VI.B. Coniferous Swamps

Coniferous swamps are forested wetlands dominated by lowland conifers, primarily northern white cedar and tamarack, growing on soils that are saturated during much of the growing season, and that may be temporarily inundated by as much as a foot of standing water. Balsam fir is a component in some stands. Soils are typically organic (peat/muck) but not as acidic and not as poor in nutrients and minerals as those of coniferous bogs. Instead, soils vary from somewhat mineral-poor and acidic, to mineral-rich and alkaline. Tamarack typically dominates on the former soils, and northern white cedar on the latter. A continuous *Sphagnum* moss mat is not present. Coniferous swamps occur primarily in and north of the vegetation tension zone. However, several large tamarack swamps occur south of the tension zone.

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VEGETATION: The tree layer of this coniferous swamp is dominated by northern white cedar (*Thuja occidentalis*). Scattered, tree size black ash (*Fraxinus nigra*), yellow birch (*Betula alleghaniensis*) and white pine (*Pinus strobus*) are also present. The groundlayer is dominated by cinnamon fern (*Osmunda cinnamomea*), marsh fern (*Thelypteris palustris*) and lady fern (*Athyrium filix-femina*). Other species include speckled alder (*Alnus incana* ssp. *rugosa*), poison sumac (*Toxicodendron vernix*), royal fern (*Osmunda regalis*), fowl manna grass (*Glyceria striata*), long-stalk sedge (*Carex pedunculata*), graceful sedge (*Carex gracillima*), northern white violet (*Viola macloskeyi* ssp. *pallens*), wood anemone (*Anemone quinquefolia*), naked miterwort (*Mitella nuda*), starflower (*Trientalis borealis*), blue-bead lily (*Clintonia borealis*), dwarf red raspberry (*Rubus pubescens*), sensitive fern (*Onoclea sensibilis*), wild lily-of-the-valley (*Maianthemum canadense*), sweet-scented bedstraw (*Galium triflorum*), bunchberry (*Cornus canadensis*), wild sarsaparilla (*Aralia nudicaulis*), hog peanut (*Amphicarpaea bracteata*) and jack-in-the-pulpit (*Arisaema triphyllum*). Ram's-head lady's-slipper (*Cypripedium arietinum*), a species listed as threatened by the State of Minnesota, was recorded in this habitat.

SOILS: Lupton muck (Typic Haplosaprists), a very poorly-drained, calcareous soil with an organic layer greater than 51 inches in depth (and can be many feet in depth). Landscape position is an ancient lakebed in the nearly level, sandy outwash of the Anoka Sandplain.

HYDROLOGY: Lupton muck is typically saturated to the surface. During September through May, the seasonal high water table can vary from 12 inches of standing water to a water table 12 inches below the surface.

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

VEGETATION: The opposing page illustrates two views of a coniferous swamp dominated by tamarack (*Larix laricina*). In addition to tamarack, the shrub layer consists of scattered speckled alder (*Alnus incana* ssp. *rugosa*), meadowsweet (*Spiraea alba*), bog willow (*Salix pedicellaris*), slender willow (*Salix petiolaris*), red-osier dogwood (*Cornus sericea*) and balsam willow (*Salix pyrifolia*). Marsh fern (*Thelypteris palustris*) and Canada blue-joint grass (*Calamagrostis canadensis*) dominate the diverse groundlayer which also includes: tussock sedge (*Carex stricta*), stalk-grained sedge (*Carex stipata*), buxbaum's sedge (*Carex buxbaumii*), lake sedge (*Carex lacustris*), wild timothy (*Muhlenbergia glomerata*), fringed brome grass (*Bromus ciliatus*), fowl mana grass (*Glyceria striata*), joe-pye weed (*Eupatorium maculatum*), northern bog goldenrod (*Solidago uliginosa*), turtlehead (*Chelone glabra*), flat-top aster (*Doellingeria umbellata*), giant goldenrod (*Solidago gigantea*), marsh cinquefoil (*Comarum palustre*) and crested shield fern (*Dryopteris cristata*).

SOILS: Markey muck (Terric Haplosaprists), very poorly-drained soils with up to 51 inches of organic materials overlying sandy materials.

