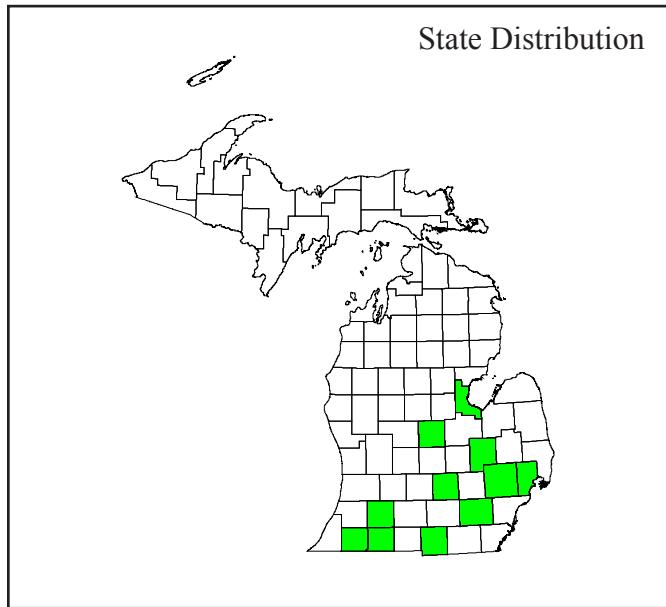




Photo by Robert H. Read WI-DNR



Status: Threatened.

Global and state rank: G4/S2

Other common names: hop-like sedge, sedge

Family: Cyperaceae (sedge family)

Synonyms: *C. lupulina* Willd. var. *polystachia* Schweinitz & Torrey; *C. lurida* Wahl. var. *polystachia* (Schweinitz & Torrey) Bailey (Reznicek and Ball 1974).

Taxonomy: *C. lupuliformis* is placed within section *Lupulinae*, a distinctive group in *Carex* characterized by having the largest perigynia in the entire genus; mature achenes are necessary for the identification of *C. lupuliformis* and some other species within the section (Flora of North American 2002, Reznicek and Ball 1974)).

Range: False hop sedge is rare throughout the majority of its wide distribution in North America, ranging from Ontario to Quebec in the north and south to Florida, and occurring west to Oklahoma and Texas. It is considered rare in Arkansas, Connecticut, Delaware, Illinois, Indiana, Maryland, Massachusetts, New Jersey, New York, North Carolina Ohio, Ontario, Pennsylvania, Quebec, Tennessee, Texas, Vermont, Virginia, West

Virginia, and Wisconsin, and is known only from historical records in Iowa (NatureServe 2010).

State distribution: Known only from 12 stations, only three of which are considered to be extant, false hop sedge is restricted to southern Lower Michigan, ranging to Bay County in the Thumb area east to Macomb County, and extending into Cass County in southwestern Michigan. The extant localities for this species include sites in Bay, Hillsdale, and Washtenaw counties.

Recognition: False hop sedge is a coarse, densely tufted perennial arising from a thick, dark, scaly rootstalk and ranging from about 0.5 to just over 1 m in height. The 4-7 leaves, which are smooth and strongly v-shaped when young, have **persistent brownish to reddish basal sheaths**. One or more fertile culms (stems) may be produced with several, large ovoid-cylindric pistillate spikes terminated by a single staminate spikelet. The pistillate spikes are typically clumped and crowded toward the terminus of the culm (these are known as distal spikes) but often some remote (or proximal) spikes are produced below. The pistillate spikes have large, strongly beaked, ascending to spreading perigynia that range from ca. 12 to nearly 20 mm in length containing stalked, diamond-shaped achenes that have **concave faces, strongly knobbed angles, and are as wide or nearly as wide as long**.



The achene is the key character for distinguishing *C. lupuliformis* from the very similar *C. lupulina*, with which it may be commonly associated and often confused. The achenes of *C. lupulina*, in contrast, are distinctly longer than wide, have smooth angles that are not knobbed or pointed, and faces that are flat to slightly concave. In *C. lupuliformis* the angles are hardened into nipple-like points that can be palpated by compressing a perigynium between one's fingers (doing so, as described by one sedge specialist, R. Naczi, "hurts", versus palpating the unknobbed, narrower achenes of *C. lupulina* that do not cause a sharp pinch). Botanists who are experienced with *C. lupuliformis* in the field also note that after repeated observations it can be distinguished from *C. lupulina* by its stockier form and narrower leaves, as well as the narrower spikelets and more spreading perigynia, the latter character illustrated in the photo above.

