Species Status Assessment

Class: Reptilia
Family: Kinosternidae
Scientific Name: *Sternotherus odoratus*
Common Name: Eastern musk turtle (stinkpot)

Species synopsis:

Also known as the stinkpot, the eastern musk turtle emits a distinctive musky odor when threatened. It is highly aquatic, leaving the water infrequently, and moving awkwardly on land when it must. Occupied habitats include lakes, ponds, and rivers that have a muddy bottom substrate and little or no current. The musk turtle has a large distribution that extends across most of the eastern United States and into southern Canada, with a noticeable gap around higher elevation areas. New York is near the northern edge of the range. Musk turtles are common and apparently secure across the range with the exception of populations on the northern edge in Ontario and Quebec. Threats include shoreline development and the removal of submerged aquatic vegetation for recreational activities.

I. Status

a. Current and Legal Protected Status

i. Federal ___Not Listed_____ **Candidate?** __No____

ii. New York ___SGCN_____

b. Natural Heritage Program Rank

i. Global ___G5_____

ii. New York ___S5_____ **Tracked by NYNHP?** __No___

Other Rank:
IUCN – Least Concern
COSEWIC – Special Concern
Species of Low Priority (NEPARC 2010)

Status Discussion:
Van Dijk (2011) refers to common musk turtle as a "very widespread, common, and adaptable species" that is "in no way threatened" despite some marginal populations of local conservation interest, including occurrences in Ontario and Quebec. Musk turtles are listed as Threatened in Canada where declines have been attributed to wetland destruction and shoreline alteration. It is also protected in Canada under the federal Species at Risk Act and is listed as a Specially Protected Reptile under the Ontario Fish and Wildlife Conservation Act. However, its COSEWIC status was changed in 2012 from Threatened to Special Concern (listed in 2002) due to the documentation of new populations in Ontario and Quebec as a result of increased survey efforts.

Musk turtles are not listed in any northeastern state and are considered SGCN only in New York and Vermont. NEPARC (2010) lists musk turtle as a species of low priority because more than 25% (but less than 50%) of northeastern states list it as SGCN.

II. Abundance and Distribution Trends

a. North America

i. Abundance

____ declining ____increasing __X__ stable ____unknown

ii. Distribution:

____ declining ____increasing __X__ stable ____unknown

Time frame considered: _____

b. Regional

i. Abundance

____ declining ____increasing __X__ stable _____unknown

ii. Distribution:

____ declining ____increasing __X__ stable _____unknown

Regional Unit Considered:_____Northeast_____
Time Frame Considered: _____

c. Adjacent States and Provinces

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

i. Abundance

____ declining ____ increasing __X__ stable ____unknown

ii. Distribution:

____ declining ____ increasing __X__ stable ____unknown

Time frame considered: __Not Specified_____
Listing Status: _____Not Listed_____ SGCN? __No____

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

i. Abundance

____ declining ____ increasing __X__ stable ____unknown

ii. Distribution:

____ declining ____ increasing __X__ stable ____unknown

Time frame considered: ___Not Specified_____
Listing Status: _____Not Listed_____ SGCN? __No___

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

i. Abundance

____ declining ____ increasing __X__ stable ____unknown

ii. Distribution:

____ declining ____ increasing __X__ stable ____unknown

Time frame considered: ___Not Specified_____
Listing Status: _____Not Listed_____ SGCN? ___No___

ONTARIO **Not Present _____** **No data _____**

i. **Abundance**

__X__ declining ____increasing _____stable ____unknown

ii. **Distribution:**

__X__ declining ____increasing _____stable ____unknown

Time frame considered: ____Listed in 2007_____
Listing Status: _____Threatened_____

PENNSYLVANIA **Not Present _____** **No data _____**

i. **Abundance**

____ declining ____increasing __X__ stable ____unknown

ii. **Distribution:**

____ declining ____increasing __X__ stable ____unknown

Time frame considered: ___Since 2000_____
Listing Status: _____Not Listed_____ SGCN? ___No___

