

Species Status Assessment

Class: Reptilia
Family: Dipsadidae
Scientific Name: *Carphophis amoenus amoenus*
Common Name: Eastern wormsnake

Species synopsis:

This small fossorial snake has a pointed tip on the tail that facilitates its burrowing habits. Eastern worm snakes occur in deciduous woodlands in southwestern Massachusetts, Connecticut, Rhode Island, and southeastern New York southward to northern Georgia and Alabama. New York is at the northern edge of the range, and populations are found only on Long Island, in the lower Hudson Valley, and in the Albany Pine Bush in Albany County.

Although it is difficult to determine abundance and population trends for worm snakes because of their secretive and fossorial behavior, populations are known to have been lost, primarily as a result of habitat loss due to suburban development.

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** S2 **Tracked by NYNHP?** Yes

Other Rank:

IUCN – Least Concern
Species of Moderate Concern (NEPARC 2010)

Status Discussion:

The eastern worm snake is a southern species that reaches its northern extent in New York and Massachusetts. It is not common in New York, and only 20 occurrences are known (NYNHP 2013). The rangewide status is secure but states at the northern edge of the range have ranked wormsnake as Imperiled (NY) and Critically Imperiled (MA).

Assessment is difficult because surveying by searching under debris will only reveal individuals that are on the surface, but the bulk of wormsnake population may be several feet under the surface (Klemens 1993). Although suburban development has removed wormsnake habitat in many areas, they are capable of persisting in small patches in relatively urban areas, and large tracts of suitable habitat remain in several state forests (Klemens 1993). NEPARC (2010) lists eastern wormsnake as a species of moderate concern because more than 25% (but less than 50%) 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: _____

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Northern edge (MA and NY)

Time Frame Considered: _____

c. Adjacent States and Provinces

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

i. Abundance

____ declining ____ increasing ____ stable X unknown

ii. Distribution:

____ declining ____ increasing ____ stable X unknown

Time frame considered: _____

Listing Status: _____ Not Listed _____ SGCN? No

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

i. Abundance

____ declining ____ increasing ____ stable X unknown

ii. Distribution:

____ declining ____ increasing ____ stable X unknown

Time frame considered: Present in 5 towns in 1 county _____

Listing Status: _____ Threatened _____ SGCN? Yes

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

i. Abundance

____ declining ____ increasing ____ stable ____ unknown

ii. Distribution:

____ declining ____ increasing ____ stable ____ unknown

Time frame considered: _____

Listing Status: _____ Not Listed _____ SGCN? No

In Massachusetts, wormsnares are found in a small area of the state that is almost completely built out, and residential development is rapidly destroying what open areas remain (Klemens 1993).

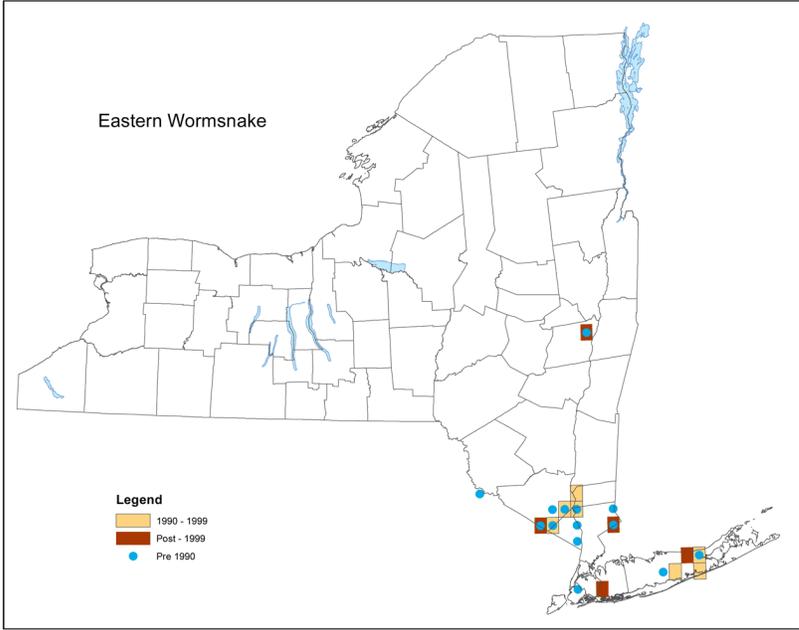


Figure 1: Distribution of eastern wormsnake in New York (NY Herpetology database, NYSDEC)

