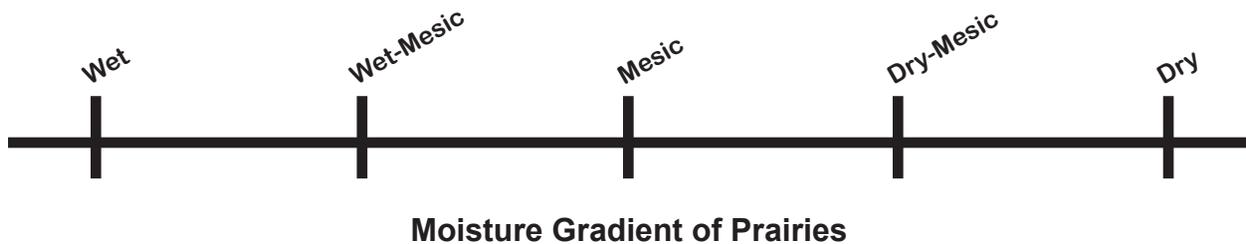


III.C. Wet to Wet-Mesic Prairies

Prairies are open, herbaceous plant communities dominated by native grass and grass-like species; at least half of the vegetative cover is made up of true grasses (Curtis 1971). Prairie communities occur along a moisture gradient as shown below. The wet end of the gradient, wet and wet-mesic prairies, meet the criteria for wetlands. These communities are similar to fresh (wet) meadows, but are dominated by native grasses and forbs associated with prairies such as prairie cord-grass, big bluestem, switchgrass, narrow reedgrass, mat muhly grass, gayfeather, New England aster, culver's root, prairie dock and sawtooth sunflower. Wet to wet-mesic prairie communities predominately occur south of the vegetation tension zone; however, some prairie communities are found in sandy barrens and wet swales north of the tension zone.



Prior to European settlement, vast expanses of prairie existed in southern Wisconsin and western and southern Minnesota. Minnesota alone had approximately 18 million acres of prairie. Prairies evolved with fire and fire is essential to maintenance of prairies. Without periodic burns, prairies become subject to invasion by woody vegetation. In the pre-European settlement landscape, huge wildfires roared across the prairies of Minnesota and Wisconsin. European settlement brought the plow and fire suppression. Once the prairie sod was broken, and the wet prairies were drained, the deep, black soils proved to be among the most productive farmland in the world. More than 99 percent of prairies in Minnesota and Wisconsin were destroyed by the conversion to agricultural use. Prairies that were not plowed under were hayed or intensively grazed for decades resulting in degradation and changes in species composition. Remaining remnant prairies often suffer because of fire suppression and may be lost without intensive management. Given this nearly total loss of prairie, it is not surprising that many prairie species once common in Minnesota and Wisconsin are now threatened or endangered. Two prairie orchids, the western prairie fringed orchid and white lady's-slipper, are prime examples.

Some large tracts of unbroken (never plowed) or otherwise high quality prairie still exist on publicly-owned preserves or those purchased and managed by private conservation groups. Notable examples are the Chiwaukee Prairie in Kenosha County, Wisconsin, the Scuppernong River Habitat Area in Waukesha County, Wisconsin, and the preserves within the Interbeach Area of Glacial Lake Agassiz in northwestern Minnesota.

WET TO WET-MESIC PRAIRIES



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VEGETATION: This example of a wet to wet-mesic prairie includes gayfeather (*Liatris pycnostachya*), prairie cord-grass (*Spartina pectinata*), giant manna grass (*Glyceria grandis*), big bluestem (*Andropogon gerardii*), hummock sedge (*Carex stricta*), flattened spike-rush (*Eleocharis compressa*), green bulrush (*Scirpus atrovirens*), sawtooth sunflower (*Helianthus grosseserratus*), Riddell's goldenrod (*Solidago riddellii*), grass-leaved goldenrod (*Euthamia graminifolia*), New England aster (*Symphotrichum novae-angliae*), sneezeweed (*Helenium autumnale*), prairie loosestrife (*Lysimachia quadriflora*), water hemlock (*Cicuta maculata*), mountain mint (*Pycnanthemum virginianum*), Dudley's rush (*Juncus dudleyi*), redtop (*Agrostis gigantea*), winged loosestrife (*Lythrum alatum*) and shrubby cinquefoil (*Dasiphora fruticosa*).

SOILS: Colwood silt loam (Typic Endoaquolls), a poorly-drained mineral soil underlain by stratified lacustrine silt and very fine sand. Landscape position is a swale connecting morainal hills with an extensive wetland complex on muck soils.

HYDROLOGY: High groundwater table and, to a lesser extent, surface runoff from morainal hills. Colwood soils have a seasonal high water table at the surface to 12 inches below the surface during October through May of most years.

LOCATION: Scuppernong River Habitat Area, Kettle Moraine State Forest, Waukesha County, Wisconsin.

WET TO WET-MESIC PRAIRIES



VEGETATION: This wet to wet-mesic prairie includes prairie cord-grass (*Spartina pectinata*), gayfeather (*Liatriis pycnostachya*), big bluestem (*Andropogon gerardii*), switchgrass (*Panicum virgatum*), Canada wild-rye (*Elymus canadensis*), narrow reedgrass (*Calamagrostis stricta*), fowl bluegrass (*Poa palustris*), mountain mint (*Pycnanthemum virginianum*), woolly sedge (*Carex pellita*), Sartwelli sedge (*Carex sartwellii*), flattened spike-rush (*Eleocharis compressa*), Riddell's goldenrod (*Solidago riddellii*), prairie loosestrife (*Lysimachia quadriflora*), culver's root (*Veronicastrum virginicum*), cowbane (*Oxypolis rigidior*), sneezeweed (*Helenium autumnale*), marsh pea (*Lathyrus palustris*), bottle gentian (*Gentiana andrewsii*), jointed rush (*Juncus nodosus*), northern bedstraw (*Galium boreale*), New England aster (*Symphyotrichum novae-angliae*), sawtooth sunflower (*Helianthus grosseserratus*), giant goldenrod (*Solidago gigantea*) and compass plant (*Silphium laciniatum*). Widely scattered willows (*Salix discolor*, *S. petiolaris*, *S. bebbiana*) are present. State-listed threatened species include tuberous Indian plantain (*Arnoglossum plantagineum*) and common valerian (*Valeriana edulis* var. *ciliata*). The large, deeply cut leaves are those of compass plant, a species typically found in uplands but in this case is part of a hydrophytic plant community, although it is stunted and not flowering. Active management, including prescribed burns, is employed to maintain this prairie.

SOILS: Tripoli silty clay (Typic Endoaquolls), poorly drained soils that formed on nearly level or slightly concave positions on dissected till plains of low relief on the Iowan Erosion Surface.

HYDROLOGY: Tripoli soils are frequently saturated at the soil surface to a depth of 12 inches during the wettest portions of the growing season. Both perched and apparent saturation can occur depending upon precipitation frequency and intensity during a given time period.

LOCATION: Iron Horse Prairie Scientific and Natural Area, Dodge County, Minnesota.

WET TO WET-MESIC PRAIRIES



© Photos by Steve D. Eggers

PRAIRIE CORD-GRASS (*Spartina pectinata* Bosc ex Link)

GRASS FAMILY (Gramineae or Poaceae)

C of C: Native (5)

