

Ontario Species at Risk Evaluation Report
for
Small-mouthed Salamander (*Ambystoma texanum*)

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

Assessed by COSSARO as ENDANGERED

December 2014

Final

Salamandre à petite bouche (*Ambystoma texanum*)

La salamandre à petite bouche est une salamandre fousseuse (famille *Ambystomatidae*). Les adultes, habituellement longs de 11 à 18 cm, sont de couleur noire ou brun foncé avec une moucheture gris pâle ou argentée, ou de petites taches grises. Les mâles sont en général plus petits que les femelles. Les salamandres à petite bouche sont des amphibiens nocturnes et souvent souterrains, qui préfèrent les habitats humides situés près des plans d'eau quasi permanents. Elles se nourrissent de petits invertébrés comme des insectes, des limaces et des lombrics. Lors de la reproduction, au printemps, les femelles pondront jusqu'à 700 œufs qui s'attachent en petites grappes d'au plus 30 œufs au fond de l'eau. Les larves mesurent un peu plus de un centimètre lorsqu'elles éclosent, puis croissent pour devenir des salamandres adultes au milieu de l'été.

Au Canada, la salamandre à petite bouche est présente uniquement à l'île Pelée, la plus grande île du lac Érié, où il ne reste plus que trois sites de reproduction connus. Le nombre précis de populations est inconnu, mais des relevés exhaustifs n'ont laissé aucun doute sur la petite taille de la population totale. On croit que les menaces qui pèsent sur les salamandres à petite bouche de l'île Pelée proviendraient de la récente introduction de dindons sauvages, qui détruisent l'habitat et sont des prédateurs connus des salamandres. Les faibles niveaux d'eau dans au moins un des sites (bois de la pointe Mosquito) pourraient également constituer une menace dans les années de faibles précipitations (CDSEPO, 2014). La petite taille de la population, les menaces potentielles permanentes et la répartition limitée des salamandres à petite bouche ont entraîné le classement de cette espèce dans la catégorie « en voie de disparition » au Canada en 2004 et en 2014 (COSEPA 2004, 2014). La salamandre à petite bouche est désignée espèce en voie de disparition au Ontario depuis 2014 par le CDSEPO en raison de sa faible répartition et du déclin prévu de la qualité de son habitat [critères B1(a)(biii) et B2(a)(biii)].

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EXECUTIVE SUMMARY

The Small-mouthed Salamander (*Ambystoma texanum*) is a mole salamander (family Ambystomatidae). Adults are typically 11-18 cm in length, and black or dark brown in colour with light-grey or silver flecking, or grey blotching. Males are usually smaller than females. Small-mouthed Salamanders are nocturnal and often subterranean, preferring moist habitats near permanent bodies of water. They eat small invertebrates such as insects, slugs, and earthworms. Breeding occurs in the spring, and females can lay up to 700 eggs, which they attach in small clumps of up to 30 eggs to substrate under the water. The larvae are just over one centimetre in length when they hatch, and they develop into adult salamanders by midsummer.

In Canada the Small-mouthed Salamander is found only on Pelee Island, the largest island in Lake Erie, where only three known breeding sites remain. Precise population numbers are unknown, but extensive surveys have left no doubt that the total population size is small. Threats to Small-mouthed Salamanders on Pelee Island are thought to come from the recently introduced wild turkeys, which alter habitat and are known to prey on salamanders. Low water levels in at least one of the sites (Mosquito Point Woods) may also be a threat in years of low rainfall (COSEWIC, 2014). Small population size, potential ongoing threats, and the limited distribution of small-mouthed salamanders meant that this species was designated as Endangered in Canada in 2004 and 2014 (COSEWIC 2004, 2014). The Small-mouthed Salamander was designated as Endangered in Ontario in 2014 by COSSARO because of its small distribution and the predicted decline in the quality of its habitat [criteria B1 (a)(biii) and B2 (a)(biii)].

1. BACKGROUND INFORMATION

1.1 CURRENT DESIGNATIONS

GRANK: G5 (*NatureServe, accessed 02/12/2014*)

NRANK: Canada: N1

COSEWIC: Endangered (2014)

SARA: Endangered (Schedule 1)

ESA 2007: Endangered (2009)

SRANK: S1

1.2 DISTRIBUTION IN ONTARIO

The Canadian distribution of this salamander is restricted solely to Pelee Island. The maximum Canadian range is only about 40 km², and only three breeding sites are known. COSEWIC (2014) identified these as a single location because of the potential that all three sites could be simultaneously wiped out in a severe storm or widespread flood.

