# Species Status Assessment

**Common Name:** Eastern tiger salamander **Date Updated:** January 2025

**Scientific Name:** *Ambystoma tigrinum* **Updated By:** Peter Davis

**Class:** Amphibia

**Family:** Ambystomatidae

## Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

As many as eight subspecies of tiger salamander, *Ambystoma tigrinum,* were once recognized by researchers (*diaboli, californiense, mavortium, melanostictum, nebulosum, stebbinsi, valasci, and tigrinum)* (Petranka 1998). However, Shaffer and McKnight (1996) provided molecular phylogenetic evidence indicating that the eastern and western tiger salamanders should be regarded as distinct species and treated the western forms as subspecies of *Ambystoma mavortium*. Lannoo (2005) included *A. mavortium* in *A. tigrinum.* The eastern tiger salamander (*A. tigrinum,* synonym *A. tigrinum tigrinum*) is a coastal plain lineage that occurs in the Atlantic Coast states, and reaches its northern extent in New York, where it is listed as an endangered species. New York's population is restricted to Long Island, where it is found in upland forested habitats with sandy soils and ponds for breeding. The population is geographically isolated, with the closest population occurring in northern New Jersey.

Tiger salamanders are known to occur or previously occurred at 129 sites, consisting of 213 individual breeding ponds, within the current range on Long Island. Much of the habitat where the species exists is protected as public land and with strong wetland regulations. Though the statewide range appears to have contracted since the 1980s, many of the known populations have remained stable since the last assessment.

## I. Status

### a. Current legal protected Status

i. **Federal:** Not listed **Candidate:** No

ii. **New York:** Endangered; HPSGCN

### b. Natural Heritage Program

i. **Global:** G5

ii. **New York:** S1S2 **Tracked by NYNHP?:** Yes

**Other Ranks:**
-IUCN Red List: Least concern
-COSEWIC: Extirpated (Carolinian population)
-Northeast Regional SGCN List (2023): Very High Conservation Concern (Terwilliger 2023)
-NEPARC Regional List (2010): Species of Severe Concern

**Status Discussion:**

The tiger salamander has been designated as a Regional species of Very High Conservation Concern in the Northeast (Terwilliger 2023). The Northeast Partners in Amphibian and Reptile

Conservation (NEPARC, 2010) list the eastern tiger salamander as a Species of Severe Concern because more than 75% of states list it as a Species of Greatest Conservation Need (SGCN). In adjacent states and provinces, populations have been extirpated (e.g., Ontario and Pennsylvania), or are state-listed as endangered (New Jersey).

The species was initially designated as endangered in New York due to declining population trends (specifically decreasing distribution throughout its suspected range), threats from development, and its isolated position in the range. However, ongoing survey efforts in New York continue to document tiger salamanders occupying known habitats, with consistent detection at these locations. Individuals are regularly found in protected habitats, and five new locations have been identified since the previous assessment. Though tiger salamanders continue to face threats, survey results do not suggest that they are at imminent risk of extirpation in the state. Many (36%) breeding ponds and their associated upland habitats are located on public lands, or are under the ownership of land conservation organizations, and all known, occupied habitat is protected by state law in New York.

## II. Abundance and Distribution Trends

| Region | Present? | Abundance | Distribution | Time Frame | Listing status | SGCN? |
|---|---|---|---|---|---|---|
| **North America** | Yes | Declining | Declining | Past 30 years | Not Listed | |
| **Northeastern US** | Yes | Declining | Declining | Last 20 Years | State Endangered: DE, MD, NJ, VA | Yes |
| **New York** | Yes | Stable | Stable | Last 30 years | Endangered | Yes |
| **Connecticut** | No | N/A | N/A | | | |
| **Massachusetts** | No | N/A | N/A | | | |
| **New Jersey** | Yes | Declining | Declining | Last 20 years | Endangered | Yes |
| **Pennsylvania** | No | | | Since early 1900s | Presumed Extirpated | No |
| **Vermont** | No | N/A | N/A | | | |
| **Ontario** | No | | | | Extirpated | |
| **Quebec** | No | N/A | N/A | | | |

*Column options*
**Present?:** Yes; No; Unknown; No data; (blank) or Choose an Item
**Abundance and Distribution:** Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
**SGCN?:** Yes; No; Unknown; (blank) or Choose an item

**Monitoring in New York** *(specify any monitoring activities or regular surveys that are conducted in New York):*

Known and historic tiger salamander breeding ponds are surveyed by regional DEC staff for productivity using annual egg mass counts and larval surveys. Survey effort since the last status assessment has been inconsistent due to lack of consistent staffing during times of the year that are most advantageous for conducting surveys.

