

**COSSARO Candidate Species at Risk Evaluation**

**for**

**Crooked-stem Aster, *Symphyotrichum prenanthoides***

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

**Assessed by COSSARO as Special Concern**

## **Aster fausse-prenanthe (*Symphyotrichum prenanthoides*)**

L'aster fausse-prenanthe est une fleur sauvage vivace pouvant atteindre 90 cm en hauteur; elle a des inflorescences bleu pâle et des tiges en zigzag. Son aire de répartition comprend l'Ontario et 20 États de l'est des États-Unis. Les populations canadiennes d'aster fausse-prenanthe se trouvent dans la région de la forêt carolinienne, à la limite nord de son aire de répartition. Il existe onze populations connues en Ontario et un autre onze dont la situation n'est pas connue, mais qui existent probablement toujours. Il n'y a aucun indice de déclin ni dans le nombre d'occurrences, ni dans la superficie de son aire d'occupation au cours des dix dernières années, bien que certains endroits n'aient pas été répertoriés pendant plus de dix ans. Les populations pourraient être menacées par des espèces de plantes envahissantes introduites et par la perte d'habitat. La plupart des populations sont relativement petites, bien qu'il soit difficile d'en obtenir des chiffres exacts en raison de la haute densité et de la propagation clonale. Les Grands Lacs représentent probablement un obstacle insurmontable à l'échange de gènes entre les États-Unis et le Canada. Leur petit nombre de populations, et dans certains cas, le petit nombre d'individus, a fait en sorte que l'aster fausse-prenanthe soit désigné comme espèce préoccupante en Ontario. Parce que certaines populations ont un plus grand nombre de tiges que dans les relevés précédents et que deux nouvelles populations ont été découvertes en 2007, l'espèce est passée de menacée à la désignation inférieure d'**espèce préoccupante**.

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## **PART 1**

### **CURRENT STATUS AND DISTRIBUTION**

#### **Current Designations:**

**GRANK – G4G5** (NatureServe, accessed 21/12/2012)  
**NRANK Canada – N2** (NatureServe, accessed 21/12/2012)  
**COSEWIC – Special Concern** (COSEWIC, November, 2012)  
**SARA – Schedule one** (Environment Canada, 2012)  
**ESA 2007 – Threatened**  
**SRANK – S2** (NatureServe, accessed 21/12/2012)

#### **Distribution in Ontario:**

Distributed along the north shore of Lake Erie in southwestern Ontario. Occurs in Elgin County, plus one population in each of Haldimand-Norfolk Regional Municipality and Oxford County. A Middlesex County population is apparently extirpated.

#### **Distribution and Status Outside Ontario:**

Occurs in the U.S.A. in 20 states from New York to Tennessee and west to Wisconsin. It is most common in the Appalachian region through western Pennsylvania, West Virginia, Virginia, Kentucky, and Tennessee.

## PART 2

### ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

#### 2.1 APPLICATION OF ELIGIBILITY CRITERIA

##### Taxonomic Distinctness

**Yes.** This species has traditionally been treated as *Aster prenanthoides* Muhl. (Nesum, 1994).

##### Designatable Units

The Canadian population comprises a single Designatable Unit within the Great Lakes Plains Ecological Area (COSEWIC 2010). All occurrences are in similar habitat types within about 20 km of Lake Erie in the Norfolk and Bothwell sand plains (Chapman and Putnam 1973), and there is no evidence to support segregating populations into distinct DUs.

##### Native Status

**Yes.** Firmly embedded in the literature as native to Ontario (Semple et al., 2002)

##### Presence/Absence

**Present.** There are 11 known populations in Ontario, with a further 11 that are likely extant.

#### 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.** G4G5 (apparently secure to secure)

##### **2. Global Decline**

**Not in any category.** No evidence of non-cyclical decline of >30% (COSEWIC 2012).

##### **3. Northeastern North America Ranks**

**Special concern.** S1, S2, SH, or SX in 42% of jurisdictions in northeastern North America (NatureServe, accessed 21/12/2012; COSEWIC 2012).

