	<i>Etheostoma cyanorum</i>
Icaturidae—North American Catfishes		Goldstripe Darter	<i>Etheostoma parvipinne</i>
Yellow Bullhead	<i>Ameiurus natalis</i>	Plains Orangethroat Darter	<i>Etheostoma radiosum</i>
Blue Catfish	<i>Ictalurus furcatus</i>	Orangebelly Darter	<i>Etheostoma pulchellum</i>
Freckled Madtom	<i>Noturus nocturnus</i>	Redfin Darter	<i>Etheostoma whipplei</i>
Flathead Catfish	<i>Pylodictis olivaris</i>	Logperch	<i>Percina caprodes</i>
Esocidae—Pikes and Mudminnows		Channel Darter	<i>Percina copelandi</i>
Grass Pickerel	<i>Esox a. vermiculatus</i>	Leopard Darter	<i>Percina pantherina</i>
Aphredoderidae—Pirate Perches		Dusky Darter	<i>Percina sciera</i>
Western Pirate Perch	<i>Aphredoderus gibbosus</i>	Sciaenidae—Drums and Croakers	
Atherinopsidae—New World Silverside		Freshwater Drum	<i>Aplodinotus grunniens</i>
Brook Silverside	<i>Labidesthes sicculus</i>		
Green Silverside	<i>Labidesthes vanhyningi</i>		

A SELECTION OF PHOTOS FROM THE 2024 NANFA CONVENTION









2024 NANFA OKLAHOMA CONVENTION: A SNORKELER'S DOUBLE-B PERSPECTIVE

Casper Cox

Chattanooga, Tennessee

MONDAY JUNE 3:

The Wolfe (Michael) and I rendezvoused within 10 minutes of one another at the great Memphis Pyramid overlooking the mighty Mississippi River. We ascended, via a credit card free bonus, to the apex and peered out over the expansive river and city while we ate lunch. I ordered a Cobb salad while Michael added a charcuterie board served under steampunk sculptures of fish, steam and gasoline powered, stained glass fins, fitted and wired with copper and brass (Figure 1). Our needs satisfied, we drove west, crossing the wide river into Arkansas, driving for an additional three hours through a rainbow, sunset, and torrential rain arriving late in Arkadelphia.

TUESDAY JUNE 4:

The morning greeted us with more rain as we headed to the Caddo River, marked on my Arkansas Gazetteer near Glenwood. Arriving there, the river was murky brown and high from all the torrential rains that had fallen days earlier. Is the NANFA convention going to be a washout? My experience in these unpleasant events told me to head to the headwaters. We drove north to my mark on the map at Caddo Gap, and again the river flowed high, turbid, and brown. Continuing even farther north, while stopping at several muddy tributary crossings, we eventually arrived at the tiny crossroad town of Norman. We enjoyed a nice lunch at the quaint Norman General Store, where we studied the Arkansas Gazetteer. The Gazetteer's detailed map offered new options. Just west was a crossing of the Caddo River at Black Springs. Once

there, turning left we soon crossed a buttressed, concrete-blocked, one-lane bridge over the Caddo. A gravel bar just beyond offered a nice pull-in adjacent to the narrowed Caddo. Walking to the river's edge, we noticed it was pleasingly clear, much clearer than anything we had seen so far that day. I returned to my van, now covered with butterflies, odd I thought, as I pulled out my Gazetteer for another look. Studying the map, I followed the thin blue line upstream westward, about two inches, translating to about seven miles. Right near where the line became blue dashes lay Cox Spring, seemingly the origin of the Caddo River. Being a butterfly Cox seeking clear water, I took this as a good omen and knew we were at the right place for a day of snorkeling.

Michael geared up (Figure 2) and I went in bare-skin, quickly observing schools of mystery shiners. We worked under the bridge to where a fallen tree blocked our passage upstream, then back under the bridge, along a gravel bar of crayfish and darters, and eventually downstream to the turn beyond the gravel bar. Wonderful water, the clarity ideal, and the temperature pleasingly cool. We observed many species to discuss, presenting a confusing wonder. Some were known from our home waters, the hog suckers, stonerollers, Steelcolor Shiners, Greenside Darters, studfish, and a world of sunfish, but there were new darters, new mystery minnows, and some ID uncertainty. By the late afternoon we were well chilled and had accumulated a species list with photographs. With the sun lowering I wanted to drive those few miles to visit Cox Spring. As an additional motivation to explore, Michael had found, via Google, a Cox Cemetery just beyond the spring. Driving west we checked out a couple more Caddo crossings, but they were uninviting—too small and shaded with awkward park-

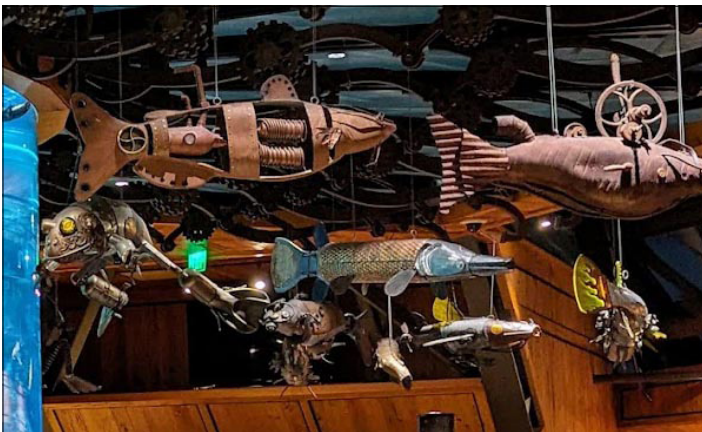


Figure 1. Steampunk fish at Memphis Pyramid. (Photo by Kirsten Franka)

Photos by the author unless otherwise indicated.

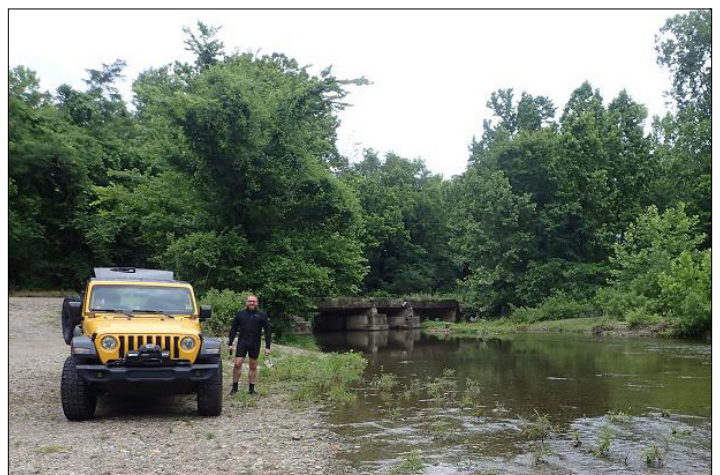


Figure 2. Finally we find clear water to immerse ourselves in.

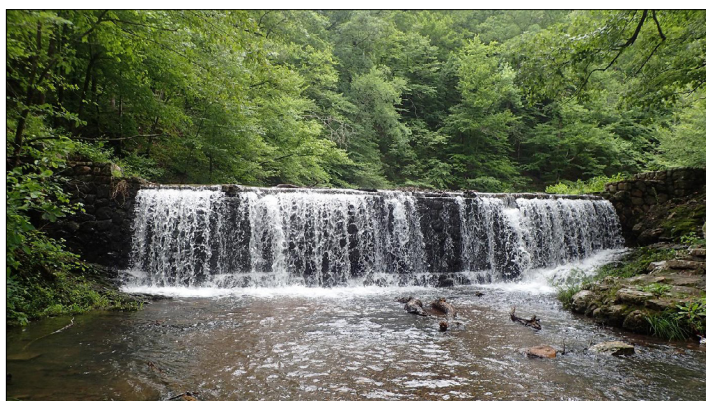


Figure 3. A picturesque view of the lower dam from a Creek Chub's perspective.



Figure 4. Wary crayfish, one of many below the first dam.

ing—and I soon became content with our initial site. We found the cemetery easily, but my big regret of the entire AR/OK/AR trip was not walking through the cemetery and viewing the gravestones for names and dates. But even more regretful was passing by an old man in Cox Spring. He likely would have offered a great deal of knowledge and history of the area. But such is adventure and opportunities lost.

We returned to the gravel bar and decided to camp overnight, breaking out leftovers, and dragging chairs to the water's edge. What an ideal site. We were relaxing and settling in for an evening chat when the mosquitoes drove us to our vehicles. Rain and thunder awoke me at 3:30 am, and I opened my van doors to let the cool, fresh air in, while listening for potential rising water torrents. I was soon swarmed with mosquitoes and pulled the thin sheet close to my nose. I thought mosquitoes could not fly in the rain! Wrong! By first light at 5:30 I had enough, and by 6:00 we were heading back to Norman General Store, flushing out mosquitoes with all my windows wide open. Relief! Refuge! Norman General is a cool store and cafe offering breakfast, lunch, and dinner with shelves stacked with all kinds of goods, regional drinks in the cooler, mosquito candles (which we eagerly purchased) but, oddly, no nets among the extensive camping and fishing supplies.

WEDNESDAY JUNE 5:

After studying our options over breakfast, we decided to drop a wee bit southward and take CR10 along the southern crest of the

Ouachita Mountains, looking for headwater streams, all the while driving in the general direction of Oklahoma. The gravel roads were wet, dust-free from the rain, and the sunlight was muted by the clouds. We drove slowly, studying options and directions at various turns, enjoying the quiet pace, and taking turns to lead the way as deer and critters appeared. There was no interest in speed, just allowing the forest to pass by slowly, at times presenting expansive overlooks.

We crossed into the Little Missouri River watershed and explored the Albert Pike Campground but turned back and eventually found the actual Little Missouri Falls. The Little Missouri was rugged, picturesque, and surging up high but was not safe for snorkeling. I understand that a lot of campers died in a massive, surprise overnight flood here years ago, making me glad we listened for flooding the night before. We took FR 43 west toward the Saline River watershed, dropping down off a ridge. However, realizing a Bard Springs Campground had beckoned us, we backtracked a few miles to check it out. Oftentimes when scouting for snorkel sites, it can become very difficult, even frustrating, navigating roads, maps, confusing turns, but working together we found ourselves at the gate to Bard Springs, now closed to camping. After deciding snorkeling was an acceptable activity, we walked past the locked gate and into the picnic/campground and soon found ourselves peering from an ancient low-head dam, slightly fallen in with rubble (Figure 3). The water looked clear enough, although not great, but good enough to see two to three feet, maybe more. Upon entry I immediately observed calm darters and wary crayfish flushing out before me (Figure 4). I relaxed and spent a good bit of time taking closeup photos while Michael entered further downstream at the actual Bard Springhead, which cascaded down over mossy green rocks from the rocky bluff above. I skipped over him downstream to another bigger, higher dam. Why two dams? There was a stone building set back between them, unmarked, and unknown as to its purpose. The water between the two dams was uninviting, an almost opaque pool, but below the second dam a rocky run looked inviting. A precarious descent and entry into the creek offered only many Creek Chubs, but the setting was picturesque.

