

Species Status Assessment

Class: Reptilia
Family: Natricidae
Scientific Name: *Regina septemvittata*
Common Name: Queensnake

Species synopsis:

Queensnakes were previously included in the large family Colubridae, but were recently reclassified to Natricidae (Collins and Taggart 2009). This species occurs from southwestern Ontario, western New York, and western Pennsylvania southward to Alabama. Queensnakes are strongly associated with water, inhabiting rivers, lakes, and streams, usually within 3 meters of the water's edge and only where crayfish are abundant. Queensnakes have experienced population declines in the northern portion of the range, due to habitat loss and degradation, pollution, and the invasion of non-native species including zebra mussel, rusty crayfish, and common reed (COSEWIC 2010, Gillingwater 2011). The queensnake's specialized diet of crayfish makes it vulnerable to declines in crayfish populations (COSEWIC 2010). Southern populations appear to be stable (NatureServe 2013).

In New York, queensnakes are known from only a few sites in Cattaraugus, Erie, and Genesee counties. It is among the rarest of reptiles in the state, with only a few specimens observed in recent years (Gibbs et al. 2007). It is listed as endangered due to its low numbers and limited distribution in the state. Queensnakes appear to have limited adaptability, given their specialized habitat needs and dependence on an abundant crayfish population (COSEWIC 2010).

I. Status

a. Current and Legal Protected Status

- i. **Federal** Not Listed **Candidate?** No
- ii. **New York** Endangered

b. Natural Heritage Program Rank

- i. **Global** G5
- ii. **New York** S1 **Tracked by NYNHP?** Yes

Other Rank:

IUCN – Least Concern
Species of Severe Concern (NEPARC 2010)
Species of Northeast Regional Conservation Concern (Therres 1999)
COSEWIC - Endangered

Status Discussion:

The queensnake is widespread in the United States and is ranked as globally secure, but populations on the northern edge of the range are declining (COSEWIC 2010). Queensnake has been designated as a species of Regional Conservation Concern in the Northeast due a lack of data that results in a suspicion of risk of disappearing from the region (Therres 1999). It is listed as endangered in New York, Massachusetts, New Jersey, and in Ontario where populations have been extirpated at half of 26 known sites (Gillingwater 2011). Populations in New Jersey are possibly extirpated. NEPARC (2010) lists queensnake 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 X stable unknown

ii. Distribution:

 declining increasing X stable unknown

Time frame considered: Last 30 years

b. Regional

i. Abundance

X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

X declining ___ increasing ___ stable ___ unknown

Regional Unit Considered: Northeast

Time Frame Considered: Since 1980s

c. Adjacent States and Provinces

CONNECTICUT Not Present X No data ___

MASSACHUSETTS Not Present X No data ___

QUEBEC Not Present X No data ___

VERMONT Not Present X No data ___

NEW JERSEY Not Present ___ No data ___

i. Abundance

___ declining ___ increasing ___ stable X unknown

ii. Distribution:

___ declining ___ increasing ___ stable X unknown

Time frame considered: Possibly extirpated

Listing Status: Endangered SGCN? Yes

Trends Discussion:

The scarcity of queensnakes combined with their cryptic behavior and aquatic habits make it difficult to assess populations (Gillingwater 2011). Significant losses have occurred in Ontario, with only 14 of 29 known locations having been confirmed since 1990 (COSEWIC 2010).

