

CHOUPIQUET ROYALE: THE BOWFIN CAVIAR CONNECTION



Konrad Schmidt

St. Paul, Minnesota

INTRODUCTION

The Bowfin *Amia calva* is one of several species descended from ancient lineages (e.g., sturgeon and gar) that are often labeled “living fossils” because they were present during the time dinosaurs roamed the Earth (Figure 1). *A. calva* was believed to be the only species surviving in the genus. However, the Emerald Bowfin *A. ocellicauda* (Figure 2) was recently accepted as a second valid species (Page et al. 2023), and the research suggests there may be more species yet to discover (Wright et al. 2022).

In January 1992, I had a unique opportunity to join Dave Mueller (River of Life Hatchery) on an aquaculture adventure to Louisiana for bowfin broodstock. Dave was already very successful in culturing Lake Sturgeon *Acipenser fulvescens*, Shovelnose Sturgeon *Scaphirhynchus platyrhynchus*, and Paddlefish *Polyodon spathula* for the aquarium trade in southeast Asia. He routinely had survival rates of all three species to saleable sizes exceeding 90%, and the wholesale prices he got were insanely profitable. A joint venture with Gary

Richmond (Kinni River Fish Farm) had similar success culturing all five species of North American gar (Schmidt 2015). The internet was still in its infancy, without Facebook or even Google to search the web, but Dave had the uncanny ability to find, by relentlessly making phone calls, very fruitful connections around the world that immensely expanded his hatchery operations. He doggedly pursued all tips and rumors, but the end results were always far more misses than hits. I have long wondered how much he spent on phone bills! Dave’s dialing diligence did eventually find John Burke, who owned the Louisiana Caviar Company in Baton Rouge.

John had found a niche demand for bowfin caviar (Bourg 1988; Cotton 1990). He knew an Acadian family along Bayou Teche that had been making bowfin caviar using a traditional Russian recipe for sturgeon caviar handed down for generations, but the demand never grew beyond local consumption. John started promoting his product as “Cajun Caviar” to restaurants in New Orleans. Chefs were at first reluctant to try it, but after a taste test, they loved it! The flavor has been described as not too fishy or salty; it does not clump and is not filmy. One chef thought it was better than Beluga caviar. In 1989, John changed the caviar’s name to Choupiquet Royale (Fig-



Figure 1. A replica cast from a bowfin fossil.



Figure 2. Emerald Bowfin from Long Meadow Lake (Hennepin County, MN) 28 May 2006.

Although the species discussed in this article is the Emerald Bowfin, the editors have used “bowfin” to avoid any confusion. Photos by the author unless otherwise indicated.



Figure 3. Processed and packaged bowfin caviar ready for sale.



Figure 4. John Burke (left) and Dave Mueller (right) sampling bowfin caviar (background).

ure 3) and sold about 5000 pounds to restaurants and caterers in Los Angeles, New York, Tokyo, and Australia. It was a very lucrative product: it retailed for \$28 per 4-ounce tin and was much more affordable than any of the three Russian sturgeon caviars. Choupique (sounds like “shoe pick”) is the Cajun name for bowfin, and comes from *shupik*, a Choctaw word that translates as “mudfish.” Bowfin is also known as cypress trout in some areas.

A FISHY—BUT TRUE—“TAIL”

Entrepreneurs are always trying to turn a profit by improving old products or inventing entirely new ones, and fish-related products are no exception. I was aware for some time that the aquarium trade was interested in the bowfin (Katula 1984) but was astonished to learn that the roe was also being marketed as a new source of caviar. In 1992, both camps became aware of each other and believed there was promise in exploring some common ground. Up to this time, both depended on harvesting wild populations, which were subject to major fluctuations or restrictive rules and regulations. Culturing the species would, in the long run, provide a constant and reliable source. My only connection to this scheme was knowing Dave Mueller. It seemed like an intriguing adventure, and he needed someone to help drive, so we were Baton Rouge bound,

We met with John at his company office, and he was extremely pleased at the growth of his business and booming sales. He was convinced, however, that the state was going to shut the entire industry down due to fears that the wild populations of bowfin were in jeopardy. He added that many unscrupulous commercial roe harvesters were littering landings with large rotting piles of bowfin carcasses, and public complaints were mounting. He gave us a tour of his operation, offered us a generous sampling of his product on crackers and cream cheese, and encouraged us to wash it down with a traditional swig of Stoli Russian Vodka (Figure 4). The aftertaste was...“unique”; an hour later something still lingered. Experiencing the culinary delight of this fine cuisine once in my lifetime was quite enough for me, thank you very much! John had made arrangements with some local commercial fishermen to catch broodstock for Dave. It was going to take a few days, so we decided to do some traveling and fish collecting along the way.

