Common Name: Eastern ribbonsnake SGCN

**Scientific Name:** Thamnophis sauritus sauritus

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S4 Tracked: No

# **Synopsis:**

The eastern ribbonsnake occurs in much of the eastern United States and adjacent Canadian provinces, and is considered to be common. Although populations may be declining in some peripheral areas (Ernst and Ernst 2003), overall the population is thought to be stable (NatureServe 2013). The eastern ribbonsnake is near the northern limit of the range in New York. Populations found farther north in Ontario and a disjunct population in Nova Scotia are of the subspecies, northern ribbonsnake (*Thamnophis s. septentrionalis*), which also occurs in Maine, New Hampshire, Vermont, and Pennsylvania as well as in New York (Conant and Collins 1998). For most records in New York, no distinction has been made between the two subspecies, as the zone of integration has not been established (COSEWIC 2002).

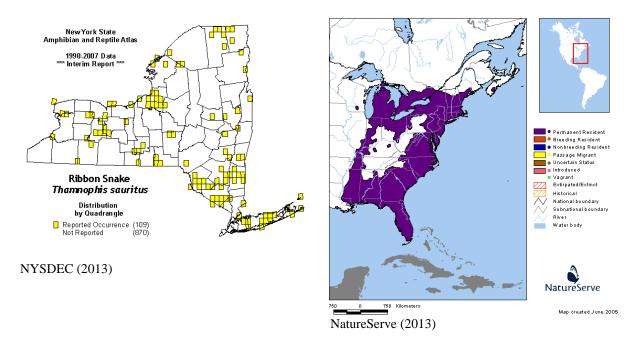
<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant			
6% to 10%	X	Common			
11% to 25%		Fairly common	X	Stable	Stable
26% to 50%		Uncommon			
> 50%		Rare			

### **Habitat Discussion:**

The eastern ribbonsnake is associated primarily with aquatic habitats, frequenting the edges of ponds, marshes, bogs, and streams (Gibbs et al. 2007). Although they avoid deep water (Tuttle and Marchand 2005), ribbonsnakes will readily swim, and are second only to the northern watersnake (*Nerodia sipedon*) in terms of their affinity for water (Gibbs et al. 2007). The ribbonsnake is semi-arboreal (Hulse et al. 2001), using thick vegetation of shrubs for shelter, and thus a shrub layer is an important component of the habitat (NatureServe 2013). Basking occurs in open grassy areas adjacent to water. Gravid females may move short distances to upland areas before giving birth (Harding 1997). Hibernation occurs in small mammal tunnels, among tree roots at the water's edge, or under fallen logs and other debris. In Pennsylvania, hibernation has been documented in shale banks (Hulse et al. 2001), and in Connecticut old ties and beds of railroads have been used (Klemens 1993).

Primary Habitat Type
Coastal Plain Pond
Freshwater Marsh
Headwater/Creek
Open Acidic Peatlands
Riparian

The ribbonsnake was reported to the NY Amphibian and Reptile Atlas project (1990-1999) in a total of 103 survey quads statewide, except for the Adirondack Mountains. The northern ribbonsnake was reported in 8 survey quads in Oswego, Monroe, and Livingston counties.



Threats to NY Populations							
Threat Category	Threat	Scope	Severity	Irreversibility			
Residential & Commercial     Development	Housing & Urban Areas (loss/degradation of shoreline habitats)	N	L	V			
2. Agriculture & Aquaculture	Annual & Perennial Non-Timber Crops (cutting and baling of hayfields)	N	L	н			
3. Pollution	Household Sewage & Urban Waste Water (degradation of water quality from urbanization)	N	L	Н			
4. Transportation & Service Corridors	Roads & Railroads (road mortality)	N	L	Н			
5. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (Phragmites, cattail, loosestrife)	W	L (possibly higher in future)	Н			

Conant, R., and J.T. Collins. 1998. Reptiles and amphibians: Eastern and central North America (3rd edition). Houghton Mifflin, Boston, Massachusetts, USA.

COSEWIC 2002. COSEWIC assessment and status report on the eastern ribbonsnake, *Thamnophis sauritus*. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp.

Ernst, C. H., and E. M. Ernst. 2003. Snakes of the United States and Canada. Smithsonian Books, Washington, D.C.

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. Harding, J.H. 1997. Amphibians and reptiles of the Great Lakes region. The University of Michigan Press, Ann Arbor. xvi + 378 pp.

Hulse, A.C., C.J. McCoy, and E.J. Censky. 2001. Amphibians and reptiles of Pennsylvania. Cornell University Press, Ithaca, NY.

Klemens, M.W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut. Bulletin No.112. Connecticut Department of Environmental Protection, Hartford, Connecticut, USA.

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 18, 2013).

Tuttle, K.A. and M.N. Marchand. 2005. Ribbon snake, *Thamnophis sauritus*. Pages A215-217 in NH Wildlife Action Plan: http://www.wildlife.state.nh.us/Wildlife/wildlife\_plan.htm. Accessed March 18, 2013.

Common Name: Eastern fence lizard SGCN

Scientific Name: Sceloporus undulatus

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S1 Tracked: Yes

# **Synopsis:**

The eastern fence lizard occupies open rocky areas and talus slopes with a southern exposure. Its distribution is widespread across much of the southern United States, but its status is poorly understood. The fence lizard's overall occurrence at the northern edge of the range is spotty and there is evidence of decline (Brittingham et al. 2005). A population in extreme southern New York is the northern extent of the distribution; because of its rarity in New York it is state-listed as threatened. As an open-area species, the fence lizard is susceptible to habitat loss through succession.

