

Aquatic Invasive Species Identification Guide

November 28, 2017
EGAD #3200-2017-44



Species – code



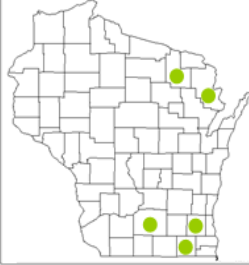
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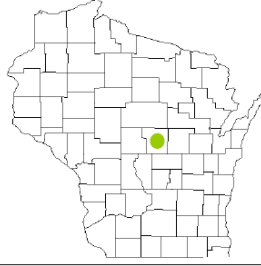

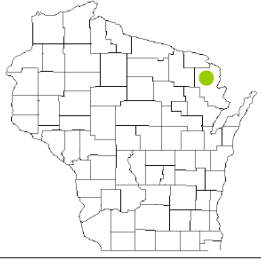
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SUBMERGED AQUATIC

Species	Identification	Distribution/Notes
<p>European frog-bit - EFB (<i>Hydrocharis morsus-ranae</i>)</p>  <p>Photo: Erich Haber</p>	<p>Leaves: Usually floating; heart-shaped with long stems; 1.2-6.3 cm (0.5-2.5 in) in diameter; smooth margins; often dark purple beneath; lateral veins are arching and make a 75-90° angle with the midvein; tissue containing airpockets are located mostly along the midvein.</p> <p>Flowers: Three white petals with yellow center; blooms mid-summer.</p> <p>Fruits & seeds: Rarely produces viable seeds and instead relies on vegetative stolons and turions for reproduction.</p> <p>Similar species: Often confused with American frog-bit (<i>Limnobium spongia</i>; not known in WI), whose leaves have lateral veins that make a 30-80° angle with the midvein, and whose leaf tissue contains large air pockets throughout. White water lilies (<i>Nymphaea odorata</i>) have circular leaves with a triangular slit, and large, multi-petaled white flowers. <i>Nuphar</i> spp. have yellow cup-like flowers.</p>	<p>Not reported in Wisconsin</p>
<p>Yellow floating heart - YFH (<i>Nymphoides peltata</i>)</p>  <p>Photo: ???</p>	<p>Leaves: Floating; heart-shaped with slightly wavy margins; 3-15 cm (1.2-6.0 in) in diameter; alternately arranged near the stem base and oppositely arranged near the top; frequently have purplish undersides.</p> <p>Flowers: 2-5 bright yellow flowers arise from erect flower stalks; 3-4 cm (1.2-1.6 in) in diameter; 5 petals arranged like the spokes of a wheel, each with a distinctive fringe along the edge.</p> <p>Fruits & seeds: Fruit is a pod-like capsule (1.2-2.5 cm; 0.5-1.0 in) that splits on one side. One fruit is produced from each flower, and contains many smooth, oval seeds with winged margins.</p>	

	<p>Similar species: Spatterdocks (<i>Nuphar</i> spp.) have much larger leaves, and cup-like flowers without fringed petals. Watershield (<i>Brasenia schreberi</i>) has small oval floating leaves often with a jelly-like covering on the undersides, and small purple flowers. Other species of <i>Nymphoides</i> such as <i>N. aquatica</i> and <i>N. cordatum</i> (native to the southern U.S.), and <i>N. cristata</i> and <i>N. indica</i> (non-native and sold as ornamental plants) are also similar in appearance.</p>	
<p>Brazilian waterweed - BWW (<i>Egeria densa</i>)</p>  <p>Photos: ??? (left); Washington State Department of Ecology (right)</p>	<p>Leaves: Finely serrated (under magnification); 1-3 cm (0.4-1.2 in) long and up to 5 mm (0.2 in) wide; occur in whorls of 4-8.</p> <p>Flowers: Small (1.8-2.5 cm; 0.7-1.0 in); three white petals with yellow center; float on or rise above the surface of the water.</p> <p>Fruits & seeds: Seeds are not known to be produced outside of its native range. Spreads through vegetative reproduction - plant fragments containing double nodes can produce new plants.</p> <p>Roots: Slender, and white or pale. Adventitious roots are freely produced from double nodes on the stem.</p> <p>Similar species: Common and slender waterweed (<i>Elodea</i> spp.) have leaves in whorls of 3, and leaf edges appear smooth to the naked eye. <i>E. densa</i> is overall more robust than native <i>Elodea</i> spp. Non-native hydrilla (<i>Hydrilla verticillata</i>), often produces tubers and has small teeth on the underside of the leaf midrib, while <i>E. densa</i> does not produce tubers and the leaf underside is smooth.</p>	
<p>Hydrilla - HYD (<i>Hydrilla verticillata</i>)</p> 	<p>Leaves: Occur in whorls of 3-8; 6-20 mm (0.2-0.8 in) long and 1-4 mm (0.04-0.16 in) wide; small spines give leaf margins a visible toothed appearance; midrib on underside of leaf is often reddish and has visible spines; rough to the touch.</p> <p>Flowers: Tiny (4-8 mm; 0.16-0.31 in); female flowers are white, have 3 petals and 3 sepals, and are located on threadlike stalks emerging from the leaf axils; male flowers are white to red/brown.</p> <p>Fruits & seeds: Monoecious variety can set viable seed although primarily propagates through vegetative means; fruit are cylindrical, 5-10 mm (0.2-0.4 in) long, smooth or with several irregular spines; seeds are 2-3mm (0.8-0.12 in) long, smooth, brown.</p>	

