COSSARO Candidate Species at Risk Evaluation

for

False Hop Sedge (*Carex lupuliformis*)

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

Assessed by COSSARO as ENDANGERED

December 2011

Final
PART 1

CURRENT STATUS AND DISTRIBUTION

Current Designations:

SARA – Endangered (Schedule 1) (Environment Canada, 2011)
ESA 2007 – Endangered (Ministry of Natural Resources, 2011)
SRANK – S1 (NHIC, 2011)

Distribution in Ontario:

False Hop Sedge is restricted to southwestern Ontario (Middlesex and Elgin Counties), which is near the northern limit of the species’ range (COSEWIC, 2011a).

Distribution and Status Outside Ontario:

False Hop Sedge is endemic to eastern North America. In Canada, it occurs in southern Quebec as well as in southwestern Ontario. In the U.S., it occurs sporadically from Vermont to Wisconsin, Iowa, Missouri and Oklahoma and south to Florida, Louisiana and Texas (COSEWIC, 2011a).
PART 2

ELIGIBILITY FOR ONTARIO STATUS ASSESSMENT

2.1 APPLICATION OF ELIGIBILITY CRITERIA

Taxonomic Distinctness

Yes. False Hop Sedge is considered a valid species in almost all recent taxonomic works including the *Flora of North America* (Reznicek, 2003). This species is closely related and quite similar to Hop Sedge (*Carex lupulina*) which often occurs in the same habitat with False Hop Sedge (COSEWIC, 2011a).

Designatable Units

No subspecies or varieties have been described for False Hop Sedge. The species is known in Ontario only from a small part of the southwest with no range disjunctions. No genetic information is available on the Ontario populations. There are no known morphological or genetic differences between the Quebec and Ontario populations, although genetic exchange between the two regions is unlikely at this time since they are separated by 700 km (COSEWIC, 2011a).

Native Status

Yes. False Hop Sedge has always been considered to be a native plant in open wetlands in southwestern Ontario. It was first reported in the province at Galt in 1902. It is not known to be in cultivation.

Presence/Absence

Present. All Ontario populations considered extant were confirmed in 2009 (COSEWIC, 2011a).

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


2. Global Decline


3. Northeastern North America Ranks

Endangered. The species is ranked in 18 of 20 jurisdictions (90%). False Hop Sedge is highly ranked (S1, S2, SH, or SX) in 15 of 18 jurisdictions (83%) (NatureServe, 2011).

4. Northeastern North America Decline

Not in any category. The northeastern North American range of the species is largely the same as its global range (COSEWIC, 2011a).

5. Ontario Occurrences

Threatened. There are seven extant Element Occurrences (confirmed in 2009) and two that are rated as extirpated (COSEWIC, 2011a).

Of the two locations regarded as extirpated, Galt was collected (and last seen) in 1902. The rather vague locality precludes detailed relocation efforts although several botanists have surveyed suitable habitat in the area several times but found no False Hop Sedge (COSEWIC, 2011a). In addition, the Galt area is now highly urbanized.

In 1985, a population of about 100 plants was found near Amhertsburg, however, focused efforts in 2002, 2005, and 2009 at the site failed to relocate the species and it is now assumed to be extirpated there (COSEWIC, 2011a).

Botanists associated with the University of Montreal have spent 28 person-days searching for False Hop Sedge in Ontario at the known sites and in potential habitat within the species range (COSEWIC, 2011a).
6. Ontario Decline

**Endangered.** Of the seven extant sites for which there is comparative population data, most have declined 50% or more in the last 4-17 years. Although three sites increased during the middle of that period, two of the three ultimately showed an overall decline of 50% or more by the end (COSEWIC, 2011a).

Table 1: Ontario Population Counts for Extant Populations of False Hop Sedge (COSEWIC, 2011a)