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common	X	Moderate Decline	Stable
26% to 50%		Uncommon			
> 50%		Rare			

#### **Habitat Discussion:**

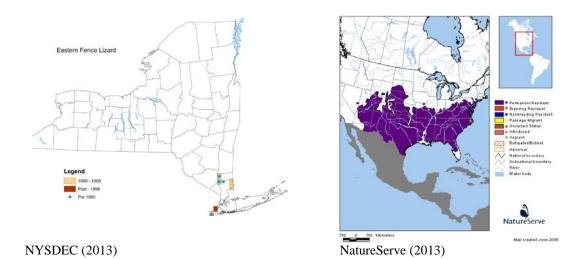
From Gibbs et al. (2007): Fence lizards occur in dry open woodlands with lots of sunlight, and are more abundant on south-facing hillsides. The availability of cover objects such as fallen logs, leaf litter, rocks, stumps, and brush piles is an important component of suitable habitat. Across the range, pine-dominated forests are most commonly used.

In Westchester and Putnam counties in New York, fence lizard populations are found in open areas of oak-hickory-ash forest with blueberry, laurel, scrub oak and pine with open rock faces or talus. Hibernation occurs in crevices under or between rocks, in rotting logs or stumps, or within burrows (NYSDEC 1993). The introduced population on Staten Island occupies sandy openings and pine woods within post oak-blackjack oak barren communities (NYNHP 2011).

Primary Habitat Type					
Cliff and Talus					
Oak Forest					
Oak-Pine Forest					
Pine Barrens					
Rocky Outcrop					

The fence lizard occurs in the extreme southeastern portion of the state, occurring in isolated small populations near Peekskill, Coldspring, and Fishkill, as well as on Staten Island, where the species was introduced in 1942 with the release of 29 individuals. It has never been documented on Long Island (NYSDEC 1993).

The NY Amphibian and Reptile Atlas (1990-99) documented fence lizards in a total of five survey quads, including three of the four historical locations. One additional survey quad was added after 1999, at Clay Pit Ponds State Park on Staten Island.



Threats to NY Populations							
Threat Category	Threat	Scope	Severity	Irreversibility			
1. Biological Resource Use	Hunting & Collecting Terrestrial Animals (collection for pet trade)	P	L	M			

## **References Cited:**

Brittingham, M., R. Criswell, T. Marget, J. Rawlins, J. Stauffer, R. Steele, editors. 2005. Pennsylvania Comprehensive Wildlife Conservation Strategy. The Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission. http://www.pgc.state.pa.us/portal/server.pt/community/pgc/9106

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.

New York State Department of Environmental Conservation. 1993. NYSDEC Species Dossier, Fence Lizard, *Sceloporus undulatus*. Delmar, NY

New York Natural Heritage Program. 2011. Online Conservation Guide for *Sceloporus undulatus*. Available from: http://www.acris.nynhp.org/guide.php?id=7517. Accessed February 27th, 2013.

Common Name: Eastern ratsnake SGCN

**Scientific Name:** Pantherophis alleghaniensis

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S4 Tracked: No

# **Synopsis:**

The eastern ratsnake was previously known as the black rat snake, *Elaphe o. obsoleta*. Genetic work over the past ten years resulted not only in a different genus and species, but a changed common name as well. Burbrink (2000) recognized three distinct species: *Pantherophis obsoletus* (west of the Mississippi), *P. spiloides* (central), and *P. alleghaniensis* (eastern). The genus *Pantherophis* was subsequently resurrected for ratsnakes north of Mexico (Crother 2008). The eastern ratsnake occurs in most of the eastern United States including New York. The gray ratsnake, *P. spiloides*, is also believed to occur in New York but the line between the two species is yet undefined.

New York is near the northern edge of the distribution, which extends from Ontario southward to Florida along all of the coastal states. Preferred habitat includes areas where open lands and wooded lands intermix; the species thus benefits from agriculture and forestry practices that result in edges and a mosaic of habitats. Old buildings are also used. Though this snake is tolerant of habitat modification, it is not tolerant of habitat loss—particularly loss of den sites—and some populations at the edge of the range have declined due to development. Road mortality, collection, and direct persecution are other threats. Populations in New York appear to be stable.

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant			
6% to 10%	X	Common			
11% to 25%		Fairly common	X	Stable	Stable
26% to 50%		Uncommon			
> 50%		Rare			

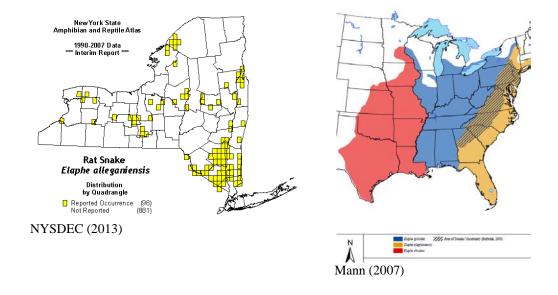
#### **Habitat Discussion:**

Eastern ratsnakes are found in areas that provide a mixture of open land and forested land. Open areas include fields, thickets, early-successional habitats, and wetland edges; occupied forests may be dense. Abandoned buildings, infrequently-used buildings, and barns may also be used. McLeod and Gates (1998) found that ratsnakes were more common in cut-over hardwood forests than in undisturbed hardwood forests in Maryland, perhaps due to the higher abundance of rodent prey.

At the northern limit of the distribution in the northeast, eastern ratsnakes may be limited by the availability of suitable hibernacula (Gibbs et al. 2007). Hibernation takes place in rocky talus, rocky woodland areas, or along ledges, as well as in basements, root cellars, cisterns, and wells (Hulse et al. 2001). Southern or southwestern exposure is necessary to provide the maximum thermal benefit from the winter sun and to provide basking areas in spring and fall. This species may overwinter with black racer, timber rattlesnake, and northern copperhead.

Primary Habitat Type
Cliff and Talus
Cultivated Crops
Non-native Shrublands
Oak-Pine Forest
Old Field/Managed Grasslands
Pasture/Hay
Plantation, Disturbed Land, Pioneer Forest
Powerline
Residential Rural
Rocky Outcrop

Eastern ratsnakes occur south of the Tug Hill Plateau and Adirondack Mountains as far north as Lake George. A disjunct population occurs in Jefferson and St. Lawrence counties; this is an extension of a population that occurs on the Rideau Lakes district in Ontario (Gibbs et al. 2007). The NYS Amphibian and Reptile Atlas documented ratsnakes in 96 out of 979 survey quads. Since 2000, records have been added to the NY Herpetology database in 4 additional survey blocks.