HYDROLOGY: The seasonal high water table for Markey soils ranges from ponded to a water table within 6 inches of the surface during November to June of most years. This is a minerotrophic (mineral rich) peatland due to groundwater inflows.

LOCATION: Rice Lake National Wildlife Refuge, Aitkin County, Minnesota.

Coniferous Swamps

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NORTHERN WHITE CEDAR

(*Thuja occidentalis* L.)

CYPRESS FAMILY (Cupressaceae) **C of C:** Native (9) **IND. STATUS:** FACW

FIELD CHARACTERISTICS: An evergreen, conifer tree up to 20 m. in height. Branches are spreading with flattened, leafy twigs. The scale-like, opposite leaves are 2-4 mm. long and overlap like shingles. The small, woody, oblong cones are paired, 8-15 mm. long and yellowish brown in color.

ECOLOGICAL NOTES: Northern white cedar is a dominant tree in coniferous swamps along with tamarack (*Larix laricina*). It is also a subdominant in some hardwood swamps. Northern white cedar typically occurs north of the vegetation tension zone on neutral to alkaline, springy soils due to groundwater seepages. It is common near the Great Lakes on soils subtended by dolomite. During the winter months, northern white cedar swamps provide both food and shelter for white-tailed deer. Another common name is arbor vitae.

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

BALSAM FIR

(*Abies balsamea* (L.) Mill.)

PINE FAMILY (Pinaceae) **C of C:** Native (4) **IND. STATUS:** [FAC]

FIELD CHARACTERISTICS: An evergreen, conifer tree up to 26 m. high. The smooth bark is gray and eventually becomes scaly. Young trunks are covered with raised resin-bearing pockets. Spreading branches have twigs with minute hairs. The flattened leaves are 12-25 mm. in length, blunt or minutely notched, sessile and tend to align in one plane. The narrow, cylinder-shaped cones are erect and 5-10 cm. long with broadly rounded scales. Papery bracts are generally hidden by the scales and may be spreading, but not reflexed.

ECOLOGICAL NOTES: Balsam fir is a shade tolerant conifer that is common in northern white cedar swamps, coniferous bogs, mixed hardwood/conifer swamps, and mesic (upland) forests.

SOURCE: Elias (1980); Gleason and Cronquist (1991); Smith (2008) and Voss (1972).

POISON SUMAC

(*Toxicodendron vernix* (L.) Kuntze)

CASHEW FAMILY (Anacardiaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A tall, deciduous shrub 5(7) m. in height with a smooth to slightly rough bark. The bark is a patchy light gray, with numerous horizontally spreading lenticels. Branches are stout with thick, coarse twigs. Leaves are alternate and pinnately compound with 7-13 sessile, oval leaflets along a red rachis. Mature leaflets are dark green and shiny above with entire margins. The unisexual greenish flowers form on drooping, raceme-like panicles. The fruits are a yellowish to grayish white, berry-like drupe. The resin, called urushiol and which occurs throughout the plant, can cause a severe allergic contact dermatitis.

ECOLOGICAL NOTES: Poison sumac primarily occurs in coniferous swamps and bogs. It also occurs in ash-dominated hardwood swamps as well as alder thickets, bogs and fens. Seeds are dispersed by birds.

SOURCE: Crow and Hellquist (2000); Gleason and Cronquist (1991); Smith (2008); Swink and Wilhelm (1994); and Voss (1985).

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Staminate catkins.

Pistillate catkins and leaves.

BALSAM WILLOW

(*Salix pyrifolia* Andersson)

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

FIELD CHARACTERISTICS: A tall, deciduous shrub to 5 m. in height. Twigs are glabrous, at first yellowish then becoming red and shiny. Petioles are red. Leaves are reddish when unfolding then becoming dark green and glossy above while lower leaf surfaces are glaucous, glabrous and reticulate. Leaves are ovate to lanceolate or lanceloate-oblong, 4-10(13) cm. by 2-4(5) cm., with a tip that is acute to acuminate. Leaf margins often have glandular teeth. Leaves are rounded to cordate at the base and have the fragrance of balsam. Catkins 2-6(8) cm. long appear with or after the leaves. Capsules are glabrous and 4-8 mm. long. In flower May-June.

