

2017 NANFA CONVENTION PRESENTATION SUMMARIES

Jenny Kruckenberg

Inver Grove Heights, MN

After a welcome introduction by Bob Hrabik, the first speaker was his boss, Brian Canaday, Fisheries Division Chief for the Missouri Department of Conservation (MDC).

He talked about relevance and recruitment. He encouraged us to share our passion with others and to help them understand why non-game native fishes are important. He also appreciated the opportunity to share Missouri with us. He (and others) are clearly proud of their state.

“THE ROUGE RIVER: STILL MICHIGAN’S MOST POLLUTED RIVER (BUT IT’S COME A LONG WAY!)”

Bob Muller’s spoke on the history and current status of the Rouge River in metro Detroit (not to be confused with the Rogue River in west-central Michigan). He began by giving a correct pronunciation of Rouge: it’s the French word for red, or the makeup on your grandmother’s rosy cheeks.

In 1916, the Ford company opened the Rouge plant, which was the largest factory in the world by 1928. By 1948, the water in the Rouge River was polluted and orange. By 1960, the river was catching fire so often that it did not merit coverage in the news. The Cuyahoga River near Cleveland, which famously burned in 1969, only caught fire once.

As time went on, the river was dredged to allow large ships to move about, which affected small creeks and tributaries. Six inches of rain could make the Rouge River swell by six feet. Bob also talked about the substrate, clay, which holds the trees in place on the banks of the river.

He talked about current fish collecting in comparison to past historical records. In 1924 Hiebs collected many species at Canton Center. Now, there are a lot less. The Johnny Darter seems to be surviving, and they’ve observed Northern Hog Suckers and some Southern Redbelly Dace; Iowa Darter are returning above the moraine.

The Friends of the Rouge include dedicated volunteers (such as Bob and fellow NANFA member Philip Kukulski) who monitor how things are progressing. The eight most common species include: Bluntnose Darter, Common Shiner, White Sucker, Creek Chub, Round Goby, Johnny Darter, Bluegill, and Central Stoneroller. The invasives include Goldfish, Common Carp, Gambusia, Brown Trout, Rainbow Trout, Mummichog, and Round Goby. The special concern fish include Redside

Dace and Northern Redbelly Dace (which are common in the upper part of Michigan, but not in the Rouge.) Immigrants (coming up into the river) include Logperch, Spottail Shiner, Bluntnose Shiner, redhorse (unknown juvenile species) Spotted Sucker, Emerald Shiner, and Mimic Shiner. The “hold-outs” include Rainbow Darter, Least Darter, Northern Hog Sucker, Blackchin Shiner, Stonecat, Iowa Darter, Mottled Sculpin, and Hornyhead Chub.

We wish Bob and friends continued good luck and success down the road!

“SPATIAL AND SEASONAL FISH RICHNESS PATTERNS WITHIN LARGE TRIBUTARIES OF MISSOURI.”

Corey Dunn, a PhD student at the University of Missouri in Columbia, received some funding from the MDC to study several of Missouri’s rivers. He said the Meramec River is considered mid-sized compared to the Missouri and Mississippi rivers. It supports a lot of diversity because it has many different habitats, e.g., riffles, shoals, etc. Corey referred to a “Goldilocks” zone where the most species occur at a single site in a river system. This is where the river contains both upland and lowland habitats suitable for many species. One such spot on the Meramec is near Eureka, where 85+ species are found. (Author’s note: I think this was near LaBarque Creek and Young Conservation Areas, where we would collect on Monday). At the mouth of the river (near St. Louis) the diversity drops to around 50 species.

The Ozark portion of the Black River is home to 105 species, including the Plains Topminnow, Crystal Darter, and Ozark Minnow. The Grand River supports 65 species but is very different, with an abundance of the four carp species.

“AN OVERVIEW OF ENVIRONMENTAL DNA (EDNA) APPLICATIONS OF CONSERVATION AND MANAGEMENT OF FRESHWATER SPECIES.”

