

Something Different: A Report from the 2004 NANFA Convention in Columbia, South Carolina

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Every NANFA convention offers something different. Different locations, different hosts, different speakers, a different mix of attendees, different fishes to catch and ogle over—they all add up to uniquely color each convention and make it memorable. But the 2004 meeting in Columbia, South Carolina, felt different. I'm not saying it was better than previous get-togethers. I'm just saying it was . . . different. Different in a good way.

Maybe it was the schedule. Instead of talks on Friday and collecting on Saturday, the order was reversed, shaking things up a bit. Instead of meeting people over coffee, we met them over a seine.

Maybe it was the location. I liked seeing palm trees (they made me think I was on vacation rather than at a convention). And I liked that South Carolina offers so many types of aquatic habitats so close together. Fast mountain rivers. Slow coastal streams. Gator-filled swamps. Brackish creeks and backwaters. And the big pond itself, the Atlantic Ocean.

Maybe it was the zoo. The Saturday talks and Saturday night banquet were held at the Riverbanks Zoo and Garden, the sights and sounds of which lent a zoological (and botanical) expeditionary air to our goings-on. The African-style Ndoki Lodge was where we gathered to hear the speakers, and we banqueted in the middle of the Zoo's Aquarium/Reptile Complex, surrounded by tanks of seahorses, moon jellies, coral reef fishes, and other aquatic creatures.

Speaking of banquets, maybe it was the food, particularly the corn bread, collared greens, pecan pie, extra-sweet iced tea, and the thin vinegar-and-mustard-spiked stuff that South Carolinians call barbecue sauce.

Maybe it was the southern hospitality and gentlemanly charm of convention hosts Chip Rinehart and Dustin Smith, who, along with Fritz Rohde, deftly handled hundreds of details and made everyone feel welcome and right at home.

Maybe (for me at least) it was something personal. My wife Stephanie and I met at the 1998 NANFA Convention in Chattanooga, and to this one we brought along our 13-month-old son, William. We enjoyed showing William off and (we hope) everyone enjoyed meeting him.

Or maybe, just maybe, it was the meerkats. Just outside the Ndoki Lodge was an exhibit of slender-tailed meerkats (Fig. 1), an African relative of the mongoose. Alert, curious, usually on their feet scanning for danger, they looked genuinely surprised every time a human walked by, which must have been several thousand times a day. If the pygmy sunfishes from Casper's t-shirt and convention logo design were the official fishes of NANFA 2004 (see Fig. 6), then the meerkat was our unofficial non-fish vertebrate.

For this convention summary article, my fifth in six years, I'd like to try something different, too. In addition to my usual summary of the talks and field trips, I will sprinkle in the thoughts and thank-yous of fellow attendees throughout the text. As in here:

I'd like to thank Dustin and Chip and everyone else who helped with the convention. I had a great time. The presentations were great. The choices of collecting trips covered a wide range of habitats. I really had a hard time deciding which trip to sign-up for. . . . All this and great BBQ, too.

— Harry Knaub (York, PA)

Four Day Trips in One Day

As attendees filed in Thursday afternoon and evening, they were confronted with a most difficult choice: Which of Friday's four field trips should I sign up for? For me the decision came down to snorkeling. Only Fritz Rohde's trip to the mountain streams of South and North Carolina offered an opportunity to snorkel, so I signed up for that one. But in so doing I lost out on Chip Rinehart's trip through the Edisto drainage, and Dustin Smith's trip across the Coastal Plain into Charleston, and Gerald Pottern's trip through the Sandhills (a row of distinctive hills that run along the Fall Line). Not to worry, though. Plenty of fishes were collected, and everybody had an opportunity to swap and trade back at the hotel. (Personal, proud Daddy moment: William was so entranced by the contents of one cooler, he fell in head first! No harm done to either William or fish.) Lists of the fishes sampled at each location are given in Tables 1-3. (Sorry, the fish list for the Sandhills trip was not available at press time.)

Once again, another great convention! I just wish I had been able to go on at least three of the four field trips on Friday! The Sandhills trip was a lot of fun in the mud with some really cool and new-to-me fishes. The speakers on Saturday were great. In between speakers, we had a chance to watch the meerkats right outside the door. The auction had lots of cool stuff, and I even won some of the stuff I bid on!

The only bad part happened on Sunday, on the trip to Charleston with Chip. About 30 miles out of Charleston, I got a flat tire on my truck. The whole crew stopped and helped change the tire in record time. I think we're ready for NASCAR next time!

— Ranger Bob Culler (Kingsport, TN)

Note from Mrs. Ranger Bob (a.k.a. Betsy):

Let's thank "Mrs. Chip" (a.k.a. Vickie) for manning the registration tables while all the folks were out playing in the creeks. And having the lectures at the Zoo was great. That way we could listen a while then go see the animals, listen some more, then go to the gardens. I enjoyed meeting more of the ladies this year and getting to know each other better.

"The Coelacanth of the Southeast"

Saturday was speakers' day. After the meerkats welcomed us outside Ndoki Lodge, Dustin Smith, NANFA president Bruce Stallsmith, and Melissa Salmon, Aquatics Department Supervisor at the Riverbanks Zoo, officially welcomed us inside. Melissa's welcome was especially nice. "We're very



Fig. 1.

The meerkat (*Suricata suricatta*) is a mongoose of the African grasslands. They are a wary, vigilant species, often seen on their hind feet with their noses in the air, keeping watch—in this instance watching NANFA conventioners just outside Ndoki Lodge at the Riverbanks Zoo in Columbia, SC. Photo by Dustin Smith.

honored to have such a wonderful group of private [hobbyists] here," she said. "As any of our staff will tell you, we have the highest respect for private hobbyists, especially ones of your caliber, who are dedicated to North American fishes."

Our first two speakers were David Wilkins of the South Carolina Aquarium, and Timothy B. Grabowski of Clemson University. Both serve on the Robust Redhorse Conservation Committee, a voluntary (i.e., non-federally mandated) partnership charged with keeping the rare robust redhorse (*Moxostoma robustum*) off the federal list of endangered species. Dave provided background on the fish and an overview of the Committee's efforts to date. Tim discussed the importance of main channel gravel bars to the fish's spawning, egg development, and larval life history.

