SECTION 3

Bogs

IV. Bogs

Bogs are a specialized wetland community with saturated, acidic, peat soils that have low concentrations of minerals (e.g., calcium, magnesium) and essential nutrients (phosphorus, nitrogen). They support a unique assemblage of trees, low shrubs, sedges and forbs growing on a mat of *Sphagnum* mosses (Curtis 1971). In Minnesota and Wisconsin, most bogs are found north of the vegetation tension zone.

Bogs are one stage in succession from open water lake to climax mesic hardwood forest (Curtis 1971). The bog originates on a floating mat of sedges that becomes colonized by *Sphagnum* mosses. As the mat gradually thickens and becomes more stable it is invaded by the evergreen shrubs of the heath family (Ericaceae). Eventually, tamarack and black spruce can be supported by the mat. The final stage of succession is, theoretically, climax mesic hardwood forest. Note that succession is rarely without interruption. It is typically a series of advancements and setbacks primarily due to fire and/or changes in water levels. These changes may be a cyclic, rather than a linear, type of vegetation development (Niering 1994). Also note that there are similar successional patterns for other wetland plant communities.

In addition to providing habitat for a unique assemblage of flora, including many orchid species, bogs are an important habitat for northern wildlife species such as gray wolf, moose, shrews, voles, snowshoe hare, red squirrel, amphibians, reptiles, spruce grouse, great gray owl, northern goshawk and numerous species of songbirds. Uses of bogs include harvesting of *Sphagnum* moss, Christmas trees, and commercial production of cranberries and wild rice.

IV.A. Open Bogs

Open bogs are composed of a carpet of living *Sphagnum* mosses growing over a layer of saturated, acidic peat. Sedges, forbs and/or the low shrubs of the heath family (Ericaceae) colonize the *Sphagnum* moss mat. Scattered, usually stunted trees of black spruce and/or tamarack may be present. Lack of forest is probably due to: conditions too wet for the tree species; *Sphagnum* moss mat too thin to support trees; recurrent fires; summer frosts; and/or lack of a seed source for the tree species.

VEGETATION: This floating bog mat supports a carpet of sphagnum mosses (*Sphagnum magellanicum* and *Sphagnum* spp.), bog sedge (*Carex oligosperma*), poor sedge (*Carex magellanica*), tawny cottongrass (*Eriophorum virginicum*), three-way sedge (*Dulichium arundinaceum*), steeplebush (*Spiraea tomentosa*), leatherleaf (*Chamaedaphne calyculata*), bog rosemary (*Andromeda polifolia*), labrador tea (*Rhododendron groenlandicum*), small cranberry (*Vaccinium oxycoccos*), large cranberry (*Vaccinium macrocarpon*), bog buckbean (*Menyanthes trifoliata*), poison sumac (*Toxicodendron vernix*), broad-leaf cattail (*Typha latifolia*) and scattered tamarack (*Larix laricina*). Three species of insectivorous plants occur in this bog community: flat-leaf bladderwort (*Utricularia intermedia*), pitcher plant (*Sarracenia purpurea)* and sundew (*Drosera rotundifolia*).

SOILS: Fibric peat (Histosols), acid. Along the perimeter of the lake basin, the peat mat is thick enough to support tree-size tamarack and black spruce. The mat becomes progressively thinner moving out towards the center of the lake basin until it only consists of a thin mat of sedge roots/rhizomes and layer of *Sphagnum* moss.

HYDROLOGY: A floating mat covering part of Beckman Lake. Fibric peat soils are saturated to the surface.

LOCATION: Beckman Lake Bog, Cedar Creek Ecosystem Science Reserve, Isanti County, Minnesota.

SPHAGNUM MOSSES

(*Sphagnum* spp.)

SPHAGNUM MOSS FAMILY (Sphagnaceae)

Sphagnum mosses are the characteristic species of bogs. They play an important role in keeping the bog environment acidic by their production of organic acids. Sphagnum mosses are commonly known as peat moss. No indicator status or C of C values have been assigned to the *Sphagnum* mosses that occur in Minnesota and Wisconsin. It is presumed that the five species shown herein are OBL.

Sphagnum moss has been used for many purposes including fuel, mulch, packing, bedding and insulation. In the First World War, it was used for surgical dressings in lieu of cotton. Commercial peat mining is done in both Minnesota and Wisconsin. Harvested peat moss is primarily used for horticultural purposes.

Sphagnum magellanicum is a robust, hummock-forming moss that is usually reddish or purplish in color, but may be pale green in the shade. It is one of the most frequent species in our bogs and prefers the most acidic and nutrient-poor habitats.

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Sphagnum squarrosum is a less common and more minerotrophic species compared to *S. magellanicum*.

Sphagnum fuscum is a common species of open and coniferous bogs.

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Sphagnum Mosses

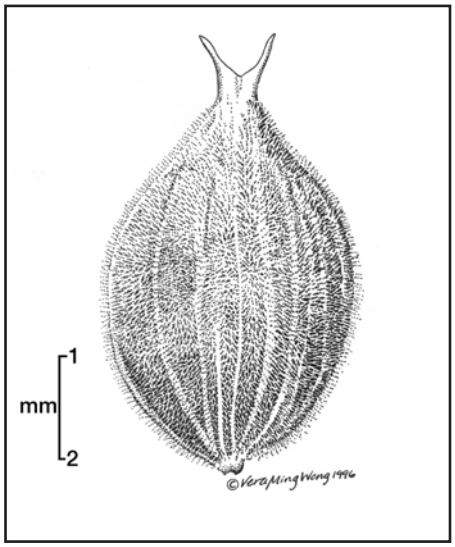
(*Sphagnum* spp.)

Sphagnum teres is a frequent species preferring slightly more minerotrophic habitats than *Sphagnum magellanicum*.

Sphagnum capillifolium is one of the most common moss species of open and coniferous bogs in our area.

Sphagnum Mosses

(*Sphagnum* spp.)



Perigynium

WIREGRASS SEDGE

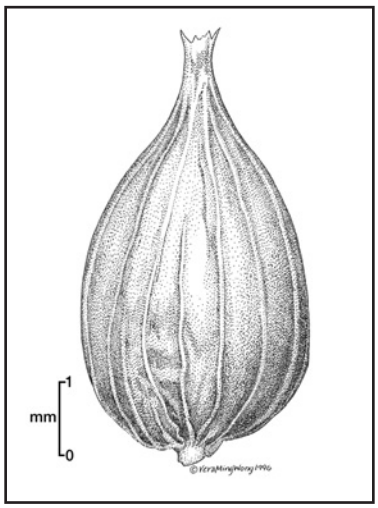
(*Carex lasiocarpa* Ehrh.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (7 MN)(9 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A clone-forming, smooth, perennial sedge with triangular stems growing to 1 m. in height. Leaves are very slender (not over 2 mm. wide), wiry, characteristically C-shaped in cross section or inrolled, and taper to very slender tips. Pistillate spikelets number 1-3, are sessile or nearly so, and 1-3 cm. long. The 1-3 staminate spikelets are 2-6 cm. long. Perigynia are 3-4.5 mm. long and densely fuzzy with an oblong-oval shape and sharp teeth not over 0.5(0.7) mm. long.

ECOLOGICAL NOTES: Wiregrass sedge is a common to dominant sedge of bogs, calcareous fens, shrub-carrs, sedge meadows and shallow marshes; frequently in shallow water. The well developed, air-filled root and rhizome system produced by this sedge makes it one of the floating mat-forming species that create the first stage in bog succession.

SOURCE: Fernald (1970); Gleason and Cronquist (1991); and Voss (1972).



Perigynium

BOG SEDGE

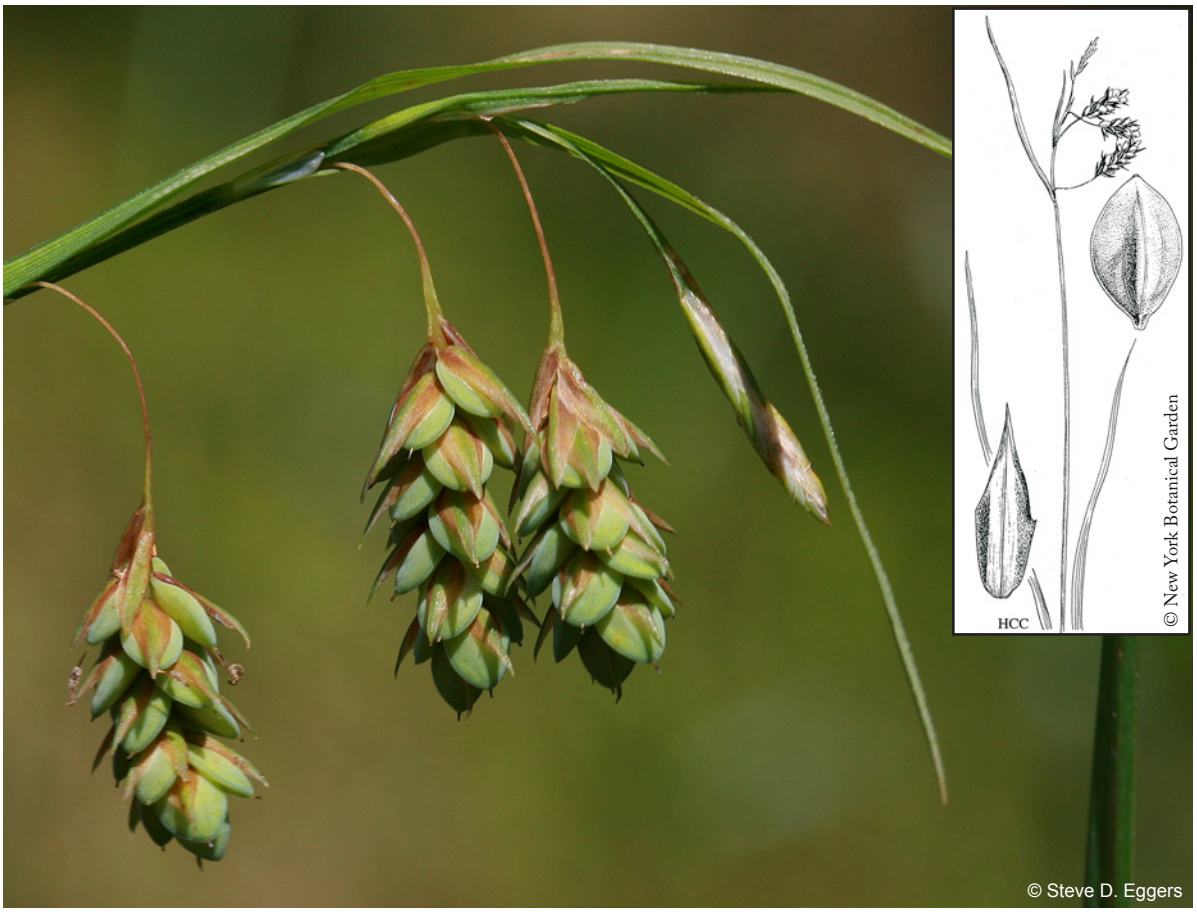
(*Carex oligosperma* Michx.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (8 MN)(10 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial sedge forming rhizomatous mats (may form a turf) with stems 40-100 cm. tall. Pale green, wiry leaf blades are inrolled (involute) and less than 3 mm. wide. Stems are glabrous and reddish at the base. Usually only a solitary staminate spikelet is present while pistillate spikelets number 1-3. Ascending perigynia number 3-15 (less than 18), are ovoid, and over 2 mm. wide with a 1-2 mm. beak. Sterile plants of this sedge may be confused with woolly sedge (*Carex pellita*), but leaf blades of woolly sedge are revolute and 2.5-4.5 mm. wide.