1.3 DISTRIBUTION AND STATUS OUTSIDE ONTARIO

This species occurs throughout south-central United States, where its status is as follows: Alabama (S3), Arkansas (S5), Illinois (S5), Indiana (S4), Iowa (S3), Kansas (S5), Kentucky (S5), Louisiana (S5), Michigan (S1), Mississippi (S5), Missouri (S5), Nebraska (S1), Ohio (SNR), Oklahoma (S5), Tennessee (S5), Texas (S5), West Virginia (S1).

1.4 ONTARIO CONSERVATION RESPONSIBILITY

<0.1% of global range occurs in Ontario. <2.5% of global population exists in Ontario,

1.5 DIRECT THREATS

Approximately 20% of the island is now under conservation ownership, including most of the natural habitats, and they are being managed for conservation. However, historical habitat degradation of wetland sites, including modified drainage patterns, led to loss of breeding habitat on the island. Development in the northern and eastern regions of the island has led to the loss of historical sites. The recognized breeding sites on Pelee Island are vulnerable to low water levels. The southern sites, in protected areas, still appear suitable but the water level reduction is a concern. Salamanders cross the roads when migrating to and from the breeding areas so, although very few cars presently are on Pelee Island during the salamanders' breeding season, traffic through those areas at night in March and April has potential for serious negative

consequences. New threats have come from the introduction of approximately 25 breeding Wild Turkeys (*Meleagris gallopavo*) onto Pelee Island in 2002. Following this initial release, a large population of Wild Turkeys now exists on the Island (a single flock of ~250 was seen near Fish Point in 2010; Al Harris, pers. Comm.), and starting in 2004 there has been a Wild Turkey Hunt on the Island (OMNR 2007). Jim Bogart (pers. comm.) and Mike Oldham (cited in COSEWIC, 2014) report that Wild Turkeys have potentially devastating consequences for salamanders as predators and as agents of microhabitat destruction. Bogart has observed turkey destruction of habitat elsewhere, at Backus Woods and in Parry Sound District; the turkeys leave few salamander hiding places untouched.

Unisexual salamanders in the genus *Ambystoma* also exist on Pelee Island: these are salamanders that for reproduction require sperm from normally bisexual species including *A. texanum*. On Pelee Island, unisexuals outnumber *A. texanum* (J. Bogart, pers. comm.), and competition from these unisexuals may pose a threat. New species of trematode parasites have been identified in Small-mouthed Salamanders in US populations (McAllister *et al.* 2008, 2010), but any threat they pose to population viability is unknown.

1.6 SPECIALIZED LIFE HISTORY OR HABITAT USE CHARACTERISTICS

Not applicable.

2. ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 ELIGIBILITY CONDITIONS

Taxonomic Distinctness: Yes *Ambystoma texanum* (Matthes, 1855)

Designatable Units: No. *Ambystoma texanum*, *A. laterale* and diploid, triploid and tetraploid unisexual genomic hybrids all exist on the island but the taxon of interest is “pure” diploid *A. texanum*,

Native Status: Yes. Small-mouthed Salamanders on Pelee Island are considered to be at the northernmost limit of their geographical range (COSEWIC, 2004).

Occurrence: Extant. Three breeding sites on Pelee Island.

2.2 ELIGIBILITY RESULTS

Small-mouthed Salamander (*Ambystoma texanum*) is eligible for status assessment in Ontario.

3. ONTARIO STATUS ASSESSMENT

3.1 APPLICATION OF ENDANGERED/THREATENED STATUS IN ONTARIO

Criterion A – Decline in Total Number of Mature Individuals

Insufficient information. There are insufficient data to allow an estimate of a percent decline, although there is a predicted decline in number of mature individuals because of new threats.

Criterion B – Small Distribution Range and Decline or Fluctuation

B1 (a)(biii). Endangered.

- B1- Extent of occurrence estimated to be <5000km² (estimated at 43 km²), and
- (a) known to exist at <5 locations
- (b) continuing decline projected in the (iii) quality of habitat (due to the recently introduced wild turkeys)

B2 (a)(biii). Endangered.

- B2: Index of area of occupancy estimated to be <500km² (estimated at 12 km²)
- known to exist at <5 locations
- continuing decline projected in the (iii) quality of habitat (due to the recently introduced wild turkeys)

Criterion C – Small and Declining Number of Mature Individuals

Not applicable. Number of individuals unknown (but undoubtedly very small (number of adults estimated as <1000; COSEWIC, 2014), however there is no clear evidence of continued decline.

Criterion D – Very Small or Restricted Total Population

D1 Threatened (<1000 individuals)

Criterion E – Quantitative Analysis

Not applicable. A quantitative population analysis has not been done.

3.2 APPLICATION OF SPECIAL CONCERN IN ONTARIO

Does not apply. Meets criteria for Endangered

3.3 STATUS CATEGORY MODIFIERS

Ontario's Conservation Responsibility

Does not apply

Rescue Effect

Closest populations are Michigan (S1, Endangered) and Ohio (no special status), including other islands in western Lake Erie, but this is an island population, therefore immigration events likely very rare.