Photos: Paul Skawinski

Roots: Reproduces primarily by rhizomatous tubers and turions

Similar species: Common and slender waterweed (*Elodea* spp.) have leaves in whorls of 3 and the leaf edges and undersides appear smooth. Non-native *Egeria densa* is also similar, however this species does not produce tubers and the underside of the leaf midrib does not have spines.

Curly leaf pondweed - CLP
(*Potamogeton crispus*)



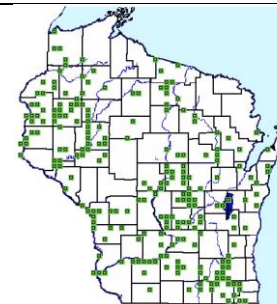
Leaves: Submersed and alternate; attached directly to stem; oblong leaves (1.2-9 cm [0.5-3.5 in] long, 4-10 mm [0.16-0.4 in] wide) have distinctly wavy edges with finely serrated teeth and 3-5 veins. Sheaths (stipules) up to 0.5 cm (0.2 in) long are free of the leaf base and disintegrate with age.

Flowers: Tiny, with 4 petal-like lobes; in terminal spikes (1-3 cm; 0.4-1.2 in) on stalks up to 7 cm (2.75 in) above the water surface.

Fruits & seeds: Seed-like achene (4-6mm; 0.16-0.24 in) including 2-3 mm [0.08-0.12 in] beak, back ridged).

Roots: Fibrous, from slender rhizomes.

Similar species: There are many native pondweed (*Potamogeton*) species found in Wisconsin. They vary considerably in leaf width, shape, and overall size, although none of them have a visibly serrated leaf margin or produce a similar pine-cone like turion. Curly-leaf pondweed emerges early in the growing season and typically dies back by mid-summer, although in cold water systems (such as spring fed trout streams) it can persist year-round.



Photos: Frank Koshere, Paul Skawinski

Eurasian water-milfoil - EWM
(*Myriophyllum spicatum*)



Leaves: Feather-like; leaves with 12 or more pairs of leaflets; typically arranged in whorls of 4 leaves around the stem; leaves fall limp when pulled out of water; whorls of leaves spaced 1-3 cm (0.4-1.2 in) apart on stem.



Flowers: Small, yellow or reddish, 4-parted on a spike that projects 5-10 cm (2-4 in) above the water surface.

Fruits & seeds: A hard, segmented capsule containing four seeds.

Roots: Fibrous, often developing on plant fragments.

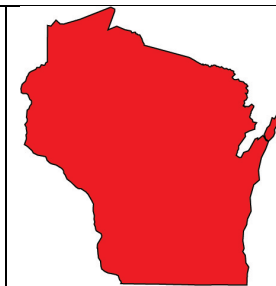
Similar species: There are several native water-milfoils (*Myriophyllum* spp.) which may be confused with EWM, however these milfoils generally have fewer than 12 pairs of leaf segments, whereas Eurasian water-milfoil leaves have 12 or more. *M.*