Satisfied with this unique site, we returned to FR 43 and recrossed the ridge and descended back into the Saline water-



Figure 5. Our fearless host Brandon Brown trapped in the jaws of an Alligator Gar.



Figure 6. NANFA goods offered at a convention discount.



Figure 7. Gar Nado! Sucked up snakes, fishes, frogs, and the mighty Bison, Oklahoma's state mammal.

shed. At a Shady Lake camping area, a small headwater stream ran alongside a low bluff line, but snorkeling the shallow water offered us pretty much the same fishes we had observed at Bard Spring and even fewer species than the day before. But the water was cooling and pretty. This was our third headwater watershed with all the streams flowing south out of the Ouachita Mountains: Caddo, Little Missouri, and now Saline. Pretty nifty in my book of adventures. My camera battery soon died, and I had enough, so we decided to drop down to AR 246, drive westward on to Vandervoort, then drop south onto AR 71 to De Queen where we got fuel and lunch, and then we eased back up and over to Broken Bow for a hotel and needed rest.

THURSDAY JUNE 6:

The next morning, we drove north just a short way into Beavers Bend State Park, where we gathered our orientations, met NANFA-OK host Brandon Brown (Figure 5) at the meeting hall, and unloaded. We set up our NANFA table and then pinned up a banner I had printed behind the speaker's podium. Directions into the NANFA convention area were confusing; so, at Brandon's urging, Michael and I re-drove the route and installed eight directional signs that I had made back in Tennessee. Beavers Bend is a beautiful state park with lots of meandering roads and access points, making for a bit of confusion. Driving to the meeting hall we crossed over a small but inviting clear-water stream, Beaver Creek, and behind the meeting hall was the Mountain Fork River with the stream flowing into it. However, this river/creek junction was signed with No Swimming/No Wading, and later, some night-walking NANFans said it was loaded with Water Moccasins. Those proclamations will give most safety concerned snorkelers pause. We moved into our Cabin 16, where there were *no* pots and pans, nor plates and silverware, and drove back into Broken Bow for a bit of boudin and a cool refreshing salad.

FRIDAY JUNE 7:

Friday was the convention. I'm so grateful to Brandon Brown for hosting this year's gathering. The 2015 convention in Tahlequah, OK, had been his response to the originally planned Broken Bow location nine years before. That year Broken Bow and southeastern Oklahoma had been blown out by disastrous flooding. Impressively, within a short month of logistics, Brandon had shifted us north to Tahlequah. Mr. Brown was and is a wonderful host. I have enjoyed both of these conventions and getting to know him. Be sure and check out his many entertaining videos on YouTube (search on Brandon Brown, Oklahoma, fish). These NANFA annual gatherings offer us the experience to explore regions of North America that we likely would never venture to. Guided by knowledgeable, like-minded hosts and their teams, we have visited 21 states (some several times) as far apart as Nevada and New Hampshire. Brandon's team had set up an outside mobile aquarium filled with big-river fish, gar, buffalo, Paddlefish, and a myriad of other gamefishes along with many smaller species. Parked in the blazing sun, DNR folks had to cover the aquarium with an awning to shade the massive tank from the oppressive heat. Tables were set on the shaded patio, promoting several organizations, but my responsibilities were directed inside and thankfully were within cool AC.

Michael and I manned the NANFA table (Figure 6), passing out registration t-shirts designed by my son Cobalt and I with the

logo of Gar Nado! (Figure 7) We offered OK hats embroidered with the year's mascot fish, the Caddoan Longear Sunfish, along with discounted past convention shirts, snorkel guides, decals, patches, and bumper stickers. The auction table spanned the adjoining left wall, and attendees were being registered to our right. The meeting hall had an open, white-trussed ceiling and was populated with many round tables offering seating for six or so people apiece. I kept the table centers covered with mini-Moon Pies donated by my Chattanooga hometown bakery. Brandon had

assembled a group of speakers covering an interesting variety of subjects. He had asked me to speak, but I initially declined as I had spoken two years ago at NANFA in Minnesota. But after a few weeks he again urged me to speak as he wanted his OK DNR folks to hear of my work with the Cherokee National Forest Snorkeling program and my time with the Hidden Rivers film and the accompanying Snorkel Guide (Figure 8).

That evening we were treated to a banquet of locally catered smoked sausage, pulled pork, and beef brisket. These offerings were complimented with tasty baked beans, potato salad, and cool coleslaw to contrast with the oppressive heat outdoors. Thankfully the AC kept up with all the attendees throughout the day. Treasurer Tom Watson tells me 84 folks registered in total, and I suspect most would not have missed a meal, but Michael counted around 78 in the chow line. After the tables were cleared and the leftovers put away, it was time for our auctioneer to move to the front of the room. Phil Nixon has done a great job auctioneering at every convention since he attended my Chattanooga 1998 NANFA Convention. I was wiped out by the time of the auction, and I put away the food, wares, drinks, and packed away all the NANFA goods, shirts, hats and everything unsold, returning them to my van. Thus ended our Friday night with Michael and I returning to Cabin 16 when we noted a bunch of NANFan neighbors headlighted for a stroll through the woods and onto the river's edge. Copperheads and Water Moccasins delighted them as did skinks, bugs, lizards, and moths. We are a diverse group.

SATURDAY JUNE 8:

The next morning, we moved slowly and missed the field trip departures, but Brandon had suggested a potential clear-water site that some dipnetters had observed the day before. We took a slow, backroad drive, exploring a unique dam site (Figure 9) where hundreds of newly arrived, multi-colored floating devices of all kinds (tubes, kayaks, canoes, etc.) were plunging into the water. Eventually, through a variety of backroads, we arrived at a nice quiet access on Yanubbee Creek, coincidentally also flowing south from the Ouachita Mountains. The water was reasonably clear, and we soon observed many of the same species seen previously but added several more including the stunning Redfin Shiner, more darters, and a collection of sunfishes: Longears, Dollar, Green, Orangespotted, Bluegill, and Rock Bass (Figure 10). It was a good show throughout the day. The male Redfin Shiners were in their peak form, with bright-red fins, shimmering blue sides, and the tops of their heads glowing white-blue with tiny tubercles. The water temperature was comfortable, the sun high, and the skies clear blue. The Yanubbee was crossed over by a culverted road, fitted with four or five culverts. These culverts created low plunges, rushing water, flowing pools, all leading down into long riffle runs of clean gravel. Water Willow lined the banks, stems clean, anchored into a pretty substrate of colored stones, with no real silt impact observed, even though farms and fields were passed on our way here. We discussed the identities of the various fishes (Figure 11) and yearned for a net that neither of us had brought. Many of those fish move so fast, especially minnows and shiners; thus, it was hard to lock eyes onto, nor could our cameras keep up with, their motion. We spent our day here, several hours, mostly to ourselves.

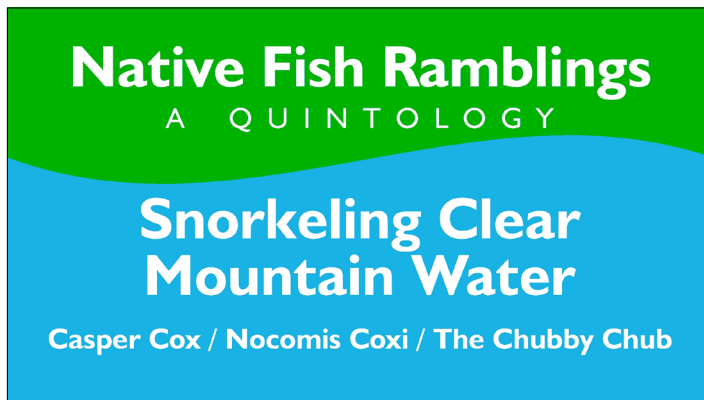


Figure 8. The title slide to my rambling talk on native fishes. A Quintology.



Figure 9. A unique dam design I have not seen before. Massive, active, with a colorful flotilla of river people launching just downstream.



Figure 10. Orangespotted Sunfish on loose, bag free.



Figure 11. Bluntnose Minnow in Yanubbee Creek.



Figure 12. Redfin Shiner inside the baggie.

After our full day, we headed north to our cabin before visiting an always handy Dollar Tree. I bought my second butterfly net, the first one purchased a few years ago to net a Redtail Chub for fish photographer Lance Merry. I now consider it my lucky net and hoped this new one would be lucky as well. I added some plastic bags to pin the critters in. We decided to continue northward exploring the touristy portion of Broken Bow known as Hochatown, a town wanting your money. After passing Hochatown, we eased back over into Beavers Bend via a northern route, passing and observing the Broken Bow Lake spillway populated with the peach-colored Palomino Rainbow Trout. We debated about trying to snorkel these waters, but safety concerns soon cooled our desire. We made it back to the cabin about dark where our seven fishy NANFan neighbors invited us over for the grilling of sausages and shared stories. A fine way to spend the day's evening. I see these guys as the future of NANFA.

SUNDAY JUNE 9:

On Sunday morning most folks were departing for home, and we had to clear the cabin for checkout. Having several options for camping later that night, we decided to return to the Yanubbee with our newly purchased net and capture the various species for some closeup ID photography. Arriving before noon we quickly set about netting premium specimens of each species and taking photographs. I tried various techniques but soon found that placing them in the bag, with minimal water and no air, I could pin them down to the clean substrate. I photographed them in the shade, holding them tight with fins flared with my camera set to microscope mode. As always, I thought I was doing quite well until I returned home and viewed my photos on my monitor (Figure 12), but together we got some decent photographs. I took Michael upstream to where I had observed Longears and Green Sunfish spawning and guarding and ravishing nests, a near-constant battle that the king males have committed themselves to. Relentless, they don't stop: this way, that way, defending, chasing, and even biting. I wondered if they could



Figure 13. Choctaw Grandma and kids cooling off.

rest through the night. We returned back to the culverts and ventured further downstream, finding another nesting site filled with Longear Sunfish. I counted nearly 50 dish-shaped depressions, most of them unoccupied, but a few were very active with a furious flurry of defense and egg eating. We eventually waded back upstream, probably a half mile or more, and found Choctaw Grandmother with her two grandchildren, Brook and Bentley, having returned to cool off (Figure 13). We spent some time talking with them, asking questions and sharing our activity. We enjoyed the beautiful day and refreshing water until the late afternoon when we said our goodbyes to the Choctaw and headed north out of Broken Bow.

