

# *Carex haydenii* Dewey

Cloud Sedge

Cyperaceae



© Arthur Haines, Native Plant Trust

## *Carex haydenii* Rare Plant Profile

New Jersey Department of Environmental Protection  
Division of Parks and Forestry  
New Jersey Forest Service  
Office of Natural Lands Management  
New Jersey Natural Heritage Program

501 East State Street  
P.O. Box 420  
Trenton, NJ 08625-0420

Prepared by:  
Megan R. King  
Meganryanking@gmail.com

June 5, 2019

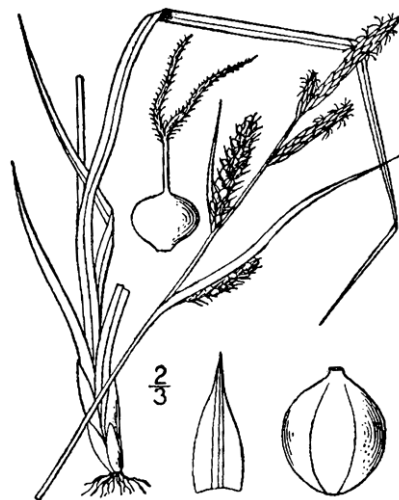
This report should be cited as follows: King, Megan. 2019. *Carex haydenii* Rare Plant Profile. New Jersey Department of Environmental Protection, Division of Parks and Forestry, New Jersey Forest Service, Office of Natural Lands Management, New Jersey Natural Heritage Program, Trenton, NJ. 11 pp.

## **Introduction**

*Carex haydenii*, cloud sedge, is commonly found in open wetland habitats with seasonally flooded or saturated soils, where land use changes have led to its population decline. The species is commonly confused with *C. stricta*, but can be properly identified by looking for an obovoid perigynia and short stolons (Cusick, 1983). One can also distinguish the two similar-looking sedges by leaf sheath characteristics when inflorescences are not present. In *Carex stricta* the lower sheaths are red-brown, scabrous, ladder-fibrillose and upper sheath fronts are scabrous, hyaline, tawny or red brown, ladder-fibrillose; whereas *Carex haydenii* lower sheaths are red-brown, glabrous and upper sheath fronts hyaline, red-brown dotted (Standley, 2011).

## **Life History**

*C. haydenii* can be distinguished from other species of the Cyperaceae family by its glanulus obovoid perigynia, and short stolons. Intraspecific variation occurs in *C. haydenii*, whether it is seen in its vegetative or floral characteristics (Standley, 1989). Unlike similar species of *Carex*, the scales of its pistillate spikelets are longer than its perigynia. The perigynia has been found to vary in shape, presence of nerves and red-brown spots (Standley, 1989). This large tufted grass-like perennial has brown-red to green spikelets, red to brown at its base with strap-like leaves and 3-6mm in width. When occurring in wet environments it is more likely to form dense tussocks, whereas in drier environments it will be rhizomatous (Standley, 1989, Natureserve, 2018). Flower spikes present themselves on stems in May (Missouri Botanical Garden, 2019), while fruiting occurs from June through August (Cusick, 1983, Standley, 2019). The pistillate (female) flowers and fruits can be seen in 3-5 clusters, with the staminate (male) flowers occurring on spikes (1-3) further up the plant, and female flowers on the lower parts (Standley, 2019 and Natureserve, 2018). Fertilization occurs through cross-pollination, with flower blooms lasting up to two weeks. The identification window for this species is short especially when occurring with *C. stricta* so identification should be done during times when the perigynia is present.



©Public Domain, Wikipedia Commons

### **Pollinator Dynamics**

*Carex haydenii* is cross-pollinated by wind (Hilty, 2019). No other information found during literature review.

### **Seed Dispersal**

The pistillate spikes produce anywhere from 50-150 fruits (Missouri Botanical Garden, 2019). Achenes are flattened and enclosed in the perigynia, which can be about 2mm long and 1.5 mm across (Hilty, 2019). There has yet to be conclusive information on many *Carex sp.* involving their dispersal. However, the two main methods of dispersal of

most *Carex sp.* are by water and animal, whether through consumption or adhering to their fur (Leck and Schütz, 2005).

