

Ontario Species at Risk Evaluation Report
for
Cutlip Minnow (*Exoglossum maxillingua*)

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

Assessed by COSSARO as THREATENED

May, 2014

Final

Bec-de-lièvre (*Exoglossum maxillingua*)

Le bec-de-lièvre est un petit cyprinidé identifiable grâce à sa mâchoire inférieure trilobée, qui lui est propre. On le trouve dans les bassins hydrographiques de l'Atlantique en Amérique du Nord, dont la pointe la plus nordique est constituée de l'Ontario et du Québec. En Ontario, il est présent dans quatre plans d'eau (sept à travers l'histoire). Ce mené préfère les ruisseaux aux eaux claires, dont le courant est modéré et le fond, rocheux ou graveleux, mais on le trouve parfois dans des lacs. La population ontarienne du bec-de-lièvre n'est pas beaucoup étudiée, et la majorité des données biologiques sont tirées des populations américaines. L'âge à la maturité serait vraisemblablement de 2 à 3 ans. Les mâles préparent les nids où sont fécondés de 300 à 1 200 œufs. Le bec-de-lièvre de l'Ontario présente un faible indice de la zone d'occupation, et sa présence décline, car on ne le trouve plus dans les emplacements où il avait l'habitude de vivre. La turbidité de l'eau et les espèces envahissantes constituent sans doute des menaces. Bien qu'il soit protégé à l'échelle mondiale (G5), le bec-de-lièvre a déjà été inscrit sur la liste des espèces menacées du CDSEPO et sur celle des espèces préoccupantes du COSEPAC (2013). L'espèce satisfait aux critères qui définissent les espèces en voie de disparition du CDSEPO (B1 et B2) en raison de sa petite aire de répartition et de son déclin. Toutefois, il existe des possibilités d'expansion grâce aux populations plus robustes du Québec et de l'État de New York. Compte tenu des possibilités que présente l'immigration de source externe, le bec-de-lièvre est classé espèce menacée en Ontario.

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EXECUTIVE SUMMARY

The Cutlip Minnow is a small cyprinid identifiable by its distinctive tri-lobed lower jaw. It is found across the Atlantic drainages of North America, with Ontario and Quebec being its northern-most extent. In Ontario they occur in four water bodies (historically seven). This minnow prefers clear streams with moderate flow and rocky or gravel substrates, and is sometimes found in lakes. The Ontario Cutlip Minnow is not well studied, and most biological data comes from U.S. populations. Age of maturation is likely 2-3 years and fecundity is between 300 and 1200 eggs laid into nests prepared by the males. Ontario Cutlip Minnows have a small index of area of occupancy and are in decline based on historic locations they are no longer found at. Turbidity and invasive species pose likely threats. While globally secure (G5), the Cutlip Minnow has been previously listed as Threatened by COSSARO and as Special Concern by COSEWIC (2013). The species meets COSSARO criteria (B1 & B2) for Endangered due to small distribution range and decline. However, there is the potential for dispersal from more robust populations (Quebec & New York). Considering the potential for rescue effect, the Cutlip Minnow is classified as Threatened in Ontario.

1.0 BACKGROUND INFORMATION

1.1 PRIMARY DATA SOURCE

COSEWIC. 2013. COSEWIC assessment and status report on the Cutlip Minnow *Exoglossum maxillingua* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 35 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

1.2 TECHNICAL SUMMARY

A summary of technical information for the species in Ontario is provided in Appendix 1.

2.0 ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 APPLICATION OF ELIGIBILITY CRITERIA

Taxonomic Distinctness: Yes

The Cutlip Minnow has only one other congener, the Tongetied Minnow (*E. laurae*), which does not occur in Ontario. The Cutlip Minnow is unambiguously identified by its tri-lobed lower jaw and lack of maxillary barbels (Page & Burr, 2011)

Designatable Units: One

There are no genetic data on genetic structure or connectivity in Ontario Cutlip Minnows, nor are there obvious breaks in their distribution. All Canadian populations (including Ontario and Quebec populations) occur in a single COSEWIC Freshwater Biogeographic Zone, hence the Ontario Cutlip Minnow constitutes a single Designatable Unit.

Native Status: Yes

The Cutlip Minnow has been known in Ontario since 1936 (COSEWIC 2013), and has been recognised as a native species at the edge of its range in Ontario.

Occurrence: Extant

The Cutlip Minnow is known to currently occur in Ontario, with live captures as recent as 2012 by OMNR personnel.

2.2 ELIGIBILITY RESULTS

Cutlip Minnow (*Exoglossum maxillingua*) is eligible for status assessment in Ontario.