**Trends Discussion** *(insert map of North American/regional distribution and status):*

In New York, tiger salamanders currently occur only on Long Island, primarily in Suffolk County. Populations in the heavily developed areas of western Long Island have been extirpated (NYNHP 2025); however, many of the known populations on eastern Long Island continue to persist. Survey efforts have not been extensive enough to determine population trends or abundance at any given site. Detection probability at any given site is relatively low, so the inability to survey consistently and with sufficient effort makes it difficult to determine whether a population has been extirpated from a site. Approximately half of the sites occupied by tiger salamanders during the previous assessment continue to show their presence, while the other half have generally been surveyed less frequently than the previous assessment period, making it difficult to draw definitive conclusions about current occupancy at these sites. However, in most cases the habitat still exists and is protected by state law and regulation, and while threats may persist, it is likely that populations continue to occupy these habitats. Advancements in the ability to detect environmental DNA and more frequent surveying in the future will help to identify broader population trends.

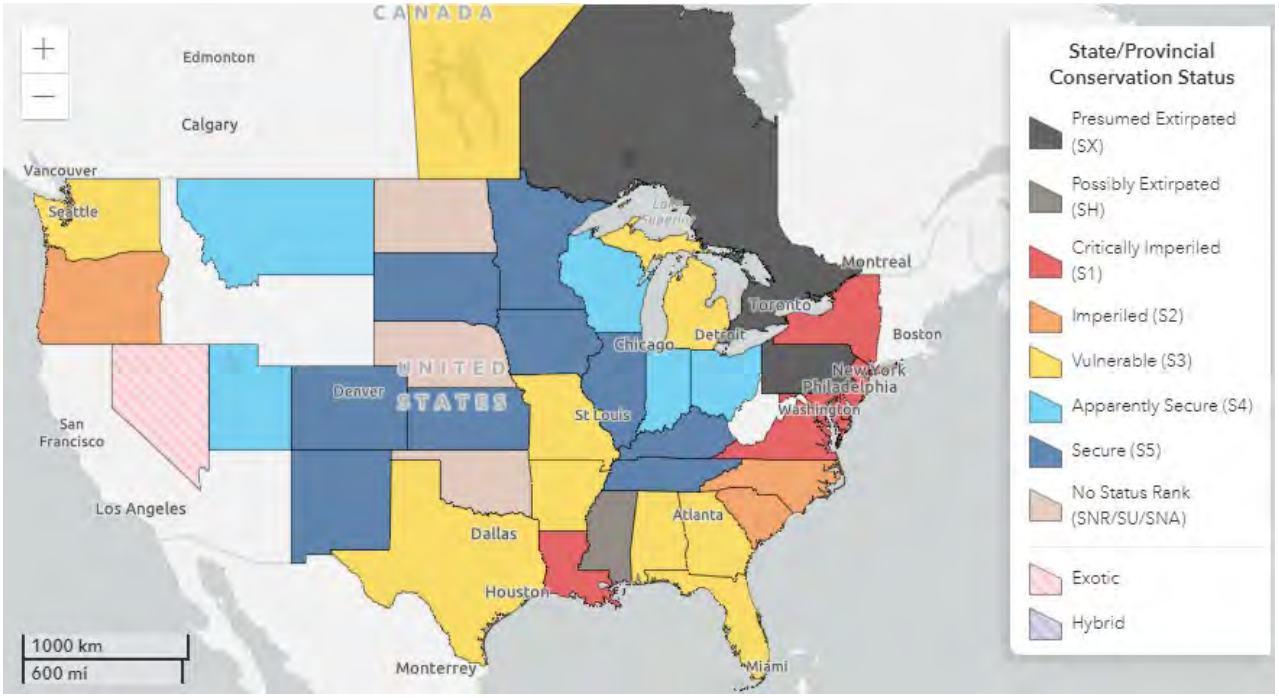


**Figure 1.** Tiger salamander status in North America (NatureServe 2023)

**Distribution Map**

*Ambystoma tigrinum*


Legend

- EXTANT (RESIDENT)
- EXTANT & INTRODUCED (RESIDENT)

