

# Life in the Rocks

## *Endangered Species in Arkansas*

The Endangered Species Act (ESA) protects twenty-nine species in Arkansas through listing as endangered (n=20) or threatened (n=9). Twenty-three of these species are animals and six are plants. Section 6 of ESA provides for coordination with states through funding conservation actions involving listed species. In Arkansas, the Arkansas Game & Fish Commission has a Cooperative Agreement with the US Fish & Wildlife Service for Section 6 activities relating to animal species and the Arkansas Natural Heritage Commission has such for plants. In a recent report to AGFC's Director, we summarized current information on the Arkansas distribution of listed animal species and species which have the highest likelihood of becoming listed in the near future.

When a species is listed under ESA, a Recovery

Plan is prepared. The Recovery Plan details what threatens the species, what conservation measures are needed, and what milestones will indicate that the species no longer needs to be listed. Twenty-one of Arkansas' 29 listed species (72%) have approved recovery plans, much higher than the national 54%.

During the listing process, areas that are vital to the species' survival and recovery can be designated as Critical Habitat. Recent lawsuits have required designation of Critical Habitat in many cases where it was not originally designated. Only three Arkansas listed species have had habitat designated, and in only one case do any of those habitats exist in Arkansas.

In this issue of Life in the Rocks we will highlight some of Arkansas' listed species.

Group	Endangered	Threatened	Total Species with Recovery Plans	Total Species with Critical Habitat
Mammals	3	0	3	1
Birds	2	1	3	0
Reptiles	0	1	0	0
Amphibians	0	0	0	0
Fishes	1	3	3	2
Clams	7	1	7	0
Snails	0	1	1	0
Insects	1	0	1	0
Arachnids	0	0	0	0
Crustaceans	2	0	2	0
Animal SubTotal	16	7	17	3
Plant SubTotal	4	2	4	0
Grand Total	20	9	21	3

Articles in this issue are excerpted from the report referenced earlier in this article. Brian, Bill, and Kelly authored these articles, as well as nongame wildlife biologists Karen Rowe, Blake Sasse, and Laurel Moore.

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## Crayfish

There are over 300 species of crayfish in North America, most of which are found in the southeast. Only four of these species are listed under the Endangered Species Act. In a 1996 review, a panel of experts considered 162 crayfish species as in need of conservation, 40.5 times as many as are currently listed. Thus crayfish are one of the most poorly known and poorly protected imperiled fauna groups.

Arkansas has the most diverse crayfish fauna of any state west of the Mississippi, yet only 2 of the state's more than 50 species are listed. Arkansas is home to several endemic crayfish which little is known about. AGFC funded a status survey of one species, *Fallicambarus harpi*, which had previously only been documented from one location. The survey greatly expanded the species' range and allowed us to determine that it was a rare species of concern, but did not warrant any action under the Endangered Species Act. We hope to fund a study next year for another rare crayfish, *Fallicambarus gilpini*. We also plan development of an Arkansas crayfish GIS database. This database will greatly expedite our understanding of the status of the state's crayfish species, improve our identification of future research needs, allow us to respond to future listing requests, and provide the starting point for a possible book on Arkansas crayfish.

Both of our currently listed crayfish species inhabit cave streams in the Ozarks. Groundwater depletion and contamination threaten these crayfish (and the Ozark cavefish). The same groundwater that these animals live in provides the drinking water for many Arkansans – indeed they have been likened to the “canary in a coal mine” for indicating the quality of groundwater in the areas where they are found.



*A blind, albino crayfish from a northwest Arkansas cave.*



A pouch snail (*Physella* sp.)

## Snails

Snails are the most diverse taxonomic group within the Phylum Mollusca. Of the 516 taxa in the United States, 31 are listed as endangered or threatened. Most of these are found in the southeastern United States.

Arkansas harbors 144 species of terrestrial snails and approximately 50 aquatic snail species. Twenty-six of the terrestrial snails are endemic to Arkansas. One of these, the Magazine Mountain Shagreen, is listed as Threatened under the Endangered Species Act.

These animals are poorly understood and only recently have many new species been recognized in the Southeast. This is due to increased sampling in specific habitats and improved genetic analysis techniques. A few researchers have conducted studies in Arkansas, but only on a limited basis. One of these studies led to an excellent accounting of the number of terrestrial snails in Arkansas. Bill has been collecting aquatic snails while conducting mussel surveys – these snails have been sent to Ohio State University, where they are being studied by a leading authority.

Bill will be assisting the U.S. Forest Service in their triennial survey for the Magazine Mountain shagreen in May 2001. This cooperative, interagency survey will provide an opportunity for him to obtain first-hand knowledge of this species. The Conway Field Office of the USFWS is taking the lead for this species' management and they hope it will soon be removed from the list of endangered and threatened species.



