

SECTION 3

FLOODPLAIN FORESTS

VII. Floodplain Forests

Floodplain forests are dominated by mature, deciduous hardwood trees growing on alluvial, mineral soils associated with riverine systems. Soils are inundated during flood events, but are usually somewhat well-drained for much of the growing season (Shaw and Fredine 1971). The most characteristic feature of floodplains is the alluvial soil that is constantly being deposited in some locations and eroded away in others. Floodplain forests typically include the northern and southern wet-mesic hardwood forest associations described by Curtis (1971). Dominant hardwoods include silver maple, green ash, river birch, swamp white oak, plains cottonwood, American elm and black willow. The shrub layer is typically sparse to lacking because of frequent flooding. Woody vines are more prevalent in floodplain forests than any other forested wetland community and include wild grape, Virginia creeper and moonseed. The herbaceous groundlayer can be sparse and includes jewelweed, nettles and certain sedges. In some cases, reed canary grass has invaded and now dominates the groundlayer.

Floodplain forests have a great diversity of plant and animal species because they serve as migration corridors. Some of the many species of wildlife that inhabit floodplain forests are wood duck, barred owl, herons, egrets and a variety of songbirds. Pools within the forest provide habitat for amphibians and invertebrates, while adjoining areas of open sand provide habitat for reptiles. During high water periods, these forests even provide habitat for fish.

Floodplain forests are extremely important for attenuation of flooding impacts. Diking and filling of floodplain forests to allow development or agricultural use can aggravate both upstream and downstream flooding impacts.

VEGETATION: The floodplain forest shown by the following two photographs is dominated by silver maple (*Acer saccharinum*) with a groundlayer dominated by wood nettle (*Laportea canadensis*) and honewort (*Cryptotaenia canadensis*). Also present are green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), plains cottonwood (*Populus deltoides* ssp. *monilifera*), riverbank grape (*Vitis riparia*), common bur sedge (*Carex grayi*), jewelweed (*Impatiens capensis*), stinging nettle (*Urtica dioica* ssp. *gracilis*), clearweed (*Pilea pumila*) and cut-leaf coneflower (*Rudbeckia laciniata*).

SOILS: Calco silt loam, frequently flooded (Cumulic Endoaquolls). Landscape position is the floor of a deep valley within the Paleozoic Plateau of southeastern Minnesota.

HYDROLOGY: Adjacent to the Cannon River and inundated during spring flood events and heavy summer rainfall events.

LOCATION: Cannon River, Goodhue County, Minnesota.

FLOODPLAIN FORESTS



April

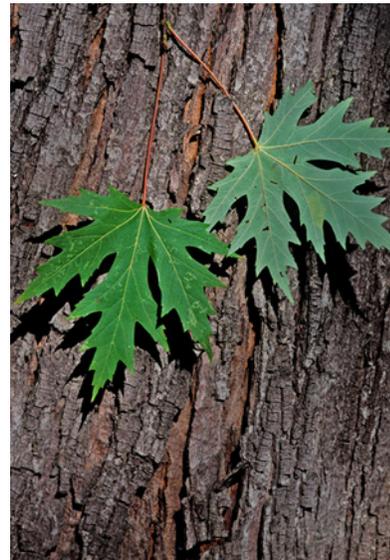


August

Two seasonal views of a floodplain forest at approximately the same location. The first photograph shows high water conditions during spring flooding; the second photograph shows low water levels during late summer.

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FLOODPLAIN FORESTS



SILVER MAPLE

(*Acer saccharinum* L.)

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

FIELD CHARACTERISTICS: A deciduous tree growing to a height of 32 m. and 153 cm. dbh. Leaves are opposite and deeply 5-lobed with a narrow terminal leaf base. Leaves are green above and silvery white below with petioles that are usually green. Both twigs and buds are reddish. Bark is gray and smooth in young trees, becoming flaky (peeling) with age. Fruit is a winged samara 3.5-5.5(6) cm. long, which falls in May and June. In flower March-April, among the earliest of any of our tree species.

Similar to red maple (*A. rubrum*). Refer to page 327.

ECOLOGICAL NOTES: Silver maple, or soft maple, is one of the dominant trees in our floodplain forests, frequently associated with green ash (*Fraxinus pennsylvanica*), plains cottonwood (*Populus deltoides* ssp. *monilifera*) and American elm (*Ulmus americana*). It is the most flood tolerant of our tree species. Silver maple is also found in hardwood swamps, especially in southeastern Wisconsin. It is frequently used for landscaping purposes as a shade tree.

SOURCE: Fernald (1970); Petrides (1972); Smith (2008); and Voss (1985).

FLOODPLAIN FORESTS



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GREEN ASH

(*Fraxinus pennsylvanica* Marsh.)

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

FIELD CHARACTERISTICS: A deciduous tree growing to a height of 34 m. and 119 cm. dbh. Leaves are opposite and compound. Leaflets number 5-9 (usually 7) and are toothed, slightly petioled and 4-5 cm. long. Leaf scars form a half circle. Branches are smooth and round, or nearly so. Bark is furrowed in a very tight, regular diamond pattern of crisscrossing ridges. Fruit is a wedge-shaped samara with a round or somewhat round body and a flat wing. In flower April-May.

ECOLOGICAL NOTES: Green ash is commonly associated with floodplain forests and, to a much lesser extent, hardwood swamps. It also occurs in rich upland habitats and is frequently used for landscaping purposes.

SOURCE: Gleason and Cronquist (1991); Petrides (1972); Smith (2008); and Swink and Wilhelm (1994).

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AMERICAN ELM

(*Ulmus americana* L.)

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

FIELD CHARACTERISTICS: A deciduous tree growing to 40 m. in height and 120 cm. dbh with a characteristic vase-shaped growth form. Leaves are alternate, doubly serrate, elliptical to oblong-ovate, 8-14 cm. long, and nearly smooth to very rough above. Leaf veins are arranged in a characteristic herringbone pattern. Mature trees have dark gray bark with ridges separated by roughly diamond-shaped areas. Flowers develop in spring before the leaves unfold. Fruit is a wafer-like samara 1 cm. long that falls in May. In flower March-May.

ECOLOGICAL NOTES: American elm used to be one of the primary dominants of the floodplain forests of Minnesota and Wisconsin; however, these populations have been decimated by Dutch elm disease caused by an introduced fungus transmitted by bark beetles. American elm is also found in hardwood swamps and rich upland forests. In the past, American elm was extensively used for landscaping but Dutch elm disease has ravaged those populations as well.

SOURCE: Brockman (1979); Gleason and Cronquist (1991); and Swink and Wilhelm (1994).

FLOODPLAIN FORESTS



Vase-shaped growth form is characteristic.



Outer bark has alternating red and white layers.

American Elm
(*Ulmus americana*)

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SWAMP WHITE OAK

(*Quercus bicolor* Willd.)

BEECH FAMILY (Fagaceae)

C of C: Native (7 WI)(8 MN)

IND. STATUS: FACW

A species of special concern in Minnesota

FIELD CHARACTERISTICS: A large, deciduous tree to 24 m. in height and 70 cm. in dbh. Bark of mature trees is gray or brownish gray, thick, with ridges separated by deep furrows. Leaf blades are 10-19 cm. long and 7-11 cm. wide. Leaves have 3-9 small to midsize rounded lobes, the deepest sinuses extending 15-50 percent of the distance to the midvein. Upper leaf surfaces are dark green, glossy, and glabrous or glabrate. Lower leaf surfaces are pale green or grayish, dull, and densely hairy with minute, appressed, star-like hairs mixed with longer, erect hairs. Flowers are unisexual and borne separately on the same branch. Male flowers are in pendulant catkins 2-8 cm. long. Female flowers number 1-3 on a long peduncle. Fruit is an acorn 1.7-2.4 cm. long and 1.3-1.7 cm. wide where the cup covers 50-65 percent of the total length of the acorn. Acorns are on a long stalk (peduncle) 3-7 cm. long. In flower in May with fruit maturing in late August to late September.

Swamp white oak resembles bur oak (*Q. macrocarpa*), but the leaves have smaller and more uniform lobes. The acorns of swamp white oak are on long stalks and lack a fringe of hairs, as opposed to the short-stalked, fringed acorns of bur oak.

ECOLOGICAL NOTES: Swamp white oak is a characteristic species of floodplain forests. In Minnesota it is restricted to the Mississippi River floodplain in the very southeastern portion of the state. Swamp white oak occurs in larger river floodplains across southern Wisconsin.

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



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Unlike other oak species in our area, the acorns of swamp white oak are on long stalks (3-7 cm. long).

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Leaves are “bicolor” in that the upper and lower surfaces have different color and texture. Shown here with immature acorns on the characteristic long stalk.



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Swamp White Oak
(*Quercus bicolor*)

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BLACK WILLOW

(*Salix nigra* Marsh.)

WILLOW FAMILY (Salicaceae) **C of C:** Native (4) **IND. STATUS:** OBL(NC/NE, MW);FACW(GP)

FIELD CHARACTERISTICS: A deciduous tree growing to a height of 25 m. and 45 cm. dbh; frequently with several trunks. Trunks are often leaning or horizontal to the water or ground surface. Leaves are alternate, narrowly lanceolate, 6-10(12) cm. long and serrulate. Both sides of leaves are green; upper side of the leaf is darker green than the lower. Bark of mature trees is flaky, heavily ridged and dark brown to black. Catkins, 2.5-7 cm. long, are borne among new leaves from mid-May to June.

ECOLOGICAL NOTES: A common willow of floodplain forests; it is also found along stream-banks, lakeshores, ditches and berms.

SOURCE: Brockman (1979); Fernald (1970); Smith (2008); and Gleason and Cronquist (1991).



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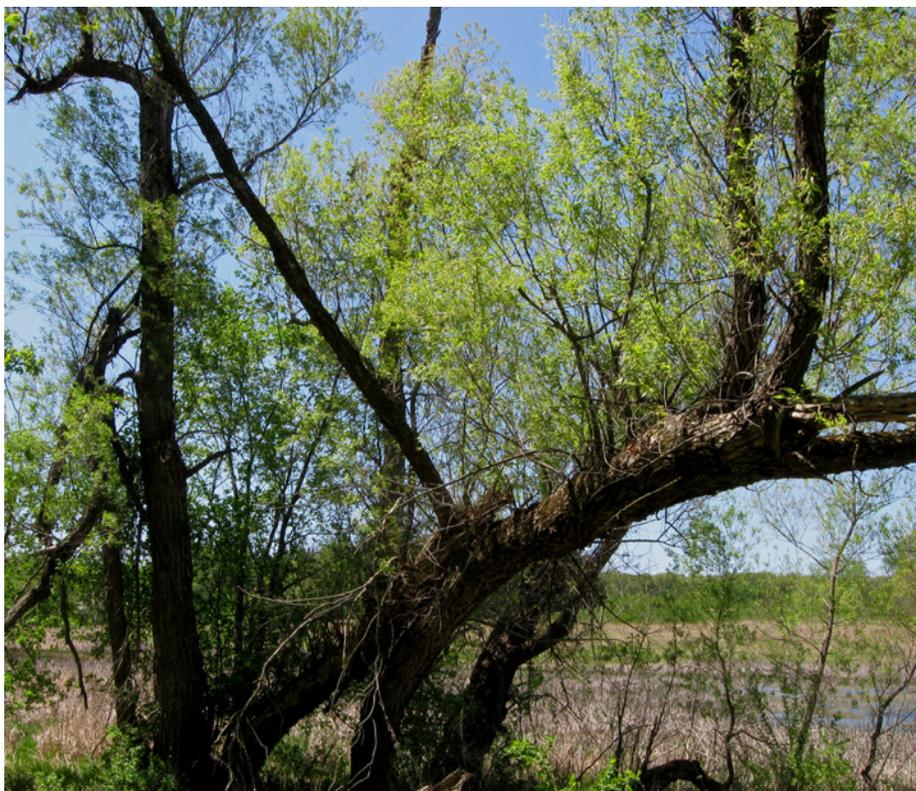
Pistillate catkins

Unlike other tree-size willow species in our area, the leaves of black willow are green on both sides.

Black Willow
(*Salix nigra*)



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WHITECRACK WILLOW

(*Salix x fragilis* L.)

WILLOW FAMILY (Salicaceae)

C of C: Introduced (0)

IND. STATUS: FAC

SYNONYM: *Salix x rubens* Schrank

FIELD CHARACTERISTICS: A large, deciduous tree with 1-5 upright or leaning trunks to 30 m. in height and 116 cm. dbh. Bark is gray or gray brown with deep furrows and coarse ridges. First- and second-year branchlets are yellow to yellowish-brown or yellowish-green. Petioles are 6-18 mm. long, usually with enlarged glandular dots or lobes at the summit. Leaves are elliptical to lanceolate and 7-15 cm. long and 1.3-3 cm. wide with an apex that is acuminate to caudate. Upper leaf surfaces are dark green, shiny or dull, and glabrous or nearly so. Lower leaf surfaces are pale green or pale blue-green, dull and glabrous or nearly so. Immature leaves are reddish or yellowish green and covered with long, silky hairs at first, then becoming glabrous. Male catkins are 3.5-6.5 cm. long while female catkins are 5-9 cm. long. Capsules are glabrous and 4-6 mm. long. In flower in early May to early June.

