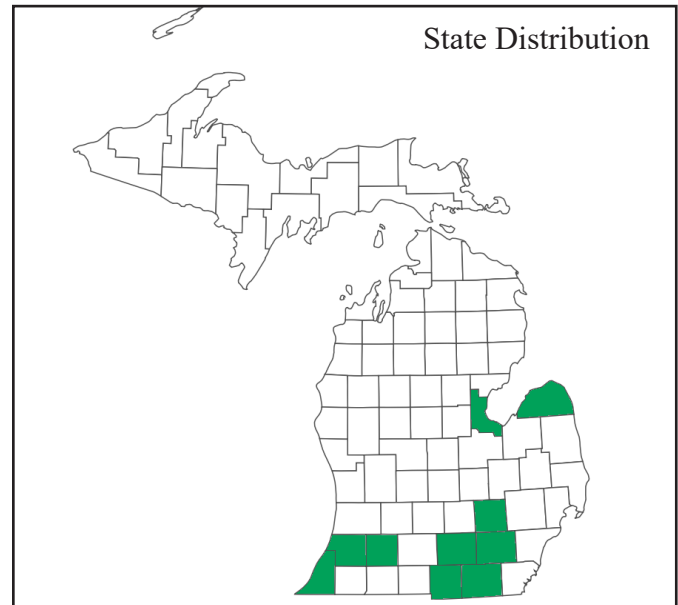
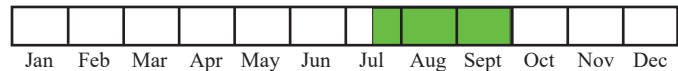




Photograph by A. A. Reznicek, courtesy of Michigan Flora



Best Survey Period



Legal status: State Threatened

Global and state rank: G2G3 (Globally Imperiled to Vulnerable) / SNR (Not Ranked)

Other common name(s): green star sedge

Family: Cyperaceae (sedge family)

Taxonomy: The genus *Carex* is divided into sections which comprise natural groups of species that generally resemble each other. *Carex viridistellata* is a recently recognized species in section *Ceratocystis* (Crins and Ball 1988, Derieg et al. 2008). Four Michigan *Carex* species are in section *Ceratocystis*: *C. cryptolepis*, *C. lava*, *C. viridula*, and *C. viridistellata*. *Carex viridistellata* had been previously classified as *C. cryptolepis*. It is one of three North American endemics in this section, the others being *Carex lutea* known from North Carolina, South Carolina, and northern Florida, USA, and *C. cryptolepis* known from the Great Lakes basin to the northeastern USA. *Carex viridistellata* was discovered in 2008 by chance while researching genetic diversity in two section *Ceratocystis* endemic species: *C. lutea* and *C. cryptolepis* (Derieg et al. 2013). Molecular

analyses were conducted in what was thought to be *C. cryptolepis* samples that revealed an exclusive species. Multiple genetic tests produced consistent evidence that *Carex viridistellata* is its own species. Besides the unique genetic markers, its distinction lies in morphological differences in reproductive parts, its highly specific habitat, and its limited geographical extent (Derieg et al. 2013).

Total Range: *Carex viridistellata* is a North American endemic species restricted to states of Indiana, Michigan, and Ohio in the USA. Within those states, *Carex viridistellata* thus far seems limited to prairie fen or lakeplain prairie communities. Prairie fen communities are specific to glaciated lands of the Midwest that run from mid-Minnesota in a southeast line across Wisconsin, Indiana, Michigan, and Ohio (NatureServe Explorer n.d.).

State Distribution: *Carex viridistellata* occurs in the southern Great Lakes region and has been found in the following counties south of the climatic tension line: Bay, Berrien, Hillsdale, Huron, Jackson, Kalamazoo, Lenawee, Livingston, Van Buren, and Washtenaw (Consortium of Midwest Herbaria 2026). The occurrences are mostly concentrated in



the southern tier of counties in the lower peninsula, with the Saginaw Bay occurrences representing the most northerly of its known North American range. There are 19 documented populations to date in Michigan: 6 in Washtenaw County and 1-3 populations each in the other counties listed. For older herbarium specimens, the location information on the herbarium label can be vague or misleading, thus, researchers have been unable to relocate a few populations that there is evidence of from an herbarium specimen. The populations from which these specimens were collected may have been destroyed or may be inaccessible or indeterminable. Michigan populations of *C. viridistellata* have yet to be evaluated and ranked for their viability and persistence.

Recognition: *Carex viridistellata* is a **robust, clumping sedge** with green, triangular, mostly glabrous fertile culms (though heavily scabrous on tips, margins and veins) ranging up to 68 cm (27 in) tall. The leaves of the fertile culm are basal and often have one cauline leaf. These leaves are 1.5–3.8 mm (0.06–0.15 in) wide and similar in length to the culm. Vegetative culms have mostly 7–14 leaves, widest leaves are 3–5 mm (1.2-2 in) wide, up to 60 cm (24 in) tall, and similar in color and texture to the fertile culm leaves.