Best survey time/phenology: Most of the Michigan collections of this species have been made from mid-July through late August, with the majority collected in July; however, the collection of this species in its northernmost state site in Bay County was obtained in mid-October. The latter collection was identifiable but in a somewhat degraded condition, and thus the estimated optimal survey period for this species is somewhat conservatively estimated to be from mid-July to early October. This is consistent with the flowering and fruiting phenology noted throughout the range of the species (NatureServe 2010)

FQI Coefficient and Wetland Category: 10, FACW+

Habitat: The few Michigan records supply little habitat information, noting that *C. lupuliformis* was collected from marshes, swamps, wet woods, shallow depressions in oak woods, swales, low wet ground, and vernal ponds in floodplains and other wooded wetlands. The relatively recent collection from Bay County indicated the population was found in a forested wetland within a headwater area for a county drain, where this species was associated with *Populus deltoides* (Eastern cottonwood), *Acer saccharinum* (silver maple), *Quercus bicolor* (swamp white oak), *Scirpus cyperinus* (woolly-grass), *Impatiens capensis* (jewelweed), and *Penthorum sedoides* (ditch stonecrop). The Hillsdale County colony also was found in a forested wetland, occurring in a densely shaded woods dominated by *Acer rubrum* (red maple). Reznicek and Ball (1974) note that *C.*

lupuliformis is more aquatic than the other species of sect. *Lupulinae*, tending to grow in open marshes and along shores, and occasionally in shallow water. They further note that when this species occurs in forests, those tend to consist of wet floodplain types. In the Chicago region, this species is known to be locally frequent in savanna depressions and morainic swamps, where it is associated with such species as *Asclepias incarnata* (swamp milkweed), *Bidens cernuus* (nodding bur-marigold), *Eupatorium maculatum* (Joe-pye-weed), *Glyceria striata* (fowl manna grass), *Lobelia siphilitica* (great blue lobelia), *Ranunculus sceleratus* (cursed crowfoot), and *Sagittaria* spp. (arrowhead) (Swink and Wilhelm 1994). Over the range of the species, false hop sedge inhabits wet forests, openings along around forest ponds, riverine wetlands, marshes, and wet thickets (Flora of North America 2002). In his notes on selected species of *Carex* in Ohio, Cusick (1996) makes the specific observation that *C. lupuliformis* occurs in swamp woods in wetter and more shaded conditions than *C. lupulina*.

Biology: Very little is known about the life history and ecology of *C. lupuliformis*. It is considered to be a long-lived, clonal perennial (NatureServe 2010). Field observations by collectors and other botanists (based on casual estimates of the discrete number of clumps observed in occurrences) indicate that population size is often small, averaging approximately 15 plants per locality, although it is known that in some portions of the range populations may be considerably larger (NatureServe 2010). Reznicek and Ball (1974) describe a Dipteron (fly) parasite that infects the achenes of species within sect. *Lupulinae* during its larval and pupal stages. The parasite distorts the achenes in a variety of ways, causing them to become longer and more oval and whitish in color, and in severe infections it may cause the perigynia to become straw colored, abnormally spread (e.g. retrorse), sterile, or filled with distorted achenes.

Conservation/management: The paucity of information on the majority of Michigan localities indicates that status surveys are a priority need for this species, as well as *de novo* inventories to identify new localities. Much more detailed population and habitat data are required in order to understand how to optimally manage for false hop sedge, and monitoring of the state's extant populations would greatly assist in management and stewardship activities. At present



this species is perhaps best conserved by protecting hydrological regime and the other natural processes that perpetuate and maintain its wetland habitats, and preventing or reducing threats such as pollution, erosion, agricultural and storm drain run-off, and other adverse impacts to riparian systems and wetlands. Excessive timber removal may be a direct threat in some sites, although the mechanical removal of vegetation through brush control and mowing has also been implemented to maintain or enhance populations in sites with questionable natural area habitat quality (NatureServe 2010).

Comments: Cusick (1996) notes a large number of misidentifications of *C. lupulina* in Ohio as *C. lupuliformis*, a problem encountered frequently elsewhere. Proper identification of false hop sedge depends on examining mature fruiting plants as well as understanding the key identification features as discussed above. For clear descriptions and definitive illustrations of the above taxa, the reader is referred to the Flora of North America volume on Cyperaceae (Flora of North American 2002).

Research needs: Virtually any study related to the natural history and ecology of this species would assist in conservation and management. Beyond the priority need for status surveys (including more specific population mapping) and acquiring more detailed habitat information, studies that investigate population structure and genetic diversity may assist land managers in identifying priority conservation sites.

Related abstracts: Floodplain forest, Blanding's turtle, box turtle, cerulean warbler, red-shouldered hawk, smallmouth salamander, yellow-throated warbler, American beak grass, cup-plant, pumpkin ash, purple turtlehead, red mulberry, snow trillium, Virginia bluebells, Virginia water-horehound.

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