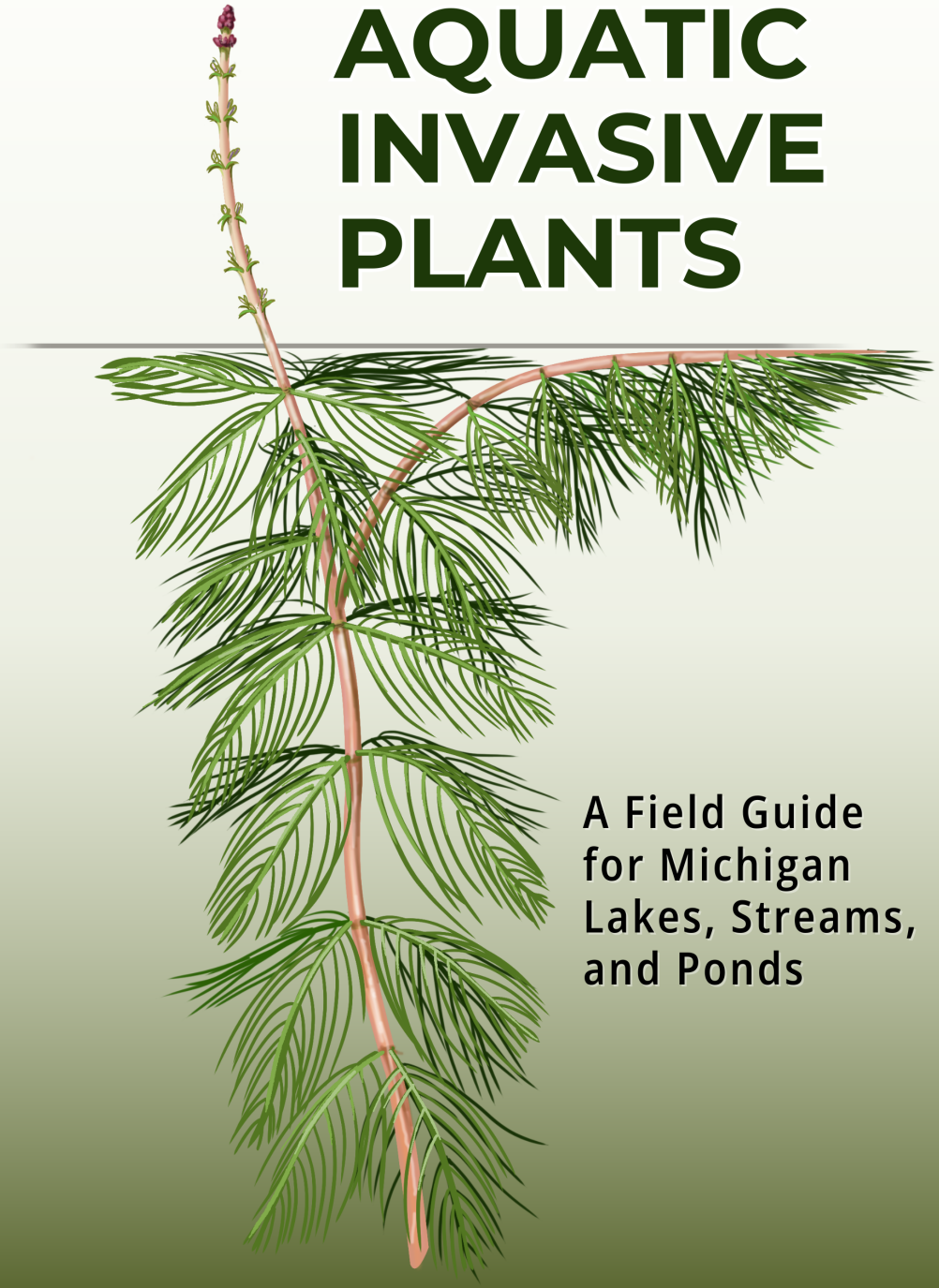
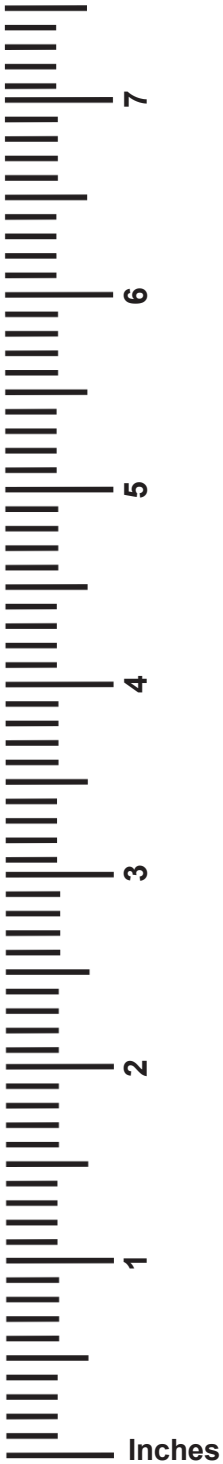
AQUATIC INVASIVE PLANTS



A Field Guide for Michigan Lakes, Streams, and Ponds

MICHIGAN STATE UNIVERSITY | Extension



Aquatic Invasive Plants: A Field Guide for Michigan Lakes, Streams, and Ponds

2025 Edition

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Michigan Clean Water Corps

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Center for Lakes and Streams

Funding and support for this publication was provided by the Michigan Department of Environment, Great Lakes, and Energy.