<p>Photo: Paul Skawinski</p>	<p><i>spicatum</i> can cross with native <i>M. sibiricum</i>, forming a viable hybrid with intermediate characteristics. Non-native parrot feather (<i>M. aquaticum</i>) often produces more than 4 leaves in a whorl and has emergent leaves. Native coontail (<i>Ceratophyllum demersum</i>) has leaves that are forked like a wishbone (not feather-like) and toothed, giving the plant a rough feel when pulled through the hand.</p>	
<p>Fanwort - FW (<i>Cabomba caroliniana</i>)</p>  <p>Photos: Paul Skawinski</p>	<p>Leaves: Submersed leaves are finely divided and fan-shaped, 1.0-3.5 cm (0.4-1.4 in) long, 1.5-5.5 cm (0.6-2.2 in) wide; arranged in opposite pairs; leaves have petioles up to 4 cm (1.5 in) long; floating leaves (when present) are 0.6-3 cm (0.25-1.2 in) long, diamond-shaped with stem attached in the center, and alternate on stems.</p> <p>Flowers: White to purplish with yellow centers; 6-15 mm (0.24-0.6 in) in diameter; at the end of 2.5-10 cm (1-4 in) long peduncles; floating; blooms May to September.</p> <p>Roots: Short rhizomes with fibrous roots.</p> <p>Similar species: Water marigold (<i>Bidens beckii</i>) has finely divided leaves which attach directly to the stem (non-petioled), and produces an 8-petaled yellow flower. White water crowfoot (<i>Ranunculus aquatilis</i>) has finely divided leaves which are alternative (not opposite) along the stem. Milfoils (<i>Myriophyllum spp.</i>) have feather-like leaves arranged in whorls, and inconspicuous flowers arranged on a spike which sticks out of the water.</p>	<p>Not reported in Wisconsin</p>
<p>Java Waterdropwort or Vietmanese parsley – JWD (<i>Oenanthe javanica</i>)</p>	<p>Leaves: Lush green pinnate leaves resemble large flat parsley or celery foliage. A popular cultivar ‘Flamingo’ has white to pink edges to the leaves.</p> <p>Flowers: Tiny white flowers bloom in umbels at the ends of stalks in late summer/early autumn.</p> <p>Fruits & seeds: Similar to other members of the carrot family they form small oval seeds at the top of the flowering stalks. Controlling the seed heads will not prevent this plant from spreading.</p> <p>Roots: Fibrous roots that can form from parts of stem touching the ground or in water.</p> <p>Stems: The jointed stems are hollow and often grow spreading along the ground. They are fairly brittle and can break off easily and take root.</p> <p>Similar species: Very similar in appearance and habit to <i>Aegopodium podagraria</i> (bishop's weed); a similarly invasive ground cover plant. In general, there are many white-flowered look-alikes in the parsley family. One example is</p>	



Queen Anne's lace (*Daucus carota*; non-native), a widespread weed in Wisconsin, with fern-like leaves, but leaves and stems are hairy. When crushed, it smells like carrots. Other look-alikes include wild chervil (*Anthriscus sylvestris*; invasive), caraway (*Carum carvi*; non-native), poison hemlock (*Conium maculatum*; invasive), Chinese hemlock parsley (*Conioselinum chinense*; native), native sweet cicely (*Osmorhiza* spp.).



Photos: Amy Kretlow, KENPAI and Susan Graham

Parrot feather - PF
(*Myriophyllum aquaticum*)

Leaves: Feather-like; emergent leaves are bright blue-green, stiff and 2-5 cm (0.8-2 in) long, arranged in whorls of 4-6 leaves, and divided into **6-18 leaflet pairs**; underwater leaves are often decayed, but if present, they are limp, 1.5-3.5 cm (0.6-

Documented in Pool 5 of the Mississippi River in 2012



Photos: ???, Paul Skawinski

1.4 in) long, and are divided into 20-30 leaflet pairs per leaf.

Flowers: Tiny (1.5mm; 0.06 in) flowers with 4 white sepals occur individually on short stalks in the axils of the emergent leaves; male and female flowers are on separate plants, but only female plants are known in North America.

Fruits & seeds: Because there are only female plants in North America, no fruits are produced here. Spreads through fragmentation of the stems and rhizomes.

Roots: Many, thin, from rhizomes

Similar species: Similar to other milfoils (*Myriophyllum*) species. Non-native Eurasian watermilfoil (*M. spicatum*) typically has 4 leaves in a whorl, and does not produce any emergent leaves. Other native milfoils generally have less than 12 leaflet pairs.

Starry Stonewort – SSW (*Nitellopsis obtusa*)



Photos: Paul Skawinski

Leaves: Whorls of 4-6 branchlets (leaves) with blunt tips, irregular length branchlets are arranged along the main thallus (stem)

Fruits & seeds: Only male individuals in North America have been documented and reproduction is via fragments or vegetative structures called "bulbils" which is the main identifying characteristic. Bulbils are produced at nodes and most are found on the rhizoids. These bulbils are 3-6 mm wide, star-shaped with 5 or more points (see image below). Male specimen may produce orange-to -brown colored antheridia in branchlet axils.

Roots: Clear rhizoids

Similar species: Similar characteristics to other charophytes like *Nitella* and *Chara* species and may be difficult to distinguish from Starry Stonewort. Star-shaped bulbils are a unique feature to this species.



Water hyacinth WH
(*Eichhornia crassipes*)



Photos: Graves Lovell, Paul Skawinski

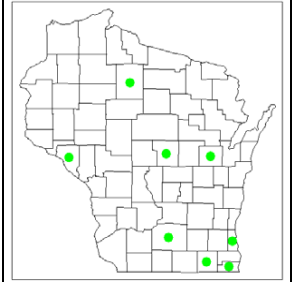
Leaves: Free-floating; thick green waxy leaves, rounded, circular or elliptical in shape with gently incurved sides. Leaves are formed in rosettes up to 15 cm (6 in) wide and can rise 0.3-1 m (1-3 ft) above the water.