Dr. Eric Larsen said that collecting eDNA is not a new thing, though most people have heard of it only recently. He said that eDNA can come from soil, water, or air samples, and that microbes in soil samples have been collected and studied for their eDNA for a long time. Study of eDNA of macro-organisms

(such as fishes) increased around 2008, with the spread of invasive carp. The process is simple: a sample is collected and run through a filter with microscopic pores. The DNA is captured and processed in the lab, where buffering chemicals fix the DNA and other chemicals multiply it. From there, the scientists can determine which species are present. He said provided mitochondrial DNA is collected, the reagents hold the material, and there's no cross-contamination, they have 95% accuracy in predicting what's there, but added that technology will only improve into the future.

On the plus side, this kind of testing is sensitive. The tests are very accurate even when little genetic material or few individuals are present. In other words, it only takes a few cells sloughed off by a particular species to detect its presence. (A species can even be detected and identified by its feces!) The testing is also easy to perform. If a lake association wants to know which fishes are present in their lake, physical sampling of the fish is unnecessary. Instead, the lake water can be collected and tested. This is especially nice for rare or sensitive species, such as hellbenders. The cost involved is not huge. Dr. Larsen estimated lab costs were around \$15-\$18 per sample and pointed out that the sample water could be used again and again for testing.

There are some negatives to eDNA. For one, there is always the possibility for false positives, as contamination of the sample in the field or in the lab can occur. Also, if a certain organism is detected, there is no way to know if the DNA traveled 10 meters or 10 kilometers. Also, detection of the presence of something does not indicate its abundance or provide other biological information like size structure or sex ratios.

Eric closed by talking about a University of Illinois grad student named Chris Rice, who is studying endemic Cold-water Crayfish, and former lab member Lesley De Sousa, who has tested for the presence of waterdogs and musk turtles in Alabama. They split the year into two sessions: the cool months (September through April), when waterdogs are spawning and more cells are sloughed off so they are easier to detect, and the warm months (May through September), when tests are more likely to detect turtles that are active in the summer.

I kept my hand raised to ask a question, but was never called on. I found this talk particularly fascinating so I talked to Eric later. My question: Is there a database of every eDNA study out there so scientists know what they are finding? Eric gave me two answers. Apparently, the US Forest Service in Missoula, MT, has established a database called the Western eDNA Atlas. It has a number of labs and researchers doing eDNA testing. Also, a woman named Caren Goldberg from Washington State University has kept track of all the papers published on this subject. Eric estimated that have been between 100 and 150 studies so far.

“WINNING AN UPSTREAM BATTLE: RECOVERY OF A MISSOURI NATIVE MIGRATORY FISH, THE LAKE STURGEON”

After a short break, Michael Moore began his talk by mentioning NANFA grants, crayfish, and the Clinch Dace, but quickly moved on to describing the Lake Sturgeon, which is larger and has duller scutes than the smaller Shovelnose Sturgeon. They also possess a shark-like tail. Sturgeon were around 200 million years ago, which predates the *Tyrannosaurus rex* by 100 million years! Sturgeon got the reputation of being “trash fish” because their scutes were sharp enough to tear nets, but their caviar increased appreciation for these fish. He also mentioned that the Lake Sturgeon's swim bladder produces a material called isinglass, which was used in beer brewing.

Michael said that Lake Sturgeon are very dependent on large rivers for spawning, but dams hinder their movement, and silt harms their eggs. It takes them as long as 20 years to reach maturity and start spawning. Once they reach maturity, males only spawn every couple years and females only every four to seven years. But still, Michael is optimistic that the Lake Sturgeon's population will be rising in the future.

He talked about an individual fish they named “Norman,” who apparently migrated upstream to an undesirable place where he required rescue to get him back to a better, more suitable spot. On the Osage and Gasconade rivers “sturgeon surgeons” use flat stretchers to lift 50-pound fish and implant tags in their abdomens. The tags had a four-year battery life and any such sturgeon swimming past a Vemco receiver would detect them. Fascinating. The MDC has been stocking Lake Sturgeon in the Meramec River since 1984. Go team MDC!!