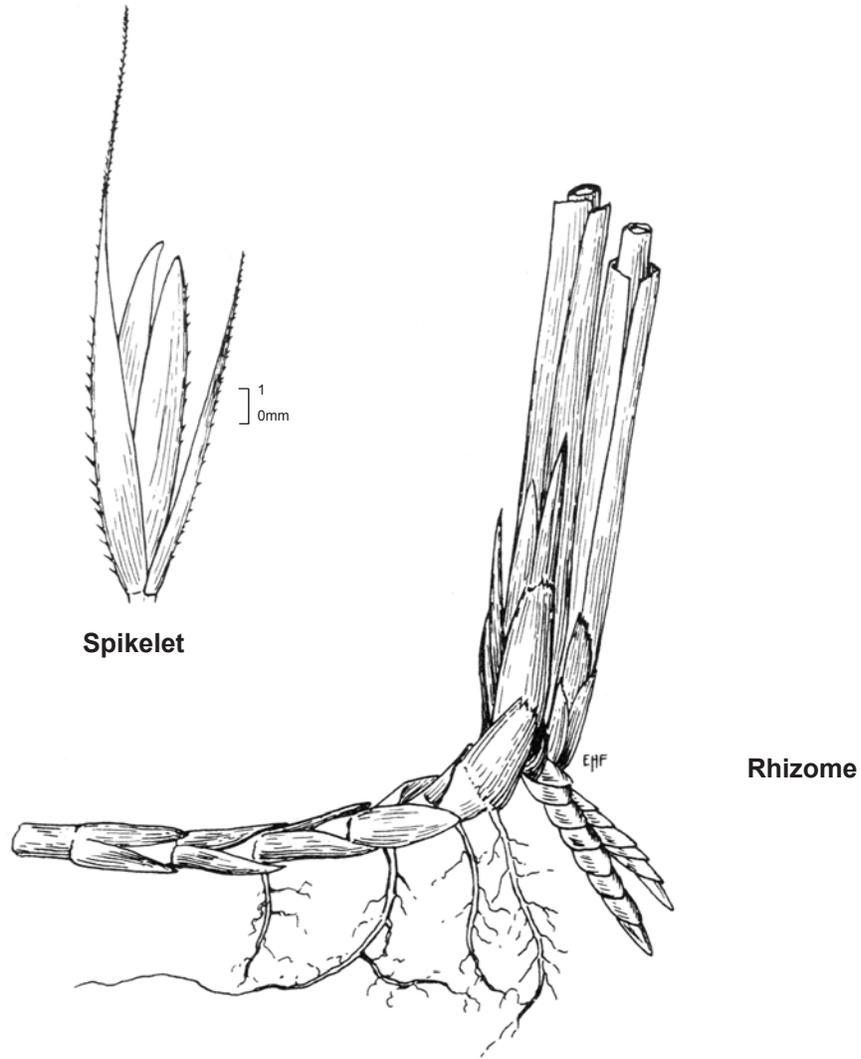
IND. STATUS: FACW

FIELD CHARACTERISTICS: A coarse, densely clonal, perennial grass 1-2 m. high. Stout, smooth, erect stems have short ligules. A dense mass of stout, scaly rhizomes can form monotypic clones 1-10 m. across. The main leaf blades are shiny, long, and flat, between 5-10 mm. wide, and up to 1 m. long. Leaves may be inrolled, but only when dry. Margins of the leaf blades are strongly roughened. Arching leaves turn red to light straw yellow in fall. Inflorescence is a panicle with numerous, distinct, one-sided spikes 5-12 cm. long. Spikelets are one-flowered, 8-11 mm. long, overlay, and ascending or lying flat, resembling a comb. They are also articulated below the glumes. Glumes are unequal in size with the first glume three-fourths as long as, to equal to, the length of the lemma. The second glume is awned.

ECOLOGICAL NOTES: Prairie cord-grass is the characteristic, dominant grass of wet prairies. It occasionally occurs in mesic prairies, but usually in low spots. It is also found on wet shores and in shallow marshes and road ditches.

SOURCE: Fassett (1951); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

WET TO WET-MESIC PRAIRIES



Prairie Cord-Grass
(*Spartina pectinata*)

Illustrations by Elsie Froeschner (Pohl 1966)

WET TO WET-MESIC PRAIRIES



© Photos by Steve D. Eggers

BIG BLUESTEM

(*Andropogon gerardii* Vitman)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Native (4) **IND. STATUS:** FACU(NC/NE, GP)
FAC(MW)

FIELD CHARACTERISTICS: A perennial, sod-forming grass 1-3 m. high with stout stems. Leaf blades are 5-10 mm. wide. Inflorescence contains 2-10 finger-like racemes with two types of spikelets: perfect, stalkless spikelets and staminate, stalked spikelets. Both types of spikelets resemble each other in size and shape, and occur in pairs at the joints of the principal axis. The twisted, fertile spikelet awn is 8-15 mm. long. The principal axis and flower stalk joints are equal. Leaves and stems turn bright yellow, red, orange or purple in the fall, and some color persists inside the stem leaf sheaths into the spring.

ECOLOGICAL NOTES: Big bluestem is a facultative species that occurs across the moisture gradient of dry-mesic to wet prairies. It reaches its optimum presence in mesic prairies where it is a dominant grass. Big bluestem occurs in calcareous fens, although it is typically stunted in such wet habitats. Turkey foot is another common name given the outline of the inflorescence (see ink drawing).

SOURCE: Fassett (1951); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).



Big Bluestem
(*Andropogon gerardii*)

Illustration from Hitchcock (1950)

WET TO WET-MESIC PRAIRIES



© Photos by Steve D. Eggers

SWITCH GRASS (*Panicum virgatum* L.)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Native (4 WI)(2 MN) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A stout, perennial, sod-forming grass up to 2 m. tall from scaly rhizomes. The firmly erect, hollow stems are essentially smooth, but pubescent at the nodes. Leaf blades are flat to somewhat inrolled along the margins and up to 15 mm. wide. Ligules are a dense fringe of hairs 2-4 mm. in length. A patch of white hairs occur in the angles between the stem and leaf (axils) near the ligule. Inflorescence is a terminal, open, spreading panicle 2-3 times as long as wide. One-flowered spikelets are ovoid and set on long pedicels that are smooth and 3-6 mm. long.

ECOLOGICAL NOTES: A common, distinctive grass of wet to mesic prairies. It also occurs in interdunal swales and flats on moist to seasonally wet sands and sandy loams.

SOURCE: Fassett (1951); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).



Switch Grass
(*Panicum virgatum*)

Illustration from Hitchcock (1950)

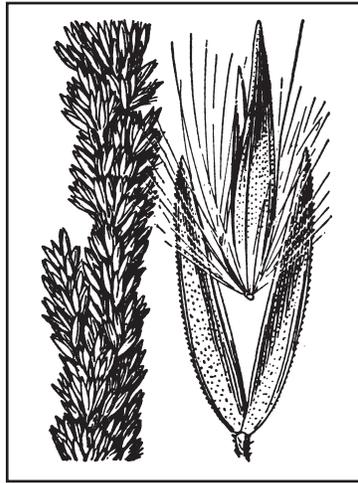


Illustration from Hitchcock (1950)

NARROW REEDGRASS

(*Calamagrostis stricta* (Timm) Koel.)

GRASS FAMILY (Gramineae or Poaceae)

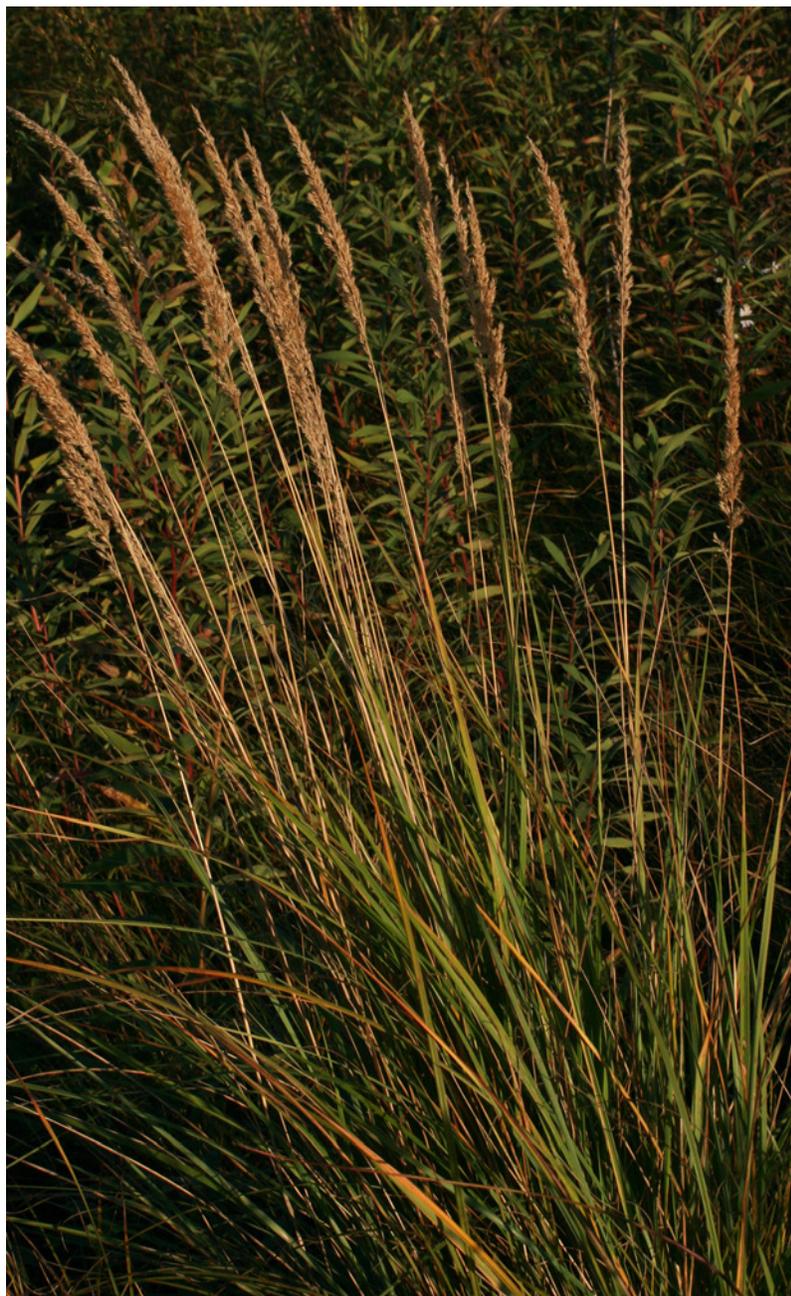
IND. STATUS: FACW

SYNONYM: *Calamagrostis inexpansa* A. Gray **C of C:** Native (7), listed as special concern in WI

FIELD CHARACTERISTICS: A perennial grass 50-100 cm. high. Slender, erect stems are hollow and arise from rhizomes. Mature, slender leaf (less than 4 mm. wide) margins tend to be rolled inward. A distinct, thin, membranous structure (the ligule) extends beyond the summit of the sheath. The ligule of the uppermost leaf is between 2.5-8 mm. long (usually about 4 mm.). Inflorescence is an erect, spike-like panicle of ascending branches that are obscured by the crowded spikelets; the panicle is referred to as strict (compact and narrow) hence its scientific name. A single, short, delicate, and straight to twisted awn arises from the base of the lemma. A slightly more robust plant than Canada blue-joint grass (*C. canadensis*).

