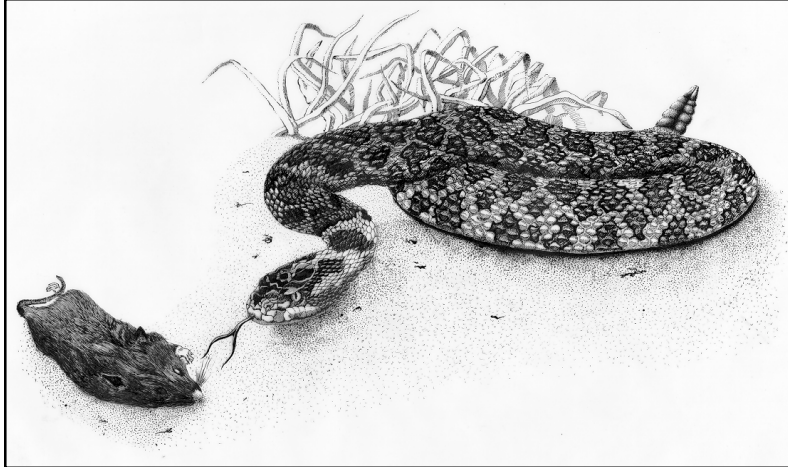


Eastern Massasauga Rattlesnake

Scientific Name: *Sistrurus catenatus catenatus*



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Introduction

The Eastern massasauga is one of two rattlesnakes that are native to Ohio. The name "massasauga" comes from the language of the Chippewa tribe of Native Americans. It was probably derived from their name for the Missisauga River in Ontario—a likely habitat for the snake. This snake is also known as the "swamp rattler" or "black snapper."

Eastern massasaugas are becoming increasingly rare in North America and are now endangered throughout much of their range. In Ohio, these snakes were found in the scattered prairies of glaciated Ohio. As with many other species, man's disturbance of their habitat, particularly through farming, has led to their reduced numbers in the state. They have been recorded in as many as 22 counties; however, they are a rare sight. The Eastern massasauga is one of three poisonous snakes in Ohio.

Although often feared, snakes are interesting and unique animals. You might think of them as limited because they lack appendages, but they have many fine adaptations that help them handle prey and locomotion.

Snakes often prey on animals larger than themselves and there is a distinct advantage in having a prey animal quiet or immobile, particularly if the animal could hurt the snake. Pit vipers, like the massasauga rattlesnake, have a pair of large, hollow fangs at the front of the mouth that are connected to the bones of the upper jaw and palate so that they are folded against the roof of the mouth when the mouth is closed and are automatically brought

forward and down when the mouth is opened. These fangs are used to inject venom into the prey. The poison of the massasauga is hemolytic, meaning it causes the breakdown of the red blood cells in the bitten animal and this eventually subdues the animal, allowing the snake to easily swallow it.

Snakes are able to swallow prey many times their own diameter because of an unusually flexible jaw mechanism. Further, the snake's digestive juices allow it to digest bones and fur.

Another unique adaptation of all snakes is the forked tongue. The split, two-pointed tongue, often seen darting from the mouth, is an organ used by the snake to interpret its world; the tongue provides the snake with a sense of touch and smell. Odorous particles adhere to it, the tongue is withdrawn into the mouth, and the tip is projected into a specialized part of the nasal cavity called the Jacobson's Organ. The Eastern massasauga also has the advantage of heat-sensitive pits near the front and sides of its head. They are located between the nostril and eye. The pits enable the snake to seek out and strike accurately at objects warmer than its surroundings; this adaptation helps the massasauga prey upon nocturnal mammals.

Snake locomotion is dependent primarily on the wavelike movements of its long trunk. When a snake moves, loops of the trunk form behind the head and move posteriorly (back through the body). When these loops meet protuberances on the ground, they push upon them and the resultant force moves the snake forward.

Description

The Eastern massasauga is a medium-sized, dark-colored, rattlesnake with 29 to 50 dark dorsal blotches on its gray or brownish gray body. There are three rows of smaller dark spots on each side of the body. The snake can be identified by its short (two to three feet), thick body. The head of this snake is thick and triangular, with black stripes. Its belly is black and irregularly marked with white or yellowish spots. The pupils of its eyes are elliptical. The triangular head and elliptical eyes are two features used to help identify a poisonous snake. The most distinguishable feature of this snake is the stubby rattle on the end of its tail. This feature is associated with all species of poisonous snakes, with the exception of the copperhead, which is also native to Ohio. Many species of snakes will *vibrate* their tail when upset, but the nonpoisonous ones **do not** have rattles.

In adults it is an organ of loosely attached horny segments that strike against one another to produce a buzzing sound when the tail is vibrated rapidly. In the very young snakes, the rattle is represented by a "button". A new segment is added each time the skin is shed; the segments become increasingly larger until the snake reaches adult size. Two to four new segments are added to the rattle each year.