ECOLOGICAL NOTES: Bog sedge is characteristic of open bogs and coniferous bogs.

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



POOR SEDGE

(*Carex magellanica* Lam.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (8 MN)(10 WI) **IND. STATUS:** OBL

SYNONYM: *Carex paupercula* Michx.

FIELD CHARACTERISTICS: A perennial sedge with loosely clustered stems growing 20-70 cm. in height, the remains of last year's leaves commonly persisting at the base. Leaves are flat and 1-3 mm. wide. The terminal spikelet is staminate and 0.7-1.5 cm. in length. Pistillate spikelets number 1-4, nodding on long peduncles, often with a few staminate flowers at the base. Pistillate scales are light to dark brown, generally longer and narrower than the perigynia, and have a green midstripe (visible in photo). Perigynia are elliptic to ovate, 2-ribbed, beakless or with a minute beak, and 2.3-4.2 mm. in length. Nutlets (achenes) are 3-sided.

ECOLOGICAL NOTES: Poor sedge is a common species of open and coniferous bogs preferring the acidic, low nutrient and low mineral (poor) conditions of these habitats.

SOURCE: Gleason and Cronquist (1991).

FEW-FLOWERED BOG SEDGE

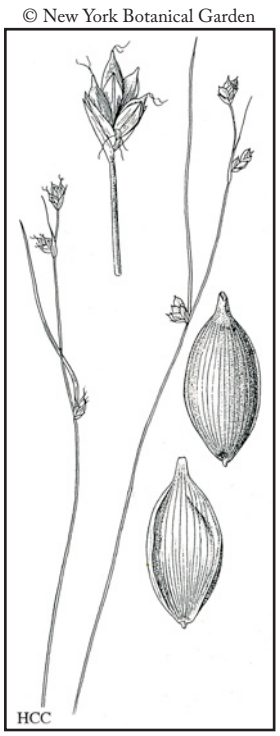
(*Carex pauciflora* Lightf.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (9 MN)(10 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial sedge with a single to few stems occurring in loose tufts. Each stem has 1-2(3) leaves that are 1-2 mm. wide. Stems are up to 40 cm. tall and typically longer than the leaves. There is only one spikelet per stem consisting of 1-6 perigynia. The very distinctive linear-lance shaped perigynia are slender, 7-9 mm. long, divergent to reflexed along the stem, and nearly rounded in cross section. They are initially light green, becoming straw to pale brown in color. Nutlets are bluntly three-angled.

ECOLOGICAL NOTES: Few-flowered bog sedge is essentially restricted to the acidic, low nutrient conditions of *Sphagnum* bogs, usually on the open mat.

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



THREE-SEEDED SEDGE

(*Carex trisperma* Dewey)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (9 WI)(7 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A loosely clumped perennial sedge with weak, slender, arching stems to 20-70 cm. in height. Leaves are 1-2 mm. wide. Bracts are threadlike and typically as long as the inflorescence. The widely separated spikelets are arranged in a zigzag pattern along the stem, sessile, number 2-3(4), and support fewer than 5 perigynia, usually 3. Staminate spikelets are basally located in the inflorescence. Ovoid perigynia are 2.7–3.8(4) mm. long and slightly beaked. Scales are ovate and shorter than the perigynia and hyaline with green centers. Nutlets are flat on one side and convex on the other.

This sedge can be confused with *Carex disperma* whose nutlets tend to be round in cross section.

ECOLOGICAL NOTES: Three-seeded sedge is characteristic of the shaded portion of *Sphagnum* bogs under spruce and tamaracks.

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

TAWNY COTTONGRASS

(*Eriophorum virginicum* L.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (10 WI)(8 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A colonial, perennial sedge with stems growing to a height of 1 m. Stem leaf blades are flat and up to 4 mm. or more wide. Two or three involucral bracts are leaf-like and often exceed the inflorescence. Summit of leaf sheaths are not tinged with a dark red color, as seen in *Eriophorum angustifolium*. Scales are thick, brownish to reddish and the mid-nerve is inconspicuous. Spikelets are several and form a dense cluster. Nutlets are 3-3.5 mm. long and surrounded by brown to coppery (tawny) silky bristles. In flower mid-July through August, which is notably later than other *Eriophorum* species in Minnesota and Wisconsin.

ECOLOGICAL NOTES: Tawny cottongrass occurs in coniferous swamps and bogs as well as open bogs.

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

TUSSOCK COTTONGRASS

(*Eriophorum vaginatum* L.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (10 WI)(9 MN) **IND. STATUS:** OBL

SYNONYM: *Eriophorum spissum* Fern.

FIELD CHARACTERISTICS: A clump-forming, perennial sedge with stems to a height of 20-70 cm. Leaves are thread-like and 1 mm. wide. Spikelets are solitary with several sterile, basal scales. Nutlets are 2.5-3.5 mm. long and are surrounded by long, silky, bright white bristles. In flower, and thus conspicuous, in May and June. Tussock cottongrass is the only *Eriophorum* in Minnesota and Wisconsin that is both densely cespitose (clump-forming) and has a single spikelet per stem.

ECOLOGICAL NOTES: Tussock cottongrass is generally restricted to bogs. Its name is derived from the fact that the flowering head resembles a ball of cotton.

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

DARK-SCALE COTTONGRASS

(*Eriophorum viridicarinatum* (Engelm.) Fern.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (9 MN)(10 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A colonial, perennial sedge from spreading rhizomes. Stems are more or less round in cross section and grow to 30-70 cm. in height. Uppermost leaves are 10-15 cm. long with green sheaths that lack a dark band at the tip (differentiates this species from *E. angustifolium*). Spikelets are terminal on the stem, typically number 20-30, with short to long pedicels. Involucral bracts number 2-4. Scales are narrowly ovate and blackish-green with a pale midrib that extends to the very tip of the scale. Nutlets are brown, 3-4 mm. long, and surrounded by bright white, silky bristles. In flower May-June.

ECOLOGICAL NOTES: Dark-scale cottongrass is generally restricted to open bogs and openings in coniferous bogs.

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

LEATHERLEAF

(*Chamaedaphne calyculata* (L.) Moench)

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

FIELD CHARACTERISTICS: A low, evergreen shrub usually 30-40 cm. tall occasionally growing to 1.5 m. in height. Leaves are alternate, oblong to elliptic, 1.5-5 cm. long, leathery, and minutely scaled beneath. Leaves assume a characteristic russet color in winter (inset photo). Flowers are white, tubular, 6-7 mm. long and arranged in 1-sided, leafy racemes. In flower April-June.

ECOLOGICAL NOTES: Leatherleaf is restricted to bogs. It often forms colonies covering many acres.

SOURCE: Fernald (1970); and Gleason and Cronquist (1991).

Fruit is a linear capsule 5-6 mm. long.

LABRADOR-TEA

(*Rhododendron groenlandicum* (Oeder) K.A. Kron & Judd)

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

SYNONYM: *Ledum groenlandicum* Oeder

FIELD CHARACTERISTICS: A low, evergreen shrub growing to a height of 1 m. Leaves are alternate, lanceolate to elliptic, 2-5 cm. long and entire. Leaves have strongly enrolled margins and are dark green above and orange-woolly beneath (younger leaves may be white-woolly beneath). Flowers are white, 1 cm. wide, composed of 5 petals, and arranged in terminal clusters. Fruit is a lance-shaped capsule 5-6 mm. long. In flower May-June.

ECOLOGICAL NOTES: Labrador-tea is restricted to bogs north of the vegetation tension zone.

SOURCE: Courtenay and Zimmerman (1972); Fernald (1970); Gleason and Cronquist (1991); and Chadde (2011).

BOG ROSEMARY

(*Andromeda polifolia* L.)

