

Note

An update to the distribution of the Endangered False Hop Sedge (*Carex lupuliformis* Sartwell ex Dewey; Cyperaceae) in Ontario

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Abstract

We provide an update to the Ontario distribution of False Hop Sedge (*Carex lupuliformis*), prompted by the first documented report of the species in the Niagara region, which represents a noteworthy eastern range extension in the province.

Key words: False Hop Sedge; *Carex lupuliformis*; *Lupulinae*; Cyperaceae; Niagara Region; Ontario; endangered species; range extension

False Hop Sedge (*Carex lupuliformis* Sartwell ex Dewey), which occurs in Canada in the southernmost portions of Ontario and Quebec, is federally listed as Endangered (SARA Registry 2019). In Quebec, False Hop Sedge is provincially listed as Threatened, with 14 extant populations as of 2010 (Environment Canada 2014). The species is also listed as Endangered in Ontario (OMNRF 2017) and was described as one of the province's rarest sedges in the Atlas of the Rare Vascular Plants of Ontario (Argus *et al.* 1982–1987). In the most recent edition of Rare Vascular Plants of Ontario (Oldham and Brinker 2009), False Hop Sedge was listed with a subnational rank (SRank) of S1, Critically Imperilled, which remains its current provincial rank. In the last decade, this species has been recorded in two new counties in southwestern Ontario (Lambton and Niagara), extending its known range in the province to six counties, including extant and extirpated populations. Neither of these new locations was mapped in the most recent Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status report (COSEWIC 2011: Figure 7). The Niagara location, reported here, is a significant eastward range extension.

Of the genus *Carex*, the section *Lupulinae* comprises six species and is endemic to central and east-

ern North America (Reznicek and Ball 1974). This section is characterized by the largest perigynia of all *Carex* species, as well as inflated perigynia with three stigmas and trigonous (three-sided) achenes (Jones and Hatch 1990). In Ontario, section *Lupulinae* is represented by four species: Gray's Sedge (*Carex grayi* J. Carey), False Hop Sedge, Hop Sedge (*Carex lupulina* Muhlenberg ex Willdenow), and Bladder Sedge (*Carex intumescens* Rudge). Hop Sedge may be challenging to differentiate from False Hop Sedge; however, significant differences in the shape of the achene make this distinction possible, as does the overall larger size of False Hop Sedge. In Ontario, mature achenes are present from early July to late October (Leslie 2018).

The achenes of Hop Sedge are rhomboid, often longer than wide and trigonous with faces flat to slightly concave, enclosed in inflated perigynia and ascending on the culm (Ball and Reznicek 2003). In contrast, the achenes of False Hop Sedge are rhombic, often as long as wide and trigonous with faces strongly concave and angles thickened with prominent nipple-like knobs (Figure 1); they are enclosed in inflated perigynia and held ascending to spreading on the culm (Ball and Reznicek 2003).

The habitat of False Hop Sedge has generally been

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FIGURE 1. Mature False Hop Sedge (*Carex lupuliformis*) achene, from plant material collected in Niagara Region. Photo: Jessica Consiglio.

described as wet forests, where it prefers canopy openings, as well as riverine wetlands, marshes, and wet thickets on calcareous soil (Thompson and Paris 2004). Ontario sites are typically treed swamps with extensive vernal pooling, characterized by Red Maple (*Acer rubrum* L.), Silver Maple (*Acer saccharinum* L.), or Green Ash (*Fraxinus pennsylvanica* Marshall) growing on clay loam (OMNRF 2017). In Québec, False Hop Sedge is predominantly found growing in canopy openings of Silver Maple swamps (Environment Canada 2014; Langlois and Pellerin 2016). Further south, common associates at sites in Connecticut and Massachusetts include Red Maple, Black Gum (*Nyssa sylvatica* Marshall), Green Ash, Swamp White Oak (*Quercus bicolor* Willdenow), and Pin Oak (*Quercus palustris* Münchhausen) in areas with extensive vernal pooling (Thompson and Paris 2004).

False Hop Sedge was first discovered in Ontario by W. Herriot who collected a specimen in 1902 from Waterloo region, although this population has not been seen again despite several attempts to relocate it (Oldham *et al.* 1993). As reported by Oldham and Crins (1988), A.A. Reznicek, M.J.O., and W. Botham rediscovered the species in Ontario in 1985 at a site near Amherstburg, Essex County, where ~15 plants were growing with Eastern Buttonbush (*Cephalanthus occidentalis* L.) and Hop Sedge in a wet willow floodplain woods. Oldham *et al.* (1993) reported a new population discovered in 1992 growing in a small depres-

sion at the edge of a deciduous woods in the City of London, Middlesex County, and two additional new sites in Aldborough Township, Elgin County, discovered in 1993. At all three sites, False Hop Sedge was observed growing in the open or at the edges of treed areas that held water in the spring (Oldham *et al.* 1993). The following year, another population was discovered in Middlesex County, near Mount Brydges, by Ron Vanderjeugd (Natural Heritage Information Centre [NHIC] files).

Over a decade later, a new population was documented several kilometres west of West Lorne, Elgin County, by staff from various agencies conducting targeted searches for the species in 2005 (NHIC files). Several years later, Ministry of Natural Resources (MNR) staff documented the species in Ailsa Craig, Middlesex County, growing in a Silver Maple swamp with associated species, such as Blue Beech (*Carpinus caroliniana* Walter), poison ivy (*Toxicodendron* Miller spp.), Wild Geranium (*Geranium maculatum* L.), jewelweed (*Impatiens* L. spp.), and Fowl Manna Grass (*Glyceria striata* Lamarck; NHIC files). In 2009, a new population was discovered by Charles Cecile in London, consisting of a few plants growing in an open, moist Silver Maple woodland located between two small wetlands (NHIC files). In addition, MNR staff observed a new False Hop Sedge population in 2011 in Southwold Township, Elgin County, growing in a treed swamp. In 2015, Brian Miller discovered two new False Hop Sedge populations: one growing in woods north of Dresden, Lambton County, which was the first record of this species in the county, and a third new population found in a wooded swamp in London (NHIC files).

