ENDANGERED SPECIES GRANT PROJECT REPORT—INDIANA
Surveys for the Eastern Massasauga in Indiana

A massasauga rests on cattails. Notice the vertical pupil, nostril and pit, which is the additional opening containing heat-sensitive tissue that allows these snakes to "see" infrared heat. (Photo by Aaron Fortin)

CURRENT STATUS

Second year of a three-year project

FUNDING SOURCES AND PARTNERS

Endangered Species Grant Program (E17R1)
Indiana University-Purdue University Fort Wayne

PROJECT PERSONNEL

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BACKGROUND AND OBJECTIVES

The Eastern massasauga (*Sistrurus catenatus*), a small rattlesnake in decline across much of its range, is listed as endangered in Indiana. It was recently listed as federally threatened by the U.S. Fish and Wildlife Service. In Indiana, massasaugas were historically distributed across much of the northern half of the state, but now are only known to be found in a limited number of locations. Declines have been largely attributed to habitat loss, intentional killing and land management for other purposes.

Surveys to assess the status of the massasauga have not been conducted in more than two decades. This void has created the need to understand where massasauga populations remain, the status of those populations, and the extent of the habitat in which those populations reside. It is also important to know where massasaugas no longer occur, either so those areas may be more aggressively managed for other needs, or if now suitable habitat, to determine whether they might be targeted as sites for population expansions or reintroductions.

Our primary objective with this project has been to

Like many snakes, massasaugas overwinter in burrows. Massasaugas are one of several snake species that spend the winter underwater, a fact that surprises many people. This massasauga is about to come out in the spring, having spent more than five months underground. (Photo by Chad Smith)

conduct baseline surveys to assess the current distribution of the massasauga in Indiana. In particular, we are interested in identifying which sites historically holding massasaugas no longer support the species. After that, we gave priority to exploring lower-quality sites where the species has not been observed for a long time. Over a two-year period, we examined 15 sites to discover if massasaugas were still present.

METHODS

The survey was designed to focus on clarifying whether massasaugas might still be present at locations where they had not recently been seen. For that reason, sites with recent, valid observations of massasaugas were given a low priority because we knew the species was likely still present. High-priority sites were those that had observations between five and 15 years ago and suitable habitat. Medium-priority sites had observations between 15 and 30 years ago and also retained suitable habitat.

To understand the extent of available habitat and discriminate between the populations within that habitat, sites potentially having massasaugas were first mapped in a geographic information system (GIS) based on population boundaries. Those boundaries were estimated based on apparently suitable habitat and barriers such as roads.

Surveys targeted the most appropriate habitat that we could gain access to in the population areas. For that reason, surveys occurred in open-canopy wetlands, identified using available aerial imagery and other data. Other habitats were surveyed less intensively, unless preferred habitat was locally uncommon. Surveys totaled up to 40 hours or more per area unless massasaugas were found sooner. During surveys, all reptile and amphibian species that were observed were recorded along with environmental conditions such as temperature and cloud cover.

PROGRESS TO DATE

Survey expectations for the project were met in this second season of surveying. Survey teams searched for massasaugas within the geographic boundaries of 15 populations scattered throughout northern Indiana. Despite the extent of these surveys, evidence of massasaugas was observed at only two locations and during the first survey season only. One specimen was found dead on a mowed trail, and another was found on private property. In addition, six specimens were found outside of survey activities and reported to the researchers. Four of these specimens were dead. Low observation rates were anticipated given the lack of recent observations, and the lower habitat quality of the high- and medium-priority sites.

Despite these results, two populations not previously known to support massasaugas had verifiable sightings. Two populations were in Steuben County, which is known to support many of Indiana's historical and current massasauga populations. One of these populations had two massasauga observations. Unfortunately, both snakes were found dead on a road. Through the acquisition of records such as these and surveys, 14 populations are considered to be currently occupied by massasauga.

We also made progress in the use of GIS to characterize habitat. Use of aerial imagery and visual data to detect suitable habitat was not as obvious for open, transitional habitats as for forested areas. Spatial data were also less reliable in determining habitat type for 2016 than in 2015. Based on our findings, we recommend that when possible, habitat be classified and assessed for suitability on site rather than remotely.

COST: $77,507 FOR THE COMPLETE THREE-YEAR PROJECT