

Timber Rattlesnake



Timber Rattlesnake (Yellow Phase)



Photo credits: Jesse W. Jaycox

Scientific Name *Crotalus horridus*
Linnaeus, 1758

Family Name Viperidae
Vipers and Pit Vipers

Did you know?

Newborn timber rattlesnakes, often born well away from the overwintering den, follow the scent trails of adult snakes back to the den for hibernation (Brown and MacLean 1983, Reinert and Zappalorti 1988).

Summary

Protection Threatened in New York State, not listed federally.

This level of state protection means: A native species likely to become an endangered species within the foreseeable future in New York (includes any species listed as federally Threatened by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Threatened, or its parts, without a permit from NYSDEC. 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

Rarity G4, S3

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are approximately 205 extant dens known in the state, but when interacting and potentially interacting populations are taken into consideration, the number of occurrences will be in the range of 35 to 60. Indiscriminate killing and unregulated collecting, including a past bounty system in some portions of the range, has resulted in many populations becoming extirpated or depleted in numbers in most areas where the species was once numerous. Bounties on timber rattlesnakes were outlawed in New York State in 1971, but even in areas without bounties, rattlesnakes were collected or severely persecuted by local residents in many areas. These factors, combined with a low reproductive potential, and current threats such as development, illegal collecting, and other disturbance factors will

likely prevent or slow population recovery.

Short-term Trends

Declines and extirpation of some timber rattlesnake populations have been documented within the past 25 years and will likely continue to some degree given current threats.

Long-term Trends

Timber rattlesnakes have been subjected to substantial reduction due to specimen collection and persecution during the past century and it is believed that denning populations in New York have been reduced by 50% to 75% of their historical numbers (Brown 1984, 1988). Management efforts focused on habitat protection and public education have somewhat stabilized the remaining populations, but loss of habitat continues to be a threat to the species.

Conservation and Management

Threats

Loss of habitat, habitat fragmentation, mining, road mortality, illegal collecting, persecution, and pathogenic organisms are all considered threats to timber rattlesnake populations.

Conservation Strategies and Management Practices

Nuisance response efforts aimed at moving rattlesnakes out of areas where they may be harmed are in effect in some areas and these efforts may be useful in other locations where homes are located within the summer foraging habitat. Timber rattlesnakes should be taken into consideration when determining trail placement on public lands. Mitigation measures to manage the adverse effects of habitat fragmentation should be developed and implemented.

Research Needs

Standardized survey protocols need to be developed and implemented at all known and potentially suitable sites to document the character, quality, and extent of occupied habitat.

Habitat

In the Northeast, this species inhabits mountainous or hilly deciduous or mixed deciduous-coniferous forests, often with rocky outcroppings, steep ledges, and rock slides (Petersen and Fritsch 1986, Brown 1993). Dens, or hibernacula, are located in rocky areas where underground crevices provide retreats for overwintering (Brown 1993). New York dens are often located in accumulations of talus below ledges or in fractures within or underneath ledges or rock outcrops. Rattlesnakes use open canopy, rocky areas for basking, shedding, gestating, and birthing. Foraging areas are generally located within forested habitat surrounding the den.

Associated Ecological Communities

Acidic Talus Slope Woodland

An open to closed canopy woodland that occurs on talus slopes (slopes of boulders and rocks, often at the base of cliffs) composed of non-calcareous rocks such as granite, quartzite, or schist.

Appalachian Oak-hickory Forest

A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Appalachian Oak-pine Forest

A mixed forest that occurs on sandy soils, sandy ravines in pine barrens, or on slopes with rocky soils that are well-drained. The canopy is dominated by a mixture of oaks and pines.

Beech-maple Mesic Forest

A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Calcareous Cliff Community

A community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus.

Calcareous Talus Slope Woodland

An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Chestnut Oak Forest

A hardwood forest that occurs on well-drained sites in glaciated portions of the Appalachians, and on the coastal plain. This forest is similar to the Allegheny oak forest; it is distinguished by fewer canopy dominants and a less diverse shrublayer and groundlayer flora. Dominant trees are typically chestnut oak and red oak.

