

## Species Status Assessment

**Class:** Reptilia  
**Family:** Viperidae  
**Scientific Name:** *Sistrurus catenatus catenatus*  
**Common Name:** Eastern massasauga

### Species synopsis:

Previously recognized as a subspecies, eastern massasauga was recently recognized as a distinct species, *Sistrurus catenatus* (USFWS 2011). In New York, eastern massasauga currently occur in two large wetland complexes near Syracuse and Rochester, separate from one another and from the rest of the geographic distribution. The range extends from western New York and southern Ontario to Iowa and Missouri.

It is associated with a variety of habitats including bedrock, peat forest, wetlands, and prairies. Most areas throughout this rattlesnake's range have lost more than 50% of their historic populations. Currently, less than 35% of the remaining populations are thought to be secure (USFWS 2011). The primary causes of the decline are habitat loss due to succession, and persecution (Szymanski 1998). Its status in New York is endangered and the species has been a candidate for federal listing since 1999.

### I. Status

#### a. Current and Legal Protected Status

i. **Federal**      Not Listed      **Candidate?** Yes

ii. **New York**      Endangered; SGCN

#### b. Natural Heritage Program Rank

i. **Global**      G3G4T3Q

ii. **New York**      S1      **Tracked by NYNHP?** Yes

### Other Rank:

IUCN – Least Concern

Species of Northeast Regional Conservation Concern (Therres 1999)

**Status Discussion:**

Eastern massasauga is represented by numerous occurrences across its distribution but many of them may be of low quality. Currently, less than 35% of the remaining populations are thought to be secure and the species is listed as endangered or threatened in every state or province where it occurs with the exception of Michigan where it is considered Special Concern (USFWS 2011). Eastern massasauga has been designated as a species of Regional Conservation Concern in the Northeast due to its unknown population status (Therres 1999). NEPARC (2010) does not consider massasauga as a species of priority because it is found in fewer than 4 northeastern states.

There are two known locations in New York, one of which has a seemingly stable population, though both populations are extremely small. One of these is currently undergoing habitat enhancement, the other is not.

**II. Abundance and Distribution Trends**

**a. North America**

**i. Abundance**

  X   declining    \_\_\_increasing       \_\_\_stable    \_\_\_unknown

**ii. Distribution:**

  X   declining    \_\_\_increasing       \_\_\_stable    \_\_\_unknown

**Time frame considered:**   Last 20 years  

**b. Regional**

**i. Abundance**

  X   declining    \_\_\_increasing       \_\_\_stable    \_\_\_unknown

**ii. Distribution:**

  X   declining    \_\_\_increasing       \_\_\_stable    \_\_\_unknown

**Regional Unit Considered:**   northern edge of distribution  

**Time Frame Considered:**   Last 20 years

c. Adjacent States and Provinces

CONNECTICUT                      Not Present   X                        No data \_\_\_\_\_  
MASSACHUSETTS                      Not Present   X                        No data \_\_\_\_\_  
NEW JERSEY                      Not Present   X                        No data \_\_\_\_\_  
QUEBEC                      Not Present   X                        No data \_\_\_\_\_  
VERMONT                      Not Present   X                        No data \_\_\_\_\_

ONTARIO                      Not Present \_\_\_\_\_                      No data \_\_\_\_\_

i. Abundance

\_\_\_\_ declining    \_\_\_\_ increasing                      \_\_\_\_ stable    \_\_\_\_ unknown

ii. Distribution:

\_\_\_\_ declining    \_\_\_\_ increasing                      \_\_\_\_ stable    \_\_\_\_ unknown

Time frame considered: \_\_\_\_\_

Listing Status:   Threatened  

PENNSYLVANIA                      Not Present \_\_\_\_\_                      No data \_\_\_\_\_

i. Abundance

  X   declining    \_\_\_\_ increasing                      \_\_\_\_ stable    \_\_\_\_ unknown

ii. Distribution:

  X   declining    \_\_\_\_ increasing                      \_\_\_\_ stable    \_\_\_\_ unknown

Time frame considered:   Since 1978, continuing through 2005  

Listing Status:   Endangered                        SGCN?   Yes

**d. NEW YORK**

No data \_\_\_\_\_

**i. Abundance**

  X   declining    \_\_\_ increasing    \_\_\_ stable    \_\_\_ unknown

**ii. Distribution:**

  X   declining    \_\_\_ increasing    \_\_\_ stable    \_\_\_ unknown

Time frame considered: Since 1960s; Cicero pop. may currently be stable

**Monitoring in New York.**

The NY Amphibian and Reptile Atlas (Herp Atlas) was conducted in 1990-99. The Herp Atlas database also includes historic records from prior to 1990; these records are primarily a compilation of museum records and researchers' field notes.

