



Life in the Rocks



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

Where is it? – A Question of Distribution

By Brian Wagner

Much of our effort in the Nongame Aquatics Program revolves around where animals are found. Why do we care? How do we collect and use the information? What factors can affect it? These are some of the questions I'll address in this article.



Photo by Brian Wagner

Ozark Cavefish

So, why do we care that the Caddo madtom is found in stream X, the Ozark cavefish in cave Y, or the central stoneroller across much of the state? Well, we're charged with the wise management of the state's fish and wildlife resources, which include these small animals that many people overlook. How well can we manage, or even monitor, a species if we don't know where it is? Distribution information is the foundation of our species conservation efforts, and for some species it is still very incomplete (of course it is difficult to know entirely for many species). Take for example the Arkansas darter, a species of concern in

northwest Arkansas for many years and a candidate for Endangered Species Act protection. It occupies very specific habitats and was reported in 1985 to occupy five sites in the state. Monitoring efforts were focused on some of these sites, yet our recent work found it to be absent from two of them and present at five additional sites. Since these five new sites were previously unrecognized, they had received no conservation attention. One was nearly destroyed because no one knew it contained any animals of note!



Distribution of Arkansas darter in Arkansas

The Nongame Aquatics Program employs a variety of field sampling techniques to find out what is at a certain place in general, or to specifically search for a certain animal species. Electrofishing passes a controlled electric

current through the water to stun fish. Seines and dip nets are used to catch fish and crayfish.



Electrofishing



Seining



Snorkeling

Commercial fishing gear, such as hoop nets, gill nets, and various types of traps, are used to catch fish, crayfish, and even turtles.

Collecting by hand, either from the surface or underwater (SCUBA, snorkel, surface supplied air), is used for mussels, reptiles, amphibians, and crayfish.

When we capture animals we record information including date, people involved, location coordinates and description, species encountered, and various descriptions of the habitat from which they were captured. In some cases, we collect voucher specimens – representative preserved individuals used to confirm identifications and deposited in a museum collection for future reference by other researchers. Sometimes identification is so difficult or in question, that we collect tissue samples for DNA analysis.



Ozark Hellbender

Records of the species collected, location, and other standardized data are stored in computerized databases for future retrieval, along with past data and similar data from partner agencies, such as the Arkansas Department of Environmental Quality or the Arkansas Natural Heritage Commission. We can then generate maps of where a particular species has been found in the state, such as for the forthcoming revised edition of *The*

Fishes of Arkansas. We can also create lists of species recorded from a stream, or in a specific area in response to an inquiry, like when major construction project is being planned.



Mosquitofish

So, some animals are wide-ranging, some are only in one unique place, and most fall somewhere in between. Why? The short answer is that animals are adapted to fill specific roles in specific habitats. Some roles are very general, like mosquitofish that eat insects from the surface around the margins of water bodies – these fish are found throughout most of the state and are considered habitat generalists, or at least use a habitat that is very common. By contrast, the Hell Creek cave crayfish is only found in a couple of caves in north-central Arkansas – it is restricted to cave habitats, and only specific ones. This brings up a second factor that affects distribution – isolation.

It makes sense that animals in Africa are different than those in Arkansas (excluding zoos), because they are unable to travel between the two places. For this same reason, there are often different animals on nearby islands if they can't travel between the two. For freshwater fish, such isolation can occur when the streams are not connected – or are not connected by habitat that the fish in question

can live in. Long-term climate changes can isolate populations of fish that were once interconnected. Human activities can also cause isolation – a case in point is the yellowcheek darter that lives in tributaries of Greer's Ferry Lake, but not in the lake itself.

Animals can also be excluded from specific areas by competition with other species or by predators. The study of all the factors that affect the distribution of organisms is called biogeography, and is often linked back to patterns of glaciation, continental drift, and other long-term processes.



Hell Creek cave crayfish

What the Nongame Aquatics Program is faced with in Arkansas is trying to piece together the best information we can about the species we focus on, where they live, and what limits them. We have a variety of methods and tools at our disposal to help fill in some of the gaps in our knowledge. If we can understand enough, we can help Arkansans coexist with the bounty of species found in “The Natural State.” If we don't understand enough, some species will become less common, or perhaps even be lost from our state forever.

Pebbles...

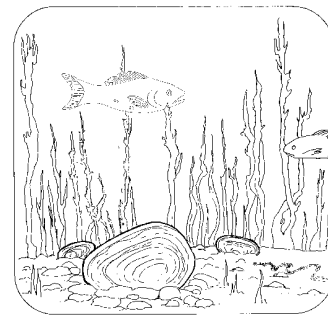
(Quick notes on what we've been up to...)