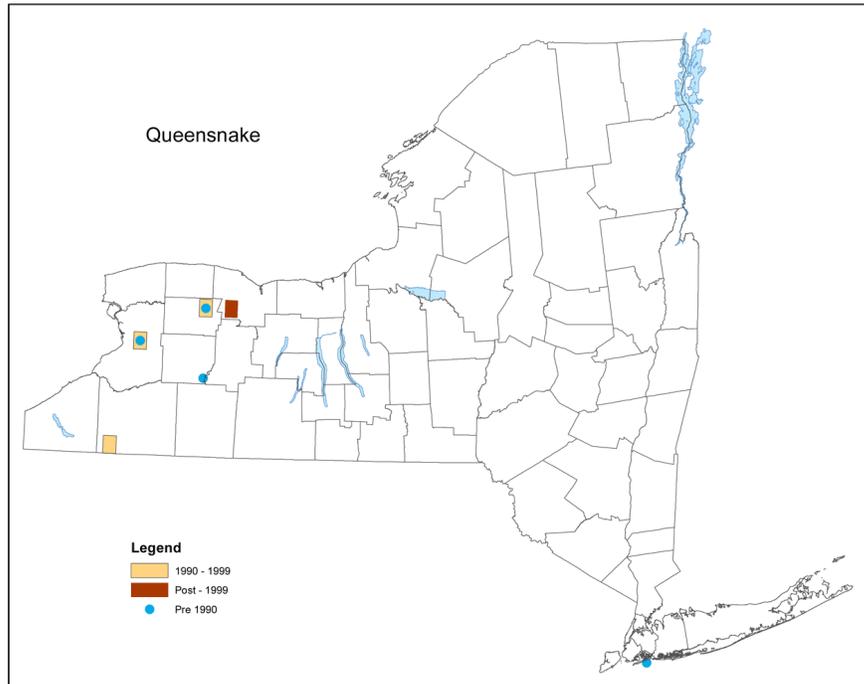


Figure 1: Distribution of queensnake in New York (NY Herpetology database).

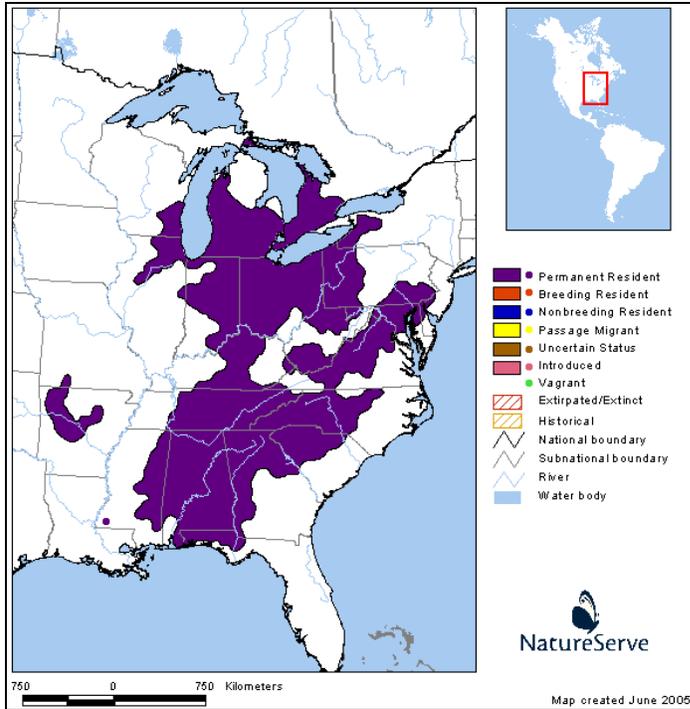


Figure 2: Distribution of queensnake in North America (NatureServe 2013).

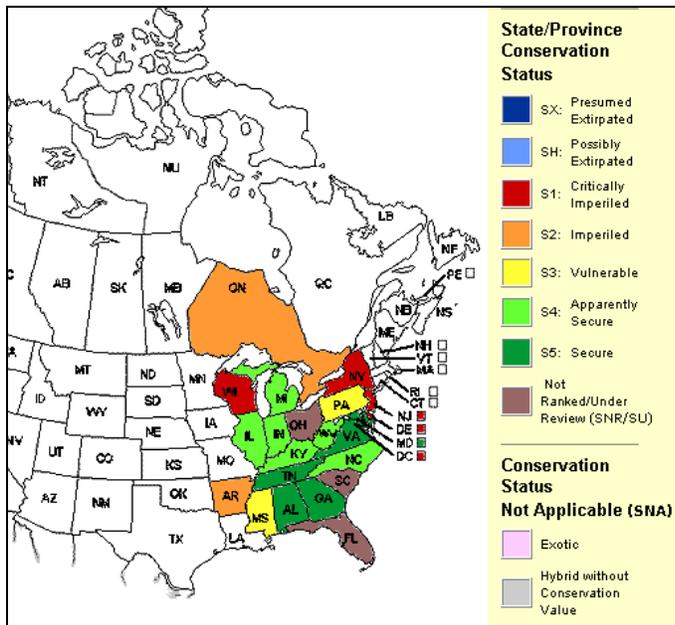


Figure 3: Conservation status of queensnake in North America (NatureServe 2013).