Cliff Community

A community that occurs on vertical exposures of resistant, non-calcareous bedrock (such as quartzite, sandstone, or schist) or consolidated material; these cliffs often include ledges and small areas of talus.

Floodplain Forest

A hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring, and high areas are flooded irregularly.

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Limestone Woodland

A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

Maple-basswood Rich Mesic Forest

A species rich hardwood forest that typically occurs on well-drained, moist soils of circumneutral pH. Rich herbs are predominant in the ground layer and are usually correlated with calcareous bedrock, although bedrock does not have to be exposed. The dominant trees are sugar maple, basswood, and white ash.

Oak-tulip Tree Forest

A hardwood forest that occurs on moist, well-drained sites in southeastern New York. The dominant trees include a mixture of five or more of the following: red oak, tulip tree, American beech, black birch, red maple, scarlet oak, black oak, and white oak.

Pitch Pine-oak-heath Rocky Summit

A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as quartzite, sandstone, or schist), and the soils are more or less acidic. This community is broadly defined and includes examples that may lack pines and are dominated by scrub oak and/or heath shrubs apparently related to fire regime.

Red Cedar Rocky Summit

A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is calcareous (such as limestone or dolomite, but also marble, amphibolite, and calcsilicate rock), and the soils are more or less calcareous. The vegetation may be sparse or patchy, with numerous lichen covered rock outcrops.

Rocky Summit Grassland

A grassland community that occurs on rocky summits and exposed rocky slopes of hills. Woody plants are sparse and may be scattered near the margin of the community. Small trees and shrubs may be present at low percent cover.

Shale Cliff And Talus Community

A community that occurs on nearly vertical exposures of shale bedrock and includes ledges and small areas of talus. Talus areas are composed of small fragments that are unstable and steeply sloping; the unstable nature of the shale results in uneven slopes and many rock crevices.

Shallow Emergent Marsh

A marsh meadow community that occurs on soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the soil is exposed during an average year.

Shrub Swamp

An inland wetland dominated by tall shrubs that occurs along the shore of a lake or river, in a wet depression or valley not associated with lakes, or as a transition zone between a marsh, fen, or bog and a swamp or upland community. Shrub swamps are very common and quite variable.

Associated Species

Copperhead (*Agkistrodon contortrix*)
Racer (*Coluber constrictor*)
Rat Snake (*Elaphe obsoleta*)
Five-Lined Skink (*Eumeces fasciatus*)

Identification Comments

Identifying Characteristics

This is a heavy bodied snake of forested uplands. The young measure approximately 12 inches at birth and adults range from 36 to 60 inches in length (Conant and Collins 1998). The coloration and pattern is highly variable geographically (Conant and Collins 1991) with two main color variations, yellow or black, found in New York. The yellow variation has a yellow head and body with black or dark brown crossbands and the crossbands, which may be "V"-shaped, may break up anteriorly to form a row of dark spots down the back and along each side of the body (Conant and Collins 1998). The black variation has a black head and body with black crossbands and a reddish mid-dorsal stripe may be present. Some individuals that are considered to be the black variation have black heads, yellow bodies, and dark crossbands. In some locations, completely black specimens are not unusual (Conant and Collins 1998). The scales have longitudinal keels giving the snake a rough textured appearance. Timber rattlesnakes, like other pit-vipers, have a two heat-sensitive openings, or pits, situated below and between the eye and nostril. This sensory organ aids the snake in the detection of prey. As the name implies, rattlesnakes also have a rattle at the end of the tail that is made up of loosely attached segments. A new segment is added each time the snake sheds its skin, which is about 1.5 times per year. When disturbed, a rattlesnake will vibrate its tail, causing the loose segments to create a buzzing sound.

Characteristics Most Useful for Identification

The presence of a rattle is the most useful diagnostic characteristic.

Best Life Stage for Identifying This Species

Adults may be easier to identify than newborn rattlesnakes, but in general the coloration and pattern of adults and young are similar, although newborn timber rattlesnakes may be more gray in color. Newborn timber rattlesnakes have a single rattle segment called a button.