Flowers: Lavender blue with a yellow blotch. Flowers have 6 petals and are 5 cm (2 in) wide.

Fruits & seeds: Three celled capsule with many seeds.

Roots: Submersed roots blue-black to dark purple, feathery, dense near root crown, tips with long dark root caps.

Similar species: Native pickerelweed (*Pontederia cordata*) is a rooted emergent plant with numerous tiny bluish-purple flowers densely packed into 7.5-15 cm (3-6 in) spikes atop flower stalks which rise 0.3-0.6 m (1-2 ft) above the water surface. May also be confused with emergent form of American frog-bit (*Limnobium spongia*; not known from WI). Non-native anchored water hyacinth (*E. azurea*) has leaves which are alternate rather than in a rosette, and is typically found rooted in mud rather than free-floating.



Water lettuce - WL
(*Pistia stratiotes*)



Photo: Paul Skawinski

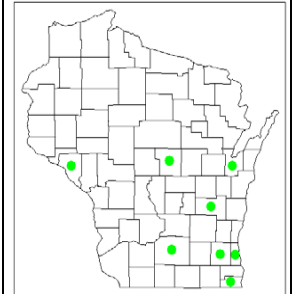
Leaves: Free-floating; light green to grayish green; soft and spongy, formed in rosettes; leaves 2-20 cm (0.8-8 in) long; raised parallel ridges (veins); covered in short hairs; leaf margins slightly wavy, top margins scalloped.

Flowers: Inconspicuous; nearly hidden in the center amongst the leaves; on small stalk, single female flower below and whorl of male flowers above; flowers in late summer to early winter.

Fruits & seeds: Seeds cylindrical, light brown, and 1-2 mm (0.04-0.08 in).

Roots: Hang submersed beneath floating leaves; feathery, numerous.

Similar species: Not likely to be confused with any other plant.



Water chestnut – WCH
(*Trapa natas*)

Leaves: Upper leaves are alternately arranged in clusters up to 50 cm across, shiny on the upper side and dull with fine hairs underneath, and diamond-shaped with toothed edges; submersed leaves are oppositely arranged, long and narrow, with green feather-like structures that often replace the linear underwater leaves. Upper leaves are attached to the stem with an inflated petiole, which keeps them

Not reported in Wisconsin



afloat.
Flowers: Small and solitary, four white or light-purple petals on short, thick stalks that float among the upper leaves; the four sepals turn into the spines of the fruit. Begin to flower in mid to late July.
Fruits & seeds: Large (2.5 cm.), variously-shaped nuts are swollen at the middle and have 2-4 sharp spines. Each nut contains a single, fleshy seed. Mature nuts sink to the bottom when dropped and may be able to produce new plants for up to 12 years.
Roots: Develop on shoots. Lower roots are unbranched and thread-like, while upper roots are sparsely branched and fibrous.
Similar species: *Trapa bispinosa* is considered a variant of *T. natans*. The nuts have two to four short spines compared to the two large spines of *T. natans*.

WETLAND

Flowering rush - FR (*Butomus umbellatus*)



Photos:???, Paul Skawinski

Leaves: Emergent leaves are stiff and triangular in cross-section; up to 1 m (3 ft) tall and 1.3 cm (0.5 in) wide. May remain submerged and/or floating if water level is too deep.
Flowers: White to pink-rose in color; 3 petals, 3 sepals, and red anthers; terminal umbels on stalks bloom June-August; will not flower in deep waters.
Fruits & seeds: Clustered follicles with long beaks containing many seeds that are generally not viable.
Roots: Rhizomes that aid in vegetative growth also produce small bulbs, or bulblets, that are easily dispersed by water.
Similar species: Native bur-reeds (*Sparganium* spp.) are another shallow-water emergent that is roughly the same height as flowering rush, however, bur-reeds have V-shaped leaves and the female flower parts look like small, spiked balls. Flowering rush leaves also lacks cross veins which are evident in bur-reeds and arrowheads (*Sagittaria* spp.).



Tall Manna Grass - GLY
(*Glyceria maxima*)

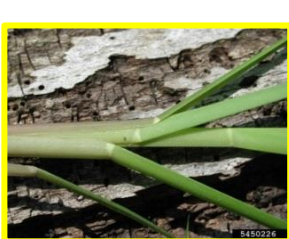


Photo from top clockwise: Jason Granberg, unknown, Brock Woods, Leslie J. Merhoff, L. Merhoff

Leaves: Leaf blades broad and flat, **closed leaf sheaths** (unique among *Glyceria* genus), angular **shiny** blades, upper ligules with 1 vein, conspicuous parallel veins on lemmas, **scaberulous leaf edge**

