# COSSARO Candidate Species at Risk Evaluation for Blackstripe Topminnow (*Fundulus notatus*)

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

Assessed by COSSARO as Special Concern

May 2012

**Final**

La **Fondule rayée** (*Fundulus notatus*) est présente dans les basses-terres des Grands Lacs inférieurs, dans la plus grande partie du basin du fleuve Mississipi et le long de la plaine côtière, du Texas à l'Alabama; elle est indigène à 16 États des États-Unis (elle n'a un statut préoccupant dans aucun de ces États). La Fondule rayée préfère les eaux troubles, tolère les eaux chaudes et faiblement oxygénées et semble dépendante de la végétation aquatique et du couvert des rives. Les populations de fondule rayée en Ontario semblent stables; cependant, le manque de données quantitatives sur la démographie et la reproduction font en sorte qu'il est difficile d'évaluer la taille et le déclin des populations. Au Canada, l'espèce est restreinte à un petit territoire dans un système de drainage hautement développé et pourrait donc être susceptibles aux perturbations et à la perte d'habitat. La Fondule rayée a le statut d'espèce préoccupante en Ontario du fait de la petite taille, de l'isolement et du degré élevé de développement de son aire de distribution dans la province. Les données démographiques quantitatives et, dans une moindre mesure, les données génétiques sont jugées déficientes.

*Cette publication hautement spécialisée, COSSARO Evaluation for Blackstripe Topminnow n'est disponible qu'en anglais en vertu du Règlement 671/92 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez contacter le secrétariat de COSSARO par courrier électronique à l'adresse COSSAROsecretariat@ontario.ca.*

## PART 1 – Current status and distribution

### Current designations

GRANK – G5 (NatureServe 2012)

NRANK Canada – N2 (NatureServe 2012)

COSEWIC – Special Concern (COSEWIC, 2012)

*SARA* – Special Concern (Schedule 1) (Environment Canada, 2012)

*ESA* 2007 – Special Concern (Ministry of Natural Resources, 2005)

SRANK – S2 (NatureServe 2012)

### Distribution in Ontario

The Blackstripe Topminnow distribution in Ontario is limited to the Sydenham River drainage in southwestern Ontario. The area of occupancy is approximately 500 $km^2$ based on 2 x 2 km squares, or 300 $km^2$ based on 1 x 1 km squares which is likely high, given the narrow stream habitat this fish uses (COSEWIC 2012).

### Distribution and status outside Ontario

The Blackstripe Topminnow is found throughout much of the Mississippi River drainage in the United States from Michigan and Wisconsin to the mouth of the Mississippi River. Generally the Blackstripe Topminnow is abundant in its US distribution and is ranked as N5 nationally in the US, although the more northern range is more sparsely populated (COSEWIC 2012).

## PART 2 – Eligibility for Ontario status assessment

### 2.1 Application of eligibility criteria

**Taxonomic distinctness**
Yes. The Blackstripe Topminnow is a well characterized and valid species, with one other congener in Ontario, the Banded Killifish (*F. diaphanous*), which has an overlapping range. The two species are morphologically and genetically distinct (Bernardi & Powers 1995).

**Designatable units**
Although no genetic analysis has been undertaken, there are no subspecies recognized for the Blackstripe Topminnow. Only a single designatable unit is recognized based on their restricted range within a single drainage (Sydenham River) in southwestern Ontario.

**Native status**
Yes. Although the Blackstripe Topminnow was first reported in the Sydenham drainage in 1972; however, it is likely that it has always been present in Ontario but limited sampling of the Sydenham River prior to that failed to detect it. Additionally, the discontinuous Blackstripe Topminnow distribution (a break between the Ontario and US populations) and low human transfer potential (it generally is not used as a baitfish) makes it unlikely that the Blackstripe Topminnow is introduced.

**Presence/absence**
Present. Ontario populations were confirmed by OMNR sampling in 2010.

### 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**
Not in any category (G5)

**2. Global decline**
Not in any category: No evidence for declines globally, and range expansions have been reported in Ohio and Wisconsin (COSEWIC 2012).