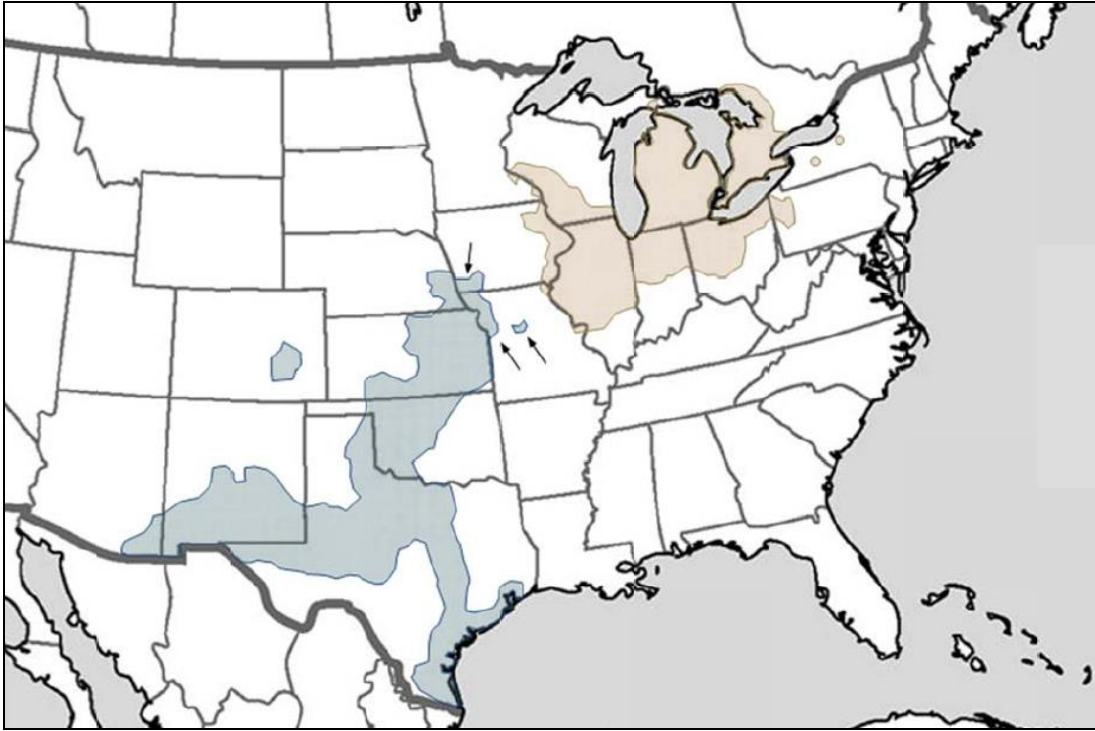
SUNY ESF and NYSDEC have partnered to conduct capture-recapture surveys since 2006. These surveys have resulted in the completion of two Masters theses and will continue through at least 2013. The results of these surveys have also guided current habitat enhancement projects.

**Trends Discussion:**

The two locations where massasauga are extant in New York are 100 miles (164 km) apart, separated by development and unsuitable habitat. The population sizes are estimated to be 168 individuals at the site near Syracuse (B. Johnson pers. comm.), and 76 individuals at the site near Rochester (Shoemaker et al. 2008).

The historical range of the eastern massasauga included southwestern Ontario, Michigan, southeastern Minnesota, southern Wisconsin, eastern Iowa, extreme northeastern Missouri; Illinois, Indiana, and Ohio excluding the southern tips; northwestern Pennsylvania, and western New York (Conant and Collins 1998). Despite references in the historical literature to the massasauga's extreme abundance in Ontario, Ohio, Illinois, Wisconsin, and Indiana, the species was recognized as imperiled nationally by the mid 1970s. The magnitude of the decline ranges from 33% in Michigan to 100% in Minnesota, and only 22% of the remaining populations are considered viable in the long-term (Szymanski 1998). Seven of the eleven states in which massasaugas occurred historically have no stable population left, including New York; recent research by Shoemaker, however, suggests the Syracuse population is stable for the time being.