Compiled by:

IUCN (International Union for Conservation of Nature), Conservation International & NatureServe, CONABIO (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad) 2021

**Figure 2.** Tiger salamander reported distribution (IUCN 2022)

## III. New York Rarity *(provide map, numbers, and percent of state occupied)*

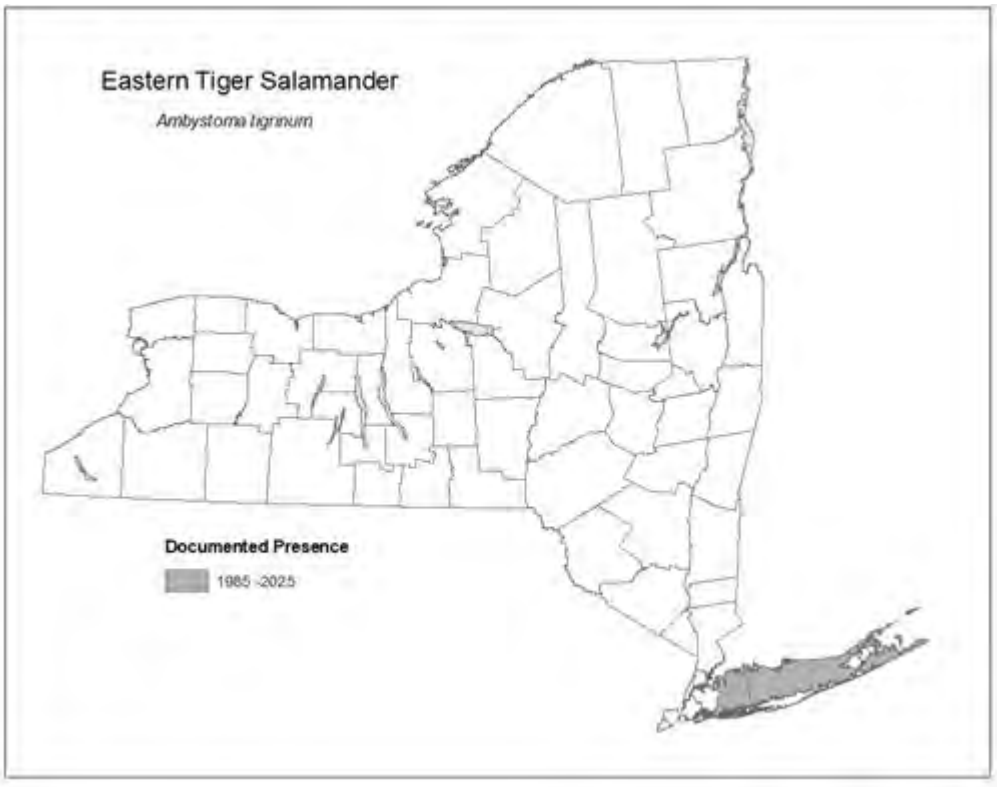


**Figure 3.** Distribution of easter tiger salamander in New York, 1985-2025 (NYSDEC)

### Details of historic and current occurrence:

**Historic:** From NYNHP (2025): Tiger salamanders occurred historically in a few isolated populations in the Hudson River Valley in Albany and Rockland counties (Bishop 1941, Stewart and Rossi 1981), as well as most of Long Island including Nassau, Queens, Brooklyn, and Staten Island (Bishop 1941).

Stewart and Rossi (1981) noted that tiger salamanders may have historically occurred in the Albany Pine Bush (Albany County); however, none were located during subsequent survey efforts at this location. Two historic observations of tiger salamanders that were reported from Onondaga County have not been confirmed, and these salamanders were most likely misidentified (Schlauch 1981). A specimen taken from Howes Cave in Schoharie County and kept in the NYS Museum until 1938 may not represent a known population.