The robust redhorse (Fig. 2) is a large, long-lived member of the sucker family (Catostomidae). Adults can reach 30 inches in length and weigh up to 17 pounds. The maximum known age is 27 years. The fish has a thick, robust body with rose-colored fins and a fleshy lower lip. Master naturalist Edward Drinker Cope first described the robust redhorse in 1870 based on a single six-pound specimen collected from the Yadkin River in North Carolina. The specimen was apparently destroyed and by the late 1800s all mention of the robust redhorse had dropped from the scientific literature. In the early 1980s, unidentified specimens were collected from the Savannah and Pee Dee rivers in North Carolina and South Carolina. However, they were not properly identified because

Table 1. Locations and fish species sampled during the Edisto River drainage collecting trip led by Chip Rinehart, 18 June 2004, during the 2004 NANFA Convention.

Murph Mill Creek

Nocomis leptocephalus, bluehead chub
Notropis cummingsae, dusky shiner
Notropis lutipinnis, yellowfin shiner
Pteronotropis stonei, lowland shiner
Noturus gyrinus, tadpole madtom
Noturus leptacanthus, speckled madtom
Esox americanus americanus, redfin pickerel
Aphrododerus sayanus, pirate perch
Gambusia holbrooki, eastern mosquitofish
Centrarchus macropterus, flier
Lepomis punctatus, spotted sunfish
Etheostoma fricksium, Savannah darter
Etheostoma olmstedi, tessellated darter
Percina nigrofasciata, blackbanded darter

Little Bull Swamp

Pteronotropis stonei, lowland shiner
Fundulus lineolatus, lined topminnow
Gambusia holbrooki, eastern mosquitofish
Enneacanthus chaetodon, blackbanded sunfish
Enneacanthus gloriosus, bluespotted sunfish
Elassoma zonatum, banded pygmy sunfish

Edisto River

Esox americanus americanus, redfin pickerel
Esox niger, chain pickerel
Gambusia holbrooki, eastern mosquitofish
Enneacanthus chaetodon, blackbanded sunfish
Enneacanthus gloriosus, bluespotted sunfish
Lepomis auritus, redbreast sunfish

Lepomis gulosus, warmouth
Lepomis macrochirus, bluegill
Lepomis microlophus, redear sunfish
Elassoma zonatum, banded pygmy sunfish

Goodland Creek

Notropis cummingsae, dusky shiner
Notropis chalybaeus, ironcolor shiner
Scartomyzon cf. *lachneri*, brassy jumprock
Gambusia holbrooki, eastern mosquitofish
Etheostoma olmstedi, tessellated darter
Percina nigrofasciata, blackbanded darter

Black Creek

Notropis cummingsae, dusky shiner
Pteronotropis stonei, lowland shiner
Noturus leptacanthus, speckled madtom
Labidesthes sicculus, brook silverside
Fundulus lineolatus, lined topminnow
Gambusia holbrooki, eastern mosquitofish
Enneacanthus chaetodon, blackbanded sunfish
Enneacanthus gloriosus, bluespotted sunfish
Lepomis macrochirus, bluegill
Lepomis marginatus, dollar sunfish
Elassoma evergladei, Everglades pygmy sunfish
Elassoma zonatum, banded pygmy sunfish
Etheostoma fricksium, Savannah darter
Etheostoma serrifer, sawcheek darter
Etheostoma olmstedi, tessellated darter
Percina nigrofasciata, blackbanded darter

the robust redhorse name had been misapplied to a related species. In 1991, fishery biologists with the Georgia Department of Natural Resources collected five unrecognized fish from the Oconee River. They sent them to Robert E. Jenkins (aka “Dr. Sucker”) of Roanoke College, who untangled the taxonomic knot and determined that the Oconee specimens and the previously collected unknown fish were the lost robust redhorse. In effect, the collection of robust redhorse from the Oconee River marked the rediscovery of a species that had been lost to science for 122 years—hence giving it the unofficial moniker of “coelacanth of the Southeast,” a reference to the famous fossil fish rediscovered off the Comoros Islands in 1938.

Robust redhorse are rare fish that appear even rarer because they are so difficult to collect. Adults live in deep, fast-flowing river beds filled with woody debris, out of the reach of nets and electroshockers. Wild populations are now known to exist in the Ocmulgee and Oconee rivers (Georgia), the Savannah River (Georgia/South Carolina), and the Pee Dee River (North Carolina/South Carolina). In addition, small stocked populations have been established by introducing fish in the Ocmulgee, Ogeechee, and Broad rivers in Georgia.

Tim’s portion of the presentation was titled “Spatial and Temporal Habitat Segregation by Spawning Fishes in the

Savannah River, South Carolina and Georgia.” According to Tim, six sucker species including the robust redhorse inhabit the lower Savannah River, all of which use the shallow main channel gravel bars for spawning. Combining visual observation (fishwatchers sitting in deer stand-like posts over the gravel bars), prepositioned grid electrofishers, and drift nets, Tim and study co-author Jeff Isley were able to evaluate spawning activity of spotted sucker (*Minytrema melanops*), notchlip redhorse (*Moxostoma collapsum*), and robust redhorse. They spawned at different times, with adults of a given species present on the bar for a discrete period of time (15-21 days) followed by a lapse of 14-20 days when no spawning individuals were observed. The study’s preliminary conclusion is that no interference of spawning activity occurs among species and that other factors—such as the scarcity of main channel gravel bar spawning and nursery habitat in the highly dammed and modified Savannah River—may be affecting sucker populations, including those of the robust redhorse.

This was my first conference and I doubt I’ll miss any in the future. . . . From speakers to collecting trips, everything was excellent. It was great to meet so many of you folks. The [email] list will be much more enjoyable knowing the people behind the emails.

