



Life in the Rocks



The Newsletter of the Arkansas Game and Fish Commission Nongame Aquatics Program

Stay at Home Mollusks

by

Bill Posey, Malacologist

Arkansas is blessed with unique physiography that ranges from the lowlands of the Mississippi River Delta to the top of Magazine Mountain at 2,753 feet above sea level. This allows for a unique fauna of aquatic species when combined with the several large river sub-basins, such as the Mississippi River Basin, on our east, and the Red River Basin, to our west, and the Arkansas River Basin bisecting the state. While these three basins eventually join in Louisiana, they are disjunct in the *Natural State*, and this is shown by several unique aquatic species that only occur in one, or the other, basin. Combine this with the Interior Highlands, made up of the Ouachita and Ozark Mountains, and the table is set to have unique mollusk species that occur only in Arkansas.

Two known species of mussels call Arkansas their only home. One, the Arkansas fatmucket (*Lampsilis powellii*) lives in the upper Ouachita, Saline, and Caddo Rivers of the Ouachita Mountains and extends slightly into the Gulf Coastal Plain in the Saline River. All of these rivers are part of the Red River Basin in Arkansas.

Considerable research has been conducted on this species to determine its distributional limit in these rivers, and to ensure its place in

taxonomy, since it exhibits similar shell shapes to other species in the genus *Lampsilis*, namely the fatmucket, *L. siliquoidea*, and the Louisiana fatmucket, *L. hydiana*. The Arkansas fatmucket was afforded this attention because it is federally listed as a threatened species. In the course of these and other studies, one new mussel species has been found in the upper Ouachita River, and at least two more may also exist in the Red River Basin in Arkansas and Oklahoma. While these latter two will not be unique to Arkansas, they will likely be unique to the basin.



Male (top) and female (bottom) Arkansas fatmucket mussels in the upper Ouachita River.



Females (left) and male (right) fatmucket. (This species closely resembles the Arkansas fatmucket)



Female Louisiana fatmucket. (Also closely resembles the Arkansas fatmucket in shell shape)

Moving eastward to the Little Red River and tributaries, there is another mussel that finds its home only there. The speckled pocketbook mussel, *Lampsilis streckeri*, is found only in this river system in Arkansas. Like the other Arkansas endemic mussel, it is federally listed, but this one is listed as endangered. Two status assessments have been conducted for this

species within the last eight years, with another assessment to come in about two years. It was once believed to only exist in the Middle Fork Little Red River, but that has been disproved through status assessment surveys, and it is found in all four forks of the Little Red River above Greers Ferry Lake and in Big Creek, a tributary below the lake. This species has also been studied extensively over the last 10 years, including its life history and its place in taxonomy.



Speckled pocketbook mussels from the Middle Fork Little Red River near Shirley, Arkansas.



Arkansas brokenray mussel.

The Little Red River system appears to be a very unique system that has been isolated from the White River in times past. The presence of the Arkansas brokenray, *L. reeviana*, in the Little Red River shows recent connectivity to the White River, but the speckled pocketbook must have invaded long before the Arkansas brokenray made its way to the Little Red. As the taxonomy of mussel species in this river system is studied in even greater detail, thanks to the advent of genetic testing, more mussel species are beginning to be found in Arkansas, and especially in the Little Red River. It appears that at least two more species of mussels will be described only from the Little Red River, and there could be more as more species are tested.

It would be hard to talk about endemic mollusks in Arkansas if the Magazine Mountain shagreen

snail, *Mesodon magazinensis*, was not discussed. This small snail species exists on Magazine Mountain, and is federally listed as a threatened species. It is similar in appearance to other snails in the same genus, but has been shown to be a unique species occurring only on Magazine Mountain. Extensive studies conducted on the species in 2008 and 2009 described its reproductive cycle, food habits, and its distribution on the mountain.

This is just a sampling of endemic species that occur in the *Natural State*. Several species of fish, and even some terrestrial animals, call Arkansas their only home, and there are a few plants that are found nowhere else in the world. Arkansas truly is a unique state with much that is worth conserving to keep the *Natural State* “natural.”



Magazine Mountain shagreen snails.

Arkansas' Endemic Madtoms:

Who is Tom, and why is he mad?

by Justin Stroman, Nongame Aquatics Technician

Madtoms, sometimes called “stonecats,” are members of the genus *Noturus*, which is part of the catfish family, *Ictaluridae*. There are 13 species of madtoms that occur in the state, two of which occur only in Arkansas, and nowhere else. Their secretive lifestyle and small size mean that most people don't even realize madtoms exist. Madtoms are much smaller than their other catfish cousins. They average two-to-four inches in length, and weigh no more than a couple of ounces. Compare that to a fish we're all familiar with, the blue catfish, which can reach upwards of 40-50 inches and weigh over a hundred pounds! So, as you can imagine, being that small means they have a different life than the other catfishes. Since the theme of this edition of Life in the Rocks is “Arkansas Endemics,” let's take a closer look into the lives of our two endemic madtoms, the Ouachita and Caddo madtoms.

The Ouachita madtom, *Noturus lachneri*, occurs right in the backyard (relatively speaking, of course) of our Benton Field Office, in the drainage of the upper Saline and Ouachita Rivers. These fish spend their days between the rocks and gravel, on the bottoms of streams and backwater areas, in the Saline River. At night, shortly after sunset, they begin a feeding frenzy, eating all sorts of aquatic insects (Robison & Buchanan 1984). This seems like a pretty easy life, right? Well, that may not be the case. Besides the ever present threat of being eaten by a bass or a bigger catfish, these fish continue to lose habitat to land development. Clear-cutting, gravel mining, and impoundment have reduced much of the Ouachita madtom's historic habitat. The International Union for Conservation of Nature (IUCN) lists the Ouachita madtom as vulnerable to further development in the watershed. Careful management of land in the watershed is essential for the survival of this Arkansas native.