Threats to NY Populations						
Threat Category	Threat	Scope	Severity	Irreversibility		
Residential & Commercial     Development	Housing & Urban Areas (loss/degradation of habitat)	N	L	Н		
2. Transportation & Service Corridors	Roads & Railroads (road mortality)	W	L	Н		
3. Biological Resource Use	Hunting & Collecting Terrestrial Animals (collection for pet trade; persecution)	N	L	М		
4. Human Intrusions & Disturbance	Recreational Activities (ATV use)	N	L	Н		
5. Energy Production & Mining	Mining & Quarrying (mining operations destroy den habitats)	N	L	Н		
6. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (disease)	R	L	V		

Burbrink, F.T. 2000. Mitochondrial DNA phylogeography of the North American rat snake (*Elaphe obsoleta*): a critique of the subspecies concept. Evolution 54: 2107-2114.

Crother, B. I. (editor). 2008. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Sixth edition. Society for the Study of Amphibians and Reptiles Herpetological Circular 37:1-84.

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.

Hulse, A.C., C.J. McCoy, and E.J. Censky. 2001. Amphibians and reptiles of Pennsylvania. Cornell University Press, Ithaca, NY.

Common Name: Eastern wormsnake SGCN

**Scientific Name:** Carphophis amoenus amoenus

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Special Concern Global: G5

New York: S2 Tracked: Yes

# **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.

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common		Moderate Decline	Moderate Decline
26% to 50%		Uncommon	X		
> 50%		Rare			

# **Habitat Discussion:**

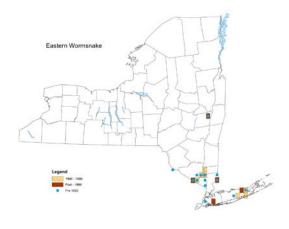
Eastern worm snakes use second-growth deciduous forests, typically in moist areas near streams (Gibbs et al. 2007). They may also occur in drier areas; worm snakes use sand plains and pitch pine/scrub oak woodlands in New York and Massachusetts. In Pennsylvania, the habitat is described as rocky forested 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  $\sim$ 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.

Primary Habitat Type
Coastal Coniferous Barrens
Coastal Hardwoods
Mixed Northern Hardwoods
Oak-Pine Forest
Old Field/Managed Grasslands
Pine Barrens
Powerline

The NY Amphibian and Reptile Atlas project (1990-99) documented eastern wormsnakes 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; wormsnakes have not been reported in this region and may not occur there.





NYSDEC (2013)

IUCN (2013)

Threats to NY Populations							
Threat Category	Threat	Scope	Severity	Irreversibility			
Residential & Commercial     Development	Housing & Urban Areas (habitat loss/degradation from suburban development)	R	L	Н			
2. Human Intrusions & Disturbance	Recreational Activities (ATV use)	N	L	M			
3. Energy Production & Mining	Mining & Quarrying (affected by mining and excavation due to fossorial nature)	N	L	Н			

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, NY.

Hulse, A. C., C. J. McCoy, and E. Censky. 2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Cornell University Press, Ithaca, NY.

Jaycox, Jesse. New York State Office of Parks, Recreation, and Historic Preservation. Staatsburg, NY.

Klemens, M.W. 1993. The amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut, Bull. I 12: l-3 18.

New York Natural Heritage Program. 2013. Online Conservation Guide for *Carphophis amoenus*. Available from: http://acris.nynhp.org/guide.php?id=7521. Accessed May 16th, 2013.

Common Name: Northern black racer SGCN

**Scientific Name:** Coluber constrictor constrictor

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S4 Tracked: No

# **Synopsis:**

The northern black racer is a large black snake that is known to shake its tail when threatened, a behavior that is thought to mimic the threatening sound of a rattlesnake. Eleven subspecies of racers occur across North America. The northern black racer is found in southern Maine and the southern half of Vermont, New Hampshire and New York, and extends southward through northern Alabama and westward to Kentucky. It is a habitat generalist, occurring in a wide variety of woodlands and open areas where prey, cover, and hibernation sites are available.

Racers remain locally common in some areas, but local extirpations have been widely noted. As large and active snakes, racers require a mosaic of habitats in a large area and populations may decline quickly in response to intensive agriculture or surburban development (Harding 1997). The most significant threats to black racer are habitat loss and the proliferation of roads and their increasing amounts of traffic. These threats are exacerbated by the extensive habitat requirements (Kjoss and Litvaitis 2000).

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant			
6% to 10%	X	Common	X		
11% to 25%		Fairly common		Stable	Stable
26% to 50%		Uncommon			
> 50%		Rare			

## **Habitat Discussion:**

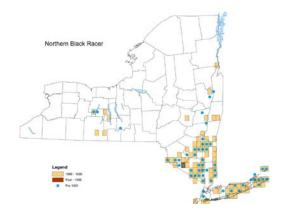
The eastern black racer is a habitat generalist, but in the Northeast is typically associated with dry, upland forest habitats. They are found in open woodlands, shrubby grasslands and pastures, old fields, dunes, and along marsh edges (Gibbs et al. 2007). Ernst and Ernst (2003) note that wetlands may be an important component of the habitat mosaic, as racers are particularly susceptible to dehydration.

Habitat at the single occupied site in Vermont is described as open ledge with grass, fern, and other herbaceous cover (Kart et al. 2005).