ECOLOGICAL NOTES: Whitecrack willow has been long mistaken for the native peach-leaf willow (*S. amygdaloides*) and non-native white willow (*S. alba*). It is actually a hybrid of two European species, white willow and crack willow (*S. fragilis*). Whitecrack willow was widely planted by early European settlers and escaped to the extent that today it is a common tree of floodplains and streambanks. See Smith (2008) for a key to distinguish between these tree-sized willow species.

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

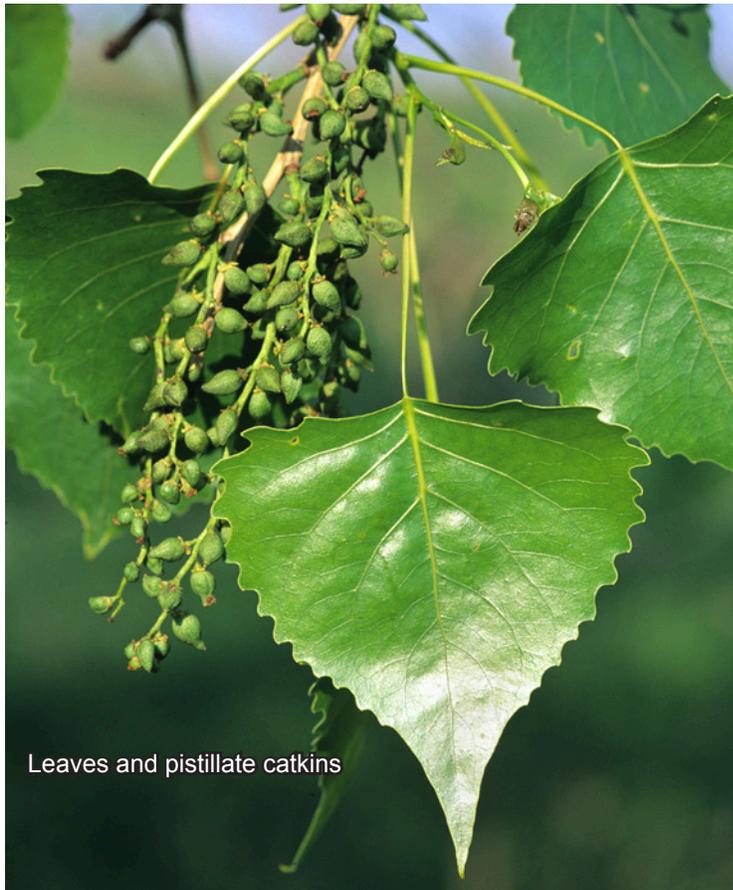
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Whitecrack Willow
(*Salix x fragilis*)

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Leaves and pistillate catkins



Staminate catkin

© Photos by Steve D. Eggers

PLAINS COTTONWOOD

(*Populus deltoides* Marsh. ssp. *monilifera* (Ait.) Eckenw.)

WILLOW FAMILY (Salicaceae)

C of C: Native (1 MN)(2 WI)

IND. STATUS: FAC

FIELD CHARACTERISTICS: The largest deciduous tree in Minnesota and Wisconsin growing to a height of 40 m. and 200 cm. in diameter. Leaves are broadly triangular (deltoid-shaped, as in the species name) with flattened petioles and serrate margins. Leaves are 8-14 cm. long and have glands at the base. Bark of mature trees is deeply furrowed and dark gray. Flowers are in unisexual catkins. Multitudes of short-lived, minute seeds with cottony hairs are produced that can be blown for long distances. In flower April-May.

ECOLOGICAL NOTES: Plains cottonwood is a common tree of floodplain forests and streambanks as well as uplands. It is typically a pioneering species of disturbed sites such as berms, ditches, dredge spoils, stormwater ponds and quarries. Eastern cottonwood (*P. deltoides* ssp. *deltoides*) is closely related but occurs south and east of Minnesota and Wisconsin (Smith 2008).

SOURCE: Brockman (1979); Fernald (1970); Gleason and Cronquist (1991); Smith (2008); and Swink and Wilhelm (1994).

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RIVER BIRCH

(*Betula nigra* L.)

BIRCH FAMILY (Betulaceae)

C of C: Native (6)

IND. STATUS: FACW

FIELD CHARACTERISTICS: A deciduous tree growing to a height of 25 m. and 57 cm. dbh. Bark can be reddish to brown to black, and peels in curled strips. Leaves are alternate and irregularly oval to triangular-oval, 4-8 cm. long, pale beneath, and the margins of upper portions are doubly serrate, while the lower margins are shallowly lobed. Catkins are 1.5-3 cm. long. Pistillate catkins are cone-like and disintegrate when ripe. Staminate catkins form in summer and open the following spring. In flower April-May. Similar to yellow birch (*B. alleghaniensis*) [page 328] but yellow birch leaves are not doubly serrate. Additionally, the twigs/bark of yellow birch have the scent of wintergreen, which river birch lacks.

ECOLOGICAL NOTES: River birch is found in floodplain forests and hardwood swamps. Its preferred germination sites are sandbars exposed after spring floods have receded.

SOURCE: Brockman (1979); Gleason and Cronquist (1991); Swink and Wilhelm (1994); Smith (2008); and Voss (1985).

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BOX ELDER

(*Acer negundo* L.)

MAPLE FAMILY (Aceraceae)

C of C: Native (1 MN)(0 WI)

IND. STATUS: FAC

FIELD CHARACTERISTICS: A deciduous tree growing to 35 m. in height and 148 cm. dbh. Compound leaves are opposite with 3 to 5 (rarely 7) irregularly serrated to shallowly lobed leaflets. The moderately stout, smooth twigs are greenish to purple with a pale waxy coating. Older bark is a gray to light brown color with deep furrows. Fruit is a winged samara 3-4.5 cm. long which falls in September to October. In flower from early April to late May.

ECOLOGICAL NOTES: Box elder, also known as ash-leaf maple, is an abundantly common species of streambanks and floodplains. It is also a frequent, pioneering species of disturbed habitats on moist alluvial soils, fertile soils of vacant urban parcels, and abandoned agricultural lands.

SOURCE: Gleason and Cronquist (1991); Petrides (1986); Swink and Wilhelm (1994); and Voss (1985).

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BUTTONBUSH

(*Cephalanthus occidentalis* L.)

MADDER FAMILY (Rubiaceae)

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

IND. STATUS: OBL

FIELD CHARACTERISTICS: A multiple-stemmed, deciduous, tall shrub to 5 m. in height and 10 cm. dbh. Bark is gray or brown and flaking with age. First-year branchlets are glabrous and greenish to greenish brown. Second-year branchlets are brown to gray-brown with whitish lenticels. Leaves are simple, opposite or occasionally in whorls of 3. Blades are entire, ovate to ovate-oblong or elliptical, 7-14 cm. long and 3-7 cm. wide. Upper leaf surfaces are dark green, glabrous and glossy; lower leaf surfaces are pale green and sparsely hairy on the main veins. The inflorescence is a tight, spherical cluster of 100-200 flowers, each cluster 2-3 cm. in diameter. Flowers are bisexual, with flower parts in 4s. Flowers are white or greenish, tubular, 8-12 mm. long, and appear in late June to early August. Fruit is a brown, cone-shaped nutlet 5-8 mm. long that matures in September-October.

ECOLOGICAL NOTES: Buttonbush is a characteristic species of floodplains as it is very tolerant of flooding and sedimentation. However, it is relatively shade-intolerant and prefers edges or openings within the floodplain forest. It has a wide range across the eastern U.S. but only extends into eastern Minnesota along the St. Croix and Mississippi River floodplains. In Wisconsin, it occurs in larger river floodplains across the southern half of the state.

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

FLOODPLAIN FORESTS



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INDIGO BUSH

(*Amorpha fruticosa* L.)

BEAN FAMILY (Fabaceae or Leguminosae)

IND. STATUS: FACW

C of C: Native (6 WI)(4 MN)

FIELD CHARACTERISTICS: An erect, perennial, deciduous, branching shrub to about 4 m. tall. Leaves are alternate and pinnately (feather-like) compound with 4-10 or more pairs of green leaflets, 2-4.5 cm. long. Leaflets are dotted with green sessile glands beneath. Petioles are typically pubescent. The purple flowers are arranged in (1)2 to several dense racemes, 6-20 cm. long. Fruit is a glandular pod, 5-9 mm. long by 2-4.5 mm. wide. In flower June-July.

ECOLOGICAL NOTES: Indigo bush is a riparian plant of streambanks, floodplains and lakeshores. It occasionally occurs in moist upland woods. It is very common along the Mississippi River.

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

FLOODPLAIN FORESTS



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Aerial roots

COMMON POISON IVY

(*Toxicodendron radicans* (L.) Kuntze ssp. *negundo* (Greene) Gillis)

CASHEW FAMILY (Anacardiaceae) **C of C:** Native (7 MN)(4 WI) **IND. STATUS:** FACU(GP)
FAC(NC/NE, MW)

SYNONYM: *Rhus radicans* L.

FIELD CHARACTERISTICS: A branching, deciduous shrub to 3 m. in height, or vines climbing to 20 m. in length. Stem diameters to 3-6 cm. with grayish to brown bark. The vine form is characterized by numerous aerial roots attached to host tree trunks (see photo: aerial roots are the copper-colored, fiber-like structures). Alternate, compound leaves are in trifoliate (3 leaflet) clusters. Leaflets are entire to few toothed or shallowly lobed and 3-12(15) cm. long. The terminal leaflet is supported by a long petiole. Mature leaflets are shiny, ovate and dark green. Immature leaflets range from reddish in spring to light green. Yellowish- to greenish-white flowers occur on ± ascending axillary panicles. The grayish-white, berry-like fruit is a spherical drupe 4-5 mm. in diameter. The resin, called urushiol and which occurs throughout the plant, can cause a severe allergic contact dermatitis.

ECOLOGICAL NOTES: Common poison ivy is very frequent in floodplain forests, especially along the Mississippi and Wisconsin Rivers. In addition, it occurs in a wide variety of habitats ranging from open sand dunes to upland fields, thickets and forests. The fruits are used as a winter food by a variety of birds and other wildlife, which aids in seed dispersal.

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

FLOODPLAIN FORESTS



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RIVERBANK GRAPE

(*Vitis riparia* Michx.)

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

FIELD CHARACTERISTICS: A perennial, deciduous, high-climbing, woody vine with stems to 25 m. in length and 20 cm. dbh. Mature bark is shredding and peeling. The stem pith is interrupted at the nodes by diaphragms up to 9.8 mm. thick. Tendrils are present. The simple leaves are opposite, rotund, 10-20 cm. long, with usually 3 forward pointing lobes. Leaf margins are coarse and sharply serrated. Young leaf blades tend to be pubescent underneath. As they mature, the undersides become green and glabrous with tufts of pubescent hairs between the veins. Panicles are 5-10 cm. long. Blue-black fruits are 6-12 mm. in diameter with a waxy bloom (glaucous) at maturity.

ECOLOGICAL NOTES: Riverbank grape is common in floodplain forests, wooded swamps, shrub swamps, along riverbanks, fence rows, upland forests and on sandy shores and dunes.

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

FLOODPLAIN FORESTS



Flowers are in elongate panicles.



© Photos by Steve D. Eggers

Fruit matures in late July to early September.



Bark peels in long, linear strips.

Riverbank Grape
(Vitis riparia)

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Leaves of three leave it be!



© Photos by Steve D. Eggers

Fruit matures late August to late September, often held over winter.

WESTERN POISON IVY

(*Toxicodendron rydbergii* (Small ex Rydb.) Greene)

CASHEW FAMILY (Anacardiaceae)

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

C of C: Native (1 MN)(2 WI)

SYNONYM: *Rhus radicans* L. var. *rydbergii* (Small) Rehd.

FIELD CHARACTERISTICS: A low, deciduous shrub to 2 m. in height and 2 cm. diameter that lacks aerial roots and has little, if any, branching. Bark is smooth and gray while branchlets are brown. Leaves are alternate, deciduous and compound with 3 leaflets. Leaflets are ovate to broadly-ovate, 8-13 cm. long by 4-9.5 cm. wide, with round to obtusely-angled bases. Leaf margins have irregular and coarse or blunt teeth. Inflorescence is an erect panicle from leaf axils. Flowers are functionally unisexual, in 5 parts, with whitish flowers 1.5-3 mm. long. Fruit is a spherical drupe, whitish to pale yellowish green, and 4.5-6 mm. in diameter. In flower in June.

ECOLOGICAL NOTES: Western poison ivy is found throughout Minnesota and Wisconsin in a wide variety of habitats except those that are permanently wet. It is primarily a forest species but also spreads to native prairies, sand dunes, road ditches and even manicured lawns adjacent to forests.