Acknowledgments

The authors wish to thank the following people for reviewing the manuscript and providing guidance and technical assistance: Lisa Adams, Cooperative Lakes Monitoring Program volunteer; Jason Broekstra, PLM Lake and Land Management Corp; Rachel Hackett, Michigan Natural Features Inventory; Jeremy Hartsock, Michigan State University Institute of Water Research; Billy Keiper, Michigan Department of Environment, Great Lakes, and Energy; and Paul Skawinski, University of Wisconsin - Stevens Point Extension Lakes.

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Introduction

This guide is designed to help you identify aquatic invasive plants that you might encounter in or near Michigan's lakes, streams, and ponds. Each invasive plant entry includes a detailed illustration or photograph highlighting key characteristics to aid in identification. For some entries, we have also included similar-looking native plants and explained how to distinguish them from the invasive species.

What are invasive species?

Invasive species are non-native species that cause harm, or are likely to cause harm to Michigan's economy, environment, or human health. These species reproduce and grow rapidly and often lack natural predators in their new environment. As a result, they can quickly dominate and disrupt local ecosystems.

What can be done?

Managing established invasions is often costly and complete eradication can be difficult, making prevention our best defense. Many aquatic invasive plants are spread by human activities like transporting trailered boats with aquatic plants attached or releasing aquarium and pond plants into the wild.

To help prevent the introduction and spread of aquatic invasive plants, never release aquarium or ornamental pond species into natural waterways. Always clean, drain, and dry boats and other recreational gear after each use and before moving them to a new waterbody.

Prior to transporting any watercraft over land, boaters are required by law to do all of the following:

- Remove all drain plugs from bilges, ballast tanks, and live wells.
- Drain all water from any live wells and bilges.
- Ensure that the watercraft, trailer, and any conveyance used to transport the watercraft or trailer are free of aquatic organisms, including plants.

This means that after loading a watercraft onto a trailer and before getting on the road, boaters must pull plugs, drain water and remove plants and debris. Violation of the law is a state civil infraction and violators may be subject to fines.

Handle aquarium and water garden plants and animals responsibly. Contact a local retailer for surrender and disposal recommendations.

Despite our best efforts, prevention isn't always successful. **Early detection is crucial to protecting Michigan's waterways.** By identifying new invasions early, we can better control their spread. This field guide is designed to help those who spend time around Michigan's lakes, streams, and ponds learn how to identify aquatic invasive plants they may encounter.

What to do if you find an aquatic invasive plant

Reporting instructions are provided for each invasive species in this book. It's important to report a possible invasion even if you're not completely sure about the identification. Experts at Michigan State University Extension and the Michigan Department of Environment, Great Lakes, and Energy can help verify the species.

Prohibited and restricted species

Some invasive species are legally designated by the State of Michigan as either "prohibited" or "restricted" and are noted as such in this guide. If a species is prohibited or restricted, it is unlawful to possess, introduce, import, sell or offer that species for sale as a live organism, except under certain circumstances.

The term "prohibited" is used for species that are not widely distributed in the state. Often, management or control techniques for prohibited species are not available. The term "restricted" is applied to species that are established in the state. Management and control practices are usually available for restricted species.

Michigan's Natural Resources Environmental Protection Act (Part 413 of Act 451) established the list of prohibited and restricted species, which is regularly amended by Invasive Species Orders. Other Michigan laws may apply to harvesting, possessing, or selling regulated and unregulated species.

For more information

- Michigan Invasive Species Program (mi.gov/invasives)
- MiCorps Exotic Aquatic Plant Watch (micorps.net)
- Michigan Clean Boats, Clean Waters (micbcw.org)
- RIPPLE: Reduce Invasive Pet and Plant Escapes (canr.msu.edu/ripple)
- Cooperative Invasive Species Management Areas (michiganinvasives.org)

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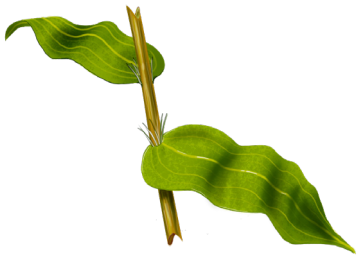
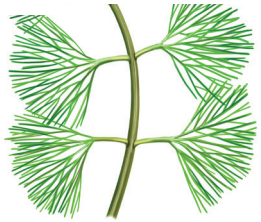
Quick Identification Features

LEAF ARRANGEMENT



Alternate



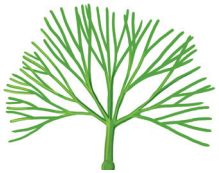
Opposite

Whorled

Basal (rosette)

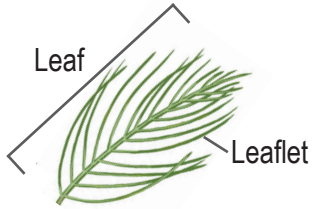
LEAF TYPE

Simple



Finely divided (compound)