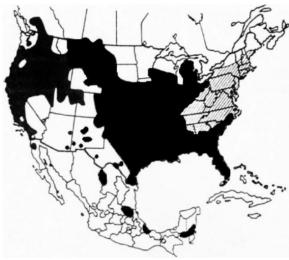
In the fall, racers move great distances to rocky, wooded slopes and ledges where hibernation occurs. Other hibernation sites include mammal burrows, old building foundations, and rotted tree stumps. In Massachusetts, racers use an artificial hibernacula that consists of a large (>1 acre) pile of waste debris from dams, dikes, and mining operations (MA Division of Fisheries & Wildlife 2005). Racers may hibernate with other large snakes including timber rattlesnakes, northern copperhead, and black ratsnakes (Gibbs et al. 2007).

Primary Habitat Type
Cliff and Talus
Forest and Woodland; Northeast Upland Forest
Maritime Dunes
Old Field/Managed Grasslands
Powerline
Wet Meadow/Shrub Marsh

In New York this species occurs primarily on Long Island and in the lower Hudson Valley.



NYSDEC (2013)



Mays and Todd (2007)

Threats to NY Populations						
Threat Category	Threat	Scope	Severity	Irreversibility		
Residential & Commercial     Development	Housing & Urban Areas (habitat loss/degradation from suburban development)	R	L	Н		
2. Agriculture & Aquaculture	Annual & Perennial Non-Timber Crops (direct mortality from farm equipment)	N	L	М		
3. Transportation & Service Corridors	Roads & Railroads (road mortality)	Р	М	V		
4. Human Intrusions & Disturbance	Recreational Activities (ATV use)	R	L	Н		
5. Pollution	Agricultural & Forestry Effluents (pesticide residue, particularly for juveniles)	N	L	М		
6. Energy Production & Mining	Mining & Quarrying (disturbance to basking areas from mining activities)	W	М	М		

Ernst, C. H. and E. M. Ernst. 2003. Snakes of the United States and Canada. The Smithsonian Institution. Washington, D.C., USA and London, England.

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, NY

Harding, J. H. 1997. Amphibians and Reptiles of the Great Lakes Region. Ann Arbor, MI: University of Michigan Press. 378 pp.

Kart, J., R. Regan, S.R. Darling, C. Alexander, K. Cox, M. Ferguson, S. Parren, K. Royar, B. Popp, editors. 2005. Vermont's Wildlife Action Plan. Vermont Fish & Wildlife Department. Waterbury, Vermont, www.vtfishandwildlife.com

Kjoss, V. A. and J. A. Litvaitis. 2000. Community structure of snakes in a human-dominated landscape. Biological Conservation 98:285-292.

Massachusetts Division of Fisheries & Wildlife. 2005. Commonwealth of Massachusetts Comprehensive Wildlife Conservation Strategy. Department of Fish and Game, Executive Office of Environmental Affairs. <a href="http://www.mass.gov/dfwele/dfw/">http://www.mass.gov/dfwele/dfw/</a>

Mays, J. D. and C. S. Todd. 2007. Northern black racer assessment. Maine Division of Inland Fisheries and Wildlife, Wildlife Division. Available at

 $http://maine.gov/ifw/wildlife/species/plans/reptiles/northernblackracer/species assessment 07.pdf \\ [Accessed May 17, 2013]$ 

Common Name: Northern coal skink SGCN

**Scientific Name:** Plestiodon anthracinus anthracinus

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S2S3 Tracked: Yes

# **Synopsis:**

Formerly classified in the genus *Eumeces* (Griffith et al. 2000), the northern coal skink occurs in highly fragmented populations in the eastern half of the United States. It reaches its northern limit in New York, where scattered populations occur in the western third of the state. Where this skink is found, it may be locally abundant but the species is generally uncommon. The coal skink typically associates with water, occurring in moist forested areas near wetlands, or in open rocky or shale areas adjacent to wetlands (Gibbs et al. 2007). Coal skinks will also use suburban areas as long as cover objects are plentiful. Although its secretive habits make documentation difficult, coal skink populations are thought to be stable to possibly declining.

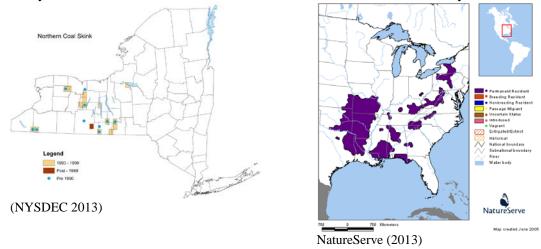
<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common		Stable	Stable
26% to 50%		Uncommon	X		
> 50%		Rare			

### **Habitat Discussion:**

Coal skinks require plentiful cover objects including loose flat rocks, leaf litter, and logs. While they are generally found within 50m (165 ft) of water, they may also occur many kilometers away from the nearest water source (Hulse et al. 2001). They are associated with water, occurring in moist forested areas adjacent to wetlands and swamp. They will also use rocky hillsides or open shale areas as long as a water body is nearby. Crevices that allow access to areas below the frost line are used for hibernation (Gibbs et al. 2007). As long as sufficient cover objects are available, coal skinks will also use anthropogenic habitats including manicured lawns, powerline cuts, railroad beds, and shale pits (Brittingham et al. 2005).

Primary Habitat Type
Floodplain Forest
Mixed Hardwood Swamp
Powerline
Riparian
Rocky Outcrop
Surface Mining
Urban and Recreational Grasses

Coal skinks are locally abundant in areas where they occur, but populations are scattered widely in the eastern United States. The northernmost population occurs across the borders of New York and Pennsylvania, about 60 miles from the next nearest records in southern Pennsylvania.



Threats to NY Populations						
Threat Category	Threat	Scope	Severity	Irreversibility		
Residential & Commercial     Development	Housing & Urban Areas	N	L	Н		
2. Natural System Modifications	Other Ecosystem Modifications (succession)	W	L (higher impact over time)	L		
3. Human Intrusions & Disturbance	Recreational Activities (ATV)	R	M	Н		

## **References Cited:**

Brittingham, M., R. Criswell, T. Marget, J. Rawlins, J. Stauffer, R. Steele, editors. 2005. Pennsylvania Comprehensive Wildlife Conservation Strategy. The Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission. http://www.pgc.state.pa.us/portal/server.pt/community/pgc/9106

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.