**Current:** Tiger salamanders occur only on Long Island, primarily in Suffolk County. The stronghold is currently in the central sections of the Pine Barrens, which stretch from Lake Ronkonkoma to Riverhead in the town of Brookhaven (Cryan 1984, Kling 2001), with a small group of populations in the town of Southampton on the South Fork (NYNHP 2025). Surveys have been conducted annually throughout their current known range by regional DEC staff to document continued presence/absence since 2015. These surveys have shown that tiger salamanders continue to be present in known locations since the time of the last species status assessment

The following information is based on a review of the New York Natural Heritage Program database as of January 2025. Of the 129 documented breeding locations on Long Island, 13% (17 of 129) are ranked as having 'good' or 'excellent' viability, 16% (20 of 129) as 'good/marginal' viability, 43% (56 of 129) as 'marginal' or 'poor' viability, 8% (10 of 129) are 'extant' with insufficient data to estimate viability, and 20% (26 of 129) 'failed to find' tiger salamanders during most recent survey efforts.

### New York's Contribution to Species North American Range:

| Percent of North American Range in NY | Classification of NY Range | Distance to core population, if not in NY |
|---|---|---|
| 1-25% | Peripheral | |

*Column options*
**Percent of North American Range in NY**: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
**Classification of NY Range**: Core; Peripheral; Disjunct; (blank) or Choose an item

## IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

- **a.** Oak-Pine Forest
- **b.** Pine Barrens
- **c.** Coastal Plan Pond
- **d.** Vernal Pool
- **e.** Water Recharge Basin
- **f.** Farm Pond/Artificial Pond

### Habitat or Community Type Trend in New York

| Habitat Specialist? | Indicator Species? | Habitat/ Community Trend | Time frame of Decline/Increase |
|---|---|---|---|
| Yes | No | Unknown | |

*Column options*
**Habitat Specialist and Indicator Species**: Yes; No; Unknown; (blank) or Choose an item
**Habitat/Community Trend**: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

### Habitat Discussion:

Tiger salamanders require both upland and wetland habitats with fish-free ponds for breeding. Loamy sand and sandy loam soil types allow the salamanders to burrow underground where they spend most of the time. In New York, tiger salamanders occur in pine barrens habitats with seasonal or permanent ponds; kettle holes ponds are frequently used. Deciduous (red maple and oak spp.) and mixed pine-deciduous (pitch pine-oak spp.) forests with a blueberry understory are preferred, as are ponds that have at least some surrounding forest but that are open to sunlight (Gibbs et al. 2007, Madison and Titus 2009). Individuals will use cover-boards for hiding (Kling 2001).

As natural woodland breeding ponds on Long Island have been destroyed by development, dumping, and pollution, man-made habitats including farm ponds and stormwater retention basins (including those within clover-leaf highway exit ramps) have come to serve as breeding sites for the tiger salamanders. Tiger salamanders will use man-made breeding pools. In New Jersey, a population was successfully established when egg masses were moved to a created pond that had been excavated on state land specifically for tiger salamanders (NJDEP 2018).

## V. Species Demographic, and Life History:

| Breeder in NY? | Non-breeder in NY? | Migratory Only? | Summer Resident? | Winter Resident? | Anadromous/ Catadromous? |
|---|---|---|---|---|---|
| Yes | - | - | Yes | Yes | - |

*Column options*
**First 5 fields**: Yes; No; Unknown; (blank) or Choose an item
**Anadromous/Catadromous**: Anadromous; Catadromous; (blank) or Choose an item

### Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Tiger salamanders spend the majority of their lives underground, emerging primarily to breed, and only rarely outside that time (Gibbs et al. 2007). Two studies monitoring use of terrestrial habitat in New York found that *Ambystoma tigrinum* moved a maximum distance of 286.5 m (Madison and Farrand 1998) and 282 m (Titus et al. 2014) from their wetlands of origin. Semlitsch (1998) suggested that a 164.3 m buffer would be necessary to protect 95% of Ambystomatid salamanders in a breeding population. However, tiger salamanders may stay within a 3 to 10 square meter area for months at a time (Gibbs et al. 2007). Breeding occurs in early spring, as soon as pond edges are free of ice. Males and females enter ponds, where mating occurs; males can be aggressive in their determination to mate with a female. Fertilized eggs are attached to submerged sticks and plants in loose masses of 20 to 100 eggs (Gibbs et al. 2007). Hatching occurs in 3 to 6 weeks and larvae metamorphose by late summer of the same year. Predators on larvae and adults include birds, snakes, frogs, fish, and small mammals.