ECOLOGICAL NOTES: Narrow reedgrass is a common species of wet prairies and calcareous fens in Minnesota and westward. In Wisconsin, *C. stricta* is an infrequent grass of moist to wet peaty, sandy or marly soils of lake shores, marshes, bogs, interdunal flats and swales, and inland fresh meadows. It tends to occur in slightly drier habitats than Canada blue-joint grass. Two subspecies, *inexpansa* and *stricta*, occur in Minnesota and Wisconsin.

SOURCE: Crow and Hellquist (2000); Fassett (1951); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).



© Photos by Steve D. Eggers

Narrow Reedgrass
(*Calamagrostis stricta*)

WET TO WET-MESIC PRAIRIES



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BUXBAUM'S SEDGE

(*Carex buxbaumii* Wahlenb.)

SEDGE FAMILY (Cyperaceae)

C of C: Native (8)

IND. STATUS: OBL

FIELD CHARACTERISTICS: A very distinctive perennial sedge with stems arising singly, or a few together, from long rhizomes. Stems are 30-100 cm. tall. Sheaths and leaf blades are glabrous. Basal sheaths break down into filamentous, pinnate fibers with age. Purple dots may be observed with a hand lens toward the base of the basal sheaths. Leaves are 2-4 mm. wide and have a bluish tinge in the spring. Erect spikelets, 2-5, are short stalked. The terminal spikelet is 1-3 cm. long and supports both staminate and pistillate flowers. Lateral spikelets are all pistillate. The bract subtending the lowest spikelet is sheathless. Perigynia are subtended by lance-shaped scales that are brown to purplish-black along the margins with a paler mid-rib. The 0.5-3 mm. scales surpass the perigynia tapering to an awn. Oval perigynia are 2.7-4.3 mm. long by 1.5-2 mm. wide, glabrous, and gray-green to whitish. The beak is very short or lacking.

ECOLOGICAL NOTES: Buxbaum's sedge prefers calcareous soils. It is often found in minerotrophic shrub/wooded swamps, shallow marl beds, shores, calcareous fens and wet prairies.

SOURCE: Gleason and Cronquist (1991); McGregor *et al.* (1991); Swink and Wilhelm (1994); and Voss (1972).



COMMON STIFF SEDGE
(*Carex tetanica* Schkuhr)

SEDGE FAMILY (Cyperaceae)

C of C: Native (7 MN)(9 WI)

IND. STATUS: FACW

FIELD CHARACTERISTICS: A perennial sedge forming small clumps with stems 20-60 cm. tall. The blue-green leaf blades are flat, (1.5)2-4.5(5) mm. wide with lower leaf sheath brownish to occasionally reddish to purplish tinged. Leaf blades are typically shorter than the stems. The terminal spikelet is staminate and on an elongated peduncle that greatly exceeds the pistillate spikelets (see photograph and ink drawing). Pistillate spikelets (1-3) are erect on slender peduncles and are 7-40 mm. long. The distinctive pistillate scales are brown to purple-tinged with green centers and hyaline margins. The essentially beakless perigynia are 2.5-3.5 mm. long, ascending, and have minute nipple-like projections on the surface. The nutlets are light to dark brown and less than 1.7 mm. wide.

Very similar to *Carex meadii* of upland prairies, whose mature nutlets are 1.8-2.2 mm. wide and have perigynia more than 3.5 mm. long.

ECOLOGICAL NOTES: Common stiff sedge prefers wet prairies and calcareous fens (in the eastern U.S. it is known as fen sedge), and also occurs in other inland fresh meadow types.

SOURCE: Fassett (1976); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

WET TO WET-MESIC PRAIRIES



© Photos by Steve D. Eggers

GAYFEATHER

(*Liatris pycnostachya* Michx.)

ASTER FAMILY (Compositae or Asteraceae)

C of C: Native (7)

IND. STATUS: FAC

FIELD CHARACTERISTICS: A perennial herb 60-150 cm. high. Stems are hairy with numerous, essentially linear leaves. Leaves are gradually reduced upwards on the stem. The sessile, disc-like flower heads are crowded (usually more than 29 heads) on a spike. Each head usually contains 5-7 perfect tubular flowers. Ray flowers are absent. The modified leaves (involucral bracts) subtending the flowers taper to a long point and are bent back or spreading. Flowers are pink-purple, occasionally white, and in bloom from July to mid-September.

ECOLOGICAL NOTES: Gayfeather, also known as prairie blazing star, is largely restricted to wet and wet-mesic prairie remnants in Minnesota and Wisconsin, and some calcareous fens. It is similar to marsh blazing star (*Liatris spicata*), which has smooth stems and appressed involucral bracts.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).



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NEW ENGLAND ASTER

(*Symphotrichum novae-angliae* (L.) Nesom)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (3) **IND. STATUS:** FACW

SYNONYM: *Aster novae-angliae* L.

FIELD CHARACTERISTICS: A perennial herb with clustered stems 30-200 cm. high. The plant is often covered with glandular hairs (use a 10-15x lens). Lance-shaped leaves are entire, have no stalks, and are conspicuously lobed-clasping. Lower and upper leaves are similar but the lower leaves tend to be deciduous. The leafy inflorescence consists of several flowering heads. Flower stalks, and modified leaves subtending the flowers, have hairy glands. Both ray and disc flowers are present. Numerous, slender ray flowers are amethyst to rosy, rarely blue or white in color, while the distinctive disc flowers are yellow to yellow-orange. Nutlets are densely covered with stiff, appressed to silky, hairs. In flower from the end of July through October. Refer to Appendix B for a key to wetland asters.

ECOLOGICAL NOTES: New England aster is a common aster of wet to wet-mesic prairies. It also occurs in other inland fresh meadows, as well as upland sites such as old fields and moist, open woods. Slight disturbances often benefit this aster.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

WET TO WET-MESIC PRAIRIES



SAWTOOTH SUNFLOWER (*Helianthus grosseserratus* Martens)

ASTER FAMILY (Compositae or Asteraceae)

IND. STATUS: FACW

C of C: Native (3 MN)(2 WI)

FIELD CHARACTERISTICS: A perennial herb 1-4 m. high. Coarse, woody, tuberous roots are in a tight cluster up to 5 cm. long and 1 cm. or more thick, with elongate rhizomes. Stems are essentially without hairs below the inflorescence, often with a white, waxy bloom (glaucous) as shown in the photograph above. Basal leaves are absent or inconspicuous. Well-developed alternate, stem leaves occur on the middle to upper stem. The sharply toothed, lanceolate leaves are densely hairy below and are often supported by winged leaf stalks. Both ray and disc flowers are present. The conspicuous, yellow ray flowers are deciduous and sterile. Disc flowers are perfect, fertile, and have yellow petals. In flower July-October.

Only two of the native, perennial sunflowers of Minnesota and Wisconsin have alternate leaves: this one and giant sunflower (*H. giganteus*).

ECOLOGICAL NOTES: Sawtooth sunflower is a common sunflower of wet to wet-mesic prairies and other inland fresh meadows. It also occurs along disturbed streambanks and in old fence rows.

SOURCE: Gleason and Cronquist (1993); and Swink and Wilhelm (1994).



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GIANT SUNFLOWER
(*Helianthus giganteus* L.)

SUNFLOWER FAMILY (Compositae or Asteraceae) **C of C:** Native (4) **IND. STATUS:** FAC(GP)
FACW(NC/NE, MW)

FIELD CHARACTERISTICS: A perennial, rhizomatous herb 1-3 m. high with thickened, fleshy roots. The often purplish stems have spreading hairs below the inflorescence, which sometimes may be scattered. Lower leaves tend to be opposite becoming alternate on the upper stem. Lanceolate leaves are usually less than 3.5 cm. wide, range from strongly toothed to subentire, and taper to short petioles. Upper leaf surfaces are rough, while the lower leaf surfaces have long hairs (1 mm. or more). Both ray and disc flowers are present. The conspicuous yellow ray flowers (12-20) are deciduous and sterile. Disc flowers are perfect, fertile, and have yellow lobes. In flower July-October. This sunflower is a very variable species, often confused with *Helianthus grosseserratus*, with which it hybridizes.