Griffith, H., A. Ngo, and W. Murphy. 2000. A cladistic evaluation of the cosmopolitan genus *Eumeces* Wiegmann (Reptilia, Squamata, Scincidae). Russian Journal of Herpetology 7:1-16.

Hulse, A. C., C. J. McCoy, and E. Censky. 2001. Amphibians and reptiles of Pennsylvania and the Northeast. Comstock Publishing Associates, Cornell University Press, Ithaca. 419 pp.

Common Name: Northern copperhead SGCN

**Scientific Name:** Agkistrodon contortrix mokasen

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S3 Tracked: No

# **Synopsis:**

Copperheads occur across most of the southern two-thirds of the eastern United States, from western Texas to the northern portion of Florida, northward to southern portions of the Great Lakes states, and just reaching into the southeastern corner of New York. Copperheads are found in open areas within deciduous forests where there is an abundance of rocky substrate. Such areas include mountainous talus slopes, rocky hillsides, and ledges during spring and fall, but during summer months copperheads may use low-lying fields, meadows, and wetlands (Gibbs et al. 2007).

Rangewide, populations appear to be stable (Frost et al. 2007). In New York, it is likely that declines have occurred as a result of habitat loss and persecution, though they have not been quantified. Copperheads apparently are able to survive in close proximity to humans, due to their cryptic coloration and secretive, frequently nocturnal behavior (Klemens 1990). Unlike timber rattlesnakes, which have been called "high-strung" because they alert humans of their presence by rattling their tail, copperheads likely protect themselves from human persecution to some degree by remaining quiet (Klemens 1990).

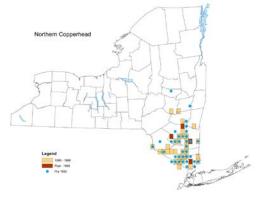
<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common		Stable	Stable
26% to 50%		Uncommon	X		
> 50%		Rare			

### **Habitat Discussion:**

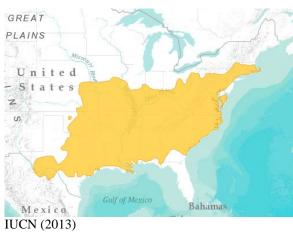
Copperheads are found in open areas of deciduous forests where the topography can be characterized as hilly or mountainous. Abundant rocks, logs, stumps and leaf litter provide an excellent match for this snake's camouflage. Exposed rocky outcrops, ledges, and talus slopes with a south-facing exposure provide important basking and hibernation opportunities. During summer months, copperheads may be found in wet meadows, fields, and at the edges of swamps (Gibbs et al. 2007).

Primary Habitat Type
Caves and Tunnels
Cliff and Talus
Oak Forest
Powerline
Residential Rural
Surface Mining
Wet Meadow/Shrub Marsh

Copperheads are widespread in Westchester, Putnam, Orange and Ulster counties, and occur sparsely northward to southern Schoharie and Albany counties.



NYSDEC (2013)



Threats to NY Populations						
Threat Category	Threat	Scope	Severity	Irreversibility		
Residential & Commercial     Development	Housing & Urban Areas (loss/degradation from suburban development)	N	L	Н		
2. Biological Resource Use	Hunting & Collecting Terrestrial Animals (collection for pet trade)	N	L	M		
3. Biological Resource Use	Hunting & Collecting Terrestrial Animals (fear-based persecution)	W	L	Н		
4. Human Intrusions & Disturbance	Recreational Activities (frequent visits to den site)	N	L	Н		
5. Invasive & Other Problematic Species & Genes	Problematic Native Species (emerging disease including fungal dermatitis)	N	L	Н		
6. Transportation & Service Corridors	Roads & Railroads (road mortality)	N	L	Н		
7. Energy Production & Mining	Mining & Quarrying (disturbance at basking sites by mining activities)	N	L	V		

Frost, D.R., G. A. Hammerson and G. Santos-Barrera. 2007. *Agkistrodon contortrix*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. < <a href="https://www.iucnredlist.org">www.iucnredlist.org</a>>. Downloaded on 29 May 2013.

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Klemens, M.W. 1990. The herpetofauna of southwestern New England. Ph.D. dissertation, University of Kent, Canterbury, UK.

Common Name: Northern diamond-backed terrapin SGCN

**Scientific Name:** *Malaclemys terrapin terrapin* 

**Taxon:** Reptiles

Federal Status: G3 Natural Heritage Program Rank:

New York Status: S4 Global: G4

New York: S3 Tracked: No

# **Synopsis:**

The diamond-backed terrapin is a fully aquatic, coastal plain species that occurs in brackish waters along the East Coast of the United States from Massachusetts to Florida and along the entire Gulf of Mexico (Carr 1952). The northern subspecies that occurs in New York is found southward to Virginia. In New York, this terrapin occurs in the bays and inlets around Long Island, the NY Harbor, and in the lower Hudson River; it is near the northern extent of the range. After recovering from near extinction as a result of overhunting for human consumption in the early 1900s, diamond-backed terrapin populations are now threatened rangewide primarily by drowning in crab traps (Butler et al. 2006, Dorcas et al. 2007), and in New York by predation of nests and nesting females, habitat loss, and habitat degradation by invasive plants (Butler et al. 2006).

