

COSSARO Candidate Species at Risk Evaluation

for

Bridle Shiner (*Notropis bifrenatus*)

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

Assessed by COSSARO as Special Concern

June 2013

Final

Méné d'herbe (*Notropis bifrenatus*)

Le méné d'herbe est un petit poisson d'eau chaude qui préfère les eaux claires à débit lent ou les eaux stagnantes. Il est généralement associé à un substrat mou et se sert de végétation aquatique pour frayer. On trouve le méné d'herbe dans l'est de l'Amérique du Nord, de la Caroline du Sud au sud du Québec et des États de l'Atlantique à l'est du lac Ontario. En Ontario, il s'agit d'une seule unité désignable, se trouvant dans ~19 endroits dans le bassin hydrographique du lac Ontario, le fleuve St-Laurent et la rivière Rideau. L'aire de répartition connue du méné d'herbe en Ontario a augmenté, ce qu'a révélé un échantillonnage ciblé en 2010; aucun indice d'infécondité ou de populations de petite taille n'a été signalé. On pense que le méné d'herbe est sensible à la dégradation de l'habitat en raison d'une plus grande turbidité, de pollution, de fluctuations du niveau et du débit d'eau et d'espèces envahissantes. L'espèce n'est pas utilisée dans l'industrie du poisson d'appât et on pense que les prises accidentelles sont minimales. Le méné d'herbe est extrêmement difficile à identifier et est communément identifié par erreur comme étant l'un de deux poissons plus communs, le menton noir (*Notropis heterodon*) et le museau noir (*N. heterolepis*). Le méné d'herbe est désigné comme G3, ce qui signifie qu'il est vulnérable à l'échelle mondiale et on a constaté un déclin de ses populations dans certaines parties de son aire de répartition nord-américaine. Le méné d'herbe est désigné comme étant une espèce **préoccupante** en Ontario.

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PART 1

CURRENT STATUS AND DISTRIBUTION

Current Designations:

GRANK – G3 (NatureServe, assessed 30/07/2012)

NRANK Canada – N3 (NatureServe, assessed 09/09/2011)

COSEWIC – SC (COSEWIC, 2013)

SARA – Special Concern (Schedule 1) (Environment Canada, 2013)

ESA 2007 – Special Concern (Ministry of Natural Resources, 2004)

SRANK – S2 (NHIC/NatureServe, accessed 06/10/1997)

Distribution in Ontario:

The Bridle Shiner is distributed within the eastern half of the Lake Ontario basin (including Prince Edward County and Rideau River system), and in the St. Lawrence River drainage in Ontario. Bridle Shiners are extant at ~19 locations in Ontario, a substantial recent increase in the known Ontario range, likely reflecting substantial increased search effort (e.g., recent (2010) DFO surveys) (COSEWIC 2013).

Distribution and Status Outside Ontario:

The Bridle Shiner is distributed in eastern North America from Lake Ontario east to Maine and from southern Quebec south to South Carolina. The Bridle Shiner is listed as globally vulnerable (G3), and has experienced a reduction in area of occupancy across much of its global range (COSEWIC 2013).

PART 2

ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 APPLICATION OF ELIGIBILITY CRITERIA

Taxonomic Distinctness

Yes, The Bridle Shiner is a well-established species based on morphometric and Barcode of Life sequence data. It is one of 15 species of *Notropis* in Canada, and the likely closest relative of the Bridle Shiner is the Blackchin Shiner (*N. heterodon*) (Gilbert 1980).

Designatable Units

One, although no genetic analysis has been undertaken, there are no subspecies recognized for the Bridle Shiner within Canada (COSEWIC 2013). All Ontario occurrences are within the Great Lakes-Upper St. Lawrence Biogeographic Zone. Only a single designatable unit is recognized in Ontario (COSEWIC 2013).

Native Status

Yes, The Bridle Shiner was first captured in Ontario in the Bay of Quinte in 1928, with collections from the broader range in Ontario in 1938 (COSEWIC 2013).

