SECTION 3

Deep and Shallow Marshes

II. Marshes

Marshes are characterized by emergent aquatic plants growing in permanent to seasonal, shallow water. Species of shallow, open water communities, as well as those found in sedge meadows and seasonally flooded basins, also occur in marshes. Species of sedge meadows and seasonally flooded basins colonize muskrat lodges, floating mats and exposed substrates during droughts or artificial draw downs. Emergent aquatic plants typically become established and spread when water levels are low or when the marsh substrate is exposed, and then persist when water levels rise. However, if water levels rise too quickly, or rise to levels higher than normal, emergent vegetation may not survive, or may rise to the water surface as floating mats. Muskrats can "eat out" emergent vegetation, creating open water areas within the marsh that favor waterfowl use. Unchecked, however, muskrats can eliminate emergent vegetation, leaving an open water area until the next drought or drawdown allows emergent vegetation to recover.

Marshes are among the most productive of all wetlands for water birds and furbearers and also provide spawning and nursery habitat for some fish species. Birds that use marshes for breeding and feeding include swans, ducks, geese, rails, herons, egrets, terns and songbirds. Raptors such as the osprey, bald eagle and northern harrier frequent marshes in search of prey. Important furbearers inhabiting marshes include muskrat and mink. Excellent winter habitat is provided for upland wildlife, including ring-necked pheasant and eastern cottontail. Marshes help replenish and maintain fish populations in adjacent lakes and rivers by providing spawning habitat, most notably for northern pike and muskellunge.

Additional important functions provided by marshes include detention of floodwaters, protection of shorelines from erosion, aesthetics, and improvement of water quality by trapping sediments and assimilating nutrients.

Marshes in Minnesota and Wisconsin are divided into deep and shallow marshes depending on water permanence and depth, and degree of soil saturation during the growing season. Because of the similarity of plant species, the discussion of the individual species occurring in deep and shallow marshes is combined.

II.A. Deep Marshes

Deep marsh plant communities have standing water depths between 6 inches and 3 or more feet during the growing season (Shaw and Fredine 1971). Herbaceous emergent, floating, floating-leaved and submergent vegetation compose this community, with the major dominance by cattails, bulrushes, pickerelweed, giant bur-reed, common reed, wild rice, pondweeds and/or water-lilies.

VEGETATION: This deep marsh community includes hardstem bulrush (*Schoenoplectus acutus*), broad-leaf cattail (*Typha latifolia*), white water-lily (*Nymphaea odorata*), yellow water-lily (*Nuphar variegata*), water shield (*Brasenia schreberi*), lesser duckweed (*Lemna minor*), floating-leaf pondweed (*Potamogeton natans*), flat-stem pondweed (*Potamogeton zosteriformis*), grass-leaf pondweed (*Potamogeton gramineus*), coontail (*Ceratophyllum demersum*), common bladderwort (*Utricularia macrorhiza*) and water milfoil (*Myriophyllum* sp.).

SOILS: Lacustrine deposits.

HYDROLOGY: Permanently to semi-permanently inundated.

LOCATION: Beaver Dam Lake, Waukesha County, Wisconsin.

VEGETATION: The emergent layer of this deep marsh community is dominated by northern wild rice (*Zizania palustris*), pickerelweed (*Pontederia cordata*), hardstem bulrush (*Schoenoplectus acutus*), river bulrush (*Schoenoplectus fluviatilis*) and giant bur-reed (*Sparganium eurycarpum*). The submergent and floating layers include common bladderwort (*Utricularia macrorhiza*), large-leaf pondweed (*Potamogeton amplifolius*), flat-stem pondweed (*Potamogeton zosteriformis*), lesser duckweed (*Lemna minor*) and big duckweed (*Spirodela polyrhiza*).

SOILS: Lacustrine deposits.

HYDROLOGY: Permanently to semi-permanently inundated.

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

II.B. Shallow Marshes

Shallow marsh plant communities have soils that are saturated, or inundated by standing water up to 6 inches in depth, throughout most of the growing season (Shaw and Fredine 1971). Herbaceous emergent vegetation such as cattails, bulrushes, arrowheads and lake sedges characterize this community. Floating and floating-leaved vegetation strata are typically reduced and the submergent vegetation stratum is absent.

© Steve D. Eggers

VEGETATION: The above shallow marsh is dominated by broad-leaf cattail (*Typha latifolia*), narrow-leaf cattail (*Typha angustifolia*), hybrid cattail (*Typha* x *glauca*), giant bur-reed (*Sparganium eurycarpum*), common reed (*Phragmites australis*) and river bulrush (*Schoenoplectus fluviatilis*). Other species include softstem bulrush (*Schoenoplectus tabernaemontani*), lake sedge (*Carex lacustris*), broad-leaf arrowhead (*Sagittaria latifolia*), lesser duckweed (*Lemma minor*), star duckweed (*Lemna trisulca*), water smartweed (*Persicaria amphibia*), bulblet-bearing water hemlock (*Cicuta bulbifera*), rice cut-grass (*Leersia oryzoides*), great water dock (*Rumex orbiculatus*) and indigo bush (*Amorpha fruticosa*). During the past 20 years, a purple loosestrife (*Lythrum salicaria*) infestation has occurred, but has been slow to expand. Hybrid cattail and common reed have been more problematic in that both species have expanded aggressively by replacing bulrushes and giant bur-reed as dominants in some portions of the wetland complex.

SOILS: Seelyeville muck (Typic Haplosaprists), a very poorly-drained soil with an upper organic layer greater than 51 inches in depth (and can be many feet in depth). Landscape position is a backwater lake and marsh complex within the broad valley of the Minnesota River.

HYDROLOGY: This backwater area is primarily groundwater fed, but is also inundated during flood events of the Minnesota River. Inundation up to 6 inches in depth is typical for this shallow marsh.

LOCATION: Gun Club Lake, Fort Snelling State Park, Dakota County, Minnesota.

© Steve D. Eggers

VEGETATION: The above shallow marsh community includes bottlebrush sedge (*Carex comosa*), broad-leaf arrowhead (*Sagittaria latifolia*), slough sedge (*Carex atherodes*), lake sedge (*Carex lacustris*), soft rush (*Juncus effusus*), rice cut-grass (*Leersia oryzoides*), giant mana grass (*Glyceria grandis*), softstem bulrush (*Schoenoplectus tabernaemontani*), marsh spike-rush (*Eleocharis palustris*), great water dock (*Rumex orbiculatus*), broad-leaf cattail (*Typha latifolia*), beggartick (*Bidens cernua*), common bladderwort (*Utricularia macrorhiza*), common bugleweed (*Lycopus americanus*) and a border of reed canary grass (*Phalaris arundinacea*).

SOILS: Palms muck (Terric Haplosaprists) with 16 to 51 inches of muck over loamy deposits.

HYDROLOGY: Saturated soils at or near the surface and shallow inundation up to 6 inches. Primarily supported by groundwater seepages, but also influenced by water levels in Lake Marion. A small, groundwater-fed, perennial stream flows through this community.

LOCATION: Adjacent to Lake Marion, Ritter Farm Park, Dakota County, Minnesota.

© Steve D. Eggers

BROAD-LEAF CATTAIL

(*Typha latifolia* L.)

CATTAIL FAMILY (Typhaceae) **C of C:** Native (1 WI)(2 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: An erect, perennial herb 1-3 m. high with long, linear leaves sheathing at the base. Leaves are D-shaped in cross section, 1-2 cm. wide, pale green, and typically do not extend above the spike. Flowers are packed into dense, cylindrical spikes, the upper portion consisting of the staminate flowers and the lower portion the pistillate flowers. The two portions of the spike are continuous or nearly so. Fruit is a tiny, tufted nutlet. In flower during May-June.

ECOLOGICAL NOTES: One of the most recognizable wetland species, broad-leaf cattail is a persistent emergent found in almost all of our wetland plant communities from deep marshes to open bogs, growing on wet substrates and often in one to two feet or more of standing water. It spreads extensively by rhizomes so that an acre of cattails may consist of only a few individual plants. Broad-leaf cattail also forms floating mats. Cattail stands provide important food and cover for wildlife. For example, the rhizomes are eaten by geese and muskrats. Muskrats also use the foliage to construct their lodges, which in turn provide resting and nesting sites for water birds. Yellow-headed blackbirds, red-winged blackbirds and marsh wrens build their nests in cattail vegetation.

Cattails are tolerant of high sediment and nutrient inputs as well as fluctuating water levels. Urban stormwater inputs and runoff from agricultural lands favors expansion and dominance by cattails. Cattails can form extensive monotypes that may be considered undesirable because they lack species diversity.

SOURCE: Fassett (1957); Fernald (1970); Gleason and Cronquist (1991); and Voss (1972).

© Steve D. Eggers

NARROW-LEAF CATTAIL

(*Typha angustifolia* L.)

CATTAIL FAMILY (Typhaceae) **C of C:** Introduced, invasive (0) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: Similar to broad-leaf cattail (*T. latifolia*) except that the staminate and pistillate portions of the spike are separated by 2 cm. or more of bare stem, the leaves are narrower (4-12 mm. wide vs. 10-20 mm. wide), and the leaves typically extend beyond the spike. Overall, the plant is less robust than *T. latifolia*.

ECOLOGICAL NOTES: Similar to broad-leaf cattail; however, narrow-leaf cattail tolerates more mixosaline and calcareous waters, as well as more degraded condition, compared to broad-leaf cattail. Narrow-leaf cattail also tends to be very invasive in less disturbed sites. It may form floating mats. Wildlife values are similar to those described for broad-leaf cattail. Broad-leaf and narrow-leaf cattail freely hybridize to form the hybrid, *Typha* x *glauca* Godr.

SOURCE: Fassett (1957); Fernald (1979); Gleason and Cronquist (1991); and Voss (1972).

© Steve D. Eggers

HYBRID CATTAIL

(*Typha* x *glauca* Godr.)

CATTAIL FAMILY (Typhaceae) **C of C:** Introduced, invasive (0) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: Hybrid cattail is usually larger than either parent, *T. latifolia* and *T. angustifolia*, growing to 3-4 m. in height. Staminate and pistillate portions of the spike are usually separated by up to 4 cm. of bare stem. The pistillate portion of the spike is often greater than 15 cm. (6 inches) in length whereas this length is almost never exceeded by either parent (see photograph on next page). *T.* x *glauca* reproduces vigorously by rhizomes.