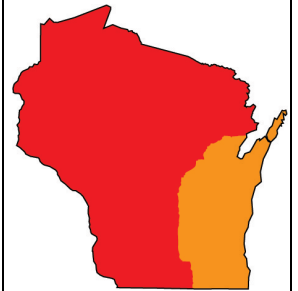
Flowers: Spikelets several-flowered (1-2.5 mm wide), Spikelet ovate less than 10 mm long with lateral compression, lemmas with conspicuously raised veins, awnless,

Fruit & seeds: Seeds are dark brown (1.5 to 2 mm long)

Similar species: *Glyceria grandis* has smooth leaf edges and smaller upper glume

Other names for this plant include:

- Common names: reed sweetgrass, reed manna grass, English water grass
- Scientific names: *G. aquatica*; *G. spectabilis*; *Molinia maxima*; *Panicularia aquatic*



Hairy Willow Herb – HWH
(*Epilobium hirsutum*)



Photos by Elizabeth Czarapata and Amy Kretlow

Leaves: **Opposite and stalkless**, with sharply toothed edges and a prominent central vein. They are oblong-lance shaped, 2-5" long and widest below the mid-point.

Flowers: Numerous, 0.75" wide, rose-colored flowers arise from the leaf axils. Each flower has **4 notched petals, 4 sepals** and a white four-lobed stigma rising above the bloom. Blooms mid-late summer.

Fruits & seeds: Fruit is a 2-3" long, **tubular capsule**, containing many small, oblong, flattened seeds, each with a tuft of **silky white hairs** that aids in wind dispersal.

Roots: Large root system with branching rhizomes that grow up to 2' long.

Similar species: Native fireweed (*Epilobium angustifolium*) can be distinguished from hairy willow herb by its alternate leaves and multiple stalked flowers arranged in a terminal raceme.



Lesser Celandine - LC
(*Ranunculus ficaria*)

Leaves & stems: Leaves are dark-green, shiny, and kidney to heart-shaped on short stalks. Leaves emerge from a basal rosette in early spring before canopy trees leaf out.

Flowers: Flowers are bright butter-yellow, glossy, and usually have 8 petals (although sometimes up to 12), arranged around central disk. Numerous 1" flowers are borne singly on stalks. Flowers open in early spring, March to April.

Fruits & seeds: This species does produce viable seed, up to 70 seeds per plant. After flowering, aerial vegetation dies back and entire plants can be dead by June.

Roots: Above-ground whitish bulblets are produced on the stem axils, usually forming after flowering. Below-ground rhizomes are thick, finger-like tubers.





These storage organs keep the plant alive through summer-fall when above-ground portions of the plant have senesced.

Similar species: Lesser celandine resembles marsh marigold (*Caltha palustris*) a native wetland plant found throughout eastern United States. Marsh marigold contains 5-9 yellow "petals" (actually sepals), while lesser celandine often contain 8 petals. Marsh marigold also does not produce tubers or bulbets.

Lesser celandine varieties include 'Pencarn' and 'Buttered Popcorn'. Notable traits of these varieties are leaves variegated with silver markings and double flower heads. These varieties are considered equally as invasive.

This species is unrelated to greater celandine (*Cheidonium majus*).



Non-native Phrag mites - PHRG
(*Phragmites australis* ssp. *australis*)

Leaves: Smooth, narrow leaves are 15-60 cm (6-24 in) long, 1-6 cm (0.4-2.4 in) wide, and blue-green in color; leaf sheaths tightly clasp the stem, are difficult to remove, and stay on throughout winter; long hairs are present at the junction of leaf and sheath.

Flowers: Bushy, light brown to purple plumes are composed of spikelets that bloom July-September; plumes are 19-38 cm (7.5-15 in) long and resemble feather dusters.

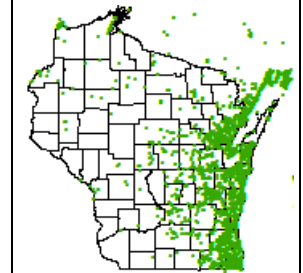


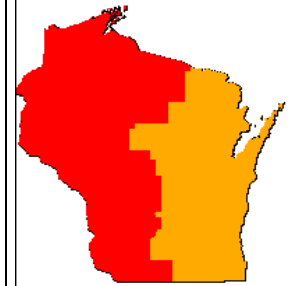


Photo:

Fruits & seeds: Small and tan with many white hairs attached.

Roots: Stout oval **rhizomes** can reach up to 1.8 m (6 ft) deep and 3 m (10 ft) horizontally.

Similar species: Native Phragmites (*Phragmites australis* ssp. *americanus*) has smooth, reddish-brown, flexible stems, often with shiny, round, black spots (a fungus). Its inflorescence is usually sparser than non-native Phragmites, as are most patches where it grows. Several species of ornamental grasses (*Miscanthus* spp.) can be confused with Phragmites due to their showy, feathery plumes. However, they have smaller stems, a white mid-rib on the leaves, and white inflorescences.