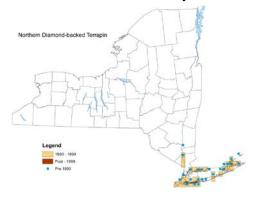
<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib	~	NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common	X	Stable	Moderate Decline
26% to 50%		Uncommon			
> 50%		Rare			

### **Habitat Discussion:**

The diamond-backed terrapin is found in estuarine systems. It is the only species of turtle in North America that requires brackish habitats. Salt marshes dominated by cordgrass, and mud flats that border quiet salty or brackish waters are used. Terrapin may also be found in coves and shallow bays. Simoes and Chambers (1999) reported individuals in the Hudson River near Piermont Marsh swimming in open water around rocky piers and sandbar areas. Nesting occurs in dry, open sandy areas nearby, typically on high dunes. Hibernation occurs in the muddy substrate in estuary channels, fresh or brackish ponds, streams, or in sheltered salt wetlands (CT DEP 2005).

Primary Habitat Type				
Estuarine; Brackish Intertidal; Tidal Wetland				
Lake and River Beach				
Maritime Dunes				
Tidal Creek				
Tidal Flat				

Diamond-backed terrapin are still found in waters around Long Island, New York City and in the Hudson River as far north as Tivoli Bay.





NYSDEC (2013)

Threats to NY Populations						
Threat Category Threat		Scope	Severity	Irreversibility		
Residential & Commercial     Development	Housing & Urban Areas (loss/degradation of habitat)	N	L	Н		
2. Transportation & Service Corridors	Roads & Railroads (road mortality, including airport runways)	W	L	Н		
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (crab pot mortality)	W	L	L		
4. Pollution	Industrial & Military Effluents (oil spills)	N	L	M		
5. Human Intrusions & Disturbance	Recreational Activities (disturbance from people on beaches)	N	L	L		
6. Human Intrusions & Disturbance	Recreational Activities (strikes from boat propellers)	W	L	Н		
7. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species & Genes (rats)	R	L	Н		
8. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species & Genes (Phragmites)	R	М	Н		
9. Invasive & Other Problematic Species & Genes	Problematic Native Species (increased raccoon populations from urbanization)	Р	M	Н		
10. Climate Change & Severe Weather	Habitat Shifting & Alteration (loss of marsh from sea level rise)	P	M	Н		

Butler, J. A., G. L. Heinrich, and R. A. Seigel. 2006. Third Workshop on the Ecology, Status, and Conservation of Diamondback Terrapins (*Malaclemys terrapin*): Results and Recommendations. Chelonian Conservation and Biology: December 2006, Vol. 5, No. 2, pp. 331-334.

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Dorcas, M. E., J. D. Willson, and J.W. Gibbons. 2007. Crab trapping causes population decline and demographic changes in diamondback terrapins over two decades. Biological Conservation 137(3):334-340.

Simoes, J. C. and R. M. Chambers. 1999. The diamondback terrapins of Piermont Marsh, Hudson River, New York. Northeastern Naturalist 6:241-248.

**Common Name:** Northern map turtle *SGCN* 

**Scientific Name:** Graptemys geographica

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5 New York: S3

Tracked: No

# **Synopsis:**

Formerly known as common map turtle, the northern map turtle is a large, aquatic species whose strong jaws are indicative of its preference for invertebrate prey, including mollusks. Map turtles are found in the eastern United States in the Great Lakes drainage and the Mississippi drainage northward to southeastern Quebec and Ontario (Rosche 2002). In New York, populations are found in the major water bodies of the Hudson River, Lake Champlain, Lake George, and along the Great Lakes Plain. Map turtles use rivers and large lakes, and can be seen basking in large groups on emergent deadwood (Lindeman 1999), exposed muddy banks, and mats of floating aquatic vegetation, as well as areas of exposed bedrock (W. Hoffman, personal observation). Populations are large and appear to be secure in the central portions of the range (NatureServe 2013), but threats including road mortality and water pollution—especially for peripheral populations—combined with delayed age to maturity are causes for concern.

Distribution (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common	X	Stable	Unknown
26% to 50%		Uncommon			
> 50%		Rare			

# **Habitat Discussion:**

Map turtles are found in large lakes and rivers with slow-moving water and a muddy bottom (Rosche 2002). A high density of deadwood snags is an important component of suitable habitat for *Graptemys* species (Lindeman 1999), as is the width of the water body such that aerial basking can occur (Selman and Qualls 2009), and a line of sight that allows turtles to drop quickly into the water when threatened (Rosche 2002). An abundant source of invertebrate prey is also important. Beyond basking, map turtles leave the water only to lay eggs, and females will move a distance to find an upland area outside the flood zone (Gordon and MacCulloch 1980, DeGraff 1983).

Juveniles use shallow areas where they are less exposed to aquatic and terrestrial predators, while adults use deeper water; their larger body size allows them to deal with a stronger current (Pluto and Bellis 1985 in Rosche 2002).

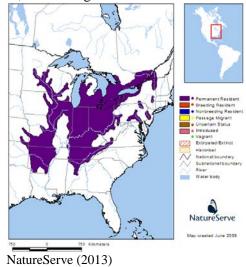
Map turtles hibernate in the mud at the bottom of deep pools within large water bodies, or in the burrows of beaver or muskrat (Gibbs et al. 2007). Well-oxygenated water is required during hibernation (Reese et al. 2001).

Primary Habitat Type
Lake
Lake and River Beach
Large/Great River

This species occurs in the large water bodies of the Hudson River, Lake Champlain, Lake George, Lake Erie, Lake Ontario, and the St. Lawrence and Niagara rivers, as well as in the New York Harbor (Gibbs et al. 2007). Since 2000, map turtles were documented in an additional 10 survey quads in four counties that previously had no records: Broome, Franklin, Jefferson, and Oswego.



NYSDEC (2013)



Threats to NY Populations						
Threat Category	Threat	Scope Severit		Irreversibility		
Residential & Commercial     Development	Housing & Urban Areas (habitat loss/degradation from shoreline development)	R	L	Н		
2. Human Intrusions & Disturbance	Recreational Activities (propeller strikes from recreational boating esp. in Niagara River)	N	L	Н		
3. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (zebra mussels)	W	L	Н		
4. Transportation & Service Corridors	Roads & Railroads (road mortality)	N	L	Н		
5. Natural System Modifications	Dams & Water Management/Use (dams may affect habitat quality)	N	L	Н		
6. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (competition with redeared sliders for basking sites)	N	L	L		
7. Climate Change & Severe Weather	Storms & Flooding (repeated catastrophic flood events in Appalachian plateau)	N	L	Н		
8. Natural System Modifications			L	М		

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Gibbs, J. P. and W. G. Shriver. 2002. Estimating the effects of road mortality on turtle populations. Conservation Biology 16(6):1647-1652.