HEATH FAMILY (Ericaceae) **C of C:** Native (10 WI)(9 MN) **IND. STATUS:** OBL

SYNONYM: *Andromeda glaucophylla* Link

FIELD CHARACTERISTICS: A low, evergreen shrub growing to 50 cm. in height. Leaves are alternate, narrowly linear, 2-5 cm. long, sessile, entire, leathery and strongly inrolled. Leaves are blue-green above and whitened below. The corolla is urn-shaped, pink (sometimes white), 5-6 mm. long and arranged on terminal, drooping, umbel-like racemes with stalks to 8 mm. Fruit is a rounded capsule to 5 mm. wide that becomes erect when mature (upper left photograph). In flower May-June.

ECOLOGICAL NOTES: Bog rosemary is restricted to bogs.

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

SMALL CRANBERRY

(*Vaccinium oxycoccos* L.)

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

SYNONYM: *Oxycoccus quadripetalus* Gilib.

FIELD CHARACTERISTICS: A very small, weak, creeping, evergreen, vine-like shrub 50 cm. or more long. Leaves are alternate, ovate to elliptical, pointed, 7-10 mm. long and 2.5-5 mm. wide, leathery, and have flat to strongly inrolled margins. Pink flowers are 1 cm. wide, 5-6 mm. long and shaped like those of a shooting star with petals turned back, away from the stigma and stamens. Flowers are solitary on stalks with 2 red bracts. Fruit is a red berry 7-12 mm. in diameter. In flower from early June to mid-July.

ECOLOGICAL NOTES: Small cranberry is restricted to bogs where it is abundantly common on the *Sphagnum* mat.

SOURCE: Gleason and Cronquist (1991); Smith (2008); and Chadde (2002).

LARGE CRANBERRY

(*Vaccinium macrocarpon* Ait.)

HEATH FAMILY (Ericaceae) **C of C:** Native (9) **IND. STATUS:** OBL

SYNONYM: *Oxycoccus macrocarpus* (Ait.) Pers.

FIELD CHARACTERISTICS: A very small, weak, creeping, evergreen, vine-like shrub to 1.5 m. in length. Leaves are alternate, elliptical to obovate, rounded to blunt at the apex, 9-16 mm. long by 3-7 mm. wide, leathery, and have flat to strongly inrolled margins. Pink flowers are 6-9 mm. long and shaped like those of a shooting star with petals turned back, away from the stigma and stamens. Flowers are solitary on stalks with 2 ovate, green, leaf-like bracts. Fruit is a red berry 10-16 mm. in diameter. In flower from mid-June to July.

ECOLOGICAL NOTES: Large cranberry is restricted to bogs. Cranberries are an important commercial crop in Wisconsin. Commercial varieties of cranberries were developed using cuttings taken directly from the native or "wild" strain of *V. macrocarpon*.

SOURCE: Gleason and Cronquist (1991); Smith (2008); and Chadde (2002).

PITCHER PLANT

(*Sarracenia purpurea* L.)

PITCHER PLANT FAMILY (Sarraceniaceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: A perennial herb that usually grows in a clump-like fashion. Leaves are hollow, pitcher-shaped, broadly winged, growing to a height of 10-20 cm. and a width of 1-5 cm. Leaves are green to red to yellowish and heavily veined. Interior lips of the leaves have stiff, downfacing hairs that trap insects and other organisms. Flowers are borne on a long, leafless stalk (30-50 cm. tall) and are mostly dark red to purple. In flower May-August.

ECOLOGICAL NOTES: Pitcher plant is found in bogs and some calcareous fens. It prefers sunny habitats, but does survive more shaded conditions as succession advances. The pitcher-shaped leaves of this insectivorous species collect water, and the stiff, downfacing hairs make it easier for an insect or other organism to travel downward rather than upward. The hairs abruptly stop at the "pitcher" where the plant tissue becomes very slippery. Once inside, the organism may not be able to crawl back up the "pitcher" wall and slips into the water. "Digestion" of the organism provides needed nutrients for the plant.

SOURCE: Gleason and Cronquist (1991); and Voss (1985).

Pitcher Plant

(*Sarracenia purpurea*)

Flower

An assortment of insects trapped within the pitcher.

SUNDEW

(*Drosera rotundifolia* L.)

SUNDEW FAMILY (Droseraceae) **C of C:** Native (7 WI)(8 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A tiny, perennial herb forming a small rosette (half dollar size or smaller) near the ground. Leaf blades are round and covered with reddish, glandular hairs. Flowers are white (rarely pink) and 4-7 mm. wide. The leafless stalk is 7-30 cm. high with 3-15 flowers. In flower July-August. Other species of sundew (*Drosera* spp.) are found in Minnesota and Wisconsin, but have narrower leaves.

ECOLOGICAL NOTES: Sundew is found in bogs, coniferous swamps, and wet, sunny, acidic, sandy habitats. This insectivorous species has reddish, glandular hairs that secrete dew-like drops of a sticky fluid that traps minute animal life. The captured prey is then "digested" thereby providing needed nutrients to the plant.

SOURCE: Courtenay and Zimmerman (1972); Gleason and Cronquist (1991); and Voss (1985).

FLAT-LEAF BLADDERWORT

(*Utricularia intermedia* Hayne)

BLADDERWORT FAMILY (Lentibulariaceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: An annual, aquatic, herb free-floating or with creeping stems along the substrate in shallow water. Stems are weak and 7.5-25 cm. long. Leaves are numerous, 0.5-2 cm. long, primarily 3-parted near the base, then again divided 1-3 times, the segments flat and linear. Bladders are 2-4 mm. wide on branches separate from the leaves. Yellow flowers number 2-4 on an emergent stalk 5-20 cm. long. The lower lip of the flower is 8-12 mm. long, twice the length of the upper lip. The spur is nearly as long as the lower lip. In flower July-August. See Appendix C for a key to bladderworts.

ECOLOGICAL NOTES: Flat-leaf bladderwort is found in open bogs, marshes, fens, interdunal swales, ponds and rivers. Swink and Wilhelm (1994) note that this bladderwort occurs in acidic habitats (e.g., *Carex lasiocarpa* mats) as well as calcareous habitats.

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

WATER ARUM

(*Calla palustris* L.)

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

FIELD CHARACTERISTICS: A perennial herb from rhizomes creeping in peat, mud, or floating. The spathe is broad, white, and 3-5 cm. long with a tip 5-10 mm. long. Spadix is golden, ovate to elliptic, fleshy, 1.5-2.5 cm. long and packed with flowers. Leaves are ovate to subrotund, heart-shaped at the base and 5-10 cm. long on petioles 10-20 cm. long. Fruit is a cluster of berries turning from green to red when mature. In flower during June.

ECOLOGICAL NOTES: Water arum is found in bogs and shallow, acidic waters.

SOURCE: Courtenay and Zimmerman (1972); Gleason and Cronquist (1991); and Voss (1972).

SHOWY LADY'S-SLIPPER

(*Cypripedium reginae* Walt.)

ORCHID FAMILY (Orchidaceae) **IND. STATUS:** FACW

C of C: Native (9 WI)(8 MN), a species of special concern in Wisconsin

FIELD CHARACTERISTICS: A hairy, perennial herb with flowers composed of white sepals and petals, and a large inflated lip (pouch) 3-5.5 cm. long. The lip is white with purple to rose to pink streaks. Flowers number 1-2 (rarely 3 or 4) per stem. Stems are leafy, hairy and 20-100 cm. in height. Leaves are elliptic-oval to ovate, 10-20 cm. long, strongly ribbed, hairy and clasp the stem. In flower during June.

ECOLOGICAL NOTES: Showy lady's-slipper, Minnesota's state flower, is found in bogs, wooded swamps, calcareous fens, and along calcareous ridges and dunes in both shaded and open (sunny) habitats. It is occasional to common in its preferred habitats in Minnesota, but is much less common in Wisconsin. The hairs on the stem and leaves are irritating to some people producing a rash similar to that caused by poison ivy.

SOURCE: Fernald (1970); Gleason and Cronquist (1991); Voss (1972); and Smith (1993).

ROSE POGONIA

(*Pogonia ophioglossoides* (L.) Ker-Gawl.)

ORCHID FAMILY (Orchidaceae) **C of C:** Native (9) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb with a stem 15-45 cm. in height. Usually a single leaf is produced about midway up on the stem. The leaf is elliptical, sessile and veiny, 3-12 cm. long and 0.6-2 cm. wide. One pink to purple flower is produced per stem, typically. Sepals are elliptical and 1.3-2.4 cm. long and 2-6 mm. wide. Petals are broadly elliptical and 1.3-2.3 cm. long by 0.7-1.2 cm. wide. Lip is pinkish with purple veins, 1.4-2.1 cm. long by 5-10 mm. wide, conspicuously bearded with a crest of bristles. In bloom mid-June to late July.

ECOLOGICAL NOTES: Rose pogonia occurs in open bogs, coniferous bogs and coniferous swamps particularly on *Sphagnum* mosses under a partial canopy of northern white cedar, tamarack or spruce. It also occurs on floating mats and in sedge meadows with acidic, peat soils.

SOURCE: Gleason and Cronquist (1991); and Smith (1993).

GRASS PINK

(*Calopogon tuberosus* (L.) B.S.P.)

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

FIELD CHARACTERISTICS: A perennial herb with a glabrous stem 19-55 cm. in height. A single, essentially basal leaf is linear and grasslike, 10-35 cm. long by 0.2-1.6 cm. wide. Inflorescence is a terminal raceme with 2-12 pink to purple (or rarely white) flowers. Sepals are ovate to elliptical and 1.2-2.4 cm. long by 5-11 mm. wide. Petals are oblong or oblong-elliptical 1.3-2.4 cm. long by 5-8.5 mm. wide. Lip is the uppermost part of the flower, broadly winged and 1.1-2 cm. wide by 6.5-14 mm. wide. The ventral surface of the lip is bearded with yellow-tipped bristles. In flower mid-June to early August.