Dennis Bruso and his wife Wendy, along with Barry McDonald and his wife Barbie, had been camping at Steven's Point Campground north of Beavers Bend. We arrived as they were grilling cheeseburgers, and they asked us to join them for dinner. What a fine time we had relaxing, lounging, with chit chat about anything and everything, all while enjoying the day's end. I had cooled substantially from the Yanubbee snorkeling, but by bedtime I was sweltering again, especially after closing up my van to prevent the invasion of mosquitoes. Mosquitoes or swelter, those are your options. I guess I could have knocked on the Bruso camper door.

MONDAY JUNE 10:

We awoke to rain but also to a promise of pancakes within the Bruso RV. An excellent awakening and breakfast with Vermont maple syrup, Tennessee black strap molasses, and currant jelly. Their camp hospitality capped well our Oklahoma experiences. Michael and I reviewed options and decided we would return eastward and look at potential snorkel sites along the way. Unfortunately, throughout the long drive we were met with muddy waters, awkward access points, or tiny shadowed streams. Eventually I realized Google was taking us near the first site we had snorkeled, and I saw this as a clear opportunity to embrace for a snorkel. We synced up at the Caddo River in Glenwood, which was now flowing clear at about five or six feet of visibility and populated with rafters of all shapes, sizes, and colors, like a sprinkling of giant confetti. The previous three or four rainless days had cleared the Caddo up quite nicely. But I was hungry, and after realizing Norman was just 30 minutes north, I urged Michael for us to revisit Norman General Store, get lunch, check out our original site, and then make a decision. After being satisfied with another café meal, we were blessed again at the Caddo as the water proved to be crystal clear.

Upon arrival, the gravel bar was populated by a bunch of splashing youngsters, attended by several Hispanic adults that had set up a table, chairs, coolers, and a grill. I walked over to introduce myself, in my typical snorkel gear fashioned attire, and after some looks of confusion from the adults, they called to the splashing youngsters, who interpreted for us, with smiles, head nods, arm play, and various attempts of chatter. Michael and I ventured upstream to avoid the turbulence, and with our butterfly net and baggies in hand, we decided to capture those mystery fish (Figure 14). After a satisfying time working the pools and runs, I ventured downstream and had a friendly turtle encounter along with several mega, but wary, redhorses. The lower site offered flowing deep pools, boulders, pods of stone-flipping log-perch, and those mystery shiners (probably Bigeye Shiner), but the visibility was marred somewhat from all the splashing activity a few hundred yards upstream. I slowly waded back and one of the children offered me, via their parents, some of the picnic grillings. Dripping wet, I selected a well-seasoned chicken thigh and was handed a cold canned soda. I walked around drying off in the sun, enjoying the youngsters at play, all still in the water splashing about, a treasured experience (Figure 15). The Wolfe returned and I selected individuals of the fish we had gathered for photography and gave a show-and-tell with the fish bagged and stretched tight against their white truck. Lots of chatter with plenty of uhs, ohs, and awes. Two of the older children asked if they could use my net and soon, surprisingly, they began bringing us additional fish to bag and observe. They were very enthusiastic and, when returning my net, I gave it back to them. As we loaded up, I approached the group again and gifted them a copy of the *Hidden Rivers Snorkel Guide* to share among themselves, offering a bit more English. After a satisfying full day, we decided to make the long drive to West Memphis and stay the night in a hotel.

I had begun to realize all the double B's on this trip, starting with our host:

Brandon Brown. Double-B.

Broken Bow.

Beavers Bend.

YanuBBee.

Brook & Bentley, the Choctaw children.

Barry & Barbie.

All uniquely capped when, on our way back to Memphis, we stopped for coffee to prop open our eyelids at:

DoubleBee Coffee. (Figure 16)

BB times 7.



Figure 14. Mystery Shiner aka Bigeye Shiner.



Figure 15. The welcoming committee of splashing children.



Figure 16. Double B to keep us wide eyed to West Memphis.



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TEXAS PLECOS



JAMES E. BURGESS

Glasgow, Kentucky

Recently, I had an opportunity to collect exotic and invasive species of catfish in my home state of Texas. As with any research, this opportunity was initiated by compiling as much information as possible on localities, legalities, and the possibilities for a favorable outcome. My initial contact was with the Texas Parks and Wildlife Department, who in turn set me up with Dr. Tom Heard of Texas State University, who is Deputy Director of The Meadows Center for the Water and Environment. He passed me on to Collin Garoutte of their Ecological Research Group, who in turn put me in touch with Nick Menchaca, owner and operator of Atlas Environmental. Nick's company has been involved with removals of invasive species from the San Marcos River since 2013. I originally wanted to sample the San Marcos River but, based on conversations with Atlas Environmental and others, I settled on visiting San Felipe Creek in Del Rio, Texas, to pursue these fishes. Atlas Environmental alone had removed 1,830 armored catfishes from the San Marcos River in 2023 (atlasenvironmentaltx.com).

The Suckermouth Catfish *Hypostomus plecostomus* (Figure 1) is native to South and Central America and has been introduced into various parts of the world, including 17 countries. Irresponsible pet owners have often been blamed, but the main culprit in this part of Texas was from specimens imported in the 1950s by the San Antonio Zoo to control the algae growths in their outdoor ponds (Texas Invasive Species Institute, tsuin-

vasives.org). The descendants of the original group introduced in the 1950s are currently on the job at the zoo, but some of the catfish escaped and now they are flourishing in the San Marcos River and other nearby waterways. There are annual fishing tournaments currently in place as a means of controlling the population.

The common pleco, as it is usually referred to in the aquarium hobby, is a popular tropical suckermouth catfish; it is now officially called Suckermouth Catfish in the latest ASIH/AFS names list (Page et al. 2023). These common plecos are usually purchased for their job performance in keeping the aquarium clean of algae.

San Felipe Creek is the product of San Felipe Springs. It is a swift-moving, highly vegetated stream with variable depths and crystal-clear water that runs through the city of Del Rio. Three state-threatened fishes can be found in its waters: Proserpine Shiner *Cyprinella proserpina*, Devils River Minnow *Dionda diaboli*, and Rio Grande Darter *Etheostoma grahami*. My overall objective in this research project is to study the wild-caught *Hypostomus plecostomus* to learn its habits, food preferences, interactions with native species, survival traits, and whether it will reproduce in an aquarium-type situation.

We (my assistant and friend Kippy Bailey from San Angelo, Texas, and I) arrived around noon on March 12, 2024. We started the collecting with dip nets then cast nets after having first put out baited fish traps set out with attached cameras. While the dip nets fared a little better than the cast nets, we only found a small cichlid and a couple of crayfish in the vegetation.

We did spot a couple of *Hypostomus*, but they did not stick around to be captured. I only saw them fleetingly as they darted



Figure 1. Suckermouth Catfish *Hypostomus plecostomus* (Family: Loricariidae). (Photo courtesy of USGS-NAS)

Photos by the author unless otherwise indicated.

James Burgess has always loved fishing and keeping fish. He became extremely interested in the diversity of catfishes as a high school student. Even while serving in the Army, James continued his catfish studies. He started writing articles and research papers after he retired from the Army and posting them on ResearchGate. He is a member of PlanetCatfish, Catfish Study Group, and American Society of Ichthyologists and Herpetologists. His grandchildren help him in collecting specimens in the local creeks. He continues to keep and be amazed by *Ameiurus natalis*.



Figure 2. San Felipe Creek, Del Rio, Texas. (Photo from leg-endsofamerica.com)



Figure 3. First specimen of *H. plecostomus* collected from San Felipe Creek.



Figure 5. Tagging *H. plecostomus*.



Figure 4. Small *H. plecostomus* from the first collection at San Felipe Creek.

from cover to cover. It soon became extremely frustrating not being able to collect my target species. I waited and waited for darkness to fall knowing that these elusive armored invaders are more commonly seen after the sun goes down.

And they were. Spotting *Hypostomus* became more common as the hour grew later. My collection skills, however, did not improve with the darkness. As soon as one was spotted, it would easily elude my lunge. The beam of the flashlight into their eyes was enough to make them scurry off before I could get my dip net in position.

My luck started to change just prior to 10:30 PM. I had resorted back to using the large cast net. Going up the creek where

I was told that I shouldn't go, I was able to collect my very first wild specimen of *H. plecostomus* (Figure 3).

It looked lighter than the ones in the pet stores. Its coloration was more rustic brown than gray; more an olive brown with black spots over the entirety of the body. Maybe the tides were starting to turn. I was one happy researcher.

In total, six specimens of *H. plecostomus* of various sizes were caught. After the first two, I switched from the large cast net to a smaller one, which worked just as well for their capture. I had finally found a good spot to collect them. It was not one in every cast, and they were mostly small, but those small ones will grow and mature (Figure 4).

Due to the small number collected, the transport container changed from the planned 40-gallon tote to a 5-gallon bucket. The original plan was to collect throughout the night, but as the night wore on it became apparent that our plans needed to be revised. We stopped collecting around 3:30 AM and, after the fish were processed, photographed, and set up with aeration, we headed back to our home base in San Angelo.

That first collection effort did not produce the number of specimens that I was anticipating. It was a very frustrating and disappointing trip, but at least I had managed to collect enough to start my research project. My trip to Texas was coming to an end when a local resident, Jesse Mendoza, told me that he would collect more fish for me if I could stay an extra day. I drove back to Del Rio on March 18th, and by the time I had arrived, Jesse had 32 plecos of various sizes. To say that I was happy with the way things rebounded would be an understatement. I now had plenty of specimens for the project that I wanted to do. The transport container changed again from the 5-gallon bucket to a 20-gallon tote with some vegetation added from the creek.