LEAFLETS

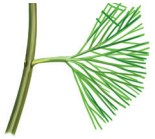


LEAF MARGIN

Serrated

Smooth

LEAF ATTACHMENT



Petiole

Clasping

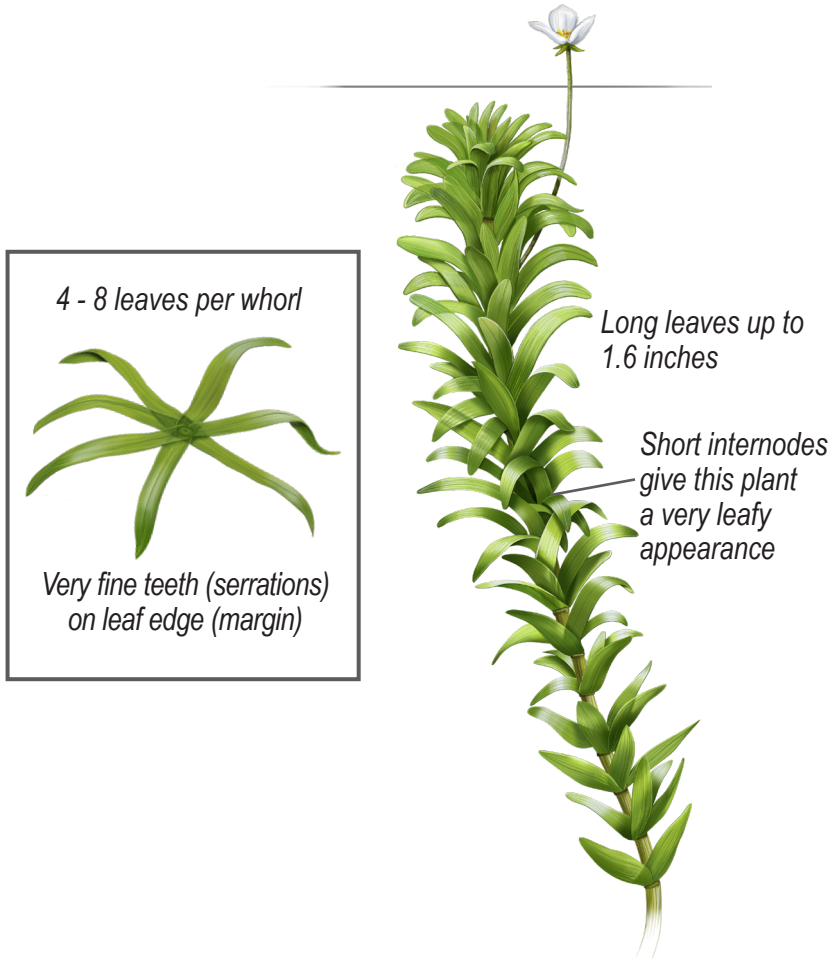
Sessile

INVASIVE | Brazilian Elodea

Egeria densa

Plant type: Submersed

Field notes: Brazilian Elodea has not been observed in Michigan as of 2024. However, there are occurrences in Illinois and Ohio. Brazilian Elodea has male and female flowers on different plants and only male plants have been found in the United States.

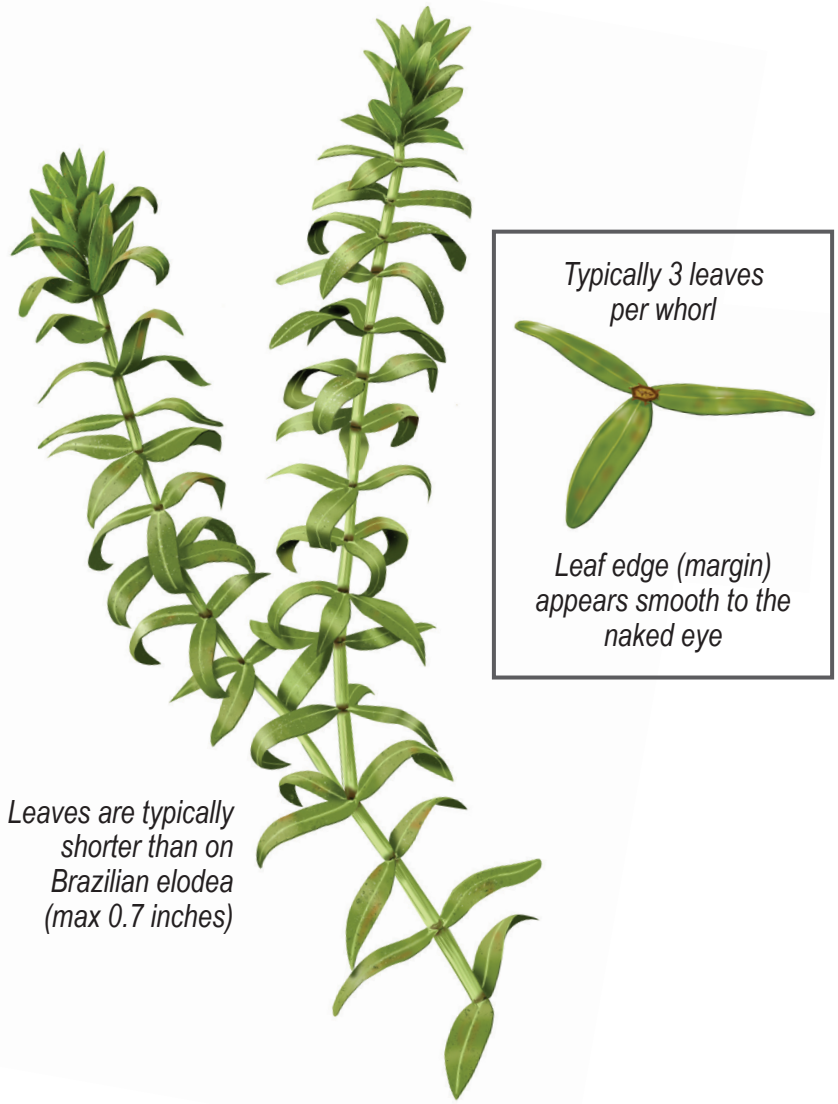


Report this prohibited species and its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, include pictures with reports.

