

**Ontario Species at Risk Evaluation Report for
Eastern Tiger Salamander
Salamandre tigrée de l'Est
(*Ambystoma tigrinum*)**

Committee on the Status of Species at Risk in Ontario
(COSSARO)

Assessed by COSSARO as Extirpated

November 2023

Final

Executive summary

The Eastern Tiger Salamander (*Ambystoma tigrinum*) is a large burrowing salamander that is primarily found across the eastern United States. Historically, records for this species included a single individual that was collected in 1915 at Point Pelee. Although considerable survey efforts have been expended at both the historic observation on Point Pelee and other areas in southwestern Ontario that contain suitable habitat for this species, there have been no further observations of Eastern Tiger Salamanders in the province. As such, Eastern Tiger Salamander has been assessed as Extirpated.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Tiger Salamanders are considered to be one of the most widespread salamander species in North America. Until recently, Tiger Salamanders were considered to be a single polytypic species with six subspecies that ranged across much of North America (Bishop 1943, Petranka 1998). The Eastern Tiger Salamander (*Ambystoma tigrinum*) was considered to be one of the six subspecies of Tiger Salamanders. However, results of genetic analysis of mitochondrial DNA (Shaffer and McKnight 1996) indicates that the Eastern Tiger Salamander is best described as a separate species (Powell et al. 1998). All five of the remaining subspecies are all now recognized as part of the Western or Barred Tiger Salamander (*Ambystoma mavortium*).

1.1.2. Designatable units

No information is available to indicate that more than one designable unit is warranted for this species in Ontario. Only one record of this species exists in Ontario.

1.1.3. Native status

The species has not been seen on Point Pelee since the sighting in 1915 despite extensive surveys. Two records of this species from 1950 located on Pelee Island are considered to be unconfirmed (COSSARO 2013). While there is some uncertainty about the locations of all three specimens, the contiguous range of the species in the US is very close to the Canadian locations in southeastern Michigan and islands in the Ohio side of Lake Erie (COSSARO 2023). It is therefore reasonable to assume that Point Pelee and Pelee Island were within the natural range of the species. Based on the weight of evidence the Tiger Salamander is believed to be native to Ontario.

1.1.4. Occurrence

There is a single confirmed record of Eastern Tiger Salamander from Point Pelee from 1915 with an additional two unconfirmed records from Pelee Island in 1950. These sites have been extensively surveyed by biologists since and did not produce any further records. The lack of any recent records of this distinctive species in Ontario (COSEWIC 2023) suggests that individuals of this species are unlikely to be present in the province.

1.2. Eligibility results

Eastern Tiger Salamander (*Ambystoma tigrinum*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5 (NatureServe 2016)
- IUCN: LC (2022)
- NRANK Canada: N1
- COSEWIC: Extirpated (2023)
- SARA: Extirpated (Schedule 1)
- ESA 2007: Extirpated (January 2013)
- SRANK: SX (ranked in 2013)

2.2. Distribution in Ontario

The Eastern Tiger Salamander has been known in Ontario from a single specimen collected at Point Pelee in 1915 and two unconfirmed records from Pelee Island in 1950. This species has not been documented in Ontario since this time despite efforts by qualified individuals.

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

Eastern Tiger Salamanders have a large, disjointed range in eastern North America (COSEWIC 2013). They occur along the Atlantic Coastal Plain from Long Island, New York south to northern Florida and west to Louisiana. They are absent in the Appalachians but also occur on the west side from Tennessee north to Michigan west to Minnesota and southeastern Manitoba; and southwest to Arkansas and Texas (COSEWIC 2013). The species can be common within the core of its range, as it is ranked as S5 in some states (Appendix 1), and G5 overall. The species is considered to be endangered in Manitoba (COSEWIC 2013).

The closest documented observations of Eastern Tiger Salamanders to Ontario include one record approximately 1km west of the Detroit River, a second in the same area approximately 5km further inland, and records on Kelly's Island, OH in Lake Erie which is over 10km south of Pelee Island (COSEWIC 2023).

As Eastern Tiger Salamanders have not been confirmed in Ontario for over 100 years, there is no broader biologically relevant range for this species.

