



HELLBENDER ECOLOGY AND GENETICS



Eastern hellbender (photo by Zack Walker)

Current Status

Second year of four-year project

Funding Sources and/or Partners

State Wildlife Grants, Purdue University, The Nature Conservancy, DNR Nongame Fund

Project personnel

Principal investigator, Dr. Rod N. Williams
Shem D. Unger (doctoral student)
Nicholas G. Burgmeier (master's student)
Grant Connette, Cory Earle, Joe Fihe, Bart Kraus,
Cody Marks, Eric McGee, Dan Smith, Aaron
Switalski, and Lucas Woody (technicians)

Background

Hellbenders are large, fully aquatic salamanders found throughout the Midwest and Eastern states. They prefer cool, swift flowing rivers and streams with high amounts of oxygen. They require large rocks for cover and usually move around at night. During nightly movement, they feed primarily on crayfish. They breed late in the fall with the males constructing and protecting nests using a method similar to that of sunfish.

Hellbenders have been declining in population throughout their range, most likely because of habitat destruction, persecution by recreationalists, and collection for the pet trade. Hellbenders, like most amphibian species, serve as indicator species (“canaries in a coal mine”). These



Nick Burgmeier locating an Eastern hellbender using radio telemetry. Photo by Marci Skelton

declines in population could indicate a reduction in local water quality.

Objective

The purpose of this project is to use a combination of field and laboratory techniques to better understand the ecology and overall health of Eastern hellbenders in Indiana and provide valuable information for use in conservation programs. We are studying various aspects of hellbender biology, including population status, habitat use and movements, overall health, water quality, and genetic variability.

Methods

To determine the population status and overall health of hellbenders in Indiana, we surveyed 40 sites, five times each, during a two-year period. Surveying for hellbenders is physically demanding and requires long, hard days in the water, so we hired numerous technicians to help with field sampling. In total, our crew surveyed nearly 53km (33 miles) of river. We took tails snips for genetic testing; blood samples for chemistry, hormone, and parasite analysis; and body swabs for chytrid fungus analysis. Genetic testing will estimate the level of inbreeding and will provide important information for future management. Blood chemistry and parasite analysis (which are similar to veterinary examination procedures) will give us a general idea of the overall health of individual hellbenders. Hormone testing will show us whether hellbenders have been affected by certain substances that could cause males to express traits similar to those of females.

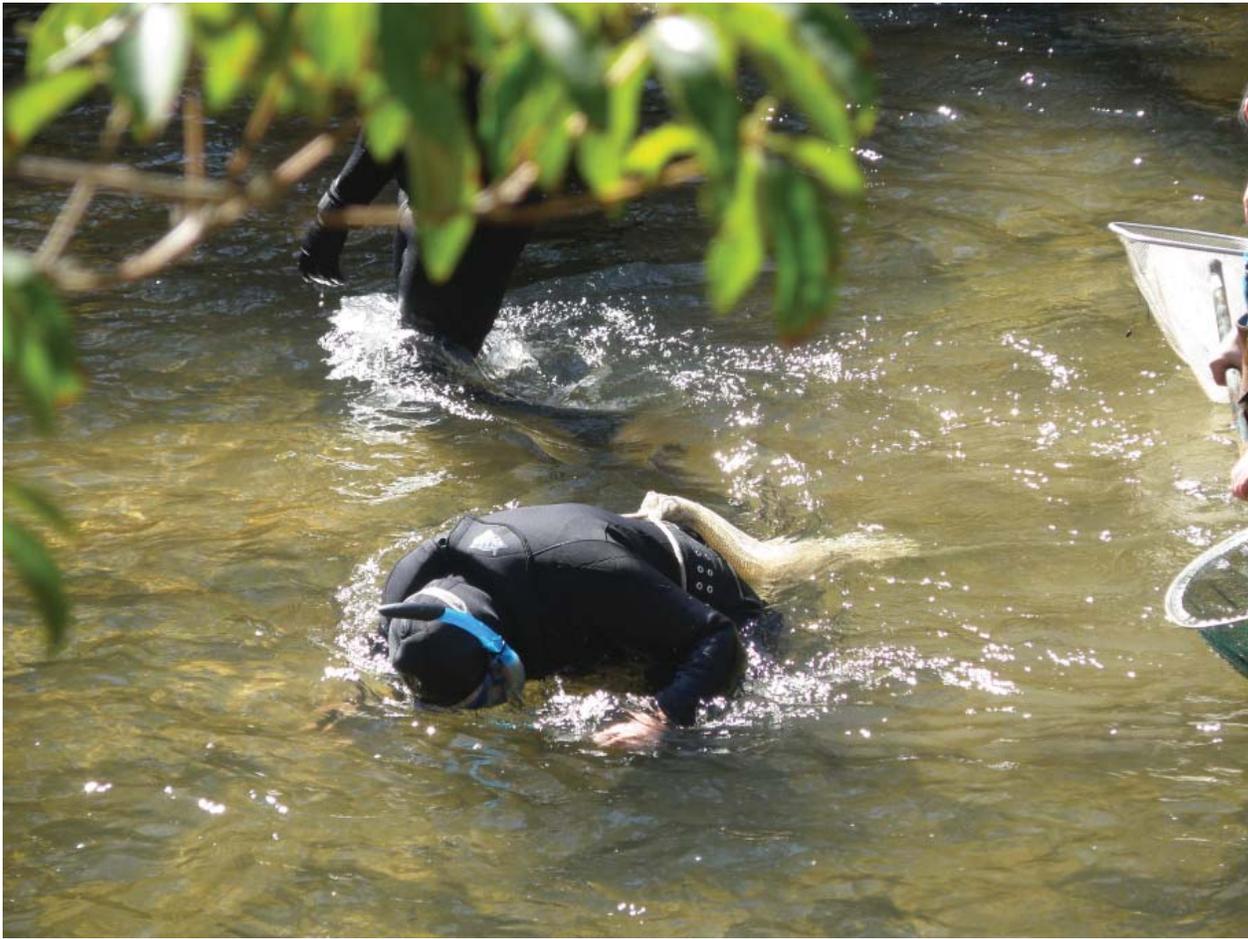
To understand how hellbenders use their habitat, we implanted 21 individuals with small radio transmitters. We tracked their movements up to three times per week for a year to see what types of habitats hellbenders use and how much space they need; and to identify important areas for breeding and overwintering. We also needed to examine both the quality and amount of existing habitat available to hellbenders. We floated a 120km stretch of the river to map the number of pools and riffles and to document the type of substrate (sand, silt, bedrock, pebbles,

etc.) found along the river bottom. Finally, water samples were taken weekly during a 10-month period to check for chemicals and nutrients that might negatively affect water quality.

Progress to date

We have successfully completed two field seasons. Despite some delays caused by extensive flooding in 2009, we have finished surveying, tracking, and testing water quality in the Blue River. Analysis of laboratory samples and field data is underway and will have results soon. This project has enabled several graduate students and numerous undergraduate technicians to learn important skills for their future careers. Data obtained from this project will be used both for graduate students to obtain their degrees from Purdue University and to provide information to help manage Eastern hellbenders in Indiana.

Cost: \$685,958 for total five-year project



Shem Unger searching underwater for Eastern hellbenders. (photo by Robert Chapman)



Sampling for hellbenders. Shown left to right (Shem Unger, Nick Burgmeier, Lucas Woody, Cody Marks and Bart Kraus). Photo by Rod Williams