



Life in the Rocks



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

Searching for Fish and Crayfish in Springs on Private Lands

By Brian Wagner

I am working with part-time Technician Mark Kottmyer to survey fish and crayfish distribution in spring-streams in northwest Arkansas. This work is being funded through Section 6 of the Endangered Species Act (ESA) to evaluate the status of the Arkansas darter, *Etheostoma cragini*, in the state.



Arkansas darter, *Etheostoma cragini*. Photo by D. Crosswhite.

This fish is a candidate for protection under the ESA. Its range spans from eastern Colorado to southwest Missouri and northwest Arkansas. It has historically been found at 5 locations in Arkansas, and the last status survey only located it at 3 of them. Our hope is that we can document stable populations and possibly discover new ones, supporting that current levels of protection are adequate.

The mission of the Nongame Aquatics Program is "... to wisely manage all native aquatic fauna of Arkansas in order to maintain viable populations and their habitats, while enhancing public appreciation of this resource."



Least darter, *Etheostoma microperca*. Photo by D. Crosswhite.



Neosho midget crayfish, *Orconectes macrus*. Photo by B. Wagner.



Orconectes nana. Photo by B. Wagner.

This survey has also provided the opportunity to gain information on several other species that are restricted to this part of the state. The least darter, *Etheostoma microperca*, ranges all the way to Canada but has only been found at 5 sites in Arkansas. The Neosho midget crayfish, *Orconectes macrus*, is restricted to SW Missouri and extreme NW Arkansas. Another crayfish, *Orconectes nana*, is restricted to NW Arkansas and NE Oklahoma.



Searching maps for springs – our low-tech GIS.

To conduct this survey, we viewed a map of springs in the Arkansas River drainage in Benton and Washington counties, Arkansas. We selected 91 representative springs covering this area. Mark has then been using county land ownership records to find landowners, if possible. This has proven challenging in this area of the state where land changes hands on a rapid basis.

Once we have a landowner name we try to find a phone number or other contact information for that person. If we can, Mark seeks permission to access their property over the phone. In the many cases where we are unable to find contact information, we start knocking on doors in the area to secure permission. We make it a point to avoid trespassing to conduct any of these surveys.

We have received a range of receptions from landowners. The most common is “go ahead and do whatever you want to.” We also get “can I go with you,” “will this keep me from selling my

land,” “can you find something that will stop <insert project> from going through,” and “I don’t need you to find any endangered species down there.” There has only been one case been turned down so far!



Dovle Crosswhite (TNC) and I collect fish from a spring as the landowner observes. Photo by M. Kottmver.

Driving to these sites has been eye-opening in some cases. Many of the springs are in pretty good shape, but we are frequently told that they don’t flow as much as they used to. Numerous springs have impoundments below them – in some cases eliminating any possible habitat for the species we’re seeking. Pollution is also a problem, and several spring have been covered over for housing developments.

In general, spring habitats are hanging on in northwest Arkansas, despite several impacts. Arkansas darter populations persist in streams that flow through cow pastures and on the edge of urban areas. However, such habitats are at risk as the human population in the area continues to grow – increasing land-values and driving a conversion from traditional agriculture to residential development. Arkansas Game and Fish and other conservation agencies and organizations need to work with developers and local governments to minimize impact to these sensitive natural resources as the landscape of northwest Arkansas changes.

The use of the Muskrat (*Ondatra zibethicus*) in malacological surveys

By Bill Posey

Many of you are probably wondering if old Bill has really flipped his lid on this one. Using a mammal, particularly a rodent, as a tool for conducting malacological surveys. Before you think I have really dropped off the deep end, let me explain.



The muskrat is a semi-aquatic mammal that makes its home near the water, only moving away from water during droughts or to find a new home range. It feeds primarily on bulbs, tubers and vegetation and builds its home from vegetation or in dens in the banks of rivers and ponds. The use of the muskrat in malacological surveys is that it also eats mussels. While this is not earth shattering, they typically eat mussels in the same location, resulting in piles of shells at their favorite eating-place called middens.

These middens are typically found in secluded places under logs or in the exposed roots of trees at the water's edge. Occasionally they are found in the open such as a log in the water or other exposed site. Sometimes a den opening is close to the middens.



Small muskrat midden on concrete slab. Of notable interest is that all of the shells were removed from the concrete slab when it was first visited. During a subsequent search of the slab two days later, a muskrat had returned and deposited more shells on the slab.

O.K., now you ask what is so earth shattering about middens? The fact is that muskrats are very effective at finding the really rare mussel species that occur in the river. In a recent investigation of muskrat middens along the Spring River, two individual specimens of the endangered pink mucket mussels were found in

separate middens. In addition to the pink mucket mussels, over 65 individuals were found of the snuffbox mussel. Only one individual of the snuffbox had been documented in Arkansas in the last 25 years. In only one day, over 50 individuals were removed from muskrat middens. While these were all dead, some still contained parts of the mussel, revealing that they were recently ate by a muskrat.



