

**Ontario Species at Risk Evaluation Report for  
Shortnose Cisco (*Coregonus reighardi*)**

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

Assessed by COSSARO as Endangered

November 2017

Final

## Cisco à museau court (*Coregonus reighardi*)

Le cisco à museau court (*Coregonus reighardi*) est un Corégonidé nord-américain, et l'une des 10 espèces de ciscos du Canada. Historiquement, on trouvait cette espèce vivant en eaux profondes (de 22 à 110 mètres; Eshenroder et coll., 2016) dans le lac Huron, le lac Michigan et le lac Ontario. Cependant, on en sait très peu sur son historique et ses besoins en matière d'habitat. On croit que le déclin historique du cisco à museau court est attribuable à la surpêche, ainsi qu'à la compétition et à la prédation d'espèces de poissons non indigènes, qui sont des causes plus récentes (COSEPAC, 2017). La désignation de son statut se complique encore davantage en raison de la possibilité d'hybridation avec différentes espèces de ciscos des Grands Lacs, où certains poissons qui ne peuvent être associés à aucune espèce de ciscos pourraient toujours présenter des traits du cisco à museau court (Eshenroder et coll., 2016). Malgré l'échantillonnage intensif et ciblé, la dernière capture recensée d'un cisco à museau court clairement identifié a eu lieu en 1985 (baie Georgienne, lac Huron; COSEPAC, 2017). L'espèce est probablement disparue, mais comme seulement 32 ans se sont écoulés depuis la dernière capture, elle ne peut être classée dans cette catégorie.

Le cisco à museau court est considéré comme étant en voie de disparition en Ontario en raison de sa faible population (< 250 individus).

*Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Shortnose Cisco» n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le CDSEPO au [COSSAROSecretariat@ontario.ca](mailto:COSSAROSecretariat@ontario.ca).*

## Executive summary

The Shortnose Cisco (*Coregonus reighardi*) is a North American coregonid, one of 10 cisco species found in Canada. The Shortnose Cisco was historically found in Lake Huron, Lake Michigan and Lake Ontario, and is a deep water species (22 to 110 meters; Eshenroder et al. 2016); however, very little is known about their life history or habitat requirements. The Shortnose Cisco's historic decline is thought to be due to overfishing, and more recently due to competition and predation by non-native fish species (COSEWIC 2017). The status of the Shortnose Cisco is further complicated by the possibility of hybridization among Cisco species in the Great Lakes, where some Shortnose Cisco traits may still be evident in fish that are not assignable to any one of the cisco species (Eshenroder et al. 2016). Despite intensive and targeted sampling, the last capture of a positively identified Shortnose Cisco was in 1985 (Georgian Bay, Lake Huron; COSEWIC 2017). The Shortnose Cisco is likely extinct; however, only 32 years have passed since its last capture, excluding it from being categorized as "extinct".

Shortnose Cisco (*Coregonus reighardi*) is classified as Endangered in Ontario due to its small population size (< 250 individuals).

# 1. Eligibility for Ontario status assessment

## 1.1. Eligibility conditions

### 1.1.1. Taxonomic distinctness

The Shortnose Cisco is a taxonomically distinct species (Mandrak et al. 2014), although there is more recent evidence for widespread hybridization among other related species (Eshenroder et al. 2016). If any Shortnose Cisco still survive, they are likely introgressing with other species, or if any genetically pure individuals still exist, they are at risk of genetic introgression with other species.

### 1.1.2. Designatable units

The entire historical range for the Shortnose Cisco lies within the Great-Lakes upper St. Lawrence biogeographic zone, thus no designatable units apply.

### 1.1.3. Native status

Yes: the Shortnose Cisco has been known to occur in Ontario waters since early in the 20<sup>th</sup> century and is thought to be endemic to the Great Lakes.

### 1.1.4. Occurrence

The last Shortnose Cisco captured was in 1985 in Lake Huron in Georgian Bay; this species is likely extinct (e.g., Burkhead 2012; Mandrak et al. 2014).

## 1.2. Eligibility results

Shortnose Cisco (*Coregonus reighardi*) is eligible for status assessment in Ontario.

## 2. Background information

### 2.1. Current designations

- GRANK: GH (NatureServe 2017)
- NRANK Canada: NH
- COSEWIC: Endangered (April 2005)
- SARA: Endangered (Schedule 1/Annexe 1 (13 Dec 2007))
- ESA 2007: Endangered (June 2008)
- SRANK: SH (ranked in 2005)

### 2.2. Distribution in Ontario

The Shortnose Cisco was historically found in the Canadian waters of Lake Ontario and Lake Huron. A sub-species of Shortnose Cisco (*C. reighardi dymondi*) reported from

Lake Nipigon and Lake Superior was re-evaluated as *C. senithicus* (COSSARO 2005). Current distribution of the Shortnose Cisco in Ontario is unknown but likely extirpated as the last captured specimen from Lake Huron was in 1985 and from Lake Ontario in 1964 (COSEWIC 2017).