<table>
<thead>
<tr>
<th>Population</th>
<th>Year</th>
<th>Mature Individuals (# fruiting stems in parentheses)</th>
<th>Overall Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ailsa Craig</td>
<td>2009</td>
<td>19</td>
<td>NA</td>
</tr>
<tr>
<td>Lambeth</td>
<td>2009</td>
<td>Unknown</td>
<td>NA</td>
</tr>
<tr>
<td>London</td>
<td>1992</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>12+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>5</td>
<td>58% in 17 years. 82% decline between 2005 and 2009</td>
</tr>
<tr>
<td>Mount Brydges</td>
<td>1992</td>
<td>25-30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>1075</td>
<td>Logging at the site in 2002 allowed a large increase in the population which has since declined as competing vegetation increased</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>29</td>
<td>Declined to pre-logging (1992) numbers</td>
</tr>
<tr>
<td>Rodney</td>
<td>1993</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>1</td>
<td>50% in 7 years</td>
</tr>
<tr>
<td>West Elgin</td>
<td>2005</td>
<td>NA (±150)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>39 (132)</td>
<td>12% in 4 years (based on stem counts)</td>
</tr>
<tr>
<td>West Lorne</td>
<td>1993</td>
<td>±100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>20</td>
<td>80% in 16 years. 68% decline between 2005 and 2009</td>
</tr>
</tbody>
</table>
The declines in some of the Ontario populations are surely greater than indicated above and in Table 1 due to recovery efforts being made by the authors of the draft COSEWIC Status Report (COSEWIC, 2011a). Ontario seed was collected in 2005 and grown in a Montreal greenhouse. The young plants were transplanted back into several Ontario populations in 2006 and 2007.

Except for the West Elgin population, the transplants were not systematically marked so that the population counts of mature individuals in 2009 (shown in Tables 1 and 2) include an unknown number of surviving transplants (COSEWIC, 2011a). At West Elgin, 112 juvenile plants were planted and marked in 2006. In 2009, 63 of the transplants had survived. Since the West Elgin transplants had been marked and recorded separately from the natural plants, their numbers are not included in the population counts in Table 1.

In Quebec, where the transplants have been carefully marked at all sites, transplant survival varies quite widely from 17% to 82% (COSEWIC, 2011a).

Table 2: Transplants of False Hop Sedge at Ontario Sites (COSEWIC, 2011a)

<table>
<thead>
<tr>
<th>Population</th>
<th>Number of Mature Plants in 2005</th>
<th>Number of Transplants Introduced in 2006-2007</th>
<th>Number of Mature Individuals (natural and transplants) in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>London</td>
<td>28</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Mount Brydges</td>
<td>1075</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>Rodney</td>
<td>26</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>West Lorne</td>
<td>63</td>
<td>106</td>
<td>20</td>
</tr>
</tbody>
</table>

For the purposes of this evaluation, the contribution of the transplants to the four populations listed in Table 2 has been ignored.

7. Ontario’s Conservation Responsibility

Not in any category. Ontario makes up <1% of the species global range (COSEWIC, 2011a).
3.2 APPLICATION OF SECONDARY CRITERIA (Threats and Vulnerability)

8. Population Sustainability

**Threatened.** The general decline over various time periods at most sites suggests there is a recruitment or reproductive failure in the province. No Population Viability Analyses have been conducted for the species, however, most populations are quite small (less than about 20 mature individuals) and may not be large enough to sustain viable populations (COSEWIC, 2011a).

9. Lack of Regulatory Protection for Exploited Wild Populations

**Not in any category.** Protective legislation in Ontario includes the *Endangered Species Act, 2007* (MNR, 2011). The species is not known to be exploited in the province.

10. Direct Threats

**Threatened.** False Hop Sedge requires periodic flooding of its habitat. However, most sites (Rodney, West Elgin, Mount Brydges, London, Ailsa Craig, and West Lorne) are surrounded or bisected by surface or sub-surface agricultural and urban development drains that are probably having an impact on site hydrology (COSEWIC, 2011a).

False Hop Sedge is shade intolerant so habitat succession is probably responsible for population declines at some sites, such as Amherstburg, Mount Brydges, and West Lorne (COSEWIC, 2011a).

Some sites (London and West Lorne) are being impacted by the spread of invasive species, such as Common Buckthorn (*Rhamnus cathartica*) and Reed Canary Grass (*Phalaris arundinacea*) which compete for light and nutrients (COSEWIC, 2011a).

Other threats, such as residential development, garbage dumping, trampling, and cattle grazing are considered to be minor threats (COSEWIC, 2011a).

11. Specialized Life History or Habitat-use Characteristics

**Not in any category.** False Hop Sedge requires periodic flooding and canopy disturbance for access to light (COSEWIC, 2011a).
3.3 COSSARO EVALUATION RESULTS

1. Criteria satisfied in each status category

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

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

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

ENDANGERED – 1
THREATENED – 1
SPECIAL CONCERN – 0

2. Data Deficiency

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

3. Status Based on COSSARO Evaluation Criteria

The application of COSSARO evaluation criteria suggests that False Hop Sedge is Endangered in Ontario.
PART 4
ONTOARIO 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
Threatened. Meets A1a. Ten year population trends are unavailable, but between 2005 and 2009, three of the five populations with monitoring data declined by over 50%, one declined by 12%, and one increased following logging, but decreased to pre-disturbance levels by 2009. The species reproduces vegetatively and generation time is unknown. Individuals can reproduce their first year.

