

by Jill Utrup and Kim Mitchell

The Ozark Hellbender: Out from Under a Rock

What lurks below the clear waters of Ozark streams? Well, it's not pretty, but it is pretty cool. The Ozark hellbender (*Cryptobranchus alleganiensis bishopi*), which can reach a length of about 2 feet (0.6 meters), is one of the largest salamanders in the world.

These strictly aquatic salamanders are found only in Ozark streams of southern Missouri and northern Arkansas. Most of their life is spent beneath rocks in fast-

flowing streams. They come out from under their rocks at night to eat crayfish and in the fall to mate. It takes them 5 to 8 years to reach sexual maturity, and they live 25 to 30 years in the wild (55 years in captivity). Males and females may prey upon their own and others' eggs.

With numerous threats to these amphibians and their habitat, Ozark hellbenders are declining in numbers throughout their range. Because of the

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hellbender's long lifespan, it took some time before researchers recognized the rapidity of the decline. Even in areas that until recently were thought to have healthy, stable populations, numbers have plummeted. Particularly disconcerting is the fact that most populations have only older individuals. The lack of juveniles indicates that there has been little to no reproduction for several years.

What happened? The Ozark area is famous for its beauty and fast, clear rivers, which are fun to canoe, kayak, and fish. But that clear water and pretty scenery can be deceiving. The story of the Ozark hellbender's decline is an all too familiar one – increased siltation, water quality degradation, and increased impoundments.

To add insult to injury, the highly infectious chytrid fungus is proving fatal to an ever-increasing number of amphibians throughout the world. Over 75 percent of hellbender deaths that occurred in the St. Louis Zoo's captive population from March 2006 through April 2007 were due to this disease. This prompted the testing of Missouri's wild Ozark hellbenders.

The results showed that the chytrid fungus was present in all remaining populations of the Ozark hellbender in Missouri. Testing continued in Missouri during the 2007 field season and began in Arkansas. Researchers view chytrid as one of the most, if not the most, challenging threat to the survival of this subspecies, whose population size is estimated at no more than 590 individuals.

Additionally, abnormalities in Ozark hellbenders are becoming increasingly more severe. Although these abnormalities have not been linked conclusively with the presence of chytrid, considering that the types of abnormalities documented (e.g., lesions, digit and appendage loss, epidermal sloughing) are similar to the symptoms of the chytrid fungus, it is possible that there is a connection.

In 2001, the Ozark hellbender was designated a candidate for Endangered Species Act protection. Even though this subspecies is on a path to extinction, with the current budget situation and listing backlog, it is not likely to be considered for listing under the Act within the next few years.

There is hope for the Ozark hellbender, however, because conservation efforts have already begun. A group of dedicated professionals formed the Ozark Hellbender Working Group shortly after the species became a listing candidate. Original members were researchers and agency personnel with common interests in hellbender conservation. Staff from hatcheries, zoos, and other interested parties later joined. The group has collaborated on field work and initiated research projects, including studies to determine the primary threats. It is also developing a comprehensive conservation strategy that will include a captive propagation protocol, an outreach strategy, and a watershed protection plan.

Growing interest in the species' status has spurred the establishment of biennial Hellbender Conservation Symposiums. Three have been held so far, with the first in 2003 and the latest in 2007. They provide opportunities for conservationists to share information and discuss topics such as status and distribution reports, current research, captive breeding programs, survey and monitoring protocols and techniques,



and other efforts. Focused research and collaboration between researchers and natural resource managers are necessary to reverse the decline of hellbender populations, and the symposiums are a perfect venue for kick-starting that collaboration.

Several ongoing research projects are directed at learning how best to decrease threats and increase hellbender survival in the wild and in captivity. Researchers at the University of Missouri-Rolla are evaluating overall health conditions, reproductive hormones, and contaminants present in adult and juvenile hellbenders through hematology and serum chemistry work. Survival and movements of resident adult and released captive-reared hellbenders are being studied by researchers from the University of Missouri (Columbia) and Missouri Department of Conservation. The Missouri Department of Conservation

and the St. Louis Zoo have been collaborating in developing a propagation protocol for the Ozark subspecies (see the preceding article).

Missouri protects hellbenders by requiring a permit for their collection, and in 2003 the state listed the hellbender as endangered. As part of the public outreach program, there are now signs throughout the range of the hellbender alerting recreationists that hellbenders are harmless and should be left alone or released unharmed if caught by anglers.

The recovery of aquatic species is particularly challenging because the threats are usually difficult to identify and address. The Ozark hellbender's situation is also a sign of the times in endangered species conservation, as global threats such as climate change add to local environmental problems. Conservationists are rising to these

challenges by looking beyond agency and geographical boundaries to collaborate and share resources, make the most of limited dollars, and persevere.

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