Carex conoidea

Field Sedge

Cyperaceae



Carex conoidea by Katy Chayka, 2015

Carex conoidea Rare Plant Profile

New Jersey Department of Environmental Protection State Parks, Forests & Historic Sites Forests & Natural Lands Office of Natural Lands Management New Jersey Natural Heritage Program

> 501 E. State St. PO Box 420 Trenton, NJ 08625-0420

Prepared by: Jill S. Dodds jsdodds@biostarassociates.com

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For: New Jersey Department of Environmental Protection Office of Natural Lands Management New Jersey Natural Heritage Program natlands@dep.nj.gov

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Life History

Carex conoidea (Field Sedge) is one of the seven species in *Carex* section *Griseae* that occur in New Jersey. Characteristics of sedges in that section include brown or red-purple coloration at the base of the culms, narrow leaves with smooth blades, staminate terminal spikes and pistillate or mixed lateral spikes, rough-awned pistillate scales, perigynia with numerous impressed veins, three stigmas, and trigonous achenes with deciduous styles. *Carex conoidea* is more likely to be found in open places than other members of the group. The sedge can also be distinguished from other species in section *Griseae* by a combination of characteristics that includes brown culm bases, smooth leaf sheaths, leaves lacking a waxy coating, scaberulous (rough) peduncles on the lateral spikes of the inflorescence, and pistillate scale awns often longer than a millimeter (Roalson et al. 2021, Naczi and Bryson 2023).



Left: Britton and Brown 1913, courtesy USDA NRCS 2025a. Right: Katy Chayka, 2015.

Carex conoidea is a perennial sedge that grows in dense tufts or clumps. The culms are dark brown to yellow-brown at the base and may reach up to 75 cm in height. The leaves are generally shorter than the culms and less than 4 mm wide. The staminate terminal spikes are on peduncles that can be 3–71 (or more) mm long. There are 2–5 rough-peduncled pistillate spikes bearing 18–37 perigynia apiece. The pistillate scales are usually awn-tipped and the awns frequently exceed 1 mm in length. The perigynia are strongly marked with 17–25 veins. When fresh they are yellowish, inflated, and ellipsoid but they tend to darken and taper at the ends as they dry. The achenes have three concave sides, and they are 1.8–2.6 mm long by 1.2–1.4 mm wide. (See Britton and Brown 1913, Fernald 1950, Gleason and Cronquist 1991, McKenzie et al. 2003, Arsenault et al. 2013, Munro et al. 2014, Naczi and Bryson 2023).

Carex conoidea may exhibit some variability in growth form. Howe (1881) made note of a New York population in which the peduncles were unusually short so that the bracts of the inflorescence surpassed the culms. *C. conoidea* plants are usually smaller in all respects when growing at higher latitudes or in habitats where water levels fluctuate wildly (Naczi and Bryson 2023). The sedge begins flowering in early May and the fruits usually mature during May and June, although some ripe fruit can still be present during July and August (Stone 1911, Arsene 1927, Hermann 1951, Hough 1983, Weakley et al. 2024).

Pollinator Dynamics

Most sedges are pollinated by wind although there are a few notable exceptions in scattered genera, including *Carex* (Goetghebeur 1998, Yano et al. 2015). Some typical adaptations to wind pollination in the family include large anthers, long filaments, and prominent stigmas (Zomlefer 1994).

In nearly all sedges, the female flowers develop before the male flowers (protogyny) and the lowest flowers on a spike are the first to mature (Goetghebeur 1998). Both strategies are generally viewed as means of promoting cross-pollination. However, experimentation to test that assumption showed that protogyny was not a particularly effective way of guaranteeing outcrossing in *Carex*, and the species in the study displayed a high degree of self-compatibility (Friedman and Barrett 2009). The authors concluded that protogyny gives wind-pollinated *Carex* species an opportunity to cross-fertilize while self-pollination assures reproductive success.