3.4 OTHER STATUS CATEGORIES

DATA DEFICIENT

Does not apply.

EXTINCT OR EXTIRPATED

Does not apply.

NOT AT RISK:

Does not apply.

4. SUMMARY OF ONTARIO STATUS

Small-mouthed salamander (*Ambystoma texanum*) is classified as Endangered in Ontario according to Criterion B: Small Distribution Range and Decline or Fluctuation.

5. INFORMATION SOURCES

Bogart JP, Licht LE, Oldham MJ, Darbyshire SJ. 1985. Electrophoretic identification of *Ambystoma laterale* and *Ambystoma texanum* as well as their diploid and triploid interspecific hybrids (Amphibia, Caudata) on Pelee Island, Ontario. Canadian Journal of Zoology 63: 340-347.

COSEWIC 2004. COSEWIC assessment and update status report on the small-mouthed salamander *Ambystoma texanum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. v + 20 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2014. COSEWIC status appraisal summary on the Small-mouthed Salamander *Ambystoma texanum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

McAllister, C.T., C.R. Bursey, and S.E. Trauth. 2008. New host and geographic distribution records for some endoparasites (Myxosporea, Trematoda, Cestoidea, Nematoda) of amphibians and reptiles from Arkansas and Texas, USA. Comparative Parasitology 75:241-254.

McAllister, C.T., C.R. Bursey, J.A. Crawford, A.R. Kuhns, C. Shaffer, and S.E. Trauth. 2010. Metacercariae of *Clinostomum* (Trematoda: Digenea) from three species of *Ambystoma* (Caudata: Ambystomatidae) from Arkansas and Illinois, USA. Comparative

Parasitology 77:25-30.

OMNR. 2007. Wild Turkey management plan for Ontario. Ontario Ministry of Natural Resources. 44 pp.

APPENDIX 1: TECHNICAL SUMMARY FOR ONTARIO

Species: Small-mouthed Salamander

Demographic Information	
Generation time.	3 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Unknown, although there may be a decline of mature individuals because of introduced turkeys (Jim Bogart, pers. comm.)
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	Unknown
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.	Unknown
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.	Unknown
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	a. Unknown b. Yes c. No
Are there extreme fluctuations in number of mature individuals?	Unknown but likely because of the short generation time and new threats

Extent and Occupancy Information in Ontario	
Estimated extent of occurrence.	43 km ²
Index of area of occupancy (IAO).	12 km ²
Is the total population severely fragmented? (i.e. is >50% of its total area of occupancy in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?)	a. No b. No

Number of locations (<i>as defined by COSEWIC</i>).	1
Number of NHIC Element Occurrences	3
3Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Unknown
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Unknown
Is there an observed, inferred, or projected continuing decline in number of populations?	Unknown
Is there an observed, inferred, or projected continuing decline in number of locations?	Unknown
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Likely, following introduction of turkeys (Jim Bogart pers. comm.)
Are there extreme fluctuations in number of populations?	Unknown but possible because of short generation time and potential new threats
Are there extreme fluctuations in number of locations?	No
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

Number of Mature Individuals In Each Sub-Population or Total Population (if known)	
Sub-Population (or Total Population)	N of Mature Individuals
Pelee Island (total population)	Unknown but undoubtedly very small (<1000 adults)

Quantitative Analysis (population viability analysis conducted)
PVA not conducted

Rescue Effect	
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Possible but highly unlikely (island)

Would immigrants be adapted to survive in Ontario?	Probably
Is there sufficient suitable habitat for immigrants in Ontario?	Probably
Is the species of conservation concern in bordering jurisdictions?	Yes (Michigan,)
Is rescue from outside populations reliant upon continued intensive recovery efforts?	N/A

APPENDIX 2: ADJOINING JURISDICTION STATUS RANK AND DECLINE

Jurisdiction	Subnational Rank	Sources	Population Trend	Sources
Ontario	S1	NS	Unquantified*	COSEWIC, 2014
Manitoba	Not present	NS		
Michigan	S1	NS	Unquantified (found only in a few sites in southeastern Michigan)*	http://mnfi.anr.msu.edu/abstracts/zooology/Ambystoma_texanum.pdf
Minnesota	Not present	NS		
Nunavut	Not Present	NS		
New York	Not present	NS		
Ohio	SNR	NS	Unquantified (but widespread and common in some areas)**	http://www.ohioamphibians.com/salamanders/Small-mouth_Salamander.html
Pennsylvania	Not present	NS		
Quebec	Not present	NS		

*Overall short-term trend: Relatively stable to decline of 30%.

**Overall long-term trend: Increase of 10-25% to decline of 30% (NatureServe, accessed December, 2014).