ECOLOGICAL NOTES: Hybrid cattail is a highly invasive species expanding into deep and shallow marshes, inland fresh meadows, lakeshores and ditches. The three species of cattails often occur together with eventual dominance by hybrid cattail. As a result, pure stands of the native cattail, *T. latifolia*, are becoming increasingly uncommon in agricultural and urban regions of Minnesota and Wisconsin.

SOURCE: Gleason and Cronquist (1991); Chadde (2002); Crow and Hellquist (2000); and Swink and Wilhelm (1994).

© Steve D. Eggers

Broad-leaf cattail (*Typha latifolia*) [left], narrow-leaf cattail (*T. angustifolia*) [center] and hybrid cattail (*T.* x *glauca*) [right]. In *T. latifolia*, the pistillate portion of a spike is typically more than 15 mm. (0.6 inch) thick and less than 15 cm. (6 inches) long. *T. angustifolia* pistillate spikes are much narrower and also less than 15 cm. long. In contrast, the pistillate portion of a spike in *T.* x *glauca* often exceeds 15 cm. in length. The surest way to differentiate cattails, however, is to examine the stigmas under 10x or greater magnification. See key in Swink and Wilhelm (1994).

Scale is in inches.

Comparison of the Pistillate Portion of Cattail Spikes

© Steve D. Eggers

SWEET FLAG

(*Acorus americanus* (Raf.) Raf.)

SWEET FLAG FAMILY (Acoraceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACERISTICS: A perennial herb with elongated, erect, sword-shaped linear leaves up to 2 m. tall. Leaves are 8-25 mm. wide and crowded at the base along a horizontal rhizome. The midvein and 1-5 additional veins are noticeably raised. A sweet, fragrant odor arises from crushed or bruised leaf bases and rhizomes. A three-angled flowering stem arises directly from the leaf base. It forms a 20-60 cm. long, spathe-like, modified leaf. A cylindrical, linear spadix, 5-10 cm. long, is covered with yellowish-brown flowers. Fruit is a gelatinous, few-seeded berry. In flower June-July.

Very similar to *Acorus calamus* L. which has only one midvein of the leaf prominently raised.

ECOLOGICAL NOTES: Sweet flag is uncommon in shallow marshes, wet swales and shallow water along shores.

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

© Steve D. Eggers

GIANT BUR-REED

(*Sparganium eurycarpum* Engelm. ex Gray)

BUR-REED FAMILY (Sparganiaceae) **C of C:** Native (5) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A stout, perennial herb usually 50-150 cm. in height. Inflorescence has zigzag branches and flowers in unisexual heads; lower heads consist of the pistillate flowers which are bur-like at maturity, while upper heads consist of staminate flowers. Pistillate heads are 2-2.5 cm. in diameter. Leaves are usually erect, 6-12 mm. wide, and strongly keeled so that they are flattened-triangular in cross section. However, ribbon-like floating and submerged leaves can also be produced. Mature fruit is 6-8 mm. long and square-topped with a sharp beak. In flower June-July.

Giant bur-reed is our most common and robust bur-reed. It can be distinguished from all other bur-reeds because it has 2 stigmas and the fruit is nearly square across the top. Other bur-reeds have 1 stigma and the fruit tapers to the base and apex.

At first glance, giant bur-reed may resemble cattail (*Typha* spp.) when not in flower or fruit; however, the strongly keeled leaves (flattened-triangular in cross section) of giant bur-reed will distinguish it from the flattened leaves (D-shaped in cross section) of cattails.

ECOLOGICAL NOTES: Giant bur-reed is a persistent emergent found in shallow water and on wet substrates in marshes, bogs and margins of lakes and streams. It is characteristic of silty, nutrient-rich waters, especially south of the vegetation tension zone, while other species of bur-reed (*Sparganium* spp.) characterize low-nutrient waters primarily north of the tension zone.

Muskrats use the entire plant and the seeds are commonly eaten by waterfowl and marsh birds.

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

Giant Bur-Reed
(*Sparganium eurycarpum*)

© Photos by Steve D. Eggers

GREENFRUIT BUR-REED

(*Sparganium emersum* Rehmann)

BUR-REED FAMILY (Sparganiaceae) **C of C:** Native (8) **IND. STATUS:** OBL

SYNONYM: *Sparganium chlorocarpum* Rydb.

FIELD CHARACTERISTICS: A perennial herb typically emersed, but sometimes lax and trailing in water, with stems growing to 20-60 cm. long. Leaves are linear, flat to keeled, and 30-70 cm. long x 3-6 mm. wide. Inflorescence is unbranched and 10-20 cm. long. Pistillate and staminate flowers are in separate heads. Pistillate heads number 1-4 and are 1.5-2.5 cm. wide. At least one of the pistillate heads is borne above the leaf axils. Staminate heads number 2-5 and are 1.5-2 cm. wide at flowering time. Nutlets (achenes) are 4-5 mm. long, shiny green, widest at the middle and taper to both ends. The prominent beak is 3-5 mm. long. In flower June-August.

ECOLOGICAL NOTES: Greenfruit bur-reed is a persistent emergent found in shallow and deep marshes, open bogs and along lakeshores.

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

© Photos by Gary B. Walton

CLUSTERED BUR-REED

(*Sparganium glomeratum* (Beurling ex Laestad.) L. Neum.)

BUR-REED FAMILY (Sparganiaceae) **IND. STATUS:** OBL

C of C: Native (8 WI)(7 MN), a threatened species in Wisconsin

FIELD CHARACTERISTICS: A perennial herb with an emersed or floating stem 20-40 cm. long. Leaves are linear, more or less flat and 3-8 mm. wide. Inflorescence is usually unbranched with several sessile, pistillate heads clustered together. Pistillate heads are 1.5-2 cm. wide when mature. Staminate heads number 1-2 and are located above the pistillate heads. Nutlets (achenes) are 3-8 mm. long, widest at the middle, tapering to both ends and shiny brown with a straight beak 1-2 mm. long.

ECOLOGICAL NOTES: Clustered bur-reed is a rare species of northern shallow marshes, alder thickets and bogs. In Wisconsin it has only been found in four counties in the northwestern part of the state. In Minnesota it has been found widely scattered across the northern part of the state.

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

Stem and Leaf Cross Sections

Cattail Leaf
(*Typha*)

Bur-Reed Leaf
(*Sparganium*)

Iris Leaf
(*Iris*)

Sweet Flag Leaf
(*Acorus*)

Sedge Stem
(*Carex, Scirpus, Schoenoplectus*)

Bulrush or Spike-Rush Stem
(*Schoenoplectus, Eleocharis*)

Grass Stem
(Gramineae)

© Steve D. Eggers

SOFTSTEM BULRUSH

(*Schoenoplectus tabernaemontani* (K.C. Gmel.) Palla)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (4) **IND. STATUS:** OBL

SYNONYM: *Scirpus validus* Vahl.

FIELD CHARACTERISTICS: A perennial sedge from slender rhizomes. Stems are 1-3 m. in height, cylindrical, light green, with a few sheathing vestigial leaves at the base. Stems are 1-1.5 cm. thick and large-chambered so they can be easily crushed between the thumb and index finger. Spikelets number several to many and are 5-10 mm. long and oval. A specialized leaf that appears to be a continuation of the stem exceeds the spikelets. Nutlets are 1.6-2.1(2.4) mm. long with 6 basal bristles about equal in length to the nutlet. Scales are shiny orange to brown, often with a conspicuous green midrib. Scales are slightly greater in length than the nutlet itself. In flower June-September.

ECOLOGICAL NOTES: Softstem bulrush is a persistent emergent found in deep and shallow marshes, lakes, streams and occasionally bogs. It can form large stands or be intermixed with other emergent species. Softstem bulrush usually prefers mucky substrates with more stagnant conditions than those preferred by hardstem bulrush (*Schoenoplectus acutus*). It provides valuable nesting cover for water birds and food for muskrats.

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

HARDSTEM BULRUSH

(*Schoenoplectus acutus* (Muhl. ex Bigelow) A. & D. Love)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (6) **IND. STATUS:** OBL

SYNONYM: *Scirpus acutus* Muhl.

FIELD CHARACTERISTICS: A perennial sedge from stout rhizomes. Stems are 1-3(4.4) m. in height, cylindrical, and dark olive green with a few sheathing vestigial leaves at the base. Stems are 0.5-1 cm. thick and small chambered so that they are stiff and not easily crushed between the thumb and index finger. There may be one spikelet or many, on stalks 7-20 mm. long. Spikelets are oval to cylindrical, exceeded by a specialized leaf that appears to be a continuation of the stem. Nutlets are 2.2-2.7 mm. long, totally covered by whitish-brown scales, and have 6 basal bristles. Scales have marginal hairs and red dots on the back. In flower June-September.

ECOLOGICAL NOTES: Hardstem bulrush is a persistent emergent found in deep and shallow marshes, lakes, streams, and occasionally bog lakes; generally in water depths to 5 feet, but it has been found in much deeper depths. It prefers sandy to marly substrates with good water circulation in the root zone. It is also found in calcareous fens, another mineral-rich habitat. Hardstem bulrush can form colonial stands or be intermixed with other emergents. It has a higher tolerance of mixosaline conditions than softstem bulrush (*S. tabernaemontani*). Hybrids between hardstem and softstem bulrush occur.

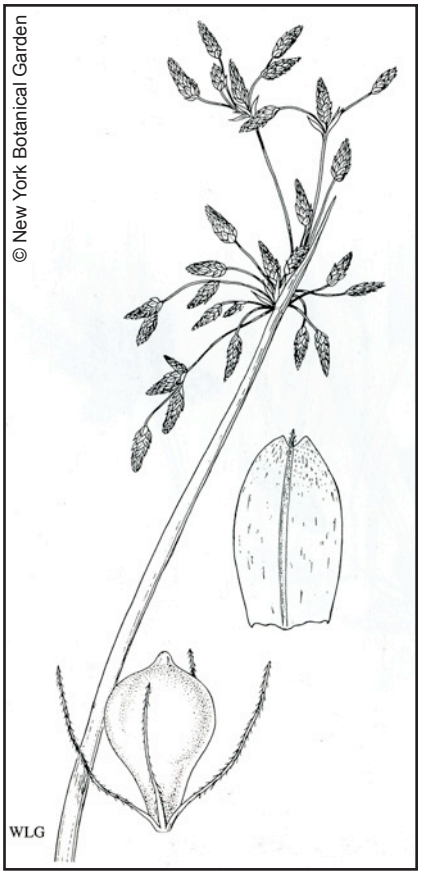
Waterfowl and shorebirds eat the nutlets, which are an important and frequently used food. Muskrats and geese eat the rhizomes and stems. In general, bulrushes (*Schoenoplectus* spp., *Scirpus* spp.) provide nesting habitat and cover for a wide variety of birds and furbearers, as well as spawning and nursery habitat for northern pike and other fish species.