Ouachita madtom

Photo by H.W. Robison



The Caddo madtom, *Noturus taylori*, is the other Arkansas endemic madtom species. It occurs within the Caddo River drainage, as well as the upper Ouachita and Little Missouri Rivers. They can be found underneath gravel, below riffles, and have a similar feeding habit as that of the Ouachita madtom. This is another species that truly does spend its “life in the rocks.” The Caddo madtom also faces similar threats as the Ouachita madtom. Ecological studies indicate that dam and bridge construction poses barriers to dispersal and migration of fishes in the Ouachita Highlands (Warren and Pardew, 1998). Hydrologic alteration and sedimentation warrant considering this species critically imperiled.

With a better grasp of the life history of these fishes, and the knowledge of the various threats they face, maybe we can answer the question of



“Who is Tom, and why is he mad?” Well, he’s mad because his home is getting destroyed. It’s not too late for these miniature catfish, though. Implementing Best Management Practices (BMP) along these streams is essential to mitigate environmental impacts and make these madtoms “happytoms,” and ensure these unique Arkansas natives are here for many generations to enjoy and appreciate.

Literature Cited

Robinson, Henry W., Thomas M. Buchanan. 1984. Fishes of Arkansas, University of Arkansas Press, Fayetteville. pp. 307–308.

Warren, M. L., and M. G. Pardew. 1998. Road crossings as barriers to small stream fish movement. Transactions of the American Fisheries Society 127:637–644.



Caddo madtom

Photo by Renn Tumblison.

Amphipods and Isopods: the Crayfish's Tiny Cousins

by Brian Wagner, Nongame Aquatics Biologist

When I think about crustaceans, I'm usually thinking of crayfish, shrimp, crabs, lobster, and such. However, there are also tinier crustaceans of a broad array, many of which live here in Arkansas. One group of these is the Superorder *Peracarida*, which includes isopods and amphipods. In peracarids, the basal segments of the legs have flattened plates which enclose a pouch where the young develop called the "marsupium."

Isopods (Order *Isopoda*), so named because all of their legs are the same, are exemplified by the pill bugs (or, roly polies) often found under rocks and logs in Arkansas forests. Around human settlement there is found a species that was introduced long ago from Europe. Native Arkansas isopods include forest floor species, aquatic species, and those found only in caves.

Amphipods (Order *Amphipoda*, literally different-footed) include the scuds (or, side-swimmers) that are an important prey item in Arkansas trout streams. Most amphipods are aquatic, but one kind that can be a pest in warm, moist climates has been introduced to California and Florida.

Arkansas is also home to a number of white, eyeless, cave-obligate isopods and amphipods that are considered "Species of Greatest Conservation Need" in the Arkansas Game and Fish Commission's Arkansas Wildlife Action Plan (AWAP). These are among the rarest and least known animals in Arkansas.



Unidentified isopod: *Caecidotea* sp.
Photo by Michael E. Slay, The Nature Conservancy



Unidentified amphipod: *Stygobromus* sp.
Photo by Michael E. Slay, The Nature Conservancy

Pebbles...

(Quick notes on what we've been up to...)

- Bill, Kelly, and Justin collected fish for host fish identification trials for a potential undescribed mussel species.
- Brian attended the Southern Division American Fisheries Society (AFS) meeting in Tampa, Florida.
- Kelly worked with Theo Witsell, Arkansas Natural Heritage Commission, for two days in January, conducting vegetation sampling as part of a state wildlife grant funded glade restoration project.
- Bill, Brian, and Justin attended the Arkansas Chapter AFS meeting in Little Rock.
- In February, Kelly attended and presented a status report on the Ozark Hellbender long-term monitoring survey at the Ozark Hellbender Working Group meeting in Springfield, Missouri.
- Bill, Brian, and Kelly attended a Fisheries Division Budget Managers meeting in Lonoke.
- Kelly was busy in February and March giving public education programs to *Master Naturalist* groups at Bull Shoals and Dardanelle State Parks, and at the TRIOS Outdoor Program at Grandview Conservation and Education Center.
- In early March, Kelly spent several days hosting Professor Ron Bonett (University of Tulsa), conducting field work in southern and central Arkansas, collecting brook and dusky salamanders for phylogeographic studies.
- Brian and Justin continued to work with The Nature Conservancy conducting darter sampling in northwest Arkansas.
- Bill attended the 1st Annual Interior Highlands Mollusk Committee meeting in Neosho, Missouri.
- Kelly spent several days installing temperature data loggers in the Ouachita Mountains, with Professor Matt Gifford and students from UALR, as part of an ongoing state wildlife grant funded project, to assess potential climate change effects on montane salamanders.
- Brian participated in a tri-state Ozark cavefish recovery planning meeting in Joplin, Missouri.
- Bill and Kelly assisted the Education Division with an education event held at Rick Evans Grandview Prairie Education Center.
- On March 17, Kelly gave a presentation to the 2011 Wildlife Officer Cadets class on the "Herpetological Program and Venomous Snake Identification and Safety" as part of their training regimen.

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The yellowcheek darter, *Etheostoma moorei*, is another fish species found only in Arkansas.



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