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

FLOODPLAIN FORESTS



Autumn colors

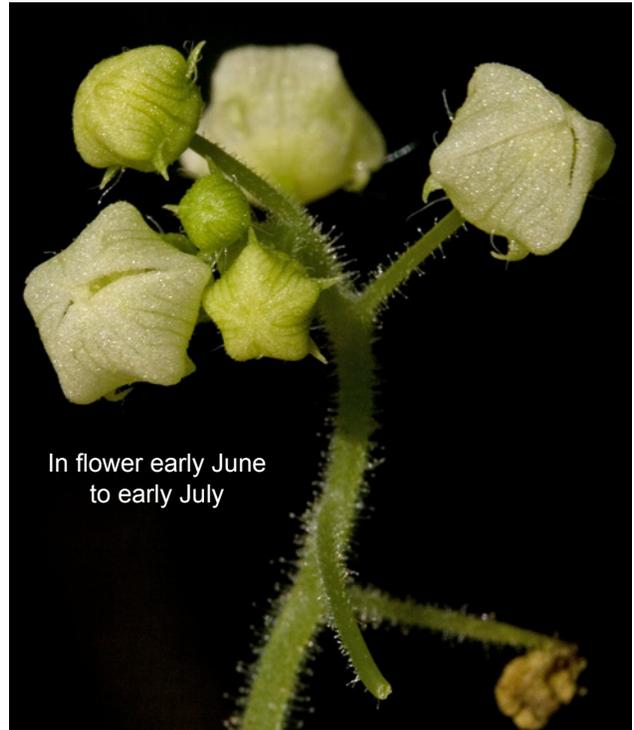
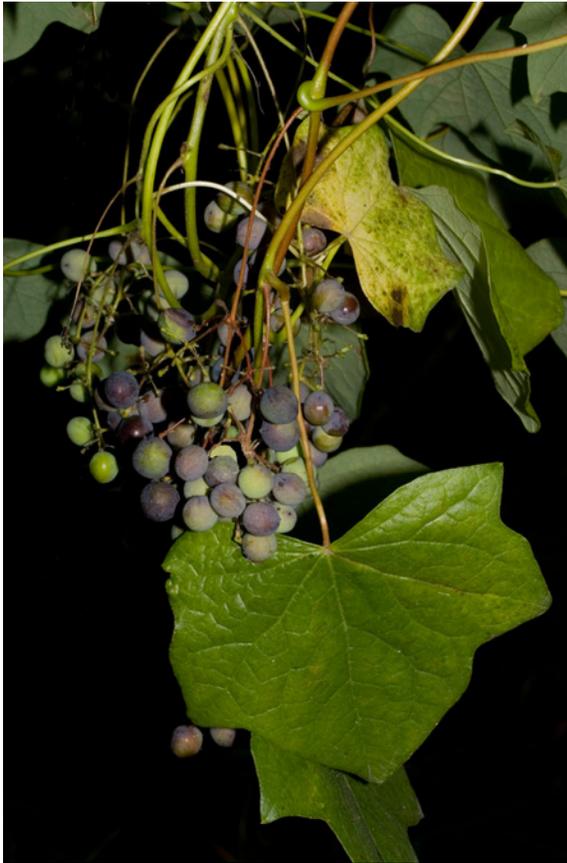


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In flower early to late June

Western Poison Ivy
(Toxicodendron rydbergii)

FLOODPLAIN FORESTS



In flower early June
to early July

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MOONSEED

(*Menispermum canadense* L.)

MOONSEED FAMILY (Menispermaceae)

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

C of C: Native (4 MN)(5 WI)

FIELD CHARACTERISTICS: A perennial, climbing vine with twining stems to 10 m. in height and 2 cm. in diameter. Bark is green to brown. Leaves are simple and alternate with blades that are reniform to broadly ovate. Blades are 4-18 cm. long and 6-22 cm. wide with a cordate base. Leaf margins have 1-3 pairs of shallow, blunt lobes. Upper leaf surfaces are dark green and sparsely hairy while lower leaf surfaces are pale green and sparsely hairy. Flowers are unisexual, whitish to greenish, and borne in axillary panicles of 15-50. In flower early June to early July. Fruit is a glabrous, bluish black drupe 9-13 mm. in diameter that matures in mid-August to early October.

ECOLOGICAL NOTES: Moonseed is a common woody vine of floodplain forests and mesic (upland) hardwood forests. It has the ability to survive in deep shade, but prefers sunny edges and partial openings in the forest canopy.

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

FLOODPLAIN FORESTS



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HOG PEANUT

(*Amphicarpaea bracteata* (L.) Fern.)

BEAN FAMILY (Fabaceae or Leguminosae)

IND. STATUS: FAC_(NC/NE, MW); FACU_(GP)

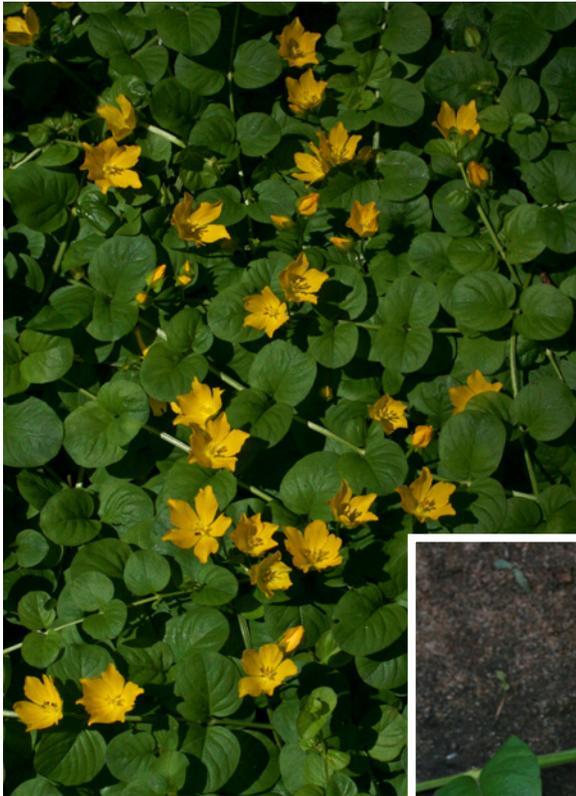
C of C: Native (2 MN)(5 WI)

FIELD CHARACTERISTICS: An annual, twining vine to 1.5 m. long. Leaves are composed of 3 leaflets each of which are 2-8 cm. long, ovate and broadly rounded at the base. Inflorescence has a long peduncle from a leaf axil and includes 2 to many pale, purplish to whitish, 5-parted flowers that are 12-18 mm. long. Fruit is a pod usually with 3 seeds. In addition, some branches at the base of the stem develop small, 1-seeded, often subterranean, fruits. In flower August-September.

ECOLOGICAL NOTES: Hog peanut is a common species of hardwood swamps, shrub-carrs and inland fresh meadows as well as mesic (upland) forests and meadows.

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

FLOODPLAIN FORESTS



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MONEYWORT

(*Lysimachia nummularia* L.)

PRIMROSE FAMILY (Primulaceae)

C of C: Introduced (0)

IND. STATUS: FACW

FIELD CHARACTERISTICS: A perennial, creeping, mat-forming herb with stems to 50-60 cm. long. Leaves are opposite, dotted with black glands, round or oval and 1-2.5 cm. long. Flowers are single in leaf axils on petioles to 2.5 cm. long. Sepals are triangular in shape and 6-8 mm. long. Petals are yellow, dotted with dark red and 10-15 mm. long. Fruit is a capsule. In flower June-August.

ECOLOGICAL NOTES: Moneywort is a native of Europe that escaped from cultivation and is potentially invasive in our region. It now occurs in a variety of shaded, wet habitats, especially floodplain forests.

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

FLOODPLAIN FORESTS



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CUT-LEAF CONEFLOWER

(*Rudbeckia laciniata* L.)

ASTER FAMILY (Compositae or Asteraceae)

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

C of C: Native (6 WI)(4 MN)

FIELD CHARACTERISTICS: A perennial herb 0.5-3 m. in height. Stems are glabrous and often glaucous. Leaves are alternate, up to 30 cm. wide, and deeply lobed (lacerated). Leaf margins are coarsely toothed to lobed. Inflorescence consists of multiple flower heads, which have both ray and disc flowers. Ray flowers are lemon-yellow while disc flowers are green-yellow. Ray flowers are 3-6 cm. long. Fruit is a 4-angled nutlet (achene). In flower July-September.

ECOLOGICAL NOTES: Cut-leaf coneflower is a characteristic species of floodplain forests and streambanks typically growing in full or partial shade. A garden cultivar known as goldenglow, which has all or most of the disc flowers converted to ray flowers, occasionally escapes to the wild.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); Swink and Wilhelm (1994); and Voss (1996).

FLOODPLAIN FORESTS



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CARDINAL FLOWER

(*Lobelia cardinalis* L.)

LOBELIA FAMILY (Lobeliaceae)

C of C: Native (7)

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

FIELD CHARACTERISTICS: A perennial herb that usually has a simple stem growing to a height of 50-150 cm. The leaves are thin, smooth, dark green, lanceolate to lance-ovate, and irregularly serrate. The racemes are terminal and 1-4 dm. long. Flowers are intense scarlet-red and 3-4 cm. long. In flower July-September.

ECOLOGICAL NOTES: Cardinal flower is found in floodplain forests, fresh (wet) meadows and along streambanks.

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

FLOODPLAIN FORESTS



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CANADA ANEMONE

(*Anemone canadensis* L.)

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

FIELD CHARACTERISTICS: A perennial herb from rhizomes often forming large patches. Stems grow to 10-60 cm. in height. Leaves are all from the base and have long petioles with the exception of 2-3 leafy, sessile bracts below the flower. Leaves from the base are 4-15 cm. wide and deeply palmately-divided into 3-5 toothed segments. The white flowers are 2-5 cm. long usually with 5 petal-like sepals (but can be 4- to 20-parted) that are 1-2 cm. long. Stamens and pistils are many. Nutlets are clustered in a semi-round head. Nutlets are hairy, 3-5 mm. long with a beak 2-4 mm. in length. In flower May-August.

ECOLOGICAL NOTES: Canada anemone is frequent in floodplain forests, fresh (wet) meadows and along streambanks.

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

FLOODPLAIN FORESTS



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WHITE AVENS

(*Geum canadense* Jacq.)

ROSE FAMILY (Rosaceae)

C of C: Native (2)

IND. STATUS: FAC

FIELD CHARACTERISTICS: A perennial herb with slender stems 40-100 cm. tall. Basal leaves have long petioles and mostly 3 obovate leaflets. Stem leaves mostly shorter petioled with more oblong-lanceolate to rhombic leaflets. Flowers have 5 white petals, which are nearly as long as the sepals, or longer. Head of fruits is obovoid and 10-15 mm. long. Fruit is a dry seed with a hook. In flower May-June.

ECOLOGICAL NOTES: White avens is a common forb of the shaded habitats of floodplain forests, high spots in hardwood swamps, and mesic (upland) forests.

SOURCE: Gleason and Cronquist (1991).

FLOODPLAIN FORESTS



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WOOD NETTLE

(*Laportea canadensis* (L.) Weddell)

NETTLE FAMILY (Urticaceae)

C of C: Native (3 MN)(4 WI)

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

FIELD CHARACTERISTICS: A perennial herb 50-100 cm. in height. Alternate leaves are broadly ovate, 8-15 cm. long, coarsely serrate and hairy. Staminate flowers are in cymes from the lower axils. Pistillate flowers are in loose, elongate, spreading cymes from the upper axils. In flower July-September.

ECOLOGICAL NOTES: Wood nettle is an abundant and characteristic species of floodplain forests. It also occurs along streambanks and in rich, mesic (upland) forests. The stinging hairs can cause a severe rash similar to or worse than that caused by stinging nettle (*Urtica dioica* ssp. *gracilis*).

SOURCE: Gleason and Cronquist (1991).

FLOODPLAIN FORESTS



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STINGING NETTLE

(*Urtica dioica* L. ssp. *gracilis*)

NETTLE FAMILY (Urticaceae) **C of C:** Native (1) **IND. STATUS:** FAC(NC/NE, GP); FACW(MW)

SYNONYMS: Numerous including *U. gracilis* Ait. and *U. procera* Muhl.

FIELD CHARACTERISTICS: A tall, slender, tough-stemmed perennial herb growing to 2 m. in height. Stems are square and coarse. Leaves are opposite, stalked, heart-shaped at the base, serrate and 5-15 cm. long. Glassy stinging hairs are present on the stem and/or leaves. Greenish flowers emerge from the leaf axils. Fruit is a nutlet 1.5 mm. long. In flower June-September.

ECOLOGICAL NOTES: Stinging nettle is found in floodplain forests, along streambanks, and on dredged spoils. It is a frequent invader of disturbed or drained organic soils of inland fresh meadows, especially after fires. Stinging nettle also occurs in pastured upland woods. Skin contact with the stinging hairs of this species can be very irritating.

SOURCE: Fernald (1970); Gleason and Cronquist (1991); Voss (1985); Swink and Wilhelm (1994); and Great Plains Flora Association (1991).

FLOODPLAIN FORESTS



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FALSE NETTLE

(*Boehmeria cylindrica* (L.) Sw.)

NETTLE FAMILY (Urticaceae)

C of C: Native (5 MN)(6 WI)

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

FIELD CHARACTERISTICS: An erect, perennial, nettle-like herb up to 60(100) cm. tall that lacks stinging hairs. The ovate leaves are opposite, coarsely toothed and have long petioles. Minute, four-parted greenish flowers occur in dense clusters along an unbranched cylindrical spike. The distinct flowering spikes are opposite and arise from leaf axils. In flower July-August.

ECOLOGICAL NOTES: False nettle is most often found in wooded swamps and on the wet alluvial soils of floodplain forests. It occasionally occurs at the edges of marshes and bogs.