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Manitoba	No	S3	NatureServe 2023
Michigan	No	S3	NatureServe 2023

Adjacent Jurisdictions	Biologically Relevant to Ontario (n/a, yes, no)	Condition	Notes & Sources
Minnesota	No	S5	NatureServe 2023
New York	No	S1	NatureServe 2023
Ohio	No	S4	NatureServe 2023
Pennsylvania	No	SX	NatureServe 2023
Wisconsin	No	S4	NatureServe 2023

2.4. Ontario conservation responsibility

Eastern Tiger Salamanders have not been documented in Ontario since 1915. Ontario's conservation responsibility for this species is low.

2.5. Direct threats

Like most amphibians with biphasic life-histories and separate habitat requirements for adults and larvae, Eastern Tiger Salamanders must contend with threats and limitations in both aquatic and terrestrial habitats in an increasingly modified and urbanized environment (Hamer and McDonald 2008). None of this is known specifically for Eastern Tiger Salamanders in Canada but may be surmised from habitat trends and information available for US populations. Loss or degradation of both the terrestrial and aquatic habitats required by Eastern Tiger Salamanders, as well as migration routes between these habitats, are expected to have detrimental effects upon the long-term persistence of salamander populations (Schock 2001). Although Vogt (1981) indicates that urbanization and agricultural activity do not always result in the extirpation of Eastern Tiger Salamanders from an area, housing and agricultural developments bring increased traffic, wetland conversion and land clearing, which are the chief drivers of habitat loss (Berger 1989; Bence and Howard 1990). According to Leja (1998), in portions of the US Midwest, European settlement has resulted in the loss of nearly 99% of pre-existing wetland habitat that could have been used by Eastern Tiger Salamanders, and other amphibians, for breeding.

In southern Ontario, historical loss of wetlands has been extensive. Pre-European settlement in ca. 1800, Essex County is estimated to have had 83.4% wetland cover, which by 1967 was reduced to 2.3%; the losses have continued to current 1.6% wetland cover (COSEWIC 2013). Major habitat loss took place within the 19th century before any biological collecting was conducted. Point Pelee National Park has old field and prairie remnant habitat on sandy soil as well as approximately 325 ha of thicketed, woodland, or forested habitat on friable, sandy soil appropriate for Eastern Tiger Salamanders to burrow into. However, there are no uncontaminated and fish-free wetlands remaining at Point Pelee (Ngo et al. 2009), and therefore no suitable breeding wetlands for Eastern Tiger Salamanders.

2.6. Specialized life history or habitat use characteristics

There have been no studies of the biology of Eastern Tiger Salamanders in Canada, and most that have been done concern populations in the southeast of their range in the United States (COSEWIC 2013).

Data available from studies in the United States suggest that the generation time of Eastern Tiger Salamanders can vary greatly among populations with some estimates being as low as 2.2 years (Bailey et al. 2004) and others being as high as 4.8 years (Church et al. 2007)

Pond-breeding amphibians, in general, are prone to large fluctuations in abundance (Green 2003); this trend has been documented in long-term studies of Eastern Tiger Salamander populations (Pechmann et al. 1991; Semlitsch et al. 1996).

In the northern portion of their range, Eastern Tiger Salamanders are found breeding wetlands following spring rains shortly after ice-off (Williams et al. 2009). To reach their breeding sites, terrestrial adult Eastern Tiger Salamanders migrate from overwintering sites (Semlitsch and Pechmann 1985). Following the breeding season, adults return to their terrestrial habitats (Petranka 1998). Migration distances can range from 255 m (Steen et al. 2006) to 300 m (Madison and Farrand 1998) from overwintering areas to breeding ponds. During periods of drought when wetlands do not contain sufficient water levels for breeding, female Eastern Tiger Salamanders are able to defer breeding until conditions are more favourable (Church et al. 2007).

During their larval and immature phases, Eastern Tiger Salamanders primarily consume aquatic invertebrates including amphipods, molluscs, insect larvae, and copepods, as well as tadpoles, small frogs, and other salamanders (Dobie 1962; Dodson and Dodson 1971; Brophy 1980; Lindquist and Bachmann 1980). Terrestrial juvenile and adult Eastern Tiger Salamanders feed on a variety of small prey such as earthworms, molluscs, and insects including crickets, grasshoppers, moths, flies, beetles and cicadas, as well as spiders, small mice and voles, frogs, and even other salamanders (Petranka 1998).

