



ENDANGERED SPECIES GRANT—INDIANA

Surveys for the Eastern Massasauga in Indiana



Massasaugas are secretive and difficult to see. The one in the center of this photo is more exposed than usual. (Photo by Jessica Hinson)

CURRENT STATUS

Third year of a three-year project

FUNDING SOURCES AND PARTNERS

Endangered Species Grant Program (E17RI)
Indiana University-Purdue University Fort Wayne

PROJECT PERSONNEL

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BACKGROUND AND OBJECTIVES

The eastern massasauga (*Sistrurus catenatus*) is a small rattlesnake in decline across much of its range. It is listed as threatened by the U.S. Fish and Wildlife Service and as endangered by Indiana DNR. In Indiana, massasaugas were historically distributed across much of the northern half of the state but now are only known from 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 Indiana 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 managed for other needs or, if now suitable habitat, to determine whether they might serve as sites for population expansions or reintroductions.

Our primary objective has been to conduct baseline surveys to assess the current distribution of the massasauga in Indiana. In particular, we are interested in identifying which sites that historically held 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.

METHODS

The survey was designed to clarify whether massasaugas might still persist at locations where they had not recently been seen. For that reason, sites

with recent, valid observations of massasaugas were a low survey 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 still contained 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 to discriminate between populations within that habitat, areas potentially having massasauga populations were first mapped in a geographic information system (GIS) based on boundaries of apparently suitable habitats and barriers, such as roads.

Surveys targeted the most appropriate and accessible habitat in the survey areas. For that reason, surveys occurred in open-canopy wetlands that were identified using available aerial imagery and other data. Other habitats were surveyed less intensively unless preferred habitat was locally uncommon. Surveys were conducted for 40 hours or more per area, unless massasaugas were found sooner. During surveys, all observed amphibians and reptiles were recorded along with environmental conditions such as temperature and cloud cover.

PROGRESS TO DATE

Survey expectations were confirmed in the second field season. Survey teams searched for massasaugas within the geographic boundaries of 15 potential populations scattered throughout northern Indiana. Despite the extent of these surveys, evidence of massasaugas was observed at only two locations and during the first field season only. Such low observation rates were anticipated given that high and medium priority sites purposefully were those areas with no recent observations and had lower habitat quality. One specimen was found dead on a mowed trail. Another was found on private property. In addition, six specimens, four of which were dead, were found outside of field surveys and had been reported to researchers.

Despite these results, two populations not previously known to support massasaugas had verifiable sightings. Two other populations remain in Steuben County, where many of Indiana's historical and current massasauga populations have been observed. One of these populations had two observations; unfortunately, both snakes were found dead on a road. Through the acquisition of records such as these and field surveys, our studies suggest that at least 14 discrete massasauga populations distributed across seven counties remain in Indiana. An additional seven counties may contain populations, but those were not verified during this survey.

Modeling of suitable habitat for the massasauga in Indiana are complete. Some challenges were identified in approach. Open, transitional habitats were not as obvious using aerial imagery and visual data as for forested areas. Spatial data were also less reliable in

determining habitat type for 2016 than in 2015. Based on those findings, we recommend that, when possible, habitat suitability be classified and assessed onsite rather than remotely. Modeling helps identify areas that might be restorable or suitable for translocations and prioritize future surveys for this secretive species.

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