— Mike Lucas (Schetecteday, NY)

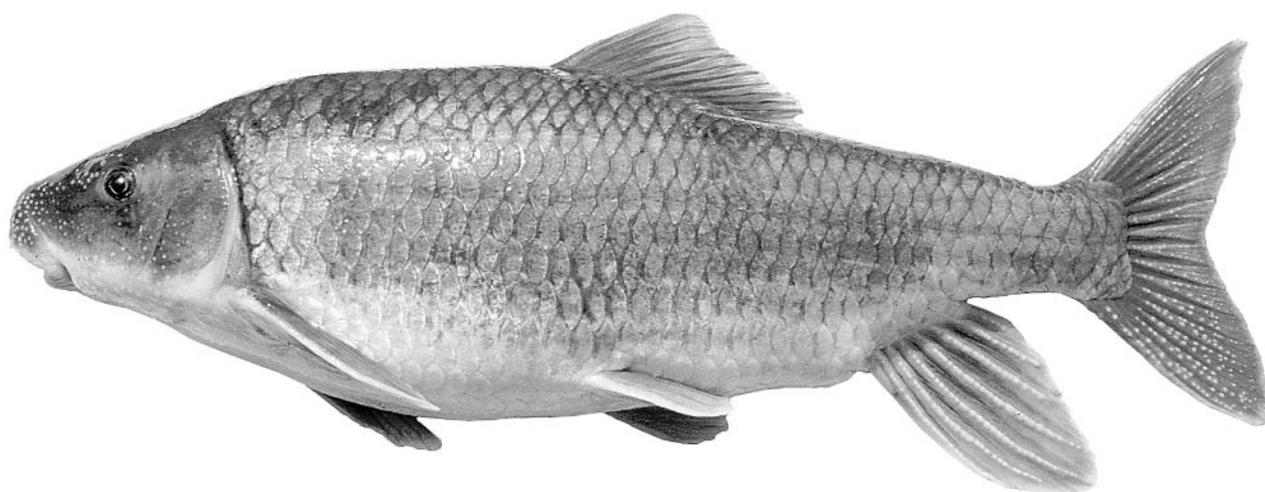


Fig. 2.

Robust redhorse (*Moxostoma robustum*), tuberculate male. Courtesy: Robust Redhorse Conservation Committee.

Aliens, Storks and Alligators: Life in Floodplain Pools

Next up was Tyler Strange, a senior at Oak Grove High School in Oak Grove, Louisiana, who spoke of his adventures studying the ecology of small floodplain pools along the lower Mississippi River with fellow NANFAns Heather Smith and Jan Hoover, and Jan's wife, Dena Dickerson.

Ninety percent of the floodplain pools that once occurred in the lower Mississippi Basin have been eliminated by human activity. These distinctive wetlands are rarely studied and the fish-habitat relationships within them are poorly known. In summer 2003, Tyler helped survey pools on or near Tara Wildlife, a hunting and nature retreat in Warren County, Mississippi. Twenty-six species of fish were collected. The most dominant species were all habitat generalists: western mosquitofish (*Gambusia affinis*), bluegill (*Lepomis macrochirus*), and bullhead catfish (*Ameiurus* sp.). In some pools, three "alien" species—silver carp (*Hypophthalmichthys molitrix*), common carp (*Cyprinus carpio*), and grass carp (*Ctenopharyngodon idella*)—represented a large percentage of the biomass and far outnumbered native fishes usually found in such habitats, such as gars and bowfin. In one pool the water surface was covered with green strings of silver carp feces.

A major focus of the study was the feeding ecology of the federally endangered wood stork (*Mycteria americana*). Tyler noted that the stork preferred feeding in deeper, cooler and less turbid pools. These pools harbored, on average, three times more fish species than the shallow pools not visited by wood storks. Predominant fishes in these pools were shad (*Dorosoma* sp.), buffalo (*Ictiobus* sp.), black crappie (*Pomoxis*

nigromaculatus), bowfin, and gars. Western mosquitofish were not abundant in some of the stork pools, which suggested the storks were feeding on larger fishes.

Easily the most charismatic fish of Mississippi floodplain pools is the alligator gar (*Atractosteus spatula*). Through exploitation and outright persecution as an unwanted fish, alligator gar are uncommon. So Tyler and company endeavored to rescue every gar they found stranded in a drying pool (Fig. 3). Specimens they collected had wounds on the body or on the head and lower jaw. Body wounds were most likely from birds. Head and jaw wounds were probably from the gars themselves, which are highly territorial and often lock jaws and fight to the death, especially when in overcrowded conditions. Rescued gar were stacked like cordwood in coolers and transported to a private boat ramp. There they were measured and tagged, had fins clipped for genetic studies, and were released into a permanent slough where fishing is prohibited. Three individuals, however, were retained and later set up in greenhouse tanks to monitor tag retention and test methods for effective radio-tag attachment.

Tyler ended his presentation by discussing some of other critters found in the pools, including aquatic snakes, jelly balls (bryozoans), clam shrimp (the first ever documented from Mississippi), and—as the title of his talk promised—actual alligators.

Many South American Plants Are Actually South Carolinian

I know nothing about plants—aquatic or terrestrial—so the next talk was quite an eye-opener. Patrick McMillan,

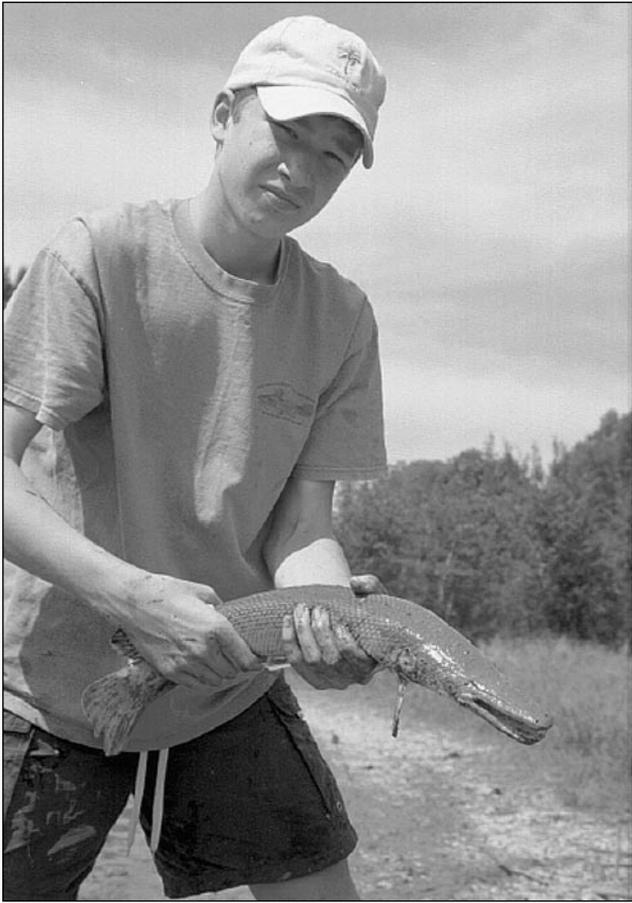


Fig. 3.

Convention speaker Tyler Strange rescuing an alligator gar (*Atractosteus spatula*) from a drying floodplain pool in Warren Co., Mississippi. Photo by Jan Jeffrey Hoover.

