

Species Status Assessment

Class: Reptilia
Family: Emydidae
Scientific Name: *Glyptemys muhlenbergii*
Common Name: Bog turtle

Species synopsis:

The smallest turtle in New York and one of the most critically imperiled in North America, the bog turtle ranges from Massachusetts southward through Maryland, occurring in 350 sites (Turtle Conservation Fund 2002). In New York, it reaches the northern extent of its distribution. Of 37 extant metapopulations, 4 are in Oswego and Seneca counties and the balance are in the southeastern part of the state. Bog turtles require open calcareous wetland complexes with a variety of pockets that may be dry, saturated, and subject to flooding. Northern bog turtle populations declined by 50% from 1980 to 2000.

I. Status

a. Current and Legal Protected Status

- i. **Federal** Threatened **Candidate?** N/A
- ii. **New York** Endangered; SGCN

b. Natural Heritage Program Rank

- i. **Global** G3
- ii. **New York** S2 **Tracked by NYNHP?** Yes

Other Rank:

Northeast Partners in Reptile and Amphibian Conservation (NEPARC 2010) – Severe concern with high regional responsibility
IUCN – Critically Endangered

Status Discussion:

The federally threatened bog turtle occurs in two allopatric populations that are separated by 250 miles. The northern population is known to occur at 350 sites in seven states: Connecticut (5 sites), Delaware (4), Maryland (71), Massachusetts (3), New Jersey (165), New York (37), and Pennsylvania (75). It is listed as endangered in each of these states except Maryland, where it is threatened. The southern population is found in southern Virginia southward to northern Georgia. NEPARC (2010) lists bog turtle as a Species of Severe Concern because more than 75% of northeastern states list it as SGCN, and as a species of high responsibility because the Northeast comprises more than 50% of its distribution.

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: 1980-2000

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Northern allopatric population

Time Frame Considered: 1980-2000

c. Adjacent States and Provinces

CONNECTICUT Not Present _____ No data _____

i. Abundance

 X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

 X declining ___ increasing ___ stable ___ unknown

Time frame considered: Not specified

Listing Status: Endangered SGCN? Yes

MASSACHUSETTS Not Present _____ No data _____

i. Abundance

___ declining ___ increasing X stable ___ unknown

ii. Distribution:

___ declining ___ increasing X stable ___ unknown

Time frame considered: Not specified; 3 occurrences since 1980

Listing Status: Endangered SGCN? Yes

There are three occurrences in MA: two are classified as good and one is classified as poor. More than 50% is on private lands.

NEW JERSEY Not Present _____ No data _____

i. Abundance

 X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

 X declining ___ increasing ___ stable ___ unknown

Time frame considered: 50% of habitat lost since 1980

Listing Status: Endangered SGCN? Yes

The bog turtle has always been considered rare and secretive. Concern for its status was first expressed in the late 1960s and early 1970s. Perhaps as a result of increased survey efforts, many new populations have been identified since its consideration for federal listing in 1996, prompting speculation that bog turtles were more secretive than rare. A “Standardized Bog Turtle Site-Quality Analysis” defines Population Analysis Sites (PAS) to describe bog turtle occurrences based on the likelihood of turtles moving between the occurrences (Klemens 1993). In some cases, this approach inflated the number of sites by changing the definition of those sites. Many of the current 350 PAS are small, marginally viable, or under threat from development.

The New York State Amphibian and Reptile Atlas distribution map illustrates the loss of historical records from several areas in the state. A total of 55 survey quads have historic records (pre-1990), but only 17 of those still supported populations during the atlas survey period, 1990-99. Six survey quads have new records since 1999 for a total of 23 survey quads with records. This is a loss of 58% in occupied atlas survey blocks since prior to 1990.

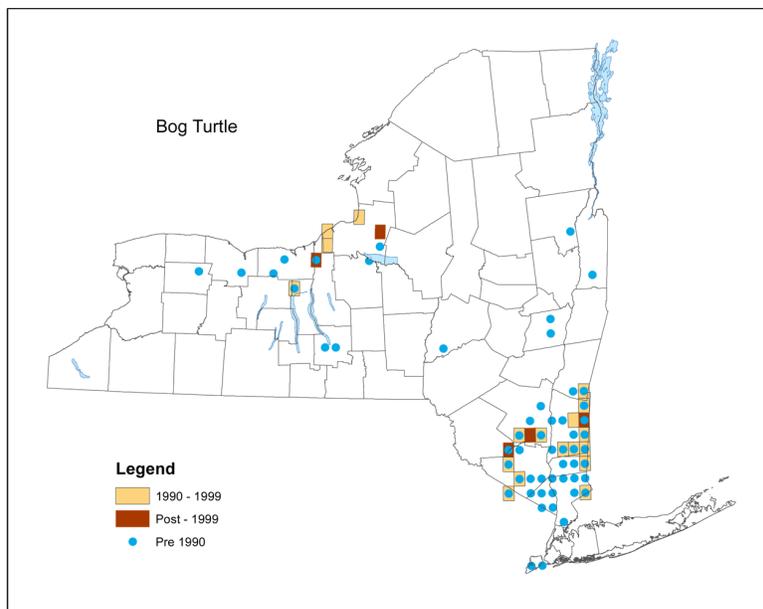


Figure 1: Current and historical distribution of bog turtles in NY (NY Amphibian and Reptile Atlas, NYSDEC).