## VI. Threats *(from NY 2015 SWAP or newly described):*

Summarized from NYNHP (2025): The loss and degradation of upland and wetland habitats, and the connections between them, is the most significant threat to tiger salamanders. Populations on Long Island have been subjected to intense development of commercial structures, housing, and roads. They suffer high levels of road mortality during migration from upland areas to breeding ponds. As a result of development, remaining breeding ponds experience water quality reductions due to factors such as contamination, hydrological changes, introduction of predatory fish, introduction of pathogens, spread of invasive plants, and ATV use. Road curbing and window wells can obstruct salamander dispersal. Drying of breeding ponds may result in total reproductive failure in some years (Semlitsch 1983).

Increased development in Long Island, an already highly developed region, creates barriers for dispersal and negatively impacts genetic dispersal within local populations (McCartney et al. 2017).

Ranavirus affects tiger salamanders and has caused mass deaths in North Dakota, Utah, and Saskatchewan (Daszak et al. 1999). The chytrid fungus, *Batrachochytrium dendrobatidis* (*Bd*), first described in 1998 (Longcore et al. 1999), has become a disease of global concern, with a recent study finding *Bd*-infection in 86 of 119 (72%) sampled countries and in 1062 of 1966 (54%) amphibian species tested (Monzon et al. 2020). Tiger salamanders are known to be susceptible to *Bd* (Davidson et al. 2003). A recently discovered, salamander-specific species of chytrid fungus, *Batrachochytrium salamandrivorans* (*Bsal*), has been associated with mass die-offs of salamanders in the Netherlands, Belgium, and Germany (Shulz et al. 2020, Martel et al. 2013); however, the susceptibility of tiger salamanders to *Bsal* is unknown, and it has not yet been detected in North America.

The tiger salamander was also 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).

| Threat Level 1 | Threat Level 2 | Threat Level 3 | Spatial Extent* | Severity* | Immediacy* | Trend | Certainty |
|---|---|---|---|---|---|---|---|
| 1. Residential and Commercial | 1.1 Housing & Urban Areas | 1.1.2 Low-density housing areas (loss of upland/wetland habitat) | Restricted | Moderate | Near-term | Stable and ongoing | Moderate |
| 4. Transportation & Service Corridors | 4.1 Roads & Railroads | 4.1.1 Roads (road mortality) | Large | Moderate | Long-term | Stable and ongoing | Moderate |
| 7. Natural System Modifications | 7.2 Dams & Water Management/Use | 7.2.7 Withdrawal of groundwater | Restricted | Moderate | Long-term | Unknown | Unknown |
| 8. Invasive & Other Problematic Species | 8.1 Invasive Non-Native Plants & Animals | 8.1.4 Aquatic plants | Restricted | Moderate | Near-term | Stable and ongoing | Moderate |
| 8. Invasive & Other Problematic Species | 8.4 Pathogens | 8.4.2 Viral pathogens (ranavirus) | Restricted | Slight | Near-term | Unknown | Unknown |
| 8. Invasive & Other Problematic Species | 8.4 Pathogens | 8.4.3 Fungal pathogens (chytrid) | Unknown | Unknown | Near-term | Unknown | Unknown |
| 11. Climate Change | 11.1 Habitat Shifting & Alteration | 11.1.2 Phenological mismatch | Large | Extreme | Long-term | Unknown | Unknown |

**Table 2.** Threats to eastern tiger salamander.

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

**Yes:** ✓ **No:** _____ **Unknown:** _____

**If yes, describe mechanism and whether adequate to protect species/habitat:**

The tiger salamander is listed as an 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 or action 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.

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 Environmental Conservation Law. In addition, amendments to the law that took effect on January 1, 2025, provide for the protection of 'productive vernal pools'. The adopted regulations (6 NYCRR Part 664) identify a vernal pool with one tiger salamander egg mass or larvae as a productive vernal pool to be protected. The adopted regulations also allow for an extended adjacent area to protect critical upland habitat to ensure that the pools remain productive. 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 Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Environmental Conservation Law.

Many (36%) tiger salamander breeding ponds are located on public lands or those owned by land conservation agencies, such as The Nature Conservancy and Peconic Land Trust. This ownership provides some level of protection to habitat since development risk is low or non-existent.