The newest recorded Ontario population of False Hop Sedge was discovered in early September 2019 by J.A.C. during a field trip with the Field Botanists of Ontario (Figure 2), led by Albert Garofalo and Nate Torenvliet in Niagara Falls. Approximately 50 clumps were found growing at the edge of extensive vernal pools; associated species included Red Maple, hickory (*Carya* Nuttall spp.), Black Gum, Pin Oak, and Highbush Blueberry (*Vaccinium corymbosum* L.). Three additional patches, containing similar numbers of clumps, were subsequently found by Andrew Dean, Nadia Cavallin, and Lisa Riederer during the course of the field trip within a few kilometres of the first patch. These represent the first recorded populations of False Hop Sedge in the Niagara region and a significant eastward range extension for the species in Ontario, as it is ~200 km from the nearest presumed extant population.

With a recent increase in the known range of the species in Ontario, it is worth discussing what may have led to False Hop Sedge being historically over-

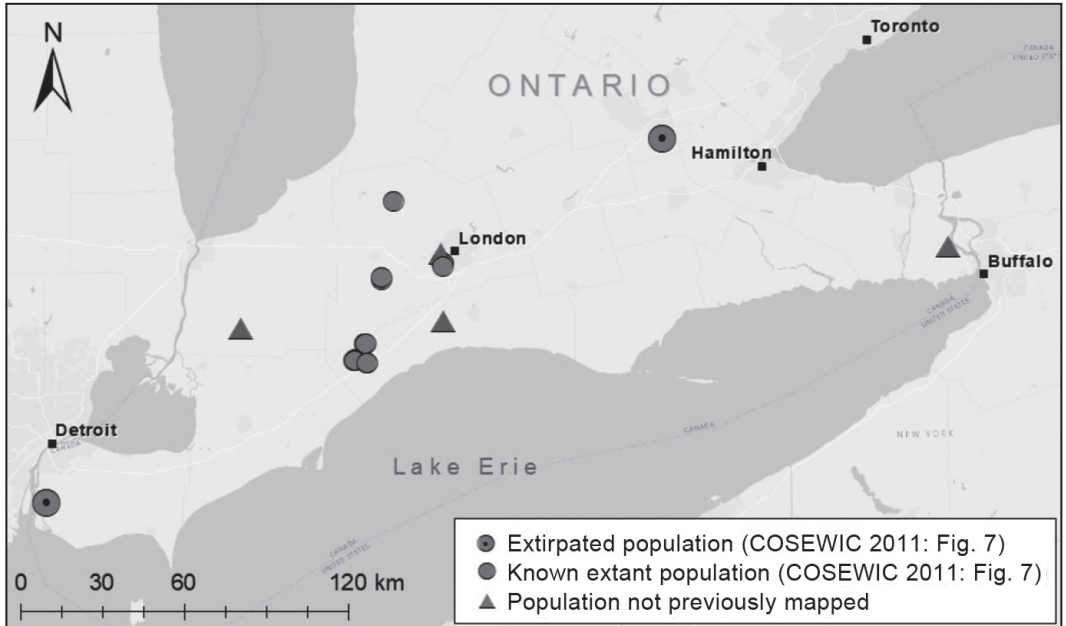


FIGURE 2. Range map of all known Ontario False Hop Sedge (*Carex lupuliformis*) populations (extirpated and known populations; COSEWIC 2011: Figure 7). On the far right is the newly discovered population in Niagara. Map: Jessica Consiglio. Basemap sources: Esri, HERE, Garmin, © OpenStreetMap contributors and the GIS user community.

looked. For instance, the visually similar Hop Sedge has been reported growing together with False Hop Sedge at most Ontario sites, which could make detection more challenging if botanists are not aware of the subtle differences mentioned above. However, it is not simply a lack of awareness of the species, as a search of major Ontario herbaria by A.A. Reznicek (1973) during his M.Sc. thesis research on the taxonomy of *Carex* series *Lupulinae* in Canada, did not reveal any misidentified material of False Hop Sedge filed with other members of the section (Oldham *et al.* 1993). This is the case outside Ontario as well, with many North American herbarium records suggesting that False Hop Sedge has never been common or abundant, and populations throughout its range generally consist of ~15 individuals (NatureServe 2019).

Despite possible challenges to detection, or perhaps because of them, field botanists in Ontario and Quebec should remain on the lookout for this rare species, especially from July to October when the mature achenes allow for identification.

Voucher specimens

In accordance with guidance given under the *Endangered Species Act, 2007* (ESA) the specimen was donated to the Ontario NHIC herbarium.

CANADA, ONTARIO: Lambton County, near Dresden, 10–20 small plants in low depression in woods, 2 September 2015, *M.J. Oldham and B. Miller* 43139

(MICH, NHIC 12029).

CANADA, ONTARIO: Niagara Region, Niagara Falls. Black Gum–Red Maple deciduous swamp, associated with *Acer rubrum*, *Nyssa sylvatica*, *Quercus palustris*, *Vaccinium corymbosum*. 7 September 2019, *J.A. Consiglio* (NHIC 09600).

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