ECOLOGICAL NOTES: Balsam willow is most common in coniferous swamps and bogs with tamarack or black spruce. To a lesser extent, it occurs in shrub swamps, on floating sedge mats, and along lakeshores and riverbanks. Balsam willow is easy to identify with its bright red, shiny petioles and branches, as well as leaves that are glossy green above and gray beneath with cordate bases.

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

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SWAMP RED CURRANT

(*Ribes triste* Pall.)

GOOSEBERRY FAMILY (Grossulariaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A small shrub 40-100 cm. tall with 1 or a few ascending, spreading or trailing stems. Stems lack the spines or bristles of some other *Ribes*. Young stems are hairy then become smooth by the second year. Leaves are 4-9 cm. long and 5-10 cm. wide with 3-5 broad lobes and no glandular dots (unlike some other *Ribes*, e.g., *R. americanum*). Flowers are green-purple, 4-5 mm. wide and arranged in long, drooping clusters of 5-12. Fruit is a smooth, red berry that is 6-9 mm. wide. In flower May-June.

ECOLOGICAL NOTES: Swamp red currant prefers coniferous swamps and bogs, especially those with tamarack, as well as hardwood swamps. This currant prefers soils that are moderately acidic and seems to be absent in the most highly acidic bogs. Of the *Ribes* in our range, swamp red currant is the only one with fruits that are both smooth and red.

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

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SKUNK CURRANT

(*Ribes glandulosum* Grauer)

GOOSEBERRY FAMILY (Grossulariaceae) **IND. STATUS:** FACW

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

FIELD CHARACTERISTICS: A small shrub with 1 or a few ascending, arching or trailing stems to 2 m. long. Spines or bristles are absent. First and second year branches are glabrous. Leaves are 2.5-5 cm. long and 3.5-7 cm. wide with 3-5 palmate lobes. The base of the leaves is deeply cordate while leaf margins have pointed serrations. Upper leaf surfaces are dark green, glabrous and lack glands. Lower leaf surfaces are pale green, glabrous or with scattered hairs, and have stalked glands along the main veins. Ascending racemes 3-6 cm. long have 6-15 flowers with pinkish to purplish petals 0.8-1.2 mm. long. The pedicels and ovaries have red, gland-tipped hairs. Fruit is a translucent red berry, 6-10 mm. in diameter, with stiff, gland-tipped hairs. In flower early May to mid-June.

ECOLOGICAL NOTES: Skunk currant is common in a variety of wetland and upland habitats north of the vegetative tension zone. A favored habitat is coniferous swamps dominated by northern white cedar and/or tamarack. True to its name, the leaves and inner bark have a skunk-like odor when crushed.

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

ALDER-LEAVED BUCKTHORN

(*Rhamnus alnifolia* L'Her.)

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

FIELD CHARACTERISTICS: A mid-size shrub with multiple upright or decumbent stems to 2.3 m. long (but usually only 1 m. in height). Leaves are alternate, lanceolate-oblong to lanceolate-ovate to elliptical, with a tip that is obtuse to acuminate. Petioles are 5-15 mm. long. Greenish flowers are in sessile umbels with 1-3 flowers each. Flowers are functionally unisexual, 5-merous with sepals 1.5-2 mm. long (petals are absent). Fruit is a black drupe 6-8 mm. in diameter with 3 stones. Fruit matures in mid-July to late August. In flower mid-May to mid-June.

ECOLOGICAL NOTES: Alder-leaved buckthorn is found in northern coniferous swamps, hardwood swamps, shrub swamps and sedge meadows, usually in shade but also full sunlight. It prefers peat or mineral soils that are weakly to moderately acidic.

SOURCE: Gleason and Cronquist (1991); Smith (2008); and Voss (1985).