“MISCELLANEOUS PARASITES OF NEARCTIC FRESHWATER FISHES: UPDATES ON PLATYHELMINTHES, NEORICKETTSIA, AND MYXOZOA”

Thomas Fayton (AKA the Rogue Parasite Guy—and this time, it's Rogue with a hard G) was hired in 2016 by the US Fish and Wildlife Service. He comes from Pennsylvania, but travels around the country doing this job. Currently, there are nine persons employed by the USFWS doing his job, but they are soon to be down to six. (Author's note: it makes me itch just reading the title, plus I know I'm not going to do a very good job reporting on Thomas' talk because it's all “Greek” to me!).

Thomas began by talking about the big three: viruses, bacterial pathogens, and parasites. First, he discussed *Myxobolus cerebralis*, which affects the brains of salmon. The infected salmon dies, the oligochaete carrier is tubifex, the next salmon eats the tubifex and becomes infected and the process starts all over again. Thomas said there are currently two clades. The first affects salmon in Japan, Canada, and the western US. The

second affects trout in Japan, Norway, New York, and Pennsylvania. Scientists are not sure if it is two species or one species with two subspecies.

The second topic was *Plagioporus opecoelidae*: flukes. Seven families of fishes are affected and scientists have identified 23 species of *Plagioporus*, which is a LOT! Thomas (and others) have worked hard to dye them, do pencil drawings and take photographs, which has translated into a lot of work. An area he worked on was the West Twin River in Wisconsin and the fish affected was the Logperch.

The third topic was *Neorickettsia digeneans*: nasty buggers. If a dog eats an infected salmon, it may die within 11 days. Mammals, such as bats, can pass this on to others. There seems to be an obligate relationship between some of the parasites to the fish. In other words, once the fish gets infected by one parasite, it actually benefits the fish by giving it an immunity to some other parasite. Why? Scientists think the parasites are competing against one another.

“FISH COLLECTING IN THAILAND”

Next up was NANFA President Fritz Rohde. Fritz and NANFA member Dustin Smith traveled to Thailand in January of 2016, and Fritz returned in January of 2017 with Katharine Hill, a Georgia DNR biologist. He began by talking a little bit about where Thailand is geographically. Neighboring countries include Burma, Laos, and Cambodia.

In 2016, they first went to the Kassat River (at 2000 feet elevation it was quite chilly in the mornings) where they collected cyprinids and loaches. At lower elevations they found glassfish and snakeheads. Later, in a tributary of the Mekong River, they found clupeids, danios, barbs, rasboras, puffers, soles, and gobies. For meals, they dined on wild boar and *Pangasius* catfish, with rice as a staple with every meal.

Some of the collecting spots were little more than cow pastures and the water was very dirty so it was nearly impossible to take photographs, but they saw some incredible bettas and croaking gouramis. The last location in 2016 had brackish water and they observed drums, eels, anchovies, archer fish, toadfish, puffers, pipefish and many other species.

In 2016, they counted 116 species of fishes in 34 families. In 2017, they found 114 species from 29 families. This included 6 new families and 74 new species for a grand total of 40 families and 188 species in two years. This included the exotic *Gambusia*! Katharine caught the first national record of *Esomus caudodiocellatus*, a cyprinid.

At the end, they went to Khao Ya National Park, the oldest in Thailand, and observed birds, including hornbills, as well as crocodiles, bats, monkeys, gibbons, civet cats, deer, porcupines, and a beautiful Clouded Leopard. Fritz closed with a photo of a female elephant chasing a motor scooter and then charging his group. Not your everyday occurrence here in the states!



The Thai elephant that tried to take out NANFA's president.

“TRANSLOCATION OF BLUEBREAST DARTERS INTO AN OHIO RIVER SYSTEM”

In 2016 Brian Zimmerman and grad students from Ohio State University moved over 900 Bluebreast Darters from rivers in the Muskingum River basin to six release sites in the Licking River upstream of a dam. Later that fall they surveyed the release area and found good numbers of stocked darters (all had VIE tags) and the first four naturally-produced Bluebreast Darters in the upper Licking River in over 100 years. They plan to relocate more darters in 2017 and to reintroduce both Tippecanoe and Longhead darters into the upper Muskingum River basin in 2018.