Behavior

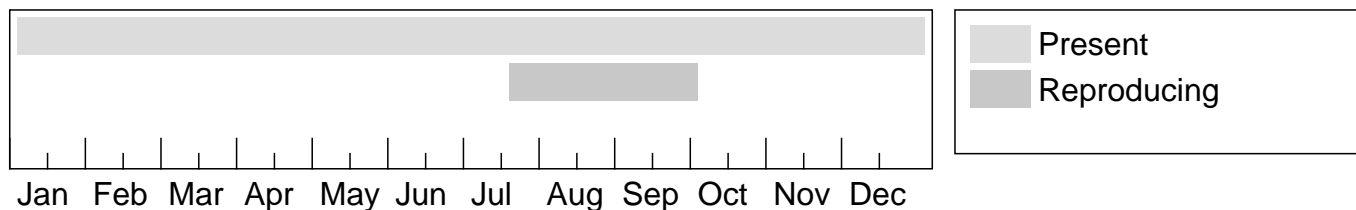
In New York, timber rattlesnakes hibernate in communal dens, often with copperheads (also venomous), and other species non-venomous snakes. Depending on the latitude and local weather conditions, hibernation generally begins from mid-September through late-October and continues through the winter until late-March through mid-May. During the active season, rattlesnakes will generally use forested habitats up to 2.5 miles (4 km) or greater from their overwintering dens for foraging and other activities. Mating takes place during late-July to early-August and the young are born in August or September of the subsequent year.

Diet

Timber rattlesnakes mainly prey upon small rodents such as mice, chipmunks, and gray squirrels, but they will also take songbirds on occasion.

The Best Time to See

In general, timber rattlesnakes are active from late April until mid-October. In some locations, rattlesnakes may start to enter dens in mid-September and may not emerge until late-May, especially at more northern locations.



The time of year you would expect to find Timber Rattlesnake in New York.

Similar Species

Massasauga(*Sistrurus catenatus*): In New York, the massasauga is found in wetland habitat in the central and western part of the state and the range of the two species do not overlap. Otherwise, the two can be differentiated by the scalation on the head; the massasauga has nine plates on the crown of its head instead of the numerous small scales found on the timber rattlesnake (Conant and Collins 1998).

Copperhead(*Agkistrodon contortrix*): The northern copperhead often occurs with the timber rattlesnake in southeastern New York. Copperheads can be distinguished from timber rattlesnakes by their coppery-orange head, hourglass shaped crossbands, and lack of a rattle.

Taxonomy

Kingdom Animalia
└ Phylum Craniata
└

Class Reptiles (Reptilia)

└─ **Order** Lizards, Snakes and Amphisbaenians (Squamata)

└─ **Family** Viperidae (Vipers and Pit Vipers)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=CROTALUS+HORRIDUS>