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BRISTLE-BERRY

(*Rubus wheeleri* Bailey)

ROSE FAMILY (Roseaceae) **C of C:** Native **IND. STATUS:** FAC

SYNONYMS: *Rubus setosus* Bigelow; *Rubus semisetosus* Blanch. var. *wheeleri* Bailey

FIELD CHARACTERISTICS: A perennial, mid-size shrub with biennial canes that are erect or arching to 1 m. long. Prickles are usually sparse and weak, 3-5 mm. long and number 2.5-5 per cm. of cane. Primocane leaves are palmately compound with 5(3) leaflets. The central leaflet is elliptical to obovate, 7-10 cm. long by 4.5-7 cm. wide, the base tapered to subcordate or rounded, while the tip is short and abrupt. Petioles have sparse, non-glandular hairs and often a few weak prickles. Inflorescence is corymb or cyme with 4-12 white flowers. Pedicels and peduncle usually have stiff bristles or weak prickles. Flowers are bisexual, 5-merous, 2.3-3.8 cm. wide, sepals usually with gland-tipped hairs. Fruit is an aggregate of black drupelets, more or less round and 8-15 mm. in diameter. In flower mid- to late June.

ECOLOGICAL NOTES: Bristle-berry occurs at the edges of swamps and marshes, and in wet meadows and sedge meadows, as well as in uplands. Its range includes most of Wisconsin but only a small portion of central Minnesota where it is considered rare. No C of C for this species has been assigned by either state.

SOURCE: Gleason and Cronquist (1991); Smith (2008); and Voss (1985).

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SWAMP FLY HONEYSUCKLE

(*Lonicera oblongifolia* (Goldie) Hook.)

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

FIELD CHARACTERISTICS: A mid-size to tall, deciduous shrub with single or multiple stems to 2 m. in height and 2 cm. basal diameter. Bark is gray or brown and exfoliating in flakes or strips. Leaves are opposite, elliptical to obovate to oblong, the larger ones 3.5-8.5 cm. long and 1.5-3 cm. wide. Leaf margins are entire and finely hairy but not ciliate. Upper leaf surfaces are green and moderately covered with fine hairs while lower leaf surfaces are pale green and densely covered with fine, woolly hairs. Flowers are bisexual, 5-merous and arranged in sessile pairs that are erect or ascending. Corolla is tubular, pale yellow to whitish, and 0.8-1.4 cm. long, the lobes longer than the tube and reflexed. Fruit is a spherical, reddish berry 7-11 mm. in diameter, shiny, maturing in early July to early August. In flower early June to early July.

ECOLOGICAL NOTES: Swamp fly honeysuckle is fairly common in coniferous swamps, shrub swamps and sedge meadows. Occasionally it can be found on lakeshores and streambanks. This species prefers openings or thin canopies of tamarack and northern white cedar. Moderately acidic peats are preferred, although it does occur on loamy soils as well. Flowers are pollinated by insects and hummingbirds.

SOURCE: Smith (2008).

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GOLDTHREAD

(*Coptis trifolia* (L.) Salisb.)

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

FIELD CHARACTERISTICS: A perennial herb from bright yellow, slender rhizomes, hence the common name. The evergreen leaves have 3 leaflets and arise from the base of the plant on long petioles. Margins of the leaves are shallowly lobed with rounded tips, with broadly rounded teeth. The one-flowered peduncle grows to a height of 5-15 cm. Flowers are white with petal-like sepals 10-15 mm. wide. Fruit is a beaked follicle 8-13 mm. long. In flower April-June.

ECOLOGICAL NOTES: Goldthread is a characteristic herb of cedar swamps, often growing on moss hummocks.

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

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BLUE-BEAD LILY

(*Clintonia borealis* (Aiton) Raf.)

LILY FAMILY (Liliaceae) **C of C:** Native (7) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A perennial, rhizome producing herb to 40 cm. in height. The 2-5 glossy, green leaves are oblong to elliptic, up to 3 dm. in length and have ciliate margins (becoming hairless with age). A scape (naked stem) produces 3-8 bright yellow, nodding flowers with 6 stamens and 6 tepals (15-18 mm. in length). Fruit is a bright blue berry 8 mm. in diameter. In flower May-June.

ECOLOGICAL NOTES: Blue-bead lily is a frequent herb of coniferous swamps and bogs in and north of the vegetative tension zone. It is often growing on the tops of hummocks and around tree trunks with raised root systems, a drier microhabitat in these forested wetlands. It is equally common in mesic (upland) forested habitats.