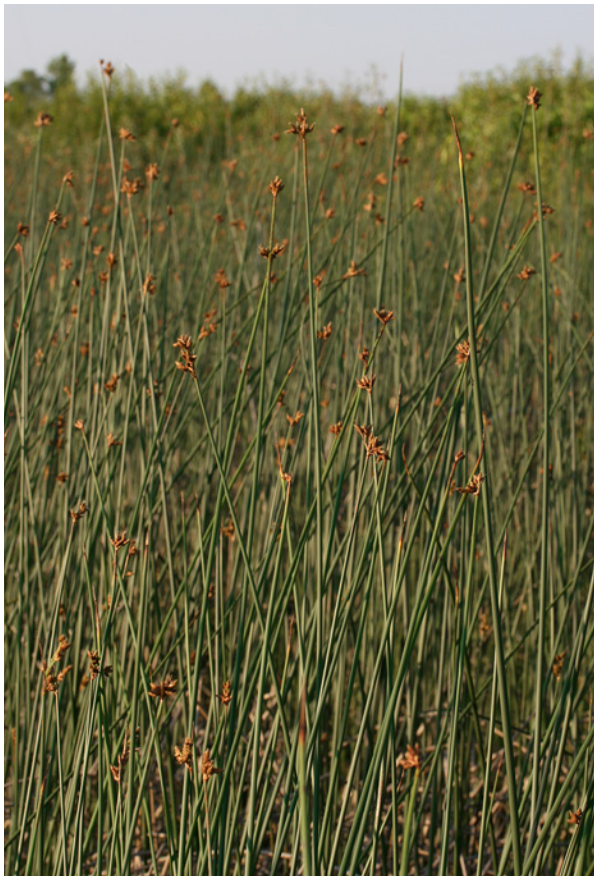
SOURCE: Gleason and Cronquist (1991); and Voss (1972).

Comparison of Stem Cross Sections

Softstem Bulrush
(*Schoenoplectus tabernaemontani*)

Hardstem Bulrush
(*Schoenoplectus acutus*)





Hardstem Bulrush (*Schoenoplectus acutus*)

© Photos by Steve D. Eggers

Stem cross section

RIVER BULRUSH

(*Schoenoplectus fluviatilis* (Torr.) M.T. Strong)

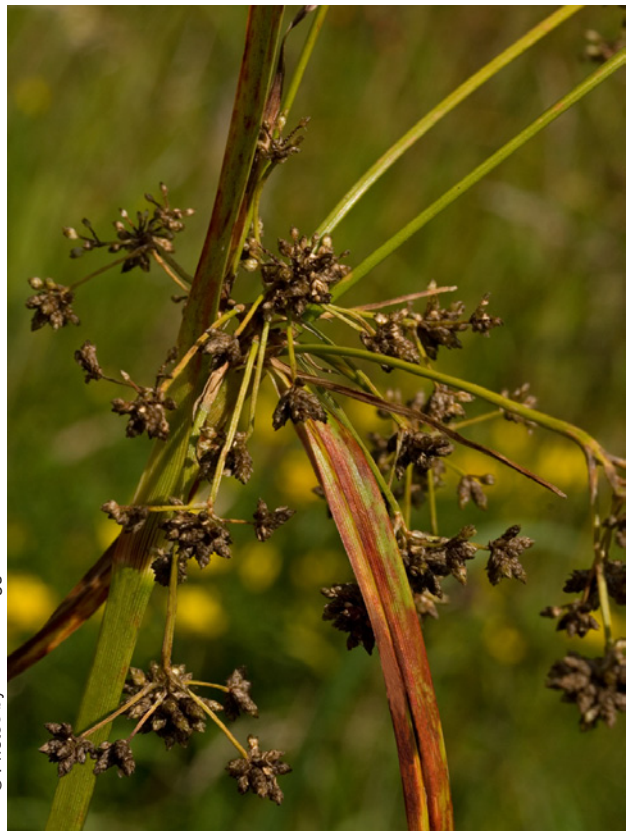
SEDGE FAMILY (Cyperaceae) **C of C:** Native (6 WI)(4 MN) **IND. STATUS:** OBL

SYNONYMS: *Scirpus fluviatilis* (Torr.) Gray; *Bolboschoenus fluviatilis* (Torr.) Sojak

FIELD CHARACTERISTICS: A stout, perennial sedge from a thick rhizome with tuber-like enlargements (corm). Stems are sharply triangular and leafy, growing to a height of 2 m. Leaf blades are 8-12 mm. wide and strongly M-shaped in cross section. Spikelets are 10-25 mm. long, and sessile or on stalks to 10 cm. long. Nutlets are 4-5 mm. long, distinctly 3-angled, with a beak and 6 barbed bristles at the base. In flower July-September.

ECOLOGICAL NOTES: River bulrush is a persistent emergent of deep and shallow marshes; wet shores and riverbanks; in fresh and mixosaline waters. It is a common dominant in Mississippi River backwaters and prairie potholes. River bulrush is a favorite food of muskrats. Wildlife values are similar to those described for other bulrushes.

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



© Photos by Steve D. Eggers

PANICLED BULRUSH

(*Scirpus microcarpus* J. & K. Presl)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (6) **IND. STATUS:** OBL

SYNONYM: *Scirpus rubrotinctus* Fern.

FIELD CHARACTERISTICS: A perennial sedge with stems 60-150 cm. tall. The coarse, stout stems are roundly triangular with several flat, grass-like leaves. Stem leaves are 4-15 mm. wide and arise singularly or in small groups from creeping rhizomes. The terminal inflorescence contains numerous sessile spikelets crowded into dense clusters of umbel-like cymes. Spikelets are 3-6 mm. long and 1-2 mm. wide. Nutlets are biconvex and about 1 mm. long with a tiny beak.

Panicled bulrush (*Scirpus microcarpus*) can be confused with green bulrush (*S. atrovirens*) but the reddish-tinged leaf sheaths and stouter stems of *S. microcarpus* distinguish it.

ECOLOGICAL NOTES: Panicled bulrush is found in wet meadows, shallow marshes, sandy lake shores, and in ditches and swales. Often it is observed along the edges of alder thickets, shrub-carrs and riverbanks.

SOURCE: Crow and Hellquist (2000); Fassett (1976); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1972).

© Photos by Steve D. Eggers

THREE-SQUARE BULRUSH

(*Schoenoplectus pungens* (Vahl) Palla)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (5 WI)(6 MN) **IND. STATUS:** OBL

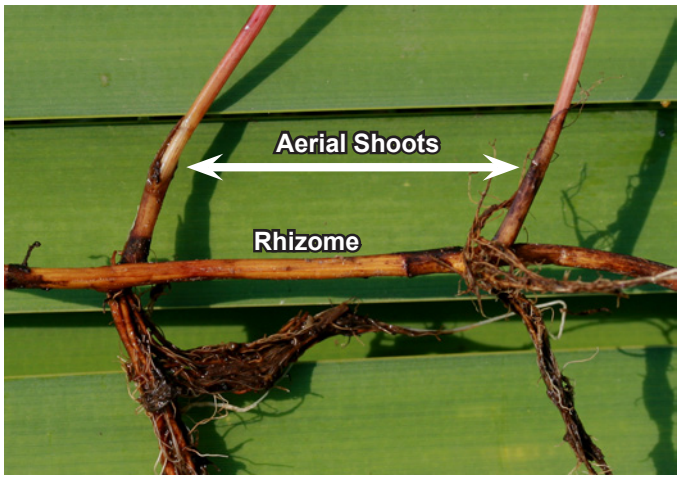
SYNONYMS: *Scirpus pungens* Vahl; *Scirpus americanus* Pers.

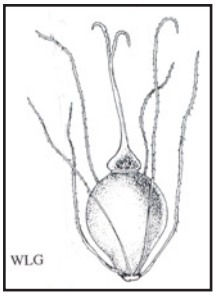
FIELD CHARACTERISTICS: A perennial sedge from long rhizomes. Stems are sharply triangular with 2 or 3 concave sides, and grow to a height of 1.5 m. Leaves form basal sheaths and are less than half the height of the stems. Spikelets number 1-8 and are 7-20 mm. long, sessile, crowded, and oblong oval. A specialized leaf resembles a continuation of the stem beyond the spikelets. Nutlets are (2.3)2.5-3 mm. long, with bristles that are as long to two-thirds as long as the nutlet. In flower July-September.

ECOLOGICAL NOTES: Three-square bulrush is a persistent emergent found in deep and shallow marshes, calcareous fens, and borders of lakes and streams, often in water depths of 1 foot and up to 2.5 feet. It is frequently found in mixosaline waters. Three-square bulrush is an excellent wildlife food plant.

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

© Photos by Steve D. Eggers





© New York Botanical Garden

Nutlet

MARSH SPIKE-RUSH

(*Eleocharis palustris* (L.) Roemer & J.A. Schultes)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (6 WI)(5 MN) **IND. STATUS:** OBL

SYNONYM: *Eleocharis smallii* Britt.; see Ecological Notes

FIELD CHARACTERISTICS: A perennial sedge from long rhizomes. Stems are stout, round, 10-100 cm. tall and 1-3 mm. wide. Stems can be solitary or in small clusters. Spikelets are lance-ovate in shape, wider than the stems, 5-40 mm. long by 2-4 mm. wide. The lowest 1-2 scales of the spikelet are sterile and encircle the stem. Fertile scales are lanceolate to ovate and 2-5 mm. long, brown to red-brown with a green or light colored midvien. Nutlets (achenes) are lens shaped, yellow to brown, 1-2 mm. long with a distinct, deltoid-shaped tubercule that is constricted at the base. Nutlets are usually subtended by 4-6 barbed bristles.

ECOLOGICAL NOTES: Marsh spike-rush is a common, persistent emergent found in deep and shallow marshes, ditches, and borders of lakes and streams. To a lesser extent it occurs in bogs and wet meadows as well. The *National Wetland Plant List* (2014) lumps *E. erythropoda* Steud. and *E. macrostachya* Britt. under *E. palustris* while the *Flora of North America* (2002) considers all three to be separate species.