Males measured snout to vent were found to be 14 to 25 inches long and females 17 to 25 inches. Tails add 1.5 to 3.5 and 1.5 to 2.5 to the male's and female's total body length respectively. Males weighed 1 to 7.5 ounces and females 2.5 to 8.5 ounces.

Nationally, the Eastern massasauga's range extends from western New York and southern Ontario south to eastern Iowa and extreme eastern Missouri. In Ohio, Eastern massasaugas have been described as common in much of the glaciated area of the state. As of 1992, this snake had been reported in 28 counties, nine of which may still have a massasauga population. Massasauga distribution is probably not as broad and uniform as portrayed in range maps. They usually occur in discrete and localized places.

Habitat and Habits

Throughout much of its range in the eastern United States, massasauga rattlesnakes are found in wet prairies, sedge meadows, and early successional fields. Preferred wetland habitats are marshes and fens. They avoid open water and seem to prefer the cover of broad-leaved plants, emergents, and sedges.

Natural succession of woody vegetation is a leading cause of recent habitat deterioration throughout its range. Intensive management to retard woody vegetation growth is necessary to maintain suitable habitat conditions.

The massasauga is not a forest-dwelling species and forests impede their movements and dispersal.

Eastern massasauga rattlesnakes prefer low-lying, poorly drained meadows and adjacent old fields. The habitat of this rattlesnake generally includes a wintering area of low woods, bogs, fens, or marshes and a summering area of drier ground, usually grassy with low shrubs.

Rattlesnakes hibernate singly or in small groups of two or three. Hibernacula (a shelter that is occupied during the winter by a dormant snake) includes mammal and crayfish burrows in low-lying areas, rock crevasses and tree root systems, partially submerged trash, barn floors, and basements.

By overwintering in moist soil, massasaugas are able to avoid lethally cold temperatures and reduce the risk of desiccation (drying out). Before and after hibernation, massasaugas frequent low, poorly drained habitats.

For snakes in temperate regions, the beginning of the year is marked by the spring thaw. Usually, the first activity after hibernation is basking in the sunlight followed by the shedding of last year's outer skin. Triggered by hormonal action, the semitransparent epidermal layer loosens around the mouth and then is rubbed against an object (log or rock) and pushed back over the head. While the old skin is held back by these objects, the snake can slowly crawl out of it.

In spring, snakes are found mainly in prairie or grassland uplands. During summer, the animals migrate to drier old fields and deciduous woodland borders. Here they feed primarily on small mammals and give birth in late July or August. In autumn, snakes reappear on the prairies and grasslands. Snakes move out of the prairie in the spring and return in late summer and fall.

Eastern massasauga rattlesnakes are active from mid-April to late October; here in the Midwest, they are most active from early May through mid-September. Peak activity for this region occurs between June and August.

Snakes do not bask in the open on excessively hot (> 86 degrees F) days with clear skies, but will bask under a partly cloudy sky at temperatures ≥ 90 degrees F. Massasaugas regulate body temperature by moving between basking sites, selecting areas of gravel, sparse grass, tussocks (a rounded knoll or rise of ground in a marsh or bog bound by roots or other vegetation) with hollow bases, or root-stem systems that create a filtering effect to direct sunlight. Solid shade sites like edges of large rocks, shrubs or other woody growth, boards, and scrap metal are used on very hot days.

Male massasaugas are known to wander and are much more active than the more

sedentary females. Adult males and females display crepuscular (twilight) or nocturnal (nighttime) activity and foraging patterns. Juveniles are active throughout the day if temperatures do not exceed 88 degrees F; otherwise, they too are crepuscular or nocturnal. In spring and autumn, snakes are most active during the warmest part of the day (noon to 4 p.m.). In summer, activity peaks during the period 4 to 8 p.m., when temperatures are lower.

Adult male and female massasauga rattlers have an average home range size of 11,753 square yards; they move approximately 30 feet a day. The average length of a massasauga's home range is .053 miles. The massasauga exhibits a fairly sedentary life style.

As in most "cold-blooded" vertebrates, snakes have slow metabolic rates (about one-tenth of that of birds and mammals of the same size). Thus they have slower but longer lives than birds or mammals of comparable size. Small snakes like the massasauga can live 18 years or more in the wild.

Reproduction and Care of Young

Mating takes place in the spring during April or May, following emergence from hibernation. For female snakes that have mature eggs in their oviducts, the molting of the skin releases a pheromone (chemical signal) that they are ready to mate. After mating, the male and female snakes separate and resume their normal activities independently. Snakes are not social creatures during most of their lives. Massasaugas, like most reptiles, are polygamous (have multiple mates).

Most massasauga females bear young for the first time when three years old, but some may not bear their first young until age four. Males also reach sexual maturity between the ages of three and four.

When females are pregnant, they feed very little, if at all, and maintain themselves primarily on fat reserves throughout gestation. Basking and remaining inactive reserve energy and may lessen the probability of becoming prey. Females will feed ravenously after they give birth.