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	_____	_____	_____

Details of historic occurrence:

The American Museum of Natural History has a record of a queensnake from Queens County in 1875. A record from Wyoming County is from 1967.

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	_____	<u><1%</u>

Details of current occurrence:

The NY Amphibian and Reptile Atlas (1990-99) documented queensnakes in four survey quads in Cattaraugus, Erie, and Genesee (Bergen Swamp) counties. A record from one additional survey quad in Monroe County was added in 2003. Surveys of three known Erie County sites and the one known Wyoming County site during 2006-2008 encountered queensnakes at only one extant Erie County site (NYSDEC unpublished reports).

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. Headwater/Creek, Warm
- 2. Small River, Warm
- 3. Freshwater Marsh
- 4. Riparian

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:

Queensnakes are strongly associated with water and rarely venture far overland. Individuals are found along rivers and streams with a rocky or gravel substrate (frequently limestone), and where crayfish are abundant. Overhanging woody vegetation is typical, and individuals can also be found among or under rocks at the water's edge (Gibbs et al. 2007). Wood (1949) noted three habitat requirements for queensnakes: (1) a permanent still or flowing body of water with temperatures at or above 18 degrees Celcius for most of the active season, (2) an abundance of cover material such as flat rocks along the bank, and (3) a large population of crayfish. Less commonly occupied habitats include ponds, marshes, lakes, and quarries. Calm waters appear to be necessary to facilitate foraging, cover and possible thermoregulation (Gillingwater 2011).

A hibernation site on the Thames River in Ontario was described as a seepage on a south-facing clay slope at the river's high water mark. The access points were through a small mammal burrow and openings beneath exposed tree roots (Gillingwater 2011). Gibbs et al. (2007) report that in New York, hibernation occurs in muskrat lodges, crayfish burrows and in earth and stone dams.

Queensnakes can be considered an indicator of environmental quality because they are particularly susceptible to water quality and the health of crayfish prey. Crayfish too, are vulnerable to contamination and increased silt in water, and declines in crayfish will affect the viability of queensnake populations (COSEWIC 2010).

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:

The biology of queensnakes is not well known in the Northeast. Gillingwater (2011) reports that queensnakes are not well-suited to telemetry studies due to their high intolerance to stress and heat as well as their thin, elastic skin that abrades easily over a sub-dermal pit tag or transmitter.

Queensnakes are active from early April through October, but have been observed on the surface during mid-winter warm spells (Gibbs et al. 2007). Individuals bask on debris or overhanging vegetation at the water's edge and drop directly into the water when disturbed. They are generally inactive at night, remaining concealed under rocks or vegetation at the shoreline (Harding 1997).

Mating takes place during spring and young are born live during late July to early September. Mating in fall has been reported but has not been confirmed (Harding 1997). Broods typically include 10-14 young. Females reach sexual maturity in their third year (Branson and Baker 1974) and males in their second year (COSEWIC 2010). Longevity in the wild is unknown, but a specimen lived in captivity at a zoo for more than 19 years (Harding 1997).

Home ranges are small, and individuals remain near water, likely due to their vulnerability to dehydration (Stokes and Dunson 1982). In a study in Kentucky, Branson and Baker (1974) found that queensnakes did not move more than 30m from their original point of capture, while Ernst (2003) found that queensnakes stay within 6m of water.

Both young and adult queensnakes eat freshly-molted crayfish almost exclusively (Raney and Roecker 1947, Wood 1949). Other prey items include insect nymphs, small fish, tadpoles, and frogs (Gibbs et al. 2007). Predators include otters, mink, raccoons, great blue heron (Gibbs et al. 2007).

VI. Threats:

Queensnakes are threatened by habitat destruction, degradation, and fragmentation. The primary threats to habitat are the loss of specific habitats (e. g. hibernacula); the alteration of proportion or configuration of habitat features; the fragmentation of habitat by roads or other barriers; and the transformation of habitat caused by invasion of non-native plants (Gillingwater 2011).