Shells of the snuffbox mussel found in the mussel midden shown previously.

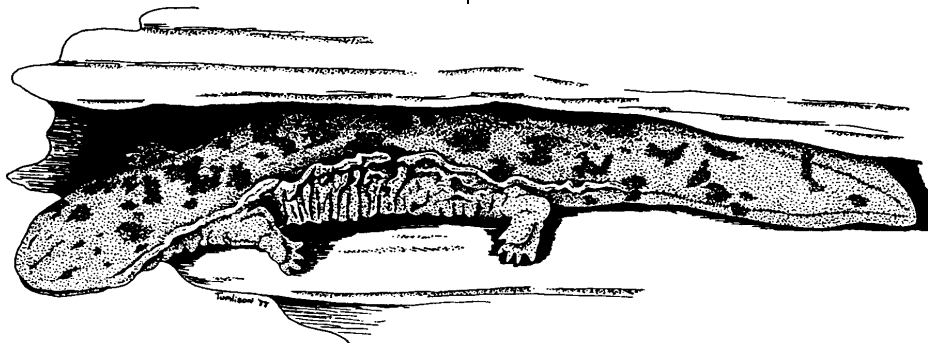
This habit of muskrats consuming mussels also helps malacologists determine the range of a species of mussel. Over three days of investigating muskrat middens, rare mussels were found over a long stretch of the Spring River.

Muskrat midden collecting also allows the collection of many individuals of a species for use in studying shell characteristics without the need to kill all of these individuals. Two middens that were searched were each at least five feet long by two feet wide with shells layered 3-4 shells deep. Each of these middens may have contained over 1000 mussels. By collecting the shells from these middens, we will be able to study these shells without killing additional animals.



Muskrat midden trailing from the bank into the water.

While we cannot use only muskrat middens to aid in finding mussels, you can bet I will be searching through them to help locate the rare and unusual species of mussels here in Arkansas.



Pebbles...

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

- Brian joined USFWS staff to visit Conservation Fisheries, Inc. (CFI) in Knoxville, TN. CFI specializes in captive propagation of imperiled fishes. One of their current projects is to develop propagation methods for the yellowcheek darter, *Etheostoma moorei*, and endemic of the upper Little Red River system.
- Bill conducted endangered mussel species surveys in the Little River and eastern Saline River for boat ramp renovations.
- Kelly was able to complete the first year of long-term monitoring of Hellbenders on the Eleven Point River, with the much-needed assistance of Brian and Bill. Thanks guys!
- Bill investigated a mussel die-off in the Ouachita River in the vicinity of Malvern. Only exotic mussels were found during the die-off.
- Brian and Bill attended a GIS Team meeting.
- Bill conducted surveys for the Spectaclecase mussel, winged mapleleaf and pink mucket in the Ouachita River, with help from Kelly.
- Kelly attended the "Herp Hatch" event at Grassy Lake, Hempstead County, hosted by Lake Club members, Mr. and Mrs. Charles Sharp, and attended by friends and family. The nests of an alligator snapping turtle, river cooter, and reed slider were opened (after removal of the wire cages that prevent predation) and the young turtles were released into the swamp after many photos were taken.
- Bill set up a mussel display at the St. Francis County Fair.
- Bill assisted The Nature Conservancy in developing a plan to determine threats to the Middle Fork Saline River.
- Brian joined Stream Biologist Jeff Quinn, District Biologist Sam Barkley, Assistant Chief Steve Filipek, Dr. Henry Robison, Dr. Tom Buchanan, and several others for 3 days of fish collecting on the Mississippi, Black, and White Rivers.
- Bill conducted a survey for the endangered Curtis pearlymussel in the Spring, South Fork Spring, and Eleven Point rivers, with help from Kelly and John Harris of AHTD.
- Brian, Bill, and Kelly helped edit species accounts for the Comprehensive Wildlife Conservation Strategy.
- Bill conducted a mussel survey in the Saline River below Dierks Dam in Howard County.
- Kelly piloted Stephen O'Neal, Regional Stream Team Coordinator, on a lengthy boat ride, from the state line down to Arkansas Highway 90, on the Eleven Point River to map problem areas.
- Bill assisted District 7 Biologists with fish sampling on Gillham Lake and Lake Greeson.
- Brian attended the Southern Division American Fisheries Society Warmwater Streams Committee meeting hosted in Yellville.
- Bill searched for the Arkansas fatmucket in Lake Ouachita.
- Brian welcomed Mark Kottmyer back to work and resumed Arkansas darter survey efforts.
- Bill conducted educational presentations for Underwater Arkansas on Lake Ouachita and a Boy Scout troop on Lake DeGray.
- Kelly gave a presentation on snake ID and handling techniques to the Arkansas Animal Control Officers Association in Hot Springs.
- The long awaited Commission approval in changes for the commercial harvest of aquatic turtles was completed in September. Whew!

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The coldwater crayfish, Orconectes eupunctus, is only found in a few spring-fed, eastern Ozarks rivers.



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