Seed Dispersal

The fruit of a *Carex* plant is an achene that forms in a sac-like perigynium in which it is eventually dispersed. Some, and indeed many, *Carex* seeds are likely to be dispersed by gravity. Because *C. conoidea* grows in more open sites local dispersal can be aided by wind (Nathan et al. 2008), but distribution over long distances is likely to be facilitated by animals. The fruits of various *Carex* species are consumed by an assortment of birds and mammals (Fassett 1957) and seed viability has been documented in a number of sedges that were dispersed by birds or hoofed mammals, including White-tailed Deer (*Odocoileus virginianus*) (Myers et al. 2004, Leck and Schütz 2005).

No information was found regarding the seed longevity or germination requirements of *Carex conoidea*. The majority of sedges are persistent in the seed bank, and in other species of *Carex* larger seed size has been associated with longer dormancy and more successful germination (Leck and Schütz 2005). However, *Carex conoidea* seeds were not detected during some seed bank investigations in places where the sedge was present in the vegetation (Kirt 2007, Burley et al. 2008), even though *C. conoidea* was noted to be the most abundant sedge at the site of the

former study. The propagules of most *Carex* species require a period of stratification at either low or high temperatures (Żukowski et al. 2010) as well as sufficient light (Leck and Schütz 2005) in order to germinate. *Carex* seeds typically sprout underground, producing their first leaf 4–5 days after germination (Alexeev 1988). It is not clear whether *C. conoidea* is mycorrhizal, although one other *Carex* species in section Griseae which was examined by Miller et al. (1999) was not.

<u>Habitat</u>

Carex conoidea can be found in a variety of moist or wet habitats at elevations ranging from 10– 1,400 meters above sea level (Naczi and Bryson 2023). The species favors open conditions and it grows best in full sun (Weakley et al. 2024). *C. conoidea* habitats have been described as damp meadows or fields; bogs, fens, swales, or prairies; the margins of seeps, springs, or seasonal ponds; and the shores of freshwater lakes and rivers (Bicknell 1917, Stone 1911, Arsene 1927, Hermann 1941, Thorne 1956, Crum 1972, Tucker 1972, Dalton et al. 1983, Hough 1983, Nekola 1990, Weakley and Schafale 1994, Freeman 1998, MacDougall et al. 1998, McKenzie 2002, Hyatt 2004, Rhoads and Block 2007, Arsenault et al. 2013, Poindexter 2013, Munro et al. 2014). Field Sedge has occasionally been reported in swamps (e.g. Knowlton 1915, Ferguson 1928) although the latter author noted that it was very rare in those habitats.

In West Virginia *Carex conoidea* is restricted to marl wetlands (Hutton 1975, Drohan et al. 2006, Bartgis and Lang 1984) but that is not the case throughout its range. Tucker (1972) observed that *C. conoidea* could grow in wet habitats regardless of the soil composition. Substrates may consist of bare sand, acidic gravel, or rich loamy soil and the underlying bedrock can be igneous or sedimentary (Betz and Lamp 1989, Nekola 1990, Freeman 1998, Terry 2005, Angelo and Boufford 2007, Naczi and Bryson 2023, Weakley et al. 2024).

The plant communities where *Carex conoidea* is found are frequently dominated by a mixture of grasses and/or other sedges (Bicknell 1917, Burnham 1919, Arsene 1927, McKenna 2004, Angelo and Boufford 2007, Gross et al. 2009, NJNHP 2024). The species often co-occurs with other carices, including *C. bicknellii, C. brevior, C. buxbaumii, C. cristatella, C. meadii, C. pallescens, C. sartwellii, C. stricta*, or *C. tetanica* (Freeman 1998, McKenzie 2002, Smith 2009, Naczi and Bryson 2023).