**3. Northeastern North America ranks**
Special concern: The Blackstripe Topminnow is ranked as extremely rare [SX, SH, S1 or S2] in 2 (ON, MI) of the 8 (25%) northeastern North American jurisdictions where it occurs (Ontario=S2, Wisconsin=S4, Michigan=S2S3, Iowa=S3, Illinois=S5, Indiana=S5, Kentucky=S4S5, Ohio=S4).

**4. Northeastern North America decline**
Not in any category: There is no evidence for population decline for any of the Northeastern Blackstripe Topminnow range; however, there are few quantitative population size estimates.

**5. Ontario occurrences**
Threatened: The sites where Blackstripe Topminnow have been most recently collected form 8, largely isolated, populations within the Sydenham River watershed 1) Sydenham River, 2) North Sydenham River, 3) Little Bear Creek, 4), Maxwell Creek, 5) Black Creek, 6) Whitebread Drain, 7) Bear Creek, and 8) a complex of four, small unnamed tributary streams between Little Bear Creek and Whitebread Drain (COSEWIC 2012).

**6. Ontario decline**
Insufficient information: Although there is no evidence for a decline in the number of Blackstripe Topminnow populations in Ontario (COSEWIC 2012), there are no data on the numbers within each population for any sampling period, thus population decline cannot be assessed.

**7. Ontario's Conservation responsibility**
Not in any category: Ontario represents a very small proportion (<1%) of the global Blackstripe Topminnow Range (COSEWIC 2012).

### 3.2 Application of secondary criteria (threats and vulnerability)

**8. Population sustainability**
Insufficient information: There have been no quantitative population size estimates, nor any population viability analyses performed for the species in Ontario. Little is known concerning the reproductive biology of the Blackstripe Topminnow, and recruitment has not been measured.

**9. Lack of regulatory protection for exploited wild populations**
Not in any category: The Blackstripe Topminnow is not exploited.

**10. Direct threats**
Special concern: The Blackstripe Topminnow prefers turbid waters and is tolerant to warm, low oxygenated waters and was found to replace banded killifish (*F. diaphanus*) in Ohio when turbidity increases (Trautman 1981). McAllister (1987) noted that destruction of aquatic vegetation and bank cover by livestock limits this species in the headwaters of Black Creek, and such activity could pose a threat in other areas. Wetland drainage is also a general cited threat. The specific threat of oil seepage from wells in the vicinity of Black Creek is identified as a potential threat as is competition from invasive fishes (in particular the Round Goby) (COSEWIC 2012), however Holm (1997) captured several specimens from three sites in this drainage in 1996 and the population appears stable based on later sampling. Since virtually all of the habitat for this species is outside of protected areas and is limited to a relatively small area that is intensively cultivated, the Blackstripe Topminnow is at high risk from habitat disturbance or loss. However, the species is relatively adaptable to poor water quality and streamside vegetation appears to be stable or increasing (SCRCA 2008) and therefore direct threats are unlikely to exceed about 25% of the species range, thereby fitting the Special Concern criteria.

**11. Specialized life history or habitat–use characteristics**
Not in any category: The Blackstripe Topminnow prefers small to large, low-gradient streams and sloughs of moderate to high turbidity (Shute 1980). In Canada, the Blackstripe Topminnow is found in turbid waters with silt, rubble and boulder substrates across a range of water quality (McAllister 1987; Mandrak et al. 2006). Streamside and instream vegetation appears to be important for this species (McAllister 1987). The species is unique in that it almost exclusively feeds on the surface on insects, but this behaviour does not seem to make it especially sensitive to disturbance.

### 3.3 COSSARO evaluation results

**1. Criteria satisfied in each status category**

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

Endangered – 0/0
Threatened – 1/0
Special concern – 1/1

Ontario-specific criteria met in each status category:

Endangered – 0
Threatened – 1
Special concern – 0

**2. Data deficiency**

No. Although there are 2 criteria assessed as "insufficient information" because of lack of information on population trends, the number of recent records at a variety of locations suggests that populations are stable.

**3. Status based on COSSARO evaluation criteria**

The application of COSSARO evaluation criteria suggests that the Blackstripe Topminnow is of Special Concern in Ontario. One primary criterion meets Threatened, which relates to the restricted range and small number of populations within Ontario. One primary and one secondary criteria qualify as Special Concern resulting from rarity in northeastern jurisdictions and threats. The Blackstripe Topminnow is peripheral to Ontario and the populations appear to be stable, therefore a status of Special Concern has been assigned.