Presence/Absence

Present

2.2 ELIGIBILITY RESULTS

1. The putative taxon or DU is valid. **Yes**
2. The taxon or DU is native to Ontario. **Yes**
3. The taxon or DU is present in Ontario, extirpated from Ontario or extinct? **Present**

PART 3

ONTARIO STATUS BASED ON COSSARO EVALUATION CRITERIA

3.1 APPLICATION OF PRIMARY CRITERIA (Rarity and Declines)

1. Global Rank

Threatened, Based on G3 Global rank (NatureServe)

2. Global Decline

Threatened In their review, COSEWIC (2013) concluded there is evidence for a reduction of area of occupancy in some areas across the North American range of the Bridle Shiner, and estimated the decline to be 32.5% overall. NatureServe (2013) estimates a long-term decline of 30 to 70% and a short-term decline of 10 to 30% based on range-wide decline in abundance, number of subpopulations, and area of occupancy. Boucher *et al.* (2011) reported that the Bridle Shiner is undersampled in some parts of its range in Quebec, and that many historical sites throughout its range in North America have not been resampled recently. Several newly discovered locations for the Bridle Shiner have been identified in Ontario. This introduces some uncertainty into the estimation of degree of decline. However, overall, the species is believed to meet the threshold of a 30% global decline under this criterion.

3. Northeastern North America Ranks

Threatened, The Bridle Shiner is ranked as extremely rare [SX, SH, S1 or S2] in 7 of the 13 (54%) northeastern North American jurisdictions where it occurs

4. Northeastern North America Decline

Not Assessed. The Northeastern North American range of the Bridle Shiner is almost identical to the global extent of the species. Under COSSARO's rules, it is inappropriate to evaluate this criterion because the results will be the same as those under "global decline".

5. Ontario Occurrences

Special Concern Although the Bridle Shiner has been reported in only 19 locations (<20) in Ontario (COSEWIC 2013), it is likely that additional undiscovered populations exist; however the necessary sampling has not been performed (N. Mandrak (DFO), Pers. Comm.). The 19 locations in Ontario reflect additional sites identified through targeted DFO sampling in 2010 (COSEWIC). NHIC Biodiversity Explorer lists no element occurrences for the Bridle Shiner (NatureServe 2013)

6. Ontario Decline

Not in any category There is no evidence for decline in Bridle Shiner in the number of occurrences in Ontario, in fact the number of locations in Ontario has risen since the

last evaluation by COSSARO likely due to increased sampling effort (COSEWIC 2013). COSEWIC (2013) noted that the known range of the species has been extended further west, based on surveys by DFO in 2010.

7. Ontario's Conservation Responsibility

Not in any category Ontario accounts for less than 3% of the global, areal extent of the Bridle Shiner (COSEWIC 2013; text & Figure 2). Abundance has not been estimated.

3.2 APPLICATION OF SECONDARY CRITERIA (Threats and Vulnerability)

8. Population Sustainability

Not in any category There is no evidence for reproductive failure or recruitment failure in Ontario as the fish has a short lifespan (2 years) but persistent populations over the last 10 years; however, no Population Viability Analysis has been performed (COSEWIC 2013). The recent westward expansion of the known range of the Bridle Shiner in Ontario (COSEWIC 2013, Boucher *et al.* 2011), in combination with their early age of maturation (1 year), indicates the species is reproducing.

9. Lack of Regulatory Protection for Exploited Wild Populations

Not in any category The Bridle Shiner is listed as Special Concern under Ontario's Endangered Species Act (2007), as well as Canada's Species at Risk Act (Schedule 1). In Canada, the federal Fisheries Act may provide protection for the Bridle Shiner's habitat due to overlap with sport fish habitat. There is no commercial harvest of this fish in Ontario, and it is not a legal baitfish in Ontario (COSEWIC 2013).

10. Direct Threats

Special concern The Bridle Shiner is a warm water fish found in the quiet waters of streams, lagoons, and sometimes in lakes, where it feeds on detritus and living plant material, microcrustaceans, and insects, and spawns near submerged vegetation (COSEWIC 2013, Boucher *et al.* 2011). Little is known about the precise physiological tolerances of the Bridle Shiner (COSEWIC 2013). However, it is thought to be vulnerable to reduced water clarity and quality in its preferred habitat of low flow streams and lakes. Based mainly on habitat preferences, rather than focused studies, specific direct threats are hypothesized to include: increased turbidity due to agricultural land use, agricultural, urban and industrial pollution (high in their range and preferred habitat), loss of aquatic vegetation and riparian habitat, water level fluctuation and flow variation and climate change (water flow and temperature fluctuations). The Bridle Shiner is too small to be targeted as a bait fish, although it is taken in small numbers as incidental catch (COSEWIC 2013). COSEWIC (2013) and Boucher *et al.* (2011) note that the region inhabited by the Bridle Shiner is exposed to stream channelization for field drainage, high loads of pesticides, sediments, and nutrients, all of which could have negative effects. For these reasons, the category of special concern is warranted.