NATIVE | Elodea

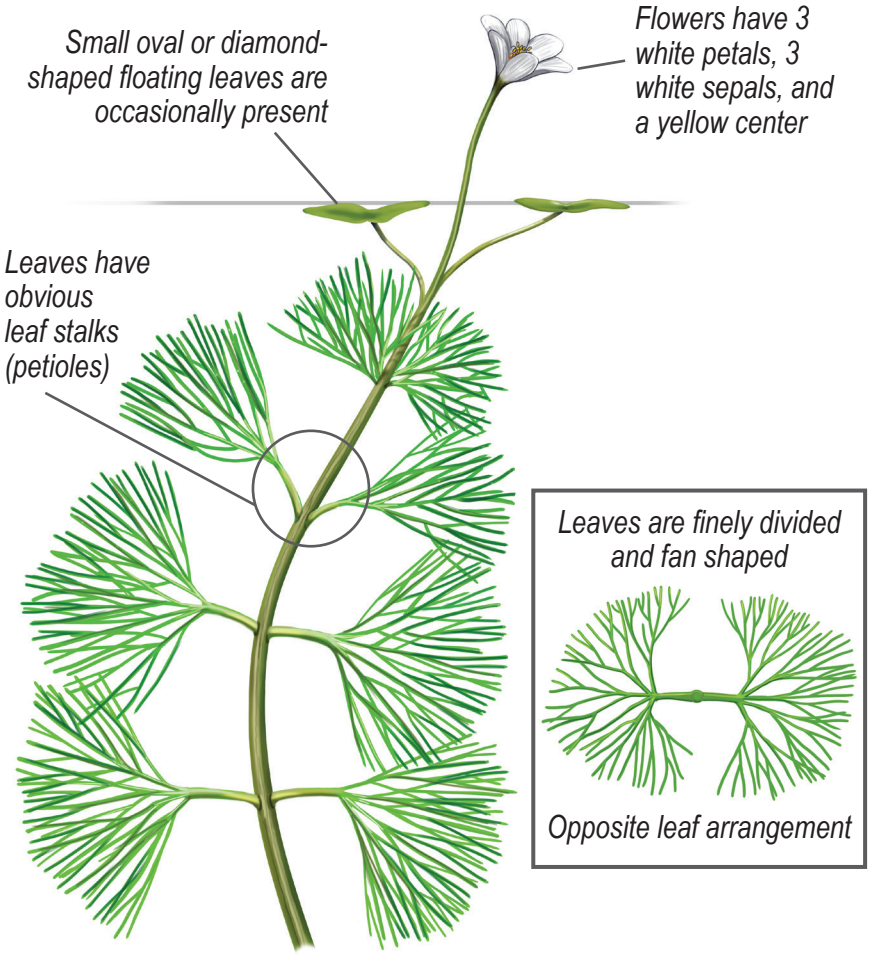
Elodea canadensis or Elodea nuttallii

Look-alike ID tips: There are two common native Elodea species (waterweed) found throughout Michigan. Brazilian Elodea has more leaves per whorl and has longer leaves compared to the native Elodea species. Brazilian Elodea also looks like invasive Hydrilla (*Hydrilla verticillata*), but does not have obvious serrated leaf edges and has much longer leaves (see page 16 for description).