Criterion B – Small Distribution Range and Decline or Fluctuation
Endangered. Meets B2 ab(ii,iii,iv,v). Area of Occupancy is 12 km$^2$ and severely fragmented. Habitat quality continues to decline. Decline in number of populations. Decline of number of mature individuals. Wide fluctuations in number of mature plants at some sites (COSEWIC, 2011a).

Criterion C – Small and Declining Number of Mature Individuals
Endangered. Meets C1 C2 a(i) b. Total Ontario population <2500 mature plants which continues to decline. No population with >250 mature individuals. Wide fluctuations in number of mature plants at some sites (COSEWIC, 2011a).

Criterion D – Very Small or Restricted Total Population

Criterion E – Quantitative Analysis
Not in any category. No Population Viability Analyses have been conducted for the species in Ontario.

Rescue Effect
No. Possible but very unlikely. Imperiled in three of the four closest states (Michigan: S2, Ohio: S2, and New York: S2) and does not occur in Pennsylvania (NatureServe, 2011). Separated from U.S. populations by Lake Erie. Separated from Quebec populations by 700 km.
4.2 COSEWIC EVALUATION RESULTS

1. Criteria satisfied in each status category

   ENDANGERED – **YES**
   THREATENED – **YES**
   SPECIAL CONCERN – **NO**

2. Data Deficiency

   **No.** No indication that data are insufficient to arrive at a status determination.

3. Status Based on COSEWIC Evaluation Criteria

   The application of COSEWIC evaluation criteria suggests that False Hop Sedge is **Endangered** 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

False Hop Sedge is classified as Endangered in Ontario.

False Hop Sedge (Carex lupuliformis) is an herbaceous perennial that grows 50 to 130 cm tall. It grows in tufts of up to 30 stems. It is distinguished from Hop Sedge (Carex lupulina), a closely-related species, by the prominent knobs on the achenes. False Hop Sedge grows primarily in forest pools, small ponds, and marshes in the Carolinian Zone of southwestern Ontario. These pools are all subject to periodic flooding. The global distribution extends from southern Quebec west to Wisconsin, Iowa, Missouri and Oklahoma, and south to Florida, Louisiana, and Texas. In Ontario, it occurs at seven locations in Middlesex and Elgin Counties. There is also a historical record from Galt (1902) and a recently extirpated site at Amherstburg. It is rare and declining in most of its range. Threats include altered drainage that interferes with periodic flooding; spread of invasive species, such as Common Buckthorn (Rhamnus cathartica) and Reed Canary Grass (Phalaris arundinacea); and habitat succession. False Hop Sedge is classified as Endangered in Ontario due to its declining numbers and small range.
**Information Sources**

1. Literature Cited


2. Community and Aboriginal Traditional Knowledge Sources

No community or Aboriginal traditional knowledge received through submissions to COSSARO.

3. Acknowledgements

No information obtained through personal communications or review of the evaluation.
## APPENDIX 1

### NORTHEASTERN NORTH AMERICA STATUS RANK AND DECLINE

<table>
<thead>
<tr>
<th>Subnational Rank</th>
<th>Sources</th>
<th>Decline</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>S4</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>S2</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>IL</td>
<td>S3</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>S2</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>IA</td>
<td>SH</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td>Not present</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>KY</td>
<td>S4</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>MA</td>
<td>S1</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>MB</td>
<td>Not present</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>S2</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>ME</td>
<td>SNR</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td>S2</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>MN</td>
<td>SNR</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>NB</td>
<td>Not present</td>
<td>NatureServe 2011</td>
<td></td>
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<tr>
<td>NF</td>
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<td>NH</td>
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<tr>
<td>NJ</td>
<td>S1</td>
<td>NatureServe 2011</td>
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<tr>
<td>NS</td>
<td>Not present</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>NY</td>
<td>S2</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
<tr>
<td>OH</td>
<td>S2</td>
<td>NatureServe 2011</td>
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<tr>
<td>ON</td>
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<tr>
<td>PA</td>
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<td>VT</td>
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<td>WI</td>
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</tr>
<tr>
<td>WV</td>
<td>S2</td>
<td>NatureServe 2011</td>
<td></td>
</tr>
</tbody>
</table>

Occurs as a native species in 20 of 29 northeastern jurisdictions. Srank or equivalent information available for 18 of 20 jurisdictions = 90% S1, S2, SH, or SX in 15 of 18 = 83%