Google Images

<http://images.google.com/images?q=CROTALUS+HORRIDUS>

New York State Department of Environmental Conservation

<http://www.dec.ny.gov/animals/7147.html>

References

- Barbour, R. W. 1971. Amphibians and reptiles of Kentucky. Univ. Press of Kentucky, Lexington. x + 334 pp.
- Behler, J. L., and F. W. King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York. 719 pp.
- Brown, C. W., and C. H. Ernst. 1986. A study of variation in eastern timber rattlesnakes, *Crotalus horridus* Linnaeus (Serpentes: Viperidae). *Brimleyana* 12:57-74.
- Brown, W. S. 1984. Background information for the protection of the timber rattlesnake in New York state. *Bull. Chicago Herpetol. Soc.* 19:94-97.
- Brown, W. S. 1987. Hidden life of the timber rattler. *National Geographic* 172:128-138.
- Brown, W. S. 1988. Timber rattlesnake: background information for protection as a threatened species in New York State. *New York Herpetological Society Newsletter* No. 115. 2 pp.
- Brown, W. S. 1991. Female reproductive ecology in a northern population of the timber rattlesnake, *Crotalus horridus*. *Herpetologica* 47:101-115.
- Brown, W. S. 1993. Biology, status, and management of the timber rattlesnake (*Crotalus horridus*): a guide for conservation. *SSAR Herp. Circ.* No. 22. vi + 78 pp.
- Brown, W. S., D. W. Pyle, K. R. Greene, and J. B. Friedlander. 1982. Movements and temperature relationships of timber rattlesnakes (*Crotalus horridus*) in northeastern New York. *J. Herpetol.* 16:151-161.
- Brown, W.S. and F.M. Maclean. 1983. Conspecific scent-trailing by newborn timber rattlesnakes, *Crotalus horridus*. *Herpetologica* 39(4):430-436.
- Campbell, J. A., and E. D. Brodie, Jr., editors. 1992. *Biology of the pit vipers*. Selva, Tyler, Texas.
- Chambers, R.E. 1983. Integrating timber and wildlife management. State University of New York, College of Environmental Science and Forestry and New York State Department of Environmental Conservation.
- Collins, J. T. 1982. Amphibians and reptiles in Kansas. Second edition. Univ. Kansas Mus. Nat. Hist., Pub. Ed. Ser. 8. xiii + 356 pp.
- Collins, J. T. and J. L. Knight. 1980. *Crotalus horridus*. *Catalogue of American Amphibians and*

Reptiles. SSAR No. 47:1-2.

- Conant, R. 1975. A Field Guide to Reptiles and Amphibians of Eastern and Central North America. Second Edition. Houghton Mifflin Company, Boston, Massachusetts. xvii + 429 pp.
- Conant, R. and J. T. Collins. 1991. A field guide to reptiles and amphibians: eastern and central North America. Third edition. Houghton Mifflin Co., Boston, Massachusetts. 450 pp.
- Conant, R., and J. T. Collins. 1998. A field guide to reptiles and amphibians: eastern and central North America. Third edition, expanded. Houghton Mifflin Co., Boston, Massachusetts. 616 pp.
- DeGraaf, R. M., and D. D. Rudis. 1983. Amphibians and reptiles of New England. Habitats and natural history. Univ. Massachusetts Press. vii + 83 pp.
- DeGraaf, R.M. and D.D. Rudis. 1981. Forest habitat for reptiles and amphibians of the northeast. United States Department of Agriculture, Forest Service Eastern Region, Milwaukee, WI. 239 pp.
- Dundee, H. A., and D. A. Rossman. 1989. The amphibians and reptiles of Louisiana. Louisiana State University Press, Baton Rouge.
- Ernst, C. H. 1992. Venomous reptiles of North America. Smithsonian Institution Press, Washington, D.C. ix + 236 pp.
- Ernst, C. H., and R. W. Barbour. 1989. Snakes of eastern North America. George Mason Univ. Press, Fairfax, Virginia. 282 pp.
- Gibbons, J. W., and R. D. Semlitsch. 1991. Guide to the reptiles and amphibians of the Savannah River Site. Univ. of Georgia Press, Athens. xii + 131 pp.
- Green, N. B., and T. K. Pauley. 1987. Amphibians and reptiles in West Virginia. University of Pittsburg Press, Pittsburg, Pennsylvania. xi + 241 pp.
- Johnson, T. R. 1987. The amphibians and reptiles of Missouri. Missouri Department of Conservation, Jefferson City. 368 pp.
- Keys, Jr.,J.; Carpenter, C.; Hooks, S.; Koenig, F.; McNab, W.H.; Russell, W.;Smith, M.L. 1995. Ecological units of the eastern United States - first approximation (cd-rom), Atlanta, GA: U.S. Department of Agriculture, Forest Service. GIS coverage in ARCINFO format, selected imagery, and map unit tables.
- Klauber, L. M. 1972. Rattlesnakes: their habits, life histories, and influence on mankind. Second edition. Two volumes. Univ. California Press, Berkeley.
- Martin, W. H. 1992. Phenology of the timber rattlesnake (*Crotalus horridus*) in an unglaciated section of the Appalachian Mountains. Pages 259-277 in Campbell, J. A., and E. D. Brodie, Jr. Biology of the pit vipers. Selva, Tyler, Texas.
- Martin, W. H. 1993. Reproduction of the timber rattlesnake (*Crotalus horridus*) in the Appalachian Mountains. J. Herpetol. 27:133-143.
- Martof, B. S., W. M. Palmer, J. R. Bailey, and J. R. Harrison, III. 1980. Amphibians and reptiles of the Carolinas and Virginia. University of North Carolina Press, Chapel Hill, North Carolina. 264 pp.
- Minton, S. A., Jr. 1972. Amphibians and reptiles of Indiana. Indiana Academy Science Monographs 3. v + 346 pp.
- Mitchell, J. C. 1991. Amphibians and reptiles. Pages 411-76 in K. Terwilliger (coordinator). Virginia's Endangered Species: Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

