

Species Status Assessment

Class: Reptilia
Family: Dipsadidae
Scientific Name: *Heterodon platirhinos*
Common Name: Eastern hog-nosed snake

Species synopsis:

Formerly in the large family Colubridae, the eastern hog-nosed snake was reclassified to Xenodontidae (Collins 2006), which became Dipsadidae. Known for its elaborate displays of cobra-like behavior followed by death-feigning, this snake is found in much of the eastern United States. It occurs in open woodlands or pine barrens that provide the sandy soils, toads, and small invertebrates that this snake requires. In the Northeast, the northern limit of the range is reached in the sand plains of Saratoga County, New York, though populations are known farther north in southern Ontario. Long-term trends, especially in northern portions of the range, suggest declines due to loss of habitat, road mortality, and persecution by humans but most populations appear to be stable in the short term.

I. Status

a. Current and Legal Protected Status

- i. **Federal** Not Listed **Candidate?** No
- ii. **New York** Special Concern; SGCN

b. Natural Heritage Program Rank

- i. **Global** G5
- ii. **New York** S3 **Tracked by NYNHP?** No

Other Rank:

NY Natural Heritage Program – Special Concern
Species of Severe Concern (NEPARC 2010)
IUCN – Least Concern
Species Northeast Regional Conservation Concern (Therres 1999)
COSEWIC – Threatened

Status Discussion:

In New York, most populations are found on Long Island and southern New York, as well as in the sand plains of Albany and Saratoga counties (Gibbs et al. 2007); populations also occur in the Hudson Highlands in exposed granite outcroppings. Michener and Lazell (1989) suggest that the distribution of hog-nosed snakes in eastern New England is likely limited by the availability of sandy soils, abundant toads as prey for adults, and small prey items for young. Hog-nosed snakes are listed as endangered in New Hampshire, threatened in Ontario, and special concern in Connecticut but in other northeastern states where it occurs (it is absent in VT and QC), populations have not been regarded as threatened enough to justify listing. NEPARC (2010) lists eastern hog-nosed snake as a Species of Severe Concern because more than 75% of northeastern states list it as SGCN.

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: Last 10 years

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: _____

Time Frame Considered: _____

c. Adjacent States and Provinces

CONNECTICUT **Not Present** _____ **No data** _____

i. Abundance

 X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

 X declining ___ increasing ___ stable ___ unknown

Time frame considered: Not Specified

Listing Status: _____ Special Concern SGCN? Yes

MASSACHUSETTS **Not Present** _____ **No data** _____

i. Abundance

___ declining ___ increasing ___ stable X unknown

ii. Distribution:

___ declining ___ increasing ___ stable X unknown

Time frame considered: SWAP states that status is unclear

Listing Status: _____ Not Listed SGCN? Yes

NEW JERSEY **Not Present** _____ **No data** _____

i. Abundance

___ declining ___ increasing X stable ___ unknown

ii. Distribution:

___ declining ___ increasing X stable ___ unknown

Time frame considered: Not Specified

Listing Status: _____ Not Listed SGCN? No

QUEBEC Not Present X No data _____

VERMONT Not Present X No data _____

d. NEW YORK No data _____

i. Abundance

___ declining ___ increasing ___ stable X unknown

ii. Distribution:

___ declining ___ increasing ___ stable X unknown

Time frame considered: _____

Monitoring in New York.

There are currently no monitoring activities or regular surveys.

Trends Discussion:

The NY Amphibian and Reptile Atlas suggests that populations have been lost from the western part of Long Island and from Staten Island where there are historic records.

Hulse et al. (2001) state that although the status of hog-nosed snakes in Pennsylvania is uncertain, they appear to be less common than formerly.

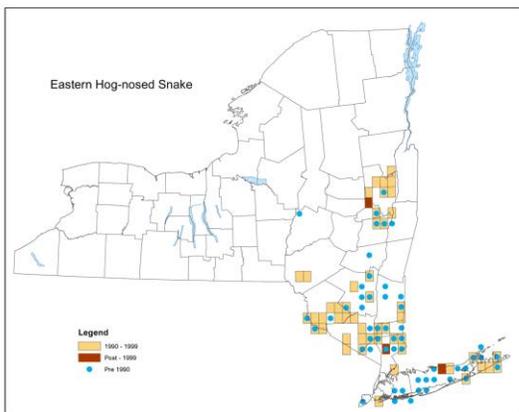


Figure 1: Distribution of eastern hog-nosed snakes in New York (NY Herp Atlas)

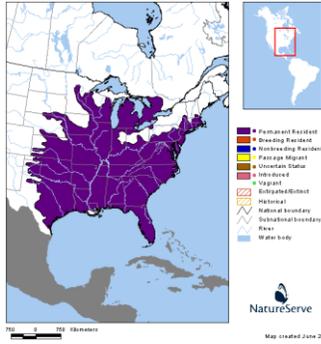


Figure 2: Distribution of eastern hog-nosed snakes in North America (NatureServe 2013).

