

Carex leptonevia

Fine-nerve Sedge

Cyperaceae



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***Carex leptonevia* 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

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Introduction

Carex leptonevia, a perennial sedge that occurs in dense culms, with a single terminal staminate spike. Its most distinctive characteristic is that its perigynia has two prominent ribs.

Life History

Carex leptonevia is known to grow in densely tufted culms. Its stems are scabrous, and its basal leaves, 0.5-1 cm wide, have brown sheaths (Minnesota Wildflowers, 2019). The leaves and sheaths are not fibrous, with the largest leaves up to 10 mm wide. Its terminal staminate spike is .7 to 1.6 cm long, usually hidden by the sessile or short peduncled pistillate spikes that are 1-2 cm long. The pistillate spikes of *C. leptonevia* occur in twos or fours, rarely five. The lower pistillate spikes are pedunculate and never basal. For each individual pistillate spike, 5-14 perigynia are present. The hairless perigynia has an abrupt beak that is curved, divided at the tip into two teeth, and has two prominent ribs that are yellow-green to brown when mature (Native Plant Trust: Go Botany, 2019; Minnesota Wildflowers, 2019).

Flowering occurs between late May to July (Obee, 1994). At higher elevations, peak flowering can occur 1-2 months later than those occurring at lower elevations.

It is similar to *C. laxiflora* and requires close examination of the inflorescence under a microscope to differentiate the species. By looking at the obtuse angled perigynia, it is almost completely nerveless and the key to distinguishing *C. leptonevia* (Obee, 1994). According to Minnesota Wildflowers, while both *C. ormostachya* and *C. blanda* are similar to *C. leptonevia*, *C. blanda*, which has a larger perigynia and leaves longer than its stem and *C. ormostachya* is known to have red-purple basal sheaths. Both *C. ormostachya* and *C. blanda* have more veins present than *C. leptonevia* (Minnesota Wildflowers, 2019).



Pollinator Dynamics

No information was found directly linking to the pollination of *Carex leptonevia*, but *C. blanda* (species also from the Laxiflorae group) is known to be cross-pollinated by wind (Bebeau, 2015; Standley, 2011).

Seed Dispersal

The perigynia of *Carex leptonevia* are 2.2-4.5 mm long by 1-1.5 mm wide enclosing an achene that is 1.8-2.8 mm long by 0.8-1.2mm wide (Minnesota Wildflowers, 2019; Standley, 2011, Obee, 1994, Flora of North America, 1993). Considering that the perigynia are not very inflated, it can be assumed that *C. leptonevia* is wind dispersed (Minnesota Wildflowers, 2019; Standley, 2011). However, Polcz's paper states that the main method for dispersal is gravity, as well as infrequent ingestion by deer and birds (Polcz, 2014).

Habitat

Carex leptonevia occurs in mesic rich forests, cedar swamps and bogs. These forests are typically evergreen (hemlock), deciduous or a mix of the two (Obee, 1994). *C. leptonevia* is known to occur in elevations ranging between 0-1800 m, with higher elevations in its southern range (Flora of North America, 1993). Soil conditions include a pH near or above 6.0 and usually circumneutral (Gaddy, 2002).

In New Jersey, this species has occurred on a rocky hemlock slope and rarely on roadsides (Obee, 1994). Two previously known locations were the Delaware Water Gap National Recreation Area and Stokes State Forest (Obee, 1994). According to the many survey reports submitted to New Jersey Department of Environmental Protection, the typical habitat for *Carex leptonevia* is one that contains a mesic slope, mixed woods (possibly late successional), that contain *Tsuga canadensis*. The substrate seems to consist of rock, and the soil contains hummus and is loamy. Dense canopy cover seems to be of preference; this would most likely be the cause of the sparse shrub and groundcover seen at most sites. Considering its mesic preference, it is often seen growing near swamps and creeks (NJ Natural Heritage Program, 2019).

Associated species in New Jersey are *Acer pensylvanicum*, *Acer rubrum*, *Acer saccharum*, *Adiantum pedatum*, *Amphicarpaea bracteata*, *Anemone quinquefolia*, *Aralia nudicaulis*, *Athyrium angustum*, *Betula alleghaniensis*, *Betula lenta*, *Carex appalachia*, *Carex bromoides* spp.bromoides, *Carex digitalis*, *Carex flexuosa*, *Carex laxiflora*, *Carex pensylvanica*, *Carex serosa*, *Dryopteris intermedia*, *Dryopteris marginal*, *Dryopteris spinulosa*, *Eurybia divaricate*, *Fagus grandifolia*, *Hamamelis virginiana*, *Ilex verticillata*, *Kalmia latifolia*, *Lysimachia borealis*, *Maianthemum canadense*, *Medeola virginiana*, *Osmunda cinnamomea*, *Panax trifolius*, *Pyrola elliptica*, *Quercus* sp. *Symplocarpus foetidus*, *Tsuga canadensis*, *Tilia americana*, *Thelypteris hexagonoptera*, *Thelypteris noveboracensis*, *Uvularia sessilifolia*, *Viburnum*

acerifolium, *Vaccinium pallidum*, *Viola blanda* var. *blanda*, and *Viola labradorica* (Obee, 1994; NJ Natural Heritage Program, 2019).