“CAPTIVE CULTURE AND HUSBANDRY OF NORTH AMERICAN FISHES”

Ray Katula was up next. Ray, Konrad, Bryan, and I traveled to Missouri together this year. We've also surveyed fish together and I've toured his fantastic fish room. There's a reason he's a NANFA Fellow. He's very knowledgeable. I used to spawn fish avidly so I was really excited to hear his talk. Ray began by talking about the pros and cons of flow-through systems.

He uses the tried and true “KISS” method (keeping it simple, stupid) which mostly involves diet, conditioning, and the length of the photoperiod to successfully spawn his fish. To condition them, their diet is mainly comprised of live foods: daphnia, mosquito larvae, fruit flies, mealworms, earthworms, and white worms. He also likes frozen foods such as brine shrimp, bloodworms, and especially glassworms. (Author's note: I think Ray ordered 6–7 gallons from me last year. They arrived alive, but he freezes them to feed throughout the year.)

Ray's Wisconsin fish room is the back portion of his garage, but is walled off from the rest of the garage. He keeps it at 40 degrees in the winter months, which is similar to natural conditions the fish would experience. He talked briefly about which fish like to spawn in the fall versus the spring.

Ray said lighting is the least important parameter, but should not be counted out, especially with fish like sculpin,

Burbot, Trout-perch, and madtoms, all of which prefer less light. In contrast, most darters and sunfish love the light. Ray talked a bit about water parameters too, especially transitioning from hard to soft versus from soft to hard water.

Next Ray covered spawning surfaces. He talked about driftwood and cracks, Spotfin Shiners using ceramic tiles or pleated filters, and Johnny Darters preferring caves and mussel shells. He also stated that darters will often spawn in places they wouldn't use in nature. He talked about Southern Redbelly Dace, spawning grass simulated with synthetic green yarn, and spawning trays (simple ice cream lids) with pebbles used as nesting sites. He said many minnow species prefer the box and tray with pebbles, many killies prefer yarn mops, pupfish prefer sand, others prefer simulated hairgrass (purchased from a pet store) or crevices. He mentioned the Snubnose Darter likes a PVC tube cut with grooves. Sometimes the box is covered with egg crate (like for fluorescent lighting). The fish spawn over this and the eggs fall through.

Then Ray talked about raising fry. He uses green water for some very, very tiny fry. Rather than messing with green water cultures, which can be sensitive to crashing, he filters the water from his pond through micromesh filters. Some fry will accept frozen cyclops, brine shrimp, or other frozen foods chopped up. He mentioned that bloodworms don't chop well. For other less fussy fry, he uses crumbled up flake foods. Ray said that darter fry may be pelagic at first, then benthic. Between two and eight weeks old, some fry develop a problem called "belly sliding," which means they will never swim properly. He mentioned Walleye being susceptible to this and tied it to an oil on the water's surface. (Author's note: I've heard of this. Perhaps when they take their first gulp of air at the surface, something goes wrong.) Ray talked about snails being our friends as they help eat excess food if keepers are overfeeding. Ray also mentioned sticklebacks and minnows with bent spines, or scoliosis. He said that having an airflow or current can help fry "work" in the tank rather than cannibalizing one another.

Next Ray talked about what sticks out in his mind when spawning certain fish species. He spawned a pair of Burbot in a 50-gallon hex aquarium and found "eggs everywhere" in February. He recalled that Trout-Perch eggs were white. He said for sticklebacks, you need to provide places for cover. Sculpin will excavate a nest. Redside and Southern Redbelly dace like the pebble nest. Studfish place their eggs in the box with pebbles covered by spawning grass. Ray closed by saying he estimates he has spawned around 180 species of fish. Wow!

"FIELD PHOTOGRAPHY TECHNIQUES FOR NATIVE FISHES"

Our next speaker was Scott Smith, who said he started by taking underwater photographs, but water clarity was a problem

in the coastal plain. Eventually he was taking the fish out of the water and bringing them to the camera. He had worked in a studio and discussed the pros and cons of working there versus in the field. In the studio, he said, it was easier to control the lighting, producing better quality photos, but he would often kill the fish quickly using cold water and salt. In the field he didn't have to kill them and they maintained truer colors, plus it was quicker.