ECOLOGICAL NOTES: Giant sunflower is characteristic of wet prairies and also occurs in a variety of other wet, sunny sites. It occasionally occurs in shaded floodplain forests and swamps. This sunflower seems to prefer calcareous soils.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1996).



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RIDDELL'S GOLDENROD

(*Solidago riddellii* Frank)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (8 MN)(7 WI) **IND. STATUS:** OBL

SYNONYM: *Oligoneuron riddellii* (Frank ex Riddell) Rydb.

FIELD CHARACTERISTICS: A perennial herb 40-100 cm. high. Leaves of the lower and upper stem are dissimilar, the lower or basal leaves being better developed and usually persistent. Leaves are sickle-shaped, folded, triple nerved, and not dotted with glands. Leaves are persistent up to flowering time. Inflorescence is a flat-topped, hairy corymb with yellow flowers. In flower from September to early November. Riddell's goldenrod can be confused with Ohio goldenrod (*Solidago ohioensis*) [page 239], which occurs in similar habitats in Wisconsin. Ohio goldenrod leaves are flat and not triple-nerved and its inflorescence is hairless. Refer to Appendix A for a key to wetland goldenrods.

ECOLOGICAL NOTES: Riddell's goldenrod is characteristic of wet to wet-mesic prairies supported by groundwater seepages. In Minnesota, it frequently occurs in calcareous fens as well.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).



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SNEEZEWEED

(*Helenium autumnale* L.)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (4) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: A perennial herb 30-150 cm. high. Stems are usually winged with well-developed, alternate, flat, stem leaves. A leafy inflorescence contains several heads of both ray and disc flowers. Yellow disc flowers are perfect and yellow. The yellow, “squared-off” ray flowers tend to be sterile and are generally 3-toothed. The diagnostic features of sneezeweed are its winged stems and bent back ray flowers with 3 teeth. In flower August-October.

ECOLOGICAL NOTES: Sneezeweed is common in wet to wet-mesic prairies and other inland fresh meadows. It is often seen along streambanks.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

WET TO WET-MESIC PRAIRIES



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CUP-PLANT

(*Silphium perfoliatum* L.)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (4) **IND. STATUS:** FAC(GP)
FACW(NC/NE, MW)

FIELD CHARACTERISTICS: A large, stout, robust, perennial herb 1-2.5 m. tall with square stems. Leaves are opposite, perfoliate (stem appears to pierce the leaves), coarsely-toothed, 8-30 cm. long by 4-15 cm. wide. Flower heads with a disk 1.5-2.5 cm. wide and ray flowers numbering 16-35. Rays are yellow and 1.5-2 cm. long. In flower July-September.

ECOLOGICAL NOTES: Cup-plant is an easy to identify, common forb of wet to wet-mesic prairies, fresh (wet) meadows, calcareous fens and streambanks.

SOURCE: Gleason and Cronquist (1991); Chadde (2011); and Black and Judziewicz (2009).

WET TO WET-MESIC PRAIRIES



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PRAIRIE DOCK

(*Silphium terebinthinaceum* Jacq.)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (7) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A coarse, tap-rooted, perennial herb 50-300 cm. high. The essentially hairless stems support reduced stem leaves. The huge principal leaves (7-30 cm. x 10-50 cm.) are essentially basal, rough, sharply toothed, heart-shaped to oblong, and supported by long leaf stems. Leaves are often oriented edgewise to the south or southwest. Inflorescence is open and resembles a corymb with both ray and disc flowers present. The conspicuous, yellow ray flowers have pistils and are fertile, while the disc flowers are sterile. Ray flower nutlets are flattened and winged along their margins. In flower from the end of June through September.

ECOLOGICAL NOTES: Prairie dock occurs in wet-mesic to dry-mesic prairies and infrequently in dry prairies and oak openings in Wisconsin. Its range does not include Minnesota.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

WET TO WET-MESIC PRAIRIES



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IRONWEED

(*Vernonia fasciculata* Michx.)

ASTER FAMILY (Compositae or Asteraceae)

C of C: Native (5)

IND. STATUS: FAC(GP)
FACW(NC/NE, MW)

FIELD CHARACTERISTICS: A perennial herb with often red or purple stems 30-140 cm. in height. Leaves are 7-17 cm. long, alternate, sharply dentate, glabrous, and conspicuously punctate beneath. Inflorescence is usually flat-topped, dense and 4-10 cm. wide. Flowers consist of disc flowers that are purple with 10-26 per head, with an involucre 5-9 mm. long. In flower July-September.

ECOLOGICAL NOTES: Ironweed occurs primarily in wet to wet-mesic prairies.

SOURCE: Gleason and Cronquist (1991); and Black and Judziewicz (2009).

WET TO WET-MESIC PRAIRIES



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BOTTLE GENTIAN

(*Gentiana andrewsii* Griseb.)

GENTIAN FAMILY (Gentianaceae) **C of C:** Native (6) **IND. STATUS:** FACW_(NC/NE, MW)
FAC_(GP)

FIELD CHARACTERISTICS: A perennial herb with unbranched, smooth stems 20-80 cm. in height. Leaves are simple, opposite, lanceolate and 4-12 cm. long by 1-3 cm. wide. Blue (sometimes white) flowers 3-5 cm. long are in terminal clusters and sessile in upper leaf axils. Sepals form a tube around the petals. Flowers usually remain closed. Petals, sepals and leaves have a fringe of tiny hairs (use 10x lens). Fruit is a capsule. In flower August-September.

ECOLOGICAL NOTES: Bottle gentian is most frequently encountered in wet to wet-mesic prairies, but also occurs in wet meadows and openings in hardwood swamps.

SOURCE: Gleason and Cronquist (1991); and Black and Judziewicz (2009).

WESTERN PRAIRIE FRINGED ORCHID

(*Platanthera praeclara* Shev. & Bowles)

ORCHID FAMILY (Orchidaceae)

IND. STATUS: FACW_(NC/NE, MW); OBL_(GP)

C of C: Native (10); Federally threatened and listed as endangered by the State of Minnesota

SYNONYM: *Habenaria leucophaea* (Nutt.) A. Gray var. *praeclara* (Shev. & Bowles) Cronq.

FIELD CHARACTERISTICS: A perennial herb 40-100 cm. tall. Lower leaves are lance-like to broadly linear and 10-20 cm. long. Upper leaves are much reduced. Spike is cylindric, 8-20 cm. tall and 5-7 cm. wide. Sepals oval to obovate, 7-13 mm. Petals toothed, slightly longer than sepals. Lip 14-27 mm., deeply 3-lobed, long-fringed. Spur is 25-60 mm. long. In bloom late June to early July.

The very similar eastern prairie fringed orchid, *P. leucophaea*, has been segregated from *P. praeclara* by flower size and morphology, and largely occurs east of the Mississippi River.

Ragged fringed orchid (*P. lacera*) is also similar, but is not as tall and has a smaller lip (no more than 15 mm. long) and shorter spur (less than 20 mm. long).

ECOLOGICAL NOTES: Western prairie fringed orchid is found in sedge meadows and wet to wet-mesic prairies, especially those that are calcareous or subsaline. The nearly total loss of its habitat has resulted in listing western prairie fringed orchid as a threatened species under the Endangered Species Act (ESA), and endangered under Minnesota state law. The eastern prairie fringed orchid occurs in Wisconsin and is similarly listed as threatened by the ESA and endangered by the State of Wisconsin. Report any sightings to the U.S. Fish and Wildlife Service or state department of natural resources. Do not disturb!

SOURCE: Gleason and Cronquist (1991); Smith (1993); Coffin and Pfanmuller (1988); and Great Plains Flora Association (1991).



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Western Prairie Fringed Orchid
(*Platanthera praeclara*)



© Photos by Steve D. Eggers

COMMON MOUNTAIN MINT

(*Pycnanthemum virginianum* (L.) T. Dur. & B.D. Jackson ex B.L. Robins. & Fern.)

MINT FAMILY (Labiatae or Lamiaceae) **C of C:** Native (6) **IND. STATUS:** FACW(NC/NE,MW)
FAC(GP)

FIELD CHARACTERISTICS: A perennial, aromatic (minty fragrance) herb 20-40 cm. high with square stems and opposite leaves. Stems are hairy along the angles. Leaves are lance-linear, entire, smooth above, and usually average less than 6 mm. wide. The outermost modified leaves of the inflorescence are leafy and essentially hairless above. The midvein of modified leaves of the inflorescence is not prominent. Triangular-shaped calyx lobes are less than 1 mm. long, and thus are shorter than the calyx tube. Inflorescence contains four or more flowers in dense, button-like cymes that terminate the stems and branches. Each white flower contains four stamens. In flower from the end of June to the beginning of October.

ECOLOGICAL NOTES: This mint is common in wet to wet-mesic prairies and calcareous fens. It occasionally occurs in dry prairies and open, upland forests. Common mountain mint may persist when other prairie species are eliminated by grazing.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

WET TO WET-MESIC PRAIRIES



© Photos by Steve D. Eggers

CULVER'S ROOT

(*Veronicastrum virginicum* (L.) Farw.)