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

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WILD LILY-OF-THE-VALLEY

(*Maianthemum canadense* Desf.)

LILY FAMILY (Liliaceae) **C of C:** Native (5) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A perennial herb 5-20 cm. in height. Leaves number (1)2(3), are short-petioled to sessile, 3-10 cm. long and ovate-oblong. Inflorescence is a raceme 2-5 cm. long with flowers that are 4-6 mm. wide. Fruits are pale red berries 3-4 mm. thick. In flower May-June.

ECOLOGICAL NOTES: Wild lily-of-the-valley is an abundant herb that occurs in a diversity of plant communities from wet to dry. In coniferous swamps and bogs, it frequently occurs on the drier microhabitat of raised hummocks.

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

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BUNCHBERRY

(*Cornus canadensis* L.)

DOGWOOD FAMILY (Cornaceae) **C of C:** Native (7 WI)(6 MN) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A perennial herb with a woody rhizome. Stems are 10-20 cm. in height. Leaves are oval to obovate and 4-8 cm. long. Four to 6 leaves are apparently whorled at the summit. A single flower cluster arises on a peduncle 1-3 cm. high. Flowers are yellow-green or creamy-white surrounded by 4 white bracts 1-2 cm. long. Fruit is a cluster of round, bright red berry like drupes 6-8 mm. wide. In flower June-July.

ECOLOGICAL NOTES: Bunchberry is a common forb of coniferous swamps and bogs frequently growing on raised hummocks. It is also common in upland forests consisting of mixed conifers/ hardwoods.

SOURCE: Gleason and Cronquist (1991); Smith (2008); Chadde (2002); and Voss (1985).

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ONE-FLOWERED PYROLA

(*Moneses uniflora* (L.) A. Gray ssp. *uniflora*)

WINTERGREEN FAMILY (Pyrolaceae) **C of C:** Native (9 WI)(8 MN) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A perennial herb 3-10 cm. in height. The finely-toothed leaves are opposite or in whorls of 3, orbicular in shape and 1-2 cm. wide. The single flower is white, nodding and 1-2 cm. wide. Fruit is a round capsule. In flower July-August.

ECOLOGICAL NOTES: One-flowered pyrola occurs in cedar swamps as well as mixed conifer/hardwood swamps.

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

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ALPINE ENCHANTER'S NIGHTSHADE

(*Circaea alpina* L. ssp. *alpina*)

EVENING PRIMROSE FAMILY (Onagraceae) **IND. STATUS:** FACW

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

FIELD CHARACTERISTICS: A perennial herb with weak stems 10-30 cm. in height. Leaves are opposite, ovate, 2-5 cm. long and 1-3 cm. wide. White flowers, with sepals 1-2 mm. long and petals up to 2 mm. long, are in racemes of 10-15 flowers. Fruit is a 1-seeded capsule 2-3 mm. long. In flower June-August.

ECOLOGICAL NOTES: Alpine enchanter's nightshade is characteristic of cedar swamps where it is frequently found on rotting logs. Voss (1985) notes that this species also occurs in depressional areas of hardwood swamps.

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

FLAT-TOP ASTER

(*Doellingeria umbellata* (Mill.) Nees)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (6) **IND. STATUS:** FACW

SYNONYM: *Aster umbellatus* Miller

FIELD CHARACTERISTICS: A perennial herb with 1-10(20) ascending to erect stems, 10-200 cm. high. It is colonial at times from creeping rhizomes. Stems are smooth to sparsely hairy. Leaves are entire, lance-elliptic, 4-16 cm. long by (7)10-35 mm. wide, and sessile or nearly so. The numerous (22-54) heads form a distinctive, generally flat-topped (corymbiform) inflorescence. The 7-14 ray flowers are white and 5-8 mm. long with 16-40 yellowish-white disc flowers. In flower July-September.

ECOLOGICAL NOTES: Flat-top aster is frequently found in openings of coniferous swamps as well as in open bogs, sedge meadows and calcareous fens.

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

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NORTHERN BOG ASTER

(*Symphyotrichum boreale* (Torr. & A. Gray) A. Love & D. Love)

ASTER FAMILY (Compositae or Asteraceae) **IND. STATUS:** OBL

SYNONYMS: *Aster junciformis* Rydb.; *Aster borealis* (Torr. & A. Gray) Prov.