ECOLOGICAL NOTES: Grass pink occurs in coniferous swamps and bogs, usually under a sparse canopy of northern white cedar, tamarack or spruce. It also occurs on floating mats dominated by sedges or *Sphagnum* mosses.

SOURCE: Gleason and Cronquist (1991); and Smith (1993).

Photos by Steve D. Eggers

MARSH CINQUEFOIL

(*Comarum palustre* L.)

ROSE FAMILY (Rosaceae) **C of C:** Native (7 MN)(8 WI) **IND. STATUS:** OBL

SYNONYM: *Potentilla palustris* (L.) Scop.

FIELD CHARACTERISTICS: A perennial herb with somewhat woody, reddish-brown stems that are trailing or erect to 20-60 cm. in length. Leaves are long-petioled and pinnately compound. Leaflets number 5-7 and are narrowly oblong to elliptic, 5-10 cm. by 1-3 cm., sharply toothed and glaucous beneath. Inflorescence consists of several red-purple flowers that are 2 cm. wide. Nutlets are smooth and attached to the enlarged, spongy receptacle. In flower June-August.

ECOLOGICAL NOTES: Marsh cinquefoil is a common forb of bogs, especially in the "lagg" around the border of the bog and uplands.

SOURCE: Gleason and Cronquist (1991); and Fernald (1970).

BOG ARROW-GRASS

(*Scheuchzeria palustris* L.)

SCHEUCHZERIA FAMILY (Scheuchzeriaceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: A perennial herb with one to several stems that are 10-40 cm. long. Leaves are alternate and wiry with several arising from the base as well as along the erect stem. Leaves are 10-30 cm. long and only 1-3 mm. wide. Flowers consist of 6 tepals 2-3 mm. long that are green-white and arranged into several-flowered racemes 3-10 cm. long. Fruit consists of follicles 5-10 mm. long each with 2 seeds that are 4-5 mm. long. In flower May-June.

ECOLOGICAL NOTES: Bog arrow-grass, or Scheuchzeria, prefers the acidic habitat of bogs, typically growing on *Sphagnum* mosses or floating mats.

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

IV.B. Coniferous Bogs

Coniferous bogs are similar to open bogs in plant community composition except that mature trees of black spruce and/or tamarack are the dominant canopy species growing on the *Sphagnum* moss mat. Trees may be stunted due to the wet, nutrient- and mineral-poor conditions. *Sphagnum* moss is the dominant groundlayer species. Sedges, orchids and pitcher plants that have endured the shaded conditions are typically present, along with the heath family (Ericaceae) shrubs.

Black spruce and the heath family shrubs are characteristic only of acidic peats such as those associated with *Sphagnum* moss mats, whereas tamarack can grow in minerotrophic peats as well.

VEGETATION: This coniferous bog is dominated by tamarack (*Larix laricina*), black spruce (*Picea mariana*), leatherleaf (*Chamaedaphne calyculata*), tussock cottongrass (*Eriophorum vaginatum*) and a carpet of sphagnum moss (*Sphagnum magellanicum*). Other species present include small cranberry (*Vaccinium oxycoccos*), bog rosemary (*Andromeda polifolia*), bog laurel (*Kalmia polifolia*), bog sedge (*Carex oligosperma*), tawny cottongrass (*Eriophorum virginicum*), sphagnum mosses (*Sphagnum* spp.) and woolgrass (*Scirpus cyperinus*). This photograph was taken in October when the tamarack had turned golden yellow in the process of shedding its needles.

SOILS: Loxley mucky peat (Typic Haplosaprists), very poorly-drained, acidic soils with an organic layer greater than 51 inches in depth. Landscape position is a kettle bog (ice block depression) located in rolling, glacial till.

HYDROLOGY: Direct precipitation (rainfall and snowmelt). Loxley soils are typically saturated at or near the surface throughout the growing season.

LOCATION: Washburn County, Wisconsin.

BLACK SPRUCE

(*Picea mariana* (P. Mill.) B.S.P.)

PINE FAMILY (Pinaceae) **C of C:** Native (8 WI)(7 MN) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: An evergreen conifer growing to a height of 10(25) m. and 48 cm. dbh; frequently stunted and scrubby. Like those of all spruces, the twigs have woody pegs for the quadrangular (4-sided) needles. Needles are 6-18 mm. long, blue-green and covered with a pale, waxy coating. Twigs and buds are hairy (see photograph). The cones are 1.5-3.5 cm. long (which is shorter than other spruces), dark purple when young, later turning gray-brown. Cones usually remain on the tree for several years.

ECOLOGICAL NOTES: In Minnesota and Wisconsin, black spruce is typically found in coniferous bogs and scattered in open bogs north of the vegetation tension zone. It often grows with tamarack (*Larix laricina*). Black spruce is parasitized by dwarf mistletoe (*Arceuthobium pusillum*) that causes the twigs to form dense clusters called "witches' brooms." Like tamarack, the shallow root system of black spruce frequently results in "wind throw." Fire hastens opening of the cones. Given a mixed stand of black spruce and tamarack, fires would gradually promote dominance by black spruce while eliminating tamarack, which is very susceptible to fire.

SOURCE: Curtis (1971); Gleason and Cronquist (1991); Smith (2008); and Voss (1972).

TAMARACK

(*Larix laricina* (Du Roi) K. Koch)

PINE FAMILY (Pinaceae) **C of C:** Native (8 WI)(7 MN) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: A deciduous conifer growing to a height of 26 m. and 84 cm. dbh; frequently stunted and scrubby. It has a cone-shaped growth pattern like the spruces (*Picea* spp.). Dwarf, spur-like branches are produced that support clusters of soft, slender, needle-like leaves. Leaves are typically less than 2.5 cm. long. Young cones are purple; mature cones are pale brown with less than 20 scales and are 1-2 cm. long.

ECOLOGICAL NOTES: Tamarack is the dominant or codominant tree in many coniferous swamps and bogs. Both north and south of the vegetation tension zone, it occurs on circumneutral to alkaline soils (*Sphagnum* moss mat is lacking). North of the vegetation tension zone, it is also frequently associated with black spruce (*Picea mariana*) and sphagnum mosses (*Sphagnum* spp.) growing on acidic, peat soils. It is the only native deciduous conifer of Minnesota and Wisconsin; the needles turn golden yellow and are shed from late September to early November [see photograph on page 280].

SOURCE: Gleason and Cronquist (1991); Smith (2008); and Swink and Wilhelm (1994).

BOG BIRCH

(*Betula pumila* L.)

BIRCH FAMILY (Betulaceae) **C of C:** Native (7) **IND. STATUS:** OBL

SYNONYM: *B. pumila* L. var. *glandulifera* Regel

FIELD CHARACTERISTICS: A deciduous shrub 1-4 m. in height. The alternate leaves are simple, coarsely toothed and ovate. New leaves are pubescent, but lose their hairs as they age. Leaves have 3-6 pairs of lateral veins and are 2-3 cm. long. Twigs have woody, cone-like pistillate catkins, supported by a short, 5-10 mm. long peduncle. Pistillate catkins are conspicuous over the winter. Fruit is a small (ca 2 x 3 mm.), winged nutlet.

ECOLOGICAL NOTES: Bog birch is a distinctive shrub of bogs, the edges of conifer swamps and occasionally calcareous fens, sometimes forming large colonies. The birches readily form hybrids and bog birch is no exception. The hybrid *B. glandulifera* x *sandbergii* is common in our bogs.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); Smith (2008); and Fassett (1976).

Leaves and pistillate catkin

BOG WILLOW

(*Salix pedicellaris* Pursh)

WILLOW FAMILY (Salicaceae) **C of C:** Native (8) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A small, erect, deciduous shrub usually 1-2 m. high. Branches are few to none. Leaves are oblong, elliptical-oblong or obovate, 2-6 cm. long by 0.6-2 cm. wide with an acute to rounded apex. Margins of the leaves are entire, sometimes revolute. Upper leaf surfaces are dark green and net-veined while lower surfaces are pale green or gray-green. Male catkins are 0.5-2 cm. long; female catkins are 1.3-3 cm. long. In flower May to early June.

ECOLOGICAL NOTES: Bog willow is found in moderately to weakly acidic peatlands including coniferous bogs, coniferous swamps, shrub swamps and sedge meadows. It does not tolerate shading or crowding by larger woody plants and tends to occur under openings in the canopy.

SOURCE: Gleason and Cronquist (1991); and Smith (2008).

DRAGON'S-MOUTH

(*Arethusa bulbosa* L.)

ORCHID FAMILY (Orchidaceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: A perennial herb with a stem 7-36 cm. in height. The single leaf is linear-lanceolate and up to 18 cm. long and 3-8 mm. wide. A single flower is produced with rose-purple sepals that are linear oblong to narrowly elliptical and 2.5-4.5 cm. long by 4.5-8 mm. wide. Petals are similar but are shorter and wider. Lip is pink with rose-purple markings and a crest of yellow bristles. The lip is oblong, curves downward, and 2.6-3.8 cm. long. In flower late May-July.

ECOLOGICAL NOTES: Dragon's-mouth typically occurs in northern coniferous swamps and bogs particularly where there are gaps in the canopy. It also occurs on floating mats and in sedge meadows with acidic peat soils.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); Voss (1972); and Smith (1993).

PINK LADY'S-SLIPPER

(*Cypripedium acaule* Ait.)