11. Specialized Life History or Habitat-use Characteristics

Not in any category The Bridle Shiner uses slow-moving and standing clear water (low turbidity), with soft substrate and aquatic vegetation – this is not limiting habitat in Eastern Ontario.

3.3 COSSARO EVALUATION RESULTS

1. Criteria satisfied in each status category

List the Number of primary and secondary criteria met in each status category:

ENDANGERED – [0/0]

THREATENED – [3/0]

SPECIAL CONCERN – [1/1]

List the Number of Ontario-specific criteria met in each status category:

ENDANGERED – [0]

THREATENED – [0]

SPECIAL CONCERN – [1]

2. Data Deficiency

No. No criteria were assessed as “insufficient information.”

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that The Bridle Shiner is **Special Concern** in Ontario. Although “threatened” resulted from application of three criteria, none applied to Ontario. A designation of special concern is therefore warranted.

PART 4

ONTARIO STATUS BASED ON COSEWIC EVALUATION CRITERIA

4.1 APPLICATION OF COSEWIC CRITERIA

Regional (Ontario) COSEWIC Criteria Assessment

Criterion A – Decline in Total Number of Mature Individuals

Not in any category There is no evidence for any decline in the number of mature individuals in Ontario (COSEWIC 2013).

Criterion B – Small Distribution Range and Decline or Fluctuation

Not in any category NHIC identifies no specific EOs for this species. Other data indicate that the range of locations of capture of the Bridle Shiner in Ontario has increased since the last COSEWIC report (COSEWIC 2013). Meets B2 for Threatened with small IAO, but is not severely fragmented, has >5 locations and there is no evidence of extreme fluctuations.

Criterion C – Small and Declining Number of Mature Individuals

Insufficient Information The number of mature individuals in Ontario is unknown (COSEWIC 2013, Boucher *et al.* 2011). Boucher *et al.* (2011) concluded that Bridle Shiner population sizes and trends are difficult to predict for Ontario, as there are few records of the species and it has never been commonly encountered. According to Boucher *et al.* (2011, p. 14) "The species appears to be stable in some areas but insufficient recent sampling makes it impossible to determine its status in other areas."

Criterion D – Very Small or Restricted Total Population

Not in any category Although the Bridle Shiner is not widespread in Ontario, it occurs in 19 locations and while population numbers have not been quantified, population sizes were not estimated to be very small (COSEWIC 2013; N. Mandrak DFO Pers. Comm.). The area of occupancy in Ontario is much greater than 20 km² and there are more than 5 locations in Ontario, which qualifies the species for "not in any category" under this criterion.

Criterion E – Quantitative Analysis

Insufficient information No PVA has been performed.

Rescue Effect

No. Although immigration from New York in the St. Lawrence region of the Bridle Shiner's range is possible, it is highly unlikely given the small size and poor swimming capabilities of these fish (COSEWIC 2013).

Special Concern Status

Yes. The Bridle Shiner is thought to be very susceptible to degradation of its preferred habitat, it has a globally vulnerable (G3) status, and is not widespread in Ontario (COSEWIC 2013).

4.2 COSEWIC EVALUATION RESULTS

1. Criteria satisfied in each status category

ENDANGERED – [no]
THREATENED – [no]
SPECIAL CONCERN – [yes]

2. Data Deficiency

No.

3. Status Based on COSEWIC Evaluation Criteria

The application of COSEWIC evaluation criteria suggests that **Bridle Shiner** is **Special Concern** in Ontario.