In Pennsylvania, systematic surveys within the historic range in the western part of the state were completed in 1978, 1990, and 2005 (Reinert and Kodrich 1978, Reinert 1990, Jellen 2005). Each subsequent survey documented further extirpation from historically occupied sites, leading to the conclusion in 2005 that the current verified distribution has been reduced to four localities (Jellen 2005).



**Figure 1:** Historic range of the eastern massasauga in tan shading. Blue shading indicates the range of western massasauga (*Sistrurus cf. tergeminus tergeminus*) and desert massasauga (*Sistrurus tergeminus edwardsii*). The black arrows indicate locations formerly considered to be within the eastern massasauga distinct population segment, but now considered to be within the range of the western massasauga (USFWS 2011).

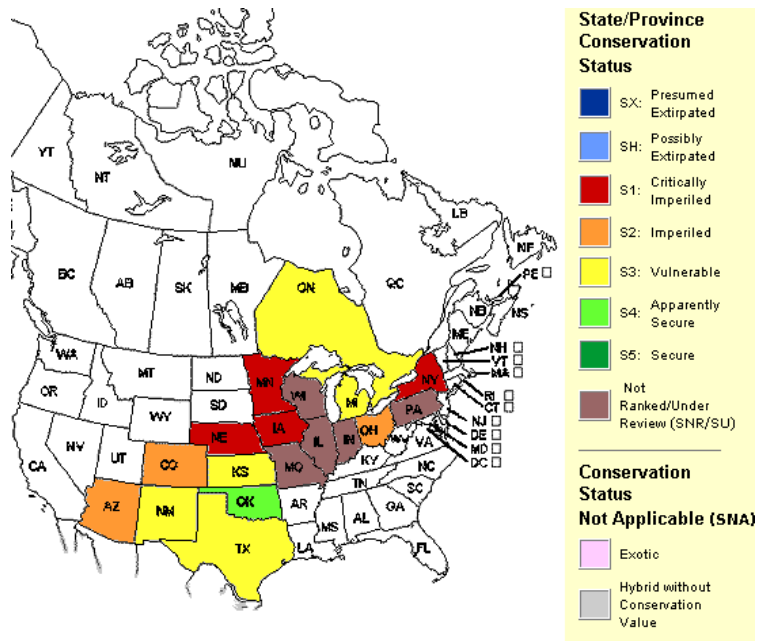


Figure 2: Conservation status of eastern massasauga in North America (NatureServe 2012)

**III. New York Rarity, if known:**

<b>Historic</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>prior to 1970</b>	_____	_____	_____
<b>prior to 1980</b>	_____	_____	_____
<b>prior to 1990</b>	<u>unknown</u>	_____	_____

**Details of historic occurrence:**

Johnson (1995) summarized the historical occurrence of massasauga in New York: they were first mentioned in the literature by DeKay (1842) when they were considered common near Rochester. At that time, the swamp was larger than it is today, and it extended into Stanley J. Hamlin Marsh to the northwest, and into Madison County to the east. Two additional locations had massasauga records: Featherbed Swamp in Cayuga County (Moesel 1918, Wright 1919) and Zurich Bog in Wayne County.

<b>Current</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
	<u>~300</u>	<u>2</u>	_____

**Details of current occurrence:**

Two populations are currently extant in New York.