Our first destination was southern Louisiana, where Louisiana Department of Fisheries biologist Mike Walker had studied and

co-authored a report on the bowfin (Davidson et al. 1991). He was definitely a different breed. One of his favorite pastimes was fishing for Alligator Gar *Atractosteus spatula*, but he seemed somewhat embarrassed to admit it. He did find something very interesting about bowfin that I hope someone will study further. Adult males and females are supposed to be sexually dimorphic and very easy to distinguish by the absence or presence of an ocellus (i.e., black eyespot) on the upper caudal fin. Both sexes exhibit this trait early in life. The eyespot is lost in adult females; males retain it and exhibit an orange-yellow ring around it during the spawning season. Mike originally used this characteristic to determine sex ratios in his study, but while examining ovaries and testes he found females that were externally sorted as males and vice-versa. Does this long-cited trait apply to some populations and not others? More research may answer this question. We also asked if he felt the bowfin populations were really at any risk of being wiped out from the caviar industry. He replied, “I really doubt it,” but added a half-hearted challenge, “Let ‘em try!”

Our next stop was the bayou country near Lake Verret, a 14,080-acre natural lake in Assumption Parish (Wikipedia contributors 2024) where we hoped to find the Banded Pygmy Sunfish *Ellossoma zonatum*. From a bridge over a small stream feeding the lake, we scanned the water, which was littered with washing machines, tires, and even a fake Christmas tree—nice structure and cover! Someone had also cleaned countless fish there, and large areas of the stream bottom were carpeted with fins and entrails. In this rotting mess we saw several female bowfin carcasses with their bellies slit open, and we knew who was responsible. As awful as this was, Banded Pygmy Sunfish were all over this carnage, but our nets and waders reeked of dead fish and really stunk up the car.

The commercial fishermen came through, and we started packing bowfin for the trip home (Figure 5). All Dave had was tropical fish shipping boxes, which could each hold one large or two medium-sized bowfin, but he had to bend some into a half circles for a proper fit. The bags lining the boxes were sealed with oxygen. They had several beautiful females but came up short on males.

John knew of one other source, which led us deep into Cajun country. Near the town of Pierre Part, there was a roadside vegetable stand, which had a small sign advertising “LIVE CHOUPIC.” There were several males, and the vendor was very happy to sell them but was puzzled that we didn’t want him to clean them for us. Bowfin is a highly valued delicacy in this part of Louisiana, and someday I may be brave enough to try it. I learned this later from NANFA member Bernard Sietman, who would often eat them growing up in Missouri and fished for them frequently. He said they were delicious every time he cooked them fresh from the water on the riverbank, but they would go “bad” quickly if he waited to clean them at home.

We finally headed North and hit a major blizzard in Arkansas, where no one knows how to drive in snow. There were an incredible number of accidents and ditch “landings.” Despite Dave’s bald tires that were useless against a patch of black ice on I-35 in Iowa, we finally arrived home 22 hours later with the loss of only two bowfin. The bowfins were injected with ovulating hormones, but hatching success was poor and only produced about 50 young on the first attempt. He kept trying with local broodstock but could not solve this species’ secrets for mass production (Figure 6). It was also bad news for the caviar industry, because Louisiana did close the commercial



Figure 5. Packing Bowfin broodstock. Top: female (above) and male (below; note that sex was determined solely on presence or absence of ocellus). Center: preparing shipping boxes. Bottom: a two-bowfin box prior to sealing with oxygen.

season on bowfin the following year. More recently, the 2024 commercial regulations do include a season with a minimum size limit of 22 inches (TL), but 5% of the catch can be less than the minimum size. The season is also closed December through February (i.e., the spawning season) but is permitted in seven parishes and several water bodies (Louisiana Department of Wildlife and Fisheries 2024).

ALTERNATIVE METHODS

It is unfortunate that the bowfin aquaculture venture did not succeed. Culturing fish has major advantages, like scheduling spawning in a controlled hatchery environment and reducing or eliminating pressure on wild populations. I am aware of two alternative attempts where wild-caught fry were reared in large aquariums or hatchery tanks. I witnessed the first effort in Bald Eagle Lake (Ramsey Coun-



Figure 6. First Bowfin culture attempt. Above: harvesting eggs. Below: The eggs were "silted" to reduce adhesion prior to rolling in hatchery jar.

ty, MN) on June 30, 1988. Eric Lindberg was a childhood friend and had been a high school science teacher, but he found that career was not for him. He dabbled in native fishes for the aquarium trade, hoping to eke out a living, but what he enjoyed most was the research and development part of learning everything he could about a species. His bowfin study site was a cattail bay of Bald Eagle Lake. Starting in early spring, soon after ice out, he canoed through the cattails searching for bowfin activity. He frequently observed male bowfins creating nests, spawning, and guarding the nests.

