

Zoos conduct multiyear study on EMRs

In 2009 the Edward Lowe Foundation partnered with the Eastern Massasauga Rattlesnake Species Survival Plan® (EMRSSP) to conduct research at Big Rock Valley (BRV), the foundation's home in southwest Michigan.

Like other SSPs sanctioned by the Association of Zoos & Aquariums, the EMRSSP is a collaborative science-based management program that strives to enhance the captive population of a particular species and promote its conservation in the wild. With members from about 20 North American zoos, the EMRSSP focuses on the eastern massasauga rattlesnake, a species that became federally listed as threatened in fall 2016.

Since 2009 EMRSSP members have been traveling to BRV each May to hold their annual planning meeting where they review breeding practices for massasaugas within member zoos, which are managed collectively. These snakes are not usually captured in the wild. They are typically bred in captivity, come from nature centers or have been rescued by law enforcement agencies that discovered the animals being illegally traded in the pet trade or



Looking for massasaugas is tough work. Researchers spend hours combing through wetlands — a favorite habitat for the eastern massasauga — as well as woodlands and grasslands looking for the shy snakes.

held in other circumstances.

“We discuss how many births we need to support the population, which snakes we want to breed, and with whom,” says Lisa Faust, senior director of population ecology at the Lincoln Park Zoo who serves as the EMRSSP's field adviser and coordinates the group's work at BRV. “Then based on those recommendations, we move the animals around to different zoos.”

A good portion of the group's time

at BRV is spent outdoors, combing wetlands, woods and marshes in search of snakes — part of a longitudinal study that will determine, among other things, survival and reproduction rates. “The goal is to find as many massasaugas as possible and then follow them through time,” Faust says.

Easy to say, hard to do, for the eastern massasauga is a shy snake that likes its privacy. In fact, during the group's first visit, EMRSSP researchers and foundation staff members found only 16 snakes — which took 275 man-hours to accomplish.

The foundation was selected for the EMRSSP study due to its known population of massasaugas. Comprised of 2,000 acres, BRV has a wide variety of ecosystems and habitats, including wetlands, which are the massasaugas' preferred habitat. In addition, the foundation has an active management program to enhance its rattlesnake population. “That was also important



because we wanted to go somewhere that had a healthy, stable population of snakes to study,” says Faust.

“It’s important to note that this research is being conducted under state and federal permitting,” adds Jarod Reibel, the foundation’s conservation stewardship land manager.

When researchers find a massasauga, they first collect environmental data about conditions in which snakes are found, such as humidity and temperature levels, both at ground level and six inches below. They also take GPS waypoints so they can return the snake to the same location it was found.

Using large tongs, the researchers carefully lift the snakes and place them in special cloth bags inside large plastic containers, which are taken to the foundation’s EcoLab. There, researchers measure and weigh the snakes. Sex is determined and blood samples are taken for future genetic, nutritional and disease analysis.

Because massasaugas have unique

coloration patterns (known as saddles), they are photographed to help identify recaptures. Snakes have a small PIT tag inserted under their skin (the same type of microchip used in dog and cat identification tags).

Recaptures are essential to the

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research — not only to study survival rates but also so researchers can more accurately determine how large the snake population is.

Yet not all recaptures are taken back to the lab. If the discovered snake is an adult that have been recently captured, researchers typically leave it undisturbed. “We take the new GPS coordinates, so we can learn about its movements, but we wouldn’t be able to get any other data off the animal,”

explains Eric Hileman, assistant professor at West Virginia University, who serves as the EMRSSP’s quantitative ecologist. “With young snakes, however, their rate of growth is very rapid, so even a week or so later, a recapture could provide valuable information.”

The researchers have found and collected data from more than 1,000 unique individual massasaugas at BRV. “That sort of dataset is rare for any species other than long-lived mammals,” Faust says. The data is being used to build

computer models that could determine which life stages are more vulnerable — and other information that could help state and federal agencies enhance conservation management practices for massasaugas.

“People don’t always appreciate the fact there are some really important species in their own regions that are endangered,” adds Faust. “It’s not just lions in Africa that warrant conservation.”

Distinguishing the eastern massasauga from look-alikes

In Michigan there are several other regional species that appear similar to the eastern massasauga, such as the northern water snake, eastern fox snake, milk snake and hog-nosed snake. Although these species lack rattles, they can produce a buzzing sound similar to a rattle if found in leaf litter.

How to tell the real McCoy? Here are a few characteristics that distinguish the massasauga from its Michigan mimics:

- Medium-size, thick body (24 to 36 inches in length).
- Segmented rattle at the end of its tail.
- Triangular head.
- Large heat-sensing pits or openings between the nostrils and the eyes.
- Gray, gray-brown or brown background.
- Dark brown rectangular blocks down the back; two or three additional rows of dark spots along its sides with alternating dark and light bands along the tail.



Massasaugas usually hibernate in crayfish or small-mammal burrows located in wetland areas. Yet the snakes have been known to use rock crevices, holes created by rotted tree roots, submerged trash and barn floors. Massasaugas usually return to the same site each year and hibernate alone or in small groups of two or three.