## 2.3. Distribution and status outside Ontario

The Shortnose Cisco is believed to be extirpated outside of Canada. Its historic range outside of Canada included the US waters of lakes Huron and Ontario, and Lake Michigan (NatureServe 2017). No Shortnose Cisco have been captured since 1964 (Lake Ontario); 1982 (Lake Michigan); and 1985 (Lake Huron). The Shortnose Cisco has been assessed as Critically Endangered on the IUCN Red List of Threatened Species and is possibly extinct (Gimenez Dixon 1996).

## 2.4. Ontario conservation responsibility

Does not Apply: the Shortnose Cisco has not been captured in any Ontario or US waters since 1985. This is despite extensive sampling that resulted in the capture of other thousands of specimens of other species of coregonids but no Shortnose Cisco were identified even with knowledgeable taxonomic assessment (COSEWIC 2017).

## 2.5. Direct threats

Direct threats include overfishing (although this threat has declined substantially as the whitefish fishery has declined). Additionally, non-native species likely serve as competitors and predators of Shortnose Cisco at various life history stages (COSEWIC 2017). Finally, the Great Lakes ciscos are believed to form a “hybrid swarm” due to loss of reproductive isolation (Eshenroder et al. 2016) and hence Shortnose Cisco may suffer from genetic introgression.

## 2.6. Specialized life history or habitat use characteristics

Unknown: Shortnose Cisco are a deep water species; however, their life history and habitat requirements are not known. Shortnose Cisco along with *C. hoyi* may have been more abundant at relatively shallow depths compared to other ciscoes (Eshenroder et al. 2016). Shortnose Cisco typically spawned in the early spring, the only known cisco to do so (DFO 2012; Eshenroder et al. 2016).

# 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

Does not apply: No individuals have been caught since 1985, hence no decline in abundance can be shown or inferred. A4 could possibly apply to the period when the Great Lakes “chub” fishery may have resulted in the collapse of the population (e.g.

1880-1903 in Lake Ontario), but there is not sufficient information to support this criterion.

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

Does not apply: Although both EO and IAO are below the threshold for “Endangered”, no sub-criteria are met as no individuals have been caught since 1985, hence no decline or fluctuations in abundance can be shown or inferred and there is no evidence for fragmented distribution.

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

Does not apply: While the total number of individuals is below the threshold for “Endangered”, no data exists to show or infer continuing decline in the numbers of mature individuals.

### 3.1.4. Criterion D – Very small or restricted total population

Endangered: Estimates of total extant individuals is zero, hence meets “Endangered” under D1 (<250 mature individuals).

### 3.1.5. Criterion E – Quantitative analysis

Does not apply: no analysis performed.

## 3.2. Application of Special Concern in Ontario

Does not apply: meets Endangered status

## 3.3. Status category modifiers

### 3.3.1. Ontario’s conservation responsibility

Does not apply: while >20% of the Shortnose Cisco’s global range was historically within Ontario, their current distribution is thought to be zero.

### 3.3.2. Rescue effect

Does not apply: The Shortnose Cisco is thought to be extirpated in most US waters (Illinois (SX); Indiana (SX); Michigan (SH); New York (SX); Wisconsin (SX)).

## 3.4. Other status categories

### 3.4.1. Data deficient

Does not apply: while there is little known about the life history and habitat requirements of the Shortnose Cisco, that lack of data is not critical for status assessment.

### 3.4.2. Extinct or extirpated

While the Shortnose Cisco is likely extirpated in Ontario (and extinct globally), the criterion is for 50 years to have been elapsed since last observation. It has been only 32 years since the last observation, representing 6-7 generations. In addition, although surveys are conducted for cisco species in Lake Ontario and Lake Huron, the Shortnose Cisco can be difficult to distinguish. There is insufficient information to document that no individuals of this species remain alive.

### 3.4.3. Not at risk

Does not apply: meets Endangered status.

## 4. Summary of Ontario status

Shortnose Cisco (*Coregonus reighardi*) is classified as Endangered in Ontario based on meeting criterion D1.

## 5. Information sources

Burkhead, N.M. 2012. Extinction rates in North American freshwater fishes, 1900-2010. *BioScience*, 62:798-808.