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

FLOODPLAIN FORESTS



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CANADIAN CLEARWEED

(*Pilea pumila* (L.) Gray)

NETTLE FAMILY (Urticaceae)

C of C: Native (3)

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

FIELD CHARACTERISTICS: A typically small, annual, nettle-like herb that lacks stinging hairs, up to 50 cm. tall. It often forms small colonies. Stems are translucent and fleshy. The shiny ovate leaves are opposite, usually glabrous, have blunt toothed margins, and long petioles. Four-parted flowers occur on loose, spreading branched panicles. Nutlets are pale green to yellowish, smooth, and ≤ 1.0 mm. wide. The nutlets of the very similar bog clearweed (*Pilea fontana*) are dark olive to blackish purple, warty, and ≥ 1.1 mm. wide. In flower July-September.

ECOLOGICAL NOTES: Canadian clearweed commonly occurs in the shaded habitats of rich, wetland forests including floodplain forests. Bog clearweed tends to occur in slightly wetter, springy habitats and in bogs.

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

FLOODPLAIN FORESTS

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HONEWORT

(*Cryptotaenia canadensis* (L.) DC.)

CARROT FAMILY (Umbelliferae or Apiaceae)

IND. STATUS: FAC

C of C: Native (3 MN)(4 WI)

FIELD CHARACTERISTICS: A glabrous, branching, perennial herb with stems 30-80 cm. in height. Leaves are trifoliate, the lower leaves on long petioles. Leaflets are lanceolate to rhomboid or ovate and 4-15 cm. long with sharply and irregularly serrated or lobed margins. Compound umbels with unequal rays and tiny, white flowers are produced. Fruit is lance-linear in shape and 5-8 mm. long. In flower June-July.

ECOLOGICAL NOTES: Honewort commonly occurs in floodplain forests where it can be a dominant species. It also occurs in rich, mesic (upland) forests.

SOURCE: Gleason and Cronquist (1991).

FLOODPLAIN FORESTS



VIRGINIA WILD RYE (*Elymus virginicus* L.)

GRASS FAMILY (Gramineae or Poaceae)

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

C of C: Native (4 MN)(6 WI)

FIELD CHARACTERISTICS: A tufted, perennial grass to 50-120 cm. in height. Leaves are flat, 4-10 mm. wide and scabrous on both sides. Inflorescence is rigidly erect, 4-12(16) cm. long, often included in the summit of the uppermost leaf sheath. Spikelets are mostly paired and 2-4(5) flowered. Glumes are 10-30 mm. overall, 0.8-2 mm. wide and bowed out at the base. Lemmas are 6-9 mm. in length usually with a long, straight awn up to 10 mm. in length, but sometimes awnless. Riverbank wild rye (*Elymus riparia*) is very similar but the inflorescence is nodding; lemmas have awns longer than 10 mm.; and glumes are 0.4-0.8 mm. wide and not bowed out at the base. It occurs in similar habitats but preferring more sandy soils.

ECOLOGICAL NOTES: This grass is a common species of floodplain forests and streambanks.

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

FLOODPLAIN FORESTS



WHITE GRASS

(*Leersia virginica* Willd.)

GRASS FAMILY (Gramineae or Poaceae)

C of C: Native (5)

IND. STATUS: FACW

FIELD CHARACTERISTICS: A perennial grass spreading from rhizomes and reaching 50-120 cm. in height. Stems are slender and weak, often reclining at the base and rooting at nodes. Leaves are rough-hairy but not scabrous to the degree of rice cut-grass (*L. oryzoides*). Leaves are 5-20 cm. long by 5-15 mm. wide with a short, flat-topped ligule. Inflorescence is an open panicle 10-20 cm. long and stiffly spreading. Spikelets are 1-flowered, oblong, overlapping, 3 mm. long by 1 mm. wide, with stiff hairs. Glumes are absent. Lemmas are 3-4 mm. long and sparsely hairy.

ECOLOGICAL NOTES: White grass is a frequent species of floodplain forests and streambanks. An additional habitat is shaded depressions in mesic hardwood forests.

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

FLOODPLAIN FORESTS



COMMON BUR SEDGE

(*Carex grayi* Carey)

SEDGE FAMILY (Cyperaceae)

C of C: Native (8 MN)(7 WI)

IND. STATUS: FACW

A species of special concern in Minnesota

FIELD CHARACTERISTICS: One of our more distinctive perennial sedges. Stems are 30-90 cm. tall, solitary or form small clusters. Basal sheaths are tinted a purplish-red. Mature leaves are 4-11 mm. wide. The solitary terminal spikelet supports staminate flowers. Pistillate spikelets number 1 or 2 and are densely globular, with (7)10-35 perigynia radiating in all directions. Lance-shaped perigynia are 12.5-20 mm. by 4-8 mm., strongly nerved, with bidentate teeth. The beak is shorter than the body. Perigynia may be pubescent.

ECOLOGICAL NOTES: Common bur sedge, also known as Gray's sedge, prefers floodplain forests. It also occurs along the edges of vernal pools.

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

FLOODPLAIN FORESTS



SWAMP OVAL (MUSKINGUM) SEDGE

(*Carex muskingumensis* Schwein.)

SEDGE FAMILY (Cyperaceae)

C of C: Native (7)

IND. STATUS: OBL

A species of special concern in Minnesota

FIELD CHARACTERISTICS: A perennial, clump-forming sedge with stout rhizomes and several conspicuous leafy stems. Fertile stems are 50-100 cm. tall. Sheaths are green-veined on the ventral (inner) side. Main leaves are 3-5 mm. wide. Five to 10 spindle-shaped, sessile spikes are tapered to points at both ends forming dense clusters about 1-2 cm. long. The perigynia are thin, scale-like, incurved, and lance-shaped, 6-10 mm. long with thin marginal wings. The tapering beak is deeply bidentate. Nutlets are narrow, lens-shaped and about 2 mm. long. This sedge is very similar to *Carex scoparia*, but larger and more robust. The vegetative form of the sedge may initially be confused with *Carex trichocarpa*.

ECOLOGICAL NOTES: Swamp oval sedge is characteristic of the floodplain forests of major river bottoms and is very common along the Mississippi River in Wisconsin. Another habitat is vernal pools.

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

FLOODPLAIN FORESTS



© Photos by Steve D. Eggers

CATTAIL SEDGE (*Carex typhina* Michx.)

SEDGE FAMILY (Cyperaceae)

IND. STATUS: OBL

C of C: Native (9), a species of special concern in Minnesota

FIELD CHARACTERISTICS: A very distinct, clumped, perennial sedge with stems about 30-80 cm. tall. The main leaves are 5-10 mm. wide. The 1-3(6) spikelets are on short peduncles subtended by a short bract. The uppermost spikelet is mostly pistillate with a short staminate portion at the base. Lateral spikelets are all pistillate. Spikelets are 2-4 cm. long and distinctly ovoid-cylindric. Pistillate scales are acute, but blunt and awnless at the tip, and hidden by the perigynia. Perigynia are (4)5.5-6(8) mm. long, smooth, abruptly beaked, dense (30-60 per spikelet), inflated and appressed-ascending. Nutlets are concave and about twice as long as wide with an essentially straight, deciduous style.

ECOLOGICAL NOTES: Cattail sedge is typically found in floodplain forests, including Mississippi River bottomlands downstream of St. Paul, Minnesota, as well as hardwood swamps.

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

SECTION 3
SEASONALLY FLOODED BASINS

VIII. Seasonally Flooded Basins

Seasonally flooded basins are poorly drained, shallow depressions that typically have standing water for a few weeks each spring, but are usually dry for much of the growing season. These basins include kettles in glacial deposits (e.g., prairie potholes), low spots in outwash plains, and depressions in floodplains. They are frequently cultivated. However, even when cultivated, wetland vegetation can become established if the planted crop is stressed or drowned out. Typical species include smartweeds, beggarticks, flat sedges and wild millet. One unique aspect of seasonally flooded basins is that the alternating periods of flood and drought can eliminate perennial plants so that annual plant species typically dominate the community.

Seasonally flooded basins are of critical importance for waterfowl and shorebirds. These temporary water holding basins frequently have an abundance of invertebrates and plant seeds, which makes them ideal feeding and resting areas for migrating waterfowl and shorebirds. In spring, seasonally flooded basins are used as pairing ponds by ducks, and the abundant invertebrate population provides a protein-rich diet for egg-laying hens.



VEGETATION: This seasonally flooded basin is located within a corn (*Zea mays*) field and was photographed in May when no vegetation was visible. Annual species, and other species adept at colonizing mudflats, would become established as the growing season progressed.

SOILS: Ashkum silty clay loam (Typic Endoaquolls), a poorly-drained soil underlain by calcareous glacial till in drainageways and depressions. Landscape position is a shallow, closed depression in the nearly level plain of Glacial Lake Chicago.

HYDROLOGY: Ponding following spring snowmelt and rainfall events, as well as a high water table. Ashkum soils have a seasonal high water table with 12 inches of standing water to a water table 24 inches below the surface during April through June of most years.

LOCATION: Kenosha County, Wisconsin.

SEASONALLY FLOODED BASINS



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VEGETATION: The seasonally flooded basin shown above is within an alfalfa (*Medicago sativa*) field. When this photograph was taken in late August, the mudflats left by the ponded conditions of the early growing season had been colonized by nearly 100 percent vegetative cover dominated by nodding smartweed (*Persicaria lapathifolia*) and pinkweed (*Persicaria pensylvanica*). Other species present include foxtail (*Setaria viridis*), wild millet (*Echinochloa crus-galli*), common ragweed (*Ambrosia artemisiifolia*) and goosefoot (*Chenopodium album*).

SOILS: Glencoe silty clay loam (Cumulic Endoaquolls), a very poorly-drained mineral soil formed in glacial till. Landscape position is a prairie pothole depression in gently rolling terrain. Under natural conditions, this was a closed basin (no defined outlet or inlet).

HYDROLOGY: Ponding following spring snowmelt and heavy summer rainfall events. In an undrained condition, Glencoe soils have a seasonal high water table with 12 inches of standing water to a water table 12 inches below the surface during October through July of most years. However, the above example has been partially drained by a surface ditch converting this hydrologic regime to that of a seasonally flooded basin – ponded for only a few weeks during the early growing season of most years.

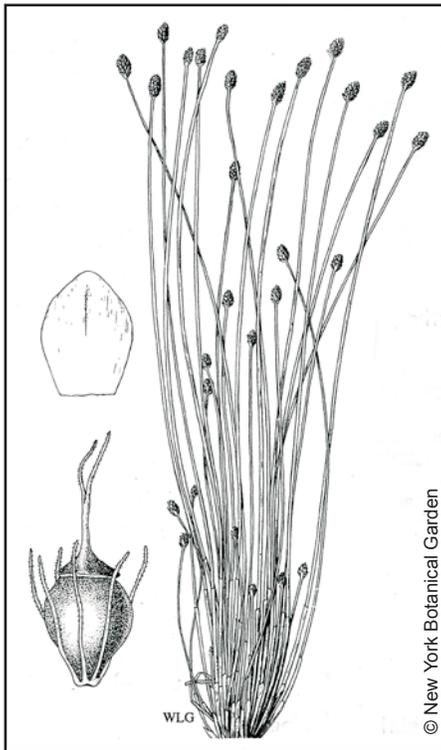
LOCATION: Nicollet County, Minnesota.

SEASONALLY FLOODED BASINS



Post growing season. Seasonally flooded basins often become ponded following the close of the growing season. The example above illustrates conditions in early November following a snowfall that subsequently melted. In the center of the basin, the planted crop -- soybeans (*Glycine max*) -- either drowned out or was not planted that year. The outer edges of the basin were apparently too wet for the farmer to harvest the soybeans still visible. In general, the waste grain, seeds of volunteering annuals, mudflats and shallow water provided by seasonally flooded basins are of critical importance for the autumn migration of waterfowl and shorebirds. Additionally, the waste grain and seeds are an important autumn/winter food source for upland wildlife including ring-necked pheasant, gray partridge, sharp-tailed grouse, mourning dove and white-tailed deer.

SEASONALLY FLOODED BASINS



BLUNT SPIKE-RUSH

(*Eleocharis obtusa* (Willd.) J.A. Schultes)

SEDGE FAMILY (Cyperaceae)

C of C: Native (3)

IND. STATUS: OBL

FIELD CHARACTERISTICS: A densely tufted, annual sedge with fibrous roots. Stems are up to 50 cm. in height and 0.5-2 mm. thick with sheaths that are oblique at the apex. Spikelets are ovoid, up to 16 mm. long and many-flowered. Nutlets (achenes) are lens-shaped, obovoid and 0.7-1.2 mm. long with a triangular (deltoid)-shaped cap (the tubercle) that is a different color and texture than the body of the achene. The tubercle is about three-fourths to nearly as wide as the broadest part of the achene (see ink drawing). Bristles subtending the nutlet usually number 6-7 and equal or exceed the length of the nutlet.

ECOLOGICAL NOTES: Blunt spike-rush is a frequent colonizer of mudflats, shorelines and marshes. It is commonly found in disturbed, saturated soils such as those of farmed wetlands and wetland creation or restoration sites.

SOURCE: Voss (1972); Swink and Wilhelm (1994); Gleason and Cronquist (1991); Great Plains Flora Association (1991); and Britton and Brown (1970).