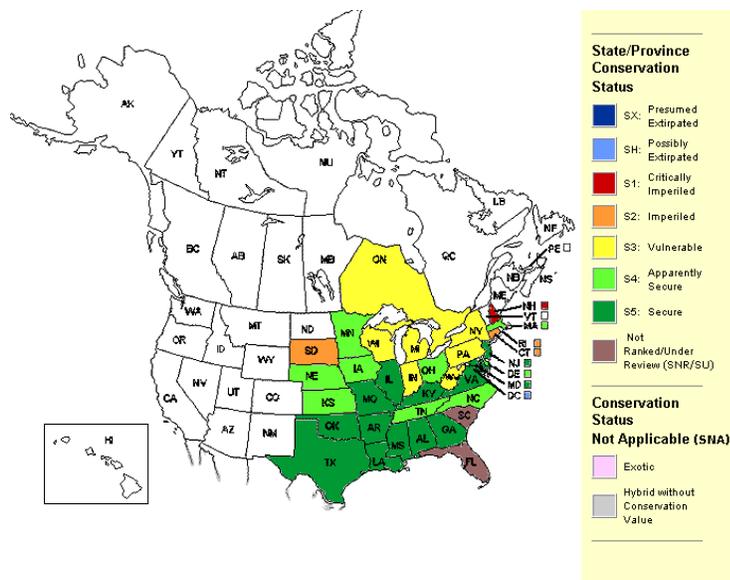


Figure 3: Conservation status of eastern hog-nosed snake in North America (NatureServe 2013)

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	<u>47 quads</u>	_____

Details of historic occurrence:

The NY Amphibian and Reptile Atlas shows historical records on most of Long Island, on Staten Island, in the lower Hudson Valley, and in the sand plains of Albany and Saratoga counties. There are 47 quads with historic records.

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	_____	<u>5%</u>

Details of current occurrence:

The NY Amphibian and Reptile Atlas (1990-99) shows hog-nosed snakes in a total of 50 survey quads, in eastern Long Island, southern Long Island, Delaware County, and as far north as Albany and Saratoga counties. Since 2000, records were added to the NY Herpetology database in an additional 3 survey blocks, each adjacent to a known location.

New York's Contribution to Species North American Range:

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

IV. Primary Habitat or Community Type:

1. Pine Barrens
2. Oak-Pine Forest
3. Oak Forest
4. Coastal Coniferous Barrens
5. Maritime Dunes
6. Old Field Managed Grasslands
7. Riparian Forest
8. Cliff and Talus

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: _____

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

Because of the unique upturned rostral scale, hog-nosed snakes are capable of excavating their own underground burrows with their unique snout, and thus are found in areas with sandy soils (Gibbs et al. 2001). Open pine or deciduous woodlands, old fields, and beaches are preferred habitats, although they may also be found in marshes and forested bottomlands as long as sandy or sand-loamy, well-drained soils are present (Gibbs et al. 2007). In the Hudson Highlands, hog-nosed snakes occur in exposed granite outcroppings and talus as well as in some sandy lowlands (J. Jaycox, personal communication).

A key component of suitable habitat is an abundance of toads, a preferred food item for adults along with frogs (Platt 1969). Young snakes feed on small vertebrates including spring peepers and redback salamanders (Michener and Lazell 1989).

Hibernation occurs in burrows that they excavate, or in burrows created by mammals, as well as under rocks or rotting logs.

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:

Eastern hog-nosed snakes typically mate in late April or May, though copulation has also been observed in the fall (Platt 1969). Females lay a clutch of 4 to 61 eggs (most clutches range from 15 to 25 eggs; Hulse et al. 2001) in loose soil or other debris during June or early July. Clutch size is positively correlated with female body size, as is the average size of the eggs (Hulse et al. 2001). The eggs hatch in September or October. Hog-nosed snakes are mobile, moving up to 600 m at a time, and have large home territories averaging 50 ha (Plummer and Mills 2000). Up to 93% of the adult's diet is frogs and toads (Platt 1969). Juveniles feed on smaller vertebrates including redback salamanders and spring peepers.