COSEWIC. 2017. [COSEWIC status appraisal summary on the Shortnose Cisco \*Coregonus reighardi\* in Canada](#). Committee on the Status of Endangered Wildlife in Canada. Ottawa. xv pp. ([Species at Risk Public Registry](#)).

COSSARO 2005. Species at Risk Evaluation form for Shortnose Cisco (*Coregonus reighardi*). Ontario Ministry of Natural Resources, Peterborough, ON, Canada.

Eshenroder, R.L., P. Vecsei, N.E. Mandrak, D.L. Yule, O.T. Gorman, T.C. Pratt, D.B. Bunnell, and A.M. Muir. 2016. [Monograph on the Ciscoes \(\*Coregonus\*, subgenus \*Leucichthys\*\) of the Laurentian Great Lakes and Lake Nipigon](#). Great Lakes Fishery Commission Miscellaneous Publication 2016-01. Ann Arbor, MI. [website accessed March 20, 2018].

Fisheries and Oceans Canada. 2012. [Recovery Strategy for the Shortnose Cisco \(\*Coregonus reighardi\*\) in Canada](#). *Species at Risk Act Recovery Strategy Series*. Fisheries and Oceans Canada, Ottawa. vi + 16 pp.

Gimenez Dixon, M. 1996. *Coregonus reighardi*. In: IUCN 2010. [IUCN Red List of Threatened Species](#). Version 2010.4. Downloaded on November 1, 2017.

Mandrak, N.E., Pratt, T.C., and Reid, S.M. 2014. Evaluating the current status of deepwater ciscoes (*Coregonus* spp.) in Canadian waters of Lake Huron, 2002-2012, with emphasis on Shortjaw Cisco (*C. zenithicus*). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/108. v + 12 p.

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. [Coregonus reighardi](#). NatureServe. [website accessed December 2017].



# Appendix 1: Technical summary for Ontario

Species: Shortnose Cisco (*Coregonus reighardi*)

## 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.	~5 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Unknown
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. No b. No c. No
Are there extreme fluctuations in number of mature individuals?	Unknown

## Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO). <i>Historical EOO &gt; 20,000 km<sup>2</sup></i>	0 km <sup>2</sup>
Index of area of occupancy (IAO). <i>Historical EOO &gt; 2,000 km<sup>2</sup></i>	0 km <sup>2</sup>
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 (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. Unknown b. Unknown

<b>Extent and occupancy attributes</b>	<b>Value</b>
Number of locations. <i>Historical: 2 (Lake Huron &amp; Lake Ontario)</i>	Likely 0
Number of NHIC Element Occurrences	5 (historic)
Is 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?	No
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?	Unknown
Are there extreme fluctuations in index of area of occupancy?	Unknown

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

<b>Sub-population (or total population)</b>	<b>Number of mature individuals</b>
<i>Lake Huron</i>	<i>Unknown, likely zero</i>
<i>Lake Ontario</i>	<i>Unknown, likely zero</i>

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

## Threats

No Threats Calculator performed. Threats include (from highest to lowest):

Historical overfishing  
 Introduced species (most critical: Alewife, Rainbow Smelt)  
 Predatory/competitive native species (e.g. Lake Trout)  
 Genetic hybridization

## Rescue effect

<b>Rescue effect attribute</b>	<b>Value</b>
Status of outside population(s) most likely to provide immigrants to Ontario	Likely extirpated

<b>Rescue effect attribute</b>	<b>Value</b>
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Possibly (US and Canadian historic ranges are connected)
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Yes
Are conditions deteriorating in Ontario?	No
Is the species of conservation concern in bordering jurisdictions?	Yes (SX or SH)
Is the Ontario population considered to be a sink?	Unknown
Is rescue from outside populations likely?	No

**Sensitive species**

Does not apply.

## Appendix 2: Adjoining jurisdiction status rank and decline

Information regarding rank and decline for Shortnose Cisco  
(*Coregonus reighardi*)

Jurisdiction	Subnational rank	Population trend	Sources
Ontario	SH	Unknown	NatureServe 2017
Quebec	Not present	Unknown	NatureServe 2017
Manitoba	Not present	Unknown	NatureServe 2017
Michigan	SH	Unknown	NatureServe 2017
Minnesota	Not present	Unknown	NatureServe 2017
Nunavut	Not present	Unknown	NatureServe 2017
New York	SX	Unknown	NatureServe 2017
Ohio	Not present	Unknown	NatureServe 2017
Pennsylvania	Not present	Unknown	NatureServe 2017
Wisconsin	SX	Unknown	NatureServe 2017

### 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

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

S3: Vulnerable

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