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

NYSDEC (2010) provides recommendations and requirements for projects within 1,000 feet of known tiger salamander breeding sites. Specifically, 100% of the existing uplands within 535 feet of the breeding pool and 50% of the uplands within 1,000 feet of the breeding pool must be maintained. Additional requirements include the following: installation of culverts to allow safe road crossings; restrictive curbing around created pool and window wells; lighting must face away from breeding pools; the breeding pool must not be used as a catch basin for drainage; certain larvicides (for mosquito control) must not be used; predatory fish must not be introduced; upland habitat must be managed to restrict recreational use.

Management actions in tiger salamander habitats have included transplanting egg masses, establishing roadway crossings, creating artificial ponds, creating salamander preserves, conducting radio-telemetry studies, designating Class 1 wetlands, and establishing buffer zones (Levy 2001, NYSDEC 2010).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for vernal pool salamanders, which includes tiger salamander. These actions continue to be essential for the conservation of this species. Actions that have been accomplished, or where progress has been made, are denoted with a check. Conservation actions following IUCN taxonomy are categorized in the table that follows.

**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.

***Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection) - https://www.iucnredlist.org/resources/conservation-actions-classification-scheme***

| Action Category | Action | Description |
|---|---|---|
| A.1 Direct Habitat Management | A.1.0.0.0 Direct Habitat Management | Site/Area management |
| A.2 Direct Species Management | A.2.0.0.0 Direct Species Management | Invasive/problematic species control |
| C.6 Design and Plan Conservation | C.6.0.0.0 Design and Plan Conservation | Resource/habitat protection |
| C.6 Design and Plan Conservation | C.6.5.1.3 Develop a conservation, management, or restoration plan for protected private lands | Habitat and natural process restoration |
| C.7 Legislative and Regulatory Framework or Tools | C.7.1.2.0 Create, amend, or influence legislation | Legislation |

**Table 3.** Recommended conservation actions for eastern tiger salamander.

## VII. References


Bishop, S. C. 1941. The salamanders of New York. New York State Museum Bulletin 324:1-365.

COSEWIC. 2023. COSEWIC rapid review of classification on the Eastern Tiger Salamander Carolinian population (*Ambystoma tigrinum*) in Canada 2023. Committee on the Status of Endangered Wildlife in Canada. Website: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/eastern-tiger-salamander-2023.html#toc0 [accessed February 2025].

COSEWIC. 2023. Canadian Wildlife Species at Risk. Committee on the Status of Endangered Wildlife in Canada. Web site:https://species-registry.canada.ca/index-en.html#/documents/26RBeAHh9ZftjQJ4CW3J9 [accessed 8 January 2025].

Crother, B. I. (editor). 2017. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. 8th edition. SSAR Herpetological Circular 43:1-104. [Updates in SSAR North American Species Names Database at: https://ssarherps.org/cndb]

Cryan, J. F. 1984. The status of the eastern tiger salamander (*Ambystoma tigrinum tigrinum*) on Long Island, New York. Unpublished report to New York State Department of Environmental Conservation, Endangered Species Unit.

Daszak, P., L. Berger, A. A. Cunningham, A. D. Hyatt, D. E. Green, R. Speare. 1999. Emerging infectious diseases and amphibian population declines. Emerging Infectious Diseases 5(6): 735–748.

Davidson, E.W., M. Parris, J.P. Collins, J.E. Longcore, A.P. Pessier, J. Brunner, and S.J. Beaupre. 2003. Pathogenicity and transmission of chytridiomycosis in tiger salamanders (*Ambystoma tigrininum*). Copeia 2003:601-07.

Gibbs, J.P., A.R. Breisch, P.K. Ducey, G. Johnson, J.L. Behler, and R.C. Bothner. 2007. The amphibians and reptiles of New York State. Oxford University Press, NY.

IUCN SSC Amphibian Specialist Group. 2022. Ambystoma tigrinum. The IUCN Red List of Threatened Species 2022: e.T83293207A196342827. https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T83293207A196342827.en. Accessed on 19 January 2025.

Kling, H. M. 2001. Emergent tiger salamander (*Ambystoma tigrinum tigrinum*) use of cover-boards at Brookhaven National Laboratory. Brookhaven National Laboratory, Upton, NY. U.S. Department of Energy-Office of Science, Energy Research Undergraduate Lab.

Lannoo, M. (editor). 2005. Amphibian declines: the conservation status of United States species. University of California Press, Berkeley. xxi + 1094 pp.