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

© Photos by Steve D. Eggers

PICKERELWEED

(*Pontederia cordata* L.)

PICKERELWEED FAMILY (Pontederiaceae) **C of C:** Native (8) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb, usually emergent to a height of 1 m. Rhizomes are thick and creeping. Leaves are heart-shaped to lanceolate and up to 18 cm. long. However, rosettes of submerged, ribbon-like leaves can also be produced. Leaves are long-petioled (petioles averaging 4.5 cm.). The violet-blue flowers (rarely white) are packed into a dense spike. In flower June-August.

ECOLOGICAL NOTES: Pickerelweed is a nonpersistent emergent found in shallow water (rarely more than 3 feet in depth) or saturated substrates of marshes, bogs, margins of lakes and streams, and Mississippi River backwaters. It often forms large colonies.

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

© Steve D. Eggers

WATER STAR-GRASS

(*Heteranthera dubia* (Jacq.) MacM.)

PICKERELWEED FAMILY (Pontederiaceae) **C of C:** Native (6) **IND. STATUS:** OBL

SYNONYM: *Zosterella dubia* (Jacq.) Small

FIELD CHARACTERISTICS: A perennial, aquatic herb usually submersed, but can also be stranded on mudflats where it forms small rosettes (as illustrated by the photograph). Stems of submersed plants are forked, often rooting at the nodes and up to 1 m. long. Leaves lack a petiole or midrib and are linear, obtuse, to 15 cm. long by 2-6 mm. wide, or smaller and thicker if emersed. Flowers are yellow and enclosed in a spathe, which is 2-5 cm. long. The 6 perianth segments are linear and 4-6 mm. long. Fruit is a many-seeded capsule about 1 cm. in length. In flower July- September.

ECOLOGICAL NOTES: Water star-grass occurs in shallow waters and muddy shores of marshes, ponds, lakes and streams. When not in flower or fruit, the lack of a midrib distinguishes this species from the linear-leaved pondweeds (*Potamogeton* spp.).

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

© Steve D. Eggers

BROAD-LEAF ARROWHEAD

(*Sagittaria latifolia* Willd.)

WATER PLANTAIN FAMILY (Alismataceae) **C of C:** Native (3) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A typically erect perennial herb with a naked stem 10-120 cm. high. The generally arrowhead-shaped leaves have great variability in width, which may be a response to varying water depths. Flowers are in whorls of 2-15 borne on the naked stem with 3 green sepals, and 3 white (or rarely pink) petals. Male flowers have many stamens. Flattened nutlets are packed into a dense head. Nutlets are 2.5-4 mm. long, winged on the margins, and have a horizontal beak 0.5-1.5(2.3) mm. long. Rhizomes end in an edible tuber. In flower July-August.

Arrowheads (*Sagittaria* spp.) in general can produce arrowhead-shaped, elliptical, or ribbon-like leaves. Like the bur-reeds (*Sparganium* spp.), pickerelweed (*Pontederia cordata*), and wild celery (*Vallisneria americana*), the arrowheads produce submerged rosettes of ribbon-like leaves that can be distinguished from the other genera by their venation (see ink drawing on page 54).

ECOLOGICAL NOTES: Broad-leaf arrowhead is a nonpersistent emergent found in shallow water and on saturated soils of marshes, shrub swamps, wooded swamps, bog ponds, and stream and lake margins.

The tubers (duck potatoes) are of considerable value to wildlife. Native Americans and early European settlers collected these starchy tubers for food. Other common names for this plant are duck potato and wapato.

SOURCE: Fassett (1957); Gleason and Cronquist (1991); and Voss (1972).

© Photos by Steve D. Eggers

Broad-Leaf Arrowhead
(*Sagittaria latifolia*)

Tuber ("duck potato")

Cut-away of pistillate head with ripening nutlets

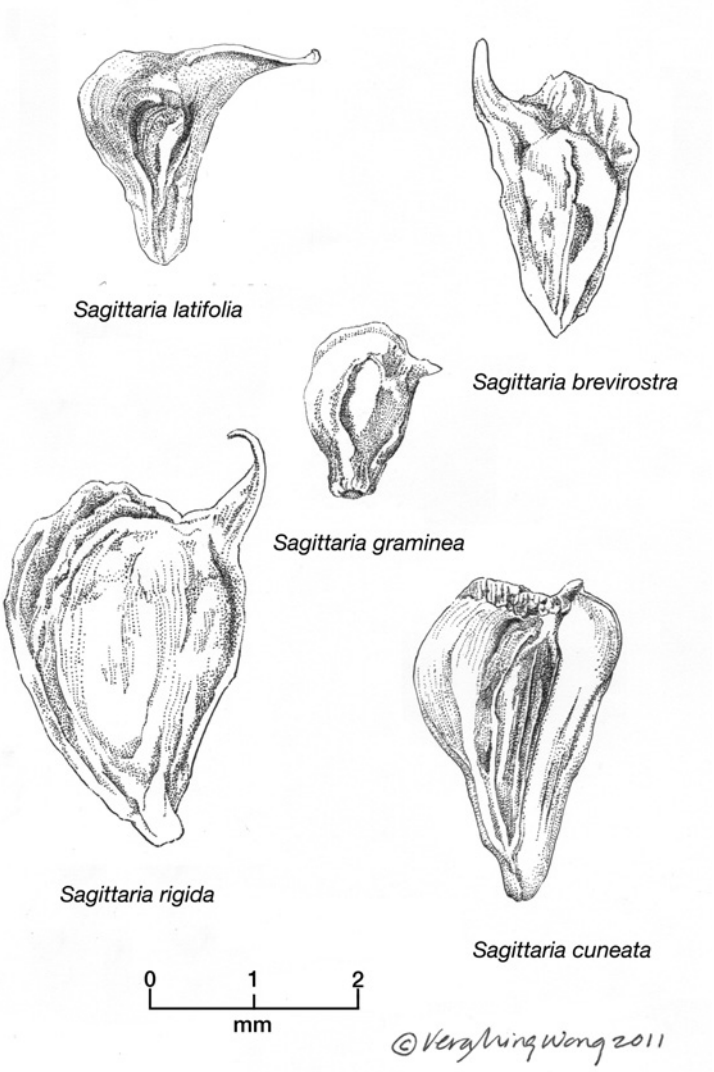
April - May

Broad-leaf arrowhead is an example of a non-persistent emergent meaning that the stems and leaves die-back at the end of the growing season leaving an open water condition. Stems and leaves re-emerge by June of the following growing season and may form nearly 100 percent areal cover as illustrated by the June - October photograph.

© Photos by Steve D. Eggers

June - October

Nutlets of *Sagittaria*



© Photos by Steve D. Eggers

STIFF ARROWHEAD

(*Sagittaria rigida* Pursh)

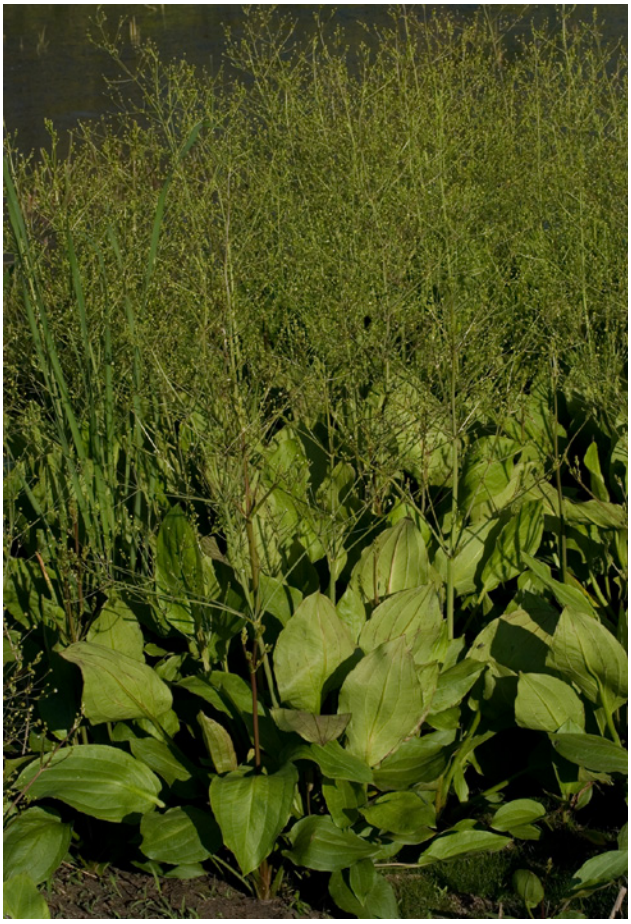
WATER PLANTAIN FAMILY (Alismataceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: A highly variable perennial herb that is erect and emersed, or lax and submersed. The naked stem is 10-80 cm. high. Leaves are lanceolate and entire, or shortly sagittate with narrow basal lobes, 4-15 cm. long and up to 7 cm. wide. Inflorescence has 2-8 whorls of flowers in heads to 1.5 cm. wide. Flowers are unisexual and consist of 3 green sepals and 3 white petals (rarely pink). Petals are 1-3 cm. long. Pistillate flower heads, when mature, are sessile on the stem. Staminate flowers have 15-many stamens. Nutlets are 2-4 mm. long with an ascending beak 1-1.5 mm. in length. In flower June-September.

ECOLOGICAL NOTES: Stiff arrowhead is a nonpersistent emergent found in shallow water and on saturated soils of shallow and deep marshes as well as stream and lake margins.

SOURCE: Fassett (1957); Gleason and Cronquist (1991); and Chadde (2002).



