

Species Dossier

State of New York
Endangered Species Working Group
Date compiled:

Common Name: Jefferson Salamander
Scientific Name: *Ambystoma jeffersonianum*
Family: Ambystomidae

I. General Status

Current New York Status: Unlisted (special concern)
Current Federal Status: Unlisted
Recommended New York Status: Special concern

Current status in surrounding states/provinces:

Connecticut:
Massachusetts: state special concern
New Jersey:
Ohio:
Ontario:
Pennsylvania:
Quebec:
Vermont:

Current Natural Heritage rank (TNC): G5 (y) S4
global state

Global and North American Ranges:

South of area of hybridization with *A. laterale*. Pure examples in southern New York southwest to West Virginia, central Kentucky and southern Indiana.

New York's position within global range:

central **peripheral** disjunct

II. Historic New York Status and Distribution (>25 years ago)

Provide numbers and/or percent of state occupied and/or number of regions occupied (and basis for estimates), narratives, maps (if available and appropriate), and references/documentation:

Widely distributed, with records lacking from most of the Southern Tier. This species was recorded for New York in 1842 by Dekay. Locally abundant in suitable habitat.

III. Current New York Status and Distribution

Provide numbers and/or percent of state occupied and/or number of regions occupied (and basis for estimates), narratives, maps (if available and appropriate), and references/documentation:

Occurs across the Southern Tier and in the Hudson Valley north to Washington and Saratoga Counties.

IV. Author's Current Estimate of Population/Habitat Trends

Population Trend _____ Essential Habitat Trend

Declining	Declining
Stable	Stable
Increasing	Increasing
Unknown	Unknown

V. Biological Description

1. Reproductive information:

Breeds in New York: yes
Confirmed in last 2 years: yes
Confirmed in last 10 years: yes
Confirmed in last 25 years: yes
Confirmed prior to 25 years ago: yes
Unconfirmed

OR

2. Does not breed in New York; is migrating or seasonal?

OR

3. Species periodically expands or contracts into or out of New York?

Age to sexual maturity: 21 months, ♂'s 70-75mm snout vent length (SVL); ♀'s 75-80mm SVL.
Juveniles probably enter the breeding population at 2-3 yrs.
Number of breeding attempts per year: 1 attempt
Average number of young per breeding attempt: 107-286 single eggs or clusters or 1-35 eggs.
Estimated number of reproductive years per female: 8-10 years.

Other narrative on species biology:

Throughout much of the year, adult Jefferson salamanders are secretive, subterranean animals. They can generally be found under large rocks and logs, leaf litter, small mammal burrows and interstices of rocks and soil. The breeding period of these salamanders ranges from February to April, and is initiated by migrations of individuals from upland wooded nonbreeding habitats to their breeding ponds (the same breeding pool is returned to every season). Emergence from hibernation varies from year to year in response to variable climate conditions. Breeding migrations are initiated by warm spring rains, rapid runoff of snow melt or conditions of high humidity and temperatures above freezing.

The first waves of migrants consists mainly of males in breeding condition and migration occurs at night, although some diurnal movements occur if the breeding pond or adequate shelter is not found. Males require minimum favorable environmental cues to commence migration and once underway, male migration is continuous unless severe environmental conditions (e.g. freezing weather) are met. Females initiate migrations when appropriate combinations of precipitation and temperature prevail and will cease movements during adverse conditions until it improves and/or stabilizes. In every thorough census of these salamanders at their breeding ponds, males seem to outnumber females. It's

been suggested that the sex ratio within a pond is controlled during this migratory period by the frequency and duration of favorable migratory conditions.

Once in the pond, males attempt to capture females in an axillary amplexus, followed by a stimulatory phase of stroking and snout rubbing by the male. Rival males will interrupt the courtship at all stages, therefore, breeding pairs of Jefferson Salamanders are not usually found in aggregations but rather, scattered across the pool bottom. The male releases the female, moves ahead and deposits a spermatophore (ranging from 12-100) in the pond's bottom litter. Receptive females will recover the sperm cap or entire spermatophore with its cloacal lips. Egg deposition occurs 1-2 days after courtship and eggs are laid onto underwater twigs or stems in oblong masses containing 1-35 eggs per mass. Large egg masses are found when females deposit eggs undisturbed. An individual egg measures approximately 2.0-2.5mm and floats in a watery jelly surrounded by multiple membranes. Hatching occurs within 30-45 days but is highly variable depending on water temperatures. Cooler temperatures produce longer periods before hatching while warm water decreases hatching time.

Newly hatched larvae are approximately 11-14mm in length, they are yellowish in color and lightly pigmented dorsally (gills, tail, fins). The throat and belly are unpigmented, the hindlegs are nonexistent and the forelegs are represented as elongated buds. The larval period is also variable 66-80 days. Metamorphosis length was found to be about 45mm but exhibits plasticity most likely in response to unpredictable aquatic sites. This would allow the larvae to escape a drying pond or to remain in the water when conditions are favorable. Metamorphosed young exit the breeding pool and can move between 3 to 247 meters in a 3-10 day period.

Food of the Jefferson salamander is variable and consists of annelids, insects (adult and larvae), millipedes, arachnids, larvae of *Ambystoma maculatum* and are occasionally cannibalistic.