FIGWORT FAMILY (Scrophulariaceae)

C of C: Native (6)

IND. STATUS: FAC

FIELD CHARACTERISTICS: An erect, perennial herb 80-200 cm. high. Narrow, finely serrated leaves occur in whorls of 3-7 around the stem. Both stem and basal leaves are present. The showy inflorescence is erect with slender, terminal, spike-like racemes. Conspicuous stamens are crowded and protrude in a brush-like fashion perpendicular to the raceme. Corollas are white and usually not much over 2 mm. in length. In flower from mid-June through August.

ECOLOGICAL NOTES: Culver's root is a frequent herb of wet to wet-mesic prairies. It is occasionally found on upland sites such as sand prairies and openings in mesic forests.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

WET TO WET-MESIC PRAIRIES



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PRAIRIE LOOSESTRIFE

(*Lysimachia quadriflora* Sims)

PRIMROSE FAMILY (Primulaceae) **C of C:** Native (8 MN)(9 WI) **IND. STATUS:** FACW(GP)
OBL(NC/NE, MW)

FIELD CHARACTERISTICS: A perennial herb with stems 30-100 cm. in height. Leaves are linear, 3-8 cm. by 2-7 mm., the margins smooth, revolute, tapering to a sessile base. Flowers are in terminal clusters on the stem and branches. Corolla lobes are 7-12 mm. by 5-9 mm. In flower July-August.

ECOLOGICAL NOTES: Prairie loosestrife primarily occurs in wet to wet-mesic prairies.

SOURCE: Gleason and Cronquist (1991); and Black and Judziewicz (2009).

WET TO WET-MESIC PRAIRIES



Fruit is an elongate pod (10-15 cm.).



© Photos by Steve D. Eggers

INDIAN HEMP

(*Apocynum cannabinum* Jacq.)

DOGBANE FAMILY (Apocynaceae)

C of C: Native (3)

IND. STATUS: FAC

SYNONYM: *Apocynum sibiricum* Jacq.

FIELD CHARACTERISTICS: A perennial herb erect to 0.5-1.5 m. or can be drooping. Leaves are opposite, oval, sessile, cordate, broadly clasping at the base. Leaves and stem have a milky juice. Corolla is greenish-white or pale yellow, cylindric, 3-6 mm. long. Fruit is a long, narrow pod 10-15 cm. long. In flower May-September.

ECOLOGICAL NOTES: Indian hemp primarily occurs in wet to wet-mesic prairies.

SOURCE: Gleason and Cronquist (1991); and Black and Judziewicz (2009).



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WINGED LOOSESTRIFE

(*Lythrum alatum* Pursh)

LOOSESTRIFE FAMILY (Lythraceae)

C of C: Native (6)

IND. STATUS: OBL

FIELD CHARACTERISTICS: A perennial herb 40-80 cm. tall with 4-angled stems. Leaves are sessile with bases rounded to subcordate, overall leaf shape linear-oblong to lance-ovate, usually only the lowest leaves are opposite. Leaves below the branches are up to 4 cm. long while leaves of the branches are smaller and narrower. Flowers are solitary in leaf axils with purple, obovate petals 2-6 mm. long. In contrast, the flowers of purple loosestrife (*L. salicaria*) are packed into dense spikes 10-40 cm. in length. The fruit of winged loosestrife is a capsule enclosed by the sepals. In flower June-August.

ECOLOGICAL NOTES: Winged loosestrife occurs in wet to wet-mesic prairies, calcareous fens, marshes and along lakeshores.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Black and Judziewicz (2009).

III.D. Calcareous Fens

Calcareous fens are the rarest wetland plant community in Minnesota and Wisconsin, and probably one of the rarest in North America. These are plant communities of saturated, seepage sites that have an internal flow of groundwater rich in calcium and magnesium bicarbonates, and sometimes calcium and magnesium sulfates as well (Curtis 1971). The calcium and magnesium bicarbonates and sulfates precipitate out at the surface creating a harsh, alkaline soil condition. Only a select group of calcium-tolerant plants, referred to as **calciphiles**, can tolerate these conditions. Healthy (unaltered) calcareous fens are sedge-dominated by *Carex* species (e.g., sterile sedge (*C. sterilis*), prairie sedge (*C. prairea*), common stiff sedge (*C. tetanica*), Buxbaum's sedge (*C. buxbaumii*)) as well as beaked spike-rush (*Eleocharis rostellata*), twig-rush (*Cladium mariscoides*) and hair beak-rush (*Rhynchospora capillacea*). Characteristic grasses and forbs include wild timothy, Ohio goldenrod, Grass-of-Parnassus, common valerian, brook lobelia and lesser fringed gentian. Shrubby cinquefoil and sage willow are characteristic shrubs. Included are species disjunct from the tundra, alpine meadows and salt marshes. Therefore, calcareous fens are described as a hybrid community by Curtis (1971).

Calcareous fen communities in general have a disproportionate number of rare, threatened and endangered plant species compared to other plant communities in the Great Lakes Region.

Trout streams are often associated with calcareous fens because of the cold, pure water provided by the springs and seepages.



Steve D. Eggers

Active springs are frequently associated with calcareous fens. The example shown by the photograph is within Nicols Meadow Fen in Dakota County, Minnesota. The aquatic plant is water cress (*Rorippa nasturtium-aquaticum*).

Two Eurasian shrubs, glossy buckthorn (*Frangula alnus*) and common buckthorn (*Rhamnus cathartica*), have become established within many fen complexes in Minnesota and Wisconsin. Without control measures, buckthorns can form dense thickets that shade out calcareous fen species including the rare taxa.

CALCAREOUS FENS

VEGETATION: The calcareous fen community shown on the following page supports five species listed as threatened (T) by the State of Minnesota as well as two species listed as special concern (SC): sterile sedge (*Carex sterilis*) (T); beaked spike-rush (*Eleocharis rostellata*) (T); hair beak-rush (*Rhynchospora capillacea*) (T); whorled nut-rush (*Scleria verticillata*) (T); common valerian (*Valeriana edulis* var. *ciliata*) (T); twig-rush (*Cladium mariscoides*) (SC) and white lady's-slipper (*Cypripedium candidum*) (SC). Additional species present include Buxbaum's sedge (*Carex buxbaumii*), limestone meadow sedge (*Carex granularis*), common stiff sedge (*Carex tetanica*), prairie sedge (*Carex prairea*), hummock sedge (*Carex stricta*), Sartwell's sedge (*Carex sartwellii*), hardstem bulrush (*Schoenoplectus acutus*), Grass-of-Parnassus (*Parnassia glauca*), lesser fringed gentian (*Gentianopsis virgata*), brook lobelia (*Lobelia kalmii*), wild timothy (*Muhlenbergia glomerata*), mat muhly grass (*Muhlenbergia richardsonis*), swamp thistle (*Cirsium muticum*), blazing star (*Liatrix ligulistylis*), Riddell's goldenrod (*Solidago riddellii*), great blue lobelia (*Lobelia siphilitica*), mountain mint (*Pycnanthemum virginianum*), northern bedstraw (*Galium boreale*), northern bog aster (*Symphotrichum boreale*), giant goldenrod (*Solidago gigantea*), shrubby cinquefoil (*Dasiphora fruticosa*), sage willow (*Salix candida*), beaked willow (*Salix bebbiana*) and red-osier dogwood (*Cornus alba*). Invasive species present include glossy buckthorn (*Frangula alnus*), common buckthorn (*Rhamnus cathartica*) and an invasive genotype of common reed (*Phragmites australis*).

SOILS: Houghton muck (Typic Borosaprists), sloping, calcareous. Muck "domes" created by upwelling groundwater pressure and muck accumulation are present within the sloping, organic muck deposit that is up to 25 feet (7.5 m.) in depth overlaying dolomite bedrock. Radiocarbon dating of muck deposits in calcareous fens in southern Minnesota revealed them to be 4,700 to 11,000 years old (Almendinger and Leete 1998).

HYDROLOGY: Upwelling, calcareous, groundwater discharge. Small, calcareous streams originate within the fen complex due to groundwater discharges. Houghton soils (sloping) are typically saturated at or near the surface throughout the growing season.

LOCATION: Savage Fen Scientific and Natural Area, Scott County, Minnesota.

CALCAREOUS FENS



© Photos by Steve D. Eggers

The photograph above was taken from the lower edge of a muck “dome” looking towards the center high spot. This dome is approximately 2 acres in extent.

The photograph to the right illustrates a typical assemblage of sedges and forbs.



CALCAREOUS FENS



© Photos by Steve D. Eggers



STERILE SEDGE (*Carex sterilis* Willd.)