© Photos by Steve D. Eggers

WATER PLANTAIN

(*Alisma triviale* Pursh)

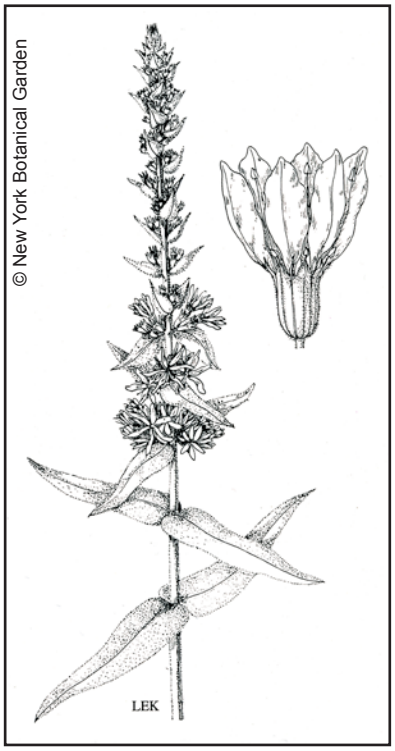
WATER PLANTAIN FAMILY (Alismataceae) **C of C:** Native (4) **IND. STATUS:** OBL

SYNONYM: *Alisma plantago-aquatica* L. var. *americanum* J.A. Schultes

FIELD CHARACTERISTICS: A perennial herb, usually emergent and 10-100 cm. high. Leaves have broad, flat blades that may be rounded or tapered at the base; however, submerged forms with only ribbon-like leaves are also produced. The inflorescence is highly branched. Flowers are perfect with 3 sepals and 3 white or pinkish petals. Petals are 2x the length of the sepals. Pistils are in a single whorl on a small, flat receptacle. Fruit is a group of minute, flat-sided nutlets borne in a whorl. Nutlets are 2.5-3 mm. long. In flower May-September.

ECOLOGICAL NOTES: Water plantain is found in shallow water and on saturated soils of marshes, shrub swamps, wooded swamps, and margins of lakes and streams. It rapidly invades exposed mudflats and is an abundant colonizer of farmed wetlands.

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



PURPLE LOOSESTRIFE

(*Lythrum salicaria* L.)

LOOSESTRIFE FAMILY (Lythraceae) **IND. STATUS:** OBL

C of C: Introduced, invasive, a state-designated noxious weed in Minnesota and Wisconsin (0)

FIELD CHARACTERISTICS: A stout, perennial herb with woody-like square stems growing to a height of 60-200 cm. Plants may be smooth or hairy. Leaves are 3-10 cm. long, lanceolate, opposite or whorled in 3's, entire, sessile and sometimes clasping the stem. Spikes are elongate (10-40 cm.) and packed with red-purple flowers composed of 6 petals. In flower June-September.

ECOLOGICAL NOTES: Purple loosestrife is a persistent emergent found in deep and shallow marshes, inland fresh meadows, and shores of lakes and streams. It is often associated with wetlands that have been disturbed by agricultural use, drainage, pasturing, siltation, or water level fluctuations.

Introduced from Eurasia, this aggressive invader poses a serious threat to North American wetlands because it can outcompete native wetland plants and take over wetland habitats. Deceptively colorful, the extensive monotypes formed by purple loosestrife result in a loss of plant and animal diversity. Biocontrol using loosestrife beetles has been successful to a degree. However, the best control method is to remove by hand the first individual plants that appear. Treatment using an herbicide approved for aquatic use is another option.

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

© Steve D. Eggers

The beginning of a purple loosestrife (*Lythrum salicaria*) invasion of a deep/ shallow marsh dominated by river bulrush (*Schoenoplectus fluviatilis*).

COMMON REED

(*Phragmites australis* (Cav.) Trin. ex Steud.)

GRASS FAMILY (Gramineae or Poaceae) **IND. STATUS:** FACW

SYNONYM: *Phragmites communis* Trin.

C of C: Both native and introduced genotypes. The native genotype has a C of C: 1. Introduced genotypes are highly invasive and have a C of C: 0.

FIELD CHARACTERISTICS: A tall (2-4 m.), robust, cane-like perennial grass that forms large colonies by rhizomes or stolons. Leaves are flat, pennant-shaped and 1-5 cm. wide. Inflorescence is a large panicle 20-40 cm. long that has a feathery appearance because the spikelets have long, silky hairs. Spikelets are 10-15 mm. long with 3-7 florets. In flower July-September.

Common reed can be distinguished from wild rice (*Zizania* spp.) by the following:

Annual, easy to pull up stem and roots as a unit; spikelets unisexual . . . . . *Zizania* spp.

Perennial, difficult to pull up because of stout rhizomes; spikelets perfect . . . . . *Phragmites australis*

ECOLOGICAL NOTES: Common reed is found in deep and shallow marshes, fresh (wet) meadows, sedge meadows, calcareous fens, bogs, road ditches, and along lake margins, sometimes in standing water up to 6 feet in depth. Common reed may be the most widely occurring plant of freshwater wetlands worldwide.

The tall, dense, cane-like stands of this persistent emergent provide excellent winter habitat for species such as white-tailed deer, ring-necked pheasant and eastern cottontail. However, invasive genotypes form large monotypic stands that displace diverse wetland communities. For example, in the lower Minnesota River Valley of the Twin Cities metropolitan area, common reed is invading high quality sedge meadow and calcareous fen communities.

SOURCE: Fassett (1957); Fernald (1970); Gleason and Cronquist (1991); and Voss (1972).

Autumn colors

Common Reed
(*Phragmites australis*)

© Photos by Steve D. Eggers

Illustration from Hitchcock (1950)

Common Reed
(*Phragmites australis*)

Illustration from Hitchcock (1950)

© Photos by Steve D. Eggers

RICE CUT-GRASS

(*Leersia oryzoides* (L.) Sw.)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Native (3) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial grass spreading by long rhizomes. Stems are 1-1.5 m. long, weak and sometimes sprawling. Leaves and stems are highly scabrous (rough, easily cutting skin). Leaves are flat, 20-30 cm. long and 5-10 mm. wide. The ligule is flat-topped and 1 mm. long. Inflorescence is an open panicle 10-20 cm. long. Spikelets are 1-flowered, oval, 5 mm. long and 1-2 mm. wide. Glumes are absent and lemmas have bristly hairs. In flower July-September.

ECOLOGICAL NOTES: Rice cut-grass is a common species of shallow marshes and inland fresh meadows as well as shores and streambanks. Large patches or colonies are sometimes formed.

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

© Photos by Steve D. Eggers

NORTHERN WILD RICE

(*Zizania palustris* L.)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Native (8) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A robust, annual grass generally 2-3 m. in height. Inflorescence is a large panicle 10-60 cm. high. Spikelets have one flower and are unisexual. Pistillate spikelets are located in the upper portion of the inflorescence, while staminate spikelets are located in the lower portion. Pistillate spikelets have a lemma with a long, bristle-like awn. Staminate spikelets are red or yellow. Leaves are 1-5 cm. wide and go through a floating stage prior to emergence. In flower June-July.

ECOLOGICAL NOTES: Northern wild rice is a non-persistent emergent found in deep and shallow marshes, lakes, ponds and streams. Optimum water depth is 1.5 to 3.9 feet, although it can be found in deeper waters. It grows best in clear, shallow water with a slight current over a silty to mucky bottom. Wild rice is of great cultural and spiritual importance to Native Americans. It is an excellent waterfowl food and is often sown to grow stands for the benefit of wildlife. Wild rice has been widely planted both within and outside its natural range. Ownbey and Morley (1991) apply *Z. palustris* L., with two varieties, for the wild rice native to Minnesota. Southern wild rice (*Z. aquatica*) also occurs in both Minnesota and Wisconsin.

SOURCE: Fassett (1957); Gleason and Cronquist (1991); Ownbey and Morley (1991); and Voss (1972).

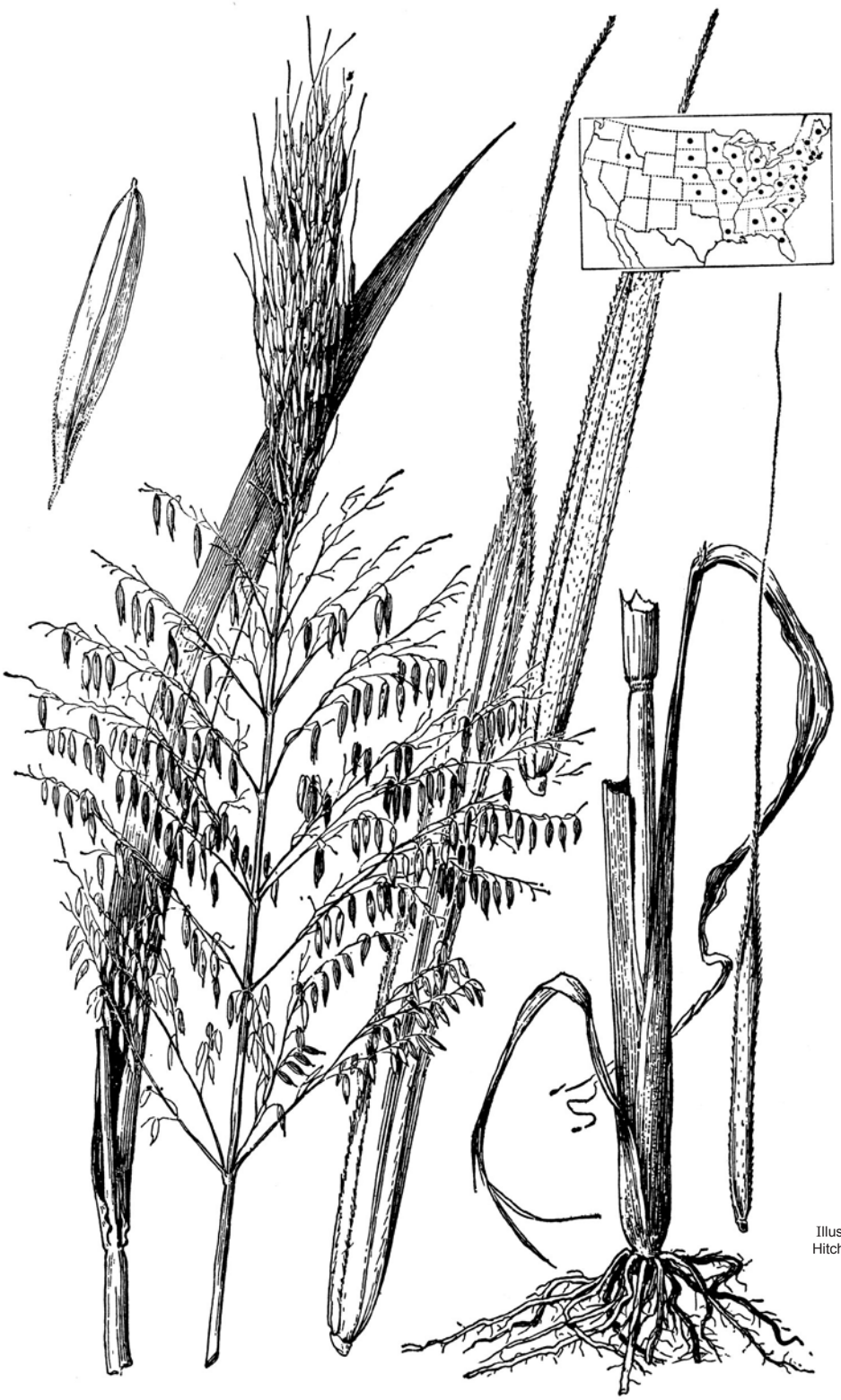


Illustration from
Hitchcock (1950)

Wild Rice
(*Zizania* spp.)