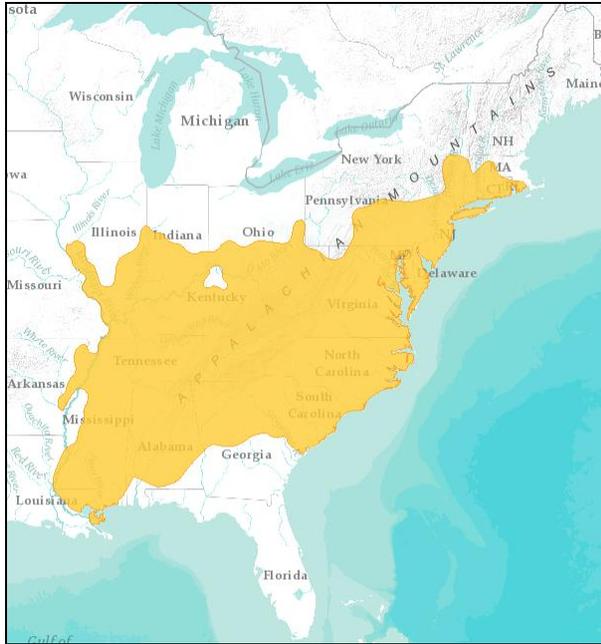


Figure 2: Distribution of eastern wormsnake in the United States (IUCN 2013)

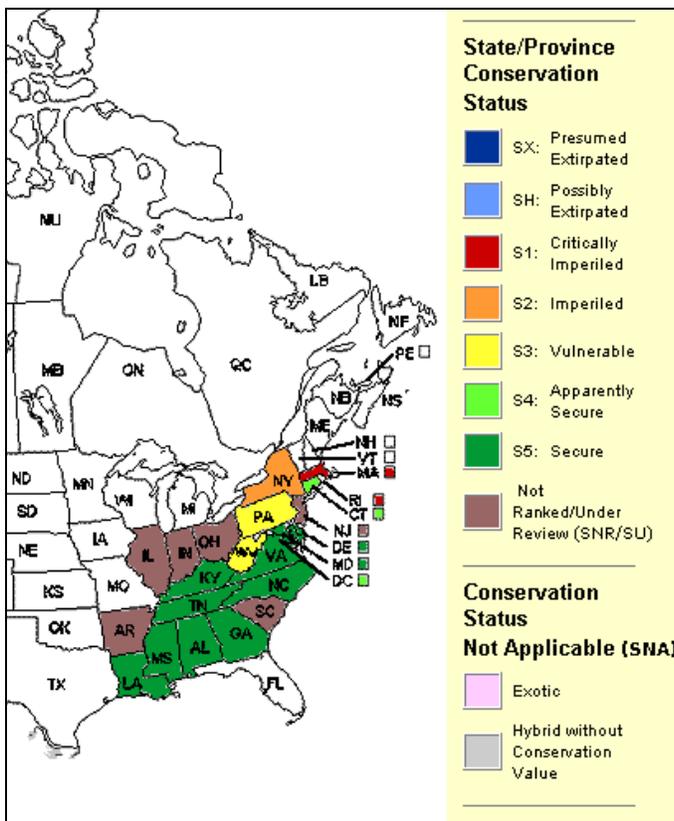


Figure 3: Conservation status of eastern wormsnake in the United States (NatureServe 2013)

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 NY Herpetology database includes a total of 19 survey quads that have historical records of eastern wormsnake.