VI. Threats:

Loss of habitat to suburban development, fragmentation by roads, road mortality, and collection for the pet trade are threats to hog-nosed snakes. This snake is highly mobile and yet slow-moving, which increases its vulnerability to road mortality (COSEWIC 2007). Their exact and convincing cobra imitation results too frequently in persecution by humans who assume that this species is dangerous. As a species that relies heavily on amphibians for prey, hog-nosed snakes could suffer losses as a result of the chytrid fungus (Daszak et al. 2003) and ranavirus (Daszak et al. 1999).

Hog-nosed snake was classified as “moderately vulnerable” 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

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:

In southern Ontario, public education at Pinery Provincial Park has resulted in fewer cases of snakes being killed by visitors (Schueler 1996).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for woodland/grassland snakes, which includes hog-nosed snake. Conservation actions following IUCN taxonomy are categorized in the table.

Easement acquisition:

Secure habitats critical to species survival by acquisition of conservation easements, or by other land protection mechanisms.

Habitat management:

Develop and implement mitigation measures to manage the adverse effects of habitat fragmentation.

Habitat research:

- Develop standardized habitat survey protocols, and implement survey protocols at all known and potentially suitable sites, to document the character, quality and extent of occupied habitat.

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 habitat requirements.

Modify regulation:

- Adopt into New York's Environmental Conservation Law provisions which designate timber rattlesnake, smooth greensnake, black ratsnake, northern black racer, northern copperhead, eastern hognose snake, short-headed gartersnake and worm snake as protected small game species.

Other action:

- Determine significance of specific threats to populations of species in this group, and formulate management options to control significant threats.
- Enhance law enforcement and public education to limit specimen collection, killing and translocation of woodland/grassland snake species.
- Educate the New York public to abandon misconceptions about the menace/value of woodland/grassland snakes.

Population monitoring:

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

Statewide baseline survey:

- Develop standardized population survey protocols, and implement survey protocols at all known and potentially suitable sites, to document the extent of occupied habitat for each of the woodland/grassland snake species in New York.

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	Habitat and Natural Process Restoration
Land/Water Management	Invasive/Problematic Species Control
Education & Awareness	Awareness & Communications
Law/Policy	Compliance & Enforcement

VII. References

Collins, J.T. 2006. A re-classification of snakes native to Canada and the United States. *Journal of Kansas Herpetology* 19:18-20.

COSEWIC. 2007. COSEWIC assessment and update status report on the Eastern Hog-nosed Snake *Heterodon platirhinos* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 36 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Daszak, P., L. Berger, A. A. Cunningham, A. D. Hyatt, D. E. Green, R. Speare. 1999. Emerging infectious diseases and amphibian population declines. *Emerging Infectious Diseases* 5(6): 735–748.

Daszak, P., A. A. Cunningham, and A. D. Hyatt. 2003. Infectious disease and amphibian population declines. *Diversity and Distributions* 9:141–150.

Gibbs, J. P., A. R. Breisch, P. K. Ducey, G. Johnson, J. L. Behler, and R. C. Bothner. 2007. *The amphibians and reptiles of New York state*. Oxford University Press, New York. xv + 422 pp.

Hammerson, G.A. 2007. *Heterodon platirhinos*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 11 March 2013.

Hulse, A.C. 2001. *Amphibians and reptiles of Pennsylvania and the Northeast*. Cornell University Press, Ithaca, NY.

Michener, M.C. and J.D. Lazell, Jr. 1989. Distribution and relative abundance of the hognose snake, *Heterodon platirhinos*, in eastern New England. *Journal of Herpetology* 23(1):35-40.

NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: March 11, 2013).

NEPARC. 2010. Northeast Amphibian and Reptile Species of Regional Responsibility and Conservation Concern. Northeast Partners in Amphibian and Reptile Conservation (NEPARC). Publication 2010-1.

Platt, D.R. 1969. Natural history of the hognose snakes, *Heterodon platyrhinos* and *Heterodon nasicus*. *University of Kansas Publications, Museum of Natural History* 18: 253-420.

Plummer, M. V, and N.E. Mills. 2000. Spatial ecology and survivorship of resident and translocated hognose Snakes (*Heterodon platirhinos*). *Journal of Herpetology* 34: 556-575.

Schlesinger, M.D., J.D. Corser, K.A. Perkins, and E.L. White. 2011. Vulnerability of at-risk species to climate change in New York. New York Natural Heritage Program, Albany, NY.

Schueler, F.W. 1996. Status Report on the Eastern Hog-nosed Snake, *Heterodon platirhinos*, in Canada. COSEWIC. 16 pp.

Therres, G.D. 1999. Wildlife species of regional conservation concern in the northeastern United States. *Northeast Wildlife* 54:93-100.

Date last revised: July 11, 2013