PART 5

ONTARIO STATUS DETERMINATION

5.1 APPLICATION OF COSSARO AND COSEWIC CRITERIA

COSSARO and COSEWIC criteria give the same result. **Yes**

5.2 SUMMARY OF STATUS EVALUATION

Bridle Shiner is classified as **Special Concern** in Ontario.

The Bridle Shiner is a small warm water fish that prefers clear, slow-moving or standing water. The Bridle Shiner is usually associated with soft substrate and uses aquatic vegetation for spawning. The Bridle Shiner is found in eastern North America, from South Carolina to Southern Quebec and from the Atlantic states to eastern Lake Ontario. Within Ontario, it constitutes a single DU with ~19 locations in Lake Ontario drainage, St. Lawrence River and Rideau River. The known range of the Bridle Shiner in Ontario has increased with targeted sampling in 2010, and there is no evidence for reproductive failure or small population sizes. The Bridle Shiner is thought to be sensitive to habitat degradation due to increased turbidity, pollution, water level and flow fluctuations and invasive species. The Bridle Shiner is not used in the bait industry, and by-catch is believed to be minimal. The Bridle Shiner is extremely difficult to identify and is likely commonly misidentified as the more common Blackchin Shiner (*Notropis heterodon*) or Blacknose Shiner (*N. heterolepis*). The Bridle Shiner is ranked G3, or vulnerable, globally and has exhibited a decline in some parts of its North American range.

Information Sources

1. Literature Cited

Boucher, J., M. Berubé, A. Boyko and M. Bourgeois. 2011. Management plan for the Bridle Shiner (*Notropis bifrenatus*) in Canada (Final version). *Species at Risk Act* Management Plan Series, Fisheries and Oceans Canada, Ottawa. v + 43 pp.

COSEWIC 2013. COSEWIC Update Status Report on Bridle Shiner *Notropis bifrenatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.

Gilbert, C. 1980. *Notropis bifrenatus* (Cope), Bridle shiner. Page 238 in Atlas of North American Freshwater Fishes. Edited by D. S. Lee, C. R. Gilbert, C. H. Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer. North Carolina State Museum Natural History, Publication Number 1980-12.

NatureServe 2013. NatureServe Explorer: An online encyclopedia of life. Web site: http://www.natureserve.org/explorer/servlet/NatureServe?post_processes=PostReset&loadTemplate=nameSearchSpecies.wmt&Type=Reset [Accessed May 2013].

2. Community and Aboriginal Traditional Knowledge Sources

NONE

3. Acknowledgements

Dr. N Mandrak provided valuable information for this report.

APPENDIX 1

NORTHEASTERN NORTH AMERICA STATUS RANK AND DECLINE

	Subnational Rank	Sources	Decline	Sources
CT	S3	NatureServe 2013		
DE	S1	NatureServe 2013		
IL	Not present	NatureServe 2013		
IN	Not present	NatureServe 2013		
IA	Not present	NatureServe 2013		
LB	Not present	NatureServe 2013		
KY	Not present	NatureServe 2013		
MA	S3	NatureServe 2013	Yes, unquantified	NatureServe 2013
MB	Not present	NatureServe 2013		
MD	SH	NatureServe 2013	Yes, unquantified	NatureServe 2013
ME	S2	NatureServe 2013		
MI	Not present	NatureServe 2013		
MN	Not present	NatureServe 2013		
NB	Not present	NatureServe 2013		
NF	Not present	NatureServe 2013		
NH	S2	NatureServe 2013		
NJ	S4	NatureServe 2013	Yes, unquantified	NatureServe 2013
NS	Not present	NatureServe 2013		
NY	S5	NatureServe 2013		
OH	Not present	NatureServe 2013		

ON	S2	NatureServe 2013		
PA	S1	NatureServe 2013	Yes, unquantified	NatureServe 2013
PE	Not present	NatureServe 2013		
QC	S3	NatureServe 2013		
RI	S5	NatureServe 2013		
VA	Not present	NatureServe 2013		
VT	S1?	NatureServe 2013		
WI	Not present	NatureServe 2013		
WV	Not present	NatureServe 2013		

Occurs as a native species in 13 of 29 northeastern jurisdictions
 Srank or equivalent information available for 13 of 13 jurisdictions = 100%
 S1, S2, SH, or SX in 7 of 13 = 54%