Over time, he perfected the techniques he uses in the field. Here's a checklist for his supplies: photo tank, black towel, press plate, camera with macro lens, blackout board, hand-held strobe flash, and clean water. He went into details about the equipment: the photo tank measures 2 x 8 x 10 inches. A black towel behind the tank is preferable to painting the tank black. The strobe should be held perpendicular to the ground and moved at angles to best illuminate the fish while also angling the lens to orient with the fish. A pokey stick can help position the fish. The black towel is held about 8-12 inches behind the tank and folded over the top of it.

Next Scott talked about the photo tanks themselves. He makes them using readily available materials and stressed that cheaper is better because they WILL break. He buys a single 2-inch x 2-inch x 4-foot piece of lumber and two 8 x 10 photo or document frames (which run about \$1.98 at big box stores). He uses screws to assemble the wood frame, which he then sprays with black spray paint. He uses black silicone to hold the glass in place. He's careful to make sure it's aquarium-safe silicone and stresses that it must be black (not clear). His blackout board is a piece of cardboard sprayed black and placed around the lens of the camera. It blocks out things that might be reflected against the front pane of glass, such as the ring of the lens. It also cuts down on ambient light. The camera Scott uses is a Nikon D7200 with a SB600 flash and a 40-mm macro lens. He recommends an RF transmitter slave, which triggers the flash, however he often activates the flash by commander mode or cables. He sets the camera in manual mode at 1/200 at f18 with ISO 100.

Into the photo tank he places bottled water and the black towel is behind the tank. He uses the press plate and pokey stick to position the fish. He next uses a focus light before he starts snapping the actual pictures and stated that a cell phone light will work. Adjust the flash as needed. As for the frame, certain types of wood (i.e., pine) may produce bubbles on the glass. These need to be removed before snapping the shots. Scott said sanding the wood prior to spray painting the frame black can help alleviate this. He stressed bringing lots of memory cards and plenty of fresh water. He also spoke of keeping everything as clean as possible. Avoid pet hair picked up in transit to the site and avoid handling the photo tank as much as possible because oily fingerprints are also undesirable. Scott always brings some Windex wipes to clean the outside of the glass (Note: do



Scott Smith shooting fish. (Photo by Kelly McDonald)

not use Windex on the inside of the photo tank as ammonia harms fish.)

Once images are in the computer, Scott edits them as needed with Photoshop or GIMP (a free program). A good shot takes roughly three minutes to edit, fifteen minutes maximum for a poor shot that you are trying hard to save. Scott asked for questions. Ray Katula commented about how much some fish move and how it's nearly impossible to capture them because they're all over the place. Scott agreed and said working with the glass press board only goes so far. He called Gilt Darters "bad" and said they just won't cooperate. Gobies are even worse.

Scott closed by talking about cleaning the photo tank with baby bottle brushes after use and showed us how he transports the tank to the field in a carrying case lined with Styrofoam, though he has also just wrapped the towel around the tank.

"A FISHES OF MISSOURI UPDATE AND NANFA AS ADVOCATES FOR NATIVE FISHES"

Bob Hrabik updated us on the progress of and a glimpse into the new *Fishes of Missouri* book, expected to be completed in 2018. Bob gave a brief history of the development of the *Fishes of Missouri*, first written by William (Bill) L. Pflieger in 1975. Pflieger began working for the MDC in 1961 and was hired to write the first *Fishes of Missouri* book. As data at the time were inadequate to describe the distribution of Missouri fishes, he began a systematic survey the state. This led to his PhD at the University of Kansas (under the great ichthyologist Frank Cross) in 1969, his dissertation forming the basis of the book. He authored the second edition in 1997 and retired from MDC shortly after. Bill is about 85 now, "sharp as a tack," and able to accurately remember details of sampling trips and locations.

Bob showed a map of Midwestern states and described the "status" of fish books for each. He classified those older than 20 years as "out-of-date," including Arkansas, Illinois, Iowa, Kentucky, and Tennessee. A new Arkansas book is in process. Efforts are underway for new Illinois and Tennessee books, but Bob is not aware of plans for new Iowa or Kentucky books. States with recent books are Nebraska (co-authored by Bob), Kansas, and Oklahoma.