##### **4. Northeastern North America Decline**

**Not in any category.** No evidence of non-cyclical decline of >30% (COSEWIC 2012).

##### **5. Ontario Occurrences**

**Special Concern.** Currently, there are 11 known extant elemental occurrences, and a further 11 sites that have not been assessed within the last five years and therefore their status is unknown (COSEWIC 2012), although they are likely extant (Al Harris, pers. comm.). Five sites were considered extirpated by COSEWIC (2012). Sites vary from a few flowering stems to hundreds (>500) of scattered flowering stems, although the species is clonal and the number of genets is probably much lower than the number of ramets (COSEWIC 2012).

##### **6. Ontario Decline**

**Not in any category.** The species is known to be absent from at least 19 % of its documented element occurrences in Ontario (5/27) COSEWIC (2002, 2012).

##### **7. Ontario's Conservation Responsibility**

**Not in any category.** Less than 1% of the global range is in Canada (COSEWIC 2002, 2012).

#### **3.2 APPLICATION OF SECONDARY CRITERIA (Threats and Vulnerability)**

## **8. Population Sustainability**

**Not in any category.** The total Canadian population size of Crooked-stem Aster is unknown and difficult to estimate because the species forms dense colonies, in which numbers of individual plants are difficult to determine. The number of sites has apparently been relatively stable since 2002. Eleven sites are currently extant, and an additional eleven may be extant (status unknown, but populations are thought to be sustainable; A. Harris, pers. comm.). The extant sites include two new sites discovered in 2007 and one population not surveyed in 2002 that has been relocated (COSEWIC, 2012). Based on available data, the index of area of occupancy and extent of occurrence appear unchanged since 2002 (COSEWIC, 2012).

## **9. Lack of Regulatory Protection for Exploited Wild Populations**

**Not in any category.** There is no evidence of unregulated actual or anticipated take from wild populations. Take is prohibited under ESA.

## **10. Direct Threats**

**Special Concern.** Habitat loss: three populations are on road right-of-ways and are potentially threatened by changes in mowing practices, herbicides, road maintenance and construction, although where repeatedly monitored, the species appears to be tolerant of recent road maintenance practices. Other populations occur on the floodplains of streams and are potentially threatened by recreational use including off-road vehicles. One site is potentially threatened by cottage development. Introduced invasive plant species were observed at 8/9 sites surveyed in 2012, although their collective impact on Crooked-stem Aster is not well known (COSEWIC, 2012).

## **11. Specialized Life History or Habitat-use Characteristics**

**Not in any category.**

### **3.3 COSSARO EVALUATION RESULTS**

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

ENDANGERED – [0/0]  
THREATENED – [0/0]  
SPECIAL CONCERN – [2/1]

ENDANGERED – [0]

THREATENED – [0]  
SPECIAL CONCERN – [1]

**2. Data Deficiency**

No.

**3. Status Based on COSSARO Evaluation Criteria**

The application of COSSARO evaluation criteria suggests that **Crooked-stem Aster** is of **Special Concern** in Ontario.

## 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. Lack of long term monitoring at most sites prevents application of the criterion, but population sizes appear to be stable where data are available.

**Criterion B (Small Distribution Range and Decline or Fluctuation):**

Not in any category. EO and IAO are below the thresholds for Endangered. However, the species is not severely fragmented, occurs in more than 10 locations, and does not undergo extreme fluctuations.

**Criterion C (Small and Declining Number of Mature Individuals):**

Not in any category. The number of mature individuals is unknown, but likely in the 1000s, and no decline has been documented.

**Criterion D (Very Small or Restricted Total Population):**

Not in any category. Estimated number of mature individuals exceeds the thresholds.

**Criterion E (Quantitative Analysis). Insufficient information. No quantitative analysis is available.**

**Rescue Effect**

The closest extant populations outside Canada are in New York, Pennsylvania, and Ohio, about 80 km across Lake Erie. The species is common (S5) in all three states. Seed dispersal by wind across Lake Erie is conceivable, but unlikely because the species is relatively uncommon in northern Pennsylvania (Grund pers. comm. 2010, cited in COSEWIC, 2012).

**Special Concern Status**

**Yes.** This globally secure perennial aster is restricted in Canada to a small area near the shore of Lake Erie in Ontario. The species has declined historically in Canada and may be at risk from several invasive non-native plant species, roadside maintenance, trampling, and herbicide use.