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

FIELD CHARACTERISTICS: A perennial herb 15-100 cm. high. Rhizomes and the slender stems are less than 2(2.2) mm. in diameter. Stems are often reddish and smooth except for lines of short, appressed hairs below the base of upper leaves. The narrowly linear leaves are entire and 4-13 cm. long by 1.5-5 mm. wide. They are sessile and very slightly clasping along 1-3+ erect stems. The flowering heads are few—occasionally solitary—and terminal. The 20-50 white to pale lavender ray flowers are about 10 mm. (up to 15 mm.) long. In flower August-September. See Appendix B for a key to wetland asters.

ECOLOGICAL NOTES: Northern bog aster, also known as rush aster, primarily occurs in open conifer swamps, bogs and calcareous fens.

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NORTHERN BOG GOLDENROD

(*Solidago uliginosa* Nutt.)

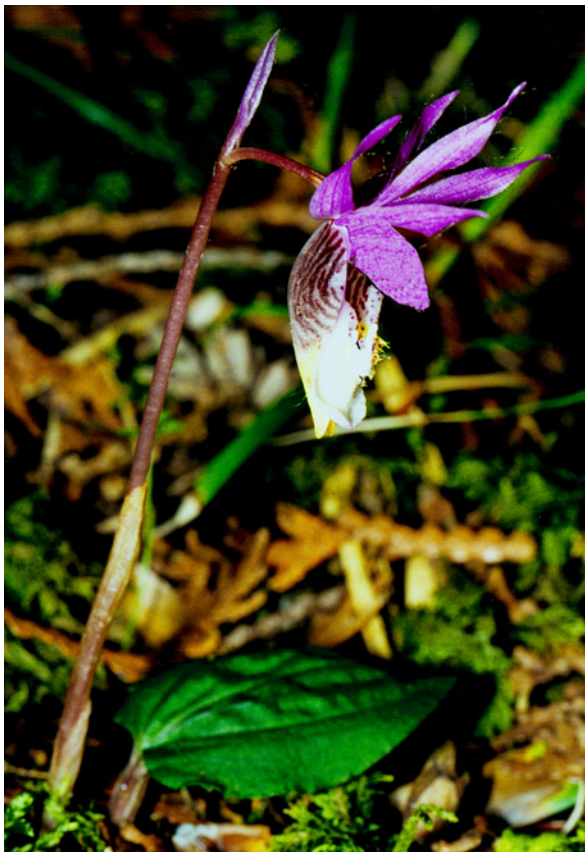
ASTER FAMILY (Compositae or Asteraceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: A perennial herb 50-150 cm. tall with smooth stems but finely hairy within the inflorescence. The alternate leaves are largest at the base of the plant, becoming smaller upward. Lower leaves taper to a long petiole while upper leaves are sessile. Larger leaves 6-15 times as long as wide (6-35 cm. x 6-60 mm.). Flowers are clustered in an elongate, narrow raceme. Flowers are yellow with involucres 3-5 mm. long. In flower July-September. See Appendix A for a key to wetland goldenrods.

ECOLOGICAL NOTES: Northern bog goldenrod typically occurs in open bogs, coniferous bogs and coniferous swamps.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Chadde (2002).



CALYPSO ORCHID

(*Calypso bulbosa* (L.) Oakes var. *americana* (R.Br.) Luer)

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

C of C: Native (9 MN)(10 WI); listed as a threatened species in Wisconsin

FIELD CHARACTERISTICS: A perennial herb with a stem 6-21 cm. in height. A single, ovate leaf 3-5 cm. long and 2-3 cm. wide is produced in fall and remains green through the winter. The single, nodding flower emerges in mid-May to June and has pale purple sepals and lateral petals 1-2 cm. long. The lip, 1.5-2.3 cm. long, is white to pink and streaked with purple.

ECOLOGICAL NOTES: The calypso orchid is a rare species associated with northern forests in relatively pristine condition (e.g., old growth forests, or forests with 80 or more years post logging). In particular, it is found in older growth cedar swamps near the base of the largest cedars. Smith (1993) states that calypso orchids also occur to a lesser extent in upland coniferous forests. He notes its short-lived and somewhat ephemeral nature making it an "…elusive orchid that cannot be found on demand."