Bob explained that the book will be written to be accessible to readers of all levels: hobbyists, fisheries managers, ecologists, and ichthyologists. He emphasized the importance of attracting young people and hobbyists, as the text will be an important educational tool. The book must have wide utility *and* be marketable and aesthetically pleasing: it will be laced with beautiful fish images because "beauty sells!" He credits Uland Thomas as a predecessor in pioneering whole-body fish portrait techniques that have been used and built upon by Lance Merry, and, more recently, Scott Smith. Along with the photos will be the work of Dr. Dave Neely, who is illustrating the keys and providing gorgeous, technically accurate line drawings and whole-body portraits of every species known to the state.

The book will have updated distributional maps showing three eras (prior to 1960, which Bob called the "Pre-Pflieger era"; 1960-1995, the "Pflieger-era;" and 1996 to present, the "Large Monitoring Program era." 1960 was chosen as it marked the beginning of Pflieger's tenure but also because in general terms if a species hasn't been detected in a location or basin for 50 years, it is considered "extirpated" from there.

A short question-and-answer session yielded these points: 1) sexual dimorphism will not only be described, but will be illustrated; 2) details on fish photography techniques used will be included; 3) juveniles and hybrids will be described, illustrated, and photographed when possible; 4) etymology for each species will be given; 5) recipes will not be included, but the importance of each species will be described; 6) the book will be sold by MDC and possibly through Amazon. An app may come later, at least for keys and fish images.

Running short on time, Bob introduced the idea of NANFA members becoming active "citizen scientists" and advocates for native fishes. He noted that the days of state agencies funding statewide surveys are ending and universities are no longer awarding degrees for such studies. Future life history studies will not be performed by state agencies and such studies are not "in vogue" in universities. His work on the *Fishes of Missouri* shows that we know little about the life histories of most native species (other than game fishes and a few endangered species). As rapid land-use and climatological changes occur, it will fall to concerned citizens to advocate for native species. Government entities will not have the funds, staff, incentive, and, in some cases, desire to conduct basic research as in the past. Bob concluded by saying that *WE*, NANFA, are the best native fish advocates in the US and had better rise to the challenge!

BANQUET TALK

Our banquet speaker was Mike Hellweg. Like many kids, Mike started keeping Goldfish at an early age, but he said he put himself through college by selling Zebra Danios! As time progressed, he learned of the American Cichlid Association and other local and national clubs.

He began keeping and breeding some really interesting fish, such as *Dario dario*. He said the males are the pretty ones so people would often overlook the females, and Florida fish farms wouldn't even send them to pet stores. He spoke of the lovely Licorice Gourami and commented how the male does a little courtship "dance" to impress his gal. The graceful Pearl Gouramis construct a bubble nest to place their eggs in.

Mike said that literature often perpetuates old wives' tales. He likes to challenge himself, and he and Ted Judy—another avid fishkeeper/hobbyist—had a friendly rivalry last year, recorded in the pages of *Tropical Fish Hobbyist* magazine. They wanted to see who could reach 300 spawns first. One of Mike's tips is, whenever possible, to let the parents do the work. Sometimes it only takes something simple like packing a tank with java moss or najas grass to take you from failure to success. Mike uses Swiss Tropicals mattenfilters made of Poret foam in his tanks. (Author's note: I would like to extend a sincere thank you to NANFA member Stephan Tanner of Swiss Tropicals for donating filters and more to the NANFA auction). He likes this form of filtration, but has had some fry and three different species of Kuhli Loach get behind the foam. He uses a gravel vacuum to clean behind the foam.