Curator of the Clemson University Herbarium, presented a witty, well-photographed program on “Aquatic and Wetland Plants of South Carolina.” I had little idea that so many of the aquarium plants that tropical fishkeepers keep with their South American tetras and cichlids are actually native to the southeastern U.S.: radican sword (*Echinodorus cordifolius*), dwarf pypy chain sword (*E. tenellus*), hornworts (*Cabomba*), banana plants (*Nymphoides*), and *Sagittarius*, to name a few.

Patrick began his tour of South Carolina’s aquatic plant communities up in the mountains (where permanent ground-water creates “cataract fens,” a bog-like ecosystem found nowhere else in the world), then down through the brown-and blackwater streams and swamps of the Carolina Sandhills, and ultimately into the tidal marshlands of the Carolina low country, or Coastal Plain. Along the way he commented on which plants make good or bad additions to the home aquarium. One plant to think twice about, Patrick said, is river weed (*Podostemon*), which grows on submerged

rocks in fast-flowing water. Although it’s tempting to take a few clumps home, it won’t live long unless it’s given cool water (<65 °F) and strong current. However, a superb aquarium plant that’s ignored by most aquarists is floating bladderwort (*Utricularia inflata*). Found in ponds and ditches, floating bladderwort is a carnivorous plant that grows well in most water conditions.

Yes, I too thought that the convention was great, but what I really want to do is thank everyone for being so nice to my Dad while we were there. As anyone who talked to him knows, he is not really into this kind of thing—more of a sport fisherman than anything else. But once again, NANFA showed some class and made someone from the outside feel welcome.

As a perfect ending to the convention, Dad and I went to a spot that Fritz told us about and did a little more seining on Sunday. (Father’s Day in the stream with my dad, not a bad deal at all!) A young family comes by and asks us what we are looking for. They had been fishing for “perch” (they mean sunnies) and “hornyheads” (big male bluehead chubs). So my dad starts to tell them about the really pretty fish that live right there in the stream. We proceeded to talk through the whole NANFA concept: hobby, beauty of the fish, conservation, education, recognizing what is in your own backyard (or local park as was the case). We showed them some fieryblacks and yellowfins and they were appropriately impressed. While I’m used to explaining what I’m doing and why, and proclaiming the beauty of our local environment, I was really surprised to hear my dad chime in so strongly. A credit to NANFA and to the hospitality of the group in South Carolina, that he took up the message so easily.

All in all a great convention, a great weekend, and a great Father’s Day!

— Mike Wolfe (Statham, GA)

Flames in the Water

Gerald Potters vividly remembers the first time he saw a *Hydrophlox* shiner in full spawning regalia. “I was wading along a little creek in Charlotte about 90 miles north of here,” he said, “when I saw a red and gold writhing mass that looked like red and gold shag carpet in the stream.” It was a dense aggregation of greenhead shiner (*Notropis chlorocephalus*), spawning over the nest of a hornyhead chub (*Nocomis* sp.). The sight amazed Gerald, just as it must have amazed David Starr Jordan over 125 years earlier, when he named the shiner subgenus *Hydrophlox* using the Greek words for water and flame—the flame being the intense red and orange colors of breeding males.

Table 2. Locations, habitat descriptions, and fish species sampled during the Coastal Plain collecting trip led by Dustin Smith, 18 June 2004, during the 2004 NANFA Convention.

Murph Mill Creek

Tannin-stained creek over sand with eel grass and submerged side vegetation. Same creek as listed in Table 1; sampling took place one river crossing downstream. Table 1 combines fishes sampled by both groups.

Back River

Impoundment or river with heavy growth of water hyacinth and hydrilla.

Anguilla rostrata, American eel
Ameiurus sp., juvenile bullhead catfish(es)
Esox sp., juvenile pickerel(s)
Labidesthes sicculus, brook silverside
Fundulus chrysotus, golden topminnow
Lucania goodei, bluefin killifish
Gambusia holbrooki, eastern mosquitofish
Heterandria formosa, least killifish
Enneacanthus gloriosus, bluespotted sunfish
Micropterus salmoides, largemouth bass

Ashley River

Large tidal creek with mud bottom.

Fundulus heteroclitus, mummichog
Fundulus majalis, striped killifish
Poecilia latipinna, sailfin molly
Syngnathus sp., pipefish
Synodus foetens, inland lizardfish
Lagodon rhomboides, pinfish
Gobiesoma bosci, nakd goby
Trinectes maculatus, hogchoker
Symphurus sp., tonguefish
Chilomycterus sp., burrfish

Unnamed marsh and canal

Very shallow hypersaline marsh with canal.

Elops saurus, ladyfish
Menidia beryllina, inland silverside
Fundulus confluentus, marsh killifish
Fundulus heteroclitus, mummichog
Lucania parva, rainwater killifish
Gambusia holbrooki, eastern mosquitofish
Poecilia latipinna, sailfin molly
Cyprinodon variegatus, sheepshead minnow

Gerald's travels as an environmental impact consultant and inveterate collector for the home aquarium has put him face-to-fin with just about every member of the *Hydrophlox* group. The rosyface shiner (*Notropis rubellus*) is the most ancestral looking fish of the bunch. [Ed. note: most systematists now consider *N. rubellus* to be in the subgenus *Notropis*.] The Ozark minnow (*N. nubilus*)—the one species Gerald has yet to see—has a coiled intestine designed for its herbivorous diet. The Tennessee dace (*N. leuciodus*) does not hold its color in aquaria; perhaps a chiller is required. The saffron shiner (*N. rubricroceus*) also needs cooler water. The rainbow shiner (*N. chrosomus*), Gerald's favorite of the group, is a tough fish to photograph because of its iridescence. ("The painting of it in the Peterson *Field Guide*," Gerald said, "is an understatement that doesn't come anywhere close to the

gaudiness of the real fish.") The rough shiner (*N. baileyi*) is the ugly duckling of the group. The yellowfin shiner (*N. lutipinnis*) has different colored fins across its range: some are yellow, some are red, some are yellow-red.

Gerald discussed the physiology and zoogeography of the group, and the adaptive significance of spawning over the nests of nest-building minnows such as chubs and stonerollers. He closed his talk summarizing his experience keeping and breeding these colorful fishes in aquaria.