### **Habitat**

*Carex haydenii* occurs in sunny to partially shaded wetland habitats, such as wet sand prairies, sedge meadows, grassy bogs or fens, sandy floodplains of rivers, edge of sandy marshes and ditches, and calcareous sinkhole pondshores. While *C. haydenii* frequently occurs on the edges rather than the center of wetlands, it can be an indicator of higher quality wetlands. In its eastern range, *C. haydenii* may be found occurring along riverbanks (Standley, 1989). It has been seen occurring in the same areas as *C. stricta*, but slightly upslope (Standley, 2019). In “Notes on Some Recently Rediscovered New Jersey Plant Species,” Snyder mentions two recorded occurrences of *C. haydenii*, one which was found to be growing in a very wet sedge meadow in full sunlight occurring with two other rare *Carex sp.* The other occurrence was found growing in semi-shade on the shore of a limestone sinkhole pond (Snyder, 1989).

### **Associated communities and species**

In New Jersey, *Carex haydenii* occurs in sedge meadow and calcareous sinkhole pondshore communities such as the *Boltonia asteroides* var. *asteroides* – *Aster racemosus* – *Mentha arvensis* community (Walz et al., 2001). In New York, *C. haydenii* has been found in the following communities listed below (New York Natural Heritage Program [hereafter “NYNHP”], 2019).

- Dwarf shrub bog
- Inland non-calcareous lakeshore
- Inland poor fen
- Patterned peatland
- Red maple-hardwood swamp
- Sedge meadow
- Shallow emergent marsh

The following associated species can be found occurring with *C. haydenii*:

*Boltonia montana* (formerly *Boltonia asteroides* var. *asteroides*), *Carex bebbii*, *Carex cryptolepis*, *Carex retrorsa*, *Carex typhina*, *Carex viridula*, *Eleocharis quadrangulata* and *Eragrostis frankii* (Walz et al., 2001). Other associated species identified by the New Jersey Natural Heritage Program (2019) [hereafter “NJNHP”] include *Carex stricta*, *Scirpus cypernius*, *Dulichium arundinaceum*, *Thelypteris palustris*, *Carex bromoides*, *Symplocarpus foetidus*, *Thalictrum pubescens*, *Osmundastrum cinnamomum*, *Ilex verticillata*.

In New York, the following associates were identified: *Betula glandulosa*, *Carex magellanica* ssp. *irrigua*, *Carex oligosperma*, *Carex stricta*, *Kalmia angustifolia*, and *Spiraea alba* (NYNHP, 2019). In the midwest, Standley (1989) identified the following associates: *Poaceae spp.*, *Phleum sp.*, *Bromus sp.*, and *Anemone canadensis*.

### **Mycorrhizal interactions**

After examining 13 plants of *Carex stricta*, in a study by Miller, et al. (1999), “Mycorrhizal status of the genus *Carex*”, no mycorrhizal interaction was found to occur.

*C. stricta* was used to represent the *Phacosystis* taxonomic group of sedges that includes *C. haydenii*. The study discovered that species that exhibited bulbous root hairs were not found to exhibit mycorrhizal interactions (Miller, 1999). While there is no conclusive data on whether *C. haydenii* has bulbous-based root hairs, it can be assumed that it, too, does not exhibit a mycorrhizal interaction.

**Wetland Indicator Status**

OBL (Obligate Wetland) – Almost always occurring in a wetland (USDA, 2019)

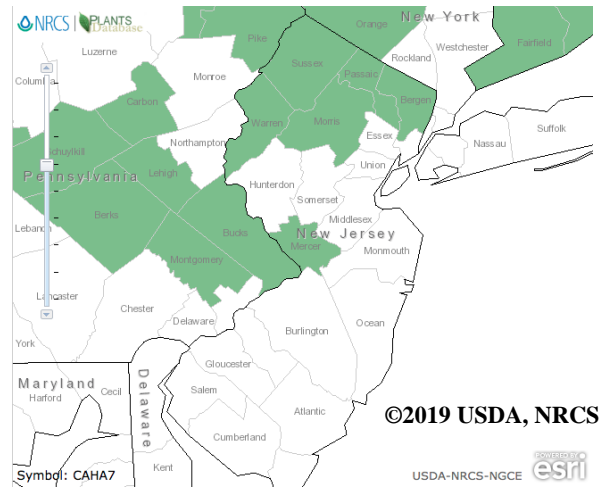
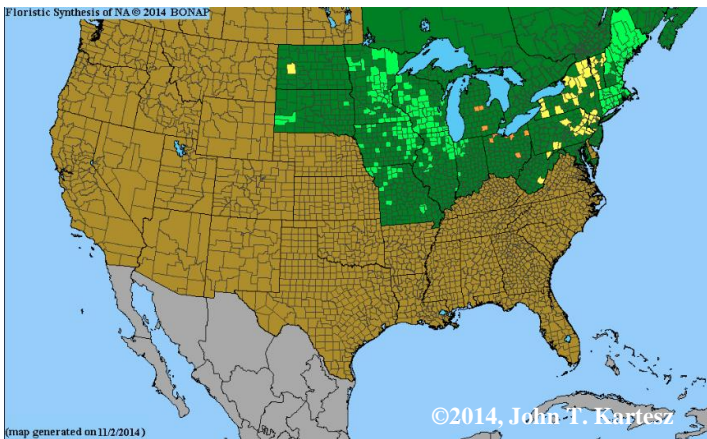
**USDA Plants Code**