Now Mike went into a bunch of different fishes he's spawned successfully. He spoke of the small Honeycomb Catfish (*Centromochlus perugiae*), which spawns in a cave. After the spawning has occurred, you must move Mom's cave with the fry to another tank so that all the other catfish don't eat the fry after the fry emerge from the cave. Mike found success with the Driftwood Catfish (*Tatia intermedia*) after it spawned on the lift tube of a sponge filter. He said the tiny *Boraras brigittae* spawns in the wild in water with such a low pH there is little food for the fry to eat so they get by on fungus growing in the leaf litter and on driftwood. The Ornate Paradisefish (*Malpulutta kretseri*), which hails from Sri Lanka, prefers cold, alkaline water. The tiny male Coral Red Pencilfish (*Nannostomus mortenthaleri*) are really mean to one another so Mike found success by packing the tank thick with hornwort. After a few days, he removed all the fish and fry started hatching out. With the Tailspot Ctenopoma (*Ctenopoma kingsleyae*), it took the lowest barometric pressure moving in to trigger a spawn. A storm coming will often cause this change in pressure and some fish respond to that.

Sometimes, other aquarists are credited with a certain spawning set-up. Mike mentioned Jim Graham's four pot ceramic caves, which are tied together using airline tubing. The pots create crevices that the fish spawn over, or they spawn within the caves. He said many *Cyprinella* species will use the crevice method. Mike said, "Fish don't read books." He talked with pride about spawning Chocolate Gourami (*Sphaerichthys ophormenoides*), and about the male Samurai Gourami (*S. vaillant*), which holds the eggs in its throat pouch. When it's



Mike Hellweg addresses the banquet. (Photo by Fritz Rohde)

holding, the throat turns bright red. Mike said sometimes all that's needed is patience. He said often the only time he's multiplied his catfish was with "benign neglect!"

Mike finished his talk by touching on how hobbyists can make a real difference. He talked about the Golden Skiffia (*Skiffia francesae*), the American Livebearers Association, and the need to keep more goodeids going because they aren't going to make it without our help. He also spoke of the intricate relationships that sometimes go on between different species: after some tetras spawned in a tank, they kept angelfish cowering in the corner, Bluenose Shiners need some sunfish spawning in the tank to trigger them to spawn. It was all really fascinating. I like how Mike is a "generalist." He's kept a wide variety of fish and learned so much about what it takes to condition them and get them to spawn. It's admirable.

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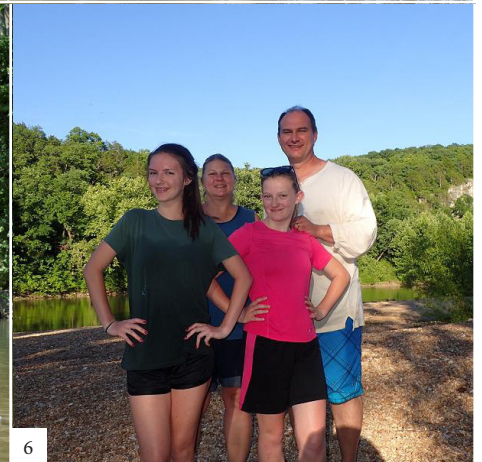
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1. Every over-fed person within earshot gathered for a group photo after the banquet.
2. Julie and Alivia Zimmerman. (Fritz Rohde)
3. Casper Cox, Michael Wolfe, Joe Siegel, Tyler Goodale, Isaac Szabo, and Brian Wilcox. (Casper Cox)
4. Justin Baker, Fritz Rohde, Josh Blylock, and Bill Ellis. (Dale Zimmerman)
5. Bob Hrabik and Ray Katula pulling a trawl, Meramec River. (Fritz Rohde)
6. The Zarlingas. (Casper Cox)
7. Gerry Hansel fishing for Plains Topminnow. (Ben Cantrell)
8. Tim Aldridge launching a cast net. (Fritz Rohde)
9. Michael Wolfe in Indian Creek with some friends. (Isaac Szabo)
10. Josh and Lauren Porter filming in Indian Creek. (Isaac Szabo)





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- 11. Cyan Cox communing with Bleeding Shiners. (Casper Cox)
- 12. Tyler Goodale, Mike Lucas and John Belcik seeking Orangespotted Sunfish. (Olaf Nelson)
- 13. Nick and Jack Proulx. (Jenny Kruckenberg)
- 14. Olaf Nelson and his redhorse ID print. (Jenny Kruckenberg)
- 15. Beauty (right) and The Beast. (Casper Cox)
- 16. Casey Elam. (Bill Ellis)