A few days later I returned home to Kentucky. The fish were set up inside the house and supplied with proper aeration and filtration in the same tote in which they made the trip. One specimen passed away from unknown causes.

To keep track of individual specimens, I devised a method of identification. I used different colored, very small zip ties and placed a different color around the fin spines in different locations (i.e., left pectoral fin spine, right pectoral fin spine, and dorsal fin spine). This allowed me to quickly identify individual fish based on color and location without harming it. Each specimen was carefully weighed and measured (total length, width at pectorals, height at the dorsal). A series of photos were also taken of dorsal, ventral, lateral, mouth, and frontal views (Figure 5).

WELCOME, NEW MEMBERS!

Robert Barrier, NC
 Bill Bevcars, IL
 Sinclair Combs, CO
 Sam Easterson, MN
 David Hostetler, ID
 Austin Kaplan, MD
 Thomas McLean, NM
 Cheyaane Olson, OK
 Kapsner Pat, RI
 Gabriel Stephenson, GA
 Stewart Thacker, TN

Once all specimens were tagged, weighed, and measured, they were relocated to a 250-gallon tank in my fish house/lab. The vegetation that was brought back from Texas was planted in two different pots of sand and gravel and placed at the back of the tank. This tank was equipped with a powerful pool filtration system that created a current similar to San Felipe Creek. Plenty of hiding spaces were provided as well as a large sunken log for their dining pleasure. In addition to the vegetation, their food consisted of a high-protein catfish pellet meal that has been ground and formed into cubes with unflavored gelatin along with sliced squash and zucchini and then frozen. Now I need to let these "suckers" settle in, and then I can start on the multiple tests.

Fast forward from March to May and the tank was drained for a health and wellness check. Some of the fish had lost their identification tags and their coloration had changed, but overall the specimens were healthy and had been eating nicely. With housing and feeding taken care of, I can now put my research plan into action. With several tasks planned, this will be a great learning experience.

Source:

Page, L.M., K.E. Bemis, T.E. Dowling, H. Espinosa-Perez, L.T. Findley, C.R. Gilbert, K.E. Hartel, R.N. Lea, N.E. Mandrak, M.A. Neighbors, J.J. Schmitter-Soto, and H.J. Walker, Jr. 2023. Common and scientific names of fishes from the United States, Canada, and Mexico, 8th edition. American Fisheries Society, Special Publication 37, Bethesda, Maryland.

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GALAVANTING AROUND NORTHERN ILLINOIS: GETTING UP CLOSE WITH THE FISHES OF THE LOWER ROCK AND KISHWAUKEE WATERSHEDS

Dylan Bane

Rockford, Illinois

Comprising six different ecoregions, the state of Illinois is a “sleeping giant” of northern fish diversity. With a vast north-south reach (it’s a six-hour drive from Rockford south to Carbondale), we are blessed with an incredible number of aquatic habitats within our borders. Up north you’re collecting in Driftless and Wisconsin Till Plains-esque ecoregions. In central Illinois you’re collecting in the fields of the Central Corn Belt Plains. Down south is an entirely different world altogether, consisting of the Interior Plateau and cypress swamps of the Interior River Valleys and Hills. This expansive “playground” makes for quite the array of habitats to explore; I can’t imagine many undertakings more worthy of such time and effort!

Living close to the northern border myself, I’ve naturally begun my exploration in our general area, but I anticipate many central and southern Illinois adventures in my coming springs and summers. In this article, we will cover three separate collection trips around the northernmost region of our state across three calendar years.

JULY 29–31, 2022: POST-NANFA ESCAPADES

I’ve had the pleasure of collecting with a handful of NANFA members around my neck-of-the-woods (greater Rockford area) over the past couple of years. During the tail-end of summer 2022, several months after the NANFA convention in Minnesota, I was pleased to host fellow NANFA members/personal friends Tony Long (Zumbrota, MN) and Tristan Mann (River Falls, WI) for an extended weekend of fishy shenanigans. They slept on my couches, microfished during the mornings while I (begrudgingly) supervised summer school, then joined me after lunch dismissal for some dipnet fun in the water.

Dylan Bane is the NANFA Regional Representative for the state of Illinois, where he is focused on expanding member interest and involvement. His degree is in Education from the University of Dubuque and he teaches/coaches at a high school in Rockford, IL, working with native fishes in his free time. His deep-dive into native fishes began in 2020 during the COVID shutdowns, and his basement is now a dedicated native fish room where he keeps a wide array of native fishes from around the country. His passion regarding native fishes centers around proper collection methods and aquarium care. His favorite fishes are (notoriously) all the Pirate Perches *Aphredoderus* spp.

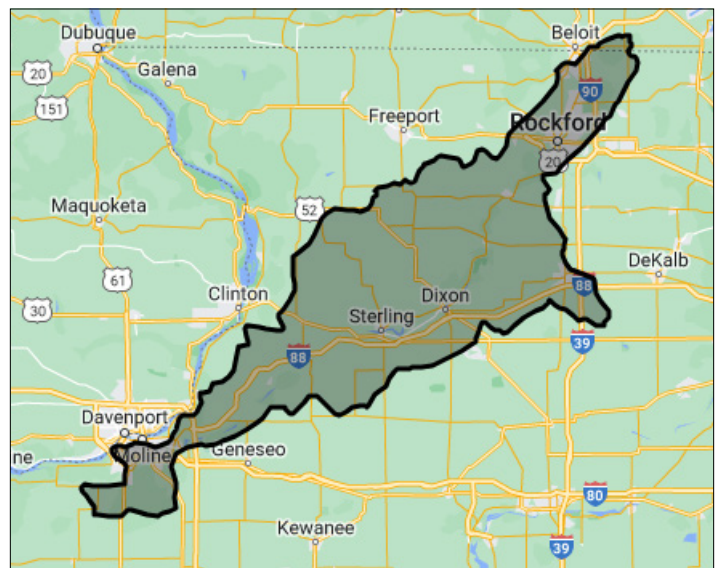


Figure 1. The Lower Rock River Watershed. (Image from fishmap.org)

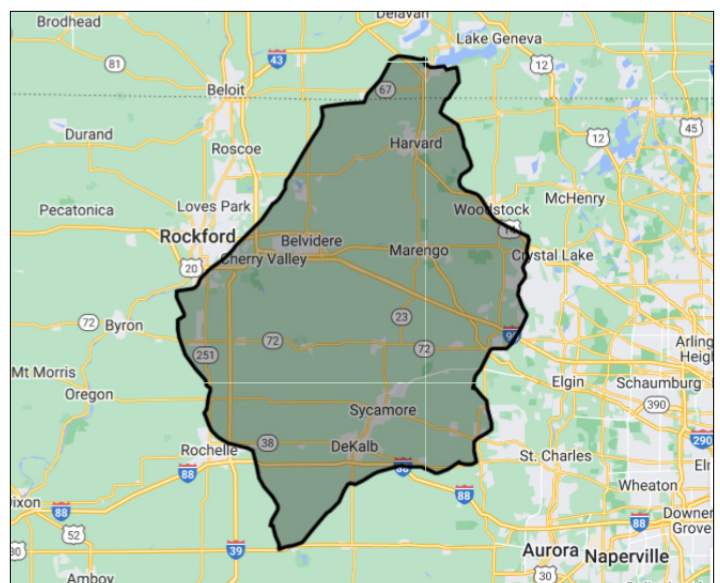


Figure 2. The Kishwaukee River Watershed. (Image from fishmap.org)



Figure 3. Tristan getting *full extension* for his lifer Blackstripe Topminnow! The author wants this as a poster. (Photo by Tony Long)



Figure 4. Tony microfishing along the structures on the edges of the Rock River near Dixon High School for Orangespotted Sunfish. (Photo by Tristan Mann)



Figure 5. One of the Orangespotted Sunfish Tony and Tristan microfished at the Rock River site. (Photo by Tristan Mann)

We visited a handful of local spots on both the Rock and Kishwaukee river watersheds (Figures 1, 2), including some of their runoff streams. Setting out armed with a seine, our Perfect Dipnets from Jonah's Aquarium, and other collecting gear in-hand, the goal was to survey local diversity and (hopefully) track down a hook/line lifer or two for Tony and Tristan along the way. Tony ended up with two lifers (Spottail Shiner *Hudsonius hudsonius* and Fantail Darter *Etheostoma flabellare*) while Tristan ended up with an additional one as well, the Blackstripe Topminnow *Fundulus notatus* (Figure 3). Tony was also successful drumming up a new hook/line spot for Orangespotted Sunfish *Lepomis humilis* (Figures 4, 5). To end the day, the three of us dropped by one of my favorite local haunts on the Rock River, Prairie Street Brewing Company, for some food-truck burgers and local ales (Figure 6). We sampled several sites during their visit, but the highlights were: working the riffle at Baumann Park, seining the pools near Deer Run, microfishing the rock beds along the Rock River at Page Park, and spending a couple of hours traversing Potawatomi Woods Forest Preserve as well.