Carex conoidea has been documented in many habitats that were created by previous or repeated disturbances. Examples include roadside ditches, old cemeteries, railroad right-of-ways, and former agricultural fields or pastures (Lakela 1944, Betz and Lamp 1989, Standley 2003, McKenna 2004, Kirt 2007, Molano-Flores et al. 2015). Burley et al. (2008) found an occurrence that had evidently regenerated or established in a Nova Scotia forest after the site was severely damaged by a hurricane. *C. conoidea* was also reported at an Indiana site that had been exposed to periodic fires (Bacone et al. 1998), and McKenzie (2002) observed that the vigorous growth and flowering of an unusually large population in Missouri may have been stimulated by a prescribed burn.

Wetland Indicator Status

The U. S. Army Corps of Engineers divided the country into a number of regions for use with the National Wetlands Plant List and portions of New Jersey fall into three different regions (Figure 1). *Carex conoidea* has more than one wetland indicator status within the state. In the Eastern Mountains and Piedmont region, *C. conoidea* is a facultative upland species, meaning that it usually occurs in nonwetlands but may occur in wetlands. In other parts of the state it is a facultative wetland species, meaning that it usually occurs in wetlands (U. S. Army Corps of Engineers 2020).



Figure 1. Mainland U. S. wetland regions, adapted from U. S. Army Corps of Engineers (2020).

USDA Plants Code (USDA, NRCS 2025b)

CACO14

Coefficient of Conservancy (Walz et al. 2020)

CoC = 7. Criteria for a value of 6 to 8: Native with a narrow range of ecological tolerances and typically associated with a stable community (Faber-Langendoen 2018).

Distribution and Range

The native range of *Carex conoidea* includes much of the eastern and central United States and Canada. Some sources note that it was probably introduced in the western states where it has been recorded (Naczi and Bryson 2023, POWO 2025). Although the range of *C. conoidea* is fairly extensive, Naczi and Bryson observed that the sedge is uncommon in most of the places where it occurs. The map in Figure 2 depicts the distribution of the species in North America.



Figure 2. Distribution of C. conoidea in North America, adapted from BONAP (Kartesz 2015).



Figure 3. County records of C. conoidea in New Jersey and vicinity (USDA NRCS 2025b).

The USDA PLANTS Database (2025b) shows records of *Carex conoidea* in eleven New Jersey counties: Bergen, Essex, Gloucester, Hunterdon, Mercer, Morris, Passaic, Somerset, Sussex, Union, and Warren (Figure 3 above). There may be an additional record from Cape May County (Mid-Atlantic Herbaria 2025). The data include historic observations and do not reflect the current distribution of the species.

Conservation Status

Carex conoidea is considered globally secure. The G5 rank means the species has a very low risk of extinction or collapse due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats (NatureServe 2025). The map below (Figure 4) illustrates the conservation status of Field Sedge throughout its range. *C. conoidea* is vulnerable (moderate risk of extinction) in two states and two provinces, imperiled (high risk of extinction) in two states and one province, and critically imperiled (very high risk of extinction) in ten states and one province. In other districts where it occurs the sedge is secure, apparently secure, or unranked.



Figure 4. Conservation status of C. conoidea in North America (NatureServe 2025).

New Jersey is one of the states where *Carex conoidea* is critically imperiled (NJNHP 2024). The S1 rank generally signifies five or fewer occurrences in the state. A species with an S1 rank is typically either restricted to specialized habitats, geographically limited to a small area of the state, or significantly reduced in number from its previous status. *C. conoidea* has also been assigned a regional status code of HL, signifying that the species is eligible for protection under the jurisdiction of the Highlands Preservation Area (NJNHP 2010).

New Jersey's earliest records of *Carex conoidea* were from Morris and Warren counties (Willis 1877). During the late 1800s numerous collections were made around the state and the sedge was considered fairly common in northern New Jersey although rare to the south (Britton 1889, Keller and Brown 1905, Stone 1911, Taylor 1915). By the mid-1900s there were current records from several northwestern counties but all other observations were more than 50 years old (Hough 1983). However, only six occurrences are tracked by the Natural Heritage Program and all of those were first documented in or after 1990. *C. conoidea* was previously listed as an S2 (imperiled) species but its state rank was downgraded to critically imperiled within the past decade (NJNHP 2016, 2024).