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

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RAM'S-HEAD LADY'S-SLIPPER

(*Cypripedium arietinum* R. Br.)

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

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

FIELD CHARACTERISTICS: A perennial herb with a pubescent stem 15-32 cm. in height. Up to 12 stems can arise from a single rhizome. Leaves number 3-5 per stem and are elliptical, 5-10 cm. long and 1.4-3 cm. wide. Inflorescence consists of one, sometimes 2, flowers. Dorsal sepal is greenish to purplish and 1.2-2.6 cm. long. Lateral sepals are separate, greenish to purplish and 1.2-2.1 cm. long. Petals are similar to the lateral sepals. The lip is an inflated pouch 1-2 cm. long, whitish or pinkish with a conspicuous downward conical projection on the underside. In flower May-June.

ECOLOGICAL NOTES: Ram's-head lady's-slipper is the smallest and rarest of our lady's-slippers. With the distinct downward protruding lip, it cannot be confused with any other lady's-slipper. Ram's-head lady's-slipper occurs in northern coniferous swamps under a canopy of northern white cedar, tamarack or spruce. Additionally, it has been found in upland habitats such as sandy, jack pine forests.

SOURCE: Smith (1993).

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SMALL ROUND-LEAVED ORCHIS

(*Amerorchis rotundifolia* (Banks) Hulten)

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

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

FIELD CHARACTERISTICS: A perennial herb with a stem 15-36 cm. in height (including the inflorescence). The single, essentially basal leaf is elliptic to ovate to obovate, and 5-15 cm. long and 2-8.5 cm. wide. The inflorescence is a terminal raceme 3-13 cm. long with 4-18 flowers. Sepals are white to pale pink and 5-8 mm. long. Petals are whitish to pink or purplish and 4.5-7 mm. long. The lip is white with purple spots, 3-lobed, and 6.5-10 mm. long and 4-7.5 mm. wide. In flower June-July.

ECOLOGICAL NOTES: Small round-leaved orchis typically occurs in northern coniferous swamps under a canopy of northern white cedar, tamarack or spruce. While rare in portions of its range in Minnesota and Wisconsin, substantial populations still exist in the large peatlands of northwestern and north central Minnesota (Smith 1993).

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

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RAGGED-FRINGED ORCHID

(*Platanthera lacera* (Michx.) Lodd.)

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

SYNONYM: *Habenaria lacera* (Michx.) R. Br.

FIELD CHARACTERISTICS: A perennial herb with a stem 20-77 cm. in height (including inflorescence). Leaves number 3-7 per stem, lower ones lanceolate to elliptical, and 5-14 cm. long and 1-3.5 cm. wide. Upper leaves are greatly reduced in size becoming bract-like. The inflorescence is a terminal raceme 4-17 cm. long and 2-4.5 cm. wide with 15-60 white to greenish white flowers. Sepals are ovate to subobicular and 3-7 mm. long. Petals are linear-oblong and 2.8-6 mm. long. The lip is white, 0.5-1.9 cm. wide and divided into three major segments. The lateral segments are deeply incised producing a fringe of thread-like divisions. The spur is curved and 1.1-1.7 cm. long. In flower in July.

ECOLOGICAL NOTES: Ragged-fringed orchid is usually found in full or partial sunlight, but sometimes in shade, on acidic peat or mineral soils. This includes open bogs, sedge meadows, coniferous bogs and coniferous swamps.

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

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CRESTED SHIELD FERN

(*Dryopteris cristata* (L.) A. Gray)

WOOD FERN FAMILY (Dryopteridaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial fern from short-creeping to somewhat ascending rhizomes. Fronds are once pinnate to nearly twice pinnate, narrow, primarily 35-80 cm. long and 7-15 cm. wide, with about 10-25 pairs of pinnae. Fronds are somewhat dimorphic in that sterile fronds are half to three-fourths as long as fertile fronds. Sori are round and located midway between the midvein and the margin. The indusium is attached at the center of the sori and looks like a clear, plastic, miniature umbrella covering the sori (see photograph above).