**Scaleshell (*Leptodea leptodon*)**

## Mussels

Freshwater mussels (also called naiads, unionids, clams and bivalves) are found worldwide in temperate and tropical climates. However, they reach their greatest diversity in the United States with 297 currently recognized taxa. Mussels spend most of their existence either partially or completely buried in the substrate. Of the 297 taxa, 21 are listed as endangered but possibly extinct, 77 as endangered but still present and 43 as threatened. Populations of 70 taxa are currently considered stable. Arkansas has a greater diversity of mussels than other states west of the Mississippi River. Of the 74 species of native mussels, seven are listed as endangered (Turgid Blossom Shell, Curtis Pearlymussel, Ouachita Rock Pocketbook, Winged Mapleleaf, Speckled Pocketbook, Pink Mucket, and Fat Pocketbook), one is listed as threatened (Arkansas Fatmucket), one is proposed as endangered (Scaleshell) and one is a candidate for listing (Neosho Mucket).

All native mussels in Arkansas have an unusual life history trait – they are all obligate parasites on fish as part of their development from embryo to juvenile. Many species of mussel will only parasitize one species of fish. It will be important to keep in mind the need of the host fish species (many of which have not been identified) when efforts are undertaken to protect mussel species.

There is much locality data for mussels mainly due to extensive surveys funded by AGFC. These and other data from smaller surveys are currently being centralized into a spatial database through a contract funded with Section 6 and AGFC funds. The results of this data layer will be utilized in a GIS format to generate occurrence models to determine locations for future surveys.

## Fishes

There are over 493 species of fish in the Southeastern United States. Nationwide, 108 fishes are listed under the Endangered Species Act. In a 1989 review, a panel of experts considered 364 fish species to be in need of conservation, 3.4 times as many as are currently listed. Thus, fish are one of the most highly imperiled faunal groups and many remain under-protected. The focal point of fish diversity is in the Southeast, leading to the formation of such professional groups as the Southeastern Fishes Council and the Southern Division – American Fisheries Society's Nongame Aquatics Committee. Recent efforts are underway to develop a Southeastern Imperiled Fishes Workgroup patterned after the successful *Partners in Flight* and *Partners for Amphibian and Reptile Conservation*, and AGFC has been active in the planning and organization of this group.

Arkansas has a highly diverse fish fauna, with over 215 species, yet only four of these species are protected under the Endangered Species Act as endangered (Pallid Sturgeon) or threatened (Ozark Cavefish, Leopard Darter, Arkansas River Shiner), and four are candidates for listing (Sturgeon Chub, Sicklefin Chub, Arkansas Darter, Alabama Shad). Our imperiled fishes can be divided into three groups: (1) localized endemic species (species restricted to a small geographic area), (2) inhabitants of specialized limited habitats, and (3) wide-ranging species that have experienced declines throughout their range.

The distribution of fishes is limited by the connectivity of stream networks, currently as well as historically (streams not connected now were sometimes connected during the Ice Age), resulting in different levels of isolation between river basins. Arkansas has species endemic to the White, Little Red, Little, and Strawberry Rivers, as well as other river basins.

Caves and springs provide unique habitats that some species have become specially adapted to, and several such species occur in Arkansas. Caves and springs are characteristic of limestone karst habitats, making the Ozarks (and particularly Northwest Arkansas) of particular concern for conservation of these species.

Large, free-flowing rivers are a habitat that is becoming increasingly altered in the southeast. These rivers are used for such things as navigation, recreation, and water supply, causing a great deal of habitat alteration. This alteration has taken its toll on several fish species adapted to the seasonal variation and unobstructed flow of these rivers.



**Yellowcheek Darter is proposed to become Arkansas' 5<sup>th</sup> candidate fish species.**

## Amphibians and Reptiles

There are 245 species of amphibians and 300 species of reptiles in North America, north of Mexico. In the conterminous United States, 15 amphibians and 24 non-marine reptiles are currently listed under the Endangered Species Act. Of Arkansas' 120 amphibians and reptiles, only one is currently listed under the Endangered Species Act and two are currently in candidate review status. The American alligator is listed only due to its similarity of appearance to a threatened taxon. This species rebounded in population numbers after 20 years of federal protection and was delisted in 1987. The proposed candidate species include the Ozark hellbender and the Illinois chorus frog, both of which have experienced habitat loss or disturbance.

Administration and regulation of the American alligator has been relegated to the state level. The AGFC is preparing to assess the current distribution and population status of the American alligator in Arkansas through the combined efforts of agency personnel and a contracted researcher. A survey to better determine the distribution and status of the Ozark hellbender in Arkansas is being funded through a USGS Biological Resources Division grant awarded to AGFC. In addition, AGFC is funding a proposal to investigate methods for captive propagation of the Ozark hellbender. We also hope to sponsor a survey on the status and distribution of the Illinois chorus frog.