The inflorescence contains both staminate and pistillate spikes. Staminate spikes are terminal, are usually solitary, and are frequently subtended by a scale-like bract. The **pistillate spikes occur as short-to-round cylinders** with 40–96 inflated perigynia on each spike, horizontally spreading, and **reflexed at the bottom of the spike**. The pistillate spikes are sessile or close and subtended by leaf-like bracts. Sometimes 5–10 staminate flowers are present at the tips. The **larger pistillate spikes are 10.5–14 mm (4.1-5.5 in) wide**.

The perigynia are 3-styled, yellow or greenish, and glabrous with 9–13 nerves. They are 4.5–6.7 mm (0.17-0.26 in) long and 0.8–2.1 mm (0.03-0.08 in) wide. The **perigynia beaks are 2.2–2.8 mm (0.08-0.11 in) long**, green, two-toothed with at least some

with **very sparsely serrulate** (i.e., finely toothed) **margins**. The **pistillate scales have one central green nerve with wide white or transparent margins and are obscured by the perigynia thus effectively invisible**. The achenes are three-sided, 1.2–1.6 mm (0.04-0.06 in) long and 1.0–1.3 mm (0.03-0.05 in) wide at the widest point. **Achene color changes from light brown to dark brown when mature**.

The taxa most closely resembling *Carex viridistellata* include the other Michigan members of the section *Ceratocystis*: *Carex viridula* is a considerably smaller plant with smaller perigynia and a shorter beak making it distinguishable based on size alone; *Carex flava* have perigynia comparable in size to *Carex viridistellata* but can be differentiated by the brown or coppery-reddish margins on mature pistillate scales that are stark against the perigynia; *Carex cryptolepis* is the species it is most easily confused with. The pistillate spikes of *C. cryptolepis* are up to 2 mm smaller in width, and the perigynia beaks are always completely smooth versus the occasionally serrate (sometimes sparsely) beak edges of *Carex viridistellata*.

The Carolina endemic *C. lutea* is a sister species but can be distinguished by geography alone (Le Blond et al. 1994). *Carex lutea* has similarly sparsely scabrous perigynia beaks, but the beaks are shorter, and the plant itself is typically larger than *C. viridistellata*.

Best survey time/phenology: *Carex viridistellata* flowers in the spring and is most easily identified in mid-to-late July through September, when the fruits and other features have matured. The measurements of mature perigynia and the characteristics of the perigynia beaks are used to distinguish from other species in the section, as well as the color of the pistillate scales which solidify by July.

Habitat: Across its range, *Carex viridistellata* is found in wetlands, with open sun, and at some sites is locally abundant (Deirig et al, 2013). *Carex viridistellata* is mostly restricted to high-quality prairie fens but can be found rarely in wet-mesic



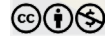
to wet lakeplain prairies in Saginaw Bay, Michigan, USA. Collections in Michigan have been in wet, marly and sandy openings, open sedge meadow and calcareous seeps within fen complexes (Consortium of Midwest Herbaria 2026, MNFI 2026, A. A. Reznicek, *personal communication*).

Associated species from Michigan collections include *Arnoglossum plantagineum* (prairie Indian-plantain), *Carex aquatilis* (water sedge), *C. lasiocarpa* (wiregrass sedge), *C. sterilis* (dioecious sedge), *C. stricta* (tussock sedge), *Cephalanthus occidentalis* (buttonbush), *Cladium mariscoides* (twig-rush), *Cornus* spp. (dogwood), *Dasiphora fruticosa* (shrubby cinquefoil), *Eleocharis rostellata* (spike-rush), *Eupatorium perfoliatum* (boneset), *Eutrochium maculatum* (Joe-pye weed), *Liatris spicata* (marsh blazing-star), *Populus tremuloides* (quaking aspen), *Schoenoplectus* spp. (bulrush), *Solidago ohioensis* (Ohio goldenrod), *Thelypteris palustris* (marsh fern), *Toxicodendron vernix* (poison sumac), and *Typha latifolia* (broad-leaved cat-tail).

Biology: Limited information exists on the biology and natural history of *Carex viridistellata*. It is perennial, though it is unknown how long-lived. Most species of the section *Ceratocystis* form cespitose clumps which is an important factor in genetic diversity and variation among populations (Deireg et al, 2008). Research has shown that cespitose sedges typically produce high amounts of viable seed (Leck and Schütz 2005, Kettenring and Galatowitsch 2007), though no studies have been conducted on *C. viridistellata*.

Among the 3 North American endemics in section *Ceratocystis*, *C. viridistellata* (and *C. cryptolepis*) populations show low genetic diversity in comparison to the high levels in *C. lutea* (Derieg et al, 2008). These findings are important because it shows that levels of genetic diversity are not necessarily relational to the geographical extent of a taxa.

