

THE MASSASAUGA

by Andrew L. Shiels

“Massasauga,” “swamp rattler,” and “black snapper,” are a few of the nicknames given to a rare, secretive, yet interesting rattlesnake found in northwestern Pennsylvania. Its limited distribution and unique ecological needs have unfortunately placed this species among Pennsylvania’s most endangered. Out of sight and out of mind to most Pennsylvanians, the massasauga has been quietly disappearing for years. However, recent conservation efforts have been undertaken to ensure its survival in the Commonwealth. Understanding its biology and ecology are keys to developing an effective conservation strategy.

The eastern massasauga (*Sistrurus catenatus catenatus*) is a medium-sized venomous snake that reaches lengths of

24 to 30 inches. It has a grayish body color with a series of dark-brown, irregularly shaped blotches along the top of the back. These blotches are the source of the Latin species name “catenatus,” which means “chain-like.” Along the sides of the body are two to three rows of smaller, more rounded spots.

Massasaugas are pit vipers, which means there is a heat-sensing pit on the side of the head between the eye and nostril. Like our other two venomous species, the northern copperhead and the eastern timber rattlesnake, massasaugas have vertically elliptical pupils and a single row of scales on the underside of the tail. Unlike timber rattlesnakes, which have many small scales on the head, a massasauga’s head is covered with nine large, scale plates typical of our non-venomous species. The body is very stout compared to the length. The portion of the tail just ahead of the rattles is often a dirty yellow or cream color in adults, and the tail ends in a series of rattles. Juveniles usually display a yellow tail. There are 23 to 25 rows of keeled scales extending up the sides and over the back, and it has a single anal plate.

Like other snakes, male massasaugas find their mates by searching for and following the scent trails of other massasaugas. Mating peaks in May and June but can occur throughout the warm season. Birthing occurs in late August and September, and a female can produce a litter of up to 20 snakes ranging in length from 7 to 10 inches. Massasaugas are oviparous, giving birth to live young encased in a membrane. The young are venomous at the time of birth. They resemble smaller versions of the adult with a single horny projection at the base of the tail referred to as a birth button. This is the first rattle segment, which will move outward one rattle segment at a time with each subsequent shedding of the skin. When startled or agitated, their rattling is quiet and reminiscent of the sound produced by a leaking tire, frying bacon or an aerated kitchen faucet. Not normally aggressive, they are content to remain quiet as potential predators pass by. Massasaugas primarily prey on small mammals, but they have been known to eat amphibians, birds and occasionally small snakes.

