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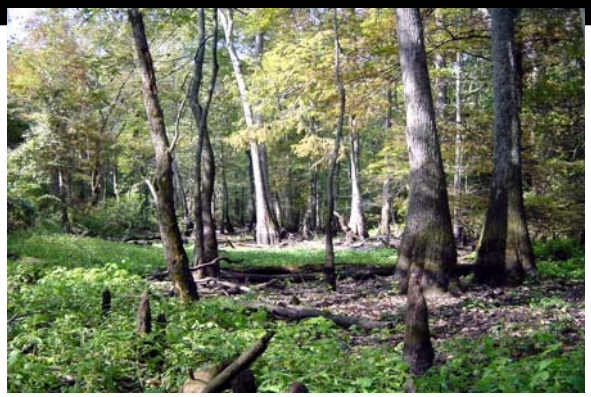
Life in the Rocks

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



The Giant Swamp Dwelling Salamanders of Arkansas

By Kelly Irwin

Arkansas is home to two species of salamanders that most people have probably never heard of, let alone seen. These fully aquatic salamanders inhabit a variety of aquatic habitats; swamps, marshes, oxbow lakes, ponds, roadside ditches, sloughs, and floodplain borrow pits throughout the Coastal Plain and Mississippi Delta regions in Arkansas. They also ascend the bottomlands and floodplains of the Arkansas River Valley, Ouachita Mountains, and Ozark Plateau. Their colloquial names, such as "lamper eel," "conger or congo eel," "ditch eel," and "blue eel" are often applied to either species. However, the standard common names for these salamanders are the Three-toed Amphiuma (*Amphiuma tridactylum*) and Lesser Siren (*Siren intermedia*). Both of these large aquatic salamanders have dark colored, eel-like body forms, hence their colloquial names, but if you look a little closer you can see they are quite different from one another. Lets take a look.

The Three-toed Amphiuma is the longest amphibian in Arkansas, with adults averaging from 18 – 30 inches in length, and a maximum known length of almost 42 inches for the species. The cylindrically shaped body can be dark brown or black, and the belly is gray or light brown in color. The head is shaped somewhat like a pointed spade, and the small eyes are gray. Amphiumas have four very small legs, with three toes each, hence the common name. They have lungs and must come to the surface to breathe.

During the day, Amphiumas remain hidden in burrows, under submerged roots, logs or other debris, or in dense aquatic vegetation. They venture forth at night to forage for food. They feed on small fish, crayfish, earthworms, aquatic insects and their larvae, tadpoles, snails, and even baby turtles! A unique aspect of Amphiuma behavior is their occasional habit of moving overland during heavy rains on warm nights, much to the delight of road cruising herpetologists.

After breeding, female Amphiumas will lay up to 200 eggs under a log or other debris near the waters edge in early autumn. The female remains coiled about the eggs until autumnal rains inundate the eggs whereupon they complete development and hatch. Once they are free-swimming larvae the gills are resorbed within three weeks and the young begin breathing air with their lungs. A few years ago, my wife and I found 17 recently transformed Amphiumas in a spongy, rotten log along the edge of a Phillips County cypress-tupelo slough in late January. However, we were uncertain as to the ecological significance of this observation, as the

herpetological literature makes no mention of such aggregations.

Though similar in appearance, the Lesser Siren differs from the Three-toed Amphiuma in several aspects. Sirens have two small front legs, with four toes each, and no hind legs; they also have three pairs of bushy external gills on either side of the back of the head. The color can be black, dark gray, grayish blue, olive green, or brown with a lighter colored belly. Black or yellowish spots are apparent in light colored individuals. A light colored stripe along the upper jaw may also be present in some specimens. The maximum known length for Lesser Sirens is about 20 inches, but adults usually range from 8 – 16 inches in length.