ORCHID FAMILY (Orchidaceae) **C of C:** Native (8 MN)(7 WI) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: A perennial herb 14-44 cm. in height. Two basal leaves per stem are produced. Leaves are elliptical to obovate, 9-23 cm. long and 2.5-9 cm. wide. Flowers are solitary with sepals 2.5-4 cm. long and greenish to brown to purple in color. Petals are 2.8-4.5 cm. long and similar in color to the sepals. A large, inflated lip (pouch) is 3.3-6 cm. long and pink to purple in color. In flower late May to mid-July.

ECOLOGICAL NOTES: Pink, or stemless, lady's-slipper prefers shaded, acidic and nutrient-poor habitats. It is found in a wide variety of northern plant communities including bogs as well as upland forests of mixed oak, pine and aspen.

SOURCE: Gleason and Cronquist (1991); Voss (1972); and Smith (1993).

SECTION 3

Shrub Swamps

V. Shrub Swamps

Shrub swamps are wetland plant communities dominated by woody vegetation less than 20 feet in height and with a dbh of less than 6 inches. Shrub swamps in Minnesota and Wisconsin are categorized as shrub-carrs or alder thickets depending upon the dominant shrub species. Both occur on organic soils (peats/mucks) as well as on hydric mineral soils.

Shrub swamps are an important habitat for many songbirds, ruffed grouse, American woodcock and small mammals, and are particularly important winter habitat for ring-necked pheasant, eastern cottontail and white-tailed deer.

V.A. Shrub-Carrs

Shrub-carrs are plant communities composed of tall, deciduous shrubs growing on saturated to seasonally flooded soils. Dominant shrubs are typically willows, red-osier dogwood, silky dogwood, gray dogwood and/or *Spiraea*. Groundlayer species include some of the ferns, forbs, grasses and sedges of sedge meadow and fresh (wet) meadow communities. The diversity of groundlayer species is dependent upon the degree of shrub canopy cover, degree of disturbance, water source and other factors. For example, disturbed shrub-carrs may have a groundlayer dominated by reed canary grass, an invasive species. Relatively undisturbed shrub-carrs can have a high diversity of groundlayer species.

Shrub-carrs are common both north and south of the vegetative tension zone. Artificial drainage and fire suppression are two factors that promote succession of inland fresh meadow communities to shrub-carr communities.

A shrub-carr dominated by red-osier dogwood (*Cornus alba*) **in Trempealeau County, Wisconsin.**

VEGETATION: This shrub-carr is dominated by slender willow (*Salix petiolaris*), Canada blue-joint grass (*Calamagrostis canadensis*) and marsh fern (*Thelypteris palustris*). Additional shrub species include beaked willow (*Salix bebbiana*), pussy willow (*Salix discolor*), sandbar willow (*Salix interior*) and meadowsweet (*Spiraea alba*). Non-dominant herbaceous species include lake sedge (*Carex lacustris*), common yellow lake sedge (*Carex utriculata*), hummock sedge (*Carex stricta*), fowl bluegrass (*Poa palustris*), blue flag iris (*Iris versicolor*), tall meadowrue (*Thalictrum dasycarpum*), giant goldenrod (*Solidago gigantea*), redstem aster (*Symphyotrichum puniceum*), joe-pye weed (*Eutrochium maculatum*), marsh skullcap (*Scutellaria galericulata*), marsh milkweed (*Asclepias incarnata*) and water hemlock (*Cicuta maculata*).

SOILS: Seelyeville muck (Typic Haplosaprists), very poorly-drained soils with an organic layer greater than 51 inches in depth. Landscape position is a glacial lake plain.

HYDROLOGY: Seelyeville soils are typically saturated at or near the surface throughout the growing season and may be inundated by up to 1 foot of water.

LOCATION: Willowsippi Wildlife Management Area, Aitkin County, Minnesota.

SLENDER WILLOW

(*Salix petiolaris* Sm.)

WILLOW FAMILY (Salicaceae) **C of C:** Native (5 MN)(6 WI) **IND. STATUS:** FACW(NC/NE) OBL(MW, GP)

SYNONYM: *Salix gracilis* Anderss.

FIELD CHARACTERISTICS: A tall shrub to 4 m. height with many branches. Bark is gray, smooth or slightly rough. Leaves are linear to lanceolate to narrowly elliptical and 3.8-11 cm. by 0.6-1.9 cm. Leaf margins are serrate to subentire, upper surfaces are dark green while lower surfaces are pale green to grayish (glaucous). Immature leaves have long silky hairs. Flowers are in unisexual catkins that appear with the leaves or slightly before. Pistillate catkins are 1-3.5 cm. long while male catkins are 1-3 cm. long. Capsules are hairy and 4-8 mm. long. In flower April to late May.

ECOLOGICAL NOTES: Slender willow is probably the most common and abundant willow in Minnesota, often dominating or codominating large wetland complexes (Smith 2008). It is similarly common in Wisconsin. In addition to shrub-carrs, slender willow occurs in sedge meadows, shallow marshes, prairie swales and along riverbanks. It is apparently intolerant of strongly acidic soils (e.g., bogs) and flood-borne sediments (e.g., floodplain forests) that smother its roots.

SOURCE: Gleason and Cronquist (1991); and Smith (2008).

Leaves are dark green above and grayish (glaucous) below.

Leaves and pistillate catkins. Capsules have split open and released their seeds.

Pistillate catkins are short and wide.

Slender Willow

(*Salix petiolaris*)

PUSSY WILLOW

(*Salix discolor* Muhl.)

WILLOW FAMILY (Salicaceae) **C of C:** Native (2 WI)(3 MN) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: An erect, deciduous shrub usually 2-5 m. high. The alternate leaves are generally elliptic, entire to slightly toothed, dark green above, whitened beneath, and are without hairs (may have sparse hairs beneath); usually less than 5.5 times as long as wide. Large, roundish stipules are deciduous. Twigs are stout, reddish to dark brown, and lack hairs (although new twigs may be hairy). Plants are unisexual. Pistillate catkins are 3-12(14) cm. long with black scales, while staminate catkins are 1.5-5 cm. long. Fruit is a densely hairy capsule. In flower late March-May.

ECOLOGICAL NOTES: Pussy willow is common in shrub-carrs, inland fresh meadows, the edges of wooded swamps, and along shores. It is usually the first willow to flower in spring. Twigs are browsed by white-tailed deer, moose and eastern cottontail. Various willows (*Salix* spp.) can be recognized in winter by insect galls that may be shaped like pine cones. Willows (*Salix* spp.) in general hybridize, sometimes making identification difficult.

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


A female plant in full bloom - May 10.

Pussy Willow

(*Salix discolor*)

Pistillate catkin

Leaves and pistillate catkins

Leaf and staminate catkin

BEAKED WILLOW

(*Salix bebbiana* Sarg.)

WILLOW FAMILY (Salicaceae) **C of C:** Native (7 WI)(6 MN) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: An erect, deciduous shrub or small tree, usually 2-6 m. high, with one to a few stems. The alternate leaves are elliptic to obovate, subentire to crenate, and conspicuously rugose-reticulate veined. An abruptly acute leaf apex (beak) is present. Leaf blades are usually less than 2.8 times as long as wide and may be pubescent above, but glaucous underneath. Small, less than 2 mm. long, deciduous stipules may be present. Twigs are slender and brownish in color. Pistillate catkins are 2-7 cm. long while the staminate catkins are small and subsessile. Fruit is a pubescent capsule. In flower from late March to early June.

ECOLOGICAL NOTES: Beaked willow, or Bebb's willow, occurs in a wide variety of wetland habitats, but it is most often seen in sedge meadows, shrub-carrs, fresh (wet) meadows, calcareous fens and along wet forest edges. Swink and Wilhelm (1994) state that this willow is frequent in shrub zones "... where there has been disturbance." The authors have also observed it in some fairly pristine sites.

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

Leaves and pistillate catkins

Leaves and staminate catkins

SANDBAR WILLOW

(*Salix interior* Rowlee)

WILLOW FAMILY (Salicaceae) **C of C:** Native (2) **IND. STATUS:** FACW

SYNONYM: *Salix exigua* ssp. *interior* (Rowlee) Cronq.

FIELD CHARACTERISTICS: An erect, deciduous shrub 2-5 m. high. A distinctive characteristic of this willow is its long, linear leaves (usually 10 times longer than wide) that are irregularly toothed. Mature leaves are without hairs. Leaf stalks lack glands and no stipules are present. It often has many stems that are slender, reddish-brown, lack hairs, and are leafy. Pistillate catkins are 3-6(8) cm. long and appear with the leaves or later. Fruit is a capsule that is hairless to thinly silky. In flower April-June.

ECOLOGICAL NOTES: Sandbar willow frequently forms large, dense, circular colonies (clones) that can be an acre or two in extent. In addition to shrub-carrs, this willow is common on sandbars, mudflats, beaches, and other alluvial mineral soils. It responds positively to water level changes and is often found colonizing dredged material sites.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1985).

HEART-LEAF WILLOW

(*Salix eriocephala* Michx.)

WILLOW FAMILY (Salicaceae) **C of C:** Native (4) **IND. STATUS:** FACW

SYNONYMS: *Salix cordata* Muhl.; *S. rigida* Muhl.

FIELD CHARACTERISTICS: A many-stemmed, deciduous shrub to 7 m. in height. Leaves are alternate, narrowly oblong to narrowly elliptical or lance-elliptical, the larger leaves 6-12 cm. long by 1-3 cm. wide. Leaf bases are acute to blunt or rarely subcordate. Leaf blades are dark green above and pale green below with a serrulate (finely-toothed) margin. Stipules are prominent, leafy and persistent. Staminate catkins are 1.5-4.5 cm. long while pistillate catkins are 2-6 cm. long, both appearing with or slightly before the leaves. Capsules are glabrous and 3-7 mm. long. In flower mid-April to late May.