SEDGE FAMILY (Cyperaceae)

IND. STATUS: OBL

C of C: Native (10); listed as a threatened species in Minnesota

FIELD CHARACTERISTICS: A perennial, dioecious sedge with stems forming tufts 20-70 cm. high (Figure a on the opposing page). The many slender leaves (1-2 mm. wide) are 30 cm. or more long. Spikelets (Figure b) usually number four and are stalkless (sessile). The perigynium (Figure c) is egg-shaped, 2-4 mm. long and up to 2 mm. wide, with a double-toothed beak 0.6-1.6 mm. long. At maturity, perigynia are dark brown and often spreading or bent backward. Nutlet is shown by Figure d. In the central photograph above, the stem labeled [Fertile] has pistillate (seed-producing) spikelets, while the stem labeled [Sterile] has only staminate spikelets (pollen producing but not seed producing). Some of the tufts are all staminate giving them the appearance of being sterile.

Interior sedge (*Carex interior*) [page 384] is similar but usually has only 3 spikelets per stem and the terminal spikelet has a club-shaped mass of staminate flowers at its base. Interior sedge also occurs in a wider range of habitats including bogs and calcareous inland fresh meadows, particularly those with fluctuating water levels.

ECOLOGICAL NOTES: Sterile sedge is a characteristic sedge of calcareous fens and other inland fresh meadows supported by stable, calcareous groundwater seepages. The authors have observed that, in Minnesota and Wisconsin, sterile sedge is essentially an obligate calcareous fen species; however, it occasionally occurs on wet dolomite pavements and other calcareous seepages.

SOURCE: Fassett (1976); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).



1988 State of Minnesota, Dept of Natural Resources

Sterile Sedge
(*Carex sterilis*)

CALCAREOUS FENS



PRAIRIE SEDGE

(*Carex prairea* Dewey ex Wood)

SEDGE FAMILY (Cyperaceae)

C of C: Native (10)

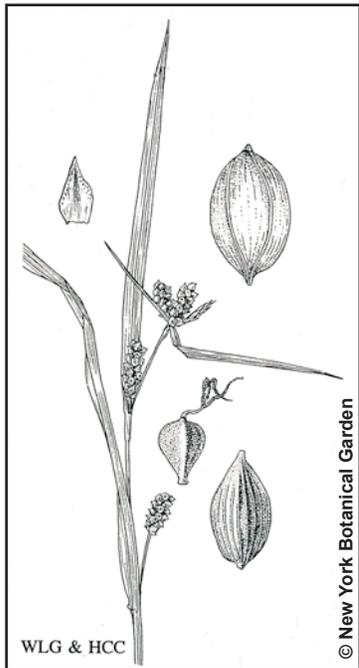
IND. STATUS: FACW_(NC/NE)
OBL_(MW, GP)

FIELD CHARACTERISTICS: A perennial sedge forming dense clusters (tussocks) of stems 50-100 cm. tall, exceeding the leaves. Leaf sheaths are prolonged 2-3 mm. beyond the leaf base and are tinged a coppery brown color on the ventral (inner) side toward the sheath summit (see photo). Numerous, small sessile spikes in a short, but loose, panicle-like arrangement are present. Reddish-brown scales conceal the perigynia. The pale brown perigynia are lance-shaped, 2.5-3 mm. long, appressed, and taper to a pale beak. Two stigmas are present and the nutlets are lens-shaped.

ECOLOGICAL NOTES: Prairie sedge primarily occurs in wet prairies and calcareous fens. It is most frequently seen in and south of the vegetation tension zone.

SOURCE: Fassett (1976); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

CALCAREOUS FENS



LIMESTONE MEADOW SEDGE

(*Carex granularis* Muhl. ex Willd.)

SEDGE FAMILY (Cyperaceae)

C of C: Native (3)

IND. STATUS: FACW(NC/NE, MW)
OBL(GP)

FIELD CHARACTERISTICS: A clump-forming, perennial sedge with very short rhizomes and stems about 30-80 cm. tall. Stems and leaves are glaucous with a bluish green tint. Mature leaves are 4-10(13) mm. wide and typically surpass the stems in height. Staminate and pistillate flowers occur in separate spikelets. Terminal spikelets are sessile, or very short-stalked, and staminate. Lateral pistillate spikelets are 1-3 cm. long. A subtending bract usually exceeds its spikelet. Tightly clustered, erect perigynia are elliptical to oval in shape, 2.2-4 mm. long, conspicuously nerved, and abruptly contracted to a short beak.

ECOLOGICAL NOTES: Limestone meadow sedge chiefly occurs in sunny calcareous areas, such as wet meadows and swales, calcareous fens and seepages, but also occurs in wooded swamps.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

CALCAREOUS FENS



© Photos by Steve D. Eggers



Fertile stem
(spikelet)

Vegetative
stem rooting at
the tip

BEAKED SPIKE-RUSH

(*Eleocharis rostellata* (Torr.) Torr.)

SEDGE FAMILY (Cyperaceae)

IND. STATUS: OBL

C of C: Native (10); listed as a threatened species in both Minnesota and Wisconsin

FIELD CHARACTERISTICS: A perennial sedge 40-100 cm. high (Figure a on opposing page). Stems are leafless and stout, but conspicuously narrower than the spikelets (Figure b). Two stem types are present: fertile and vegetative (labeled in the photograph above). Vegetative stems are characteristically long and arching, and root at the tip. No other spike-rush (*Eleocharis* sp.) found in Minnesota and Wisconsin has this trait. The nutlet (Figure c) is 1.9-2.8 mm. long and three-sided to planoconvex.

ECOLOGICAL NOTES: This rare spike-rush is restricted to calcareous fens, spring fens in northern peatlands, and calcareous shores. It can form dense stands.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

CALCAREOUS FENS



1988 State of Minnesota, Dept of Natural Resources

Beaked Spike-Rush
(*Eleocharis rostellata*)

CALCAREOUS FENS



© Photos by Steve D. Eggers

NARROW-LEAF COTTONGRASS

(*Eriophorum angustifolium* Honckeney)

SEDGE FAMILY (Cyperaceae)

C of C: Native (8 MN)(9 WI)

IND. STATUS: OBL

FIELD CHARACTERISTICS: A colonial, perennial sedge with stems growing to a height of 20-60 cm. Stem leaf blades are generally flat for most of their length and up to 4 mm. or more wide. The 2 or 3 involucre bracts are leaf-like and often exceed the inflorescence. The summit of the leaf sheaths, as well as the base of the involucre bracts, are tinged with a dark red color. Scales are single (mid-) nerved. Nutlets are blackish in color, 2-3 mm. long and surrounded by long, silky white bristles. In flower, and thus conspicuous, in late April to mid-May.

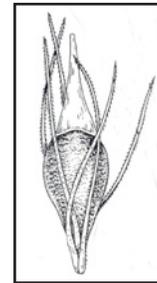
ECOLOGICAL NOTES: Narrow-leaf cottongrass is common in calcareous fens and also occurs in bogs and openings in coniferous swamps. It is a circumboreal species.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

CALCAREOUS FENS



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© New York Botanical Garden

Nutlet

HAIR BEAK-RUSH

(*Rhynchospora capillacea* Torr.)

SEDGE FAMILY (Cyperaceae)

IND. STATUS: OBL

C of C: Native (10), a threatened species in Minnesota

FIELD CHARACTERISTICS: A perennial, tufted sedge 10-40 cm. tall. The wiry stems are erect or curved, hair-like, and leafy. Leaves are ascending, outwardly curved, and hair-like. Leaf blades are 0.2-0.4 mm. wide with inwardly rolled margins. Inflorescence consists of 1-4 spikelets in narrow, ascending clusters. Each cluster is subtended by an ascending green, scale-like leaf (involucral bract). Spikelets are pale reddish brown to brown, spindle-shaped and 6-7 mm. long. Each spikelet is usually 1-2 flowered. Nutlets are pale brown, usually 1-4 per spikelet, and surrounded by 6 bristles (perianth bristles). Nutlet body surfaces have small longitudinally marked fine lines. Each nutlet terminates with a distinct, 5 mm. or less, beak-like tubercle.

Two similar *Rhynchospora* species also occur in fens: the usually taller *R. capitellata* with wider (to 3 mm.) flat leaves and slightly shorter spikelets (3.5-4 mm. long) and *R. alba* with its distinct tan to white spikelets and 9-12 perianth bristles.