INVASIVE | Carolina Fanwort
Cabomba caroliniana

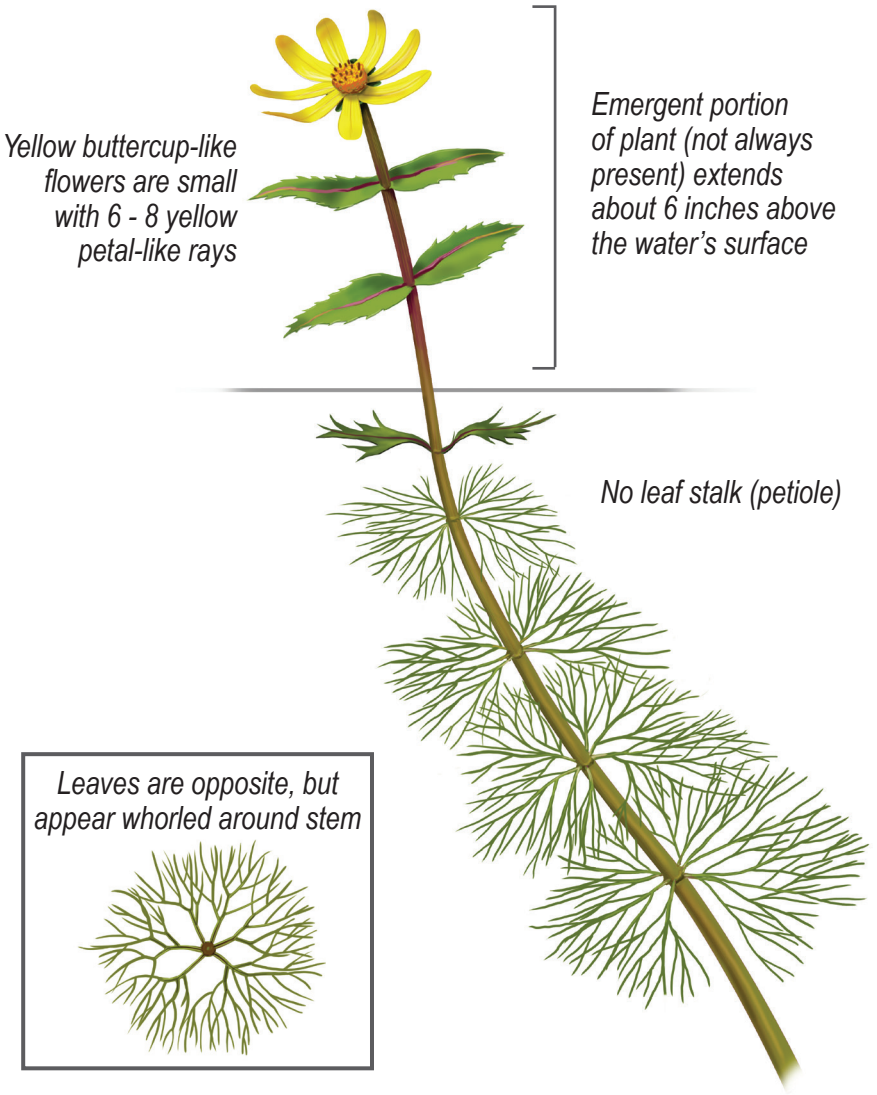
Plant type: Submersed
Field notes: Carolina fanwort is mostly found in the southern half of the Lower Peninsula. It can grow up to 6.5 feet in length. Now illegal to possess, it was once a popular plant in the aquarium trade and was likely introduced to Michigan waters from aquarium releases.



Report this prohibited species to the Midwest Invasive Species Information Network (misin.msu.edu).

NATIVE | Water Marigold
Bidens beckii

Look-alike ID tips: There are a few similar looking species in Michigan, including water marigold (*Bidens beckii*); coontail (*Ceratophyllum demersum*); and white water-crowfoot (*Ranunculus aquatilis*). However, Carolina fanwort is the only aquatic plant in Michigan with finely divided, fan-shaped leaves that are arranged opposite to one another on the stem with long, distinct petioles.

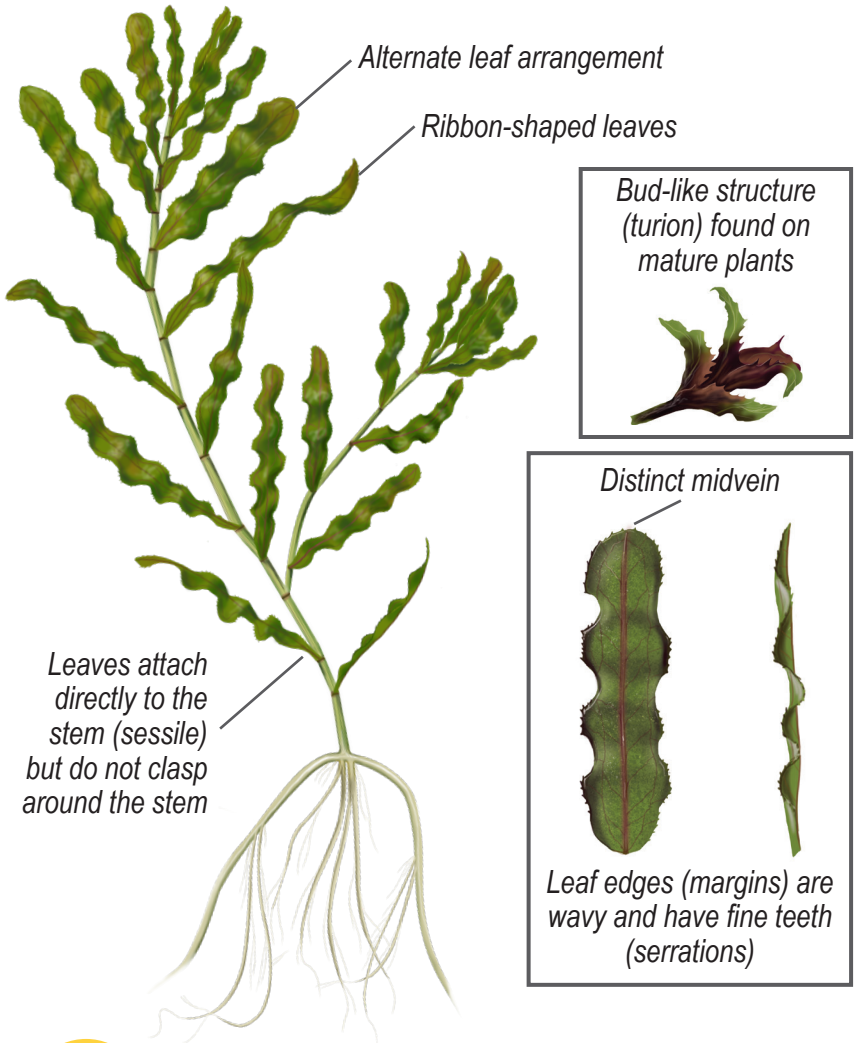


INVASIVE | Curly-leaf Pondweed

Potamogeton crispus

Plant type: Submersed

Field notes: Found in both lakes and streams, curly-leaf pondweed is often most abundant in the spring and fall when water temperatures are cooler. It can even grow under the ice. Curly-leaf pondweed was first documented in Michigan in the 1920s and is now widespread throughout the state.

