

## SPECIES PROFILE

# Smooth Green Snake

*Opheodrys vernalis*

Federal Listing: None

State Listing: None

Global Rank: G5

State Rank: S3

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## ELEMENT 1: DISTRIBUTION AND HABITAT

### 1.1 Habitat Description

Smooth green snakes may be found in a variety of open or lightly forested habitats such as pastures, old fields, wet meadows, marsh borders, coastal grasslands, pine barrens, blueberry barrens, and grassy hilltops (Klemens 1993, New Hampshire Reptile and Amphibians Reporting Program 2005). Smooth green snakes feed primarily on invertebrates including arthropods, caterpillars, grasshoppers, slugs and earthworms. Females may lay two or more clutches of well developed eggs a season, usually in July- August, in piles of rotting vegetation or sawdust, rotting logs and stumps or mammal burrows (Ernst and Ernst 2003). Ant mounds, rock crevices and mammal burrows may be used during hibernation (Carpenter 1953, Ernst and Ernst 2003).

### 1.2 Justification

Anecdotal accounts appear to indicate a decline in smooth green snake abundance since the mid-1900s in southern New England (Klemens 1993) and in other areas (Brodman et al. 2002). Since that time, many early successional habitats that smooth green snakes prefer have become reforested or have been converted to residential and commercial developments (Klemens 1993, SPNHF 2005). The maintenance of lawns and hayfields by mowing can lead to

direct mortality of individual smooth green snakes. Frequent mowing may reduce habitat suitability by altering the diversity of vegetation and soil moisture, potentially limiting the abundance of prey such as gastropods (Kjoss and Litvaitis 2001a). Insecticides reduce prey bases and direct mortality to smooth green snakes (George and Stickel 1949).

### 1.3 Protection and Regulatory Status

No special protection in New Hampshire.

### 1.4 Population and Habitat Distribution

The smooth green snake likely occurs throughout most of New Hampshire including documented records on Star Island, Isles of Shoals (Taylor 1993, D. Hayward, personal communication). A 2003 record from Berlin in Coos County represents the most northerly location in the state for this species. Other records for Coos County (i.e., Gorham, Shelbourne) are historic (Oliver and Bailey 1939). In a historic unpublished report, Donald Carle, a professor of science at Keene Teachers College, wrote "They have been reported at the tree line on Mount Monadnock in Jaffrey, on top of Mount Stinson in the White Mountains and at the tree line next to the cog railroad going up Mt. Washington."

### 1.5 Town Distribution Map

*Not completed for this species.*

### 1.6 Habitat Map

The University of New Hampshire (J. Taylor, Zoology Department, and S. Hale, Complex Systems Research Center) was contracted to map predicted smooth green snake habitat. The New Hampshire Landcover data layer was the primary source of data.

Hayfields, pastures, and orchards were considered favorable habitats. Proximity to known smooth green snake locations was also incorporated. Maps will need field verification.

### 1.7 Sources of Information

Status and ranking information was taken from NatureServe (2005). New Hampshire Reptile and Amphibian Reporting Program (RAARP) records and Taylor (1993) were the primary source of locality records. Online museum collection databases (Museum of Comparative Zoology, Harvard and Yale Peabody Museum) were searched for historical records. The University of New Hampshire completed predicted habitat maps.

### 1.8 Extent and Quality of Data

The distribution, habitat use, and condition of smooth green snake populations in New Hampshire are not well understood. This assessment was limited to high quality records that were included in museum collections, were found in scientific reports, or were reported to the New Hampshire Reptile and Amphibian Reporting Program by a trained expert or reports that included a specimen or clear photograph. We suspect that smooth green snakes in towns with historic observations probably have not been extirpated but rather these areas have not received recent survey effort targeting this species.

### 1.9 Distribution Research

Systematic surveys (either taxonomically or habitat-based) are needed to assess the distribution, relative abundance and condition of populations in different habitats and how populations respond to habitat management (e.g., mowing, prescribed burns). Systematic surveys must first assess the most efficient sampling protocols (Kjoss and Litvaitis 2001b).

## ELEMENT 2: SPECIES/HABITAT CONDITION

No information is available to evaluate the condition of smooth green snake populations in New Hampshire although they are thought to be in decline (See element 1.9).

## ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

The loss and degradation of early successional habitats and grasslands, along with frequent mowing or insecticide spraying, pose the greatest threats to smooth green snakes. See Threats in Grassland Habitat Profile for discussion of threats.

## ELEMENT 4: CONSERVATION STRATEGIES

See associated habitat profiles for relevant conservation strategies.

## ELEMENT 5: REFERENCES

### 5.1 Literature

- Brodman, R., S. Cortwright, and A. Resetar. 2002. Historical changes of reptiles and amphibians of northwest Indiana fish and wildlife properties. *American Midland Naturalist* 147:135-144.
- Carpenter, C. C. 1953. A study of hibernacula and hibernating associations of snakes and amphibians in Michigan. *Ecology* 34:74-80.
- Crother, B. I. Committee Chair, J. Boundy, J. A. Campbell, K. De Queiroz, D. R. Frost, R. Highton, J. B. Iverson, P. A. Meylan, T. W. Reeder, M. E. Seidel, J. W. Sites, Jr., T. W. Taggart, S. G. Tilley, and D. B. Wake. 2000. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Society for the Study of Amphibians and Reptiles. *Herpetological Circulars*. 29
- 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.
- George, J. L. and W. H. Stickel. 1949. Wildlife effects of DDT dust used for tick control on a Texas prairie. *American Naturalist*. 42:228-237.
- Kjoss, V.A. and J.A. Litvaitis. 2001a. Community structure of snakes in a human-dominated landscape. *Biological Conservation*. 1-8.
- Kjoss, V. A. and J.A. Litvaitis. 2001b. Comparison of 2 methods to sample snake communities in early successional habitats. *Wildlife Society Bulletin* 29: 153-157.

- 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. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.2. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: August 2, 2005).
- Oliver, J. A. and J. R. Bailey. 1939. Amphibians and reptiles of New Hampshire exclusive of marine forms: Pages 195-217 in H.E. Warfel, editor, Biological Survey of the Connecticut watershed. New Hampshire Fish and Game Department Survey Report 4.
- Society for the Protection of New Hampshire Forests. 2005. New Hampshire's Changing Landscape. Population growth and land use changes: what they mean for the Granite State. Executive Summary. Concord, New Hampshire, USA.
- Taylor, J. 1993. The Amphibians and Reptiles of New Hampshire. Nongame and Endangered Wildlife Program. New Hampshire Fish and Game Department. Concord, New Hampshire, USA.

## 5.2 Data Sources

New Hampshire Reptile and Amphibian Reporting Program (RAARP) database. Maintained by the New Hampshire Fish and Game Department, Nongame and Endangered Species Program, Concord New Hampshire (Accessed: August 2, 2005)

## Distribution of Smooth Green Snake in New Hampshire

**Distribution**  
■ Known  
■ Potential  
▨ Historic



0 10 20 40 Miles

Known = verified observations based on specimens, photos, or expert observation [e.g., NHFG's Reptile & Amphibian Reporting Program (RAARP), museum specimens, etc.]  
Potential = observations reported without specimens or photos  
Historic = observations greater than 20 years old from the same data sources and Oliver and Bailey (1959)