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 project (1990-99) documented eastern wormsnares in 7 survey quads in Orange, Rockland, Putnam, and Suffolk counties. Records were added in 5 additional survey quads since 1999, most significantly in 3 quads where historic records existed but where the species was not confirmed during the Atlas. These included the Albany Pine Bush in Albany County, and two survey quads in Westchester County.

The NY Herpetology database includes a total of 12 survey quads in 7 counties (Albany, Orange, Rockland, Putnam, Westchester, Nassau, and Suffolk) that have records of eastern wormsnake since 1990. The NY Natural Heritage Program recognizes fewer than 20 occurrences statewide, but this is not a comprehensive list of known occurrences (NYNHP 2013). There is a gap in distribution in the mid-Hudson Valley counties of Dutchess and Columbia; wormsnares have not been reported in this region and may not occur there.

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. Oak-Pine Forest
2. Pine Barrens
3. Mixed Northern Hardwoods
4. Coastal Hardwoods
5. Coastal Coniferous Barrens
6. Old Field Managed Grasslands
7. Powerline

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:

Eastern worm snakes use second-growth deciduous forests, typically in moist areas near streams (Gibbs et al. 2007). They may also occur in drier areas; worm snakes use sand plains and pitch pine/scrub oak woodlands in New York and Massachusetts. In Pennsylvania, the habitat is described as rocky forested areas at woodland edges where there is an abundance of rocky cover (Hulse et al. 2001); this habitat is similar to that used in the Hudson Highlands of New York where wormsnakes have been found at ~1,400 foot elevation in Putnam and Dutchess counties (J. Jaycox, personal communication). Barbour (1960) reports wormsnakes using old fields and open pastureland, but only if forested areas are nearby. Compost piles and gardens may also be used. Wormsnakes appear to be restricted only from areas with compact soils (Gibbs et al. 2007).

Klemens (1993) notes that the highest elevations at collection sites in Connecticut are 800 to 900 feet (224-274m) and suggests that wormsnakes are excluded from high elevations by poorly drained and rocky soils, and by late spring and early autumn frosts.

Orr (2006) found wormsnakes in Virginia to occupy soils with a wide range of moisture content (10 to 83%) and a mean pH of 6.1 (5.0 to 6.9).

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 wormsnakes are active in New York from March through October. They are rarely observed on the surface and spend most time under cover objects or underground; most daily activity is probably nocturnal (Ernst and Ernst 2003). Little is known about courtship and mating. Gibbs et al. (2007) report that mating may occur in spring and early, but that some authors believe that mating occurs in the fall and females store sperm. A clutch of 1 to 8 eggs is deposited during late June to early July in rotting logs or sawdust piles. Eggs hatch in August or early September (Gibbs et al. 2007).

Wormsnakes feed almost exclusively on earthworms but will also eat other soft-bodied insects (Barbour 1960). The mean home range in Kentucky was found to be 253 square meters (280 square yards; Barbour et al. 1969). Orr (2006) found that males exhibited site fidelity but were also capable of exploiting new habitats.

Clark (1970) listed the following potential predators: large snakes, opossums, shrews, and moles. Klemens (1993) noted that a wormsnake had been killed by a domestic cat.

VI. Threats:

The primary threat to wormsnakes is habitat loss due to suburban development (Klemens 1993, Gibbs et al. 2007). Sandy areas inhabited by worm snakes are also frequently used by recreational off-road vehicles (ATVs). Flooding of wooded lowlands and forest fires can be very destructive to wormsnake populations (Ernst and Ernst 2003).

As a fossorial woodland species, wormsnakes are threatened by mining and excavation activities, and may be affected by floods. Sudden, hard frosts were reported to be a cause of mortality in Kansas (Clark 1970 *in* Klemens 1993). Ernst (1962 *in* Klemens 1993) reported that 6% chlordane dust applied to soil for insect control killed wormsnakes.

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, and few species are open to harvest (wormsnakes are not). 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:

Standardized survey protocols are needed for eastern wormsnake, and should be implemented at known and potential sites to characterize the quality and extent of habitat (NYNHP 2013) and to assess the population trend. Information is needed on threats.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for woodland/grassland snakes, which includes eastern wormsnake. 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

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