

Research on hellbenders documents the habitat and health of waterways

July 24, 2011 12:00 am

By John Hayes / Pittsburgh Post-Gazette



Thomas Hayes, an aquarist at the Pittsburgh Zoo and PPG Aquarium, displays the head of the aquarium's hellbender and also the slime coating its body after it was removed from a display tank.

With the mercury cracking the "dangerous heat index," Eric Chapman worked up a sweat Thursday, up to his knees in an Indiana County stream lifting rocks. Big rocks -- car hood-size boulders that can take as many as five people to tip.

Underneath: the Allegheny alligator. Neither crocodilian nor limited to the Allegheny River watershed, the pug-nosed freshwater amphibian goes by many names -- devil dog, mud devil, snot otter and leverian water newt, to name a few. But to Chapman, aquatics director at the Western Pennsylvania Conservancy, it's *Cryptobranchus alleganiensis*, the Eastern hellbender.

Harmless to humans but the toothy nemesis of crayfish, the hellbender can stretch to more than 2 feet in length. It's considered a valuable indicator species whose sensitivity to changes in habitat and water conditions can give wildlife researchers a glimpse of what may come for game species and other animals.

"[The hellbender] was probably under-researched in the past, and there were certainly some serious misconceptions about it," Chapman said. "But we're realizing now how important it is to the health of waterways."

With a newfound amphibian disease seriously threatening its smaller Southern cousin, the Ozark hellbender, and evidence of the contagion in Pennsylvania waters, the Conservancy and Pittsburgh Zoo and PPG Aquarium are among several partners in grant-funded research to document and track hellbenders in southwest and southcentral Pennsylvania. Results of their work, which began in 2007, will be submitted for peer review this fall, used to monitor regional water quality and hellbender populations, and track the spread of the amphibian disease.

Not to be confused with the smaller and gilled mudpuppy or waterdog, the hellbender dates to prehistoric times. Living only in the Appalachian Mountain region, it's the largest American salamander and third largest aquatic salamander in the world. It spends its life mostly hidden underwater, breathing through fleshy lateral folds on each side of its body. Hellbenders reach sexual maturity in five years and spawn in the fall -- territorial males guard dens under nest rocks, protecting the eggs and young. They are known to live 30 years in captivity.

"Some people think they eat trout and other game species, but that's untrue," Chapman said. "They feed almost entirely on crayfish. In fact, stocked trout are one of the biggest predators of juvenile hellbenders."

Curiously, native trout have a harder time catching them.

"In Pennsylvania, brown and rainbow trout are not native, and the hellbender, which has been around since the dinosaur ages, is hard-wired to smell and recognize a native animal," said Tom Hayes, of the Pittsburgh Zoo and PPG Aquarium (no relation to the writer of this story). "In studies, a juvenile hellbender was shown coming out from under a rock and a non-native trout was waiting for it. It didn't sense the fish [and was eaten]. Then they put in a native trout, and when a hellbender poked its head out, it just shot back in and didn't come back out again because it recognized [the native trout] as an enemy."

In a paper prepared for the zoo, Hayes reports that in the 1930s Pennsylvania aquatic wildlife authorities organized hellbender hunts, wrongly believing the animal was eating stocked trout. More recently, in 2007, the state Fish and Boat Commission strengthened protection of hellbenders by requiring a collector permit for capture and possession.

Local populations of mature hellbenders are generally healthy, said Hayes, although the ongoing Pittsburgh Zoo-Conservancy research shows a declining population of juveniles in some areas.

Three things threaten hellbenders today:

Black-market poachers can get as much as \$2,000 per hellbender, and illegal collection and sale is a problem. Hayes said pet shops in Ohio are frequent offenders.

In the Laurel Mountains, some 200 years of deforestation and agricultural runoff have changed the nature of streams -- strip mining and poorly constructed industrial dirt roads result in the siltation of streams, burying hellbender nesting sites.

Compounding those stresses is the spread of Chytridomycosis, a fungus that is not harmful to humans or drinking water but is known to kill frogs and salamanders, including hellbenders.

"The Chytrid disease is having a huge impact on hellbenders in the South," said Hayes. "It's in all the streams we test and on the animals here, but it doesn't seem to bother them, and we're not sure why."

A female hellbender at PPG Aquarium, captured in 2007 from an Indiana County stream, tested positive for Chytrid on arrival despite showing no signs of distress. It was treated before being put on exhibit.

"I can't account for why they're succumbing to the disease in other parts of the United States, but not here," Hayes said. "There's a lot of unknown natural history with this animal. We're just beginning to understand it, particularly in deeper water where it's hard to survey."

Thursday's Conservancy research marked the fifth visit to a specific test site in July during consecutive years, adding to one of the most thorough hellbender data bases. Chapman and about a dozen assistants, including people from Clarion and Purdue universities, found and processed seven hellbenders -- the same number as in 2010. Two had been previously documented.

The animals were measured and weighed. GPS coordinates, water chemistry and habitat conditions were logged. DNA samples were taken from tail clippings, and the slime exuded when they're handled was collected for analysis.

Finally, a tiny microchip was inserted under each animal's thin skin.

"It's like a little hellbender Social Security number," Chapman quipped. The microchip is used to track the hellbender's growth and location if sampled multiple times.

The chips can also identify an individual hellbender, should wildlife authorities find it in a pet shop or collector's aquarium.

John Hayes: jhayes@post-gazette.com.

First Published 2012-03-15 01:36:12