SEASONALLY FLOODED BASINS



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WILD MILLET

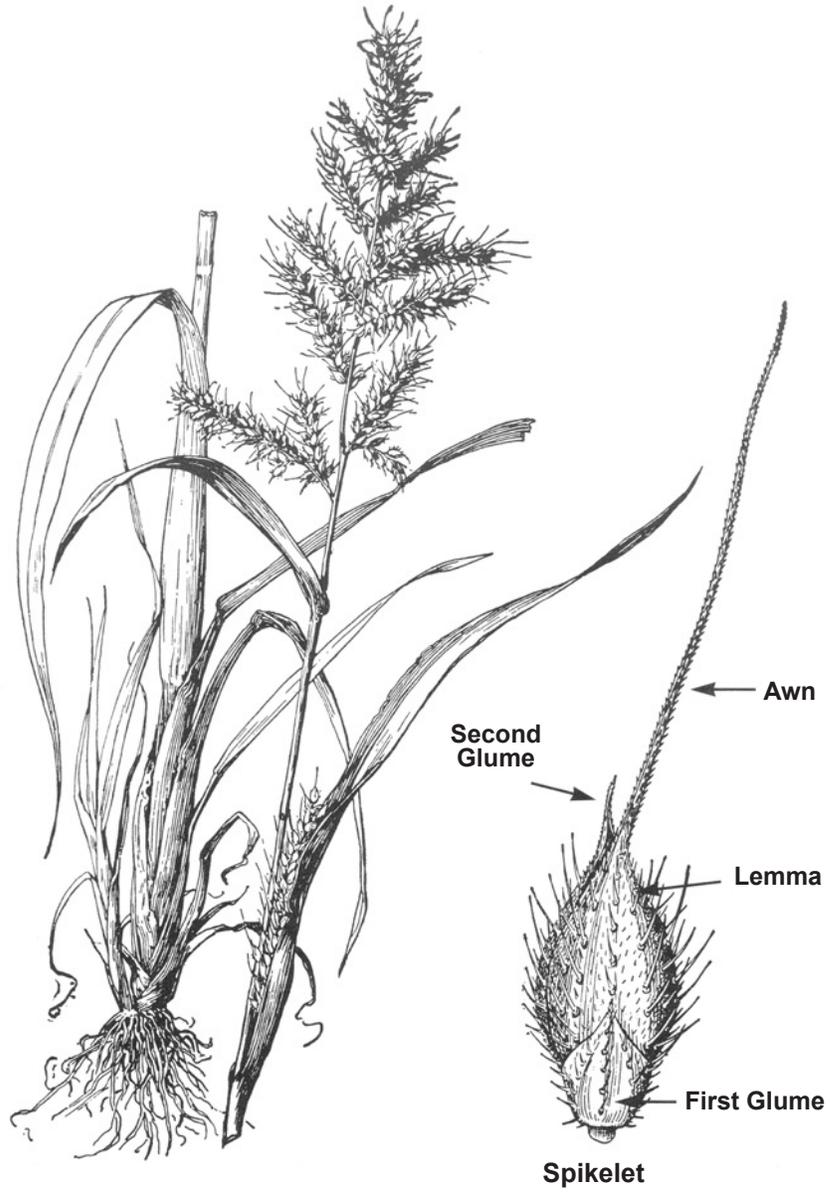
(*Echinochloa crus-galli* (L.) Beauv.)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Introduced (0) **IND. STATUS:** FACW(MW)
FAC(NC/NE, GP)

FIELD CHARACTERISTICS: An annual grass with a stout stem usually 10-100 cm. tall. Leaves are lanceolate and 0.5-1.5(2.3) cm. wide. Inflorescence is a panicle 3-25 cm. long that is often green- to purple-tinged and has a bristly appearance because of numerous spines covering the spikelet, as well as an awn. The length of the awn is quite variable and may be pronounced (as shown by the ink drawing) or nearly lacking. In flower June-November.

ECOLOGICAL NOTES: Wild millet is found in disturbed areas such as cultivated lands and vacant urban parcels. It also occurs in fresh (wet) meadows and along streambanks. *Echinochloa crus-galli* is a native of Eurasia and has become naturalized here. Two native species of *Echinochloa* also occur in Minnesota and Wisconsin: *E. muricata* and *E. walteri*. Note that *E. muricata* appears in some floras under the incorrect name of *E. pungens* (Voss 1972). The seeds are an important food for waterfowl and mourning doves, as well as many other birds.

SOURCE: Fernald (1970); Gleason and Cronquist (1991); Martin *et al.* (1951); and Voss (1972).



Wild Millet
(Echinochloa crus-galli)

Illustration from Hitchcock (1950)

SEASONALLY FLOODED BASINS



RED-ROOT FLAT SEDGE

(*Cyperus erythrorhizos* Muhl.)

SEDGE FAMILY (Cyperaceae)

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

IND. STATUS: OBL

FIELD CHARACTERISTICS: An annual, cespitose sedge from fibrous, blood-red roots. Stems are 10-70 cm. tall, smooth and bluntly triangular. Leaves are 2-10 mm. wide with scabrous margins. Inflorescence is a compound umbel with one to several spikes with numerous crowded spikelets that are 8- to 39-flowered and very narrow. Small wings along the rachilla are deciduous. Scales are 1.1-1.6 mm. long and reddish brown with a green keel. Nutlets are three-sided, ovoid, 0.7-0.8 mm. long and gray, ivory or white in color.

ECOLOGICAL NOTES: Red-root flat sedge occurs on mudflats, riverbanks, borders of marshes and sandy or muddy shores. The specimen shown by the photograph was collected from a recently excavated, sandy, wetland creation site with saturated soils.

In general, members of the genus *Cyperus* have spikelets with scales in two ranks so that they are flattened, hence one common name of "flat sedge." Unlike some other members of the sedge family, the nutlets of *Cyperus* species lack a beak and are not subtended by bristles. There are approximately 14 species of *Cyperus* found in Minnesota and Wisconsin. Some species (e.g., *C. esculentus*) may become a nuisance to agriculture. However, the nutlets and tubers are a food source for wildlife.

SOURCE: Great Plains Flora Association (1991); Voss (1972); Fassett (1957); and Gleason and Cronquist (1991).

SEASONALLY FLOODED BASINS



STRAW-COLOR FLAT SEDGE

(*Cyperus strigosus* L.)

SEDGE FAMILY (Cyperaceae)

C of C: Native (1 WI)(2 MN)

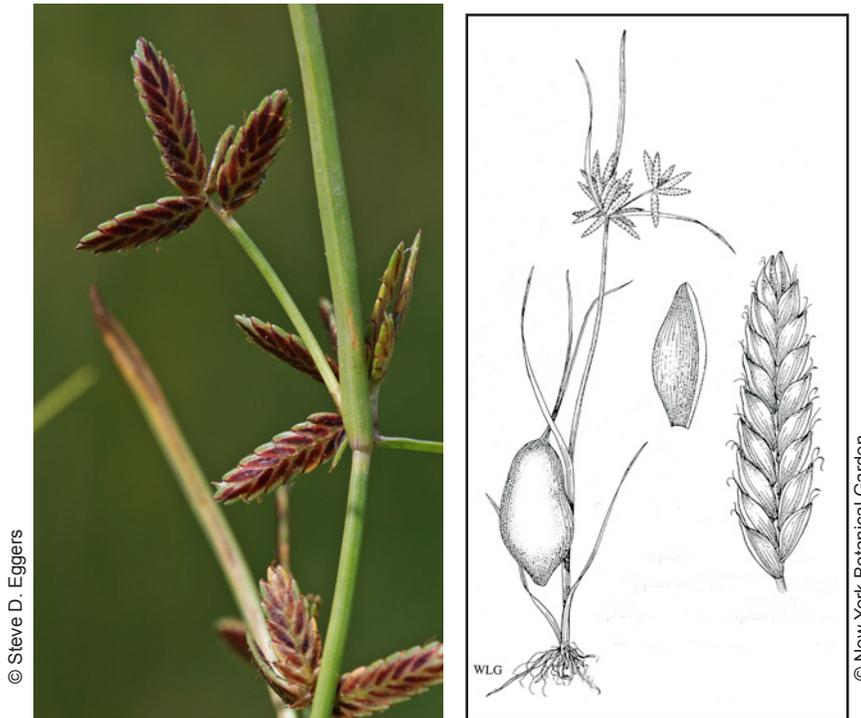
IND. STATUS: FACW

FIELD CHARACTERISTICS: A short-lived perennial sedge with stems arising from rhizomes. The stems are bulbous at the base. Stems may be single to few, are sharply triangular, and up to 60(100) cm. tall. Leaves are crowded at the base and are 2-10(15) mm. wide. Short, cylindric spikes are usually branched at their base with numerous spikelets. Spikelets spread from the rachis at nearly right angles and are strongly compressed. The keeled scales are longer than wide, 3.5(3)-4.5(5) mm. long, persistent, and overlap each other toward the tips. Scales have a greenish mid-rib with yellowish-golden sides and are not out-curved at their tips (appressed). Scales and spikelets are deciduous at maturity. There are 3 stigmas and 3 stamens present. Nutlets are linear, 1.5-2 mm. long, and triangular in cross section.

ECOLOGICAL NOTES: Straw-color flat sedge is one of the more common flat sedges. It is a pioneer species of wetlands, including farmed wetlands and mudflats.

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

SEASONALLY FLOODED BASINS



SHINING FLAT SEDGE (*Cyperus bipartitus* Torr.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (3 WI)(4 MN) **IND. STATUS:** OBL(MW)
FACW(NC/NE, GP)

SYNONYM: *Cyperus rivularis* Kunth

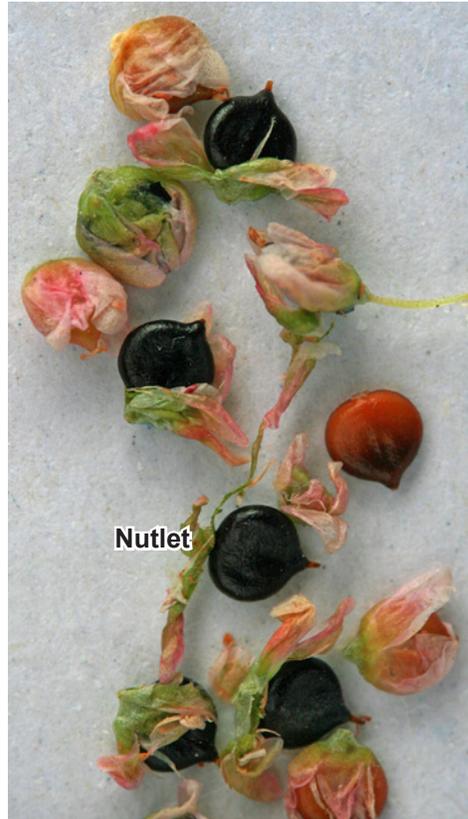
FIELD CHARACTERISTICS: A tufted, annual sedge with stems about 10-20(40) cm. tall. Stem leaves are 1-3 mm. wide and usually shorter than the stem. Spikes are sessile with 3-10 spikelets that each have several flowers. Mature scales are strongly pigmented a red-brown color toward the base and margins. Scales are egg-shaped and 2-2.5 mm. long with a prominent vein that becomes incurved toward the tip. Scales are deciduous at maturity. There are 2 stigmas present. Lens-shaped nutlets are smooth, two times longer than wide, 1-1.5 mm. long, rounded at the tip, and brownish in color (not black).

Shining flat sedge can be confused with *Cyperus diandrus*, which has reddish colors concentrated more towards the tip of the scales. The scales also tend to persist at maturity.

ECOLOGICAL NOTES: Shining flat sedge occurs along lake and pond shores and in shallow marshes, ditches and swales. This annual is a colonizer of disturbed, wet soils such as those of farmed wetlands.

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

SEASONALLY FLOODED BASINS



© Photos by Steve D. Eggers

PINKWEED

(*Persicaria pensylvanica* (L.) M. Gomez)

SMARTWEED FAMILY (Polygonaceae)

C of C: Native (1)

IND. STATUS: FACW

SYNONYM: *Polygonum pensylvanicum* L.

FIELD CHARACTERISTICS: An annual herb growing to a height of 2 m. (but sometimes growing along the ground). Leaves are lanceolate, 3-15 cm. long and 1-4 cm. wide. Ocreae (swollen joints of the stem) are 0.5-1.5 cm. long with a margin that is entire or irregular, but not fringed with bristles. Inflorescence is cylindric, 2-3 cm. long and 1-1.5 cm. wide. The flower stalk (peduncle) has abundant, glandular hairs (use 10x lens). Flowers are white to pink to rose and 3-4 mm. long. Fruit is a shiny, lens-shaped nutlet 2.2-3.5 mm. broad. In flower July-September.

ECOLOGICAL NOTES: Pinkweed is found in shallow marshes and disturbed areas, especially on recently exposed mudflats, cultivated land, and dredged material disposal sites. There are about 18 species of smartweeds (*Persicaria*, *Polygonum*) in Minnesota and Wisconsin. The nutlets of pinkweed, and smartweeds in general, are an important food source for waterfowl and many songbirds.

SOURCE: Fernald (1970); Gleason and Cronquist (1991); Martin *et al.* (1951); and Voss (1985).

SEASONALLY FLOODED BASINS



© Photos by Steve D. Eggers

NODDING SMARTWEED

(*Persicaria lapathifolia* (L.) S.F. Gray)

SMARTWEED FAMILY (Polygonaceae) **C of C:** Native (2) **IND. STATUS:** FACW(NC/NE, MW)
OBL(GP)

SYNONYM: *Polygonum lapathifolium* L.