JUNE 20TH, 2023: SHOWING THE AQUATIC HABITATS TEAM AROUND NORTHERN ILLINOIS

Johnathon Butkus (Crystal Lake, IL) and I have become good friends through our fish escapades these past couple of years. Last May, during one of our phone conversations, he brought up the possibility of hosting a group of people who were putting together a book, that highlights a myriad of aquatic biotopes. The team was led by author Tai Strietman (Cambridge, UK) with the rest of his associates coming from around the US to work together. Ryan Noel came from Indianapolis, IN; Ken Johnson and Alex Rose came from Chicago, IL; and Jason Katzman came from New York, NY. They were interested in seeing what our part of northern Illinois had to offer, especially the possibility of seeing some Hornyhead Chub *Nocomis biguttatus* mounds in action as part of a highlight on Midwest stream habitats. Excited at the prospect of this on any regular day (let alone showing outta-towners



Figure 6. Tony overlooking the Rock River and a local ale at Prairie Street Brewing Company. (Photo by Tristan Mann)

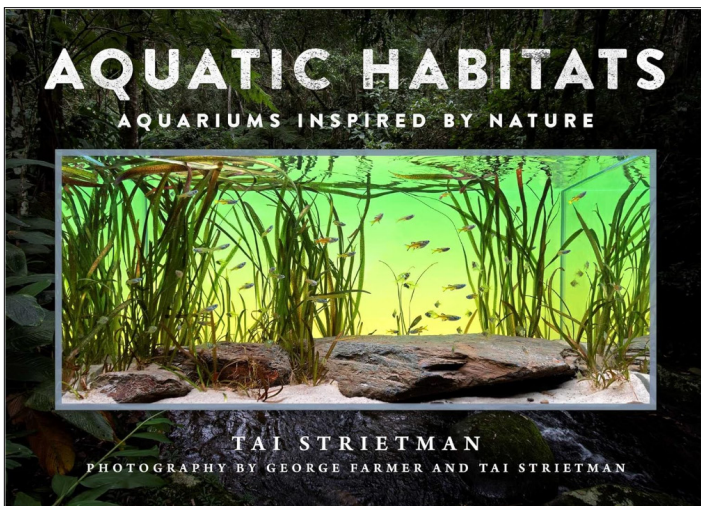


Figure 7. *Aquatic Habitats*, the book containing a highlight on Upper Midwest streams in the United States (among other global biotopes) by Tai Streitman. (Photo from Amazon.com)



Figure 9. The first Southern Redbelly Dace that turned up in our seine in Adee's Woods. (Photo by Johnathon Butkus)



Figure 10. The same Southern Redbelly Dace in the author's photo tank. (Photo by Johnathon Butkus)



Figure 8. The crew at Adee's Woods Park, post-collection, taking photos of a Hornyhead Chub in the photo tank. (Photo by Johnathon Butkus)

our stream gems), of course we accepted the invitation! Funny enough, I'd recently pre-ordered Tai's book, *Aquatic Habitats: Aquariums Inspired by Nature* (Figure 7), a few weeks before we were introduced. Small world!

As the day came, we met at the picnic area near the entrance of Adee's Woods Park (Kirkland, IL). Showing my naivete regarding fish photography, I was unprepared for the amount (and quality) of equipment that our new friends brought with them! I was in awe. I gained a lot of respect for the on-site underwater photography process that day. Arduous, stressful, but so rewarding. I took a few pictures myself, but most of the photography was handled by Tai, Alex, Johnathon, and my girlfriend, Isabel Fischer. They get all the credit for documenting such a fun, productive day (Figure 8).

After we unloaded our equipment, we started the walk down to the collection site. It's a bit of a walk down the main trail from the picnic area, followed by a trek down an unbeaten, hilly path, through the brush, to the water. Even then, once you're to the stream, it's a four-foot drop down the undercut bank to the water. We traversed this obstacle as a team, handing our buckets, cameras, dipnets, and



Figure 11. The author proudly holding a photo tank with a male Southern Redbelly Dace in Adee's Woods. (Photo by Johnathon Butkus)

photo tanks/stands down like an assembly line until we were good to go. We all stayed on our feet on the drop down, too!

We spent about five hours at this site dipnetting, seining, photographing, and shooting the breeze. We talked about Hornyhead Chub mounds, the presence of Southern Redbelly Dace *Chro-*

Table 1. Common and scientific names of fishes from the Kishwaukee and Lower Rock watersheds visited during our collection outings in 2022–2024.

Common Name	Scientific Name
Leuciscidae—Minnows	
Central Stoneroller	<i>Campostoma anomalum</i>
Southern Redbelly Dace	<i>Chrosomus erythrogaster</i>
Spotfin Shiner	<i>Cyprinella spiloptera</i>
Common Shiner	<i>Luxilus cornutus</i>
Hornyhead Chub	<i>Nocomis biguttatus</i>
Emerald Shiner	<i>Notropis atherinoides</i>
Bigmouth Shiner	<i>Ericymba dorsalis</i>
Spottail Shiner	<i>Hudsonius hudsonius</i>
Carmines Shiner	<i>Notropis percobromus</i>
Sand Shiner	<i>Miniellus stramineus</i>
Bluntnose Minnow	<i>Pimephales notatus</i>
Fathead Minnow	<i>Pimephales promelas</i>
Western Blacknose Dace	<i>Rhinichthys obtusus</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Catostomidae—Suckers	
Quillback	<i>Carpiodes cyprinus</i>
White Sucker	<i>Catostomus commersonii</i>
Northern Hog Sucker	<i>Hypentelium nigricans</i>
Golden Redhorse	<i>Moxostoma erythrurum</i>
Ictaluridae—North American Catfishes	
Black Bullhead	<i>Ameiurus melas</i>
Yellow Bullhead	<i>Ameiurus natalis</i>
Umbridae—Mudminnows	
Central Mudminnow	<i>Umbra limi</i>
Fundulidae—Topminnows and Killifishes	
Blackstripe Topminnow	<i>Fundulus notatus</i>
Centrarchidae—Sunfishes	
Rock Bass	<i>Ambloplites rupestris</i>
Green Sunfish	<i>Lepomis cyanellus</i>
Orangespotted Sunfish	<i>Lepomis humilis</i>
Bluegill	<i>Lepomis macrochirus</i>
Smallmouth Bass	<i>Micropterus dolomieu</i>
Largemouth Bass	<i>Micropterus nigricans</i>
Black Crappie	<i>Pomoxis nigromaculatus</i>
Percidae—Darters and Perches	
Rainbow Darter	<i>Etheostoma caeruleum</i>
Fantail Darter	<i>Etheostoma flabellare</i>
Johnny Darter	<i>Etheostoma nigrum</i>
Banded Darter	<i>Etheostoma zonale</i>
Blackside Darter	<i>Percina maculata</i>
Gasterosteidae—Sticklebacks	
Brook Stickleback	<i>Culea inconstans</i>



Figure 12. The Adee's Woods crew on May 18, 2024: Ben Cantrell, Ally Cantrell, the author, and Johnathon Butkus. (Photo by Ben Cantrell)

somus erythrogaster in that stretch of stream (a personal goal of mine to discover) (Figures 9–11), sharing identification and collection tips, all while being general native fish nerds. In all we collected 19 species on this day (an amazing total count for this one site) (Table 1) and obtained underwater/photo tank shots of almost all of them along the way. Many of those images will be in Tai's book. Johnathon, Isabel, and I had an amazing time showing the team around our neck-of-the-woods and fostering appreciation for some local native fishes along the way. Adee's Woods is a local hidden gem.

MAY 18TH, 2024: NORTHERN ILLINOIS NANFA SAMPLING

This past January, shortly after being named the NANFA rep for Illinois, I received a phone call from Johnathon. We talked about current projects, shared plans for fish room shuffles, and discussed the upcoming NANFA Convention in Oklahoma.

After that hour spent yapping on about fish nerd stuff, I shared a rough set of plans to coordinate some outreach events around the state, a miniature “tour de force” to enlist more NANFA interest around Illinois. These would be regional, moving events that would occur a couple times per year to sample various river systems around the state. For 2024, we decided on a “northern” leg and an “east/central” leg. Our first “northern” event of the year was to be focused around Adee's Woods again, due to the overwhelming success we had at this site the summer before.

As May rolled around, we were champing at the bit to get in the water. This was my first collecting trip of 2024, and it served as a nice warm-up for the upcoming convention in Oklahoma. I needed to regain my “riffle legs” after a long winter! Armed with snacks, drinks, collecting gear, and a burning desire to find more Southern Redbelly Dace, we met in the parking lot and hiked down to the water. Ben and Ally Cantrell (Peoria, IL), Johnathon, and I had a great day in the water (Figure 12). We took lots of photos (Figure 13), but I didn't bring much home for my aquariums except for a young Western Blacknose Dace (for my minnow tank) and a trio of Blackside Darters that Johnathon netted for me at one of the sites we visited (Figure 14).



Figure 13. The author and Johnathon Butkus going over that riffle's catches before snapping some photo tank shots. (Photo by Ben and Ally Cantrell)

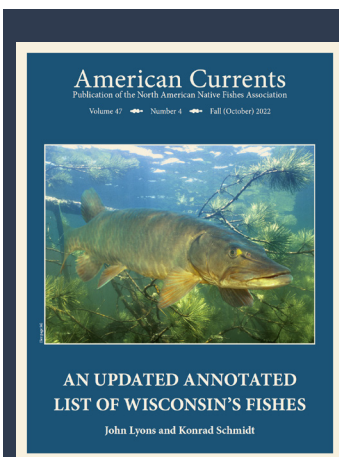


Figure 14. One of the three Blackside Darters that came home with the author. All three reside in the 60-gallon aquarium that houses his darter community. (Photo by Johnathon Butkus)

Although not as fruitful species-wise as the prior year's visit to Adee's Woods, we did collect 15 different species throughout the day, comprising three collection sites along the same stretch of the Kishwaukee River runoff. I will add, though, that we did *not* have a seine present at this year's visit, whereas we did in 2023. We missed out on several species from the year before, however, we did meet two this year (Yellow Bullhead and Green Sunfish) that were absent from the 2023 visit.

If we have an end goal here, we're just trying to expand interest in our native fishes around the state. If we can recruit a few new members each year, then we've done a fantastic job on our end. We're just getting started but, boy, are we hav-

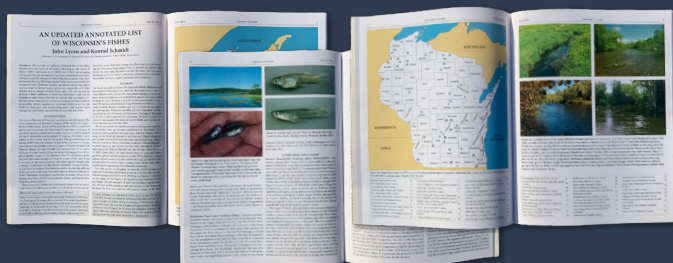
ing a good time along the way. Can't wait for our next event! More to come in the near future! A huge thank you to the NANFA Board of Directors and Michael Wolfe for this platform, Johnathon Butkus, Ben and Ally Cantrell, Lance Merry, Mark Binkley, Dr. Lawrence Page, and everyone else involved in coordinating these events, and one final thank you to "The NANFA Boyz" (they know who they are). We plan all this as a group. Thanks, fellas!



Copies of the special Wisconsin Fishes issue of *American Currents* are still available. It covers 164 species, with a complete checklist, species profiles, the latest science, current distribution data, name changes, an extensive bibliography, and more.