Japanese knotweed - JK
(*Fallopia japonica*)



Photo: Elizabeth Czarapata

Leaves: Simple, alternate, 7.5-10 cm (3-4 in) wide and 10-15 cm (4-6 in) long; **spade-shaped** to more heart-shaped on young shoots; long petioles are broad at the base and narrow to a fine point; upper surface is dark green while the lower surface is pale green.

Flowers: Creamy white or greenish; tiny 3 mm (0.125 in) wide; borne in **plume-like clusters** in upper leaf axils near the end of stems; blooms August to September.

Fruits & seeds: Seeds are small, triangular, shiny, and black; rare since colonies seldom have both male and female plants; seed is enclosed in a **winged calyx** that contributes to its buoyancy.

Roots: Roots are white and present along the rhizome; plants can also produce adventitious roots on lower stems; roots extend deeply into the soil creating a dense impenetrable mat.

Similar species: Japanese knotweed has **hollow stems** with distinct raised nodes that give it the appearance of **bamboo**, although it is not related. Also similar in appearance to Giant knotweed (*Polygonum sachalinense*; invasive); which can hybridize with Japanese knotweed. Japanese knotweed has a leaf base which is squared off while Giant knotweed is heart shaped.



Giant knotweed – GK
(*Fallopia sachalinense*)



Leaves: Alternate, simple, dark green. Leaves are 6-14" long and have a heart-shaped base coming narrow to a point.

Flowers: Numerous small, greenish-white flowers appear in the leaf axils of the upper stems. Blooms are up to 4" long and occur during August-October. Giant knotweed blooms have both male and female parts in the same flower.

Fruits & seeds: Fruits are papery and broadly winged. Each fruit contains a 3-sided achene that is small, shiny and brown. Small amounts of seed are viable and have no dormancy requirement.

Roots: Rhizomes that extend deeply into the soil creating a dense impenetrable mat.

Similar species: Japanese knotweed (*P. cuspidatum*) and Bohemian (hybrid) knotweed (*P. cuspidatum* x *P. sachalinense*) look very similar but can be distinguished by the type of hair on the veins on the undersides. Each species are equally as invasive. Japanese knotweed leaves are abruptly squared at base and the flowers are dioecious. It has hollow stems with distinct raised nodes that give it the appearance of bamboo, though it is not related. Young plants are most commonly mistaken for rhubarb, and referred to as donkey rhubarb.



Giant hogweed – GHW
(*Heracleum mantegazzianum*)



Leaves: Compound, 1-5' wide, palmate, deeply lobed, and pointed. Undersides of leaves are covered in coarse white hairs and the leaf stalk also has purple mottling.

Flowers: Large umbels, up to 20" wide across its flat top, with many white, 5-petal flowers that bloom from May-July.

Fruits & seeds: Fruits are 2 winged mericarps that each contain 1 flattened, oval to elliptical seed. On average, plants produce approximately 20,000 seeds with a germination rate of more than 50%. Seedlings germinate after exposure to cold temperatures.

Roots: Large, deep taproot.

Similar species: American cow parsnip (*Heracleum lanatum*; native) is 3-7' tall with non-mottled flower stems and pinately divided leaves. Great angelica (*Angelica atropurpurea*; native) is smaller with a smooth, purplish stem, spherical umbel and pinnately compound leaves. Glade mallow (*Napaea dioica*; native) is 3-6' tall with leaves 4-12" with 5-9 deep lobes that are coarsely toothed. Poison hemlock (*Conium maculatum*; invasive) has similar stem and coloring, but is hairless and 3-10' tall.



Photo by Donna Ellis



Photos by Leslie Mehrhoff and DNR

Purple loosestrife - PL
(*Lythrum salicaria*)



Photos: Paul Skawinski

Leaves: Simple, lance-shaped and attached directly to the stem; usually opposite and rotated 90° from those below, but are sometimes whorled.

Flowers: Closely attached to the stem with 5-6 purple-pink colored petals; blooms from the bottom of the flower spike to the top from early July to September; plants can bloom the first year after seeds germinate.

Fruits & seeds: Capsules burst open when mature in late July-September.

Roots: Large woody taproot and many side roots; plants intertwine to form dense clumps.

Stems: Green, sometimes tinged purple, stiff, erect, and generally 4-sided (older stems, 5 or 6 sided).

Similar species: Garden loosestrife (*Lysimachia vulgaris*) is a non-native, wetland garden escapee with yellow flowers. Smaller, native winged loosestrife (*L. alatum*) is found in moist prairies and wet meadows, has winged, square stems, solitary flowers in separated leaf axils, paired lower leaves and alternate upper leaves. Swamp loosestrife (*Decodon verticillatus*) arches out from shorelines, has mostly whorled leaves, and flowers in well-separated leaf axils.