QUEBEC **Not Present _____** **No data _____**

i. **Abundance**

____ declining ____increasing _____stable __X__ unknown

ii. **Distribution:**

____ declining ____increasing _____stable __X__ unknown

Time frame considered: _____
Listing Status: _____federally Threatened_____

VERMONT **Not Present _____** **No data _____**

i. **Abundance**

____ declining ____increasing ____stable __X__ unknown

ii. **Distribution:**

____ declining ____increasing ____stable __X__ unknown

Time frame considered: __Not Specified_____
Listing Status: _____Not Listed_____ SGCN? ___Yes____

d. NEW YORK **No data _____**

i. **Abundance**

____ declining ____ increasing ____ stable __X__ unknown

ii. **Distribution:**

____ declining ____ increasing ____ stable __X__ unknown

Time frame considered: _____

Monitoring in New York.

There are currently no monitoring programs for musk turtles in New York.

Trends Discussion:

Musk turtles are widely distributed and locally common in New York but trends are unclear.

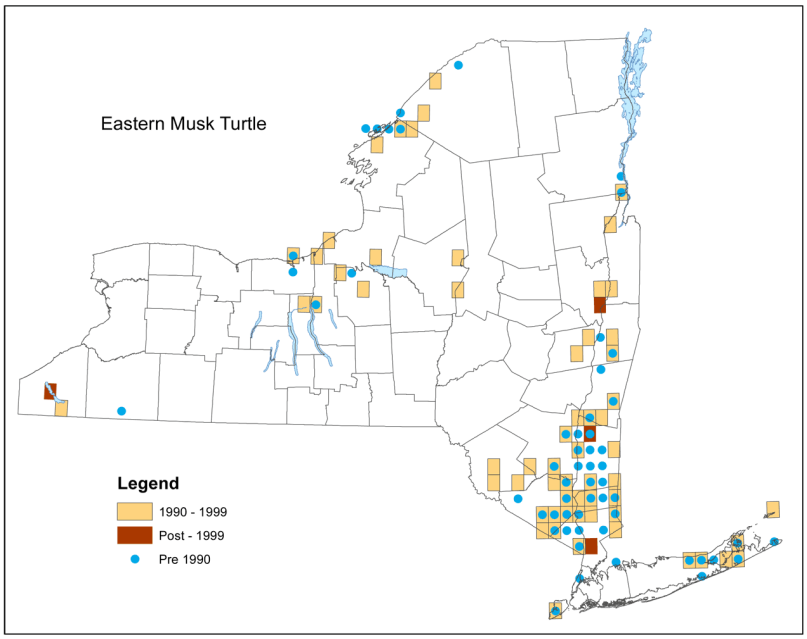

Figure 1: Distribution of eastern musk turtle in New York (NY Herpetology database, NYSDEC)