In intensively cultivated landscapes, riparian habitat may be eliminated or degraded by livestock or agriculture. Any type of land use that extends to the edge of rivers and streams can be detrimental to queensnakes. Livestock that have access to rivers cause erosion, rutting, sedimentation, and excess nutrients. Runoff from agricultural fields results in siltation, erosion, contamination, and higher water levels. Channelization of rivers and streams, and dams reduce or destroy the quality of queensnake habitat. Plant succession that results in a heavy canopy degrades habitat by causing excessive shading (Gillingwater 2011).

Because of their trophic position, queensnakes could suffer from bioaccumulation of various chemical pollutants. Fontenot et al. (1996) reported a queen snake with significant quantities of PCBs. Queensnakes also have exceptionally permeable skin, which increased their susceptibility to pollutants (Stokes and Dunson 1982, Gillingwater 2011).

Rusty crayfish, *Orconectes rusticus*, is a non-native species that displaces native crayfish and may kill juvenile queensnakes; its large size may make it difficult for queensnakes to consume (COSEWIC 2010). This species has not yet been reported in western New York where queensnakes occur, but it is present in several drainages in the eastern and central parts of the state. The potential impact of rusty crayfish on queensnake populations is not yet understood. Other invasive wildlife that are problematic to queensnakes include common carp (*Cyprinus carpio*), zebra mussel (*Dreissena polymorpha*), and round goby (*Neogobius melanostomus*) (COSEWIC 2010, Gillingwater 2011).

Queensnakes are a target of indiscriminant killing by anglers who believe that the snakes are feeding on game fish (Harding 1997). Ernst and Ernst (2003) described an incident in southeastern Pennsylvania in which approximately 100 basking queensnakes were shot and killed by teenage boys. Recreational activities including hiking, angling, canoeing and ATV use can disturb or kill queensnakes. Although the effects of predation on queensnake populations are unknown, unnaturally high predator populations (e. g., raccoons) may reduce queensnake populations in urban areas or heavily used parks (COSEWIC 2010).

Queensnakes were classified as “presumed stable” 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 queensnake 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.

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, and no snake species are open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Army Corps of Engineers has the authority to regulate smaller wetlands in New York State, and the DEC has the authority to regulate smaller wetlands that are of unusual local importance. The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Conservation Law.

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

COSEWIC (2010) notes that the possibility of unassisted recolonization is low due to the queensnake’s limited ability to disperse. Assisted recolonization is also limited because queensnakes do not do well in captivity and movement of such a specialized species from one locale to another may prove difficult. Queensnake populations benefit from fencing that protects riparian areas (Homyack and Giuliano 2003).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for lake and river reptiles, which includes northern queensnake. Conservation actions following IUCN taxonomy are categorized in the table.

Habitat management:

- ___ Manage the variety of adverse influences which might reduce lake/river habitat suitability for the subject reptile species, including invasive aquatic plant species, water pollutants, lake level manipulations, aquatic weed control measures, excessive disturbance by watercraft, and fishing practices which incidentally take lake/river reptiles in significant numbers.
- ___ For lake/river turtles in this group, manage uplands adjacent to aquatic habitat in order to provide adequate and secure nesting habitat sites and to provide dispersal routes for migrating animals.

Habitat research:

- ___ Develop standardized habitat survey protocols for the subject species, 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 wetland/upland habitat requirements.

Modify regulation:

- ___ Adopt into New York's Environmental Conservation Law provisions which designate queen snake, eastern ribbonsnake, northern map turtle and spiny softshell as a protected small game species.

Other action:

- ___ Enhance law enforcement and public education to limit collection/translocation of wood turtles.

Population enhancement:

- ___ Employ restoration techniques for the spiny softshell and the queen snake at selected sites as needed, including captive breeding, head starting, nest protection, and repatriation/relocation strategies.

Population monitoring:

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

Statewide baseline survey:

— Develop population survey protocols and implement protocols at known and potentially suitable sites to determine the extent of occupied habitat in New York

Conservation Actions	
Action Category	Action
Land/Water Management	Site/Area Management
Land/Water Management	Habitat and Natural Process Restoration
Land/Water Management	Invasive/Problematic Species Control
Species Management	Species Recovery
Education & Awareness	Awareness & Communications
Law/Policy	Legislation
Law/Policy	Compliance & Enforcement

VII. References

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