Japanese hops
(*Humulus japonicus*)

Leaves: Opposite, 5-12.5 cm (2-5 in) long, with serrated edges and palmately divided into 5 or more lobes; petioles are as long as or longer than length of leaves.

Flowers: Originate in leaf axils, are dull green with 5 petals on spikes; male and female flowers are on separate plants; male flowers are upright while female flower clusters droop; blooms from July-September.

Fruits & seeds: Achenes are yellow-brown in color.

Similar species: Native hops (*H. lupulus*) have 3-lobed leaves with petioles shorter





Photo: David Eagan

than the length of the leaf.



Yellow flag iris (*Iris pseudacorus*)



Photo:???

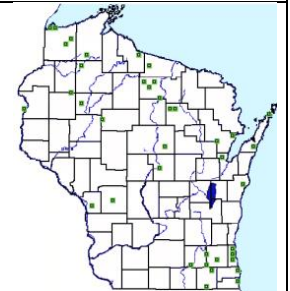
Leaves & stems: Broad, sword-shaped leaves grow upright, tall and stiff; green with a slight blue-grey tint.





Flowers: Showy and variable in color from pale to dark yellow; need flowers to know ID, but should still take pictures of plant if suspected. 7.5-10 cm (3-4 in) wide and on a stem which can be 1.0-1.2 m (3-4 ft) tall; blooms from April to June; three upright petals are less showy than the larger three downward pointing sepals, which may have brown to purple colored streaks.

Fruits & seeds: Fruits are 6-angled capsules, 5-10 cm (2-4 in) long; each fruit may have over 100 seeds that start pale before turning dark brown; each seed has a hard outer casing with a small air space underneath, which allows the seeds to float.

Roots: Thick, fleshy pink-colored rhizomes spread extensively in good conditions, forming thick mats that can float on the surface of water.

Similar species: When not flowering, yellow flag iris could be easily confused with native blue flag irises (*I. versicolor* and *I. virginica*) as well as other ornamental iris that are not invasive. Blue flag irises are usually smaller and do not tend to form dense monocultures. Yellow flag iris which is not in flower may also be confused with other emergent plants such as cattails (*Typha* spp.), sweet flag (*Acorus* spp.), or bur-reeds (*Sparganium* spp.).



<p>Broadleaf cattail NATIVE SPECIES (<i>Typha latifolia</i>)</p> 	<p>Leaves: 14-23 mm wide, shorter than flower spike Stems: 1-3 m tall Flowers: Male and female portions of spike typically together; spike < 6" Similar species: <i>Typha angustifolia</i>, <i>Typha x glauca</i></p>	
<p>Narrowleaf cattail - NLC (<i>Typha angustifolia</i>)</p>  <p>Photos: Robert Freckmann (left) Elizabeth J. Czarapata (right)</p>	<p>Leaves: 4-10 mm wide, taller than flower spike. Stems: 1-3 m tall Flowers: Male and female portions of spike separated by 2-4 cm gap; spike <6" Similar species: <i>Typha latifolia</i>, <i>Typha x glauca</i></p>	
<p>Hybrid cattail - HC (<i>Typha x glauca</i>)</p>	<p>Leaves: Variable width and height, usually between broadleaf and narrowleaf in width. Stems: 2-3 m tall Flowers: Male and female portions of spike typically separated by 2-4 cm gap; spike 6" or longer Similar species: <i>Typha angustifolia</i>, <i>Typha latifolia</i></p>	



Moneywort - MW
(*Lysimachia nummularia*)



Leaves: Simple; opposite, round, 0.5 to 1" long; shiny have short leaf stems, remain green most of the year.

Stems: **Trailing**; low-growing, smooth; 6-24" long; branch frequently to form matlike growth.

Flowers: **Yellow with small dark red dots**; arise from leaf axils; wheel-shaped; 5 petals; 1" in diameter; have slender stalks; bloom June to August.

Similar species: Ground ivy (*Glechoma hederacea*)



Japanese stilt grass - JSG
(*Microstegium vimineum*)



Leaves: annual grass resembling a small, delicate **bamboo**; mature plants grow to 2-3 ft. in height

Flowers: fruits and seeds: hidden (cleistogamous), self-fertilizing flowers in axils and/or exposed (chasmogamous) flowers in terminal racemes of paired, **hairy spikelets** that open and are wind-pollinated; fruits awned and bristly; late summer to fall

Fruits & seeds: ?

Similar species: Virginia cutgrass (*Leersia virginica*), hairy jointgrass or small carpetgrass (*Arthraxon hispidus*), and possibly other delicate grasses and wildflowers like Pennsylvania knotweed (*Polygonum persicaria*).