ECOLOGICAL NOTES: Heart-leaf willow is a common species of shrub-carrs, inland fresh meadows, shallow marshes, streambanks and ditches. Despite its common name, the leaves are rarely heart-shaped. Leaf shape is highly variable and can resemble slender willow (*S. petiolaris*) and black willow (*S. nigra*); however, the leafy, persistent stipules (see photos) distinguish heart-leaf willow.

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

Note the persistent, leafy stipules and serrulate leaf margins.

Pistillate catkins

Heart-Leaf Willow

(*Salix eriocephala*)

AUTUMN WILLOW

(*Salix serissima* (Bailey) Fern.)

WILLOW FAMILY (Salicaceae) **C of C:** Native (8 WI)(7 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A deciduous shrub 1-4 m. in height. First year branchlets are yellowish and glabrous while second year branchlets are yellowish to red, shiny and glabrous. Leaves are alternate, elliptical to oval to lance-shaped, and 4-10 cm. long by 1-3 cm. wide. Leaf blades are glossy, dark green above and white-waxy below. Leaf margins are finely-toothed (serrulate). Petioles have glands near the summit and stipules are usually absent. Staminate catkins are 1.5-3(4) cm. long while pistillate catkins are 2-4 cm. long, both appearing with or after the leaves in spring (mid-May to mid-June). Capsules are glabrous and 7-10 mm. long. Seeds are not released until late summer or autumn. Capsules are often seen retaining seeds after the leaves are shed in autumn, sometimes after snow falls (Smith 2008).

ECOLOGICAL NOTES: Autumn willow is intolerant of shade but is tolerant of a wide range of pH conditions from weakly acidic to strongly calcareous. It occurs on shallow peats, or less frequently hydric mineral soils, as widely scattered individuals or small, sparse populations. This includes shrub-carrs, coniferous swamps, calcareous fens, shallow marshes and floating sedge mats.

SOURCE: Gleason and Cronquist (1991); Smith (2008); and Chadde (2011).

SILKY DOGWOOD

(*Cornus obliqua* Raf.)

DOGWOOD FAMILY (Cornaceae) **C of C:** Native (4) **IND. STATUS:** FACW

SYNONYM: *Cornus amomum* P. Mill.

FIELD CHARACTERISTICS: An erect, deciduous shrub usually 1-3 m. high. Leaves are opposite, ovate to elliptic, and 6-12 cm. long with 4-6 pairs of lateral veins. Twigs and branches are magenta with fine hairs and brown pith. Inflorescence is an open cyme with white flowers. Mature fruit is a dark blue berry while immature fruit is white to bluish-white. In flower May-July.

ECOLOGICAL NOTES: Silky dogwood is not as common as red-osier dogwood (*Cornus alba*) in shrub-carrs. It is primarily seen along streambanks and in shrubby thickets adjacent to wooded swamps. Silky dogwood is frequently planted for wildlife cover and foodplots.

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

RED-OSIER DOGWOOD

(*Cornus alba* L.)

DOGWOOD FAMILY (Cornaceae) **C of C:** Native (3) **IND. STATUS:** FACW

SYNONYMS: *Cornus stolonifera* Michx., *Cornus sericea* L.

FIELD CHARACTERISTICS: An erect, deciduous shrub usually 1-3 m. high. Leaves are opposite, lanceolate to ovate, 5-10 cm. long with 5-7 pairs of lateral veins. Twigs and branches are greenish to yellowish in summer turning to red in autumn/winter. Inflorescence is an open cyme with white flowers. Mature fruit is a white berry. In flower May to mid-August. *C. alba* is the only dogwood in our range with both white berries and white pith. It can be easily distinguished from silky dogwood (*Cornus obliqua*), which has dark blue berries and brown pith.

ECOLOGICAL NOTES: Red-osier dogwood is a characteristic species of shrub-carrs and can form dense thickets. This common shrub can invade sedge meadows, wet to wet-mesic prairies and calcareous fens in response to water level changes and/or lack of fire. Red-osier dogwood is also common in wooded swamps and along streambanks. The berries are eaten by songbirds and ruffed grouse; white-tailed deer and eastern cottontail browse the twigs and buds.

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

Red-Osier Dogwood
(*Cornus alba*)

GRAY DOGWOOD

(*Cornus racemosa* Lam.)

DOGWOOD FAMILY (Cornaceae) **C of C:** Native (2) **IND. STATUS:** FAC

SYNONYM: *Cornus foemina* P. Mill.

FIELD CHARACTERISTICS: An erect, deciduous shrub usually 1-3 m. high. Leaves are opposite, ovate to elliptic, and 6-12 cm. long with 4-6 pairs of lateral veins. Twigs and braches are gray with brown pith. Inflorescence is a conical-shaped, open cyme with bright red pedicels, white flowers and white berries. In flower early June to early July.

ECOLOGICAL NOTES: Gray dogwood is a common shrub that is particularly adept at colonizing abandoned agricultural lands, areas disturbed by logging, and forest edges. It is an excellent wildlife food plant. This shrub is especially conspicuous in winter with its dull gray twigs and bright red pedicels.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Smith (2008).

Comparison of Dogwood Twigs

Red-osier dogwood (*Cornus alba*) with red twigs and white pith is on the left. Gray dogwood (*C. racemosa*) with gray twigs and brown pith is in the center. On the right is silky dogwood (*C. obliqua*) with brownish-magenta twigs and brown pith.

COMMON BUCKTHORN

(*Rhamnus cathartica* L.)

BUCKTHORN FAMILY (Rhamnaceae) **C of C:** Introduced, invasive (0) **IND. STATUS:** FACU (GP);FAC(NC/NE, MW)

FIELD CHARACTERISTICS: A shrub or small tree growing to 6 m. in height. Some branches end in short thorns. Leaves are mostly opposite or subopposite, with some alternate. Leaves are broadly elliptic, oblong, or elliptic-oblong, 3-6 cm. long, with a margin of fine teeth (serrulate). Lateral leaf veins (2)3(4) on each side are strongly upcurved. Plants are dioecious (unisexual) with female plants producing black fruit, 5-6 mm. in diameter, commonly with 4 stones (hard seeds). Flowers appear with the leaves and have parts in 4s.

ECOLOGICAL NOTES: Introduced from Eurasia and planted as an ornamental, common buckthorn is an aggressive invader of both upland and wetland habitats becoming a serious weed. Birds eat the fruit and spread the seeds such that even scientific and natural area quality fens, prairies and woodlands now have infestations of buckthorn. Common buckthorn can form dense thickets that shade out species of sedge meadows, calcareous fens and the spring ephemerals of woodlands. It is especially prolific in drained peatlands and upland oak forests. Also see comments under glossy buckthorn (*Frangula alnus*).

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Smith (2008).

Leaves and pistillate flowers

Staminate flowers

Common Buckthorn

(*Rhamnus cathartica*)

GLOSSY BUCKTHORN

(*Frangula alnus* P. Mill.)

BUCKTHORN FAMILY (Rhamnaceae) **C of C:** Introduced, invasive (0) **IND. STATUS:** FAC (NC/NE, GP);FACW(MW)

SYNONYM: *Rhamnus frangula* L.

FIELD CHARACTERISTICS: A shrub or small tree growing to 7 m. in height. Leaves are all or mostly alternate, oblong to obovate-oblong, 5-8 cm. long, and acute to short-acuminate. Leaf margins are entire and may be wavy (see photograph), but are easily distinguished from the fine-toothed leaf margins of common buckthorn (*Rhamnus cathartica*). Leaves are also shiny compared to the leaves of common buckthorn and branches do not end in thorns. Flowers are perfect with parts in 5s. Fruits are red turning to black, with 2-3 stones. In flower May-August.

ECOLOGICAL NOTES: Introduced from Eurasia and planted as an ornamental, glossy buckthorn is an aggressive invader and serious weed of wooded swamps, shrub swamps, bogs and inland fresh meadows, especially calcareous fens. It is not as widespread in Minnesota and Wisconsin as common buckthorn and prefers wetter habitats. Glossy buckthorn often occurs in association with disturbance (power lines, ditches), but also has infested scientific and natural area quality wetlands, such as Cedarburg Bog in southeastern Wisconsin and calcareous fens in the lower Minnesota River Valley, due to seed dispersal by birds.

SOURCE: Voss (1985); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

MEADOWSWEET

(*Spiraea alba* Du Roi)

ROSE FAMILY (Rosaceae) **C of C:** Native (5 MN)(4 WI) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: A low, deciduous shrub, usually up to 2 m. high. Leaves are alternate, simple, unlobed, finely serrate, without hairs, oblanceolate, and 3-5 cm. long. The unarmed twigs are slender, ascending, and generally a dull brown. Inflorescence is a terminal, finely hairy, elongate panicle 5-25 cm. in height. Five-petaled flowers are white, 6-8 mm. wide and fuzzy. Fruit is a follicle. In flower June-August. A similar species, steeplebush (*S. tomentosa*)[page 308], can be easily distinguished from *S. alba* because of its pink flowers and woolly twigs and leaf undersides.

ECOLOGICAL NOTES: Meadowsweet occurs in sedge meadows, wet to wet-mesic prairies, alder thickets and shrub-carrs. It can form relatively tall, dense thickets on disturbed sites and tends to increase with declining water levels.