Massasaugas are ovoviviparous (eggs develop in the body of the parent and hatch within or immediately after being expelled). The female produces large, yolk-filled eggs which are retained within her reproductive tract for a considerable period of development. The developing embryo receives no nourishment from the female, only from the yolk. Eggs of the massasauga hatch inside the female and the young are born "alive". A female snake that retains eggs in her body can bask in the sun, thus raising the temperature of the eggs and speeding their development,

resulting in a variable gestation period of two to four months.

When born, massasauga rattlers on average are nine inches long (snout to base of rattle) and weigh 0.3 to 0.6 ounces. After birth, the young are on their own—no maternal care is known in snakes.

As is the case for all cold-blooded vertebrates, the growth of the young is heavily dependent upon the amount of food available. Young garter snakes are very important food items for the massasauga during its first year of life. Small mammals (voles, shrews, and mice) become the major food item as the snakes mature.

Snakes will shed their skin for the first time 10 to 15 days after birth.

Management Plans

Loss and fragmentation of wetlands and associated grassland habitats are problems; few massasaugas exist on sites where the original wetland acreage has been severely reduced. Important massasauga habitat exists at three Division of Wildlife areas: Killdeer Plains, Mosquito Creek, and Spring Valley.

To prevent the loss of wetlands and other special habitats required by massasaugas, the Division promotes statewide wetlands protection legislation; acquires wetlands and other special habitats; promotes acquisition and protection of wetlands by other public agencies and by private organizations; promotes restoration and maintenance of wetlands and other special habitats on public and private property; provides information to the public on the value of wetlands and other special habitats and the need to protect them; and influences and supports wetland conservation provisions of federal farm programs.

Snakes that are struck while crossing roads or are victims of indiscriminate killings are also major causes for the species' decline. Division personnel work to inform and educate the public about the Eastern massasauga in an effort to reduce these mortality factors. The Division distributes G. L. Denney's *Ohio's Reptiles*. This booklet is a fact-filled presentation that includes brief discussions of Ohio's snakes, including the massasauga. It has helped stimulate interest in and appreciation for reptiles.

In 1976, a Division of Wildlife regulation was passed which, in effect, prohibited the taking or killing of all reptiles and amphibians, except turtles and frogs, on Division of Wildlife controlled lands. This measure extends a level of protection to the Eastern massasauga, which is listed as a species of special interest in Ohio. A species of special interest is one that might become threatened under continued or increased stress.

Viewing Opportunities

Killdeer Plains, Mosquito Creek, and Spring Valley wildlife areas and the Cedar Bog Natural Area currently support massasauga rattlesnake populations.

Massasauga rattlers are typically found resting under flat boards, metal, or other discarded material. They often bask in the sunlight in clearings and openings.

These snakes are quite timid and pose no threat to people if they are **left alone**. Snakes do not seek out people to bite; striking and biting is a defensive measure on the part of the snake. The risk of snake bite is highly overrated; annually, more people die from bee stings or lightning strikes than from snake bites.

Massasaugas are active and found most commonly in April, May, and October; they are less likely to be encountered during the months of July, August, and September.

Do Something Wild!

The Eastern massasauga is among the majority of wildlife species in Ohio that are not hunted. All these animals are vital parts of our overall ecosystem and contribute to wildlife diversity in the state. Helping us manage and research these species are the generous citizens of Ohio. With money they either donated through the state income tax checkoff, their direct contribution to the Endangered Species Special Account, or their purchase of a wildlife conservation plate, the Division is able to purchase critical habitat such as wetlands, which are essential to sustaining populations of species like the massasauga rattler.

Tax time **is not** the only time you can help. Contributions to our Endangered Species and Wildlife Diversity Program are accepted throughout the year. To make a donation, please send a check to: Endangered Species Special Account, Ohio Division of Wildlife, 1840 Belcher Drive, Columbus, Ohio 43224-1329. All contributions, whether made on your income tax return or directly, are tax deductible.

At a Glance

Mating: Polygamous

Peak Breeding Activity: April and May

Gestation Period: 2-4 months

Young are Born: Late July through September

Litter Size: 3-19; 8 average

Young: Precocial and are on their own after birth

Number of Litters per Year: 1

Adult Weight: Females - 6 oz.; Males - 4 oz.

Adult Length: 20-36 inches

Life Expectancy: 18 years

Migration Patterns: Year-round resident; young go, on average, less than 0.6 miles to establish their own territory.

Feeding Periods: Early morning, late afternoon, or at night

Typical Foods: Small mammals (short-tailed shrew, meadow vole, deer and white-footed mice), small snakes, small frogs, salamanders, toads, and young birds.

Native to Ohio: Yes

Active or Potential Nuisance Species: Potential - Not because of overabundance, but because of potential harm/conflict to humans if the snake uses an inhabited area (e.g., a basement).

The Eastern massasauga is a state species of special interest.



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