3.0 ONTARIO STATUS BASED ON COSSARO CRITERIA

3.1 APPLICATION OF COSSARO CRITERIA FOR ONTARIO

Applicability of Criteria for Endangered or Threatened Status in Ontario

Criterion A – Decline in Total Number of Mature Individuals

Not Applicable (Unknown): There are no quantitative estimates of the number of Cutlip Minnows in Ontario. Most surveys in which Cutlip Minnow has been detected were not specifically targeting the species, and there have been no studies to determine the abundance or population size of this species in Canada.

Criterion B – Small Distribution Range and Decline or Fluctuation

Endangered: B1ab(i,ii,iv) + B2ab(i,ii,iv)

(B1 (<5000 km²); B2 (<500 km²); “a” (≤ 5 locations); “b” (decline))

The estimated Extent of Occurrence in Ontario is 2230 km² while the Index of the area of occupancy is 71.4 km², therefore the Cutlip Minnow qualifies as Endangered under criterion B1 and B2. The estimated number of locations is currently 4-5, which falls under the Endangered criterion. Finally, there is good evidence for observed continuing decline in Ontario extent of occurrence, area of occupancy and number of locations.

Criterion C – Small and Declining Number of Mature Individuals

Not Applicable (Unknown): There are no quantitative estimates of the number of Cutlip Minnows in Ontario, and so declines in mature individuals cannot be measured

Criterion D – Very Small or Restricted Total Population

Not Applicable (Unknown): There are no quantitative estimates of the number of Cutlip Minnows in Ontario and so D1 cannot be applied. Although there are only 4-5 locations for Cutlip Minnow in Ontario, there is no evidence that the species is highly prone to stochastic effects such that it may become endangered in a short time.

Criterion E – Quantitative Analysis

Not Applicable: There is no quantitative analysis of Cutlip Minnow population dynamics

3.2 SPECIAL CONCERN: No.

3.3 STATUS CATEGORY MODIFIERS

Rescue Effect: Yes.

Rescue of populations within the St. Lawrence River and perhaps its larger tributaries is considered likely. The Cutlip Minnow is secure (S5) in New York State and movement probably occurs across the border as the species is secure up to the northern border

(Douglas Carlson, NY State DEC, pers. comm). Although there are no published reports on Cutlip Minnow dispersal, the related and ecologically similar Creek Chub (*Semotilus atromaculatus*) and Longnose Dace (*Rhinichthys cataractae*) (among others) have been shown to disperse broadly within a river system contributing to population connectivity (Larson et al. 2002; Boizard et al. 2008), although dams and impoundments have been shown to disrupt dispersal in the Creek Chub (Hudman & Gido 2013). The Cutlip Minnow has been reported from New York tributaries of Lake Ontario (Page and Burr 2011), and is also found in the St. Lawrence and its tributaries in Quebec. Dispersal is much less likely into smaller tributaries (e.g. Raisin River, Little Rideau Creek) than into the Ontario St. Lawrence River range. There is likely sufficient suitable habitat for immigrants, there are no major barriers to dispersal and they would be adapted to survive in Canadian waters.

High Conservation Responsibility: No

The Cutlip Minnow is globally ranked G5, and the percentage of the global range occurring in Ontario is estimated at less than 5%. The percentage of the global population occurring in Ontario is unknown.

Ontario's Conservation Responsibility:

See above.

G RANK – G5 (Last Reviewed 27/01/2012) (NatureServe, accessed 13/05/2014)

3.4 DATA DEFICIENT: No

3.5 NOT AT RISK: No

3.6 SUMMARY OF STATUS EVALUATION

Cutlip Minnow (*Exoglossum maxillingua*) is classified as **Threatened**, in Ontario.

Applicable Criteria: Small Distribution Range and Decline or Fluctuation

(B1ab(i,ii,iv) + B2ab(i,ii,iv)). Due to high likelihood for Rescue effect from Quebec and New York, **Cutlip Minnow** in Ontario classification should be modified to **Threatened**.

Classification Summary:

The Cutlip Minnow (*Exoglossum maxillingua*) is a small cyprinid identifiable by its distinctive tri-lobed lower jaw. It is found across the Atlantic drainages of North America, with Ontario and Quebec being its northern-most extent. In Ontario they occur in four

water bodies (historically seven). This minnow prefers clear streams with moderate flow and rocky or gravel substrates, and is sometimes found in lakes. The Ontario Cutlip Minnow is not well studied, and most biological data comes from U.S. populations. Age of maturation is likely 2-3 years and fecundity is between 300 and 1200 eggs laid into nests prepared by the males. Ontario Cutlip Minnows have a small index of area of occupancy and are in decline based on historic locations they are no longer found at. Turbidity and invasive species pose likely threats. While globally secure (G5), the Cutlip Minnow has been previously listed as Threatened by COSSARO and as Special Concern by COSEWIC (2013). The potential for dispersal from more robust populations (Quebec & New York) reduces the conservation status of this species in Ontario. The species meets COSSARO criteria (B1 & B2) for small distribution range and decline with rescue effect applied. The **Cutlip Minnow** should thus be classified at **Threatened** in Ontario.