In *Carex* section *Ceratocystis* hybridization is common (Kukkonen and Toivonen 1988, Cayou-



Photograph by Rachel A Hackett, Michigan Natural Features Inventory

Figure 2. At least some perigynium beaks have sparsely serrulate (i.e., toothed) margins.

ette and Catling 1992, Weil 2007). Hybrids of *C. cryptolepis* × *C. viridistellata* and *C. viridula* × *C. viridistellata* have been documented in Michigan. Fertile hybrids, plants that can mediate gene exchange between otherwise well-defined species (i.e., introgression), are known to occur which have important connotations in understanding evolutionary relationships, but hybrids between *C. viridistellata* and *C. cryptolepis* show no evidence of introgression (Deireg et al, 2013).

Conservation/management: *Carex viridistellata* faces threats of habitat destruction, degradation, invasive species, woody encroachment, fire suppression, and hydrological alterations (Cohen et al., 2025). There are no known current conservation efforts in place specifically for *Carex viridistellata*, although many of the Michigan populations occur on land that is protected and fire-managed by various state-level nature organizations (A.A. Reznicek, *personal communication*). Periodic monitoring of populations and identifying new potential sites of occurrences throughout the prairie fen range are merited to better understand its distribution and abundance (MDNR *in press*).

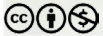
The survival of *Carex viridistellata* depends on



Michigan Natural Features Inventory

Phone: (517) 284-6200 Email: mnfi@msu.edu

Website: mnfi.anr.msu.edu



Photograph by [Avery Allert](#), iNaturalist

Figure 3. Unlike *Carex flava*, the pistillate scales of *C. viridistellata* have one central green nerve with white or transparent, not copper-colored, margins and are overshadowed by the perigynia.

the persistence and health of both prairie fen and lakeplain prairie communities in Michigan. Prairie fens are ranked vulnerable (moderate risk of extinction) at the State and Global level. The lakeplain wet prairies and lakeplain wet-mesic prairies in Saginaw Bay are critically imperiled (very high risk of extinction) at the State level and imperiled (high risk of extinction) at the Global level. These communities face threats of habitat destruction from development, fire suppression, and hydrological alteration (Cohen et al. 2025). The groundwater source of prairie fens can be miles from the fen itself (Sam-path et al. 2015, 2016). Destruction or degradation of the groundwater recharge area may take decades or more to show its effects in the fen, by then it is often too late to rectify.

Research needs: More research on various aspects of this species could help in understanding its conservation needs. Understanding what factors are limiting its distribution including and beyond habitat conditions can aid understanding how to protect the species.

Life history studies of *Carex viridistellata* including growth form and rates, and stages of development in relation to habitat and climate could inform suitable habitat to conduct surveys and the effects of climate change on the species. Research into its seed bank and seed viability, and how it maintains population growth and spreads can also help guide conservation needs. Research into the hydrological workings and threats of prairie fen wetlands, especially relative to alterations in groundwater recharge areas miles away, will help predict habitat persistence. Status surveys and viability assessments should be conducted periodically to monitor the conditions of populations, particularly where populations are at a greater risk of extirpation due to small population size, poor habitat or nearby development or disturbances. Surveying other similar suitable habitats in Michigan and across its range is advisable to better understand *C. viridistella*'s distribution, extent, and habitat needs.

Population studies that detail the genetic diversity of *Carex viridistellata* in relation to the other endemic sedges of section *Ceratocystis* can reveal important factors besides geographical restrictions that can then aid conservation of these rare endemics. Having three endemic species in the same section with a spectrum of range restrictions creates an opportunity to better resolve some of the complex evolutionary picture of the section as well as add to the understanding of endemism in general.

Related abstracts: Prairie fen, lakeplain wet prairie, lakeplain wet-mesic prairie, emergent marsh, southern wet meadow, wet prairie, wet-mesic prairie, rich tamarack swamp, *Arnoglossum plantagineum*, *Cypripedium candidum* (white lady's-slipper), *Filipendula rubra* (queen-of-the-prairie), *Muhlenbergia richardsonis* (mat muhly), *Polemonium reptans* (Jacob's ladder, state threatened), *Sporobolus heterolepis* (prairie dropseed, state special concern), *Valeriana edulis* var. *ciliata* (edible valerian), *Acris crepitans blanchardi* (Blanchard's cricket frog), *Calephelis muticum* (swamp met-almark), *Clonophis kirtlandii* (Kirtland's snake), *Flexamia huroni* (Huron River leafhopper), *Oar-*



isma poweshiek (Poweshiek skipper), *Papaipema beeriana* (blazing star borer), *Sistrurus c. catenatus* (eastern massasauga), *Neonympha m. mitchellii* (Mitchell's satyr).

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Figure 4. The larger pistillate spikes range from 10.5 to 14 mm wide, while several other species in Section *Ceratocystis* have smaller pistillate spikes.



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Abstract citation:

Klain, A.K., and R. A. Hackett. 2026. Species Abstract for *Carex viridistellata* (Greenstar sedge). Michigan Natural Features Inventory, Lansing, Michigan, USA.

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Funding for this project was through the Michigan Department of Natural Resources' State Wildlife Grant T-9-T in cooperation with the U.S. Fish and Wildlife Service, Office of Conservation Investment.

