

Life in the Rocks

Spring Colors are Underwater!

by Brian Wagner

Ah, spring! ...Birds singing, frogs calling, flowers blooming. Indeed, the “mind” of nature seems to turn to romance. We will soon see more daylight than night and temperatures are on the rise. These important cues trigger many animals to begin their annual rituals of courtship and reproduction.

No place am I made more aware of the magic of springtime than under the waters of Natural State streams. Minnows and darters feature their most vivid colors of the year – red, orange, yellow, green, blue... all the hues of the rainbow flash under these rolling waters.

The bright colors are the way that the males of these fish attract mates. The females are much blander in coloration, because the bright colors may also catch the eyes of predators. I guess the males are expendable, but when a predator eats a female a whole potential nest of eggs is lost as well.

The darters have drawn the bulk of attention when it comes to color in our streams, with names such as rainbow, orangethroat, redfin, yellowcheek, greenside, harlequin, and goldstripe. Indeed, darters have



Rainbow Darter (*Etheostoma caeruleum*)



Red Shiner (*Cyprinella lutrensis*)

such fantail darters, lay their eggs in nests that are guarded by the male until the eggs hatch!

Minnnows are the most diverse family of fish in Arkansas. They have been touted less, but can also exhibit bright breeding colors, witnessed by the names bluehead shiner, red shiner, rosyface shiner, redfin shiner, and bleeding shiner. Minnows also have keener hearing than many other fishes and some have been found to transmit sound as part of their courtship rituals. As far as egg-laying, there are minnows that scatter eggs, attach eggs to vegetation, build nests, or even lay eggs in the nests of other fish!

Minnnows and darters are often considered just bait fish. If one takes time to look a bit closer, they provide a world of beauty and show an interesting variety of behaviors. Spring is a great time to see this, so take some time and look for these little gems!

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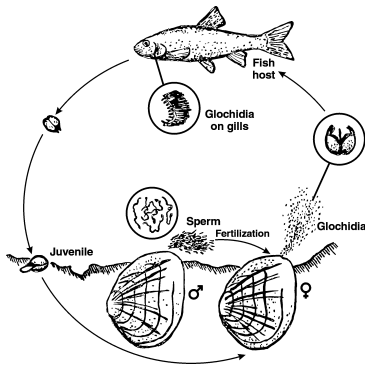
Gone Fishing

by Bill Posey

Freshwater mussels need a lot of luck to successfully reproduce. Their unusual life cycle begins when sperm collected while siphoning water fertilizes eggs held inside the female's gills. For most species, if a male of her kind isn't nearby upstream, she can't reproduce. For a few, this is not a problem because they seem able to fertilize themselves.

In the likely event that a male and female or in close proximity to one another, fertilization does occur and a complex process continues. A generalized diagram of the reproductive cycle is shown below.

Freshwater Mussel Life Stages



The difficult part of the reproduction is the attachment of the young mussels (glochidia) to a suitable host. This stage of development is necessary for almost all mussel species and is the only long distance mode of transportation for them. Because of the necessity for the young mussels to attach to a fish, the mother employs some very

elaborate strategies to attract a possible fish host. This is where some mussels literally "go fishing".

The adaptations these species use to attract host fish are absolutely amazing considering mussels don't even have eyes to see what they are mimicking! The time of year freshwater mussels "go fishing" varies by species and takes place throughout the year. The part of the mussels used for mimicry is the mantle, the part of a mussel that envelops the mussel inside the shell. Several species have an extra bit of mantle that when protruded from the shell, resembles many different things. The Arkansas broken ray mussel's mantle flaps resemble a fish.



Arkansas broken ray mussel with lure extended



Rainbow mussel with projections extended.

The rainbow mussel utilizes her siphons in her mimicry and extends small projections that some would say resemble alive worms. Others say that if the animal is viewed displaying alive, the lure resembles a crayfish.

Others don't use lures attached to their bodies but will expel the glochidia in packets called conglutinates. These can resemble larval fish, aquatic insects or nothing at all.



Conglutinates resembling larval fish.

Whatever the method, some species are more successful than others are. This process is very important to remember when protecting mussel species since many are host fish specific

If you would like more information regarding this and other mussel topics, I would recommend visiting Dr. Chris Barnhart's website. The photos included in this article are from his website and he has many more. Also included on his website, you can find video of these mussels fishing.

Dr. Barnhart's website can be found at:
www.courses.smsu.edu/mcb095f/gallery/

Pebbles...

- ? January 31st and February 1st Brian attended a meeting of the SE Imperiled Fishes Workgroup. After the meeting we broke into several workgroups to continue work. Brian is on the steering committee that is working on development of the organizational structure of whatever group forms to implement the strategy (copy attached). This committee includes federal agencies, universities, conservation organizations, an industry, and 2 state agency representatives. The group's DRAFT mission statement is "The (organization name to be decided) advocates the conservation and recovery of southeastern imperiled fishes and their ecosystems for the benefit of current and future generations through science-based research, management, communication, education, and cooperation."
- ? Program personnel completed boating safety courses.
- ? Bill and Brian attended the annual meeting of the Arkansas Chapter of the American Fisheries Society. Bill gave a presentation on the commercial mussel industry in Arkansas.
- ? Brian completed the state Inter-Agency Training Program's course on Interpersonal Communication.
- ? Bill presented a seminar to some members of the Fisheries Division staff on Arkansas mussels.
- ? Brian and Bill met with Cindy Osborne of the Arkansas Natural Heritage Commission to compare our respective agencies records on threatened and endangered species.



- ? In mid January Kelly and his wife Lisa found a series of winter kill amphibians and reptiles in the St. Francis National Forest, of which two species were new county records. This phenomenon was later documented in other counties with reports from other AGFC personnel.
- ? Brian attended the Southern Division American Fisheries Society's midyear meeting in Jacksonville, Florida. Arkansas will be hosting this meeting next year in Little Rock.
- ? Bill worked with ASU to begin constructing a geographical database for mussels in Arkansas.
- ? Bill helped District 11 Biologist place Christmas trees in a lake for fish habitat.
- ? Bill attended two meetings concerning the White River Navigation Project.

Pebbles (continued)...

- ? In February Kelly made two trips to Clay County in the extreme northeastern corner of the state, to search for the Illinois Chorus Frog, a proposed candidate species for federal listing as a Threatened and Endangered species. The first trip was unsuccessful and uneventful, even after sufficient rains had fallen. The second trip, on 24 February, was quite successful and most certainly eventful. A line of tornado spawning severe thunderstorms was fast on our heels as we drove to Jonesboro late that afternoon, our rendezvous point with a visiting graduate student from Texas. We left Jonesboro at 7 PM in a driving thunderstorm and headed up Highway 49 unbeknownst to us a tornado had crossed the highway we were traveling on not 15 minutes before. The fast moving thunderstorms headed on east and the remainder of the evening was balmy and calm and the frogs were calling in abundance.
- ? On February 28 Kelly instructed Wildlife Officer Cadets at the Mayflower training facility in venomous snake identification and regulated amphibians and reptiles.
- ? Bill spent two days snorkeling on the South Fork of the Saline River searching for and endangered mussel.
- ? Kelly spent the last weekend of January searching for the endemic Dusky Salamander of Crowley's Ridge with Lisa and graduate student Ron Bonett.
- ? Kelly presented an overview of the new herpetological program to the Fisheries Division quarterly staff meeting at DeGray Lake Resort on January 31.



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