Sirens obtain oxygen from their aquatic environment via their external gills. Should their wetland habitat dry up due to a drought they will burrow down into the mud or muck bottom or expand crayfish burrows, then secrete a mucous layer over their entire body that hardens into a parchment like cocoon. This cocoon prevents the animal from drying out and the siren can survive for several months until rains refill the wetland. As a direct air breather the Three-toed Amphiuma does not secrete a mucous cocoon to avoid desiccation, but simply burrows deep into the substrate and waits for the waters return. I have received calls from the public on several occasions wanting to know what kind of critter they had just dug up during the excavation of a dried ditch or pond. In all cases it was either a Lesser Siren or Three-toed Amphiuma. In one particular instance a very large number (100+) of sirens were unearthed when a dried farm pond was dredged in Hempstead County.

Lesser Sirens are active at night, when they prowl for food, such as earthworms, crayfish, aquatic insects and their larvae, snails, or other aquatic invertebrates. During the day, they remain hidden in burrows, dense aquatic vegetation, or under submerged logs or debris. Female Lesser Sirens lay from 200 – 700 single eggs in masses or layers, in a depression or under plant debris on the wetland bottom.

Based on laboratory observations, Lesser Sirens can emit a series of clicking sounds, particularly when other sirens are present. This acoustic behavior was often associated with head-jerking movements, indicating that this may be part of a territorial display. They can also emit a yelping sound of distress when attacked by a predator or when bitten or butted by other sirens. Both the Three-toed Amphiuma and Lesser Siren are preyed upon by a variety of larger vertebrates: water snakes, alligators, fishes, and wading birds. However, their most proficient predator is the strikingly colored, yet completely innocuous (they never open their mouth or attempt to bite), Mud Snake (*Farancia abacura*). This semi-aquatic snake is noted for its ability to locate and consume these eel-like salamanders with alacrity. It has been suggested that the pointed terminal scale on the tail tip is used to manipulate this slippery prey into position for easier swallowing, hence the colloquial name, “stinging snake.” But that’s another story.

Three-toed Amphiuma (top) and Lesser Siren
Photos courtesy of Dr. Stan Trauth, Arkansas State University

Paddlefish harvested from Arkansas River.

CITES and the Arkansas Game and Fish Commission

By Bill Posey

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international treaty established in 1975 to ensure that the trade of plants and animals does not result in the extinction of a species. This is accomplished by regulation and monitoring of the commercial trade among participating countries.

This treaty has been ratified by 169 countries (referred to as "Parties"), making it the largest conservation agreement in the world. Adherence to the treaty is strictly voluntary, and the treaty is legally binding to participating Parties. The treaty does not usurp national laws but provides a framework to be followed by each Party. This is to ensure that CITES is implemented at the national level, usually through legislation.

Regulated species are classified in one of three categories (listed as appendices in the treaty), determined by the degree of their threatened status. Appendix-I species are in imminent threat of extinction and trade in these species is permitted only in exceptional cases. An example would be to permit the import or export of a species for scientific research. Such instances are generally permitted for the study of the species in question in attempts to reverse the possibility of extinction.

Appendix-II species are not faced with imminent extinction, but their trade must be closely monitored to ensure that over utilization does not decrease their chances of survival. In the United States the Paddlefish and several species of sturgeon are listed in Appendix II. These fish are commercially harvested here in Arkansas and are regulated due to the international demand for their eggs, which are consumed as caviar. Appendix-II also lists the American Alligator. Even though its wild populations are no longer threatened, the alligator is commercially harvested and farmed for its meat and hide products. Due to the international demand for crocodilian hides and meat products, it is closely regulated because of its similarity in appearance to Appendix-I crocodilian species.

Appendix-III species are those that are regulated in one country, but need the cooperation of other parties to prevent the unsustainable use of, or illegal trade in the species. The alligator snapping turtle and map turtles (members of the genus Graptemys), were recently added to Appendix-III. In Arkansas these species are either commercially harvested (map turtles) or produced in captivity (alligator snapping turtle) for international pet trade markets.