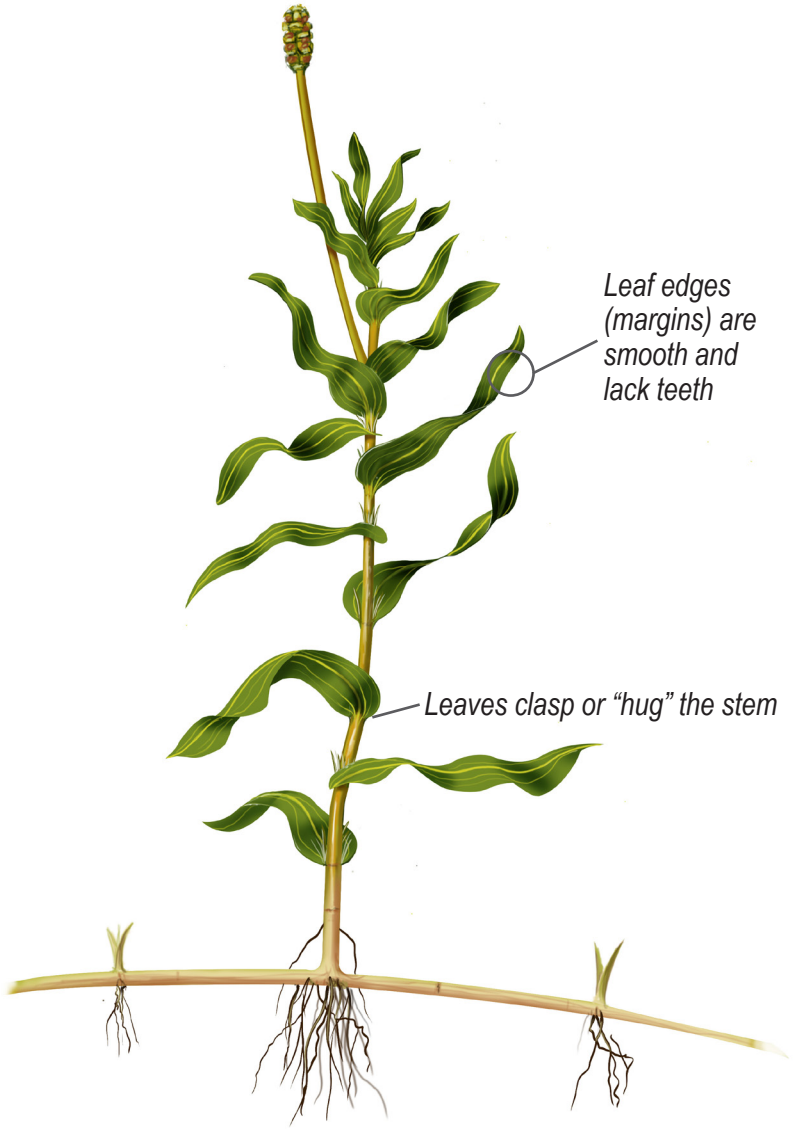


Report this restricted species to the Midwest Invasive Species Information Network (misin.msu.edu).

NATIVE | Clasping-leaf Pondweed

Potamogeton richardsonii

Look-alike ID tips: There are many pondweeds native to Michigan. However, only curly-leaf pondweed has teeth (serrations) along the leaf edge (margin). All other pondweed species have a smooth leaf edge. Curly-leaf pondweed also forms a rigid structure (turion) in mid to late summer which is unique to this plant.