"*Hydrophlox* are fantastic aquarium fish," Gerald said. "They love captivity. They're easy to feed. They take flake food (the greatest invention on Earth). Most of them will eat flake foods the day you get them home."

The best way to get them home is in a dark bucket or cooler supplemented with salt or some other kind of water conditioner. Dark-colored containers reduce stress, while the salt and water conditioners replace the body salts they lose during the adrenaline rush of being captured and thrown into a container. Dark buckets also help the fish retain their colors if you want to photograph them in the field. Once in the aquarium, it's good to keep adding salt and minerals since *Hydrophlox* do not like soft, acid water. Gerald adds a tablespoon of aquarium salt per five gallons, and places aragonite or crushed coral into the filters to increase hardness and buffer the water.

Rainbow shiners are the easiest *Hydrophlox* to spawn. Gerald places a small container filled with pebbles or glass marbles under the outflow of a filter to serve as an imitation chub nest. He paints the tank dark to relax the shiners and intensify their colors. The tank bottom is bare to help see and collect eggs that don't make it into the nest. After spawning, Gerald removes the "nest" and pours the water and eggs into a plastic shoebox or similar container. Eggs hatch in 2-3 days. Fry eat daphnia. Gerald's rainbow shiners do not need a winter cooling-down period or a manipulated daylength. They spawn every two weeks just about year-round, he said.

Diversity of Freshwater Sculpins: New Approaches to Studying "Blobs"

Blobs, muddlers, miller's thumbs, gudgeons, muffle-jaws, bullheads—sculpins are known by lots of local vernacular names. Their scientific nomenclature is just as varied, with many more to name, said David A. Neely, a postdoctoral researcher at Saint Louis University. Dave's Ph.D. thesis centered on a phylogenetic analysis of the genus *Cottus* based on mtDNA sequence data. His talk provided a brisk and

Table 3. Locations and probable fish species sampled during the “mountain” collecting trip led by Fritz Rohde, 18 June 2004, during the 2004 NANFA Convention.

Middle Saluda River

Cyprinella pyrrhomelas, fieryblack shiner (Fig. 4)
Cyprinella zanema, Santee chub
Hybopsis rubrifrons, rosyface chub
Notropis lutipinnis, yellowfin shiner
Notropis scepticus, sandbar shiner
Ameiurus natalis, yellow bullhead
Noturus leptacanthus, speckled madtom
Lepomis macrochirus, bluegill
Etheostoma thalassinum, seagreen darter

Matthews Creek (tributary of North Saluda River)

Cyprinella pyrrhomelas, fieryblack shiner
Hybopsis rubrifrons, rosyface chub
Notropis lutipinnis, yellowfin shiner
Hypentelium nigricans, northern hog sucker

French Broad River (NC)

Campostoma anomalum, central stoneroller
Cyprinella galactura, whitetail shiner
Luxilus coccogenis, warpaint shiner
Nocomis micropogon, river chub
Notropis rubricroceus, saffron shiner
Notropis spectrunculus, mirror shiner
Phenacobius crassilabrum, fatlips minnow
Rhinichthys atratulus, eastern blacknose dace
Semotilus atromaculatus, creek chub
Hypentelium nigricans, northern hog sucker
Cottus bairdii, mottled sculpin
Ambloplites rupestris, rock bass
Etheostoma flabellare, fantail darter
Etheostoma rufilineatum, redline darter
Etheostoma swannanoa, Swannanoa darter
Percina evides, gilt darter (Fig. 5)

Eastatooe Creek

Hybopsis rubrifrons, rosyface chub
Nocomis leptocephalus, bluehead chub
Notropis lutipinnis, yellowfin shiner
Hypentelium nigricans, northern hog sucker
Scartomyzon sp., jumprock
Ameiurus brunneus, snail bullhead
Noturus insignis, margined madtom
Lepomis auritus, redbreast sunfish
Lepomis gulosus, warmouth
Micropterus coosae, redeye bass
Micropterus salmoides, largemouth bass
Etheostoma inscriptum, turquoise darter
Percina nigrofasciata, blackbanded darter

fascinating overview of his findings, most of which will shake up sculpin classification once more data is collected and papers start hitting the scholarly journals. For example, when all is said and done, only one true *Cottus* will occur in North America, the spoonhead sculpin (*Cottus ricei*); all others will be placed in new or synonymized genera.

The most complex “complex” of North American sculpins are the mottled sculpins, referable to *Cottus bairdii* and numerous other species, subspecies, nominal subspecies, and undescribed forms. Mottled sculpins range across North America (but are conspicuously absent from the Great Plains),



Fig. 4.

Fieryblack shiner (*Cyprinella pyrrhomelas*), from the Middle Saluda River, SC. Photo by Todd Crail.

displaying extreme variations in shape, coloration, meristic characters, behaviors, habitat requirements, and just about every other attribute that can be measured and quantified.

Dave got one of the biggest laughs of the day when he breezed through two slides explaining the molecular techniques used in his dissertation:

“Blah blah, blah blah, DNA. Blah blah, blah blah blah, DNA. Blah blah blah.”

I want to offer my congratulations to Dustin, Chip, Fritz, and all those involved in the Columbia meeting. It was obvious a tremendous amount of time and effort was put in with the result a wonderful convention. Dustin and Chip provided a personal touch. Each went out of his way to assist in the resolution of the inevitable problems that arise when a large group of people travel a long distance for a three-day event. Chip even enlisted his daughter to help my daughter enjoy the speakers' day.

— Charles Ray (Auburn, AL)

Ditch Crickets

Freshwater lobster. Crawfish. Crawdads. Crawdaddies. Mud bugs. Ditch crickets. Whatever you call them, crayfish are a major component of aquatic ecosystems, and the subject of the next presentation, “An Introduction to Crayfishes,” by longtime NANFA member (and former NANFA Vice President) Brian Wagner. Brian, who works as a nongame aquatic biologist with the Arkansas Game and Fish Commission, covered a lot of ground in his fact-filled talk. Classification. Distribution. Morphology. Life history (including molting, breeding, burrowing, and feeding). Habitat. Collecting. Human use. And conservation status. Several interesting facts:

- “What’s the difference between crayfish and lobsters?” is the question Brian is asked most often. The answer: Lobsters



Fig. 5.

Gilt darter (*Percina evides*) from the French Broad River (NC), captive specimen. Photo by Todd Crail.

are marine with pelagic larvae. Crayfish are freshwater and carry their eggs.

