

Species Status Assessment

Class: Amphibia
Family: Ambystomidae
Scientific Name: *Ambystoma opacum*
Common Name: Marbled salamander

Species synopsis:

The marbled salamander occurs in the southeastern part of the United States and reaches its northern extent in southeastern New York. Adults are found in upland or floodplain deciduous forests and seem to prefer areas with dry or friable soil. Breeding occurs during the fall when eggs laid in forest depressions are protected by the female until rains flood them and initiate hatching. Populations are thought to be declining, primarily due to loss and fragmentation of habitat resulting from urbanization.

I. Status

a. Current and Legal Protected Status

- i. **Federal** Not Listed **Candidate?** No
- ii. **New York** Special Concern; SGCN

b. Natural Heritage Program Rank

- i. **Global** G5
- ii. **New York** S3 **Tracked by NYNHP?** No

Other Rank:

NY Natural Heritage Program – Watch List
Species of High Concern (NEPARC 2010)

Status Discussion:

Marbled salamanders occur only in the extreme southeastern part of New York. This species is considered relatively common except on eastern Long Island and in lower Westchester County where habitat fragmentation and urbanization have reduced populations. NEPARC (2010) lists

marbled salamander as a Species of High Concern because more than 50% of northeastern states list it as SGCN.

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: Not Specified

b. Regional (e.g., Atlantic Flyway, USFWS Region 5 – Northeast, Watershed, Hydrologic Unit)

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Northeast

Time Frame Considered: Not specified

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: Klemens (1990): stable

Listing Status: _____ Not Listed _____ SGCN? Yes

MASSACHUSETTS Not Present _____ No data _____

i. Abundance

____ declining ____ increasing ____ stable X unknown

ii. Distribution:

____ declining ____ increasing ____ stable X unknown

Time frame considered: 78 occurrences since 1980; no trend

Listing Status: _____ Threatened _____ SGCN? Yes

NEW JERSEY Not Present _____ No data X

i. Abundance

____ declining ____ increasing ____ stable X unknown

ii. Distribution:

____ declining ____ increasing ____ stable X unknown

Time frame considered: _____

Listing Status: _____ Special Concern _____ SGCN? Yes

VERMONT Not Present X No data _____

i. Abundance

___ declining ___ increasing ___ stable ___ unknown

ii. Distribution:

___ declining ___ increasing ___ stable ___ unknown

Time frame considered: species reported in VT but never verified

Listing Status: Not Listed SGCN? No

d. NEW YORK

No data _____

i. Abundance

X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

X declining ___ increasing ___ stable ___ unknown

Time frame considered: past several decades

Monitoring in New York.

There are currently no regular monitoring activities in New York. The NY Amphibian and Reptile Atlas (Herp Atlas) was conducted in 1990-99. The Herp Atlas database also includes historic records from prior to 1990; these records are primarily a compilation of museum records and researchers' field notes.

Trends Discussion:

NatureServe (2012) notes a long-term trend in North America of "stable to declining by 50%," and a short-term trend of "stable to declining by 30%." Reliable trends are not available for salamanders in general and concern for the marbled salamander is based on its dependence on small, isolated seasonal wetlands and the knowledge of threats including loss of wetland habitat (Scott 2005), road mortality, acid rain, and the effects of predicted climate change.

Many local marbled salamander breeding sites have been eliminated by conversion of habitat to intensive human uses, and such losses are ongoing (Petranka 1998). Trends for New York's resident marbled salamanders appear to be decidedly negative over the past several decades (NY SWAP).

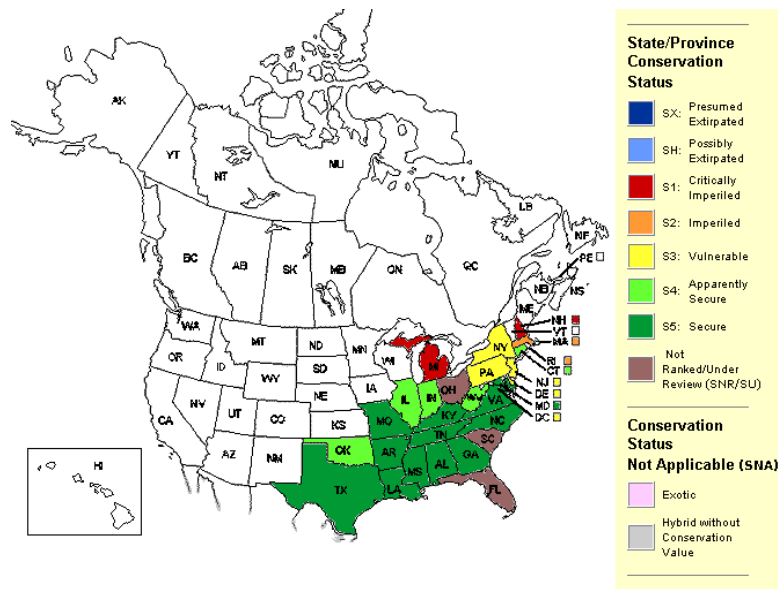


Figure 1: Conservation status of marbled salamander in the United States (NatureServe 2012).