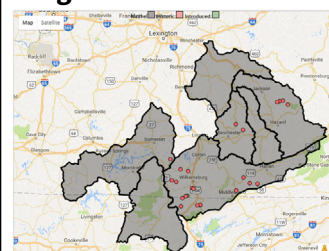
\$25 (free shipping)

<http://www.nanfa.org/cart.shtml#WISC>

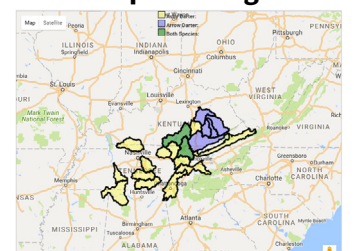


FishMap lets anglers, aquarium hobbyists, researchers, or anyone with a passion for fishes visually explore species' ranges or learn what species are in their local waters. The site is dedicated to spreading knowledge and respect for all fish species. **FishMap** combines numerous data sources (NatureServe, the National Atlas, the USGS water resources and Nonindigenous Aquatic Species programs, FishNet2, iNaturalist.org, GBIF, and iDigBio) to provide a better view and more complete understanding of fish species distribution. **FishMap** is sponsored by NANFA. Users can submit their own data to the portal to help map species distribution, so FishMap.org has been working with NANFA members to create an additional database of fish sightings and collections (currently nearly 30,000 records and growing).

Range and Collection Data



Compare Ranges



ENJOYING NATIVE FISHES, ONE BEER AT A TIME

John Lyons

University of Wisconsin Zoological Museum, Madison

I'm obsessed both with native fishes and with collecting things—I'm a museum curator of fishes after all—and I also like drinking beer. So, it was almost inevitable that as craft beers took off in popularity 10–15 years ago, I would start amassing an assemblage of fish-themed cans and bottles in my basement. Right now, I have 488 different beers (and counting) with a fish or fishing motif from 111 different breweries in 8 countries and 32 states (Figure 1). Admiring and organizing my collection is a great way to appreciate fish when I'm not on the water. And enjoying a cold one from my assortment is very relaxing after a long day of sampling. But at the rate I'm going, I'm going to need a bigger house to store it all!

My collecting began in 2012. A year earlier, Bell's Brewery in Comstock, Michigan, had come out with Big Hearted India Pale Ale, which had a nice drawing of a Brook Trout on the bottle label (Figure 2). The "Big Hearted" referred to a famous Earnest Hemingway short story, "The Big Two-Hearted River," that I had read and enjoyed and that told the tale of an emotionally scarred World War I veteran who began to heal during a camping and Brook Trout fishing trip to the Upper Peninsula of Michigan. There actually is a Big Two-Hearted River with Brook Trout in the UP and I've been to it, although Hemingway scholars feel his story was based on an amalgam of several different northern Michigan

streams. Regardless, it's a good fishing tale from a beautiful part of the US. I'm not a big IPA fan, but my wife Mary Kay, who is, gives this beer high marks. After we tried it, I held on to one of the empty bottles because of its fishing and literary connections.

Not long afterwards, I was in a local liquor store and noticed that Northwoods Brewery of Eau Claire, Wisconsin (since moved to Osseo, Wisconsin), had just released four beers with fish on their labels, Mouthy Musky Light Ale (Muskellunge), Prickly Pike Pilsner (Northern Pike), Wall-IPA (Walleye), and Floppin' Crappie Ale (Black Crappie) (Figure 3). I decided to buy them, primarily for the bottles (but also for the beer), and my collection (and obsession) began.

Just like those (including me) who are interested in finding different fish species and who keep a life list of all the fish species they've caught, I quickly determined that I would try to collect and photograph every different bottle and can that I encountered with a fish or fishing theme. I set up a spreadsheet to track my collection and cleared off shelves in my basement to hold it. I decided to include beers that had a fish name in their title, even if the beer name was not really related to a fish. So, for example, I incorporated Shiner Bock (and 41 subsequent Shiner beer types, named after the place they were brewed, not the minnow) from Spoetzl Brewery in Shiner, Texas, Old Chub Scottish Ale (Scottish slang for an overweight person, not the minnow) from Oskar Blues Brewery in Lyons (no relation), Colorado, and Kokanee Lager (a mountain range in the



Figure 1. Views of part of my beer collection, jammed into my basement with my fish tanks.



Figure 2. The beer that started it all for me, Two Hearted IPA, Bell's Brewery, Comstock, Michigan, in various packaging and strengths. From left to right: original Two Hearted 12-oz bottle, 2012; original 16-oz can, 2014; Light Hearted (low calorie) 12-oz can, 2020; Double Two Hearted (double IPA) 12-oz bottle, 2020; Imperial Big Hearted (more alcohol) 19.2-oz can, 2024; Imperial Big Hearted 12-oz can, 2024.

Photos by the author.

John Lyons is the Curator of Fishes at the University of Wisconsin Zoological Museum. He is a former Wisconsin Department of Natural Resources Fisheries Research Scientist who has been working on Wisconsin fishes since 1979. He received his PhD and MS in Zoology from the University of Wisconsin-Madison and his BS in Biology from Union College, Schenectady, NY.



Figure 3. The four beers that began my collecting frenzy in 2012: Mouthy Musky Light Ale, Prickly Pike Pilsner, Wall IPA, and Floppin' Crappie Ale, Northwoods Brewery, Eau Claire, Wisconsin, 2012.



Figure 4. Three beers in my collection with fishy names that don't actually refer to fish. Left to right: Shiner Bock, Spoetzl Brewery, Shiner, Texas (I have 42 different Shiner beers); Old Chub Scottish Ale, Oskar Blues Brewery, Lyons, Colorado; Kokanee Lager, Columbia Brewery, Creston, British Columbia.

Canadian Rockies, not the landlocked Sockeye Salmon) from Columbia Brewery in Creston, British Columbia (Figure 4). Additionally, I included imaginary species like mermaids and sea monsters if they were sufficiently fish-like in the picture on the label. I also decided that I would try to get all the different sizes and styles of the cans and bottles available for each beer and any re-issues that had a label design change. Many beers were sold in both a 12-ounce bottle and 12-ounce can, and I bought each. For the beer that started it all, Big Hearted IPA, I have acquired six versions in different sizes and strengths that were released from 2012–2024 (Figure 2).

Early on, the growth of my collection was rapid. In 2012, I found 100 different beers, and in 2013, 42. Nearly every time I went to a liquor store, I added a new brew. Madison, Wisconsin, where I live, has several large beer stores, and I became a regular, visiting each about once a month to search their shelves for new releases. Whenever I traveled, I made a point of seeking out brands and designs unavailable in Madison. It was a lot of fun, just like visiting new waters to look for new fishes in nature. But my refrigerator and basement soon began to fill up. Mary Kay and I like to drink beer, but after a while we couldn't keep up with all my purchases. To get most beers, I had to buy a six-pack or sometimes a 12-pack



Figure 5. Four of the oldest beers in my collection. Left to right: Bosch Beer, Houghton, Michigan, 1965; Schmidt Beer, Heilemen Brewing, Lacrosse, Wisconsin (1 of 3 designs I have), 1975; Bricks Keller Beer, Pittsburgh Brewing, Pittsburgh, Pennsylvania, 1977; and Pocono Mountains Beer, D. G. Yuengling and Sons, Pottsville, Pennsylvania, 1978.

or case, and after a while the full bottles and cans stacked in the corner far outnumbered the empties on display on the shelves. Over time my rate of acquisition slowed, and we gradually caught up, aided by a well-received program I implemented to donate my extras to friends and to host them at a large beer-lubricated picnic at a local park. But I still always seem to have the equivalent of three or four cases in my basement waiting to be enjoyed.

While a few beers have remained long-term favorites and are consistently produced, such as Two Hearted IPA, most fish beers have a short lifespan and may be available for less than a year. The craft beer industry is quite volatile. New breweries open and others close or change hands every month, and even the well-established breweries are constantly creating new recipes and updating their packaging. Most of the 100 beers I obtained in 2012 are now "out of print." Thus, even though I've made many dozens of visits over the last decade, I continue to prowl my local stores for beers that may only be present for a few weeks. I do internet searches for new beers, and I order them online if possible. When I travel, I do my homework to identify the local fish beers I might encounter.

I also surf the web and occasionally visit antique stores and beer-can-collector shows looking for vintage cans and bottles. There are surprisingly few. The oldest I've found are from 1965 (Bosch Premium Beer, Houghton, Michigan: fishing), 1975 (Schmidt Beer, Heilemen Brewing, Lacrosse, Wisconsin; Northern Pike, 2 designs, Largemouth Bass), 1977 (Bricks Keller Beer, Pittsburgh Brewing, Pittsburgh, Pennsylvania; Colorado Pike-minnow), and 1978 (Pocono Mountains Beer, D. G. Yuengling and Sons, Pottsville, Pennsylvania; Largemouth or Smallmouth Bass, identity unclear) (Figure 5). In total, I've come up with only 20 fish- or fishing-themed cans or bottles produced before 2012.

There are several patterns in the type of fish or fishing found on the beers in my collection. Nearly all the fish species portrayed are gamefishes, and non-game species are rare. Despite Shiner and Old Chub beers, actual minnows (Leuciscidae) are rarely seen even though they are the most diverse family of North American freshwater fishes. I have a 1977 can of Bricks Keller Beer from Pittsburgh Brewing in Pittsburgh, Pennsylvania, with a Colorado Pikeminnow (the label uses the offensive "squawfish") on it, the



Figure 6. Four of the 12 beers I have from Angry Minnow Brewing, Hayward, Wisconsin. From left to right: River, Pig Pale Ale, Oaky's Oatmeal Stout, Charlie's Rye IPA, and Peach Gose. I'm not sure what species or family the fish on the cans is supposed to represent; it's certainly not a minnow.



Figure 8. Six of the 10 beers I have from Flying Fish Brewery, Sommerdale, New Jersey.



Figure 7. Five bottles and cans of the 12 marine sculpins I have from Ballast Point Brewing, San Diego, California.



Figure 9. Six of the 22 beers I have from SweetWater Brewing, Atlanta, Georgia. The packaging always features a Rainbow Trout.

only fish in their endangered species series (Figure 5). The Angry Minnow Brewery is in Hayward, Wisconsin, but the stylized fish on their cans has either two dorsal fins or a dorsal and an adipose fin and so is not a true minnow in the taxonomic sense (Figure 6). I'm not quite sure what species or even family their logo is meant to represent. I've never seen a lamprey, gar, shad, sucker, killifish, darter (but see Addendum), or other common freshwater non-game species on a can or bottle. Ballast Point Brewing from San Diego, California, has several versions of a marine sculpin (Figure 7). In freshwater, sculpins are clearly non-game, but some marine species get large enough that they are caught and kept for eating by anglers, so in the ocean one might count this as a game species. Flying Fish Brewery in Sommerdale, New Jersey, celebrates a group of fishes not usually targeted by anglers, although sometimes they are caught for bait, but the label has an odd drawing of a fish skeleton with propellers like an airplane, so I'm not sure what, if any, species they are trying to portray (Figure 8).