CAHA7 (USDA, NRCS, n.d.)

**Coefficient of Conservatism**

CoC = 9 (Walz et al., 2018); Native with a narrow range of ecological tolerances, high fidelity to particular habitat conditions, and sensitive to anthropogenic disturbance.

**Distribution and Range**

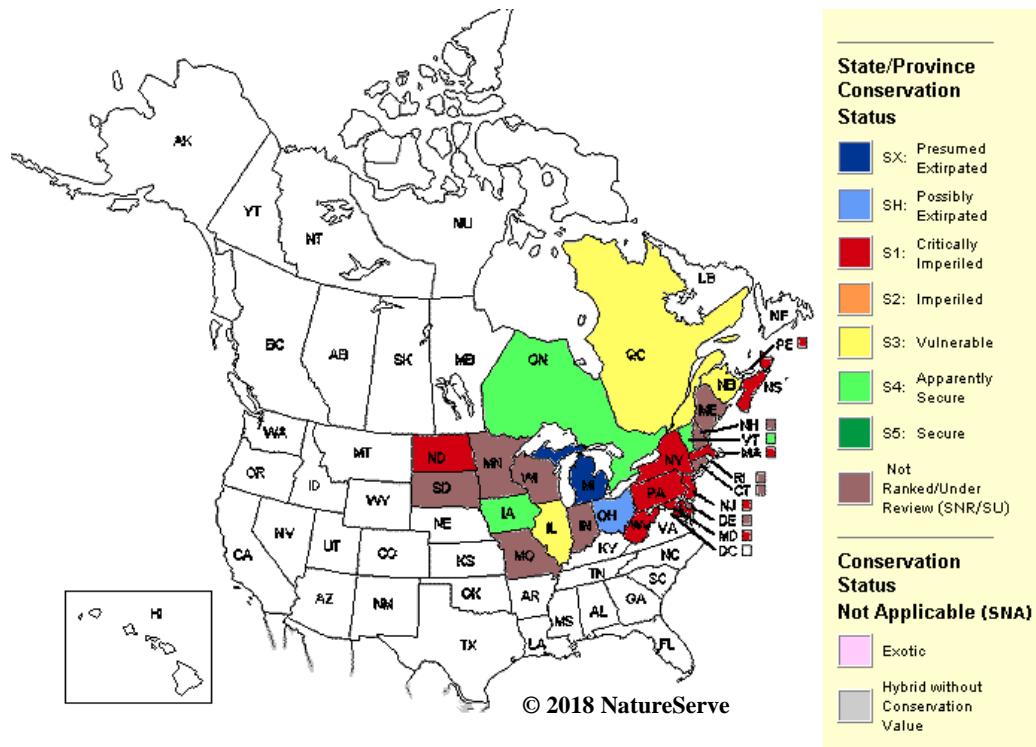


For the Kartesz map (Kartesz, 2015):

**County Color Key:** ■ Native, not rare ■ Native, rare ■ Native, adventive ■ Extirpated ■ Extinct ■ Exotic  
■ Noxious weed ■ Eradicated ■ Waif ■ Questionable presence

The range of the species with their respective rankings in the United States is as follows, Connecticut (SNR), Delaware (SNR), Illinois (S3S4), Indiana (SNR), Iowa (S4), Maine (SNR), Maryland (S1), Massachusetts (S1S2), Michigan (SX), Minnesota (SNR), Missouri (SNR), New Hampshire (SNR), New Jersey (S1), New York (S1S2), North Dakota (S1), Ohio (SH), Pennsylvania (S1S2), Rhode Island (SNR), South Dakota (SNR), Vermont (S4), West Virginia (S1), Wisconsin (SNR).