Ozark Hellbender



## Pebbles...

- ? Kelly instructed a class of wildlife officer cadets on "Identification of Venomous Snakes" and "Regulated Amphibians and Reptiles"
- ? Brian attended the Arkansas Academy of Science meeting and helped chair a session on aquatic ecology.
- ? In March Kelly spent several days in the field with visiting graduate students and professionals. Many amphibians were observed and several important distribution records were made.
- ? Brian has been designated as the Benton office representative for implementation of the upcoming Arkansas Administrative Statewide Information System, resulting in required attendance at several training sessions.
- ? Kelly assisted members of the Law Enforcement Division in the identification of amphibians and reptiles in a case of illegal sale of wildlife.
- ? Brian attended a meeting of the Karst Resources Support Team, an AR-MO-OK cave conservation group, and gave a brief presentation on Project Underground.
- ? Kelly participated in a workshop sponsored by Partners in Amphibian and Reptile Conservation held in Chicago, Illinois. The purpose of the workshop was to develop management guidelines for land managers and owners in the conservation of amphibians and reptiles.
- ? Brian participated in inventories of caves in Carroll and Madison counties.
- ? At the request of U.S. Fish and Wildlife Service, St. Vincent National Wildlife Refuge Kelly acted as an oversight consultant on initiation of an Eastern Indigo Snake survey. This was accomplished in the spirit of interagency cooperation and as a professional courtesy. Kelly has been working with the refuge staff on assessing the amphibian and reptile diversity since 1998.
- ? Brian made brief fish collections and photographed fish and crayfish from 5 streams in Saline and Madison counties.
- ? Kelly met with U.S. Fish and Wildlife Service biologist, Susan Rogers, and Professor Stan Trauth and Ph.D. candidate Ben Wheeler of Arkansas State University to discuss plans for the upcoming distribution survey of the Ozark Hellbender this spring and summer.
- ? The remainder of the month of April was spent collaborating in the preparation of a special report for Director Durham on Threatened and Endangered species in Arkansas.

## ***Terrestrial Endangered Species***

### **Insect**

While there are 46 listed insect species, only one occurs in Arkansas. The American burying beetle is presently found only in AR, OK, NE and RI. The historic range included 35 states in the eastern and central United States, as well as southern Ontario, Quebec and Nova Scotia. East of the Appalachian Mountains, the beetle declined in a generally north to south direction and the decline may have been complete by 1923. In the Midwest, the decline appears to have proceeded generally from the center of the range outward, with all collections since 1960 occurring at the peripheries of the range. There are fewer than 1000 individuals in the only remaining population east of the Mississippi River and the Arkansas/Oklahoma populations are of uncertain size but are currently being inventoried.



### **Birds**

Arkansas provides important nesting habitat for three species of federally listed threatened and endangered birds: bald eagle, least tern and red-cockaded woodpecker. Despite the fact that these three species are all federally protected, their conservation problems and future population outlooks are quite different.

The bald eagle is an endangered species success story and is currently undergoing the administrative process of being delisted as a “recovered species”. As our national symbol its widespread public appeal focused attention on its plight and support for its conservation. The banning of DDT and the implementation of recovery plan conservation and education measures have brought bald eagle populations back to sustainable levels. Arkansas’ current breeding population of bald eagles is already three times greater than the established recovery goal.

The least tern (interior population) depends on open sandbar nesting sites, formerly found in abundance when the Arkansas River was free-flowing. With the advent of water control measures, for flood prevention, navigation, and recreation, the least tern has lost much of its former sandbar nesting habitat. The least tern could benefit from more public exposure of its plight and conservation needs. Fortunately, conservation measures from the Corps of Engineers coupled with the species’ adaptability to using man-made nest sites have allowed the interior breeding populations to increase at a slow rate.

The red-cockaded woodpecker (RCW) is an endangered species with very specific habitat requirements and a unique cooperative breeding behavior. Their nesting habits require old growth pine, the commercial value of which has contributed to the species endangerment. While the species is holding its own on public lands, which are specifically managed for the woodpecker, RCW’s have faced and will continue to face greater challenges on private lands. Efforts to maintain current population levels will depend on the cooperative efforts of timber companies and state and federal agencies.

### **Mammals**

Arkansas is home to 48 species of nongame mammals, comprised of shrews, moles, bats, armadillos, chipmunks, pocket gophers, rats, mice, and flying squirrels. Arkansas’ three endangered nongame mammals, the Indiana bat, Ozark big-eared bat, and the gray bat were all listed relatively early in the history of the Endangered Species Act. Some of the earliest endangered species work funded through our Section 6 agreement with the U.S. Fish and Wildlife Service included surveys to determine the status of bats and Florida panthers in the state. Recovery efforts have focused on protecting bats from disturbance during critical periods, such as winter and nursery roosting periods, through the construction of “bat gates” or fences and educational projects publishing booklets on the “Bats of the Eastern United States” and “Bats of the United States.”

## A Note Regarding T&E Plants

The Arkansas Natural Heritage Commission has responsibility for conservation of federally listed plants in Arkansas under Section 6 of the Endangered Species Act. There is only one known occurrence for a federally listed plant on a Wildlife Management Area. The plant is Pondberry and AGFC has a conservation agreement in place with ANHC for this location. AGFC will continue to work with ANHC staff to identify and manage for sustained protection any federally listed plants occurring on areas that AGFC manages.

The following listed plants are known to occur in Arkansas:

- Geocarpon minimum* (no common name)
- Lesquerella filiformis* (Missouri bladderpod)
- Lindera melissifolia* (pondberry)
- Platanthera leucophaea* (eastern prairie fringed orchid)
- Ptilimnium nodosum* (harperella)
- Trifolium stoloniferum* (running buffalo clover)



**Pondberry**



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