As for acknowledged gamefishes, the species found on beer cans and bottles generally reflect the region where the beers are from, and areas where sport fishing is an important part of the culture and economy tend to have the greatest variety of designs. In these places, fish beers celebrate and promote the species that help define the local community, and as such they raise awareness of the value of fish and fishing among both anglers and non-anglers. In the Midwestern US,

coolwater and warmwater species such as Walleye, Northern Pike, Muskellunge, Largemouth Bass, and Channel Catfish are the most common subjects. Largemouth Bass and Channel Catfish are also regularly found in the South although, interestingly, one of the most prolific Southern producers of fish beers, SweetWater Brewing in Atlanta, Georgia, always uses a picture of a Rainbow Trout (Figure 9). Trout and salmon and fly fishing dominate beers in the Northeast, West, and Alaska. Breweries on the coasts are the most likely to have marine species. Fish- and fishing-themed beers seem to be primarily produced in the United States, and I only have 22 non-US beers in my collection, 9 from Canada, 2 from Mexico, 10 from Europe, and 1 from New Zealand.

People who hear about my collection often ask me which beer is my favorite. But that's like asking me what my favorite fish is; I can't give an answer. I do have a few that I particularly like. The original Two Hearted IPA bottle is a sentimental choice. I appreciate the details and realism of the Ballast Point Brewing artwork and their focus on marine species. I love fly fishing for trout, so I enjoy cans and bottles that portray trout and fishing flies (Figure 10). Dogfish Head Craft Brewing in Milton, Delaware, brews a bewildering variety of amazing beers, and I have a soft spot for the shark logo that adorns their products (Figure 11). Dogfish Head represents the biggest part of my collection with 62 different cans and bottles, and since they release several new beers each year, my holdings of them will continue to grow. But the bottom line is, I just can't choose a single favorite.



Figure 10. Six of the many beers in my collection featuring trout or trout fishing flies. From left to right: Dancing Trout Ale, Bayern Brewing, Missoula, Montana; Fish Tale Organic Amber Ale, Fish Brewing, Olympia, Washington; Trout Town Brown Ale, Roscoe Brewing Company, Roscoe, New York; Cutthroat Pale Ale, Uinta Brewing, Salt Lake City, Utah; Irresistible (fishing fly) Amber Ale, Madison River Brewing, Belgrade, Montana; Zonker Stout (wooly bugger fishing fly), Snake River Brewing, Jackson Hole, Wyoming.

Collecting fish- and fishing-themed beer cans and bottles is a lot of fun, although it can never quite live up to seeing live fishes in



Figure 11. Six of the 62 (and counting) beers I have from Dogfish Head Craft Brewing, Milton, Delaware.

their natural environment. But combining the two, capturing or viewing a long-sought-after species in the wild and then celebrating with a good fish beer or two, is tough to beat!

Addendum: Associate Editor Bruce Stallsmith commented that Darter Ale produced by Good People in Birmingham, Alabama, has a Vermilion Darter on the can, both a darter and an endangered species. Good People are part of hosting Darter Fest in Birmingham every May. Hellbender Brewing in Washington, DC, produces Ignite IPA with a Hellbender on the can.

GEORGE MAIER FUND 2024 GRANT CYCLE ANNOUNCEMENT

The Board of Directors of the George Maier Fund has approved a grant budget for the 2024 grant cycle. We are accepting proposals through December 1, 2024.

The purpose of all submitted proposals must be to directly enhance the knowledge of killifish, especially as applied to one or more of the following: Reproduction, life cycle, maintenance, nutritional requirements and food sources, biology, ecology, habitat, conservation, nomenclatural and biological relationships. One or more grants may be issued at the discretion of the independent grant selection committee.

Grant Number reference: GMF A-24

Application Deadline: December 1, 2024.

Grant Awards: Announced no later than January 2, 2025.

Total Available Funding: Up to \$7,500

Length of Project Period: Up to 2 years

Subject to the following limitations, grants are open to both professional and non-professional individuals and organizations whose pro-

posals meet the above criteria, regardless of race, ethnicity, gender, or religious affiliation. The individual applicant cannot be a legal relative of any Officer, Board member or Grant Committee member. An organizational applicant can neither be the direct employer of, nor have a consulting relationship with any Officer, Board member or Grant Committee member.

Proposals must be in accordance with document GMF P-1 and are to be submitted via e-mail in Microsoft Word or Adobe Acrobat (PDF) format. Request copies of relevant documents and send completed proposals to Charles Nunziata at epiplaty@tampabay.rr.com. Please refer to grant number GMF A-24 in all correspondence.

The George Maier Fund is a 501(c)3 public charity. All donations are tax exempt.

The Fund was created to honor the memory of George Maier, founding member of the American Killifish Association and the Chicago Killifish Association.

NANFA members can help make a great organization and its publication even better.

Contact the editors with ideas for articles you'd like to write and to suggest authors or topics you want to read. • Mention AC to people who have interesting things to write about. • Submit your photos and artwork. • Suggest items for Riffles. • **Tell us what you want to see in these pages.**

RIFFLES

NOTES ON CAPTIVE HUSBANDRY, BIOLOGY, CONSERVATION, NOMENCLATURE, AND RECENT PUBLICATIONS

Compiled by Bruce Stallsmith

POPULATION GENETICS OF THE ENDANGERED CITICO DARTER TO BE STUDIED



The Citico Darter, an endangered fish found in portions of the Little Tennessee River system. (Illustration by Joe Tomelleri)

When a species is designated as Endangered or Threatened under the US Endangered Species Act, that's the beginning of a series of actions to protect that species. This can take a variety of forms, of which studying and protecting genetic diversity in a species typically found in a small range is one.

The Citico Darter *Etheostoma sitikuense* has a small (recent) native range of two creeks in east Tennessee, Citico and Abrams, in the Little Tennessee River system in the Great Smoky National Park. It has been reintroduced to the Tellico River. The species was likely more widespread before the construction of the Tellico Dam altered and blocked access to suitable habitat. The species was formally described by Dr. Rebecca Blanton Johansen of Austin Peay State University in 2008.

Work to protect the species began even before it was described, when Conservation Fisheries Inc. of Knoxville, Tennessee, began rearing the species at their facilities in 1993. This provided fish to be released in areas lost to the species, such as the Tellico River and Abrams Creek, which had all of its fish fauna eliminated by rotenone in a misguided management action by the National Park.

With all the work done to propagate and release fish in the original range, how can you tell if it's successful, i.e., is there reasonable genetic diversity in the newly expanded range? Dr. Johansen has received a three-year grant from the Tennessee Wildlife Resources Agency to study the conservation genetics of existing populations. This information could guide future introductions of CFI-raised fish to avoid inbreeding and low genetic diversity.

From: <https://www.apsu.edu/news/aug-2024-cefb-darters-0805.php>

A SAWFISH HAS BEEN TAGGED FOR THE FIRST TIME IN 16 YEARS OF SHARK MONITORING OFF OF FLORIDA AND GEORGIA



A Smalltooth Sawfish is tagged before being released by a crew member with the University of North Florida Shark Biology Program. (Photo by University of North Florida)

I would not have guessed I would write a second Riffle piece about Sawfishes in a year, but because of good news that's exactly what I'm doing. In particular, the Smalltooth Sawfish *Pristis pectinata*, the first marine fish and first elasmobranch (sharks and rays) to be listed as Endangered in the US in 2003, now seems to be making a recovery. Formerly common from Texas to New York, in the last century its range shrank to the Fort Myers/Florida Keys area.

The University of North Florida Shark Biology Program has been monitoring elasmobranchs in the South Georgia and North Florida region for 16 years by catching and tagging them. This past July for the first time the team captured a three-meter long male Smalltooth Sawfish in the St. Mary's River on the Georgia/Florida border. Males can reach almost four meters in length. Other Smalltooth Sawfish recently have been captured in Tampa

Bay and Cedar Key, much further north along Florida's Gulf coast than they have been seen in decades.

Anyone who catches or sees a sawfish anywhere in the US is encouraged to report their observations to the US Sawfish Recovery Team by visiting www.SawfishRecovery.org, calling 1-844-4SAW-FISH, or emailing sawfish@myfwc.com.

AN EMERGENCY RESCUE OF AN ENDANGERED SPECIES AS STREAM LEVELS DROP



Tennessee Aquarium VP, Chief Conservation & Education Officer Dr. Anna George, right, and US Fish & Wildlife Service Conservation Delivery Coordinator Geoff Call collect critically endangered Laurel Dace from Bumbee Creek. (Photo by WTVC News Channel 9)



A Laurel Dace collected from Bumbee Creek. (Photo by WTVC News Channel 9)

Wild stream fishes have been rescued from disappearing streams several times in North America. Most famously was the rescue of all 800 remaining individuals of the Owens Pupfish *Cyprinodon radiosus* from their one drying pool near Bishop, California, in August, 1969, by Phil Pister and several other employees of the California Department of Fish and Game. The fish were carried to safety in two buckets and later released into suitable habitat.

A similar rescue was carried out in late July, 2024, for the Endangered Laurel Dace *Chrosomus saylori*. This species is considered to be one of the ten most at-risk fish species in North America. The species' range is now down to two streams on a ridge north of Chattanooga, Tennessee. East Tennessee has had little rain this summer, and those two streams were reduced to a series of puddles with negligible flow.

The rescue effort collected and transferred 105 fish to the Tennessee Aquarium Conservation Institute outside Chattanooga, Tennessee. People from the Tennessee Aquarium, the US Fish and

Wildlife Service (USFWS), the University of Georgia's River Basin Center and the Tennessee Wildlife Resources Agency worked on the relocation. The Endangered Species Act prohibits handling or moving listed species, but personnel from the USFWS are authorized to permit removals under emergency conditions such as the Laurel Dace faced in July. It is hoped that these fish can be released sooner than later, weather permitting.