**New York's Contribution to Species North American Range:**

<b>% of NA Range in New York</b>	<b>Classification of New York Range</b>
<u>   </u> 100 (endemic)	<u>   </u> Core
<u>   </u> 76-99	<u>   </u> Peripheral
<u>   </u> 51-75	<u>  X</u> Disjunct
<u>   </u> 26-50	<b>Distance to core population:</b>
<u>  X</u> 1-25	_____





**V. New York Species Demographics and Life History**

- Breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Anadromous**
- Non-breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Catadromous**
- Migratory only**
- Unknown**

**Species Demographics and Life History Discussion:**

Adults reach sexual maturity in three years (Gibbs et al. 2007). In most populations, including New York, females reproduce every other year. However, there is one record from each of the two New York populations of a female in gravid condition in consecutive years (see Bell and MacBlane 2012). It is suspected that some snakes with small body size may be triennial breeders, suggesting that breeding interval is linked to body size (T. Bell, pers. comm.). Males are capable of reproducing annually. Mating occurs in late summer and early fall, and females store sperm until the following spring. Females give birth to 3 to 19 live young in mid-August to mid-September.

## VI. Threats:

The threats to eastern massasauga include vegetative succession, persecution by humans, illegal collecting, road mortality, and habitat loss due to wetland drainage for agricultural and residential development, urbanization, fragmentation, non-native species (*Phragmites*), and damming (Johnson 1995, Parent and Weatherhead 2000, Gibbs et al. 2007, USFWS 2008). Disease is a new concern. A naturally occurring soil fungus (*Chrysosporium* sp.) has led to mortality of several individuals in an Illinois population (Allender 2011). Muck farming and peat mining are thought to have caused the extirpation of two historic populations in New York (see Johnson 1995).

Although the eastern massasauga suffers from many threats, the three believed to have the most impact in New York are natural succession, small population size, and population isolation. The two populations in New York occur on protected lands; however, natural succession has been identified as a major factor at these locations. The loss of open areas causes three concerns: (1) open areas with direct sun exposure are vital to massasaugas during all life stages for thermoregulation (Peterson et al. 1993). Johnson (1995) showed that gravid females spend significantly more time basking than non-gravid females and males; (2) succession also evens out the hummock-hollow topography that snakes use for hibernation at New York sites (Johnson 1995); (3) finally, prey populations may change with succession, thereby decreasing foraging opportunities and increasing seasonal movements, potentially to unfavorable locations.

Eastern massasauga was classified as “presumed stable” in regard to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

### **Are there regulatory mechanisms that protect the species or its habitat in New York?**

No       Unknown

Yes

The eastern massasauga is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. At the Syracuse site, 87% of the 5,000 acres is owned by the state, including the area used by massasaugas, which is protected as a “Restricted Area.” The site near Rochester (1,977 acres) is privately-owned and conservatively managed.

In 2006, the State of New York adopted legislation (ECL section 11-0107 sub 2) that gave all native frogs, turtles, snakes, lizards and salamanders legal protection as game species, with very few open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

**Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:**

Conservation and management actions are detailed in the Eastern Massasauga Rattlesnake Conservation and Management Plan for New York State, 2012-2017 (Bell and MacBlane 2012). Since 2010, 1.5 hectares of basking habitat (capable of supporting 87 gravid females) has been created (T. Bell, pers. comm.).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for eastern massasauga. Conservation actions following IUCN taxonomy are categorized in the table.

**Habitat management:**

- \_\_\_ Manage vegetative succession and invasive plant species by means of prescribed burns, herbicide applications and/or by mechanical removal, and evaluate the effectiveness of such measures in enhancing habitat suitability for the species.

**Life history research:**

- \_\_\_ Document life history parameters specific to New York populations of the species, including age and sex ratios, longevity, age at sexual maturity, survivorship of young, predator-prey relationships, and wetland/upland habitat requirements.

**Modify regulation:**

- \_\_\_ Adopt into New York's Environmental Conservation Law provisions which designates massasauga rattlesnake as a protected small game species.

**Other action:**

- \_\_\_ Enhance law enforcement to prevent collection of snake specimens.

**Population enhancement:**

- \_\_\_ Employ restoration techniques at selected sites as needed, including captive breeding, headstarting, and repatriation/relocation strategies.

**Population monitoring:**

- \_\_\_ Conduct periodic re-survey of known sites of species occurrence, in order to detect population trends.

Conservation Actions	
Action Category	Action
Land/Water Protection	Site/Area Protection
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Site/Area Management
Land/Water Management	Invasive/Problematic Species Control
Land/Water Management	Habitat & Natural Process Restoration
Species Management	Species Management
Law/Policy	Compliance & Enforcement

## VII. References

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**Date last revised:**      July 11, 2013