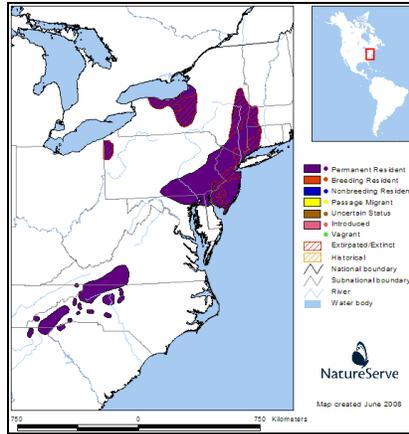


Figure 2: North American distribution of bog turtle (NatureServe 2013).

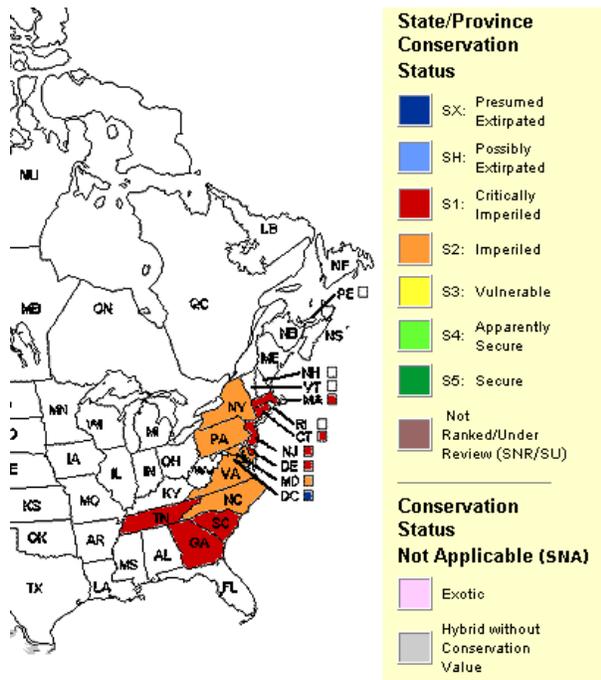


Figure 3: Conservation status of bog turtle in North America (NatureServe 2013).

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

There are records of historic or extirpated populations in the following counties: Albany, Dutchess, Genesee, Monroe, Onondaga, Rensselaer, Rockland, Otsego, Sullivan, Tompkins, Ulster, Warren, Wayne, and Westchester.

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	<u>67</u>	_____

Details of current occurrence:

NY Natural Heritage Program tracks bog turtles using Element Occurrences (EOs), which are divided into Principle and Sub-Element occurrences (Jaycox et al. 2005). There are currently 126 filtered EOs for bog turtle, 61 of which are principle EOs and 65 of which are sub-EOs. Of the 61 principle EOs, 19 are considered extant (ranked A, B, C, D, or E) 25 are ranked as F (Failed to find), 11 are ranked as H (Historic), 5 are U (Unrankable) and 1 is X? (Extirpated).

Bog turtles are restricted primarily to the southeastern part of the state, on both sides of the Hudson River, where in 2001, 33 extant metapopulations were described in the USFWS recovery plan in small areas in seven counties. This area is divided into three recovery subunits: Hudson Valley, Harlem/Housatonic, and Wallkill. Currently, sub-EOs occur in the following distribution: Columbia (6), Dutchess (50), Orange (16), Putnam (6), Sullivan (2), Ulster (1), and Westchester (1). Additional populations are known from central New York, in Oswego (3), Seneca (1), and Wayne (1) counties. All but 2 of the 37 extant sites were ranked (USFWS 2001): 8 were classified as good, 15 fair, and 12 poor.

The USFWS is currently performing the second 5-year species status review and Population Analysis Sites re-evaluation.

New York's Contribution to Species North American Range:

% of NA Range in New York

100 (endemic)

76-99

51-75

26-50

1-25

Classification of New York Range

Core

Peripheral

Disjunct

Distance to core population:

IV. Primary Habitat or Community Type:

1. Freshwater Marsh
2. Wet Meadow/Shrub Swamp
3. Great Lakes Freshwater Estuary Marsh
4. Open Acidic Peatlands
5. Mixed Hardwood Swamp
6. Open Alkaline Peatlands

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: Since 1950s

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

Bog turtles occur low-lying, open wetlands bordered by woodlands, particularly calcareous fens, herbaceous sedge meadows, and pastures. These wetlands are characterized by a continuous flow of water seeping through the saturated soil surface. Within these wetlands, bog turtles need a variety of micro-habitats for basking, foraging, nesting, shelter, and hibernation including dry pockets, saturated areas, and areas that are subject to flooding. Home ranges vary from 0.5 to 2.0 ha (see Shoemaker et al. 2011).