**Conservation Status**

**Global Rank: G5** (USDA, 2019)

(Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.)

**State Rank: S1** (Natureserve, 2018)

Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements ranked S1 are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements, which were formerly more abundant but because of habitat destruction or some other critical biological factor, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered (NJDEP, 2010a).

**State Status: Endangered (E)** (NJDEP, 2010b)

Endangered species - an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors - a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow (NJDEP, 2010a).

## **Regional Status Codes for Plants and Ecological Communities**

### **LP** (NJDEP, 2010b)

Indicates taxa listed by the Pinelands Commission LP as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the NJNHP. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan (NJDEP, 2010a).

### **HL** (NJDEP, 2010b)

Indicates taxa or ecological communities protected by the Highlands Water Protection and Planning Act within the jurisdiction of the Highlands Preservation Area (NJDEP, 2010a).

### **Threats**

*Carex haydenii* can be significantly impacted by succession, since it will be quickly overgrown and shaded by woody species (Cusick, 1983). Woody succession was also noted by surveys conducted by Jack & Janet Holt as a threat to a known New Jersey occurrence (NJNHP, 2019). In other population occurrences in New Jersey, invasive grasses, *Phragmites australis*, *Microstegium vimineum* and the native aggressive grass *Phalaris arundinacea* have been documented as threats (NJNHP, 2019). Populations surveyed in New York have been noted to need monitoring of invasive species before *C. haydenii* is outcompeted (NYNHP, 2019). Introduction of light through an open canopy can cause *C. haydenii* to be outcompeted by invasive species, while soil disturbance can also be a threat to the seed-bank that is crucial to many *Carex sp.* for recovery (Galatowitsh, 1998).

### **Management Summary & Recommendations**

After the research conducted by Galatowitsh (1998), it was suggested that this species be considered for future studies, especially those concerned with wet meadow seed-banks. NYNHP recommended that prior collections of *C. haydenii* should be re-identified for accuracy because of the confusion with *C. haydenii* and *C. stricta*. Data collected for historical populations should then be surveyed to see if the plants are still extant.

### **Recorded Occurrences for New Jersey**

Historic occurrences are present in the herbarium collection from the Chrysler Herbarium at Rutgers University.

### **Recognized Experts**

The following may be contacted for further information regarding *Carex haydenii* as well as other species in the Cyperaceae Family:

Robert Naczi, New York Botanical Garden

Anton Reznicek, University of Michigan



### **Botanical Synonyms**

*Carex acuta* L. var. *erecta* Dewey  
*Carex rousseaui* Raymond  
*Carex stricta* Lamarck var. *decora* L. H. Bailey  
*Carex stricta* var. *haydenii* (Dewey) Kükenthal

### **Other Common Names:**

Hayden's Sedge  
Long-scaled tussock sedge

### **Family:**

Cyperaceae

### **References**

Cusick, A.W. 1983. *Carex haydenii* Dewey. Division of Natural Areas and Preserves Ohio Department of Natural Resources.

Galatowitsch, S.M. & Biederman, L.A. 1998. Vegetation and seedbank composition of temporarily flooded *Carex* meadows and implications for restoration. *International Journal of Ecology and Environmental Sciences*, 24, 253–270.

Go Botany *Carex haydenii*. (n.d.). Received on February 28, 2019, <https://gobotany.newenglandwild.org/species/carex/haydenii/>

Hilty, J. (n.d.). Hayden's Sedge. Retrieved March 1, 2019, from [http://www.illinoiswildflowers.info/grasses/plants/hayden\\_sedge.html](http://www.illinoiswildflowers.info/grasses/plants/hayden_sedge.html)

Kartesz, J.T., The Biota of North America Program (BONAP). 2015. Taxonomic Data Center. (<http://www.bonap.net/tdc>). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2015. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)]

Leck, M.A. & W. Schütz. 2005. Regeneration of Cyperaceae, with particular reference to seed ecology and seed banks. *Perspectives in Plant Ecology, Evolution and Systematics* 7: 95-133.