© Photos by Steve D. Eggers

GIANT MANNA GRASS

(*Glyceria grandis* S. Wats.)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Native (6) **IND. STATUS:** OBL

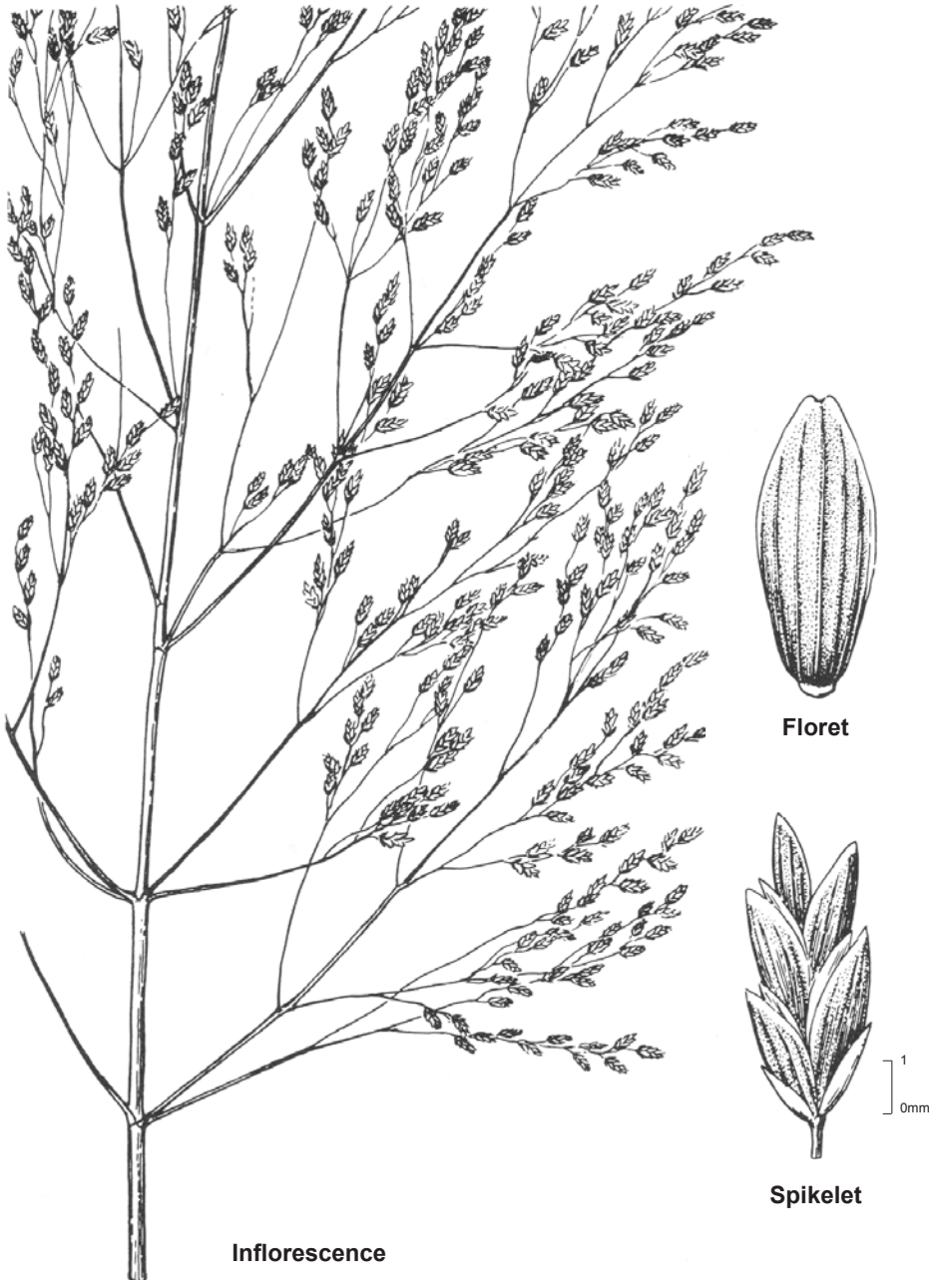
FIELD CHARACTERISTICS: A perennial grass with stems growing to a height of 1.5 m. Inflorescence is a large panicle 20-40 cm. long. Leaves are 8-12 mm. wide. Spikelets each have 5-9 florets. Lemmas are distinctly 7-ribbed and are usually purple. In flower June-August.

Giant manna grass can be easily distinguished from rattlesnake manna grass (*Glyceria canadensis*). Rattlesnake manna grass has lemmas with less conspicuous nerves unlike the strongly nerved or ribbed lemmas of giant manna grass. Additionally, spikelets of rattlesnake manna grass are 3-5 mm. wide at maturity compared to the less than 2.5 mm. wide spikelets of giant manna grass.

Good field characteristics that aid in distinguishing the manna grasses (*Glyceria* spp.) in general from other grasses are the parallel ribs on the lemmas (use 10-15x magnification) and their frequently closed leaf sheaths.

ECOLOGICAL NOTES: Giant manna grass is found in shallow and deep marshes, fresh (wet) meadows, bogs and ditches; commonly in shallow water.

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



Giant Manna Grass
(*Glyceria grandis*)

Illustrations by Elsie Froeschner (Pohl 1966)

© Photos by Steve D. Eggers

RATTLESNAKE MANNA GRASS

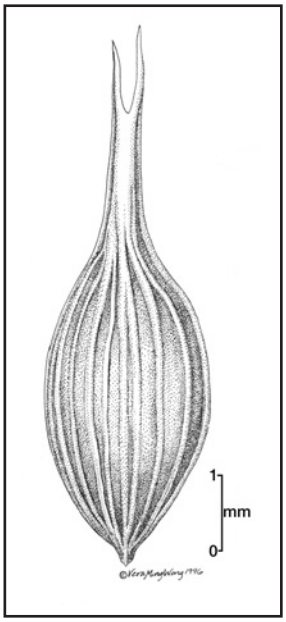
(*Glyceria canadensis* (Michx.) Trin.)

GRASS FAMILY (Gramineae or Poaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial grass with usually solitary erect stems growing to a height of about 1 m. Leaf blades are 3-8 mm. wide. Inflorescence is a diffuse panicle of drooping branches 10-30 cm. long. Spikelets are ovate and 3-5(8) mm. long, have 3-8(10) flowers and become 3-5 mm. broad at maturity. Lemmas are pointed and exceed the palea by about 0.5-1.0 mm. Nerves on the lemmas are conspicuous, but not raised significantly. Glume margins are entire.

ECOLOGICAL NOTES: Rattlesnake manna grass is found in a variety of wet habitats such as deep and shallow marshes, bogs, wooded swamps and lakeshores. It is more commonly found north of the vegetation tension zone. Southward, it prefers bogs.

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



Perigynium

© Steve D. Eggers

PORCUPINE SEDGE

(*Carex hystericina* Muhl. ex Willd.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (3 WI)(4 MN) **IND. STATUS:** OBL

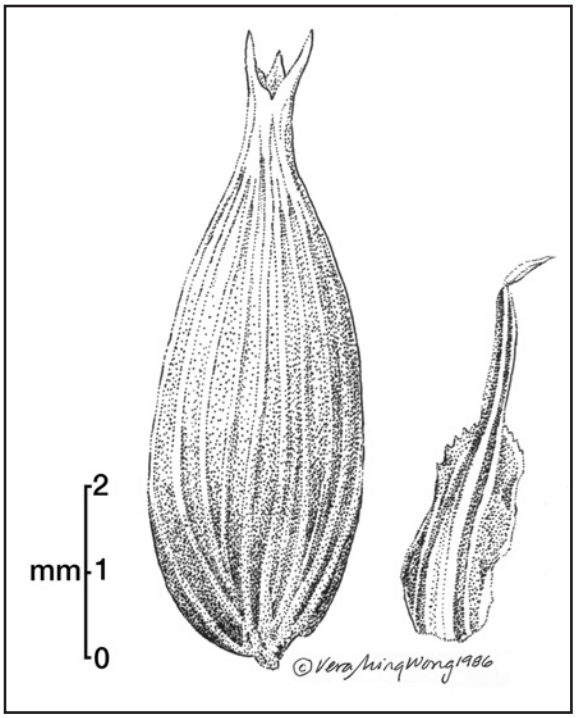
FIELD CHARACTERISTICS: A slender, clustered, perennial sedge with triangular stems about 30-100 cm. tall. Leaves are 3-9 mm. wide, M-shaped and are not septate. Bracts of the lowest pistillate spikes are generally longer than the inflorescence. The several pistillate spikelets are 1.5-4 cm. in length and on slender stalks, the lower spikelets drooping. The numerous perigynia are 5-7 mm. long, 15-20 nerved and densely clustered. The slender beak of the perigynium is conspicuous and has short, straight teeth to about 0.7 mm. long.

ECOLOGICAL NOTES: Porcupine sedge is very similar to bottlebrush sedge (*Carex comosa*)[page 118] but close inspection of mature perigynia (see figures) will distinguish the two. It is a common sedge of marshes, fens and ditches.

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

© Steve D. Eggers

Pinnate fibers



Perigynium and scale

LAKE SEDGE

(*Carex lacustris* Willd.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (6 WI)(5 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A stout, perennial sedge with triangular stems 50-120 cm. in height. Leaves are coarse, M-shaped, bluish-green, 1 m. or more long and 8-15 mm. wide. Basal sheaths are reddened and have open, feather-like (pinnate) fibers. Pistillate spikelets number 2-4, are 2-10 cm. long, and sessile or on short stalks. Staminate spikelets number 2-4. Perigynium is 5.5-7.3 mm. long, without hairs, distinctly ribbed, and gradually tapers into a beak. Nutlets are three-angled.