ECOLOGICAL NOTES: Crested shield fern occurs in bogs, coniferous swamps and alder thickets, typically on a moss substrate.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Chadde (2002).

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ROYAL FERN

(*Osmunda regalis* L. var. *spectablis* (Willd.) A. Gray)

ROYAL FERN FAMILY (Osmundaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial fern to 1 m. in height. Blades are bipinnate, broadly ovate, 4-8 dm. long and 3-5 dm. wide. Petioles are smooth green to red-green, to three-quarters of the length of the blade. Fronds are dimorphic. The uppermost pinnae of fertile fronds are replaced by clusters of rusty-brown colored clusters of sporangia.

ECOLOGICAL NOTES: Royal fern is frequent in coniferous and hardwood swamps, alder thickets and bogs. It prefers acidic soils.

SOURCE: Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Chadde (2002).

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INTERIOR SEDGE

(*Carex interior* L.H. Bailey)

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

FIELD CHARACTERISTICS: A perennial sedge with stems forming dense tufts 20-70 cm. tall. Mature leaves are usually 1-2.1 mm. wide. Typically only 3(2-5) star-like sessile spikelets per stem are present. The spikelets are monoecious (dioecious in *C. sterilis*). Terminal spikelets are pistillate above. The egg-shaped perigynia are 2.3-3.0 mm. wide, typically nerveless above the mid-section on the ventral surface, spreading or reflexed at maturity. Perigynium-beak teeth are obscure, rarely to 0.25 mm. Scales are rounded. Two stigmas are present and the nutlets are lens shaped.

The spikelets of this sedge are remarkably similar to the pistillate spikelets of sterile sedge (*Carex sterilis*)[page 226].

ECOLOGICAL NOTES: Interior sedge occurs in bogs, cedar swamps and calcareous fresh (wet) meadows. It also occurs on wet marly ground, especially with fluctuating water levels.

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

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SMALL YELLOW SEDGE

(*Carex cryptolepis* Mack.)

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

FIELD CHARACTERISTICS: A clumped, perennial sedge with stems 20-60 cm. tall, surpassing its leaves. Lower portion of stem sheaths are white. Mature leaf blades are 1.5-3.5(4) mm. wide. The distinctive short, thick, prickly looking spikelets have yellowish to golden brown perigynia. Spikelets have staminate and pistillate flowers arranged toward the tip and base, respectively. Perigynia are recurved along the stem axis with lower being reflexed and flattened. Perigynia are 3.2-4.8(5) mm. long and abruptly contract into smooth beaks, about one-half as long as the body. Pistillate scales are lance-oval shaped, inconspicuous and the same color as the perigynia.

This sedge is considered by some to be a variety of *Carex flava* (pistillate scales are brown).

ECOLOGICAL NOTES: Small yellow sedge often holds its distinctive perigynia into September. It prefers cedar swamps, calcareous wet prairies, sedge meadows and interdunal swales.

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

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BROWN SEDGE

(*Carex brunnescens* (Pers.) Poiret.)

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

FIELD CHARACTERISTICS: A clump-forming, perennial sedge with stems up to 90 cm. tall. Stems are sharply triangular and rough toward the top. Leaves are green, 1-2.5 mm. wide and shorter than the stems. A bristle-like lower bract usually does not exceed the flowering stem. Sessile spikelets number 5-10, are brownish in color and 4-8 mm. in size. Both staminate and pistillate flowers are mixed in each spikelet with staminate flowers borne below pistillate flowers. Each spikelet consists of 3-10(15) loosely spreading and ascending perigynia. Perigynia are convex on one side, up to 3 mm. long and have rounded margins (lack wings). Nerves are subtle or indistinct. Perigynia are widest near the middle of the body and taper to a short, flattened beak. The beak has minute, sharp, forward pointed teeth along its margins as seen with a 10x hand lens. Perigynia are subtended by oval scales with white hyaline edges surrounding a green center.

ECOLOGICAL NOTES: Brown sedge, also known as green bog sedge, prefers peaty soils along the borders of bogs, cedar swamps and hardwood swamps. It occasionally occurs in upland forests.

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