- Brian attended the annual Arkansas Academy of Science meeting held in Batesville, where he presented the results of our study of the status and distribution of Arkansas darters in Arkansas.
- Kelly spent 11 days in April and early May hiking the western Ouachita Mountains to collect salamanders for a State Wildlife Grant funded collaborative research project on the Rich Mountain Salamander (*Plethodon ouachitae*) species complex. This work is being conducted to assess the genetic boundaries of this salamander group using modern molecular techniques. As principal investigator, Dr. Frank Burbrink (City University of New York, Staten Island), is leading the collaboration with Kelly and Don Shepard (University of Oklahoma doctoral student) on this three-year project.
- Brian and Mark set up and manned a crayfish display for 2 days during the Little Rock Zoo's Earth Day Celebration.
- Bill conducted conservation education programs for local grade school students at WinRock Farms, students at the annual Arkansas Association of Conservation Districts camp and students at Career Camp.
- Kelly attended the annual Arkansas Herpetological Society field trip to hunt for amphibians and reptiles in and around the Logoly State Park area in Columbia County. The AHS thanks Jim Gann, Park Superintendent, and his staff for hosting this field trip.
- Brian and Mark set up a display and gave presentations to classes at Tolleson Elementary School in Jacksonville as part of their Earth Day activities.
- Kelly assisted Enforcement Division personnel in removing approximately 1200 alligator snapping turtles from the facilities of an unpermitted commercial breeding facility. Kelly spent many days in May at the Lonoke Fish Hatchery overseeing the care and maintenance of these turtles.
- Bill conducted mussel surveys on the Middle Fork Saline River, Middle Fork Little Red River, Crooked Creek and Little River.
- Brian and Mark joined Dr. Henry Robison (Southern Arkansas University) and Dr. Keith Crandall (Brigham Young University) while collecting crayfish for a study of the status and genetics of several species in southwest Arkansas.
- Kelly inspected two aquatic turtle breeder facilities as part of the new regulations requiring permits to commercially harvest, breed, and deal in aquatic turtles.
- Brian transported crayfish specimens to the Illinois Natural History Survey, where they will be cataloged and made available to other crayfish researchers.
- In early May, Kelly completed and submitted the final Nuisance Alligator Occurrence report to the Wildlife Management Division. This report will provide the WMD essential information for the long-term management of the American Alligator in Arkansas.
- Brian attended a meeting for AGFC's Fisheries Management Section, where he presented an introductory crayfish talk.

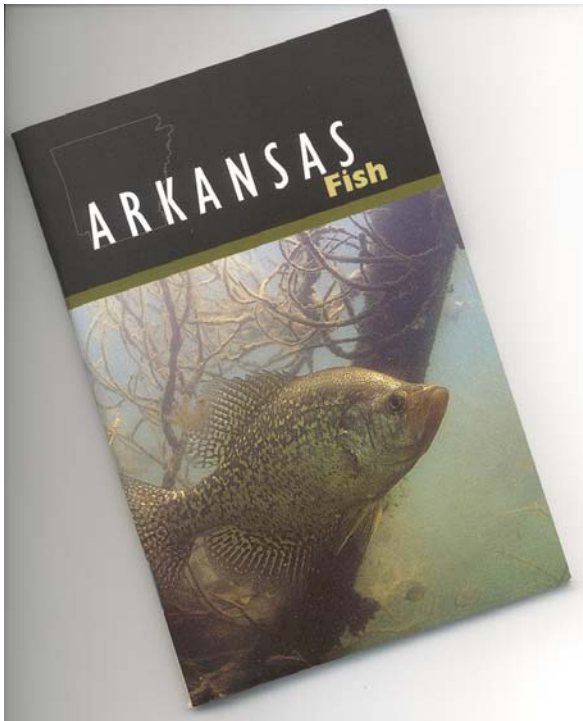
Pebbles...

(Continued...)

- Brian and Mark worked with graduate students from the University of Arkansas and Saint Louis University to collect crayfish in the South Fork Spring River and other nearby streams.
- Bill assisted the Murfreesboro Hooked on Fishing, Not on Drugs Program with a kids fishing derby.
- Kelly visited Grassy Lake to conduct general herpetological survey work and monitor alligator snapping turtle nesting. Unfortunately only one nesting AST was observed during this period.
- Brian gave a presentation on our work with Arkansas darters at the Commission meeting in May.
- Kelly attended an Alligator Management Team meeting at the Monticello office to work on an alligator management plan.
- Bill attended a meeting with The Nature Conservancy to discuss a conservation plan for the forks of the Saline River.
- Brian and Bill attended the annual AGFC/ US Forest Service Coop meeting.
- Brian and Mark assisted Missouri Department of Conservation Geneticist Jeff Koppelman in attempts to collect fish for a genetics study.
- In an effort to better inform the citizens of Arkansas about alligators, Kelly taped two AGFC sponsored television programs for AETN. On June 15 he did a program in the field with Phyllis Speer, host of “Arkansas Outdoors” and again on June 21 with Steve “Wildman” Wilson, on “Talkin’ Outdoors at the Corner Café.”
- Brian and Mark assisted USFWS Biologist Mitch Wine with collection of yellowcheek darters for captive rearing experiments. These fish are being held at the Greer’s Ferry National Fish Hatchery in hopes of observing hatching and early larval development and food habits.
- Bill assisted the Hooked on Fishing, Not on Drugs Coordinator with training of new sponsors.
- Brian and Bill assisted AGFC’s Education Division with a teacher workshop at the Fred Berry Conservation Education Center on Crooked Creek. Bill gave a mussel presentation and Brian gave a crayfish presentation and helped with fish collection demonstrations.



Brian Wagner, Nongame Aquatics Biologist - bkwagner@agfc.state.ar.us
 Bill Posey, Malacologist/Commercial Fish Biologist - brposey@agfc.state.ar.us
 Kelly Irwin, Herpetologist - kirwin@agfc.state.ar.us
 Mark Kottmyer, Part-time Technician
 Arkansas Game & Fish Commission, 915 E. Sevier Street, Benton, AR 72015



Fish Pocket Guide Available

The Arkansas Game and Fish Commission recently produced an Arkansas Fish pocket guide. This guide provides an introduction to some of the diverse kinds of fish found in our state. Dr. Henry Robison and Dr. Thomas Buchanan provide a more thorough treatment in their book *Fishes of Arkansas*, published by the University of Arkansas Press and currently being revised by the authors for a second edition.

Copies can be requested free of charge from the AGFC Communications Division at 1-800-364-GAME.



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Nongame Aquatics Program
915 E. Sevier Street
Benton, AR 72015