- Crayfish are found throughout the world except Africa (although some species are found in Madagascar). North America is the hub of the crayfish world, home to 400+ species, 338 of which occur in the United States and Canada, most of them east of the Rocky Mountains.

- Of the 338 U.S. and Canadian species, two are extinct or presumed extinct, 65 are endangered, 45 are threatened, and 50 are special concern. In other words, nearly half of North America's crayfish species (not including México and Cuba) are in some sort of decline.

- It's rare to find more than four or five crayfish species in the same stream. "They don't play well together," Brian said. "Just put two in an aquarium and see for yourself."

- The enlarged claws on crayfish are called chelae. They aren't used to gather food, as many people think. Instead, chelae are used in defense, mating and burrowing.

- Speaking of burrowing, every crayfish does it, some more so than others. Crayfish can burrow down to the water table, or up to 20 feet deep.

- The life histories of most crayfish species have not been studied. But one fact is known for sure: Crayfish are "key-stone" species—species that play an essential role in

aquatic systems. "Crayfish eat everything," Brian said. "And everything eats crayfish."

Expect to hear more from Brian Wagner. He had so much fun at this convention, he volunteered to host NANFA 2005 in Little Rock!

This was my first convention and I have to admit I haven't had that much fun in many years. I genuinely enjoyed meeting everyone and I look forward to my next convention.

— Charles Michael "Moon" Hissom (Wilmington, NC)

Pygmy Sunfishes from *Z(onatum)* to *A(labamae)*

Fritz Rohde had been handling the speaker introductions. Since Fritz himself was next up at the podium, Dustin Smith did the honor, mentioning that Fritz has "married more women than has described new species, but is working on both numbers." Fritz delivered what he called a "personal overview" of the pygmy sunfish family *Elassomatidae*, which featured some interesting nomenclatural arcana.

David Starr Jordan described the first species of the family (and genus), *Elassoma zonatum*, the banded pygmy sunfish (front cover, bottom), in 1877. At the time Jordan didn't

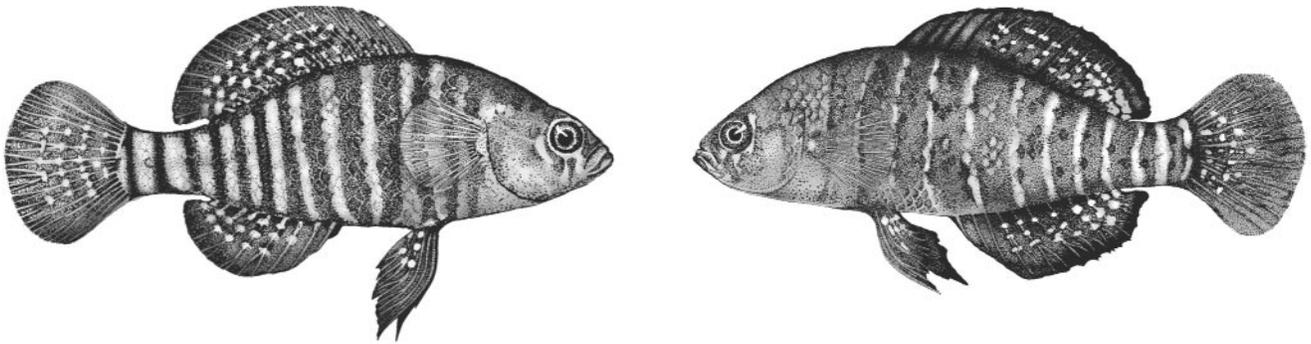


Fig. 6.

Left: Carolina pygmy sunfish (*Elassoma boehlkei*). Right: Bluebarred pygmy sunfish (*Elassoma okatie*). These are the two pygmy sunfish images that Casper Cox used in his convention logo, signage and t-shirt designs. The source art was two black-and-white illustrations, to which Casper added shading and color based on color photographs supplied by Fritz Rohde.

know what the fish was, so he stuck it in the cichlid family. Jordan also described the second known species, *E. evergladei*, the Everglades pygmy sunfish (front cover, top), in 1884.

The taxonomy of the third described species, *E. okefenokee*, the Okefenokee pygmy sunfish, is controversial. James Böhlke of the Academy of Natural Sciences in Philadelphia, published his description in 1956, a mere eight months after he had been given the type specimen from aquarium legend William T. Innes, who had received the fish from a sharp-eyed aquarist who noted its uniqueness. Unfortunately, in his rush to publish, Böhlke overlooked a paper by Swedish naturalist E. Lönnberg, who described what is clearly an Okefenokee pygmy sunfish, based on specimens from Orlando, under the name *E. orlandicum* in 1894. Which name should be used? Since Lönnberg himself was unsure about the validity of the new species, and never deposited any type specimens into a museum, Böhlke's much later but more definitive description stands—at least for now. Franklin Snelson of the University of Central Florida is investigating the problem.

The next pygmy sunfish species was discovered in 1937 but was not named until 56 years later. Specimens sat in a museum jar at the University of Michigan while Carl Hubbs and Reeve Bailey promised descriptions, but never came through with them. Richard L. Mayden finally gave the rarest *Elassoma*, the federally endangered Alabama pygmy sunfish, its official moniker of *E. alabamae* in 1993.

Between the discovery and description of *E. alabamae*, two more species of *Elassoma* were discovered and described. In 1970s a “snot-nosed graduate student” looking to make a name for himself—Fritz Rohde—discovered a distinctive pygmy sunfish in Brunswick Co., North Carolina. Again, a description would have to wait. Fritz sent the specimens to James Böhlke and was eager to co-author the description with

the famous ichthyologist. But nothing happened. Fritz later learned that Böhlke had taken his own life after losing his position at the Academy. Fritz then teamed up with his friend Rudy Arndt to pen the description. While surveying for additional populations, they discovered a second new species in Jasper Co., South Carolina. Fritz and Rudy described both species in the same 1987 paper. They named the first species *E. boehlkei*, the Carolina pygmy sunfish (Fig. 6, left), after James Böhlke. They named the second species *E. okatie*, the bluebarred pygmy sunfish (Fig. 6, right), after an Indian word meaning “coming from water.” Concerned that the two species might later be recognized as one, they made sure that *boehlkei* had priority by naming it first in their publication. Indeed, their concern may be prescient; DNA studies shows that the two forms share alleles, which may be evidence that *E. okatie* is actually *E. boehlkei*. Stay tuned.