In the United States, the U.S. Fish and Wildlife Service (FWS) is in charge of monitoring these natural resources and administering export and import permits. Close cooperation with state fish and wildlife agencies, such as the Arkansas Game and Fish Commission (AGFC) is critical. The AGFC provides harvest and regulatory information to the FWS and reviews export and import applications relevant to the state.

For example, the permitting process for the export of Paddlefish and sturgeon products from Arkansas involves the cooperation of the Division of Management Authority and the Division of Scientific Authority, within the FWS and the AGFC commercial fisheries biologist. The Division of Management Authority is responsible for assessing the legal take of the wildlife resource; and in this case needs to know if: (1) the fish were legally taken from a water body open to commercial harvest of that species and (2) were the fishermen properly licensed. The Division of Scientific Authority is responsible for determining if the harvest is detrimental to the population. Harvest data and expert scientific opinions regarding the current conservation status of the species are used in arriving at a determination of either detrimental or non-detrimental take. The AGFC commercial fisheries biologist reviews applications and provides comments to the FWS regarding aspects of legal take and findings of non-detriment.

Since 2002, over 30 applications have been submitted for CITES permits to export paddlefish and sturgeon caviar or meat from Arkansas. In 2006, 14 applications for export were reviewed and of those, six were approved and the remaining are pending until additional information is submitted. The caviar and/or meat products were bound for Belgium, Germany, Japan, or cruise ships.

Alligator snapping turtle.

Pebbles...

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

- Bill collected endangered winged mapleleaf mussels for Missouri State University to conduct host fish experiments.
- Kelly gave a presentation to the Little Rock Chapter of the Audubon Society on the AGFC Herpetological Program on October 12.
- Brian and Mark conducted crayfish sampling in the Strawberry River basin with the help of fisheries biologists Sam Barkley and Sam Henry.
- Bill conducted an endangered species survey in the Caddo River for a boat ramp construction.
- We attended and hosted a Programs Section Staff Meeting and a Fisheries Budget Unit Managers Meeting at our office in Benton. Thanks go to Mark for all that sweeping and mopping!
- Bill conducted surveys for the Arkansas fatmucket mussel in the Saline River.
- Kelly conducted 9 days of fieldwork in the Ouachita and Caddo Mountains to collect more specimens of endemic montane woodland salamanders, as part of the ongoing State Wildlife Grant research project to determine species boundaries in the *Plethodon ouachitae* species complex.
- Brian and Mark conducted crayfish sampling in the middle White River basin with the help of fisheries biologist Stan Todd.

- Bill, with the assistance of other fisheries biologists, conducted a five day Special Harvest Season on Ozark Pool.
- Brian attended an endangered cave aquatics monitoring team meeting at the USFWS office in Conway.
- Bill attended a two-day Southeast Aquatic Habitat Plan meeting in Huntsville, Alabama.
- Office work and vacation occupied much of the months of November and December.
- Brian, Mark, and Stream Team Coordinator Dave Evans met with a NW Arkansas landowner and surveyed possible layout for reconstruction of a stream channel for Arkansas darters.
- Bill assisted the Education Division and Enforcement Division with interviews.

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Logperch – *Percina caprodes.* One of the first dater species I caught growing up in Kansas. I went to graduate school in Virginia, and there was my old friend, the logperch. I came to Arkansas – logperch everywhere! But now it has changed!

Based on recent taxonomic changes, Arkansas now has not one, not two, but THREE logperch species! In addition to my old friend, *Percina caprodes*, we also have *Percina fulvitaenia*, the Ozark logperch, and *Percina macrolepida*, the bigscale logperch.

According to Dr. Tom Buchanan, University of Arkansas – Fort Smith, there are even a few places in Arkansas where you can encounter 2 logperch species in the same place. So, I have some new fish to learn, and the mug shot on the left may not be who I think it is!

-Brian Wagner

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