2.7. Existing Conservation and Recovery Actions

None.

3. Ontario status assessment

3.1. Application of endangered/threatened status in Ontario

3.1.1. Criterion A – Decline in total number of mature individuals

Not applicable.

3.1.2. Criterion B – Small distribution range and decline or fluctuation

Not applicable.

3.1.3. Criterion C – Small and declining number of mature individuals

Not applicable.

3.1.4. Criterion D – Very small or restricted total population

Not applicable.

3.1.5. Criterion E – Quantitative analysis

Not applicable.

3.2. Application of Special Concern in Ontario

Not applicable.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Not applicable.

3.3.2. Status modification based on level of risk in broader biologically relevant geographic range

Not applicable.

3.3.3. Rescue Effect

Not applicable. While Eastern Tiger Salamanders are known to occur in states bordering Ontario, this species is not highly vagile and the likelihood of them moving long distances or crossing the great lakes is low.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

Applicable. Eastern Tiger Salamanders were historically documented at Point Pelee. However, despite considerable search effort, this species has not been documented in

Ontario since 1915. This species is still present throughout much of the eastern United States.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Eastern Tiger Salamander (*Ambystoma tigrinum*) is classified as Extirpated in Ontario based on meeting criterion for this status.

This status of this species is consistent with the definition of Extirpated under the Endangered Species Act, 2007.

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Appendix 1: Technical summary for Ontario

Species: Eastern Tiger Salamander (*Ambystoma tigrinum*)

Demographic information

Demographic attribute	Value
Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.	Variable ~2-5 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	N/A
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	N/A
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	N/A
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	N/A
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future.	N/A
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	N/A
Are there extreme fluctuations in number of mature individuals?	N/A

Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	N/A
Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	N/A
Is the total population severely fragmented? i.e., is >50% of its total area of occupancy is in habitat patches that are: (a) smaller than would be required to support a viable population, and	N/A

Extent and occupancy attributes	Value
(b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	
Number of locations. <i>See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.</i>	1
Number of NHIC Element Occurrences <i>Request data from MNR.</i>	1
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	N/A
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	N/A
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	N/A
Is there an observed, inferred, or projected continuing decline in number of locations?	N/A
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	N/A
Are there extreme fluctuations in number of populations?	N/A
Are there extreme fluctuations in number of locations?	N/A
Are there extreme fluctuations in extent of occurrence?	N/A
Are there extreme fluctuations in index of area of occupancy?	N/A

Number of mature individuals in each sub-population or total population (if known)

Sub-population (or total population)	Number of mature individuals
<i>Insert additional rows as necessary. If total population, do not use table format.</i>	0

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is [not applicable].

Threats

Not applicable.

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	N/A
Status of outside population(s) most likely to provide immigrants to Ontario	N/A
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	No
Would immigrants be adapted to survive in Ontario?	Unknown
Is there sufficient suitable habitat for immigrants in Ontario?	No
Are conditions deteriorating in Ontario?	Probably
Is the species of conservation concern in bordering jurisdictions?	Yes
Is the Ontario population considered to be a sink?	N/A
Is rescue from outside populations likely?	No

Sensitive species

Not applicable.

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

COSSARO: Committee on the Status of Species at Risk in Ontario

ESA: Endangered Species Act

EO: Element occurrence (as defined by NHIC)

EOO: extent of occurrence

GRANK: global conservation status assessments

IAO: index of area of occupancy

IUCN: International Union for Conservation of Nature and Natural Resources

MNRF: Ministry of Natural Resources and Forestry

NHIC: Natural Heritage Information Centre

NNR: Unranked

NRANK: National conservation status assessment

SARA: Species at Risk Act

SNR: unranked

SRANK: subnational conservation status assessment

S1: Critically Imperiled

S2: Imperiled

S3: Vulnerable

S4: Apparently Secure

S5: Secure

IUCN: International Union for Conservation of Nature and Natural Resources

CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario