



SHORT-TERM RESPONSE OF TIMBER RATTLESNAKES TO TIMBER MANAGEMENT IN INDIANA



This adult female Timber Rattlesnake patiently waits for chipmunk or other potential prey animal to scurry by along this log. Photo by Brian MacGowan

Current Status

First year of a four-year project
(Jan. 1, 2009–Dec. 31, 2012)

Funding Sources and Partners

State Wildlife Grant, Purdue University, DNR
Nongame Fund

Project Personnel

Principal Investigator, Brian MacGowan,
extension wildlife specialist
Mathew Cross, field crew chief
Jami MacNeil, field technician
Keith Norris, field technician
Lucas Woody, field technician

Background and Objectives

Timber rattlesnakes (*Crotalus horridus*) are endangered in Indiana. Their distribution is restricted to primarily large forest patches in the south-central part of the state.

Timber harvesting is a common practice on Indiana forestlands that can potentially change timber rattlesnake habitat. The type of harvesting method, the time of year it is done, its location relative to critical timber rattlesnake areas (e.g., hibernation sites) can affect the practice's level of impact to timber rattlesnakes. Learning how timber harvesting affects rattlesnake behavior and habitat use provides information necessary to minimize or avoid such impacts.

The objectives of this project are to:

1. Measure the home range, movements and habitat use of timber rattlesnakes on managed forests.
2. Assess the short-term impacts of timber harvesting on timber rattlesnakes' movement and habitat use.

Methods

The study sites are located on Morgan-Monroe and Yellowwood state forests and are part of the Hardwood Ecosystem Experiment (www.HEEForestStudy.org). We randomly assigned one of three treatment controls where



Purdue Wildlife Biologist, Brian MacGowan, transfers a timber rattlesnake from a bag to a handling tube. The tube allows researchers to safely handle rattlesnakes while collecting important biological information. Photo by Angela Garcia

(a) no timber harvesting takes place, (b) uneven-aged where some trees are harvested, and (c) even-aged where trees are harvested in 10-acre clearcuts. We studied movements and habitat use of timber rattlesnakes to assess how those may change (either positively or negatively) in areas where trees are harvested.

Timber rattlesnakes are very hard to find, even in areas where they may be relatively common. They blend extremely well with their environment and spend most of their time motionless, in thick cover. For this project, rattlesnakes were located by actively searching for them or opportunistically finding them while driving or conducting other work. Upon finding a snake, trained technicians marked the location coordinates, measured, weighed, determined the sex, and marked each snake using a PIT tag,

a device similar to what veterinarians use to mark dogs and cats.

We used radio telemetry to relocate, three times per week, 31 snakes throughout their active season (April-October). Purdue University veterinarians surgically implanted small transmitters (about the size of an AA battery) within each of these snakes. Habitat measurements for one location (and random point) per week per snake were collected during part of the summer. We organize and analyze the data while the snakes are underground during the winter.

Progress

Throughout the 2009 field season, we tracked 31 snakes (14M:17F) around five core units. These totaled over 1000 locations. In addition, we measured habitat data for at over 600 points during the summer. Multiple years of data collection will be required to account for environmental variability that occurs from year to year. However, this information will help us map the areas each snake uses during the year and assess what habitat features they use in their environment. Many snakes remained almost exclusively on core units of study. However, many snakes wandered far (1-2 km) from units which is normal behavior for large males looking for mates during mid- to late-summer.