(From WTVC News Channel 9, Chattanooga, Tennessee, August 22, 2024)

19 FISH SPECIES ARE FOUND ONLY IN ALABAMA



Vermilion Darter is found only in Turkey Creek north of Birmingham. (Photo by Pat O'Neil)



Pygmy Sculpin is found in Coldwater Spring near Anniston. (Photo by Pat O'Neil)

After living and working in Alabama for 25 years I take it for granted that Alabama is one of the most biodiverse states in the US by any measure, but especially for aquatic animals. Allow me to share this obsession with you with the help of a recent article in *The Bama Buzz* summarizing the known 19 freshwater fish species found only in Alabama.

Why does this high biodiversity exist in Alabama? Several factors are responsible. The first is lots of rain so there's lots of surface water. Second, the geomorphology of the state with lots of chiseled river beds allows the capture and routing of that rain into a network of rivers. Third, the geologic history of the state going back tens of millions of years meant no glaciers in the state to grind down the northern part of the state, leaving a stable network of isolated streams and springs. So, the state is wet, drained by often isolated river systems, and has been this way a long time. Species have been able to evolve in isolation from other similar populations leading to high biodiversity.

The 19 'Bama-only species are primarily found in the northern half of the state, often associated with springs that are very common. Most of the species on this list are considered to be Endangered, found only in a small range such as a spring. Here's the list with their range, you may know of several of them:

- Cahaba Shiner, *Paranotropis cahabae*: Cahaba River, Locust Fork
- Silverside Shiner, *Alburnops candidus*: Alabama River, Tombigbee River

- Skygazer Shiner, *Miniellus uranoscopus*: Coosa, Cahaba and Alabama river basins
- Cahaba Bass, *Micropterus cahabae*: Cahaba River Basin
- Warrior Bass, *M. warriorensis*: Black Warrior River Basin
- Spring Pygmy Sunfish, *Elassoma alabamiae*: Beaverdam Creek, Madison County
- Pygmy Sculpin, *Cottus paulus*: Coldwater Spring, Calhoun County
- Warrior Darter, *Etheostoma bellator*: Warrior River
- Locust Fork Darter, *Etheostoma* sp. cf. *bellator*: Calvert Prong (Locust Fork)
- Crown Darter, *E. corona*: Cypress Creek in Lauderdale County
- Tuskaloosa Darter, *E. douglasi*: Black Warrior
- Vermilion Darter, *E. chermocki*: Turkey Creek, Jefferson County
- Watercress Darter, *E. nuchale*: Various Jefferson County springs
- Rush Darter, *E. phytophilum*: Birmingham, Sipsey Fork
- Alabama Darter, *E. ramseyi*: Alabama River tributaries
- Tuscumbia Darter, *E. tuscumbia*: Tennessee Valley springs
- Coal Darter, *Percina brevicauda*: Cahaba, Locust Fork, and Hatchet Creek
- Bankhead Darter, *P. sipsi*: Sipsey Fork
- Alabama Cavefish, *Speoplatyrhinus poulsoni*: Key Cave, Lauderdale County

(by Pat Byington, *The Bama Buzz*, August 26, 2024)

KLAMATH RIVER OPEN TO MIGRATORY SALMON AFTER 100 YEARS OF DAMNATION



The Klamath River runs along state Highway 96 near Happy Camp, California. Most river dams are scheduled to come down by the end of the year. (Photo by Nathan Howard/AP file)

It's like waking from a bad dream—several dams on the Klamath River along the California/Oregon border are almost gone, so the river can flow in its original bed and allow the full return of historic salmon runs. The dams being removed were built by 1934 for hydropower. Recently those dams produced only 2% of the power needed by their owner, PacificCorp. That power has been replaced.

Before the dams, the Klamath was the third-largest salmon producing river on the US Pacific coast. Salmon numbers fell sharply as they were cut off from previously available spawning habitat. Two smaller dams further up the river still stand, because they have functional salmon ladders that allow fish to move past them.

Among the beneficiaries of opening the river to salmon are local Tribes including the Yurok and Karuk. These groups have treaty rights to harvest salmon in the river, with little to harvest for the last 100 years.

It's expected that the removal work will be completed in time to allow the fall spawning run of Chinook Salmon *Oncorhynchus tshawytscha* to move further up the river than has been possible for a long time. A similar dam removal project on the Elwha River in the Olympus Peninsula of Washington State was completed in 2011. Chinook Salmon quickly returned to the river, as did Pacific Lamprey *Entosphenus tridentatus*, but it took ten years before fish numbers returned to what had been observed a century before. It takes a while to repair damage done over a century.

(The Associated Press, August 26, 2024)

SEAGRASSES CAN FILTER HUMAN PATHOGENS FROM MARINE WATERS



Elgrass migrated to the Atlantic from the Pacific hundreds of millennia ago. (Photo by Christoffer Boström, Åbo Akademi University)

Seagrass meadows have long been known to be important for the healthy function of coastal ecosystems as filters and stabilizers. Recent research demonstrates that seagrasses can also filter human bacterial pathogens from the water, preventing their uptake by marine bivalves. These bivalves are an important food source for people around the world.

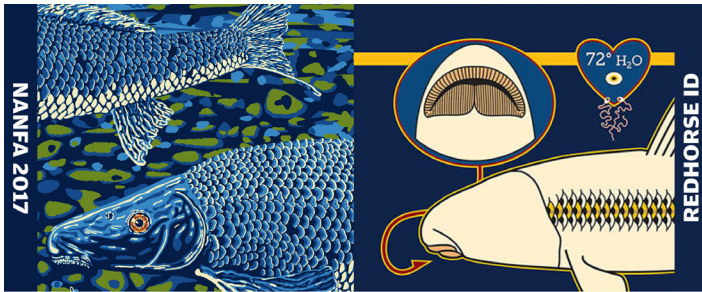
The immediate importance of this is that contaminated bivalves can be the source of human infectious disease. That's bad enough, but many of these pathogens are also drug resistant, adding to that disease burden. In monetary terms this burden is estimated at \$12 billion globally and likely to increase if no action is taken to reduce the threat.

Researchers studied 20 Puget Sound beaches in Washington state with varying seagrass cover. Mussel gills were examined for the presence of pathogenic bacteria. Mussels from beaches with heavier seagrass cover were found to have up to a 65% reduction in pathogenic bacteria compared to those from beaches with lighter seagrass cover.

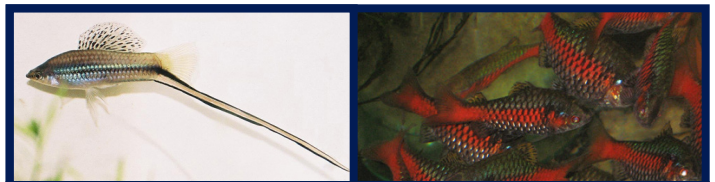
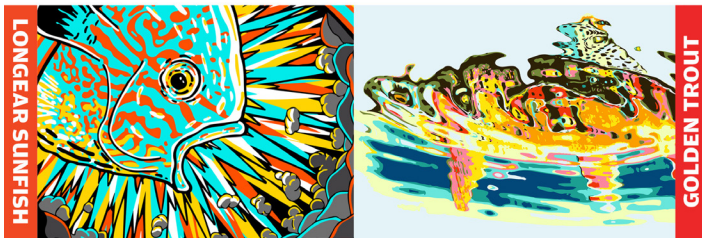
This study reinforces what is already known, that advancing environmental degradation can have direct effects on human health. People can take actions that both conserve and expand seagrass meadows in coastal waters such as Puget Sound, as well as land and waste water management to discourage bacterial growth through overloading natural waters with nutrients such as phosphate.

We take ecosystem services such as seagrass filtration for granted. That's a bad idea.

The full study can be found at: Phoebe D. Dawkins et al, Seagrass ecosystems as green urban infrastructure to mediate human pathogens in seafood, *Nature Sustainability* (2024). DOI: 10.1038/s41893-024-01408-5



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FISHES OF WISCONSIN POSTERS



The University of Wisconsin Zoological Museum has some amazing fish posters for sale. The 13-foot canvas poster shows all 183 species found in the state, at life size, and costs \$150. Nine smaller posters, each depicting a subset (eight show families: the sunfishes, the pikes, the perches, the gars, the suckers, the salmonids, the catfishes, and the minnows; "The Little Fishes of Wisconsin" includes 16 families) are also available. The excellent art is by Kandis Elliot, UW-Senior Artist Emerita, and reference photos were provided by NANFA member John Lyons. See <https://charge.wisc.edu/zoology/items.aspx> for more info.

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THE NORTH AMERICAN NATIVE FISHES ASSOCIATION

DEDICATED TO THE APPRECIATION, STUDY AND CONSERVATION OF THE CONTINENT'S NATIVE FISHES

AN INVITATION TO JOIN OR RENEW

The North American Native Fishes Association is a 501(c)(3) not-for-profit, tax-exempt corporation that serves to bring together professional and amateur aquarists, anglers, fisheries biologists, ichthyologists, fish and wildlife officials, educators, and naturalists who share an interest in the conservation, study, and captive husbandry of North America's native fishes. A portion of each member's dues helps support three important initiatives: NANFA's Conservation Research Grant Program, which funds research on the biology and conservation of North America's most neglected and imperiled fishes; the Gerald C. Corcoran Education Grant, which funds educational outreach programs aimed at children and the general public; and the John Bondhus Conservation Grant, which supports organizations and groups working to conserve native fish populations.

MEMBER BENEFITS

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- **REGIONAL NANFA CHAPTERS**. State and regional aquarium groups where members may get together to collect and discuss native fishes, remove exotics, and perform conservation and stream restoration work.
- **NEW MEMBER PACKET**. An 8-page newsletter that's sent to new NANFA members introducing them to NANFA, and to the fascinating world of collecting, keeping and conserving North America's native fishes.
- **ANNUAL CONVENTION**. Where NANFA members from around the country meet for lectures, collecting trips, auctions, fun and finship. **The 2025 convention will be May 29–June 1 at Kentucky Dam Village State Park, Gilbertsville, KY.**
- **GRANT FUNDING**. Only NANFA members can apply for NANFA's Conservation Research Grant and Gerald C. Corcoran Education Grant programs. For details, see NANFA's website (www.nanfa.org), or contact Dr. Bruce Lilyea, Conservation Grant Chair, 863-513-7611, bruce.lilyea@gmail.com, or Scott Schlueter, Education Grant Chair, scott_schlueter@hotmail.com.

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(See Contents page.)