ECOLOGICAL NOTES: Lake sedge is a common to dominant sedge found in shallow marshes, shrub-carrs, alder thickets, wooded swamps, sedge meadows and borders of lakes and streams. This persistent emergent forms scattered clones or beds.

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

© Steve D. Eggers

Lake Sedge
(*Carex lacustris*)

© Photos by Steve D. Eggers

COMMON YELLOW LAKE SEDGE

(*Carex utriculata* Boott)

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

FIELD CHARACTERISTICS: A robust, perennial, colonial sedge with blunt, three-sided stems 50-120 cm. tall. Stems and leaf sheaths are spongy at the base. Leaves are flat, tend to be yellow-green in color, and have knobby ridged partitions. The large leaf blades are 5-12 mm. wide. Upper spikelets are staminate. Lower pistillate spikelets are 2-10 cm. long with densely crowded, shiny perigynia. Pistillate scales are narrower and shorter than the inflated perigynia. Perigynia abruptly contract to a beak. Triangular nutlets (achenes) are yellowish and 1.3-2 mm. long.

Some authors treat this species as a variety of *Carex rostrata*. However, *Carex rostrata* has very distinctive U-shaped leaves that are narrower (1.5-4 mm. wide).

ECOLOGICAL NOTES: Common yellow lake sedge is a common to dominant species of marshes and near shore shallows, especially north of the vegetation tension zone. It seems to prefer cool, soft waters. Gleason and Cronquist (1991) note that it may form a dense sod.

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

© Steve D. Eggers

© New York Botanical Garden

AQUATIC/WATER SEDGE

(*Carex aquatilis* Wahlenb.)

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

FIELD CHARACERISTICS: A clump-forming, perennial sedge (although does not form tussocks) with stems about 50–100 cm. tall. Stems do not usually exceed the height of the leaves. Mature leaves are slender (3-8 mm. wide), coarse, glaucous, and retain a blue-green tint through the autumn. Flowering stems arise from the center of the plant. Basal sheaths lack the pinnate fibers seen in hummock sedge (*Carex stricta*). The somewhat flattened perigynia are 2-3 mm. long, beakless, lack nerves and are widest above the middle section of the body. Nutlets (achenes) are lens-shaped.

See the discussion of *Carex stricta* [page 138] for further remarks on the dissimilarities of these two species.

ECOLOGICAL NOTES: Aquatic sedge tends to prefer wetter sites than those supporting *Carex stricta,* although the two species often occur together. Aquatic sedge is found in fresh (wet) meadows, shallow marshes, and along the margins of lakes, ponds and streams.

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

© Photos by Steve D. Eggers

© New York Botanical Garden

RETRORSE SEDGE

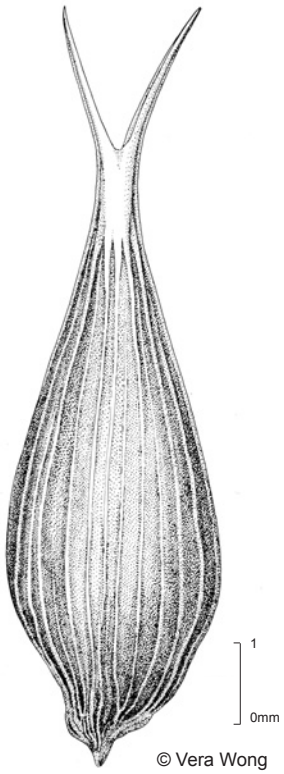
(*Carex retrorsa* Schwein.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (6 WI)(5 MN) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A stout, perennial sedge with triangular stems 50-120 cm. in height. Leaves are coarse, M-shaped, bluish-green, 1 m. or more long and 8-15 mm. wide. Basal sheaths are reddened and have open, feather-like (pinnate) fibers. Pistillate spikelets number 2-4, are 2-10 cm. long, and are sessile or on short stalks. Lower perigynia are downward or backward facing (retrorse). Staminate spikelets number 2-4. Perigynia are 5.5-7.3 mm. long, lack hairs, are distinctly ribbed and gradually tapered into a beak. The nutlet (achene) is three-angled.

ECOLOGICAL NOTES: Retrorse sedge is a very common sedge in shallow marshes, shrub-carrs, alder thickets, floodplain forests, wooded swamps, sedge meadows and borders of lakes and streams.

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



Perigynium

© Photos by Steve D. Eggers

Pubescent leaf sheath

SLOUGH SEDGE

(*Carex atherodes* Spreng.)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (8 WI)(5 MN) **IND. STATUS:** OBL

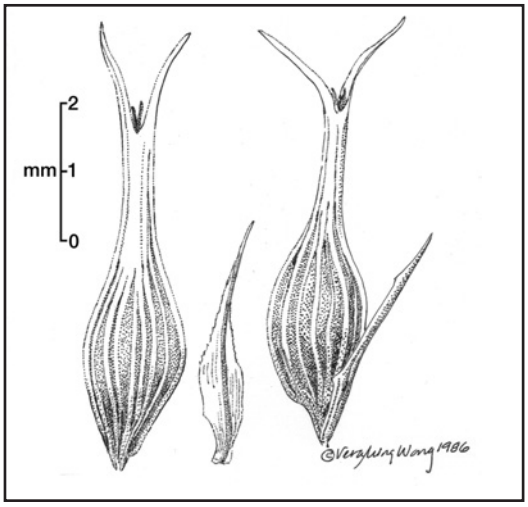
FIELD CHARACTERISTICS: A perennial sedge from long, coarse rhizomes. Triangular stems are stout, 30-150 cm. in height, growing singly or a few together. Leaf sheaths are densely covered with fuzzy hairs (see photograph). Leaf blades are 4-10 mm. wide. Spikes number several with pistillate spikes 2-10 cm. long and 1 cm. wide. Staminate spikes are 2-6 cm. long. Perigynia are strongly ribbed, ribs numbering 12-29. Perigynia are 7-10 mm. long with divergent teeth 1.5-2.5(3) mm. long. Nutlet (achene) is more or less triangular in shape.

Slough sedge resembles lake sedge (*C. lacustris*)[page 112]; however, lake sedge leaf sheaths are smooth, not covered with fuzzy hairs, and the perigynia of lake sedge have two short teeth instead of the long, widely-spread teeth of slough sedge.

ECOLOGICAL NOTES: Slough sedge is common in sedge meadows, shallow marshes and lake shores, often found in shallow water. It is one of the most frequently encountered sedges of prairie potholes in southern and western Minnesota.

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

© Photos by Steve D. Eggers



Perigynia and scale

BOTTLEBRUSH SEDGE

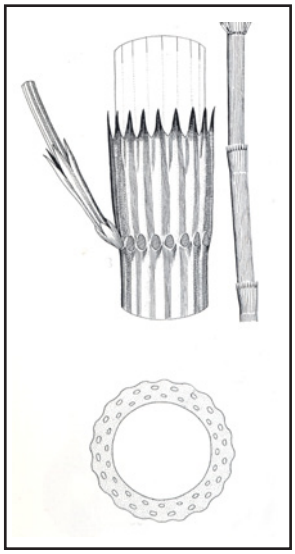
(*Carex comosa* Boott)

SEDGE FAMILY (Cyperaceae) **C of C:** Native (4 MN)(5 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A stout, clump-forming, perennial sedge with sharply triangular stems growing to a height of 50-150 cm. Leaves are 6-15 mm. wide, M-shaped, septate and rough-margined. Pistillate spikelets number 3-6, are 3-7 cm. in length, and are on short stalks, the lower spikelets drooping. The perigynium is 5.5-7 mm. long, strongly ribbed, and has widely spreading, reflexed teeth (1)1.2-2.2 mm. long. Nutlets (achenes) are three-angled and 1.7-2 mm. long with a persistent style.

ECOLOGICAL NOTES: Bottlebrush sedge is found in shallow marshes, bogs and shores of lakes and streams.

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



© New York Botanical Garden

Stem: sheath, teeth, and cross section

© Steve D. Eggers

WATER HORSETAIL

(*Equisetum fluviatile* L.)

HORSETAIL FAMILY (Equisetaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A horsetail with annual stems that are all alike and grow to a height of 1 m. or more from smooth, shiny rhizomes. The central cavity of the stem is about 80 percent of the stem's diameter. Stem sheaths are green and 6-10 mm. long. Teeth of the sheath number 12-24 and are narrow, black (sometimes with white margins) and 1.5-3 mm. long. Branches can be none to numerous and whorled, 4-6 angled and simple. Cones are 1-2 cm. long, terminal, deciduous and mature in summer.

ECOLOGICAL NOTES: Water horsetail is typically found in shallow, standing water of marshes, bogs, lakes and ditches.

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

© Photos by Steve D. Eggers

SOFT RUSH

(*Juncus effusus* L.)

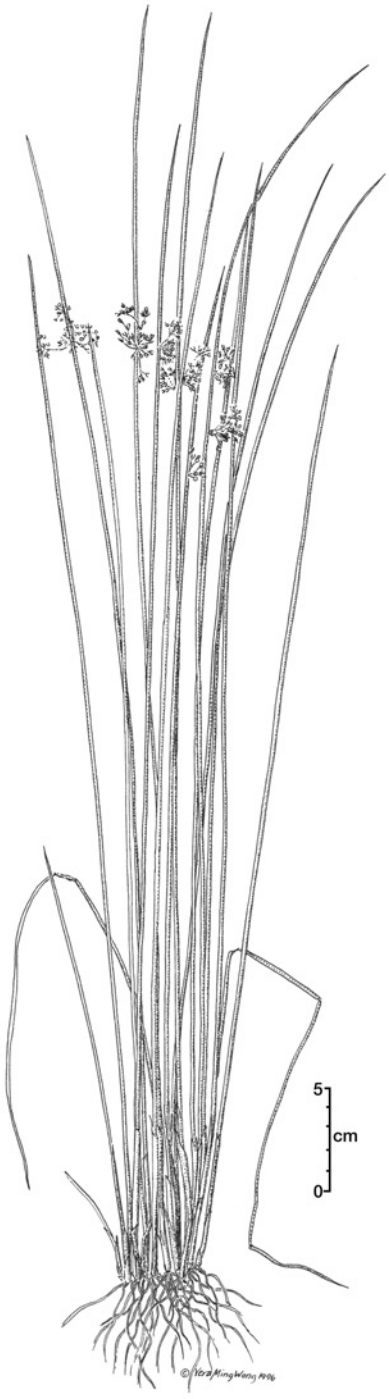
RUSH FAMILY (Juncaceae) **C of C:** Native (4) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A densely cespitose (tufted), perennial rush with stout rhizomes and soft stems 20-120 cm. in height. Leaves lack a leaf blade and auricles, only a sheath is present. An involucral leaf (10)15-25(35) cm. long appears to be a continuation of the stem. The many-flowered inflorescence appears to "erupt" from the side of the stem. Flowers consist of 6 tepals (3 sepals + 3 petals that are similar in color and size (2-2.5(3) mm. long)) surrounding a capsule. Capsule is many-seeded. Seeds are minute (0.2-0.3 mm. long).