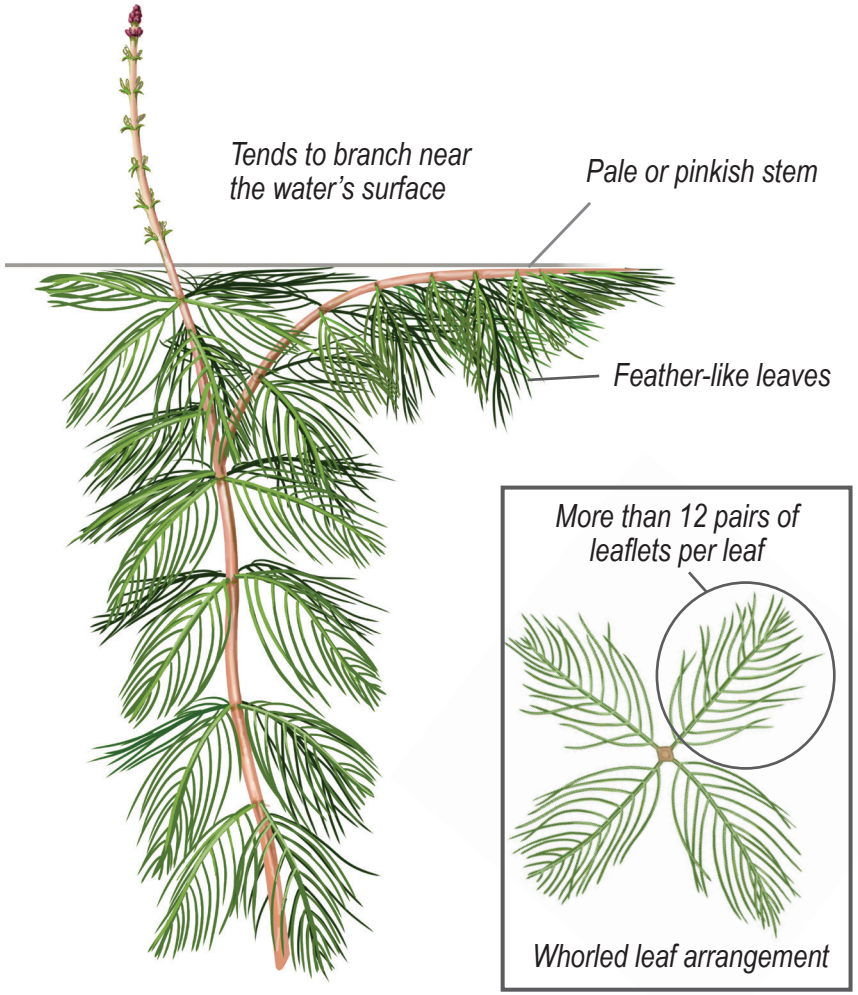


INVASIVE | Eurasian Watermilfoil

Myriophyllum spicatum

Plant type: Submersed

Field notes: Eurasian watermilfoil is widespread across Michigan. When removed from the water, Eurasian watermilfoil leaves are limp unlike native northern watermilfoil. Hybridization between Eurasian watermilfoil and native northern watermilfoil is common and can make identification difficult.



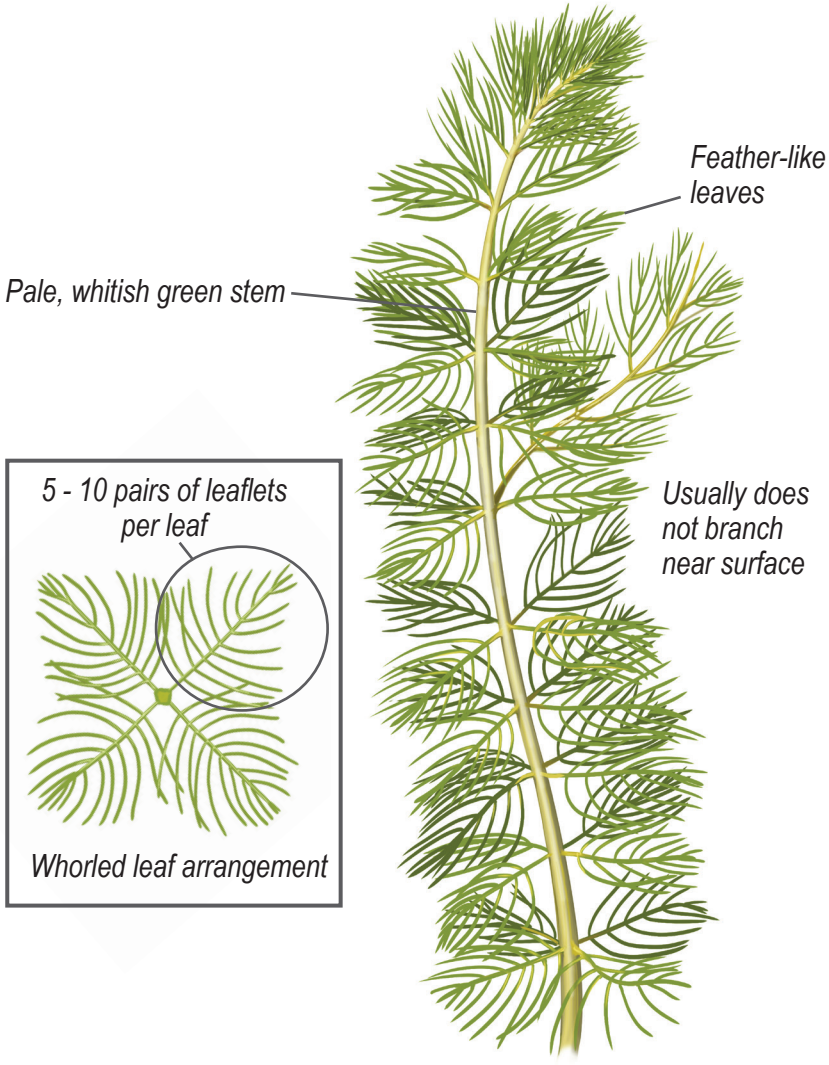
Report this restricted species to the Midwest Invasive Species Information Network (misin.msu.edu).