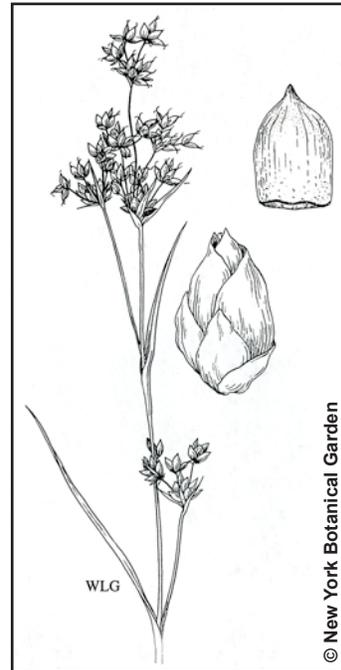
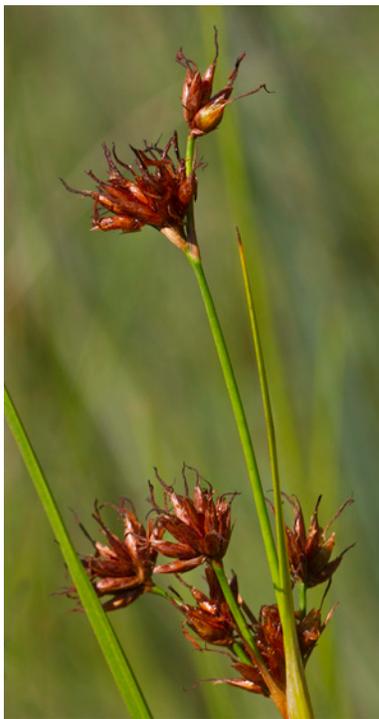
ECOLOGICAL NOTES: Hair beak-rush characteristically occurs in calcareous fens and on open, marly, sedge flats. It also occurs on seepages over dolomite pavements and on calcareous sands of interdunal swales. The similar *Rhynchospora alba* is usually found on open bog mats.

SOURCE: Crow and Hellquist (2000); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

CALCAREOUS FENS



© Photos by Steve D. Eggers



TWIG-RUSH

(*Cladium mariscoides* (Muhl.) Torr.)

SEDGE FAMILY (Cyperaceae)

IND. STATUS: OBL

C of C: Native (10), a species of special concern in Minnesota

FIELD CHARACTERISTICS: A solitary to sparsely colonial perennial sedge with stiff, slender stems growing to about 1 m. The 1-3 mm. wide stem leaf blades are folded or inrolled inward lengthwise. The compound inflorescence is much branched, each bearing a cluster of 1-2 flowered spikelets. A perianth (floral envelope) is absent. The flattish scales are in a shingle-like spiral arrangement forming a lance- to oval-shaped spikelet. Nutlets are ovoid, pointed at the summit, and whitish to pale green in color. In flower June–August.

ECOLOGICAL NOTES: Twig-rush prefers calcareous fens and calcareous watertracks of northern peatlands. In addition, it is found on floating mats, sandy seepage areas, and in interdunal swales.

SOURCE: Crow and Hellquist (2000); Gleason and Cronquist (1991); and Swink and Wilhelm (1994); and Voss (1972).

CALCAREOUS FENS



Illustration from Hitchcock (1950)



© Steve D. Eggers

WILD TIMOTHY

(*Muhlenbergia glomerata* (Willd.) Trin.)

GRASS FAMILY (Gramineae or Poaceae)

C of C: Native (8 MN)(9 WI)

IND. STATUS: FACW(MW, GP); OBL(NC/NE)

FIELD CHARACTERISTICS: A perennial grass 50-120 cm. high. Stems usually do not branch above the base. Ligules are 0.25-0.5 mm. long. Inflorescence is a terminal, stout, condensed head of compact spikelets. Glumes are longer than the lemmas, which taper to a slender point.

ECOLOGICAL NOTES: Wild timothy is a characteristic grass of calcareous fens and is occasionally found growing on calcareous soils of wet to wet-mesic prairies and sedge meadows supported by groundwater seepages.

SOURCE: Fassett (1951); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

CALCAREOUS FENS



© Photos by Steve D. Eggers

SPRING-CRESS

(*Cardamine bulbosa* (Schreb. ex Muhl.) B.S.P.)

MUSTARD FAMILY (Brassicaceae or Cruciferae) **C of C:** Native (6) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb 20-45 cm. high and up to 60 cm. high when in flower. The erect stems are borne singly, or a few together, from a bulbous, tuber-like rhizome. Unbranched stems support 4-8 simple, rounded leaves. Basal leaves are rotund to heart shaped. Lower leaves are supported by petioles, while upper leaves are tapered to their bases. The upper part of the stem and inflorescence is glabrous. The showy flowers have 4 white petals 7-16 mm. long. Sepals are bright green turning yellow with age. Seed pod is a silique with a single row of seeds. In flower from late April through June.

ECOLOGICAL NOTES: Spring-cress is typically found in calcareous fens and other sunny, springs or seepages. It also occurs in openings of hardwood swamps.

SOURCE: Crow and Hellquist (2000); Fassett (1976); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1985).

CALCAREOUS FENS



GRASS-OF-PARNASSUS

(*Parnassia glauca* Raf.)

SAXIFRAGE FAMILY (Saxifragaceae) **C of C:** Native (9 MN)(8 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb 15-30 cm. high. The stalked basal leaves are entire, smooth, rounded, 2-7 cm. long x 1-5 cm. wide, forming a basal rosette. The stem leaf, if present, is stalkless and located at or below the middle of the stem. Flowers are white with five star-like, green-striped petals 1-2 cm. long, and solitary at the end of a single stem. Fruit is a conspicuous, terminal capsule. In flower August-October.

ECOLOGICAL NOTES: Grass-of-Parnassus is a characteristic species of calcareous fens. It also occurs along calcareous shores and on wet lake dune flats if groundwater seepages are present.

SOURCE: Gleason and Cronquist (1991).

CALCAREOUS FENS



COMMON VALERIAN

(*Valeriana edulis* var. *ciliata* Nutt. ex Torr. & Gray)

VALERIAN FAMILY (Valerianaceae)

IND. STATUS: FACW(NC/NE, MW); FAC(GP)

SYNONYM: *Valeriana edulis* Nutt. ex Torr. & Gray

C of C: Native (10); listed as a threatened species in Minnesota

FIELD CHARACTERISTICS: A perennial herb 10-50 cm. tall, occasionally to 120 cm. Leaves are generally parallel-veined with a margin of dense white hairs (ciliated). Basal leaves are linear to oblanceolate, entire or with 1-2 divisions toward the base. Stem leaves are pinnately parted. Inflorescence is an elongate panicle with creamy white flowers. In flower April-June.

ECOLOGICAL NOTES: Common valerian is characteristic of calcareous fens and calcium-rich wet to wet-mesic prairies. It is one of the first herbs to flower during the spring in these habitats. In Minnesota, railroad rights-of-way are one of the few remaining habitats where this species occurs.

SOURCE: Fassett (1976); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

CALCAREOUS FENS



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OHIO GOLDENROD
(*Solidago ohioensis* Riddell)

ASTER FAMILY (Compositae or Asteraceae)

IND. STATUS: OBL

SYNONYM: *Oligoneuron ohioense* (Riddell) G.N. Jones

C of C: Native (9 WI); a species of special concern in Wisconsin

FIELD CHARACTERISTICS: A perennial herb 40-90 cm. high. Leaves of the lower and upper stem are dissimilar; the lower or basal leaves are better developed than the upper, and are usually persistent. Leaves are flat, not triple-nerved, and are not dotted with glands. Inflorescence is a flat-topped corymb that is without hairs. Flowers are yellow. In flower June-October. This species is similar to Riddell's goldenrod (*Solidago riddellii*) [page 210], which occurs in similar Wisconsin habitats. However, the leaves of *S. riddellii* are sickle-shaped, folded and triple-nerved, and its inflorescence is hairy. Refer to Appendix A for a key to wetland goldenrods.

ECOLOGICAL NOTES: In Wisconsin, Ohio goldenrod is characteristic of calcareous fens and also occurs in wet to wet-mesic prairies supported by groundwater seepages. Eastern Wisconsin is the western extent of its range. This goldenrod has not been recorded in Minnesota.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).



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SWAMP THISTLE
(*Cirsium muticum* Michx.)

ASTER FAMILY (Compositae or Asteraceae)

IND. STATUS: FACW(GP); OBL(NC/NE, MW)

C of C: Native (6 MN)(8 WI)

FIELD CHARACTERISTICS: A biennial herb 50-200 cm. high. Leaves are pinnatifid, green beneath and have weak spines. A basal rosette is formed the first year, and an unwinged flowering stalk the second year. Flower heads do not have stiff spines as in most other thistles, but instead are weakly spined and sticky because of a gummy resin. Flowers are pink to purple. In flower July-October.

ECOLOGICAL NOTES: Swamp thistle, or fen thistle, is characteristic of calcareous fens and also occurs in wet to wet-mesic prairies and sedge meadows supported by groundwater seepages.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

CALCAREOUS FENS



© Photos by Steve D. Eggers

GOLDEN RAGWORT

(*Packera aurea* (L.) A. & D. Love)

ASTER FAMILY (Compositae or Asteraceae)

C of C: Native (6)

IND. STATUS: FACW

SYNONYM: *Senecio aureus* L.

FIELD CHARACTERISTICS: A perennial herb to 30-80 cm. in height. Basal leaves are heart-shaped, 5-10 cm. long and as wide, on long petioles with rounded teeth. Stem leaves are much smaller and pinnately-lobed becoming sessile. Flower heads number several to many, the disc is 5-10 mm. wide. Rays are golden yellow and 6-13 mm. long. The involucre is 5-8 mm. tall, the tips often purple. Fruit is a smooth nutlet (achene). In flower May-June.