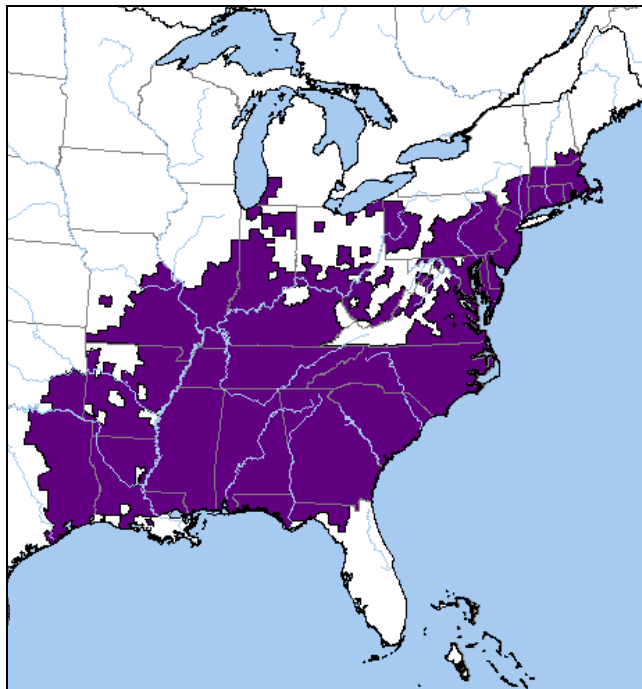


Figure 2: Distribution of marbled salamander in the United States (NatureServe 2012). "Data developed as part of the Global Amphibian Assessment and provided by IUCN-World Conservation Union, Conservation International and NatureServe."

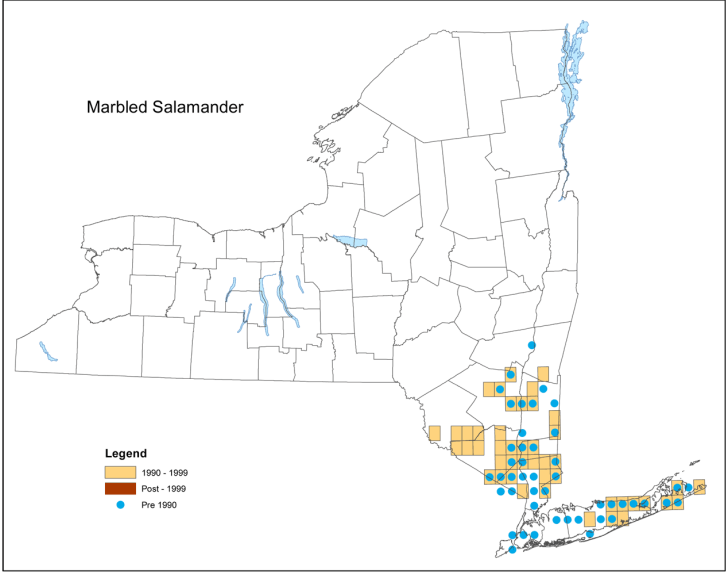


Figure 3: Distribution of marbled salamander in New York (NYS Herpetology database)

III. New York Rarity, if known:

Historic (select one)	<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:

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	_____	_____5%_____

Details of current occurrence:

The New York Amphibian and Reptile Atlas (1990-1999) documented marbled salamanders in 46 survey blocks, which are concentrated in the southeastern part of the state including eastern Long Island. There is a noticeable gap in western Long Island where development is extensive.

New York's Contribution to Species North American Range:

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

Rarity Discussion:

In early accounts marbled salamander are described as common but secretive; however, no data on population sizes were collected before the 1960s. They are currently considered to be common across the range and may be locally abundant; population sizes range from dozens to hundreds (Scott 2005).