Eric was aware of my interest in native fishes and invited me to try to harvest fry off the nests (Figure 7). At the first nest, he knew the fry were now about 10 days old. As he started dip netting through the nest, he began giggling. I asked what was so funny. He said the male had just latched on to the net and would not let go. I had a

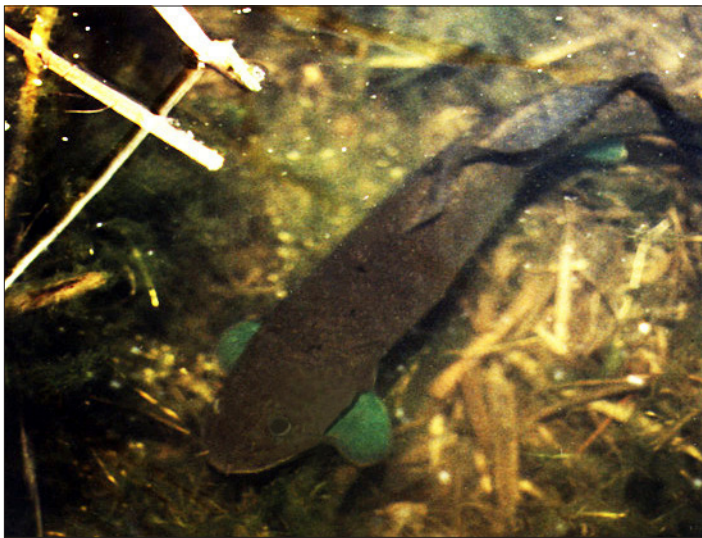


Figure 7. Collecting Bowfin fry in Bald Eagle Lake on June 30, 1988. Top, left to right: Eric Lindberg standing over a Bowfin nest; Eric laughing over male attacking his dip net. Center: a wary male Bowfin guarding nest. Bottom: Bald Eagle Lake Bowfin fry at about ten-days old.

wonderful photo, sadly lost in the mail, of Eric lifting the bowfin out of the water with its jaws still locked on the dip net's frame. He returned the fish to the water away from the nest and netted what he could find. We moved to a second nest and started again. Luckily, Eric checked on the first batch just in time to find them suffocating

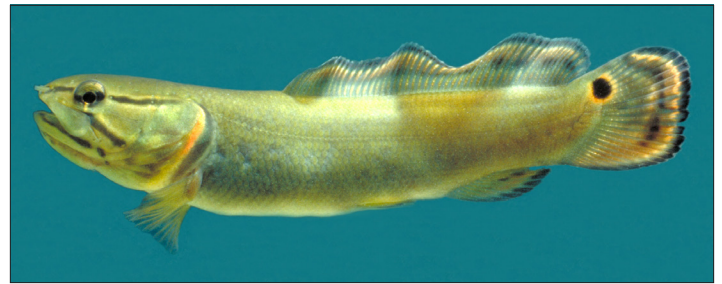


Figure 8. Wild-caught, captive-reared Emerald Bowfin. Top: June. Bottom: October.



Figure 9. Male Emerald Bowfin guarding nest in May. Yellow arrow shows some of many visible eggs. (Photo by Ray Katula)

in the bucket. He grabbed an air pump and after a few suspenseful moments, all were swimming upright again. The lesson learned was that 10-day-old baby bowfin cannot yet gulp in air to supplement their oxygen needs. Eric estimated that between the two nests he had collected approximately 1,200 fish. The little guys proved to be voracious feeders, grew at stunning speed, and dramatically changed in appearance over their first summer (Figure 8.).

The second bowfin culture attempt was made by NANFA member Ray Katula of Onalaska, Wisconsin. Ray is a fish culturist extraordinaire and has published many articles on the subject in *American Currents* and elsewhere. Ray grew up on the Mississippi River and spent a great deal of his childhood on the river and its backwaters. He learned many things about native fishes in his private outdoor lab, including a very intimate understanding of the bowfin (Katula 1998). He was well aware male bowfins not only guard the eggs and fry in the nest (Figure 9) but continue to shepherd their free-swimming offspring, which school in close-knit bowfin balls for several weeks after hatching (Figure 10). The timing of the bowfin spawn and the best time to collect fry vary year to year. Fluctuations in spring temperatures and water levels

can accelerate or delay spawning periods for many species. The odds are better than being a mega-winner in a lottery, but finding fry to collect requires constantly returning to the bowfin's haunts.