Levy, J. R. 2001. Analysis of the Long Island habitat of the eastern tiger salamander (*Ambystoma tigrinum*) using a geographic information system. M.S. Thesis, University at Albany, State University of New York, Albany, NY.

Longcore, Joyce & Pessier, Allan & Nichols, Donald. 1999. Batrachochytrium Dendrobatidis gen. et sp. nov., a Chytrid Pathogenic to Amphibians. Mycologia. 91. 219. 10.2307/3761366.

Madison, D.M., & Farrand, L. 1998. Habitat Use during Breeding and Emigration in Radio-Implanted Tiger Salamanders, Ambystoma tigrinum. Copeia, 1998, 402-410.

Madison, D. and V. R. Titus. 2009. Final report for New York State Department of Environmental Conservation: Tiger salamander upland habitat requirements. Project MOU # AM 05513.

Martel, A., A. Spitzen-van der Sluijs, M. Blooi, W. Bert, R. Ducatelle, M.C. Fisher, A. Woeltjes et al. 2013. Batrachochytrium salamandrivorans sp. nov. causes lethal chytridiomycosis in amphibians. Proceedings of the National Academy of Sciences 110: 15325-15329.

McCartney-Melstad, E., Vu, J., & Shaffer, H. B. 2017. Population Genomics of Endangered Tiger Salamanders (Ambystoma tigrinum) on Long Island, NY Reveals a Highly Structured Species Impacted by Major Roads.

Monzon, F.C., M.-O. Rödel, and J.M. Jeschke. 2020. Tracking *Batrachochytrium dendrobatidis* infection across the globe. EcoHealth 17:270-279.

NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: January 12, 2024).

NEPARC. 2010. Northeast Amphibian and Reptile Species of Regional Responsibility and Conservation Concern. Northeast Partners in Amphibian and Reptile Conservation (NEPARC). Publication 2010-1.

New Jersey Department of Environmental Protection. 2018. New Jersey's State Wildlife Action Plan. New Jersey Dept. of Environmental Protection, Division of Fish and Wildlife, Trenton, NJ.

NYNHP (New York Natural Heritage Program. 2025. Online Conservation Guide for *Ambystoma tigrinum*. Available from: https://guides.nynhp.org/tiger-salamander/. Accessed February 10, 2025.

NYSDEC (New York State Department of Environmental Conservation). 2010. Guidance for land cover set aside for conservation of the eastern tiger salamander. October 26, 2010.

Petranka, J. W. 1998. Salamanders of the United States. Smithsonian Institution Press. 587 pp.

Schlauch, F.C. 1981. Report on the status of the eastern tiger salamander, *Ambystoma tigrinum tigrinum*, in the state of New York. Report to Endangered Species Unit, New York State Department of Environmental Conservation. Delmar, NY. 55 pp.

Schlesinger, M.D., J.D. Corser, K.A. Perkins, and E.L. White. 2011. Vulnerability of at-risk species to climate change in New York. New York Natural Heritage Program, Albany, NY.

Semlitsch, R. D. 1983. Structure and dynamics of two breeding populations of the eastern tiger salamander, *Ambystoma tigrinum*. Copeia 1983:608-616.

Semlitsch, R.D. 1998. Biological delineation of terrestrial buffer zones for pondbreeding salamanders. Conservation Biology 12:1113–1119. Wacasey, J.W. 1961. An ecological study of two sympatric species of

Schulz V, et al. 2020. *Batrachochytrium salamandrivorans* in the Ruhr District, Germany: history, distribution, decline dynamics and disease symptoms of the salamander plague. Salamandra 56, 189-214.

Stewart, M.M. and J. Rossi. 1981. The Albany Pine Bush: A northern outpost for southern species of amphibians and reptiles in New York. The American Midland Naturalist 106:282-292.

Terwilliger Consulting, Inc. and the Northeast Fish and Wildlife Diversity Technical Committee. 2023. Northeast Regional Conservation Synthesis for 2025 State Wildlife Action Plans. Northeast Association of Fish and Wildlife Agencies, Washington, D.C.

Titus, Valorie & Madison, Dale & Green, Timothy. 2014. The Importance of Maintaining Upland Forest Habitat Surrounding Salamander Breeding Ponds: Case Study of the Eastern Tiger Salamander in New York, USA. Forests. 5. 3070-3086. 10.3390/f5123070.

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|---|---|
| **Originally prepared by** | Kimberley Corwin |
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