FIELD CHARACTERISTICS: An erect, taprooted, annual herb growing to 1.5 m. in height. Leaves are variable but usually lanceolate and acuminate, often woolly underneath. Ocreae (swollen joints of stem) are not fringed with hairs (unlike some similar species). Inflorescence consists of numerous, nodding racemes that are 1-5 cm. long. Flowers (tepals) are white to pink to green and 3-4 mm. long. Outer tepals are strongly 3-nerved, each nerve divided at the summit into 2 recurved branches. Nutlets are 2-sided (lenticular) and 1.7-3.2 mm. long. In flower July-September.

ECOLOGICAL NOTES: Nodding smartweed is a common colonizer of all types of disturbed, wet to moist soils. Typical habitats include farmed wetlands, mudflats, roadsides, ditches and construction sites.

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

SEASONALLY FLOODED BASINS



Photos by Steve D. Eggers

WATER PEPPER

(*Persicaria hydropiper* (L.) Delarbre)

SMARTWEED FAMILY (Polygonaceae)

C of C: Introduced (0)

IND. STATUS: OBL

SYNONYM: *Polygonum hydropiper* L.

FIELD CHARACTERISTICS: An erect or sprawling, annual herb growing to 60 cm. Stems are glabrous and often reddish. Leaves are narrowly lanceolate to lance-ovate, 0.4-2.5 cm. wide, and have a sharp, peppery taste. Ocreae (swollen joints of stem) are fringed with short hairs, those of the upper half of the stem concealing self-pollinating flowers that remain closed. Inflorescence consists of racemes that are commonly nodding at the summit. Flowers (tepals) are greenish, usually with rose-pink (white) margins, and are dotted with glands (punctate). Nutlets (achenes) are 2-sided, or more commonly 3-sided, dark brown to black, dull, rough, and 2.2-3.3 mm. long. In flower July-August. Contrast these characteristics with those of dotted smartweed (*Persicaria punctata*).

ECOLOGICAL NOTES: A native of Eurasia, water pepper is a common colonizer of all types of disturbed, wet to moist soils. Typical habitats include farmed wetlands, mudflats, roadsides, ditches, construction sites and edges of marshes.

SOURCE: Crow and Hellquist (2000); Gleason and Cronquist (1991); and Black and Judziewicz (2009).

SEASONALLY FLOODED BASINS



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LADY'S THUMB

(*Persicaria maculosa* S.F. Gray)

SMARTWEED FAMILY (Polygonaceae) **C of C:** Introduced (0) **IND. STATUS:** FAC_(NC/NE)
FACW_(MW, GP)

SYNONYMS: *Polygonum persicaria* L.; *Persicaria persicaria* (L.) Small

FIELD CHARACTERISTICS: An annual herb with upright to spreading stems 20-80 cm. long. Leaves are lance-shaped, 3-15 cm. long and 0.5-3 cm. wide. Upper leaf surfaces usually have a dark blotch somewhat resembling a thumb print. Undersides of leaves are often dotted with small glands. Ocreae are 5-15 mm. long with short hairs and fringed with bristles. Flowers are rose to pink in erect, cylindric racemes 1-4 cm. long and 0.5-1 cm. wide. Fruit is a black, shiny nutlet usually lens-shaped but may be 3-angled and 2-3 mm. long. In flower July-September.

ECOLOGICAL NOTES: Introduced from Europe, lady's thumb is a common colonizer of all types of disturbed, wet to moist soils. Typical habitats include farmed wetlands, streambanks, mudflats, roadsides, ditches, construction sites and edges of marshes. Voss (1985) cautions that other smartweeds, e.g., *Persicaria lapathifolia* and *P. hydropiperoids*, sometimes have a dark blotch on the leaves; therefore, other characters need to be used to separate these species. For example, the ocreae of *P. lapathifolia* are not fringed with bristles in contrast to those of *P. maculosa*.

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

SEASONALLY FLOODED BASINS



© Photos by Steve D. Eggers

CURLY DOCK

(*Rumex crispus* L.)

SMARTWEED FAMILY (Polygonaceae)

C of C: Introduced (0)

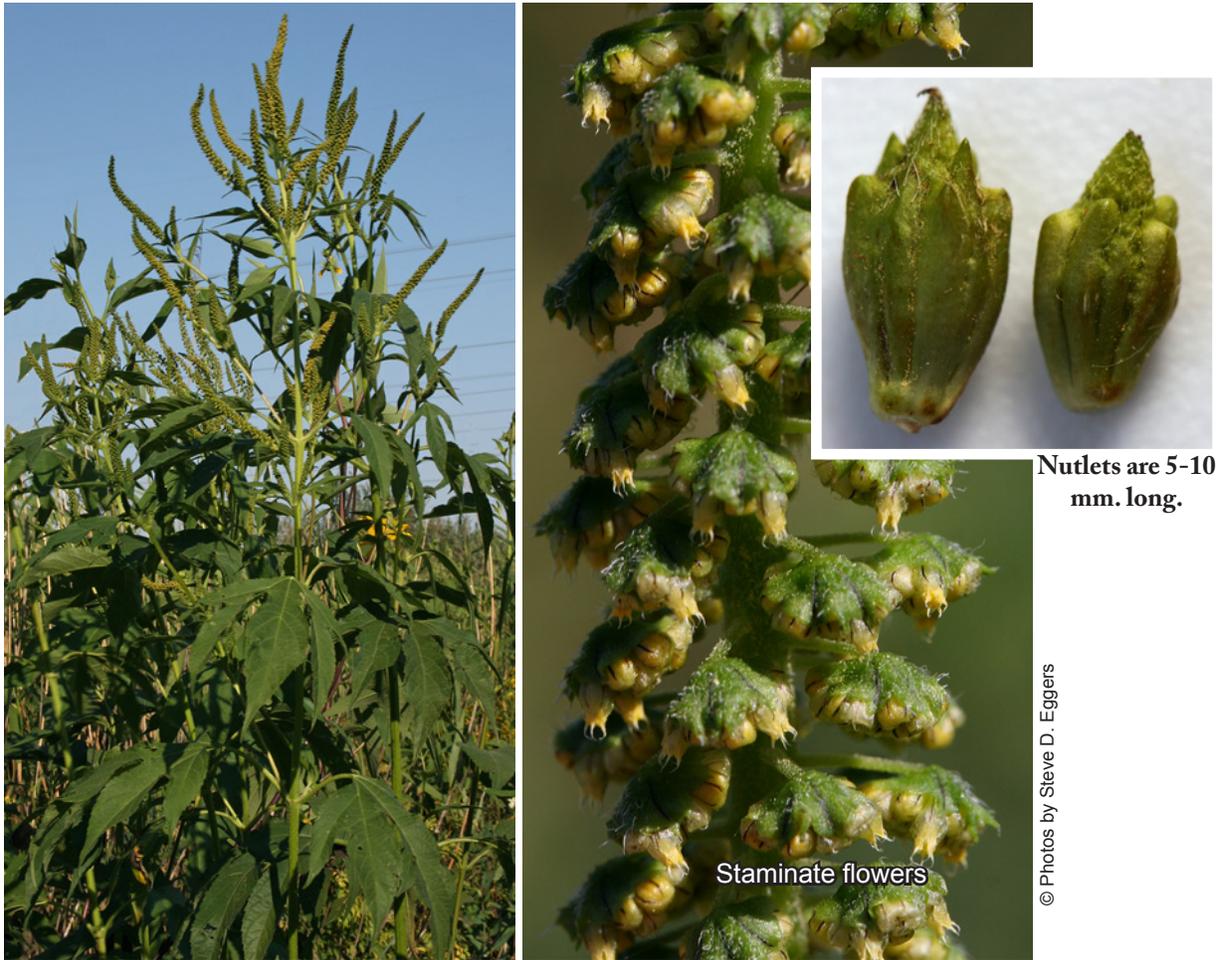
IND. STATUS: FAC

FIELD CHARACTERISTICS: A stout, taprooted, perennial herb 50-150 cm. in height. Leaves are strongly crisped (wavy). Basal leaves are large, 10-30 cm. long and 1-5 cm. wide, commonly rounded or subcordate at the base, and on long petioles. Leaf shape is lance-like to oval. Stem leaves are smaller with shorter petioles. Inflorescence consists of large, branched panicles. Flower stalks drooping at the tips, 5-10 mm. long, with a swollen joint at the base. Valves are heart-shaped to broadly ovate, 4-5 mm. long and as wide, with more or less smooth margins. Grains number 3 and are often of unequal size. Fruit is a brown achene 2-3 mm. long. In flower July-September.

ECOLOGICAL NOTES: Curly dock is a Eurasian species that has become a common weed and colonizer of all types of disturbed, wet to moist soils. Typical habitats include farmed wetlands, stormwater detention basins, mudflats, roadsides, ditches, construction sites and edges of marshes.

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

SEASONALLY FLOODED BASINS



GIANT RAGWEED
(*Ambrosia trifida* L.)

ASTER FAMILY (Compositae or Asteraceae) **C of C:** Native (0) **IND. STATUS:** FAC

FIELD CHARACTERISTICS: A weedy, annual herb to 2(5) m. in height. Stems are stout and have spreading hairs in the upper part. Leaves are opposite, stalked, simple, and unlobed to 3-5 palmately divided lobes. Staminate and pistillate flowers occur in separate heads. Pistillate flowers arise from the leaf axils, while staminate flowers occur as terminal and near-terminal spike-like structures. The distinctive bur-like nutlets develop in the leaf axils, are 5-10 mm. long, and have several distinct ribs that terminate as blunt spines. In flower July-September.

ECOLOGICAL NOTES: Giant ragweed often forms large monotypic colonies on moist to wet, waste ground and the recently cultivated fields of floodplains. It also occurs along the margins of ponds, streams and ditches. Dense stands of giant ragweed are a favored winter habitat of ring-necked pheasants.

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

SEASONALLY FLOODED BASINS



© Photos by Steve D. Eggers

COMMON COCKLEBUR

(*Xanthium strumarium* L.)

ASTER FAMILY (Compositae or Asteraceae)

IND. STATUS: FAC

C of C: Native (0 MN)(1 WI)

FIELD CHARACTERISTICS: An annual herb growing to 20-200 cm. in height. Leaves have long petioles and are broadly ovate to suborbicular or reniform, and are generally cordate or subcordate at the base. Leaves are shallowly lobed and up to 15 cm. long. Staminate heads are in a terminal cluster. Pistillate heads are in several to many short, axillary branches. Burs are broadly cylindrical to ovoid or subglobose, 1-3.5 cm. long, covered with stout, hooked prickles. Burs become somewhat woody with age. In bloom August-September.

ECOLOGICAL NOTES: Common cocklebur is a frequent colonizer of exposed, wet to moist soils. In particular, it colonizes farmed wetlands where the planted crop is drowned out or never planted due to wet conditions. Mudflats left after high water events in stormwater ponds, prairie potholes, or along shores, are other favored habitats. It is the bane of those who own long-haired dogs.

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

SEASONALLY FLOODED BASINS



© Photos by Steve D. Eggers

BEGGARTICK

(*Bidens cernua* L.)

ASTER FAMILY (Compositae or Asteraceae)

IND. STATUS: OBL

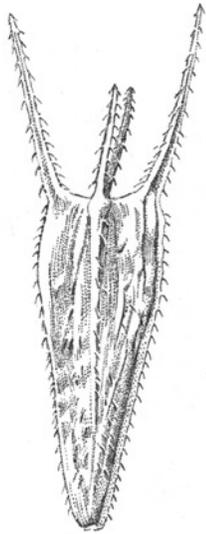
C of C: Native (3 MN)(4 WI)

FIELD CHARACTERISTICS: An annual herb growing to 10-100 cm. in height. Leaves are opposite, simple, sessile, and serrate to somewhat serrate. Flower heads are erect, but then become nodding with age. The flower disc is 12-25 mm. wide. Rays, if present, are yellow and up to 1.5 cm. long. Nutlets are smooth, curved, 5-8 mm. long and have 4 (rarely 2) barbed awns as shown by the ink drawing on the following page. In flower August-October.

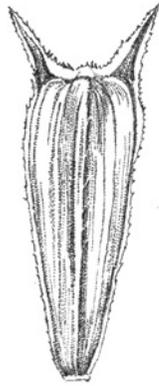
ECOLOGICAL NOTES: Beggartick is a common species of fresh (wet) meadows, shallow marshes, along shores, and in areas of disturbed or exposed, wet soils and mudflats. Another name for beggarticks is stick-tights. Walking through a stand of these plants in late summer or autumn results in numerous barbed nutlets adhering to clothing.