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

STEEPLEBUSH

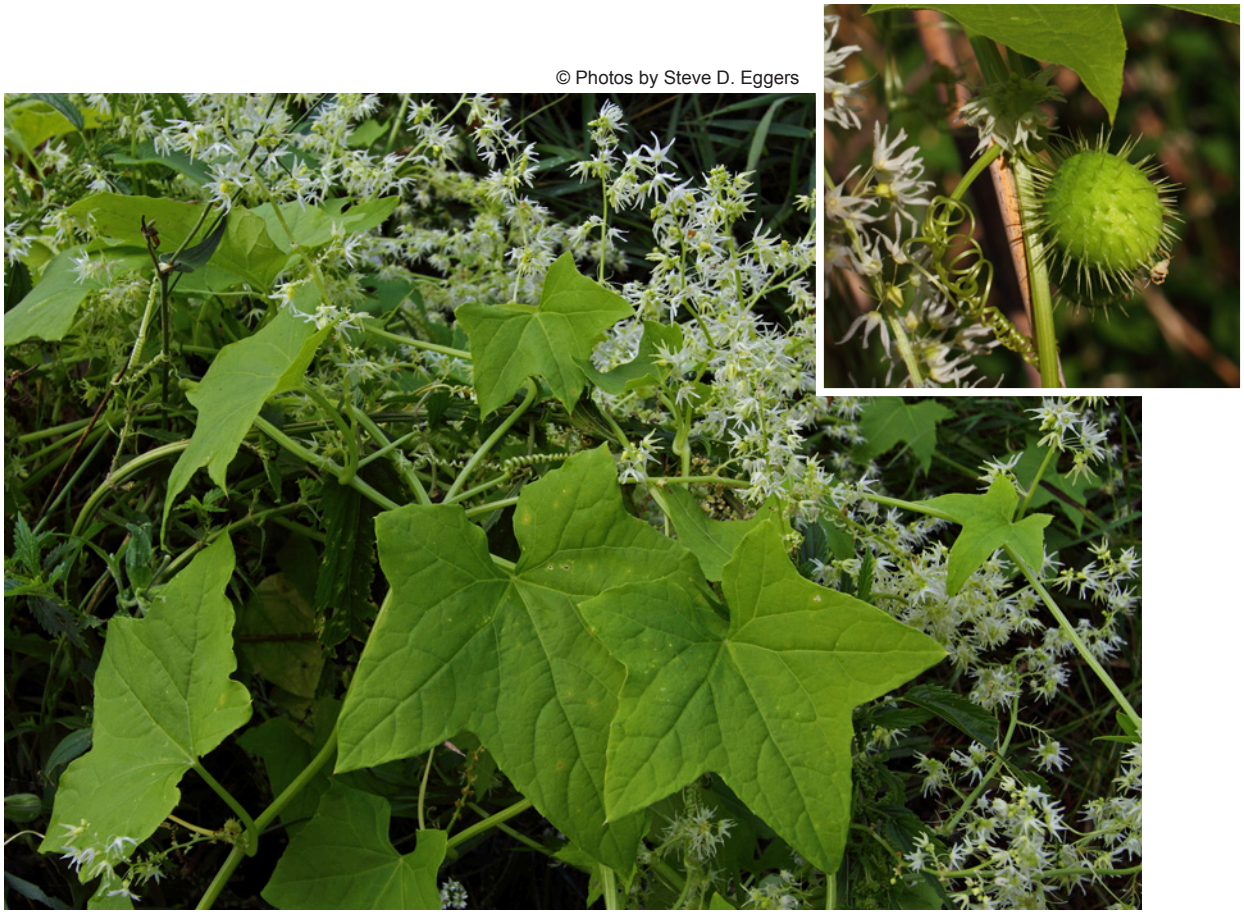
(*Spiraea tomentosa* L.)

ROSE FAMILY (Rosaceae) **C of C:** Native (6 WI)(7 MN) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: A low, deciduous shrub, usually up to 2 m. high. Leaves are alternate, simple, unlobed, finely serrate, oblanceolate, 3-5 cm. long, dark green above and white woolly beneath. The unarmed twigs are slender, ascending, and generally a dull brown. Both twigs and the undersides of leaves are densely covered with hairs. Inflorescence is a terminal, finely hairy, elongate panicle 5-15 cm. long. Five-petaled flowers are rose-pink, 3-4 mm. wide, and fuzzy. Fruit is a follicle. In flower June-August.

ECOLOGICAL NOTES: Steeplebush occurs in northern sedge meadows, shrub swamps and open bogs.

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



WILD CUCUMBER

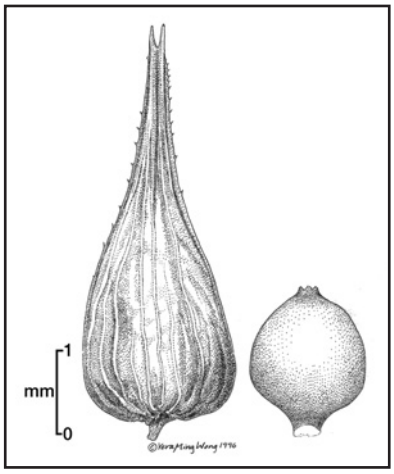
(*Echinocystis lobata* (Michx.) Torr. & Gray)

GOURD FAMILY (Curcurbitaceae) **C of C:** Native (2) **IND. STATUS:** FACW(NC/NE, MW) FAC(GP)

FIELD CHARACTERISTICS: An annual, vining herb to 5 m. or more in length. Leaves usually have 5 sharp, triangular lobes (some leaves may have 3 or 7 sharp lobes). Flowers are white and unisexual. Staminate flowers are 8-10 mm. wide with lance-like lobes and are arranged in long, upright racemes. Pistillate flowers are one to several on short stalks from leaf axils. Fruit is ovate, inflated, 3-5 cm. long, and covered with soft prickles. In flower August-September.

ECOLOGICAL NOTES: Wild cucumber is an abundantly common species of shrub and wooded swamps, floodplain forests, inland fresh meadows, streambanks and road ditches, often seen sprawling over other vegetation or fences.

SOURCE: Chadde (2011).



Perigynium and nutlet

Cespitose growth habit

STALK-GRAIN SEDGE

(*Carex stipata* Muhl. ex Willd.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (2 WI)(3 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A somewhat stout, perennial sedge with clustered, sharply triangular stems 30-100 cm. in height. Leaves are coarse, M-shaped, green, and usually shorter than the stem. Whitish, thin sheaths extend beyond the leaf base and are conspicuously cross-wrinkled (see photo on page 178). Each spikelet is typically subtended by a long, linear bract. The lance-triangular shaped perigynia are 4-7 mm. long, sessile, and densely aggregated. The conspicuous beak of the perigynia is less than twice as long as the body and gives the inflorescence a prickly appearance. Similar to fox sedge (*Carex vulpinoidea*)[page 178] but larger with flaccid stems.

ECOLOGICAL NOTES: A common sedge of wooded swamps and shrub swamps, but also occurring in ditches and other sunny, wet habitats.

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

V.B. Alder Thickets

Alder thickets are a tall, deciduous shrub community similar to shrub-carrs except that speckled alder (*Alnus incana* ssp. *rugosa*) is dominant. Speckled alder can pioneer exposed peat or alluvial soils because of its tiny seeds and ability to fix nitrogen. Alder thickets are generally found in and north of the vegetation tension zone.

Speckled alder may occur as a monotype in the canopy layer, but alder thicket communities can have a diversity of shrubs including American high-bush cranberry (*Viburnum opulus* var. *americanum*), sweet gale (*Myrica gale*) and common winterberry (*Ilex verticillata*).

The groundlayer typically includes some of the ferns, sedges, grasses and forbs of sedge meadows and fresh (wet) meadows. The diversity of species in the groundlayer is often dependent on degree of shrub canopy cover, degree of disturbance, and water source (e.g., groundwater versus surface runoff from urban or agricultural lands). Stands with 100 percent shrub canopy cover may have a depauperate groundlayer. The example of an alder thicket shown by the photograph is groundwater fed and minimally disturbed resulting in a rich diversity of species in the groundlayer.

Alder thickets provide high quality habitat for ruffed grouse and American woodcock as well as white-tailed deer. Rare, threatened and endangered species use alder thickets including golden-winged warblers, a globally threatened species. Alder thicket communities on the Lake Superior red clay plain of northwestern Wisconsin can include state-listed threatened or special concern species such as sweet coltsfoot (*Petasites sagittatus*) and small yellow water crowfoot (*Ranunculus gmelinii* var. *hookeri*).

Alder thickets provide important habitat for the most popular upland gamebird in Minnesota and Wisconsin - ruffed grouse.

Alder Thickets

© Steve D. Eggers

VEGETATION: As shown by the photograph, "thicket" is an accurate description of this community dominated by speckled alder (*Alnus incana* ssp. *rugosa*). Non-dominant shrubs include common winterberry (*Ilex verticillata*), common elderberry (*Sambucus nigra*), meadowsweet (*Spiraea alba*) and steeplebush (*Spiraea tomentosa*). Skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens capensis*) and cinnamon fern (*Osmundastrum cinnamomeum*) dominate the groundlayer which also includes Canada blue-joint grass (*Calamagrostis canadensis*), rattlesnake manna grass (*Glyceria canadensis*), silvery sedge (*Carex canescens*), hummock sedge (*Carex stricta*), stalk-grain sedge (*Carex stipata*), sensitive fern (*Onoclea sensibilis*), crested shield fern (*Dryopteris cristata)*, marsh marigold (*Caltha palustris*), arrow-leaf tearthumb (*Persicaria sagittata*), swamp dewberry (*Rubus hispidus*), marsh blue violet (*Viola cucullata*), northern white violet (*Viola macloskeyi*) and small patches of sphagnum moss (*Sphagnum* sp.). Bog bluegrass (*Poa paludigena*), a species listed as threatened by the State of Wisconsin, occurs in this habitat.