IV. Primary Habitat or Community Type:

- 1. Oak Forest
- 2. Hardwood Swamp
- 3. Coastal Plain Pond
- 4. Floodplain Forests
- 5. Vernal Pool
- 6. Coastal Hardwoods

Habitat or Community Type Trend in New York:

Declining **Stable** **Increasing** **Unknown**

Time frame of decline/increase: wetlands declining since 1970s; forests stable

Habitat Specialist? **Yes** **No**

Indicator Species? **Yes** **No**

Habitat Discussion:

From Gibbs et al. (2007): Marbled salamanders are found in upland and floodplain deciduous forests with wet depressions that provide fall breeding pools. Bishop (1941) noted that this salamander seems to prefer forests with dry, friable soils and well-drained slopes as long as moist areas are nearby. Breeding occurs during the fall in forest depressions that contain water during the fall, winter, and spring but dry up during summer. Merovich and Howard (2000) note that constructed pools will be used for breeding but that pools older than 30 years are preferred. Streambeds may be used for migration routes (Gibbs 1998).

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:

Modified from Gibbs et al. (2007): Marbled salamanders have the unusual distinction among amphibians of breeding during the fall rather than during the spring. Migration to breeding areas takes place during late summer or early fall. Males are followed by females to the edges of forest depressions. Courtship and mating may take place at those depressions, or during the migration. Fertilized eggs are laid in a shallow nest near the depression that is constructed by the female. Nests may be under leaf litter or woody debris in depressions that are moist or dry. The female remains with the eggs, curled around them and turning them periodically until fall rains fill the depression and submerge the eggs. Flooding of the nest initiates hatching quickly and larvae remain in the frozen pool through the winter months. Metamorphosis occurs in May through July. Parental care of the unhatched eggs is vital to nest survival.

In the spring, marbled salamander larvae feed on the newly hatched larvae of other salamanders with an intensity that can affect which species persist in an area (Cortwright and Nelson 1990).

VI. Threats:

Known threats to all salamanders include loss and degradation of habitat due to conversion of land to agriculture and urban areas. Klemens (1990) noted that although marbled salamanders were most frequently found at undisturbed sites, they were found at disturbed sites as well. As an

obligate vernal pool species, marbled salamanders are sensitive to degradation of water quality from a variety of pollution sources including household garbage, agricultural runoff, pesticides, and siltation. Acid deposition may result in embryo death and larval deformities, though studies have been contradictory (Massachusetts Division of Fisheries & Wildlife 2005). Roads negatively affect marbled salamander abundance in roadside habitats, as they are a significant source of mortality (deMaynadier and Hunter 2000). Logging affects vernal pool obligates by disrupting migratory movements, introducing roads, and reducing water quality. In addition, reforestation of commercial forests with coniferous species is detrimental to species that rely on a mixed forest habitat (NH State Wildlife Action Plan 2005).

Climate change that affects hydroperiod and/or water temperature of vernal pools could have significant impacts on productivity (Rowe and Dunson 1995). Global warming may also increase the frequency of fungal outbreaks (Gibbs et al. 2007).

The chytrid fungus, *Batrachochytrium dendrobatidis* (Bd), first described in 1998 (Longcore et al. 1999), is a fungal pathogen that has affected more than 200 amphibian species in 6 countries (Skerratt et al. 2007). Bd has been identified in marbled salamanders (Kinney et al. 2011).

Marbled salamander was classified as “highly 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

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 no salamander species are open to harvest. The legislation also outlaws the sale of any native species of herpetofauna regardless of its origin.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Army Corps of Engineers has the authority to regulate smaller wetlands in New York State, and the DEC has the authority to regulate smaller wetlands that are of unusual local importance. The seasonal woodland pools that are required for breeding have no regulatory protection in New York State.

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

Semlitsch (1998) reviewed literature on several *Ambystoma* species and concluded that a radius of less than 200 meters around a breeding pond would likely encompass the terrestrial habitat used by more than 95 percent of adults.

Conservation actions following IUCN taxonomy are categorized in the table below.

Conservation Actions	
Action Category	Action
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
Law/Policy	Legislation

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for vernal pool salamanders, which includes marbled salamander.

Easement acquisition:

- Secure wetland and adjacent upland habitats critical to species survival by acquisition of conservation easements, or by other land protection mechanisms.

Habitat management:

- Develop and implement measures to manage reductions of wetland habitat quality caused by invasive plants, by offroad vehicles, and by introductions of fish and other predatory species.

Habitat research:

- Enable research to further document extent of upland habitat required by vernal pond breeding salamanders.
- 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.

Life history research:

- Document life history parameters specific to New York populations of the species, including age and sex ratios, longevity, age at sexual maturity, survivorship of young, predator-prey relationships, and wetland/upland habitat requirements.

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 tiger salamander, marbled salamander, Jefferson salamander and blue-spotted salamander as protected small game species.

Other action:

- 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 tiger salamanders at selected sites as needed, including head starting, 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.
- Develop standardized population survey protocols, and implement survey protocols at all known and potentially suitable sites, to document the statewide distribution of species in this group.

VII. References

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