ECOLOGICAL NOTES: Golden ragwort occurs primarily in wet to wet-mesic prairies and calcareous fens.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Black and Judziewicz (2009).

CALCAREOUS FENS



© Steve D. Eggers

SWAMP LOUSEWORT

(*Pedicularis lanceolata* Michx.)

FIGWORT FAMILY (Scrophulariaceae) **C of C:** Native (8) **IND. STATUS:** FACW(NC/NE)
OBL(MW, GP)

FIELD CHARACTERISTICS: A perennial herb with stems 30-80 cm. tall. Leaves are opposite, or in part alternate, lanceolate, 4-9 cm. long and 1-2 cm. wide, pinnately-lobed with margins of rounded teeth. Flowers are in spikes 2-10 cm. long at the end of branches from the upper leaf axils. Flowers are pale yellow, two-lipped and about 2 cm. long. Fruit is a capsule. In flower July-August.

ECOLOGICAL NOTES: Swamp lousewort primarily occurs in calcareous fens and wet to wet-mesic prairies.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Black and Judziewicz (2009).

CALCAREOUS FENS



BROOK LOBELIA

(*Lobelia kalmii* L.)

BELLFLOWER FAMILY (Campanulaceae)

C of C: Native (9)

IND. STATUS: OBL

FIELD CHARACTERISTICS: A perennial herb 10-40 cm. high. Basal leaves are spatula-shaped and may be deciduous. Stem leaves are linear. Inflorescence is a loose raceme with small (7-13 mm. long) flowers that are blue with a white “eye.” Flowers consist of an erect, upper, 2-lobed lip and spreading, lower, 3-lobed lip. In flower July-October.

ECOLOGICAL NOTES: Brook lobelia is characteristic of calcareous fens and shores. It also occurs on calcareous soils of wet to wet-mesic prairies and wet lake dune flats if groundwater seepages are present.

SOURCE: Gleason and Cronquist (1991).

CALCAREOUS FENS



© Steve D. Eggers

FEN TWAYBLADE

(*Liparis loeselii* (L.) L.C. Rich.)

ORCHID FAMILY (Orchidaceae)

C of C: Native (6 MN)(7 WI)

IND. STATUS: OBL(GP)
FACW(NC/NE, MW)

FIELD CHARACTERISTICS: A perennial herb 10-25 cm. tall from a bulb-like base. Two shiny leaves, lanceolate to oval and 4-15 cm. long by 1-4 cm. wide, arise from the base of the plant. Flowers number 2-15 and are arranged in an open raceme 2-10 cm. long and 1-2 cm. wide. Flowers are yellow-green with lanceolate sepals 4-6 mm. long and linear petals 3-5 mm. long. The lip is obovate, 4-5 mm. long and 2-3 mm. wide. Fruit is a capsule that is short-cylindric and 8-12 mm. long. In flower June-August.

ECOLOGICAL NOTES: Fen twayblade primarily occurs in calcareous fens but also in coniferous swamps.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Black and Judziewicz (2009).

CALCAREOUS FENS



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WHITE LADY'S-SLIPPER (*Cypripedium candidum* Muhl. ex Willd.)

ORCHID FAMILY (Orchidaceae)

IND. STATUS: OBL

C of C: Native (10); a threatened species in Wisconsin and a species of special concern in Minnesota

FIELD CHARACTERISTICS: A perennial herb 15-40 cm. high. Stems range in number from 1-30 per plant. Leaves on the stem number 3-5 and are curved and strongly ribbed or pleated. Leaves tend to form an erect cluster near the ground, sheathing the stem. Flowers are distinctive and solitary with a white lip (1.5-2.5 cm. long) streaked with violet. Sepals and lateral petals are 2-4 cm. long, green-yellow and streaked with purple. Lateral petals are often spirally twisted. In flower from mid-May to early June, only for a few days in hot weather.

ECOLOGICAL NOTES: White lady's-slipper is a rare orchid that occurs on calcareous, wet soils of calcareous fens and wet to wet-mesic prairies. The flowers and flower buds are eaten by white-tailed deer and eastern cottontail.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

CALCAREOUS FENS



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NODDING LADIES' TRESSES ORCHID

(*Spiranthes cernua* (L.) L.C. Rich.)

ORCHID FAMILY (Orchidaceae)

C of C: Native (5)

IND. STATUS: FACW

FIELD CHARACTERISTICS: A perennial herb seldom over 20 cm. high. Stem leaves are usually persistent at flowering time. Several white flowers, with lips 7-12 mm. long, form a 3-ranked, spirally twisted spike. Callosities at the base of the lip are conspicuous, projecting, and rounded. Flowers are sometimes fragrant. In flower August-October.

ECOLOGICAL NOTES: Nodding ladies' tresses is a frequent orchid of inland fresh meadows, particularly calcareous fens and wet to wet-mesic prairies that have been slightly disturbed.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1991).

CALCAREOUS FENS



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NORTHERN BOG VIOLET (*Viola nephrophylla* Greene)

VIOLET FAMILY (Violaceae)

C of C: Native (8 MN)(9 WI)

IND. STATUS: FACW

FIELD CHARACTERISTICS: A low perennial herb 10-15 cm. in height and spreading by rhizomes. Leaves are all basal, smooth, heart-shaped to kidney-shaped, 1-4 cm. long and 2-6 cm. wide, and rounded at the tip. Leaves arise from long petioles that are 2-16 cm. long. Leaf margins have rounded tips. Flowers are violet, single, nodding on slender stalks and held above the leaves. The spurred petal is densely hairy within. Fruit is a capsule 5-10 mm. long. In flower in May, but sometimes flowering again in August or September.

ECOLOGICAL NOTES: Northern bog violet prefers cold, groundwater-fed, calcareous habitats such as calcareous fens and some interdunal swales.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Black and Judziewicz (2009).

CALCAREOUS FENS



© Photos by Steve D. Eggers

LESSER FRINGED GENTIAN (*Gentianopsis virgata* (Raf.) Holub)

GENTIAN FAMILY (Gentianaceae)

IND. STATUS: OBL

SYNONYM: *Gentianopsis procera* (Holm) Ma **C of C:** Native (8); special concern in Wisconsin

FIELD CHARACTERISTICS: A biennial herb up to 80 cm. tall. Leaves are opposite, without stalks, linear to lance-shaped, and less than 1 cm. (8 mm.) wide. Flowers are blue with four fringed corolla lobes, and are solitary to numerous at the end of branches. In bloom September-October.

Greater fringed gentian (*Gentianopsis crinita*) is similar, but occurs in less calcareous habitats. *G. crinita* leaves are greater than 1 cm. wide and the flowers are more box-shaped. These two species may hybridize.

ECOLOGICAL NOTES: Lesser fringed gentian is characteristic in calcareous fens, and also occurs on calcareous soils of wet to wet-mesic prairies and along shores, particularly if groundwater seepages are present.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

CALCAREOUS FENS



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SHRUBBY CINQUEFOIL

(*Dasiphora fruticosa* (L.) Rydb.)

ROSE FAMILY (Rosaceae)

C of C: Native (7 MN)(9 WI)

IND. STATUS: FACW

SYNONYMS: *Potentilla fruticosa* L., *Pentaphylloides floribunda* (Pursh) A. Love

FIELD CHARACTERISTICS: A low, bushy, deciduous shrub with woody stems usually 20-50 cm. tall, but can be up to 1 m. high. Leaves are pinnately compound with 5-7 fuzzy leaflets that are gray-green and about 1-2 cm. long. The five-petaled flowers are yellow, 2-3 cm. wide, and solitary to few at the ends of branches. In flower May-October.

ECOLOGICAL NOTES: Shrubby cinquefoil occurs on calcareous soils, particularly in calcareous fens. Occasionally, it is found in wet to wet-mesic prairies, bogs and along shores. It tends to increase aggressively with declining water levels. A horticultural variety of this species is used for landscaping.

SOURCE: Fassett (1976); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

CALCAREOUS FENS



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Pistillate catkins

SAGE WILLOW

(*Salix candida* Fluegge ex Willd.)

WILLOW FAMILY (Salicaceae)

C of C: Native (9 MN)(10 WI)

IND. STATUS: OBL

FIELD CHARACTERISTICS: A low deciduous shrub usually up to 1 m. high. Leaves are entire with inrolled margins, have dense white-matted hairs on the undersides, and are 4-8 cm. long by 0.7-2 cm. wide (between 5-10 times as long as wide). Twigs are also covered by dense white-matted hairs, but tend to become somewhat hairless with age. Capsules are woolly and pink-white in color (see photograph). In flower April-May.

ECOLOGICAL NOTES: In addition to calcareous fens, this small willow is found in wet to wet-mesic prairies, coniferous swamps and bogs. It usually is found growing solitary and scattered.

SOURCE: Gleason and Cronquist (1991); and Swink and Wilhelm (1994).