Ray also made an attempt at pond culturing bowfin. In the early 1970s, the Muséum-Aquarium de Nancy in France was looking for bowfin specimens for a new exhibit. John Bondhus (NANFA's founder), with the help of Ray's uncle, who was a commercial fisherman, captured several juveniles. Ray held them temporarily in a fiberglass pool at his home until they could be shipped to France.



Figure 10. Emerald Bowfin balls. Top: Mississippi River backwater (Buffalo County, WI; photo by Ray Katula). Center: Lower Balsam Lake (Itasca County, MN, July 2, 2008). Bottom: a member of a Emerald Bowfin ball seined in a St. Croix River backwater (St. Croix County, WI, June 16, 2022; photo by Jenny Kruckenberg).

When the order from the museum was cancelled, Ray had to move them ASAP. There was a pond down the hill from his home in Bluff Siding, Wisconsin about three to four feet deep (Figure 11). Winter kills would occur in the pond from time to time, but he never saw any bowfin in it alive or dead. Before construction of road and railroad dikes, the Mississippi River regularly flooded the pond but now had been cut off from the intermittent highwater connections. Ray drilled a hole through the ice and stocked 12 bowfin about 12–16 inches long. The following spring, he found a bowfin nest with eggs and, later, fry. He kept checking the pond for years but never saw any bowfin again. Ray emphasizes that what he did in his youth he would never do today, because both stocking fish and aquaculture are now tightly regulated in Wisconsin. He does feel pond culture has great potential for supplying the aquarium and caviar trade if the demand persists. However, state-sanctioned research to develop culture techniques that are effective and affordable must be done before entrepreneurs can supply the demand of profitable markets. These entrepreneurs also will be required to comply with state, and possibly national and international, regulations. It just may be more rewarding panning for gold or playing the lottery.

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Figure 11. Top: the yellow arrow on the aerial photo indicates the pond where Ray Katula stocked Bowfin to culture. **Bottom:** Ray next to the same pond 50 years later.

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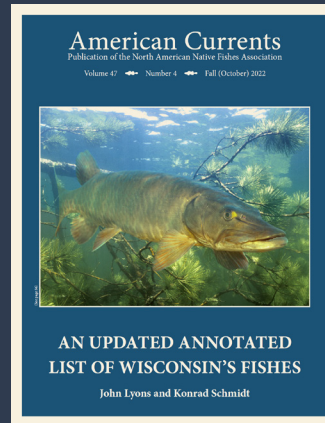
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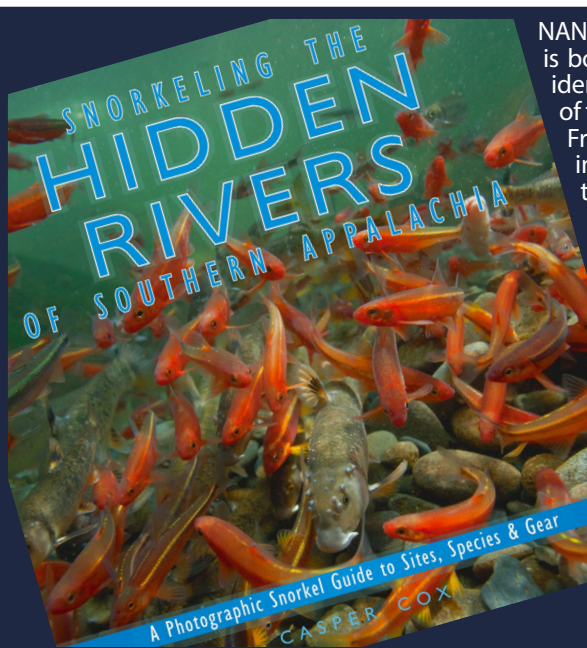
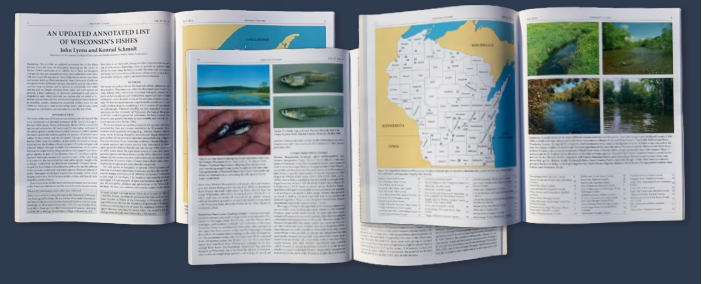
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