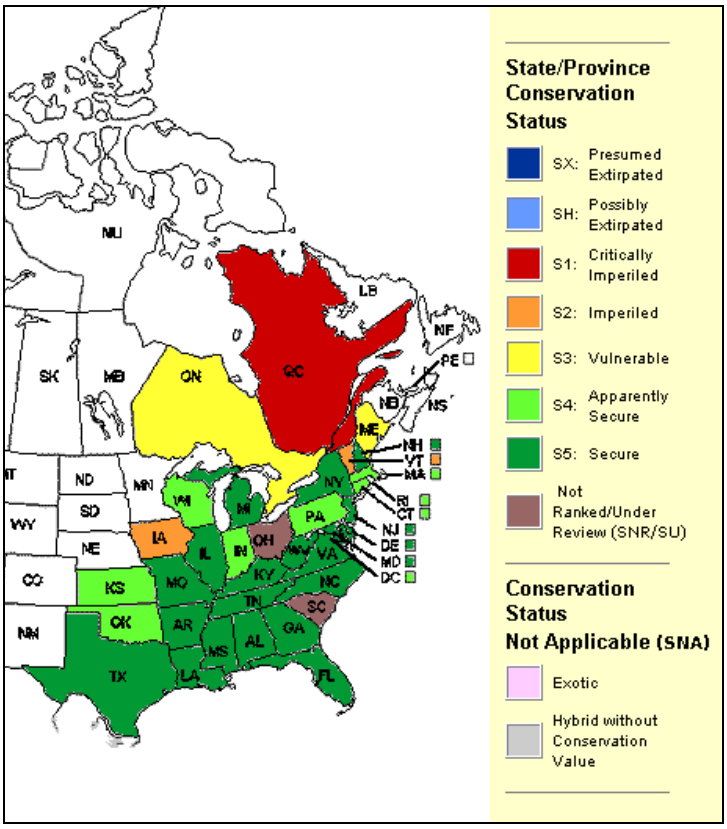

Figure 2: Conservation status of eastern musk turtle in North America (NatureServe 2013)

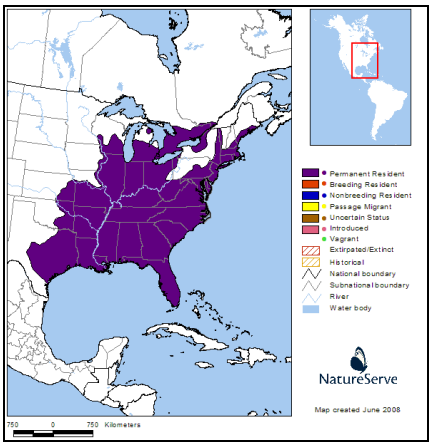

Figure 3: Distribution of eastern musk turtle in North America (NatureServe 2013)

III. New York Rarity, if known:

Historic	# of Animals	# of Locations	% of State
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

Current	# of Animals	# of Locations	% of State
	_____	_____	___6%___

Details of current occurrence:

Musk turtles are found in the Great Lakes drainages, the Hudson River and many tributaries, and on Long Island (Gibbs et al. 2007). The NY Amphibian and Reptile Atlas (1990-99) documented musk turtles in 53 survey quads. Four additional survey quads within the known distribution were documented to have musk turtles since 2000.

New York's Contribution to Species North American Range:

% of NA Range in New York	Classification of New York Range
____ 100 (endemic)	____ Core
____ 76-99	__X__ Peripheral
____ 51-75	____ Disjunct
____ 26-50	Distance to core population:
__X__ 1-25	_____

IV. Primary Habitat or Community Type:

1. Eutrophic Pond

2. Eutrophic Dimictic Lake

3. Large/Great River

4. Freshwater Marsh

Habitat or Community Type Trend in New York:

____ Declining __X__ Stable ____ Increasing ____Unknown

Time frame of decline/increase: _____

Habitat Specialist? _____ Yes __X__ No

Indicator Species? _____ Yes __X__ No

Habitat Discussion:

Musk turtles use a variety of water bodies that have a soft, muddy substrate, submerged vegetation, and little or no current. They may be found in canals, ponds, large streams, marshes, and weedy coves of natural lakes and rivers (Hulse et al. 2001, Connor et al. 2005, Gibbs et al. 2007). Isolated water bodies are generally not occupied since musk turtles do not wander distances across land. Brackish water is avoided although Gibbs et al. (2007) note the presence of musk turtles in Onondaga Lake (Onondaga County), which is slightly salty. Nesting sites are variable, but must be close to water and have exposure to direct sunlight.