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Lindeman, P.V. 1999. Surveys of basking map turtles *Graptemys* spp. in three river drainages and the importance of deadwood abundance. Biological Conservation 88:33–42.

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Roche, B. 2002. COSEWIC status report on the northern map turtle, *Graptemys geographica* in Canada. In COSEWIC assessment and status report on the northern map turtle *Graptemys geographica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-34 pp.

Selman, W. and C. Qualls. 2009. Distribution and abundance of two imperiled *Graptemys* species of the Pascagoula River system. Herpetological Conservation and Biology 4(2):171-184.

Common Name: Short-headed gartersnake SGCN

Scientific Name: Thamnophis brachystoma

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G4

New York: S3 Tracked: No

# **Synopsis:**

The short-headed gartersnake was formerly classified in the large family Colubridae. It has an extremely limited distribution, occurring only in small regions of New York and Pennsylvania; there is an introduced population in Ohio. In New York, this gartersnake occurs only in parts of five western counties: Chautauqua, Cattaraugus, Chemung, Allegany and Erie. The occurrence of this species in a restricted range makes it vulnerable and declines have been noted (Harding 1997). In New York populations appear to have stabilized at lower numbers following severe declines after the 1950s (Gibbs et al. 2007).

This gartersnake uses a variety of open grassland habitats and adapts well to urbanized areas. Short-headed gartersnakes may benefit from human activities that create open habitats at the expense of wooded areas, but intense urbanization and agricultural land use changes can be detrimental.

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant			
6% to 10%		Common			
11% to 25%		Fairly common	X	Moderate Decline	Moderate Decline
26% to 50%		Uncommon			
> 50%		Rare			

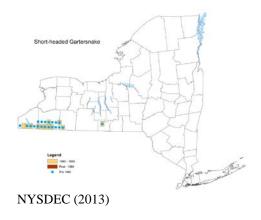
# **Habitat Discussion:**

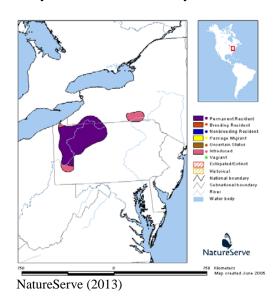
Short-headed gartersnakes are found in a variety of non-wooded areas, often in close proximity to water or wetlands but not always (Gibbs et al. 2007). Such areas include meadows, pastures, old fields, hillsides and embankments as well as forest edges (Harding 1997). During June, July, and August they may be most easily found by turning over natural cover objects such as logs or rocks, or human-generated debris such as plywood, roofing metal, and tar paper (Harding 1997, Hulse et al. 2001). Short-headed gartersnakes occur in both urban areas and agricultural areas, only avoiding shady woodland habitats (Harding 1997, Ernst and Ernst 2003). They may be found at elevations ranging from 900 to 2,400 feet (275 to 730m) (Gibbs et al. 2007).

Bothner (1963) reported on a hibernaculum in Cattaraugus County. The hibernacula was on a shale bank about 200 feet (60m) from a stream. Twelve individuals were found wedged in cracks and crevices at depths that varied from about 17 to 45 inches underground. Also found in the hibernaculum were eastern newts, spotted salamanders, and red-bellied snakes.

Primary Habitat Type
Old Field/Managed Grasslands
Pasture/Hay
Residential Rural

The NY Amphibian and Reptile Atlas (1990-99) documented short-headed gartersnakes in 10 survey quads in Allegany, Cattaraugus, and Chautauqua counties. A disjunct population occurs in a single survey quad near Horseheads in Chemung County. A second disjunct population has more recently been documented in the vicinity of the Buffalo River in the City of Buffalo, Erie County.





Threats to NY Populations							
Threat Category	Threat	Scope	Severity	Irreversibility			
Invasive & Other Problematic     Species & Genes	Problematic Native Species (increased predation by human- subsidized predators including opossum, coyote, fox)	W	L	Н			
2. Natural System Modifications	Other Ecosystem Modifications (succession)	W	M	M			

# **References Cited:**

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Ernst, C.H. and E.M. Ernst. 2003. Snakes of the United States and Canada. Smithsonian, Washington, D. C.

Harding, J. H. 1997. Amphibians and Reptiles of the Great Lakes Region. Ann Arbor, MI: University of Michigan Press. 378 pp.

Hulse, A. C., C. J. McCoy, and E. Censky. 2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Cornell University Press, Ithaca, NY.

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, NY.

Common Name: Smooth greensnake SGCN

Scientific Name: Opheodrys vernalis

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S4 Tracked: No

# **Synopsis:**

The smooth greensnake's bright green color allows for excellent camouflage in its upland herbaceous habitat which includes fields, meadows, and forest clearings. The distribution extends over much of the northeastern United States to Nova Scotia, continuing southward to West Virginia and westward to Nebraska; several small disjunct populations occur farther west (Conant and Collins 1991). New York is in the core of the distribution. A subspecies, *L. v. borealis*, was described by Grobman (1992) in Nova Scotia and New Brunswick.

While there is little quantitative evidence to indicate a decline, it is thought that smooth greensnakes are encountered less frequently than in the past (Kart et al. 2005) and have declined in some areas (Harding 1997, Redder et al. 2006, Gibbs et al. 2007). Pesticides used to control mosquitoes, and habitat loss due to succession have been suggested as primary causes (Klemens 1993). Smooth greensnakes are secretive and easily overlooked, and thus may be more common than is known.