A major division in keys to *Juncus* species involves whether the inflorescence is terminal or lateral. Soft rush has a lateral inflorescence that appears to erupt from the side of the stem. Dudley's rush (*J. dudleyi*) exhibits a terminal inflorescence (page 188).

ECOLOGICAL NOTES: Soft rush occurs in shallow marshes, inland fresh meadows, borders of bogs and along shores.

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



Soft Rush
(*Juncus effusus*)

© Photos by Steve D. Eggers

FALSE LOOSESTRIFE

(*Ludwigia polycarpa* Short & Peter)

EVENING PRIMROSE FAMILY (Onagraceae) **C of C:** Native (6) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb from leafy stolons produced in the fall. Stems are erect to 10-90 cm., smooth and usually 4-angled. Leaves are alternate and lanceolate with entire margins, 3-12 cm. long by 5-15 mm. wide. Single flowers are sessile in leaf axils and 2-4 mm. long. Flower parts are in 4s with green petals that are minute or absent. Fruit is short cylindric to widened above, 4-7 mm. by 3-5 mm., glabrous and roundly 4-sided or shallowly grooved. In flower July-September.

ECOLOGICAL NOTES: False loosestrife primarly occurs in shallow marshes and inland fresh meadows.

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

© Photos by Steve D. Eggers

Undersides of fertile pinnae

MARSH FERN

(*Thelypteris palustris* Schott)

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

SYNONYM: *Dryopteris thelypteris* (L.) Sw.

FIELD CHARACTERISTICS: A perennial fern with fronds emerging singly from slender, long-running, blackish rhizomes. Pinnate-pinnatifid fronds are usually 20-60 cm. high, occasionally to 75 cm., light green to yellow-green, narrowly lanceolate, about 15 cm. wide, and deciduous. Petioles are black at the base, smooth (hairless) and scaleless. Lowest pinnae are less than 5 cm. long. Sterile fronds have up to 40 pairs of pinnae while fertile fronds have up to 25 pairs. Pinnae are lanceolate with rounded to blunt tipped lobes and the margins are not toothed. Veins of the subpinnae are forked. Fertile (spore-bearing) fronds tend to be more erect on longer stalks. Sori are inter-marginal on the bottom of the pinnae, each being borne on a vein.

ECOLOGICAL NOTES: Marsh fern occurs in more wetland community types than any other fern in our area. It is particularly common in marshes, inland fresh meadows and bog mats. To a lesser extent it occurs in shrub-carrs, alder thickets, coniferous swamps, hardwood swamps and calcareous fens.

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

© Photos by Steve D. Eggers

SPOTTED WATER HEMLOCK

(*Cicuta maculata* L.)

CARROT FAMILY (Umbelliferae or Apiaceae) **IND. STATUS:** OBL

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

FIELD CHARACTERISTICS: An erect perennial herb up to 2 m. tall. The stout stems are branched, smooth, hollow and often purple spotted. This herb has highly poisonous tuber-like roots. Aternate leaves are 2-3 times pinnately compound. Leaflets are lanceolate, sharply toothed, and 5-25 mm. wide, excluding the teeth. Leaf veins end in sinuses rather than teeth. Lacks the axillary vegetative bulblets seen in *Cicuta bulbifera*. Supports several compound umbels, up to 12 cm wide. Petals are white. Fruit is small, 3-4(5) mm. long and slightly flattened. In flower June-September. **CAUTION:** All parts of this herb are highly poisonous.

ECOLOGICAL NOTES: Spotted water hemlock is an herb primarily of shallow marshes and wet prairies. It also occurs in sedge meadows, shrub-carrs, swales, ditches and along streambanks.

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

© Photos by Steve D. Eggers

BULBLET-BEARING WATER HEMLOCK

(*Cicuta bulbifera* L.)

CARROT FAMILY (Umbelliferae or Apiaceae) **C of C:** Native (7) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: An erect perennial herb 30-100 cm. tall. The smooth, slender stems are hollow. Leaves are all alternately arranged along the stem. They are pinnately-divided into linear leaflets with sparsely toothed margins. Leaflets are usually about 3(5) mm. wide, excluding the coarse teeth. Leaf veins end in sinuses rather than teeth. Vegetative bulblets form in upper leaf axils. Inflorescences occur as a few compound umbels up to 5 cm. wide but often no inflorescence is present. Petals are white. In bloom August-September.

CAUTION: All parts of this herb are highly poisonous.

ECOLOGICAL NOTES: Bulblet-bearing water hemlock occurs in shallow marshes and along wet streambanks and pond margins. It also occurs in sedge meadows and along the edges of laggs (border between a bog and uplands).

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

© Photos by Steve D. Eggers

WATER PARSNIP

(*Sium suave* Walt.)

CARROT FAMILY (Umbelliferae or Apiaceae) **C of C:** Native (5) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A perennial herb up to 2 m. tall with fibrous roots (lacks a stolon). The solitary stems are stout, glabrous, corrugated and hollow. Stems have a slight zigzag form and may be inflated when submersed. Alternate leaves are one-pinnate (feather-like) compound, with (5)7-17 flat, elongated leaflets 5-10 cm. long. Lateral leaflets are opposite, sessile, and linear to lanceolate with numerous fine teeth (serrate) along the full length of the margins. Submerged leaves are often dimorphic (occur in two forms): lower leaves when submerged may be bipinnately dissected. Twice compound umbels are 3-12 cm. wide and support 5-petaled, white flowers. The ovoid fruits are flattened with prominent ribs. This herb has a sweet fennel odor. In bloom July-September.

Very similar to cowbane (*Oxypolis rigidior)*, but cowbane has irregularly-toothed leaves.

ECOLOGICAL NOTES: Water parsnip is often found in shallow marshes, ponds, wet meadows and swales. It is very characteristic of vernal pools.

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

© Photos by Steve D. Eggers

TUFTED LOOSESTRIFE

(*Lysimachia thyrsiflora* L.)

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

FIELD CHARACTERISTICS: A perennial herb with stems 30-70 cm. in height. Leaves are narrowly lanceolate to linear, 5-12 cm. long and punctate. Inflorescence consists of a few, short racemes 1-3 cm. long on spreading stalks from axils of leaves in the middle of the stem. Flowers are yellow with corolla lobes 4-5 mm. long and marked with black. In flower May-July.

ECOLOGICAL NOTES: Tufted, or swamp, loosestrife is found in shallow marshes, bogs and along shores.

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

© Steve D. Eggers

MARSH BELLFLOWER

(*Campanula aparinoides* Pursh)

BELLFLOWER FAMILY (Campanulaceae) **C of C:** Native (5 MN)(7 WI) **IND. STATUS:** OBL

FIELD CHARACTERISTICS: A low perennial herb with slender, weak, tangling stems. Three-angled stems are covered with short, stiff, hooking hairs or bristles. Alternate leaves are linear to narrowly lanceolate, with the lower leaves 9 cm. by 7(8) mm. Each funnel-shaped corolla is white to pale blue, 4-13 mm. long, and supported by a long, slender, nodding pedicel. Fruit is a capsule. In flower July-September.

ECOLOGICAL NOTES: Marsh bellflower is often unnoticed unless in flower. It is frequent in shallow marshes and fresh (wet) meadows and also occurs in shrub-carrs, calcareous fens, and along lake shores, pond margins and streambanks.

SOURCE: Crow and Hellquist (2000); Gleason and Cronquist (1991); Swink and Wilhelm (1994); and Voss (1996).

Terrestrial Form

Floating-leaved Form

© Photos by Steve D. Eggers

WATER SMARTWEED

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

SMARTWEED FAMILY (Polygonaceae) **C of C:** Native (5 WI)(4 MN) **IND. STATUS:** OBL

SYNONYM: *Polygonum amphibium* L.

FIELD CHARACTERISTICS: A highly variable, rhizomatous, perennial herb with prostrate or erect stems to a length of 1-2 m. Several lance-shaped leaves occur along the elongate stems. This species is divided into two forms: an aquatic form with submergent, glabrous floating leaves 2-15 cm. by 1-2 cm. (formerly known as *Polygonum natans*) and a terrestrial form with erect, densely hairy leaves usually less than 4.5 cm. wide (formerly known as *Polygonum coccineum*). Inflorescence is a usually solitary terminal spike of densely crowded, pink flowers. Swollen stem joints of at least the aquatic form exhibit a green flange at its summit. In flower June-September.

ECOLOGICAL NOTES: Water smartweed is a common species of marshes, prairie potholes, lakes, permanent and ephemeral ponds, quiet backwater areas and river edges. The terrestrial form typically occurs in marshes and on shores.

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

© Photos by Steve D. Eggers

ARROW-LEAF TEARTHUMB

(*Persicaria sagittata* (L.) Gross.)

SMARTWEED FAMILY (Polygonaceae) **C of C:** Native (4 MN)(6 WI) **IND. STATUS:** OBL

SYNONYM: *Polygonum sagittatum* L.

FIELD CHARACTERISTICS: A slender, annual, vine-like herb growing to 1-2 m. Often climbing or reclining on and/or tangling with other plants. Stems are 4-angled and armed with prickly recurved barbs, thus the common name. Arrowhead-shaped leaves are up to 10 cm. long and about 2.5 cm. wide, have basal lobes that are directed downward (sagittate), and a barbed midvein along the lower surface. Inflorescence is a raceme, usually less than 1 cm. long, with flowers in globular clusters at the end of a long, glabrous stalk (peduncle). Flowers are pink to white, sometimes green. Nutlet is 3-sided and 2.2-3 mm. long. In flower July-September.

ECOLOGICAL NOTES: Arrow-leaf tearthumb occurs in shallow marshes, sedge meadows and fresh (wet) meadows. In bogs it may form a thick distinctive zone, especially if the bog has been burned. It also occurs in wooded swamps where it is often a pioneering species following a burn.

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