Mychorrhizal Interactions

In a study done by Miller, “Mycorrhizal status of the genus *Carex*”, *C. blanda* was used to represent the Laxiflorae group which *C. leptonevia* is a part of. There were 3 plants infected out of the 9 examined in this study. *C. blanda* showed no presence of bulbous-based root hairs, and was infected with arbuscules, vesicles, and hyphae. Soil conditions consisting of low moisture and high pH are favorable to those species of *Carex* that exhibit mycorrhizal interactions (Miller et al., 1999).

Wetland Indicator Status (USDA, NRCS., 2019)

FACW – Usually occur in wetlands, but may occur in non-wetlands

FAC – Occur in wetlands and non-wetlands

USDA Plants Code (USDA, NRCS., 2019)

CALE11

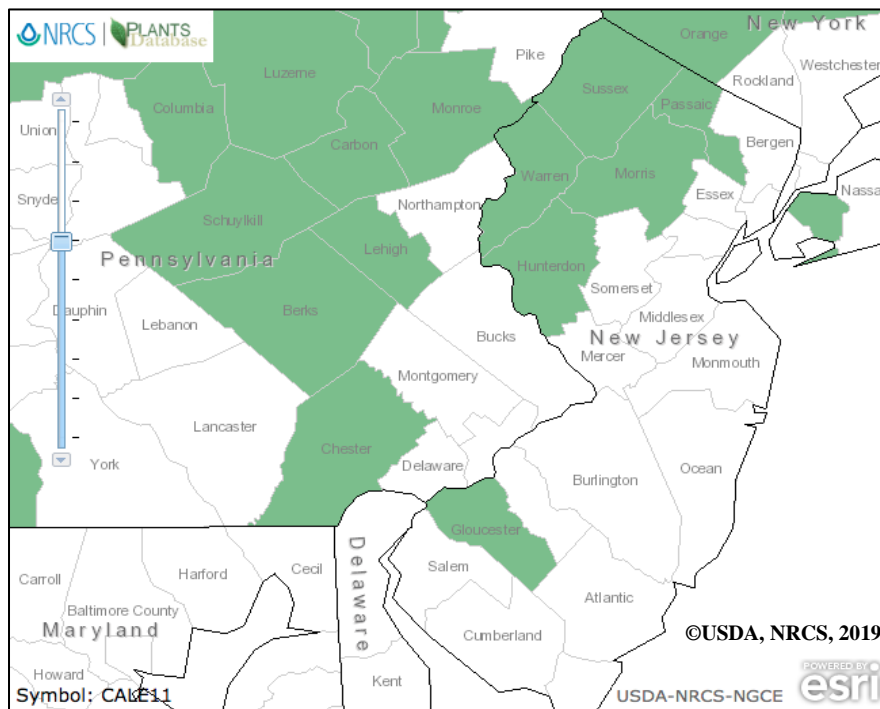
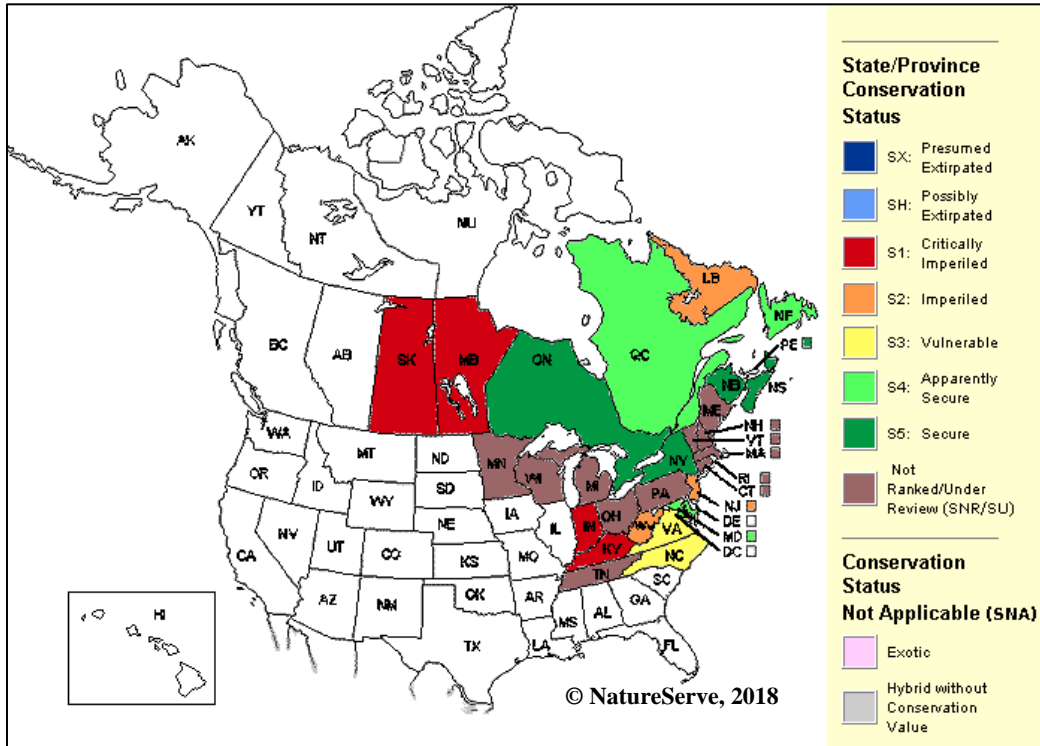
Coefficient of Conservatism (Walz et al., 2018)