VI. Habitat
(describe type, vulnerability, distribution and trend in amount
overtime, also estimate future trends -- do you expect habitat
to be lost in future? Amount, location, type?)

During the non-breeding season, adult Jefferson salamanders are essentially nocturnal, subterranean organisms found in deciduous or mixed woodland habitats. In New York, they have been found in mixed woods of beech, chestnut, oak, maple, hemlock and on river flats consisting of large elms and maples with a willow and alder understory. The key requirement to these woodlands is an ephemeral or permanent water source absent of fish. The presence of these ponds is the main factor governing *A. jeffersonianum*'s distribution rather than the forest composition. Individuals can be found beneath logs and large rocks, in leaf litter, in the burrows of small mammals and in the interstices of rock and soil.

Breeding habitat consists of a semipermanent or permanent pond/pool of variable size usually formed by ground water seepage, surface runoff and/or rainfall. They tend to be isolated and situated away from larger bodies of water. The breeding pools of the Jefferson salamander tend to be cooler, more turbid (pH 5.1-6.1) and contain more aquatic, decaying and living vegetation.

VII. Discussion of Problems/Threats/Limiting/Overall Vulnerability
(of both individuals and essential habitat):

1. Wet spot excavation and the creation of farm ponds or larger bodies of water with subsequent introduction of game fish may prove detrimental to adults and larvae through increase predation.
2. Wetland drainage resulting in loss of critical breeding habitat due to lack of protection and enforcement of wetland laws.
3. Upland nonbreeding habitat destruction (e.g. incursion by humans through various activities such as new constructions and developments) and lack of protection for these areas.
4. Acid rain and decreased pH levels (below optimal level) may result in embryo death and larval deformities.
5. Hybridization between Jefferson and blue-spotted salamanders in areas of range overlap resulting in the loss of genetic pureness and of either species as well as the production of confusing hybrids with unknown consequences.
6. Vehicle collisions during breeding migrations across roads.

VIII. Additional Study, Documentation, Research or Management Needed:

1. Precisely delineating the area of hybridization and the consequences of these interactions.
2. Investigations into population densities and long term population studies to better understand and manage the species.
3. Animal movements and habitat (breeding and nonbreeding) use.
4. Strict protection of breeding and nonbreeding habitats.

IX. Prognosis for Recovery:

Identification and protection of Jefferson salamander sites and populations would likely aid in maintaining current population densities.

X. Documentation/References:

(also list or attach pertinent references, survey documents, studies, etc.)

1. Anon. 1987. Checklist of the Amphibians, Reptiles, Birds and Mammals of New York State, Including Their Protective Status 1987. N.Y.S.-D.E.C. Division of Fish and Wildlife Nongame Unit.
2. Bishop, S.C. 1941. The Salamanders of New York. New York State Museum Bulletin. No. 324. Albany, New York.
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4. Brandon, R.A. 1961. A Comparison of the Larvae of Five Northeastern Species of *Ambystoma* (Amphibia Caudata). Copeia No. 4: 377-383.
5. Collins, J.T. 1990. Standard Common and Current Scientific Names for North American Amphibians and Reptiles. Society for the Study of Amphibians and Reptiles, Herp. Circular No. 19.
6. Conant R.C., J.T. Collins. 1991. Field Guide to Reptiles and Amphibians of Eastern/Central North America. Houghton Mifflin Co., Boston, MA.
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8. Douglas M.E., 1979. Migration and sexual selection in *Ambystoma jeffersonianum*. Can. J. Zoo. Vol. 57: 2303-2310.
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11. Green, N.B., T.K. Pauley. 1987. Amphibians and Reptiles in West Virginia. University of Pittsburgh Press, Pittsburgh, PA.

12. Minton, S.A. 1954. Salamanders of the *Ambystoma jeffersonianum* Complex in Indiana. Herpetologica Vol. 10: pp 173-179.

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14. New York Natural Heritage Program Biological Conservation Data System/New York State Department of Environmental Conservation. October 21, 1991. Summation of Natural Heritage ranks for amphibians and reptiles.

15. Pflingsten, R.A., F.L. Downs. 1989. Salamanders of Ohio. Bulletin of the Ohio Biological Survey 7(2). The College of Biological Sciences The Ohio State University, Columbus, OH.

16. Thompson, E.L., J.E. Gates, G.J. Taylor 1980. Distribution and Breeding Habitat Selection of the Jefferson Salamander, *Ambystoma jeffersonianum*, in Maryland. J. of Herpetology 14 (2): 113-119.

17. Uzzel, T.M. 1964. Relations of the Diploid and Triploid Species of the *Ambystoma jeffersonianum* Complex (Amphibia, Caudata). Copeia No. 2: 257-300.

18. Uzzel, T.M. 1967. *Ambystoma jeffersonianum* (Green) Jefferson Salamander. Catalogue of American Amphibians and Reptiles: 47.1-47.2.

XI. Experts Consulted/Reviewers of Dossier:

Prepared By:

Preparer's Status Recommendation:

Endangered

Threatened

Special Concern

Status Unknown

Status Secure

(no listing)