-Source: <https://www.nps.gov/plants/alien/pubs/midatlantic/mivi.htm>



Not reported in Wisconsin

INVERTEBRATES

Zebra Mussel - ZM
(*Dreissena polymorpha*)
& Quagga Mussel – QM
(*Dreissena bugensis*)



Photo: Myriah Rieherson

Zebra mussels have a yellowish or brownish **D-shaped** shell, usually with alternating dark- and light-colored stripes. They can be up to 5 cm (2 inches) long, but most are under 2.5 cm (1 inch). The ventral (bottom side) of the shell is flat, allowing the mussel to sit flat on a surface.

Quagga mussels have black narrow stripes or blotchy lines on white to light tan shells. Unlike the zebra mussel, the quagga mussel shell has a **rounded ventral side**, and will not sit upright if placed on a flat surface. The quagga is no bigger than an adult's thumbnail.

Asian Clam - AC
(*Corbicula fluminea*)



Photo: WDNR

Asian clam is a freshwater bivalve mollusk. The outside shells are yellow-green to brown with **elevated concentric rings**. If the color chips away, white spots can be seen underneath. The inside of the shells may be **light purple**. Adults are small, usually less than 1 1/2" in length.

New Zealand mudsnail - NZMS
(*Potamopyrgus antipodarum*)

The New Zealand mudsnail has a dextral (right-handed coiling), elongated shell with 7-8 whorls (twirls) separated by deep grooves. The shell color can range from gray to light or dark brown. In the Great Lakes the New Zealand mudsnail typically measures **4 to 6 mm** in length, but grows to 12 mm regularly in its native range.



Photos: Paul Skawinski

Faucet snail - FS
(*Bithynia tentaculata*)



Photo: Paul Skawinski

The faucet snail has a shiny pale brown shell, oval in shape, with a relatively large and rounded spire consisting of 5–6 somewhat flattened dextral whorls (right-handed coiling), no umbilicus, and a very thick lip. The aperture is less than half the height of the shell. Adult *B. tentaculata* possess a white, calcareous, tear-drop to oval-shaped operculum with distinct concentric rings.

Chinese mystery snails - CMS
(*Cipangopaludina chinensis malleata*)



Photo: Paul Skawinski, ???

Adult snails are often greater than 1.5 inches in length.
 They have a width to height ratio of 0.74–0.82, the shell has 6–7 whorls.
 Operculum (trap door) present
 Shell is typically light to dark olive green
 Uniform coloring on the shell (no banding)
 Chinese mystery snail is often wider than the native brown mystery snail.

Banded mystery snails - BMS
(*Viviparus georgianus*)

Often smaller than Chinese mystery snails
 Adult snails can get up to 1.5 inches in length
 Operculum (trap door) present
 Shells have distinct reddish-brown bands circling the shell. This feature is obvious

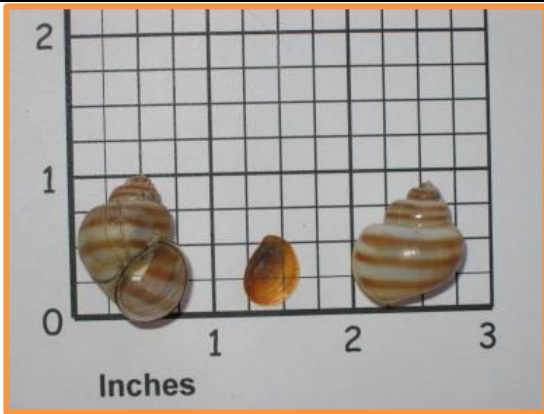


Photo:???

in empty shells, but more subtle on living snails.

Rusty crayfish - RC
(*Orconectes rusticus*)



Photo: Jeff Gunderson, MN Sea Grant

This crayfish measures two and one-half inches (not including claws) in length. Look for their large claws with **black bands on the tips** and dark, **rusty spots** on each side of their carapace (hard outer body covering). Their claws are grayish-green to reddish-brown and smoother than most other crayfish. The rusty spots may not always be present or well developed on rusty crayfish from some waters.

Red Swamp Crayfish - RSC
(*Procambarus clarkii*)

Color: The Red swamp crayfish are **dark red** in color with raised bright red spots covering the body and claws and a black **wedge-shaped** stripe on the top of the abdomen. Occasionally, a genetic mutation may turn the body and/or claws blue.
Size: They may vary in length between 2 to 5 inches.



Photo Credit.

Spiny waterflea – SWF
(*Bythotrephes longimanus*)



Spiny waterflea on fishing line

Body: The Spiny Water Flea has a **1/4"-1/2" long**, translucent body, making it hard to spot unless gathered in a large cluster. The species is also characterized by a **long spine** that extends from its abdomen, giving reason for its name. In addition, the Spiny Water Flea has a **dark black eye** that can easily be seen against its contrasting light body.