Hibernation occurs in more densely vegetated areas of the wetland complex, where turtles use channels beneath hummocks that are covered with small trees and shrubs (USFWS 2001). Individuals may also hibernate in the soft mud of spring-fed rivulets (Gibbs et al. 2007).

The presence of beaver, deer, and sometimes livestock maintain suitable wetlands. Natural succession necessitates that bog turtles find new suitable habitat when wetlands become shrubby or are flooded due to extensive beaver activity. Bog turtles move between adjacent areas of suitable habitat.

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:

Bog turtles are naturally limited by low reproductive productivity, low juvenile survivorship, and a long maturation period. Sexual maturity is reached in 8 to 11 years. In New York bog turtles are active from late April to mid-September. Most studies report a 1:1 sex ratio, but in southeastern New York, J. Behler (see USFWS 2001) reported a 1:2 male to female ratio. Clutches range from 1 to 5 eggs and average 3 to 5. In New York, eggs hatch in the fall and hatchlings begin growth during the following summer. Bog turtles are suspected to live 30 years.

Kiviat (1978) found that bog turtles are able to successfully disperse between suitable habitat patches within a stable wetland complex in response to changes in suitability due to succession or water levels.

Common predators of adults, young and eggs include raccoon, skunk, possum and crow.

VI. Threats:

Bog turtles are most seriously threatened by destruction and fragmentation of suitable wetland habitat from alterations in groundwater, nonpoint source pollution (fertilizer and septic runoff), invasive plant species (common reed, purple loosestrife), off-road vehicle traffic, and filling of wetlands. Fire suppression and the decline of grazing livestock also contribute to the succession of suitable open wetland habitat (MA SWAP). While light grazing by livestock is beneficial to maintenance of bog turtle habitat, heavy grazing is detrimental due to overload of nutrients, trampling of habitat, overgrazing, and crushing of adults. The bog turtle is prized in the pet trade and collection is a serious threat despite legal protection.

Bog turtle was classified as “extremely vulnerable” to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

Are there regulatory mechanisms that protect the species or its habitat in New York?

No Unknown

Yes

The bog turtle is a federally threatened and state endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. Since 1992, bog turtles are included in Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

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, with very few open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

Even with these protections, habitat loss and degradation still take place. Indirect impacts associated with storm water or other activities outside of the wetland and adjacent areas can still negatively impact the bog turtle wetland.

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

The Landowner Incentive Program (LIP) for Management and Protection of Bog Turtle Habitat is a grant program administered by the New York State Department of Environmental Conservation (DEC) to encourage landowners to participate in management and protection of bog turtle habitat.

The NRCS program, Working lands for Wildlife, and the Wetlands Reserve Program also provide funding for habitat management on private lands.

Management recommendations are provided in the Federal recovery plan (USFWS 2001) and by agency personnel.

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for uncommon turtles of wetlands, which includes bog turtle. Conservation actions following IUCN taxonomy are categorized in the table.

Easement acquisition:

___ Secure habitats critical to species survival by acquisition of conservation easements for wetlands and adjacent uplands.

Habitat management:

- ___ Develop and implement mitigation strategies to manage adverse effects of habitat fragmentation.
- ___ Conduct a variety of habitat management activities where needed, including management of vegetation succession, management of invasive species, maintenance of hydrological regimes, curtailment of contaminant inputs, and management of human access, in order to preserve wetland suitability for these uncommon turtles of wetlands.

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.

Modify regulation:

- ___ Modify Freshwater Wetlands Act, in order to protect wetlands smaller than 12.4 acres where they support species of conservation concern, and in order to expand the protected upland buffer beyond the 100-foot limit where necessary.

Other action:

- ___ Develop and implement mitigation measures to manage turtle population losses to egg predators and to vehicular roadkill.
- ___ Enhance law enforcement and public education in order to curtail collection/translocation of turtle specimens.
- ___ Determine significance of specific threats to populations of species in this group, and formulate management options to control significant threats.

Population enhancement:

- ___ Employ restoration techniques for bog turtle, Blanding's turtle and mud turtle at selected sites as needed, including captive breeding, headstarting, nest protection, and repatriation/relocation strategies.

Population monitoring:

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

Statewide baseline survey:

- ___ Develop standardized population survey protocols, and implement survey protocols at all known and potentially suitable sites, to document the extent of occupied habitat.

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
Species Management	Species Recovery
Education & Awareness	Awareness & Communications
Law/Policy	Legislation
Law/Policy	Compliance & Enforcement

VII. References

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