- Mount, R. H. 1975. The reptiles and amphibians of Alabama. Auburn University Agricultural Experiment Station, Auburn, Alabama. vii + 347 pp.
- NatureServe. 2005. NatureServe Central Databases. Arlington, Virginia. USA
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.7. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: March 28, 2006).
- New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources. 2006. Timber Rattlesnake fact sheet.
- New York State Department of Environmental Conservation, Division of Fish, Wildlife, and Marine Resources. 2006. New York State Comprehensive Wildlife Conservation Strategy. Albany, NY: New York State Department of Environmental Conservation.
- Petersen, R. C., and R. W. Fritsch, II. 1986. Connecticut's Venomous Snakes: The Timber Rattlesnake and Northern Copperhead. Second Edition. State Geol. Nat. Hist. Surv. Connecticut. Bull. 111. 48 pp.
- Peterson, A. 1990. Ecology and management of a timber rattlesnake (*Crotalus horridus* L.) population in south-central New York. Pages 255-261 in Mitchell et al., eds. Ecosystem management: rare species and significant habitats. New York State Mus. Bull. 471.
- Pisani, G. R., J. T. Collins, S. R. Edwards. 1972. A re-evaluation of the subspecies of *Crotalus horridus*. Trans. Kansas Acad. Sci. 75(3):255-263.
- Reinert, H. K., D. Cundall, and L. M. Bushar. 1984. Foraging behavior of the timber rattlesnake, *Crotalus horridus*. Copeia 1984:976-981.
- Reinert, H. K., and R. T. Zappalorti. 1988. Field observation of the association of adult and neonatal timber rattlesnakes, *Crotalus horridus*, with possible evidence for conspecific trailing. Copeia 1988:1057-1059.
- Reinert, H. K., and R. T. Zappalorti. 1988. Timber rattlesnakes (*Crotalus horridus*) of the Pine Barrens: their movement patterns and habitat preference. Copeia 1988:964-978.
- Smith, P. W. 1961. The amphibians and reptiles of Illinois. Illinois Natural History Survey 28:1-298.
- Stechert, Randy. 1980. Observations on northeastern snake dens. Bulletin of the New York Herpetological Society. 15(2):7-14.
- Stechert, Randy. 1982. Historical depletion of timber rattlesnake colonies in New York State. Bulletin of the New York Herpetological Society. 17(2):23-24.
- Tennant, A. 1984. The Snakes of Texas. Texas Monthly Press, Austin, Texas. 561 pp.
- Tyning, T. F., editor. 1992. Conservation of the timber rattlesnake in the northeast. Massachusetts Audubon Society, Lincoln, Massachusetts.
- Vogt, R. C. 1981. Natural history of amphibians and reptiles of Wisconsin. Milwaukee Public Museum. 205 pp.
- Webb, R. G. 1970. Reptiles of Oklahoma. University of Oklahoma Press, Norman. 370 pp.

New York Natural Heritage Program

625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

This project is made possible with funding from:

- New York State Department of Environmental Conservation Hudson River Estuary Program
- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

Information for this guide was last updated on Aug 07, 2017

This guide was authored by