SOILS: Dawson peat (Terric Haplosaprists), a very poorly-drained soil on floodplains or lake basins with an organic layer between 16 and 51 inches in depth underlain by acidic, sandy material. Dawson soils are typically saturated to the surface and may have as much as 6 inches of standing water after spring snowmelt and heavy rainfall events.

HYDROLOGY: Groundwater discharge (seepages). A small, groundwater fed, perennial stream flows through this alder thicket.

LOCATION: Fort McCoy Military Reservation, Monroe County, Wisconsin.

SPECKLED ALDER

(*Alnus incana* ssp. *rugosa* (L.) Moench)

BIRCH FAMILY (Betulaceae) **C of C:** Native (4 WI)(3 MN) **IND. STATUS:** FACW

SYNONYM: *Alnus rugosa* (Du Roi) Sprengel

FIELD CHARACTERISTICS: A deciduous shrub or small tree occasionally reaching 10 m. in height. Leaves are alternate, simple, serrate to doubly serrate, and ovate to oval. Undersides of leaves are pale green or have a thin, waxy coating. Leaves are often hairy above with hairy veins beneath. Main leaves have 9-12 pairs of lateral veins. Twigs have sessile, woody, cone-like, pistillate catkins. Staminate catkins are pendulous and usually clustered. Over winter, both types of catkins are conspicuous: last growing season's pistillate catkins and the new staminate catkins that will flower in spring.

ECOLOGICAL NOTES: Speckled alder, or tag alder, is the dominant in alder thickets of Minnesota and Wisconsin, and also is common in bogs and coniferous swamps on acidic soils. It occurs primarily in and north of the vegetation tension zone. Speckled alder is an important wildlife food plant, especially for beaver and white-tailed deer.

SOURCE: Gleason and Cronquist (1991), Swink and Wilhelm (1994); and Voss (1985).

COMMON ELDERBERRY

(*Sambucus nigra* L.)

HONEYSUCKLE FAMILY (Caprifoliaceae) **C of C:** Native (3) **IND. STATUS:** FAC(GP) FACW(NC/NE, MW)

SYNONYM: *Sambucus canadensis* L.

FIELD CHARACTERISTICS: An erect, coarse, deciduous shrub, usually up to 3 m. high. The light brown or gray stems are stout, but very weak and brittle because of a large pith, which is white. Opposite, pinnately compound leaves have 5-7 lanceolate to ovate leaflets with serrate margins. Inflorescence is 5-rayed from the base, umbel-like, flat-topped, and wider than long. Flowers are white. The 3-seeded fruit is a small, purple-black berry. In flower June-August. Red elderberry (*S. racemosa*) is similar but has brown pith, a panicle-like inflorescence and red berries (**warning**: berries may be toxic to humans if consumed without adequate preparation [source: USDA Plant Fact Sheet]).

ECOLOGICAL NOTES: Common elderberry is frequent in shrub swamps, wooded swamps and roadside ditches. It may form dense thickets. Berries are eaten by songbirds and ruffed grouse and can be used to make wine or jam.

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

DWARF RED RASPBERRY

(*Rubus pubescens* Raf.)

ROSE FAMILY (Rosaceae) **C of C:** Native (7 WI)(6 MN) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: A low growing shrub with annual or partially biennial stems that are hairy but lack bristles, spines or glands. Sterile stems are trailing, rooting at the nodes and tips, and grow to 2.8 m. long. Fertile stems grow erect to 30 cm. tall. Leaves consist of 3 leaflets. The central leaflet has a short petiole and is 3-8 cm. long and 2-5 cm. wide. Flowers are borne singly or in a loose cluster of 2-4. Petals are whitish to pinkish and 4-8 mm. long. In flower mid-May to June. Fruit is an aggregate of red to dark red drupelets 5-12 mm. in diameter that matures in late June to early August.

ECOLOGICAL NOTES: Dwarf red raspberry is frequently encountered in a variety of habitats including coniferous swamps, coniferous bogs, hardwood swamps, shrub swamps, sedge meadows and even calcareous fens. To a lesser extent it also occurs in upland forests.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Smith (2008).

AMERICAN RED RASPBERRY

(*Rubus idaeus* L. var. *strigosus* (Michx.) Maxim.)

ROSE FAMILY (Rosaceae) **C of C:** Native (3) **IND. STATUS:** FAC(NC/NE); FACU(MW, GP)

SYNONYM: *Rubus strigosus* Michx.

FIELD CHARACTERISTICS: A low-growing shrub with stems up to 2 m., erect, arching (sometimes prostrate), sparsely to densely covered with slender-based prickles and stiff bristles. Flower stalks and leaf stalks of younger foliage have gland-tipped bristles (use a 10x lens, these look like a stalk with a ball on the end). Leaves are compound with 3-5 leaflets, green above and strongly whitened beneath. Flowers are white to greenish white, blooming in May. Mature fruit is red and about 1 cm. wide.

The European red raspberry (*Rubus idaeus* L. var. *idaeus*) is similar, but glandless. It sometimes escapes from gardens, but typically does not persist in the wild (Swink and Wilhelm 1994).

Black raspberry (*Rubus occidentalis* L.) also has strongly-whitened leaf undersides, but has glandless, broad-based prickles or thorns, glaucous stems, and the mature fruit is purple-black.

ECOLOGICAL NOTES: American red raspberry is frequent along the edges of wooded and shrub swamps, as well as bogs. It is especially common following logging, burning or other disturbances.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1985).

Note the gland-tipped bristles on the pedicel and petioles.

American Red Raspberry

(*Rubus idaeus* L. var. *strigosus*)

SENSITIVE FERN

(*Onoclea sensibilis* L.)

WOOD FERN FAMILY (Dryopteridaceae) **C of C:** Native (4 MN)(5 WI) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: This colonial fern produces very dissimilar sterile and fertile fronds. Sterile fronds (leaves) are up to about 60 cm. tall, deciduous (very sensitive to frost), 18-40 cm. x 15-35 cm., leathery, light to medium green in color, and simple. The deeply pinnatifid leaflets occur as 8-12 paired segments, 1.5-5 cm. wide, with characteristic net venation. The upper side of the leaflet is smooth and the bottom side has scattered white hairs, usually on the veins. The rachis is broadly winged as are the upper leaflets. Fertile fronds are produced beginning in midsummer, turn dark brown at maturity and persist through winter. They grow to about 30 cm. tall and are upright with many short leaflets that form small, inrolled bead-like divisions (pinnules). These divisions contain the spore cases. A mass of pale red fiddle-heads forms in spring.

ECOLOGICAL NOTES: Sensitive fern primarily occurs in wooded swamps, alder thickets and shrub-carrs, particularly near their borders. It also occurs in marshes and along edges of shaded ponds.

SOURCE: Gleason and Cronquist (1991); and Tryon (1980).

INTERRUPTED FERN

(*Osmunda claytoniana* L.)

ROYAL FERN FAMILY (Osmundaceae) **C of C:** Native (6) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A clumped, perennial fern to 1 m. or more in height. Blades are 40-100 cm. long and 15-30 cm. wide. The stipe is covered with woolly hairs when young, becoming glabrous with age. Fertile fronds are "interrupted" in that the upper and lower portions of the blade are sterile (green) while the middle portion is fertile (brownish due to fertile pinnae). Fertile pinnae soon whither and are less conspicuous during the latter half of the growing season.

ECOLOGICAL NOTES: Interrupted fern is frequent in hardwood swamps, alder thickets, edges of sedge meadows, and upland forests. It occurs in drier habitats more often than the related cinnamon fern (*Osmundastrum cinnamomeum* - FACW) and royal fern (*Osmunda spectabilis* - OBL).

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

NORTHERN WHITE VIOLET

(*Viola macloskeyi* Lloyd)

VIOLET FAMILY (Violaceae) **C of C:** Native (7) **IND. STATUS**: OBL(NC/NE, MW) FACW(GP)

FIELD CHARACTERISTICS: A small, perennial herb spreading by rhizomes or stolons. Leaves all arise from the base and are heart-shaped to kidney-shaped, 1-3 cm. wide at flowering, later growing to 8 cm. wide. White flowers are on upright petioles equal to or longer than the leaves. The lower 3 petals are purple veined near the base. The upper 2 petals are only slightly (or not at all) recurved, not twisted. Lateral petals are beardless or with sparse hairs. Fruit is a green capsule 4-6 mm. long. In flower April-June.

ECOLOGICAL NOTES: Northern white violet occurs in alder thickets, coniferous swamps and sedge meadows, particularly where groundwater discharges (e.g., springs, seeps) occur. Voss (1985) notes that it also occurs in bogs on *Sphagnum* hummocks.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); and Voss (1985).

ROUGH BEDSTRAW

(*Galium asprellum* Michx.)

MADDER FAMILY (Rubiaceae) **C of C:** Native (6 MN)(7 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb spreading or reclining on other plants and much branched to 2 m. long. Stems are 4-angled and rough on the angles with downward-pointing (retrorse) barbs that cling to clothing. Leaves are 6-whorled on the stem and 4-5 whorled on the branches. The narrowly oval leaves are widest above the middle, 1-2 cm. long and 4-6 mm. wide, with a sharp tip. The underside midvein and leaf margins are lined with barbs. Inflorescence consists of loosely arranged, few-flowered clusters that are both terminal and axillary. Flowers have 4 white petals that are 3 mm. long. Fruit is round and smooth. In flower May-August.

ECOLOGICAL NOTES: Rough bedstraw reaches it highest presence in alder thickets (Curtis 1971) and is also a common species of marshes, hardwood swamps, inland fresh meadows and streambanks.

SOURCE: Curtis (1971); Gleason and Cronquist (1991); Chadde (2002); and Black and Judziewicz (2009).

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