## 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**
Insufficient information: No data for Ontario populations.

**Criterion B – Small distribution range and decline or fluctuation**
Not in any category: The Ontario Blackstripe Topminnow occupy ~ 300 $km^2$ of stream habitat in a very limited geographical range (Sydenham River drainage), which would qualify as Endangered on this criteria alone but there is no evidence that the number of populations are declining.

**Criterion C – Small and declining number of mature individuals**
Not in any category: The total number of sites with Blackstripe Topminnow is small; however the populations appear to be stable (COSEWIC 2012).

**Criterion D – Very small or restricted total population**
Not in any category: The Blackstripe Topminnow occupies a very limited range and the population number is not known but it certainly well above the threshold of 1000 to qualify for this criterion.

**Criterion E – Quantitative analysis**
Insufficient information: No data exists for Ontario populations.

**Rescue effect**
No: There is little known information concerning natural dispersal in the Blackstripe Topminnow. The nearest known populations in southern Michigan is approximately 100 km away, and separated by open water habitat, therefore natural dispersal is unlikely.

**Special concern status**
Yes. Blackstripe Topminnow has a very restricted range within Ontario and a range occupancy of ~ 300 $km^2$ and therefore it qualifies as Endangered under the area of occupancy part of Criterion B, but does not meet the decline part. Consequently it qualifies as Special Concern under the COSEWIC criteria.

### 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 Blackstripe Topminnow 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 status evaluation

The application of COSEWIC evaluation criteria suggests that Blackstripe Topminnow is Special Concern in Ontario.

The Blackstripe Topminnow (*Fundulus notatus*) occurs in lowland areas of the southern Great Lakes, throughout much of the Mississippi basin, and along the lower coastal plain from Texas to Alabama and is native to 16 US states (not listed special concern in any state). The Blackstripe Topminnow prefers turbid waters and is tolerant to warm low oxygenated waters and appears dependent on aquatic vegetation and bank cover. Ontario Blackstripe Topminnow populations appear stable; however a lack of quantitative demographic and reproductive data make population size decline difficult to assess. The species in Canada is restricted to a small range in a highly developed drainage, and thus may be susceptible to habitat disturbance and loss. The Blackstripe Topminnow is of Special Concern in Ontario due to their small and isolated distribution, coupled with the highly developed nature of their range. Both quantitative demographic data and, to a lesser extent, genetic data are identified as deficient.

## Information sources

### 1. Literature cited


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SCRCA 2008. Watershed report card. St. Clair Region. St Clair Region Conservation Authority.

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### 2. Community and Aboriginal traditional knowledge sources

No community knowledge or traditional Aboriginal knowledge was available.

### 3. Acknowledgements:


Dr. Nicholas Mandrak provided valuable information for this assessment.

## Appendix 1: Northeastern North America status rank and decline

| State/Province | Subnational Rank | Sources | Decline | Sources |
|---|---|---|---|---|
| CT | Not present | | | |
| DE | Not present | | | |
| IL | S5 | COSEWIC | | |
| IN | S5 | COSEWIC | | |
| IA | S3 | COSEWIC | | |
| LB | Not present | | | |
| KY | S4S5 | COSEWIC | | |
| MA | Not present | | | |
| MB | Not present | | | |
| MD | Not present | | | |
| ME | Not present | | | |
| MI | S2S3 | COSEWIC | | |
| MN | Not present | | | |
| NB | Not present | | | |
| NF | Not present | | | |
| NH | Not present | | | |
| NJ | Not present | | | |
| NS | Not present | | | |
| NY | Not present | | | |
| OH | S4 | COSEWIC | | |
| ON | S2 | COSEWIC | | |
| PA | Not present | | | |
| PE | Not present | | | |
| QC | Not present | | | |
| RI | Not present | | | |
| VA | Not present | | | |
| VT | Not present | | | |
| WI | S4 | COSEWIC | | |
| WV | Not present | | | |

Occurs as a native species in 8 of 29 northeastern jurisdictions

SRANK or equivalent information available for 8 of 8 jurisdictions = (100%)

S1, S2, SH, or SX in 2 of 8 = (25%)