Miller, R. M., C. I. Smith, J.D. Jastrow, and J.D. Bever. 1999. Mycorrhizal status of the genus *Carex* (Cyperaceae). *Am. J. Bot.*, 86: 547-553. doi:10.2307/2656816

Missouri Botanical Garden (n.d.). *Carex haydenii*. Retrieved March 1, 2019, from <http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=279776&isprofile=0&>

NatureServe. *Carex haydenii*, 2018. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Accessed March 2, 2019 from:

[http://explorer.natureserve.org/servlet/NatureServe?sourceTemplate=tabular\\_report.wmt&loadTemplate=species\\_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular\\_report.wmt&elKey=130368&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=130368&offPageSelectedElType=species&offPageYesNo=true&post\\_processes=&radiobutton=radiobutton&selectedIndexes=130368](http://explorer.natureserve.org/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=130368&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=130368&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=130368).

New Jersey Department of Environmental Protection. 2010a. *Explanation of Codes Use in Natural Heritage Reports*. Trenton, New Jersey. Retrieved from [https://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes\\_2010.pdf](https://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2010.pdf)

New Jersey Department of Environmental Protection. 2010b. *List of Endangered Plant Species of Plant Species of Concern*. Trenton, New Jersey. Retrieved from <https://www.state.nj.us/dep/parksandforests/natural/heritage/jan2010plantlist.pdf>

New Jersey Department of Environmental Protection. 2013. N.J.A.C. 7:5C Endangered Plant Species Program Rules. *N.J.A.C. 7:5C-3.1 Plant species of concern*. (pp. 4) Trenton, New Jersey. Retrieved from [https://www.nj.gov/dep/rules/rules/njac7\\_5c.pdf](https://www.nj.gov/dep/rules/rules/njac7_5c.pdf)

New Jersey Natural Heritage Program. 2019. Biotics5 Database. NatureServe. Trenton, New Jersey.

New York Natural Heritage Program. 2019. Online Conservation Guide for *Carex haydenii*. Available from: <https://guides.nynhp.org/cloud-sedge/>. Accessed March 4, 2019.

Snyder, D. 1989. Notes on Some Recently Rediscovered New Jersey Plant Species. *Bartonia*, (55), 40-46. Retrieved from <http://www.jstor.org/stable/41609980>

Standley, L.A., J. Cayouette, & L. Bruederle. (n.d.). *Carex haydenii*. Retrieved March 18, 2019 from [http://beta.floranorthamerica.org/wiki/Carex\\_haydenii](http://beta.floranorthamerica.org/wiki/Carex_haydenii).

Standley, L. 1989. Taxonomic revision of the *Carex stricta* (Cyperaceae) complex in eastern North America. *Canadian Journal of Botany*, 67(1), 1–14. <https://doi.org/10.1139/b89-001>

Standley, L. A. 2011. *Field Guide to the Carex of New England*. [PDF]. Special Publication of the New England Botanical Club. Retrieved from <http://www.rhodora.org/specialpublications/pdf/Standley-Field-Guide-Carex-of-New-England.pdf>

Walz, K. S., R. J. Canace, J. Boyle, R. Witte, M. S. Serfes, W. Honachefsky, J. Kurtz, and R. Dutko. 2001. Identification and protection of reference wetland natural communities in New Jersey: Calcareous sinkhole ponds of the Kittatinny Valley. New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of Natural Lands Management, Natural Heritage Program, Trenton. 276 pp. plus appendices.

Walz, K.S., L. Kelly, K. Anderson and J.L. Hafstad. 2018. Floristic Quality Assessment Index for Vascular Plants of New Jersey: Coefficient of Conservancy (CoC) Values for Species and Genera. New Jersey Department of Environmental Protection, New Jersey Forest Service, Office of Natural Lands Management, Trenton, NJ, 08625. Submitted to United States Environmental Protection Agency, Region 2, for State Wetlands Protection Development Grant, Section 104(B)(3); CFDA No. 66.461, CD97225809. Retrieved from <https://universalfqa.org/>

USDA, NRCS. (n.d.). The PLANTS Database. Retrieved March 4, 2019, from <https://plants.usda.gov/core/profile?symbol=CAHA7>

USDA, NRCS. 2019. The PLANTS Database (<http://plants.usda.gov>, 4 June 2019). National Plant Data Team, Greensboro, NC 27401-4901 USA.