## **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 **Crooked-stem Aster** is **of 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**

**Crooked-stem Aster** is classified as **Special Concern** in Ontario.

Crooked-stem Aster (*Symphyotrichum prenanthoides*) is a perennial wildflower up to 90 cm tall with pale blue flower heads and zigzagging stems. Its range encompasses Ontario and 20 eastern U.S. states. Canadian populations of Crooked-stem Aster occur in the Carolinian Forest Region at the northern limit of the species' range. There are 11 known populations in Ontario, and a further 11 for which status is uncertain, but likely extant. There is no evidence of decline in either extent of occurrence or area of occupancy within the last 10 years, although some sites have not been surveyed in more than 10 years. Populations may be threatened by introduced invasive plant species and by habitat loss. Most populations are relatively small, although accurate counts are difficult because of high density and clonal spread. The Great Lakes likely form an insurmountable barrier to gene flow from the USA into Canada. The small number of populations, and in some cases their small sizes, has led to classification of Crooked-stem Aster as Special Concern in Ontario. Because some populations have a greater number of stems than in previous surveys, and two new sites were discovered in 2007, it was downlisted from the previous status of Threatened.

## Information Sources

### 1. Literature Cited

Chapman, L.J. and D.F. Putnam. 1973. The Physiography of Southern Ontario. 687 Second Edition. University of Toronto Press

COSEWIC Status Report on Crooked-stem Aster *Symphyotrichum prenanthoides* in Canada prepared for COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA, 2-month Interim Report, September 2012; COSEWIC Assessment: November 2012

COSEWIC 2002. COSEWIC assessment and status on report on the crooked-stem aster *Symphyotrichum prenanthoides* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 16 pp.

Nesum, G.L. 1994. *Phytologia* 77:290.

Semple, J.C., S.B. Heard and L. Brouillet. 2002. Cultivated and native asters of Ontario (Compositae: Astereae): *Aster* L. (including *Asteromoea* Blume, *Diplactis* Raf. and *Kalimeris* (Cass.) Cass.), *Callistephus* Cass., *Galatella* Cass., *Doellingeria* Nees, *Oclemena* E.L. Greene, *Eurybia* (Cass.) S.F. Gray, *Canadanthus* Nesom, and *Symphyotrichum* Nees (including *Virgulus* Raf.). U. Waterloo. Biol. Series No. 41: 1-134.

### 2. Community and Aboriginal Traditional Knowledge Sources

There was no known Community or Aboriginal Traditional knowledge on this species.

### 3. Acknowledgements

## APPENDIX 1

### NORTHEASTERN NORTH AMERICA STATUS RANK AND DECLINE

	Subnational Rank	Sources	Revised Rank (COSEWIC 2012)	Decline
CT	SH	NatureServe 2012		No data available
DE	S1	NatureServe 2012		No data available
IL	SU	NatureServe 2012	S4	No data available
IN	SNR	NatureServe 2012	S4	No data available
IA	S3	NatureServe 2012		No data available
LB	Not present	NatureServe 2012		
KY	S5	NatureServe 2012		No data available
MA	S2	NatureServe 2012		No data available
MB	Not present	NatureServe 2012		
MD	SNR	NatureServe 2012	S4S5	No data available
ME	Not present	NatureServe 2012		
MI	SNR	NatureServe 2012	Not present	No data available
MN	Not present	NatureServe 2012	S3	
NB	Not present	NatureServe 2012		
NF	Not present	NatureServe 2012		
NH	Not present	NatureServe 2012		
NJ	S2	NatureServe 2012		No data available
NS	Not present	NatureServe 2012		
NY	S5	NatureServe 2012		No data available
OH	SNR	NatureServe 2012	S5	No data available
ON	S2	NatureServe 2012		No data available
PA	SNR	NatureServe 2012	S5	No data available
PE	Not present	NatureServe 2012		
QC	Not present	NatureServe 2012		
RI	Not present	NatureServe 2012		
VA	S4S5	NatureServe 2012		No data available
VT	Not present	NatureServe 2012		
WI	SNR	NatureServe 2012	S5	No data available
WV	S4	NatureServe 2012		No data available

Occurs as a native species in 17 of 29 northeastern jurisdictions  
 Srank or equivalent information available for 12 of 17 jurisdictions = (71%)  
 S1, S2, SH, or SX in 5 of 12 = (42%)