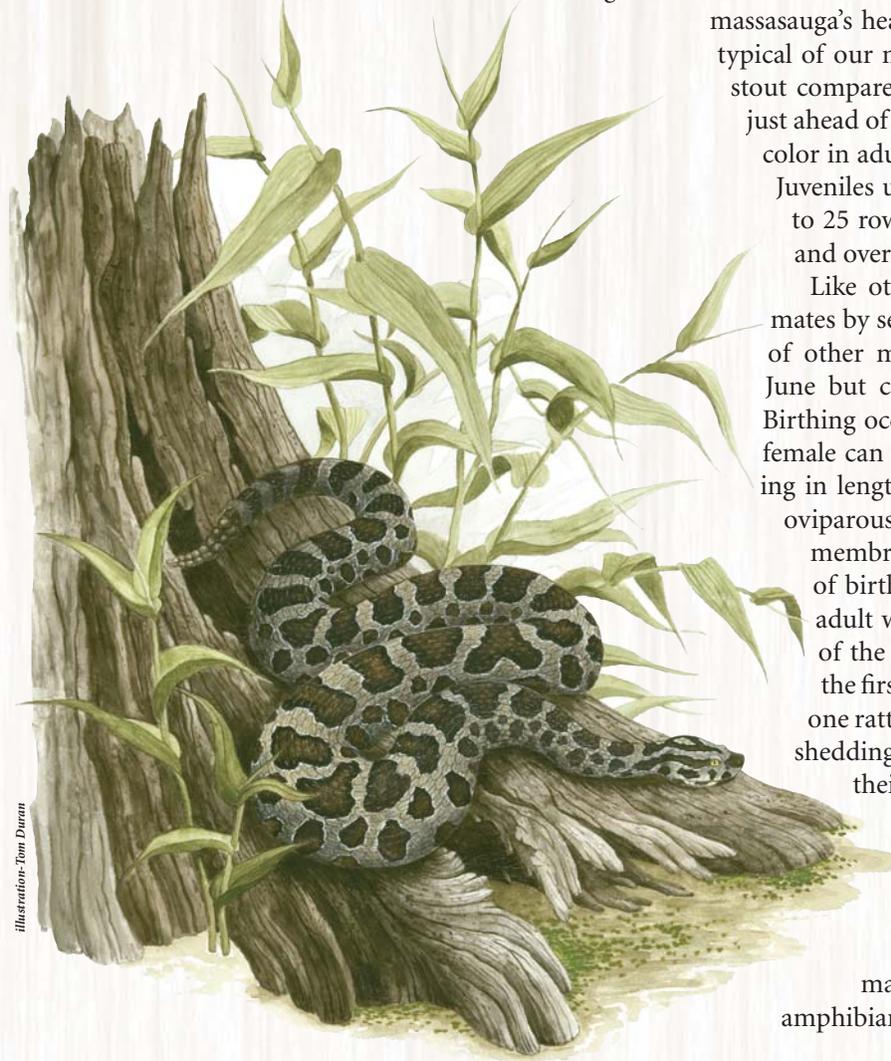


Illustration: Tom Duran

a Rattlesnake

Massasaugas occur from southern Ontario, through western New York, western Pennsylvania, and portions of Ohio into Michigan and through the upper midwestern states from Minnesota down to Missouri. Massasaugas aren't widespread in Pennsylvania and live only in certain areas of northwest Pennsylvania. They're strongly associated with relict prairie habitat in Crawford, Mercer, Butler and Venango counties. Relict prairie is the natural prairie habitat that remains, which hasn't previously been converted to agriculture or development. Pennsylvania is on the extreme eastern end of this habitat type, which is much more common in midwestern states.

Massasaugas are habitat specialists. They require swamps and bottomland wetlands near upland meadows, old-field or grassland habitats. The wetlands are needed for over-wintering. To avoid death from freezing, massasaugas descend under ground through small mammal or crayfish burrows to reach the water table where they spend the winter, often partially submerged. Thus, their health and survival depends on the presence of other organisms such as crayfish. Upland habitats are used for basking and foraging. Massasaugas travel back and forth between these habitat types depending on the season. Unless both habitats are present, massasaugas can't survive. When roads separate these habitats, mortalities often occur.

Sites in Pennsylvania where this species is still present are few. Search efforts in recent years have attempted to confirm whether they remain in historic locations and the extent of their range today. A study conducted from 2002 through 2005 in cooperation with researchers from the Western Pennsylvania Conservancy revealed that there are four relatively healthy metapopulations where snake numbers are large enough to provide hope for their continued survival. A number of smaller, less populated sites exist where the initial prognosis isn't as good and additional survey work is needed. From 2005 to 2007, a radio tracking study has been underway to better understand how much this species moves on a daily, seasonal and annual basis. Such information is critically needed to better understand the size of a massasauga's home range, the specific habitats they use and how they move within those habitats.

These recent studies and survey work conducted by Commission staff and others over the years have resulted in a recognition that we must find ways to protect and conserve the remaining properties where massasaugas exist. Currently,

the Commission and its conservation partners are prioritizing properties for conservation easements or purchase. Some properties are already under public or private ownership that will allow habitat improvement and restoration efforts to occur. For example, as an old field or idled farm pasture matures and becomes filled with trees and shade, it's less able to meet the sun basking needs of a massasauga. Removal or thinning of trees and burning of the grasses and shrubs can set the succession process back by several years and create habitat more suitable to this little rattlesnake.

The eastern massasauga, a Pennsylvania endangered species, is rare throughout its range in the U.S. and is on the endangered, threatened or rare list in each state where it's found. The U.S. Fish & Wildlife is reviewing this species for federal Endangered Species Act listing because of its declining populations range-wide. In recognition of its extreme rarity and to ensure that research and habitat work are properly coordinated, biologists in the Commission's Natural Diversity Section are working on a long-term management plan for the massasauga. To maintain a viable population of massasaugas in Pennsylvania, active research, site protection and habitat management projects will be needed in the years ahead. The massasauga is a vital part of the Commonwealth's natural history, which we cannot afford to let quietly pass. □

State Wildlife Grants

The Pennsylvania Fish & Boat Commission administers the State Wildlife Grants (SWG) Program funds from the U.S. Fish & Wildlife Service for the protection of our trust species including fish, amphibians, reptiles and mussels. This program is designed for the protection of rare or declining animals and their habitats. This program benefits all Pennsylvanians because these animals are frequently valuable indicators of environmental conditions and important components of our quality of life. For more information on SWG, visit the Commission's web site, www.fish.state.pa.us, and enter this address into your browser: www.fish.state.pa.us/promo/grants/swg/00swg.htm. Pennsylvania currently lists 15 amphibians and 22 reptiles in the State Wildlife Action Plan as "species of greatest conservation need." The eastern massasauga rattlesnake is one of these reptiles.