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

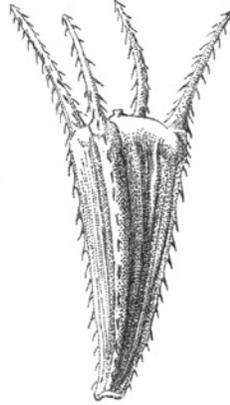
Nutlets of Some
Common *Bidens*



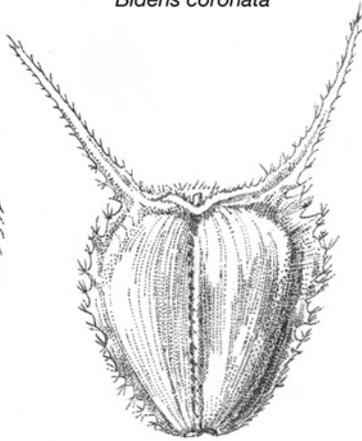
Bidens comosa



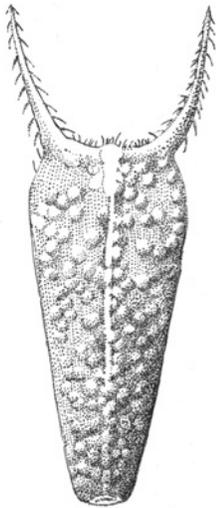
Bidens coronata



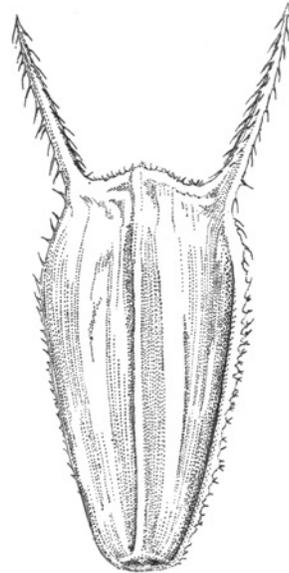
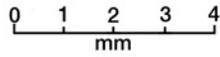
Bidens cernua



Bidens aristosa



Bidens frondosa



Bidens vulgata

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APPENDIX A

APPENDIX A

**KEY TO THE WETLAND GOLDENRODS (*Solidago*)
OF MINNESOTA AND WISCONSIN**

[Modified from Gleason and Cronquist (1991)
and Swink and Wilhelm (1994)]

1A. Flowering heads are flat-topped (inflorescence is a corymb).

2A. Leaves of lower and upper stem are dissimilar, the lower or basal leaves being better developed and usually persistent; leaves are not glandular-punctate; typically occur on calcareous soils.

3A. Branches and pedicels of the inflorescence are glabrous; leaves are flat and not triple nerved *Solidago ohioensis*

3B. Branches and pedicels of the inflorescence are pubescent; leaves tend to be sickle-shaped (falcate), folded (conduplicate), and triple nerved *Solidago riddellii*

2B. Leaves linear (narrow), similar on lower and upper stem, and glandular-punctate (use a 10-15x hand lens); stems are pubescent; tends to be clonal *Euthamia graminifolia*¹

1B. Flowering heads occur in axillary clusters, racemes, panicles or thyrses, but never as a corymb.

4A. Inflorescence spreading, with recurved-secund branching. Branches and branchlets of the inflorescence are pubescent.

5A. Leaves very scabrous above; basal and lower cauline leaves persistent and very large; stem generally angled in cross section; typically occurs in calcareous fens and shaded seeps
..... *Solidago patula*

5B. Leaves triple nerved, not scabrous; leaves of lower and upper stem tend to be similar; stem glabrous and glaucous below the inflorescence and not angled; tends to be clonal
..... *Solidago gigantea*

4B. Inflorescence much longer than broad; branches rather short and not recurved-secund; branches and branchlets of the inflorescence are not pubescent (but may be puberulent). Stems not angled, nor glaucous below the inflorescence; typically occurs in both bogs and fens
..... *Solidago uliginosa*

¹ Formerly known as *Solidago graminifolia*.

APPENDIX B

APPENDIX B

KEY TO THE WETLAND ASTERS OF MINNESOTA AND WISCONSIN

[Modified from Gleason and Cronquist (1991)
and Swink and Wilhelm (1994)]

1A. Involucral bracts and peduncles glandular-pubescent; leaves auriculate-clasping; herbage often glandular; rays very numerous, violet or amethyst to rosy, rarely blue or white; large discs yellow to yellow-orange, distinctive*Symphyotrichum novae-angliae*

1B. Plant with inflorescence pubescent or glabrous, but not glandular.

2A. Stem leaves with perfoliate or auriculate-clasping bases.

3A. Stems reddish, coarsely hispid; leaves not serrate and not conspicuously crowded; inner involucral bracts taper to a slender tip; rays violet; nutlets glabrous; clonal
.....*Symphyotrichum puniceum*

3B. Stems green or with purple lines or nodes, glabrous or sparingly hispid; leaves not serrate but conspicuously crowded, particularly towards the inflorescence; inner involucral bracts taper to a slender tip; rays very pale blue or lavender; nutlets pubescent; clonal*Symphyotrichum firmum*

3C. Stems zig-zag and pubescent to glabrous toward the base; leaves nearly perfoliate and coarsely serrate; rays blue to pale purple; nutlets strigose; not clonal; rare
.....*Symphyotrichum prenanthoides*

2B. Stem leaves usually not clasping at the base (not auriculate).

4A. Flowering heads are flat-topped (inflorescence is a corymb); rays white; not clonal
.....*Doellingeria umbellata*

4B. Flowering heads not flat-topped.

5A. Stem leaves entire or serrate, more than 8 mm. wide, not linear.

6A. Leaves pubescent beneath; rays white to slightly purple
.....*Symphyotrichum ontarionis*

6B. Leaves glabrous or only pubescent along the veins.

7A. Leaves entire or subentire, 5 times as long as wide; usually scabrous above; rays usually bluish-purple*Symphyotrichum praealtum*

7B. Leaves mostly serrate, usually less than 5 times as long as wide; usually not scabrous above.

APPENDIX B

8A. Flower heads secund (racemes 1-sided); leaves usually villous or puberulent beneath, at least along the midrib; rays usually white; not clonal*Symphyotrichum lateriflorum*

8B. Flower heads form a panicle and are usually not secund; inflorescence leafy; leaves are usually glabrous beneath, except for occasionally ciliated margins; rays usually white; clonal*Symphyotrichum lanceolatum*

5B. Leaves essentially entire, less than 8 mm. wide, linear.

9A. Leaves yellowish green, with revolute margins, generally scabrous above; areolae isodiametric*Symphyotrichum praealtus*

9B. Leaves green to dark green, margins not revolute, glabrous or scabrous. areolae mostly rectangular.

10A. Ray flowers about 10 mm. long; flower heads few, subcorymbose, terminal; plant slender; rays white to pale lavender; typically found in open cold bogs and open fens*Symphyotrichum boreale*

10B. Ray flowers less than 10 mm. long; flower heads numerous, forms a panicle; plant stouter; generally not found in cold bogs*Symphyotrichum lanceolatum*

APPENDIX C

APPENDIX C

KEY TO THE *UTRICULARIA* SPECIES
OF
MINNESOTA AND WISCONSIN

-Donald M. Reed-

- 1A. Leaves minute, simple and filiform or narrowly linear; leaves and bladders¹
embedded in substrate; not free floating; flowers 1-6 on scape:
- 2A. Flowers yellow, spur down curved; bracts accompanied each by a pair of
branchlets*U. cornuta*
- 2B. Flowers violet, spur up curved; bracts not accompanied by branchlets
.....*U. resupinata*
- 1B. Leaves dichotomously branched or dissected, not minute; leaves all or mostly on
stems in the water, free floating; flowers 1 – 20 on scape(s):
- 3A. Upper leaves in whorls (4-9); bladders borne at leaf segment apex; flowers rose
-purple.....*U. purpurea*
- 3B. Upper leaves alternate; bladders borne at base or on sides of leaf segments;
flowers yellow:
- 4A. Leaf segments flattened, nearly to fully as wide as the primary segments;
lower corolla lip about 2 times as long as the upper lip:
- 5A. Bladders located on specialized branches lacking leaves; leaf segment
margins spinulose-toothed; lower corolla lip 8-12 mm with well developed
palate.....*U. intermedia*
- 5B. Bladders located on leafy branches; leaf segments entire; lower corolla lip
4-8 mm with small or no palate.....*U. minor*
- Note: The taxonomy of *Utricularia x ochroleuca*, which would be located in this couplet,
is disputed and is treated here as the hybrid *Utricularia intermedia x minor*.
- 4B. Leaf segments terete, filiform, progressively narrower in successive
segments; lower and upper corolla lips essentially equal in length:

¹Tans (1987) notes that *U. cornuta* may occasionally lack bladder-traps.

APPENDIX C

- 6A. Leaf segments with many bladders, stems loosely floating beneath water surface; flowers mostly 6-20 per peduncle; plants large, robust, more than 30 cm. long:
- 7A. Peduncles with 1- few widely scattered bract-like scales below the lowest bract; emergent scapes 1 mm. or more in diameter; lower corolla lip 1-2 cm. long.....*U. macrorhiza*
- 7B. Peduncles without scales below the lowest bract; emergent scapes less than 1 mm. in diameter; lower corolla lip 6-8 mm. long...
.....*U. geminiscapa*
- 6B. Leaf segments with 1-few bladders, stems forming tangled mats beneath water surface; flowers 1-6 per peduncle; plants small, slender, less than 30 cm. long.....*U. gibba*

Sources: Crow and Hellquist (2000); Gleason and Cronquist (1991); R.L. McGregor *et al.* (1991); Swink and Wilhelm (1994); Tans (1987); and Voss (1996).

GLOSSARY

acid: having more hydrogen ions than hydroxyl ions: a pH of less than 7.

aerobic: a condition in which free molecular oxygen is present.

alien: a non-native (introduced) species, which may or may not be naturalized.

alkaline: basic, having more hydroxyl ions than hydrogen ions; a pH of greater than 7.

anaerobic: a condition in which free molecular oxygen is absent.

annual: a plant that completes its life cycle in one growing season, then dies.

auriculate: having ear-shaped lobes at the base.

awn: a bristle, often located in a terminal position on a specific plant part.

axil: the upper angle formed between the axis and a lateral organ such as a leaf or branch that arises from it

beak: a relatively stout tip such as on a nutlet.

biennial: a plant that completes its life cycle in two years, usually flowering and producing fruit the second year, and then dies.

bract: a modified leaf or scale-like structure that arises from the base of an inflorescence.

calcareous: limy, rich in calcium, usually in the form of calcium carbonates.

calciphile: a plant species with a high tolerance of calcium.

callosites: a hardened thickening of plant tissue.

calyx: the frequently green outer series of floral leaves (or sometimes the only ones); the sepals collectively.

CFR: Code of Federal Regulations.

clasping: partly surrounding another organ at the base.

clonal: forming clones.

clone: a group of vegetatively produced, genetically identical individuals.

colonial: forming colonies.

colony: a group of individuals of the same species produced vegetatively, or by seed, that may or may not be genetically identical.

GLOSSARY

- community:** in reference to plants, an interacting assemblage of plant populations sharing a given habitat.
- composite:** a member of the aster family (Compositae).
- corolla:** the inner series of floral leaves, often showy; the petals collectively.
- dbh:** diameter at breast height; a measure of tree diameter at 4.5 feet above the ground or root collar.
- deciduous:** falling off, usually at a certain season after completion of the normal function.
- dichotomous:** forking into two directions of essentially equal branches.
- dioecious:** producing male and female flowers on different individual plants
- disc:** in the aster family (Compositae), a group of tubular flowers located in the central part of the flower head.
- dolomite:** in Minnesota and Wisconsin, a bedrock mineral consisting of calcium magnesium carbonate ($\text{CaMg}(\text{CO}_3)_2$).
- dominant:** a species that exerts a considerable influence on, or defines the character of, a community because of such factors as its number, coverage, and/or size.
- ericaceous:** refers to members of the heath family (Ericaceae).
- fen:** in a broad sense, wetlands that are predominately supported by groundwater discharge; fens can be segregated by soil chemistry, water chemistry and vegetation, e.g., calcareous fens.
- floret:** a small or reduced flower, such as that of grasses.
- follicle:** a dry fruit that splits open along one seam.
- forbs:** herbaceous plants, excluding the grasses, rushes and sedges; especially used to describe broad-leaved, flowering plants.
- frond:** the leaf of ferns; also, the vegetative structure of duckweeds (Lemnaceae) that is not differentiated into stem and leaf.
- genus:** the first part of the scientific name for an organism, always capitalized (plural, genera).
- glabrous:** smooth.
- glaucous:** covered with a pale, waxy coating or “bloom.”
- glume:** a specialized, scale-like leaf at the base of a grass spikelet.
- graminoid:** grass-like plants including grasses, sedges and rushes.
- growing season:** that portion of the year when soil temperatures at 19.7 inches below the surface exceed biologic zero (41 degrees F.). This can be approximated by the number of frost-free days (i.e., the period between the last frost of spring and first frost of autumn).
- herb:** a herbaceous (non-woody) plant.

GLOSSARY

hispid: having rigid hairs.

hybrid: a cross-breed between two species.

hydric soils: soils formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

hydrophyte: a plant that grows in water or on a substrate saturated at a frequency and duration during the growing season sufficient to affect plant occurrence.

hypersaline: extremely salty; very high concentration of dissolved salts.

inflorescence: the entire flower cluster of a plant.

isodiametric: having equal diameters.

keel: a longitudinal ridge (like the keel of a boat).

lagg: a moat, or open water area at the border between a bog and uplands.

leaflet: one of the blades of a compound leaf.

lemma: the lowermost scale-like leaves at the base of a grass floret.

lenticel: a small dot (opening) on the bark of young trees or shrubs.

ligule: in the grasses (Gramineae), a papery extension at the summit of a leaf sheath.

lip: one part of a two-lipped (bilabiate) flower; in the orchids (Orchidaceae), the odd petal that is usually the lowest.

macroscopic: visible without magnification.