V. New York Species Demographics and Life History

__X__ Breeder in New York

__X__ Summer Resident

__X__ Winter Resident

_____ Anadromous

_____ Non-breeder in New York

_____ Summer Resident

_____ Winter Resident

_____ Catadromous

_____ Migratory only

_____Unknown

Species Demographics and Life History Discussion:

In New York, musk turtles are active from late March through October. Nesting begins in the first half of June. Females leave the water to lay eggs but do not venture far. Ernst (1986) reported that nests were an average of 6.6m (23ft) from water, with a maximum distance of 11m (36ft). A clutch of 1 to 9 eggs will hatch in August or September. The average clutch size in a Pennsylvania study was 3.25 and the reproductive potential was 0.5 young per clutch (Ernst 1986). Ernst (1986) found the male to female ratio to be 1.34:1.00 and the population density was 24 adults per hectare.

Males reach sexual maturity in just 3 or 4 years while females require 6 to 10 years or longer (Gibbs et al. 2007). Nesting success and recruitment are low while adult survivorship is high (Edmonds 2002). Ernst (1986) reported that 78% of all nests were depredated; crows and raccoons are common egg predators (Gibbs et al. 2007). Adults in the wild can live for at least 28 years. Mitchell (1988) reported annual survivorship in a Virginia population was 0.84 to 0.86. Predators on adults include raccoons, otters, mink, and bald eagles (Harding 1997, Gibbs et al. 2007).

Musk turtles have been reported to be primarily nocturnal, though Hulse et al. (2001) found them active both day and night. W. Hoffman (unpublished data) noted high activity levels on bright sunny days in late May. Most movements are made not by swimming, but by walking along the bottom of the lake or pond. Their movement on land has been described as "ludicrously slow and clumsy" (Edmonds 2001). Despite this, musk turtles are apparently good navigators; Gibbs et al. (2007) reported that musk turtles released a mile from their capture point in Westchester County returned in less than a day. Hibernation occurs in groups that may include several hundred individuals (Thomas and Trautman 1937).

VI. Threats:

Musk turtles are threatened primarily by shoreline residential development that leads to loss of aquatic vegetation and nesting sites (Harding 1997), boating activity (Edmonds 2002), and fisheries by-catch (Larocque et al. 2011).

Their tendency to bask at the water's surface under the cover of vegetation makes musk turtles susceptible to strikes from recreational boat propellers. Increased use of personal watercraft, which can move closer to shorelines, has likely affected mud turtles. Harvesting machines that are used to remove invasive water chestnut can also take musk turtles.

Because musk turtles are frequently caught by people fishing with live bait, there is a misconception that musk turtles consume game fish, and this has lead to persecution by anglers who consider them to be a nuisance (Harding 1997). Larocque et al. (2011) reported that musk turtles were one of four turtle species caught in fisheries hoop traps in southern Ontario.

Musk turtle do not venture far from their aquatic habitats, and are therefore not as vulnerable to road mortality as are some other turtle species. Moss et al. (2009) found a high concentration of PCBs in a female musk turtle in Tennessee but the potential risk of such a concentration on health and reproduction needs to be assessed. Background levels of mercury have been isolated from tissue samples from an adult musk turtle found dead in Dutchess County (W. Hoffman, personal communication).

In the winter of 2002-03, a small population at Lake Luzerne, Warren County, experienced a large die-off (~45 adults) that was noted in the spring by local residents. The cause of these death is unknown, as is the status of that population (W. Hoffman, personal communication).

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

_____ No ____ Unknown

__X__ Yes

In 2006, the State of New York adopted legislation (ECL section 11-0107 sub 2) that gave all native frogs, turtles, snakes, lizards and salamanders legal protection as game species, and few species are open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

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

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for uncommon turtles of wetlands, which includes eastern musk 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.

____ Adopt into New York's Environmental Conservation Law provisions which designate stinkpot, eastern mud turtle, Blanding's turtle, and spotted turtle as protected small game species.

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
Education & Awareness	Awareness & Communications
Law/Policy	Legislation
Law/Policy	Compliance & Enforcement

VII. References

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Date last revised: July 9, 2013