After Fritz's talk, James Clark of the Riverbanks Zoo (now at the Shedd in Chicago), spoke briefly about the Zoo's *Elassoma* breeding program. The Zoo is maintaining refuge populations of four species—*evergladei*, *okefenokee*, *boehlkei*, and *okatie*—the last two of which are state-listed in the Carolinas. (Efforts to acquire *E. alabamae* are underway.) Not only is the species being maintained, but also every specific collecting locality, or Evolutionary Significant Unit, of each species. Nineteen other zoos and aquariums have agreed to maintain backup populations in case something happens to Riverbanks' stock. Later that evening during the banquet, we went behind the scenes and toured the crowded back-up area that houses the Zoo's 40-tank *Elassoma* refuge. This made for an interesting photo, which you can see on the back cover.

We had a few hours to kill between the final speaker and the banquet, during which Stephanie, William and I delightfully spent touring the rest of the zoo.

Fellow Casper

“You can’t eat atmosphere,” the restaurant adage goes, but the delicious southern-style banquet we enjoyed was made even more enjoyable by the aquatic exhibits that surrounded us. I can’t imagine a more perfect atmosphere for fish geeks to feast than in an exhibit hall surrounded by spectacular tanks of coral reef and other fishes.

Following the banquet, I donned a wireless microphone and told the audience about NANFA’s highest honor, the NANFA Fellow. As I ticked off the many accomplishments of the night’s honoree, I could see his face turn from interest to surprise to a combination of pride and embarrassment. Few moments in NANFA have made me prouder than to honor Casper Cox for his many significant contributions to the organization. Thanks, Casper!

A Trip to Brazil

Immediately following my remarks and Casper’s stunned and speechless acceptance, Dr. Robert J. Goldstein, author of 16 books on fishes and fishing, including *American Aquarium Fishes*, took center stage in front of the reef tank. Dr. Goldstein, wearing a brilliant floral print shirt, was appropriately attired for his talk on collecting the colorful fishes of Brazil. With two carousels of slides, he provided not only a taxonomic survey of tropical catfishes and tetras, but useful advice for all fish collectors. Dr. Goldstein noted early on the importance of personal contacts. Permits are difficult to secure by outsiders so he established contact with local biologists before entering the country and was subsequently able to collect freely by working off existing permits. Because he intended to transport, maintain, and breed the fishes he found, Dr. Goldstein needed data on water quality of each species collected. Since rigors of traveling precluded electronic meters, he used safe and easy water quality test strips to determine pH and hardness. This allowed him to recreate similar water quality in his aquaria. Many of the fishes were inhabitants of dense vegetation, so instead of seines, he and his assistants used small, flat, sieve-like nets that would slide easily through submersed plants. Dr. Goldstein brought fishes back from his first trip by packaging the fish in small breathable bags and inserting them into socks. For his second trip, he enlisted the help of a local fish exporter who shipped the fish back to the states for him.

One of Dr. Goldstein’s more memorable accounts was a fishing trip taken with local property owners. He was taken

out in small dugout to fish for the Brazilian equivalent of largemouth bass—the peacock cichlid (*Cichla ocellaris*), or tucunare. A fierce, powerful predator, this fish can reach lengths approaching 30 inches and weights of 15 pounds. Consequently, this species is the premier sport fish of Brazil’s fresh waters, attracting anglers from all over the world. Using chunks of freshly caught knifefishes as bait, Dr. Goldstein’s party caught and released many peacock bass along with beautiful specimens of piranha.

Casper’s Fellow Fellow

The hour was getting late and the auction had yet to begin. So why was Bob Bock grabbing the microphone and blathering about when he took over *American Currents* in 1997? Bob, I thought to myself, *no one cares. Can we just begin the auction, please?* Then Bob mentioned how he recruited me to do an issue of *AC*, and how I did another one, and then another ... and then I realized what was going on. Little did I know that while I was planning Casper’s NANFA Fellowship, my fellow Board members had been secretly planning the same for me. I was surprised and, like Casper, speechless. “Let’s start the auction!” was all I mustered.

And so we did. With Phil Nixon once again serving as auctioneer, and with so many generous contributors and bidders, the annual convention auction once again packed NANFA’s coffers, this time to the tune of \$1351.50.

Sundry Sunday Adventures

Sunday (Father’s Day) was getaway day for some attendees, and another day to play for others. Some visited sites they didn’t visit on Friday. Others joined Dustin Smith on a blackwater swamp collecting trip (Table 4). I joined Chip, Casper, Ranger Bob and Betsy, and others on a visit to the South Carolina Aquarium in Charleston, and to Cypress Gardens, a cypress swamp, in nearby Moncks Corner. Our convention registration included free admission to both.

The theme of the South Carolina Aquarium is a journey across the state, from the eastern flank of the Blue Ridge Mountains, through the hills and valleys of the Piedmont plateau, across the swamps and marshes of the Coastal Plain, to the ocean waters of the Continental Shelf. Native fish enthusiasts will not be disappointed. Exhibits feature gars, shiners, darters, chubs, suckers (including robust redbhorse), bullheads, brook trout, sunfishes, and a large collection of inshore and offshore marine species.



Fig. 7.

Swampfish (*Chologaster cornuta*), collected at Scape Ore Swamp, SC Hwy 34, Lee Co., west of Bishopville, during the 2004 NANFA Convention in Columbia, SC. Photo by David A. Neely.

Cypress Gardens was once a shallow reservoir that served a plantation in the early 1900s. Now it's a nature center that includes a reptile zoo, bird aviary, butterfly house, and, of course, an aquarium, which houses many species collected directly from the cypress swamp. The location is strikingly beautiful and has been featured in many movies, most recently the Mel Gibson Revolutionary War epic, *The Patriot*. Thanks to Chip and Dustin's relationship with the aquarists who work there, we were allowed to sample the swamp for some of the most spectacular bluefin killies you've ever seen.

Stephanie and I returned to Charleston for an overnight stay, whereas Casper, Chip, Mark Otnes, and others continued driving around looking for obscure places to dip their nets. They had some interesting animal encounters, which Casper described in his blog-like convention journal:

Not ready to call it a day, our remaining two vehicles swung by a boat ramp where a couple of us waded in for a few net pulls. . . . Chip and Mark Otnes had another site in mind where [we] would have better luck in catching some bluefin killies. Off we went down a paved back road. Ahead I could see a snake coiled up in the road and straddled it as I passed over. The snake struck at my van and I could see cotton white in its mouth. I looked in the mirror just as the fat snake burst red. I did a quick u-turn to see if it was indeed a water moccasin and it surely was, [now] a dead one. Traci Greve picked its limp body up by the tail and we guessed it to be about 3.5 feet long. She tossed it to the side of the road and we headed back across to our vehicles.