Threats

Throughout its range, *Carex conoidea* has experienced local declines due to development, habitat losses resulting from succession, and occasional threats from flooding or from the trampling of plants in sites that are utilized as pastures (MacDougall et al. 1998, Standley 2003). Some of the sedge's habitats in New Jersey have experienced detrimental impacts from filling, dumping, and off-road vehicles. The spread of invasive species—including *Elaeagnus umbellata*, *Rosa multiflora*, and *Lythrum salicaria*—have also been identified as concerns for some *C. conoidea* populations in the state (NJNHP 2024).

Carex conoidea is susceptible to a rust fungus (*Puccinia grossulariae*) that uses *Ribes* species as an alternate host (Jackson 1920). Fungal diseases often reduce reproductive capacity or increase mortality, particularly when infections are intense or plant vigor has been depleted by other factors (Kranz 1990). Avasthi et al. (2023) noted that *Puccinia* is an especially destructive genus and many species can cause severe losses in the host plants.

<u>Climate Change Vulnerability</u>

Information from the references cited in this profile was used to evaluate the vulnerability of New Jersey's *Carex conoidea* populations to climate change. The sedge was assigned a rank from NatureServe's Climate Change Vulnerability Index using the associated tool (Version 3.02) to estimate its exposure, sensitivity, and adaptive capacity to changing climactic conditions in accordance with the guidelines described by Young et al. (2016) and the state climactic computations by Ring et al. (2013). Based on available data *C. conoidea* was assessed as Less Vulnerable, meaning that climate change is not expected to have a notable detrimental impact on its extent in New Jersey by 2050. However, the potential effects on the species may have been underestimated due to gaps in knowledge.

Shifting climactic conditions in New Jersey are resulting in higher temperatures, more frequent and intense precipitation events, and increasing periods of drought (Hill et al. 2020). It is not clear how much the climate plays a role in the distribution of *Carex conoidea*. As Figure 4 indicates, the sedge is at risk all along its southern border, but that might either be attributable to its natural scarcity or signify a response to rising temperatures. The extent of drought tolerance in *C. conoidea* has not been studied. Threats from *Puccinia grossulariae* could either increase or

be reduced as the climate continues to change: Studies of other *Puccinia* species have revealed variable responses but to date most of the research has focused on the pathogens that have the greatest impacts on crop production (Gautam et al. 2013, Helfer 2014, Raza and Bebber 2022). The risk to New Jersey's *C. conoidea* populations from invasive flora is likely to escalate because introduced plants are expected to become an even greater threat to native communities in the northeast as a result of climate change (Bellard et al. 2013, Salva and Bradley 2023).

Management Summary and Recommendations

An updated status evaluation of *Carex conoidea* is needed in New Jersey. While there appear to be numerous old records of the species from the northern part of the state only six occurrences in three counties are currently tracked. Two of those have never been formally assessed and two others have not been monitored since the 1990s (NJNHP 2024). Site visits are recommended to ascertain the current condition of those occurrences and their habitats and to determine whether active management is required.

There is anecdotal evidence that fire may be an appropriate tool for maintaining the open plant communities that are utilized by *Carex conoidea* (Bacone et al. 1988, McKenzie 2002, McKenzie et al. 2003). However, research is needed to determine the frequency, intensity, and timing of burns that are beneficial to the sedge. Studies of how *C. conoidea* responds to changes in moisture regime or other climate-driven conditions could also be helpful in planning for the long-term conservation of the species.

Synonyms

The accepted botanical name of the species is *Carex conoidea* Schkuhr ex Willd. Orthographic variants, synonyms, and common names are listed below (ITIS 2025, POWO 2025, USDA NRCS 2025b).

Botanical Synonyms

Carex conoidea f. katahdinensis (Fernald) B. Boivin Carex katahdinensis Fernald Carex granularioides Schwein. Carex illinoensis Dewey

Common Names

Field Sedge Open-field Sedge Ancient Prairie Sedge Silvery Sedge Prairie Gray Sedge

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