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant			
6% to 10%		Common			
11% to 25%	X	Fairly common		Stable	Moderate Decline
26% to 50%		Uncommon	X		
> 50%		Rare			

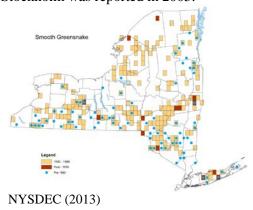
## **Habitat Discussion:**

Suitable habitat for smooth greensnakes includes wet grassy areas along stream or woodland edges, meadows and abandoned farmland, as well as manicured lawns provided that there is sufficient nearby cover. Urban and disturbed areas are also used (Klemens 1993). In New Hampshire greensnakes have been found at the tree line on Mt. Monadnock and Mt. Washington, and at the top of Mount Stinson, elevation 3,900' (Kart et al. 2005).

Eggs are laid under rotting wood or other objects including rocks, or underground. Greensnakes hibernate underground and have been found in abandoned ant mounds (Carpenter 1953) and in rodent burrows, frequently with other snake species including garter snakes, redbelly snakes, and ringneck snakes (Gibbs et al. 2007).

Primary Habitat Type
Old Field/Managed Grasslands
Pasture/Hay
Riparian
Urban and Recreational Grasses
Wet Meadow/Shrub Marsh

The NY Amphibian and Reptile Atlas project (1990-99) documented smooth greensnakes in 184 survey quads statewide. Records have been added in 14 additional survey quads since 1999. The distribution includes most of the state. Gibbs et al. (2007) noted the absence of smooth greensnakes from much of St. Lawrence County except for the southernmost areas, but a record near Brasher Falls in the Town of Stockholm was reported in 2005.





IUCN (2013)

Threats to NY Populations							
Threat Category	Threat	Scope	Severity	Irreversibility			
Residential & Commercial     Development	Housing & Urban Areas (loss/degradation of habitat due to suburban development)	N	L	Н			
2. Pollution	Agricultural & Forestry Effluents (reduced prey availability from pesticides)	R	L	Н			
3. Natural System Modifications	Other Ecosystem Modifications (succession)	W	M	M			
4. Climate Change & Severe Weather	Drought	W	L	V			

Carpenter, C.C. 1953. A study of hibernacula and hibernating associations of snakes and amphibians in Michigan. Ecology 34:74-80.

Conant, R. and J.T. Collins. 1991. Peterson Field Guide to Reptiles and Amphibians, Eastern and Central North America. 3<sup>rd</sup> Edition. Houghton Mifflin Company, Boston, Massachusetts.

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Common Name: Snapping turtle SGCN

**Scientific Name:** Chelydra serpentina

**Taxon:** Reptiles

Federal Status: Not Listed Natural Heritage Program Rank:

New York Status: Not Listed Global: G5

New York: S5 Tracked: No

# **Synopsis:**

The common snapping turtle is a large aquatic turtle that is well-known across its extensive distribution, which includes all of the eastern United States and southern Ontario, Quebec, and Nova Scotia. A game species with an open season in New York, it can be found in any freshwater body with shallow water and a muddy bottom (Gibbs et al. 2007). Although snapping turtles are common and widespread in New York, the population trend is unknown. Its populations are considered to be stable in most of the range, but local declines have been documented at the northern edge of the range (e.g., Brooks et al. 1991) and a management plan is being written for in Canadian populations (Annual Report of the ECO 2011). The export of snapping turtles from the United States (wild caught and farmed combined) has increased from 10,000 in 1999 to 558,000 in 2008 (Van Dijk 2012).

<b>Distribution</b> (% of NY where species occurs)		Abundanc (within NY distrib		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant			
6% to 10%		Common	X		
11% to 25%		Fairly common		Stable	Moderate Decline
26% to 50%		Uncommon			
> 50%	X	Rare			

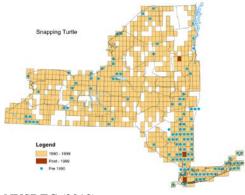
## **Habitat Discussion:**

Snapping turtles are aquatic, spending most of their time in fresh water bodies or basking at the surface. Any freshwater water body may be used, but there is a preference for slow-moving, shallow water with muddy bottom. The shallower edges of larger, deeper lakes may also be used, as well as salt marshes occasionally (Gibbs et al. 2007). While they require permanent water bodies to survive, snapping turtles may live without water for up to two weeks, allowing for extensive terrestrial migrations through dense forest and uneven terrain (Obbard and Brooks 1980), or across salt water to coastal islands and into estuaries (Brown 1969, Graves and Anderson 1987).

Manmade structures including roadsides (especially gravel on road shoulders), dams, and aggregate pits are used for nesting. Hibernation occurs in the soft mud of shallow water where turtles congregate, often one on top of the other (Graves and Anderson 1987, Brooks et al. 1991).

Primary Habitat Type
Coastal Plain Pond
Freshwater Marsh
Lake
Lake; Reservoir
Vernal Pool
Wet Meadow/Shrub Marsh

Snapping turtles occur statewide in New York.



NYSDEC (2013)

Threats to NY Populations						
Threat Category	Threat	Scope Severity		Irreversibility		
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources (persecution/poaching)	W	М	M		
2. Biological Resource Use	Fishing & Harvesting Aquatic Resources (hunting)	P	L	L		
3. Transportation & Service Corridors	Roads & Railroads (road mortality)	P	L	M		
4. Invasive & Other Problematic Species & Genes	Problematic Native Species (subsidized predators including raccoons)	W	L	Н		
5. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (disease)	N	L	V		
6. Biological Resource Use Fishing & Harvesting Aquatic Resources (potential relaxation of regulations)		W	L	М		

Brooks, R. J., G. P. Brown, and D. A. Galbraith. 1991. Effects of a sudden increase in natural mortality of adults on a population of the common snapping turtle (*Chelydra serpentina*). Canadian Journal of Zoology 69(5):1314-1320.

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