-merous: A Greek suffix referring to the number of members of a set, e.g., 5-merous meaning that flower parts are in 5s.

mesic: intermediate between dry and wet conditions, moderately moist.

mixosaline: of intermediate salinity; somewhat salty.

monoecious: with unisexual flowers, both types borne on the same individual plant.

monotype: a plant community consisting of only one species.

muck: a soil consisting of partially decomposed plant remains where the decomposition has progressed to a point where the contributing plant species cannot be identified; an organic soil as opposed to mineral soils.

native: an indigenous species.

nerve: a ridge or vein on a plant structure.

nonpersistent emergent: an aquatic emergent plant whose upper portions (stems, leaves) die back at the end of the growing season (e.g., arrowhead).

GLOSSARY

- nutlet:** a small dry fruit that does not split open along a seam or surface; as used herein, synonymous with achene.
- ocrea:** a stipular, tube-shaped sheath that surrounds the stem just above the leaf base; a characteristic of the smartweed family (Polygonaceae).
- oogonia:** eggs of algae.
- ovary:** the lower, usually enlarged portion of the pistil, in which the seeds are produced.
- peat:** a soil consisting of partially decomposed plant remains in which the contributing plant species can still be identified; an organic soil as opposed to mineral soils.
- pedicel:** the stalk of a single flower.
- perennial:** a plant species living three or more years.
- perfect flower:** a flower having both pistils and stamens.
- perigynium:** a flask-like papery structure that surrounds the ovary in *Carex* (plural, perigynia).
- persistent emergent:** an aquatic emergent plant that remains standing through the winter and at least until the start of the next growing season (e.g., cattails).
- petiole:** the stalk of a leaf.
- pinnae:** one of the primary lateral divisions of a pinnately compound leaf.
- pinnatifid:** a deeply lobed, pinnate-like pattern cut along a central axis; the inter-segmented clefts, however, do not reach the axis.
- pioneer:** a plant species that characteristically first colonizes exposed soils.
- pistil:** the seed producing organ of a flower, composed of an ovary, and one or more styles and stigmas.
- pistillate:** having only pistils (lacking staminate (pollen-producing) organs).
- pith:** the spongy central portion of stems and branches.
- prostrate:** laying flat on the ground.
- pubescent:** hairy.
- punctate:** dotted.
- rachis:** a main axis, such as that of a compound leaf.
- ray:** in the aster family (Compositae), a strap-shaped marginal flower radiating from the flower head.
- receptacle:** in the aster family (Compositae), an enlarged summit of the flower stalk to which the flowers are attached.
- recurved:** curved backward.

GLOSSARY

- revolute:** having the margins rolled backward.
- rhizome:** an underground stem, usually growing horizontally.
- rosette:** a dense, circular, clump of leaves.
- saline:** salty; having a high concentration of dissolved salts.
- samara:** a dry fruit that does not split open along a seam and has a well-developed wing.
- scabrous:** rough.
- scale:** a minute, modified leaf subtending an individual flower, especially referring to sedges (Cyperaceae).
- secund:** arranged along only one side of the axis.
- sepal:** a single segment of the calyx, usually green.
- septate:** with hard cross partitions.
- sessile:** lacking a stalk.
- siliqua:** a seed pod consisting of 2 fused flower pistils, usually longer than wide. The outer walls of the fused pistil (referred to as valves) typically separate when ripe leaving a persistent partition (the replum). Shorter seed pods of similar structure are called a silicle. These seed pods are characteristic of the mustard family (Cruciferae).
- sorus:** a cluster of sporangia, as in ferns (plural: sori).
- spikelet:** a small spike with reduced flowers on a central axis; applied to the flower cluster (inflorescence) of grasses (Gramineae) and sedges (Cyperaceae).
- sporangia:** a case or structure that contains spores.
- spur:** a flower part that is a hollow, pointed projection.
- stamen:** the male or pollen-producing organ of the flower.
- staminate:** having only stamens (lacking pistillate (seed producing) organs).
- stand:** a particular example of a plant community.
- stigma:** the terminal portion of a pistil which is receptive to pollen.
- stipe:** a stalk.
- stipule:** an appendage at the base of a leaf.
- stolon:** an above-ground, horizontal stem.
- strigose:** having straight, stiff hairs that are flattened along a surface.
- style:** the stalk-like portion of a pistil connecting the stigma and ovary.
- tepal:** in a given plant, sepals and petals that strongly resemble each other.
- thyrs:** an inflorescence resembling a compact panicle.

GLOSSARY

tuber: a starchy, enlarged portion of a rhizome or root.

tubercle: a small enlargement or appendage, usually distinct in color or texture, as in the “cap” on the nutlet of spike-rushes.

unisexual: having only stamens (staminate) or pistils (pistillate).

upland: an area that does not have the hydrologic conditions necessary for the development of hydric (wetland) soils and establishment of wetland plant communities.

whorl: a group of three or more parts surrounding a node.

villous: having long, soft hairs that are not matted.

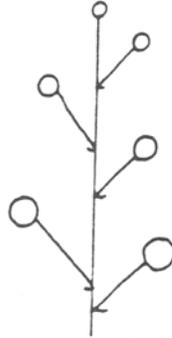
wetlands (regulatory definition): areas saturated or inundated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

wetlands (scientific definition): an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical and biological features reflective of recurrent, sustained inundation or saturation. Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physiochemical, biotic or anthropogenic factors have removed them or prevented their development (National Research Council 1995).

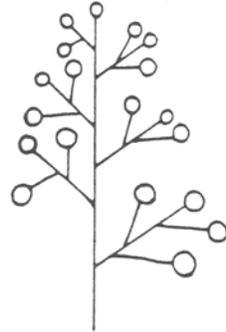
GLOSSARY



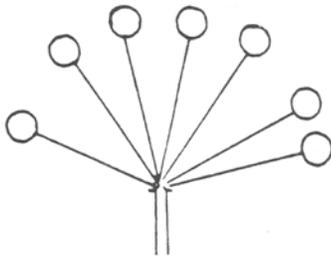
Spike



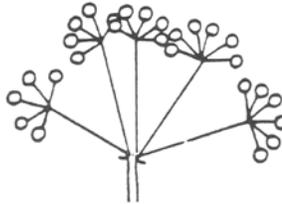
Raceme



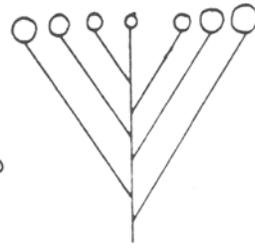
Panicle



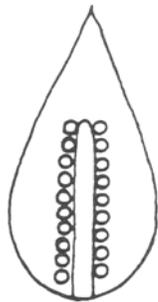
Umbel



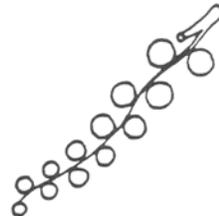
Compound Umbel



Corymb



Spathe and Spadix



Catkin

Inflorescence Types

GLOSSARY



Linear



Oblong



Orbicular



Oval



Ovate



Heart-shaped



Lanceolate



Deltoid



Sagittate



Oval



Kidney-shaped



Obovate

Leaf Shapes

GLOSSARY



Parallel



Pinnate



Palmate

Leaf Venation



Entire



Crenate



Serrate



Doubly Serrate



Serrulate



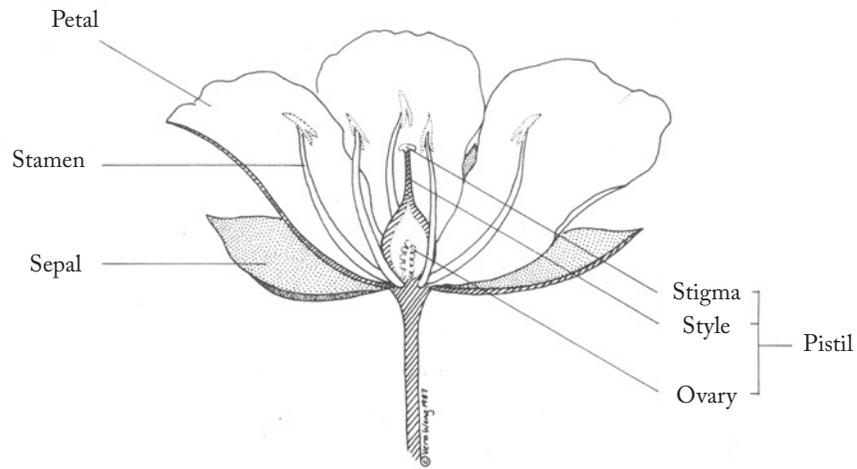
Ciliate



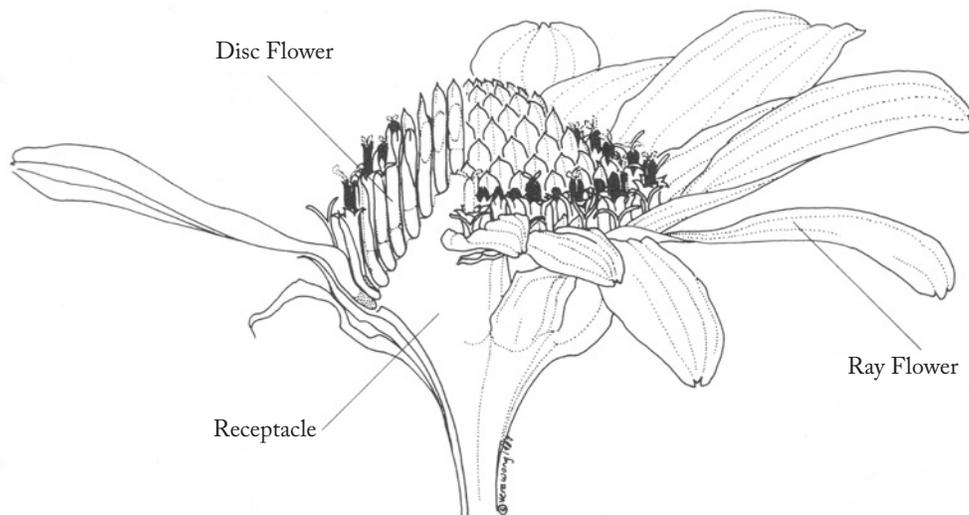
Dentate

Leaf Margins

GLOSSARY

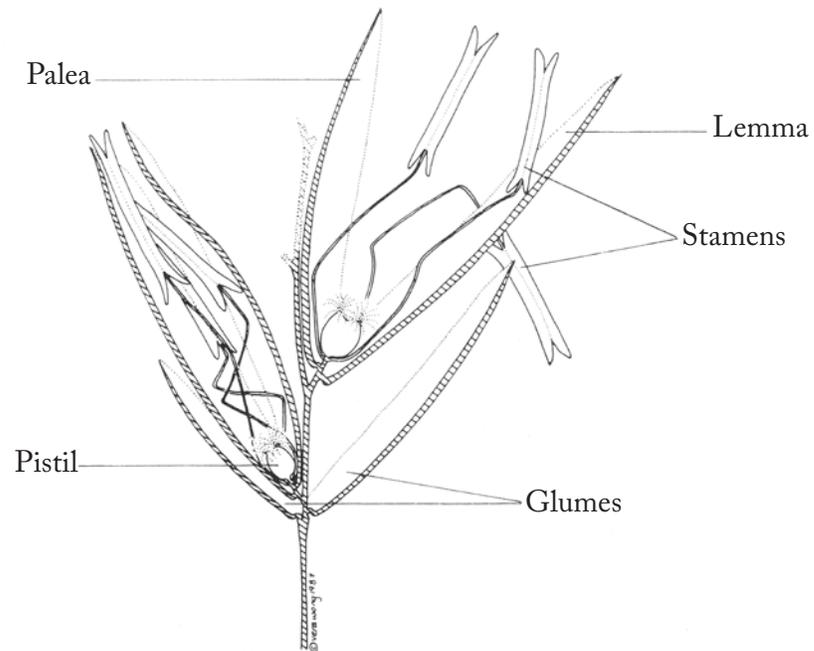


Cross Section of a Typical Flower

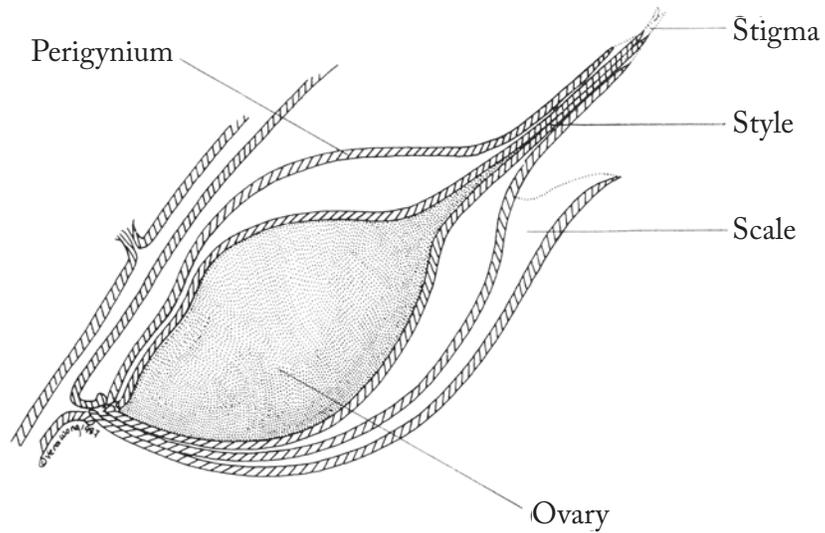


Cross Section of a Typical Composite Flower (Compositae)

GLOSSARY



Cross Section of a Typical Grass Spikelet



Cross Section of a Perigynium (*Carex*)

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