CoC = 8; Native with a narrow range of ecological tolerances and typically associated with a stable community.

Distribution and Range

As of 2018, the Office of Natural Lands Management’s Biotics 5 database had a total of nineteen occurrences recorded for the state. Thirteen occurrences are believed to be extant, while the remaining six occurrences were last observed prior to 1985. With the exception of one population, only small numbers of plants have been observed at each of the extant sites. Most of the populations were recorded in Sparta Mountain Wildlife Management Area, Delaware Water Gap National Recreation Area and Stokes State Forest.

The range of the species with their respective rankings in the United States is as follows Connecticut (SNR), Indiana (S1), Kentucky (S1), Maine (SNR), Maryland (S4), Massachusetts (SNR), Michigan (SNR), Minnesota (SNR), New Hampshire (SNR), New Jersey (S2), New York (S5), North Carolina (S3), Ohio (SNR), Pennsylvania (SNR), Rhode Island (SNR), Tennessee (SNR), Vermont (SNR), Virginia (S3), West Virginia (S2), Wisconsin (SNR).



Conservation Status

It is considered to be rare in several states such as New Jersey, West Virginia, North Carolina, Ohio and Indiana, but this could be because most of these states are on the edge of the species' range (Obee, 1994). Please note, additional occurrence information present in herbaria or other sources that are not yet documented in the NJNHP Biotics database may occur. Ongoing digitization efforts by herbaria around the world will lead to an increase in occurrences in the near future.

G Rank: G4

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

S Rank: S2

(Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.)

State Status: E

(Endangered species-an endangered species is one whose prospects for survival within the state is 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.)

Regional Status Codes for Plants and Ecological Communities: LP, HL

LP (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 Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.)

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

Threats

Carex leptonevia is threatened by habitat fragmentation, succession, land-use conversion, forest management and logging (Obee, 1994; Natureserve, 2018). Interestingly enough, outside of its forested habitats, it has been seen thriving in disturbed habitats, such as clear cuttings. In areas of increased sunlight, it has been noticeably more robust (Minnesota Wildflowers, 2019). This directly contradicts the threats seen to *C. leptonevia* populations in New Jersey. While there was no supporting literature linked to this statement, geographical location might be the reason for this observation. In areas where invasive species are less of a threat, an opening in the canopy might be less of a concern. With that being said, while *C. leptonevia* does like roadside and disturbed areas, areas that are infrequently maintained are preferred; frequent mowing threatens it (Obee, 1994). Threats to populations occurring in New Jersey have been noted in survey reports from the New Jersey Department of Environmental Protection. These threats include

logging, heavy road use and improvements to roadways. When occurring in wetland habitats, *Microstegium vimineum* and *Phragmites australis* risk outcompeting *C. leptonevia*, but this was noted to be a moderate threat (NJ Natural Heritage Program, 2019).

Management Summary and Recommendations

Surveying of areas of suitable habitat is needed, while also developing methods for better understanding life history traits (Obee, 1994). It is thought that if populations begin to decline, then controlled disturbance may be necessary, but that natural disturbance regimes should be enough to maintain populations. Disturbances such as fire, wind, and insects are all considered natural disturbance regimes. In order for this to happen, a large area surrounding current populations, as well as potential habitat should be protected and managed at the ecosystem level (Obee, 1994). If reintroduction to extant populations were to become a management plan, this should be prepared for late summer when it wouldn't interfere with seed dispersal (Obee, 1994). While recovery potential has been understudied, it can be presumed that it would recover well due to its response to disturbed areas (Obee, 1994).

Spraying areas that have not yet been sprayed for Woolly Adelgid (*Adelges tsugae*) would help to greatly reduce the deaths of *Tsuga canadensis* that inhabit areas of *Carex leptonevia* populations in New Jersey.

Botanical Synonyms

Carex laxiflora var. *leptonevia* Fern.

Other Common Names

Nerveless Woodland Sedge

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