Statements relating to a status category modification:

See Rescue effect text above (Section 3.3)

4.0 INFORMATION SOURCES

4.1 LITERATURE CITED

- Boizard, J, P. Magnan and B. Angers. 2009. Effects of dynamic landscape elements on fish dispersal: the example of creek chub (*Semotilus atromaculatus*). *Molecular Ecol.* 18: 430-441.
- COSEWIC. 2013. COSEWIC assessment and status report on the Cutlip Minnow *Exoglossum maxillingua* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 35 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- Hudman, S.P. and K.B. Gido. 2013. Multi-scale effects of impoundments on genetic structure of creek chub (*Semotilus atromaculatus*) in the Kansas River basin. *Freshwater Biol.* 58: 441-453.
- Larson, G.L., R.L. Hoffman and S.E. Moore. 2002. Observations of the distributions of five fish species in a small Appalachian stream. *Trans. Am. Fish. Soc.* 131: 791-796.
- Page, L. M. and B. M. Burr. 2011. Peterson field guide to the freshwater fishes, North America north of Mexico. Second Edition. Houghton Mifflin Company, Boston, Massachusetts. xix + 663 pp.

4.2 COMMUNITY AND ABORIGINAL TRADITIONAL KNOWLEDGE SOURCES

None

4.3 ACKNOWLEDGEMENTS

S. Hogg (OMNR) provided valuable input on this report.

APPENDIX 1: TECHNICAL SUMMARY FOR ONTARIO

Species: Cutlip Minnow

Demographic Information	
Generation time. <i>Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.</i>	2.4 Years
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Yes (loss of locations in Ontario)
Estimated percent of continuing decline in total number of mature individuals within 6 years.	Unknown
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last 10 years.	Unknown
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next 10 years.	Unknown
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 year period or over a time period including both the past and the future].	Unknown
Are the causes of the decline clearly reversible and understood and ceased?	No
Are there extreme fluctuations in number of mature individuals?	Unknown

Extent and Occupancy Information in Ontario	
Estimated extent of occurrence. <i>Pre-2002: 3810 km²</i>	<i>2002-2012: 2230 km²</i>
Index of area of occupancy (IAO). <i>Pre-2002: 77.8 km²</i>	<i>2002-2013: 71.4 km²</i>
Is the total population severely fragmented?	No
Number of locations.	4 locations: Little Rideau Creek; Raisin River; 2 locations in St. Lawrence River (includes Rotary Creek) due to separation by a dam which will isolate populations on either side.

Number of NHIC Element Occurrences	11 (1998)
Is there an [observed, inferred, or projected] continuing decline in extent of occurrence?	Yes
Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?	Yes
Is there an [observed, inferred, or projected] continuing decline in number of populations?	Yes
Is there an [observed, inferred, or projected] continuing decline in number of locations?	Yes
Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat?	Likely
Are there extreme fluctuations in number of populations?	Unknown
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 Population or Total Population	
Population (or Total Population)	N of Mature Individuals
Unknown	Unknown

Quantitative Analysis (population viability analysis conducted)
No PVA performed

Threats (refer to Threats Calculator and text in status report)
<p>The Cutlip Minnow is vulnerable to loss of habitat through reduced water quality. Specifically, the Cutlip Minnow is vulnerable to pollution toxicity (urban waste water) as well as increased turbidity (agriculture & urbanization) and they inhabit areas exposed to human generated pollution and runoff.</p> <p>The invasive Round Goby represents a potential direct threat to the Cutlip Minnow as impacts on other benthic species have been shown. However, the COSEWIC report indicates this is of medium to low risk, as no direct threat to the Cutlip Minnow has been documented yet.</p>

Rescue Effect (immigration from outside Ontario)

Rescue of populations within the St. Lawrence River and perhaps its larger tributaries is considered likely. The Cutlip Minnow is secure (S5) in New York State and common in western Quebec and movement probably occurs across the borders.

Ontario's Conservation Responsibility The Cutlip Minnow is globally ranked G, and the percentage of the global range occurring in Ontario is estimated at less than 5%. The percentage of the global population occurring in Ontario is unknown. Ontario's conservation responsibility is low.

G-rank (see also section 3.3 Status Category Modifiers)

G5