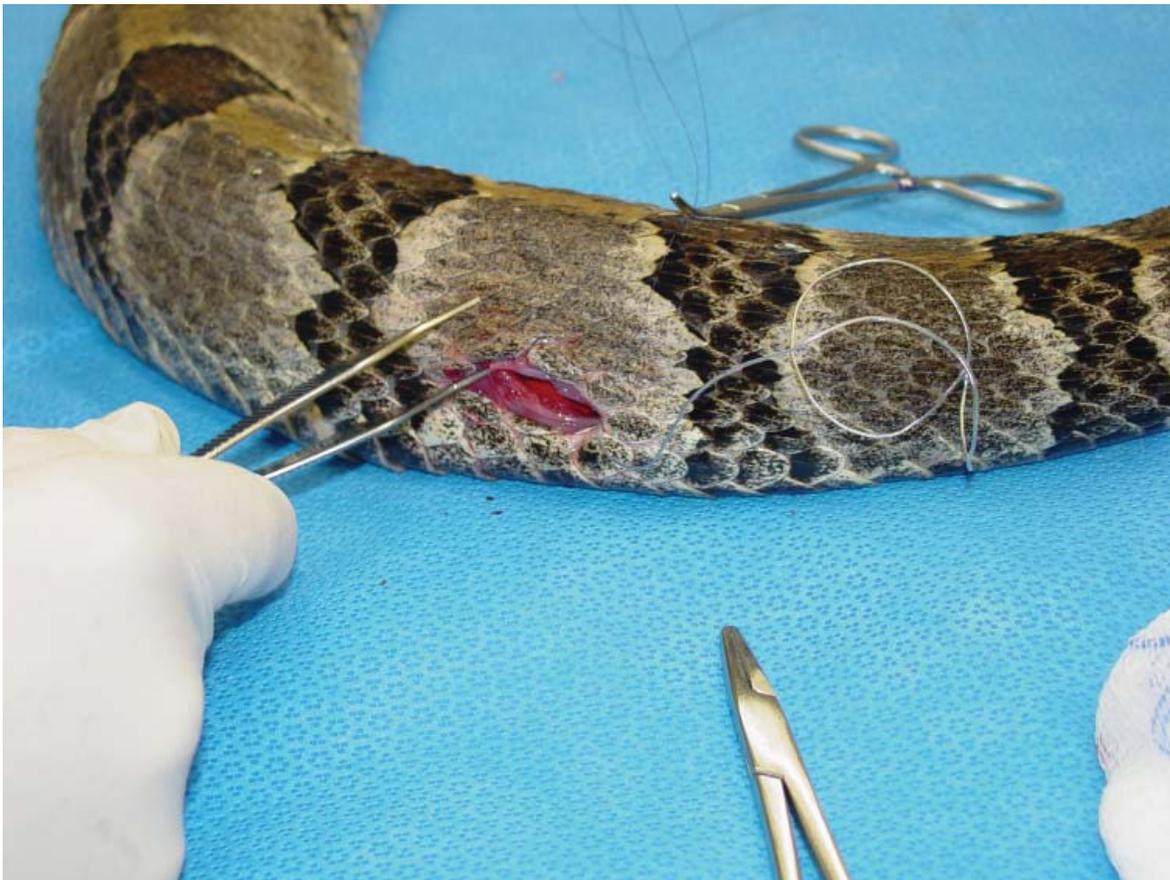
A major challenge of the project is working in a large, remote area. A major portion of our costs is associated with technician salary and their cost getting around (vehicle maintenance and gas). For example, our farthest study sites are over 17 miles away from each other as a crow flies and vehicle access on most areas is limited. Thus, there is time getting from site to site, and even more time walking around on a site.

Radio telemetry is another costly but necessary aspect to this project. Without the assistance of radio transmitters, it would be impossible to relocate snakes throughout the year. Snake must be relocated on a regular basis to assess the size of area they use, length of movements, and the type of habitat structure they use within a year or between years. Aside from the challenge of doing telemetry in hilly, rocky areas with a lot of trees – that is, it can take time – each transmitter costs about \$300 and the battery lasts 1-3 years depending on size. There are also costs for the receivers (\$900-\$2,000 each) used to track the snakes, and high sensitivity GPS units to estimate locations.

Cost: \$321,924 for total four-year project.



Timber Rattlesnake Technician, Matt Cross, is weighing a timber rattlesnake. Photo by Brian MacGowan



Dr. Steve Thompson surgically implants a radio transmitter in a timber rattlesnake. After a period of recovery, it will be released at the exact site of capture and subsequently tracked 3 days per week. Photo by Brian MacGowan