Just as we were getting back in the van Chip called out, "Hold on!" A seven-foot gator had been lying within just a few feet of the passenger side of the van the whole time. Stunned, we had a bit of

Table 4. Locations, habitat descriptions, and fish species sampled during the Piedmont/Sandhills trip collecting trip led by Dustin Smith, 20 June 2004, during the 2004 NANFA Convention.

Little River

Medium-sized stream flowing over sand and gravel.

Cyprinella chloristia, greenfin shiner
Cyprinella zanema, Santee chub
Nocomis leptocephalus, bluehead chub
Notropis hudsonius, spottail shiner
Notropis lutipinnis, yellowfin shiner
Notropis procne, swallowtail shiner
Notropis scepticus, sandbar shiner
Hypentelium nigricans, northern hog sucker
Scartomyzon cf. lachneri, brassy jumprock
Armeiurus natalis, yellow bullhead
Noturus insignis, margined madtom
Lepomis auritus, redbreast sunfish
Micropterus salmoides, largemouth bass
Etheostoma olmstedti, tessellated darter
Etheostoma thalassinum, seagreen darter
Percina crassa, Piedmont darter

Scape Ore Swamp

Blackwater swamp with heavy side vegetation.

Notemigonus crysoleucas, golden shiner
Erimyzon oblongus, creek chubsucker
Noturus gyrinus, tadpole madtom
Esox americanus americanus, redfin pickerel
Esox niger, chain pickerel
Umbra pygmaea, eastern mudminnow
Aphredoderus sayanus, pirate perch
Chologaster cornuta, swampfish (Fig. 7)
Fundulus lineolatus, lined topminnow
Gambusia holbrooki, eastern mosquitofish
Centrarchus macropterus, flier
Enneacanthus chaetodon, blackbanded sunfish
Enneacanthus gloriosus, bluespotted sunfish
Lepomis gulosus, warmouth
Lepomis marginatus, dollar sunfish
Micropterus salmoides, largemouth bass
Elassoma zonatum, banded pygmy sunfish
Etheostoma serrifer, sawcheek darter

fun seeing who was brave enough for a gator wrestling photo. The most I could "jpeg" was some nervous over-the-shoulder looks while the gator lay a few feet away!

To read more of Casper's convention "blog" in its complete and unedited splendor, and to see his alligator "jpeg," go to NANFA's website, click on "Annual Meetings," and scroll down to South Carolina.

Closing and Personal Thoughts

Let me add to the chorus of well-deserved thank-yous and way-to-gos for our friends Dustin, Chip and Fritz for the absolutely fabulous job they did putting together and hosting the NANFA Convention. Also mega-thanks go out to the staff at Riverbanks Zoo, who went above and beyond in terms of their generosity, both for the free use of their beautiful

Comments from 2004 Convention Co-Host Dustin Smith

I would like to take a second to thank everyone for coming to the 2004 convention. I really got to spend a lot of time and get to see many of the faces behind the names I hear so often. Surprisingly, the event went well. I know that it was a very long trip for most and I think this goes to show that NANFA is a very strong and flourishing organization. I also wanted to thank the people who helped Chip and me in the planning and execution of the events.

First off, the folks at Riverbanks Zoo were wonderful. They not only donated the facilities, but also gave of their time for months beforehand. They assisted us with and eventually donated all of the wonderfully printed name tags. The night of the banquet every member of the aquarium staff was there, some, as I understand it, on their own time. They also opened the facilities for us to tour on our own which is not done often. Jim Clark, one of the aquarists, has been there with us for months coordinating things and helping with the planning. Without Jim, things would certainly not have gone as smoothly.

I want to thank the speakers for donating their time and expertise. Some came from quite a distance at their own expense just to be able to give their presentation. As always, I think they were top-notch and we all learned something from each and every one.

I would also like to thank Chris Scharpf, Dan Hagley, Casper Cox, Dave Graley, Gerald Pottern, and Fritz Rohde, among others, for all of their help. One thing I learned from this experience is that even though Chip and I were the names listed as hosting this event, it took so many more people to pull it off. Everyone at the convention was eager to lend a hand and this really made things go more smoothly.

Again, thank you all for coming. And I look forward to seeing everyone this year in Little Rock.

facility and the tremendous amount of hours they put in. It's a tribute to the class and professionalism of the SC chapter of NANFA that they've fostered this wonderful relationship with the Riverbanks Zoo. The Board of Directors agreed to donate a pair of Perfect DipNets to their aquarium staff, and to give them an honorary NANFA membership, but this is small recompense for their generosity and effort.

Speaking personally, Stephanie, William and I had a blast. We enjoyed meeting old friends and making new ones, and we certainly appreciate everyone's patience in letting our 'lil one mix and mingle among y'all. My only regret was not being able to spend more time socializing with everybody. But with the wee one getting me up at 5:30 every morning, I had little energy left over for late-night socializing.

Also a heartfelt thank you to the BOD for the wonderful honor of a NANFA Fellowship. I was certainly surprised. And to be honored at the same time as my fellow Fellow Casper Cox—well, that's an honor in and of itself.

I also wish to thank David Wilkins, who gave Stephanie, William and myself a behind-the-scenes tour of the South Carolina Aquarium on Monday, and Jan Hoover, whose uncredited contribution to this article is greatly appreciated.

Once again, the NANFA Convention was a profitable event. Thanks to everyone who attended, bought a t-shirt, bought an auction item, and joined or renewed!

My seine net still smells like the last collecting site.

— Bruce Stallsmith (Huntsville, AL) 



Free NANFA Decal Offer: Casper Cox printed a couple hundred NANFA decals last year and made them available as a gift and promotional item to attendees at the South Carolina NANFA Convention. They measure 1.5" x 8" and are printed in color. He still has a few on hand. If you would like to receive two or three, mail a self-addressed stamped no. 10 envelope (about 9" long) to: Casper Cox, 1200 Dodds Ave., Chattanooga TN 37404. They are printed on exterior material and can be used on vehicles, coolers, aquariums, boats, or whatever suits your fancy.