NATIVE | Northern Watermilfoil

Myriophyllum sibiricum

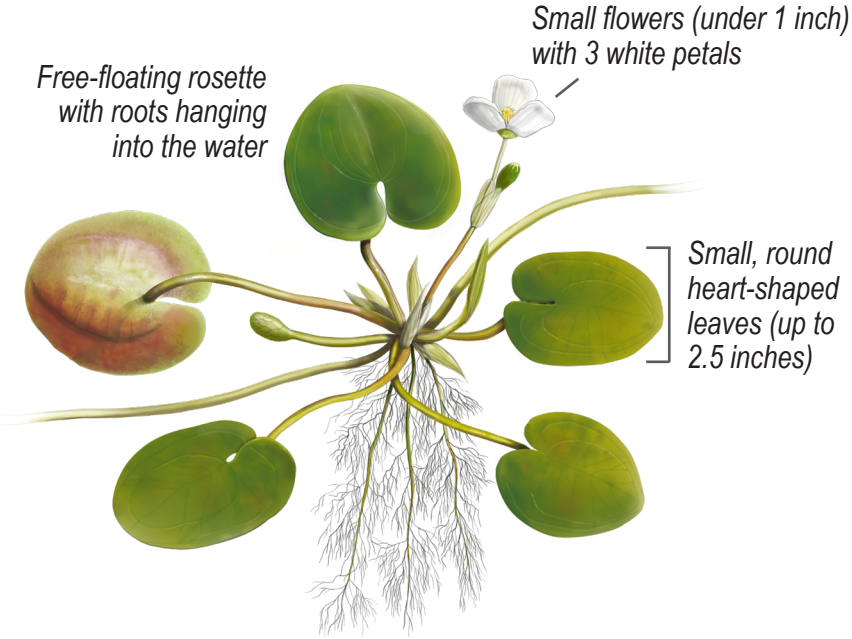
Look-alike ID tips: There are many similar species in Michigan, including six native species of watermilfoil. However, Eurasian watermilfoil is the only species with this combination of characteristics: over 12 leaflet pairs per leaf, whorled leaf arrangement, and a pale or pinkish stem.

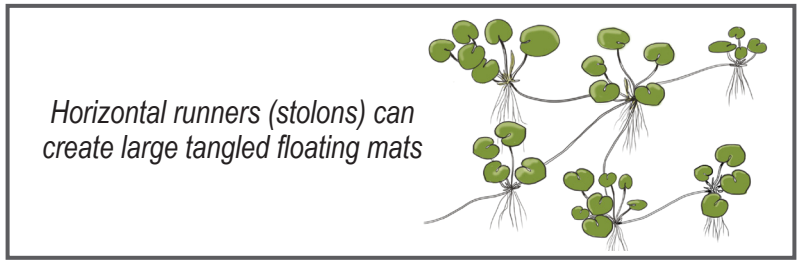
Other similar plants include bladderworts (*Utricularia* spp.), coontails (*Ceratophyllum* spp.), and buttercups (*Ranunculus* spp.), but they do not have feather-like leaves.



INVASIVE | European Frog-bit
Hydrocharis morsus-ranae

Plant type: Free-floating
Field notes: Found in Michigan in 1996, European frog-bit is widespread in coastal wetlands of the Great Lakes with sporadic populations found in inland lakes and ponds. It is often seen from June to August along shorelines and growing among emergent plants like cattail. It is sometimes rooted if stranded on a shoreline.

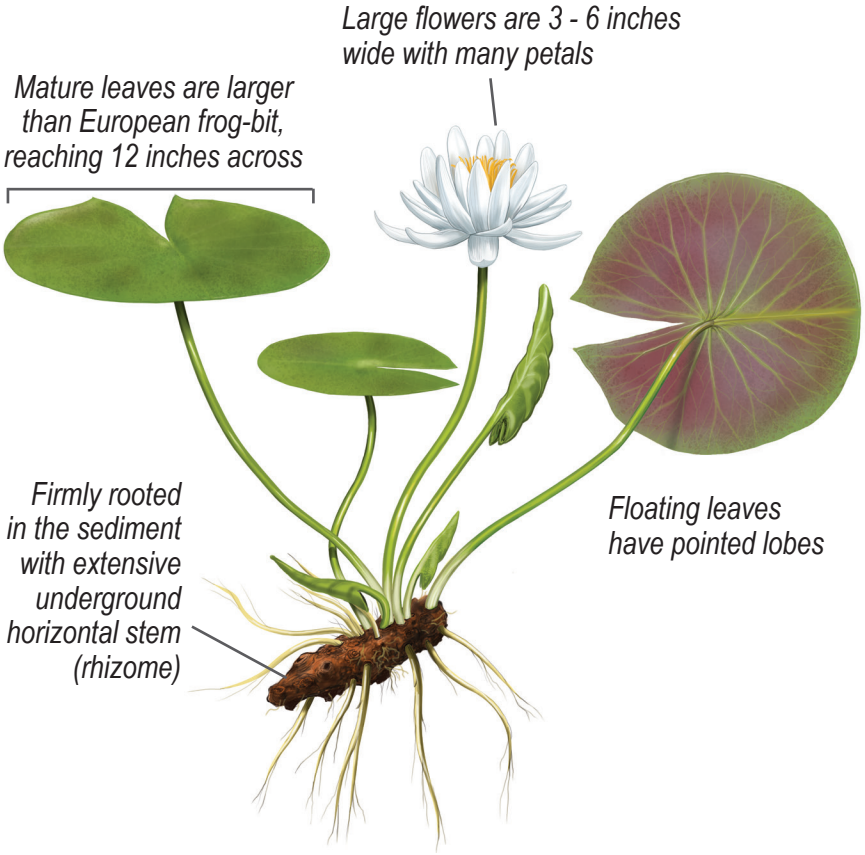




Report this prohibited species to the Midwest Invasive Species Information Network (misin.msu.edu).

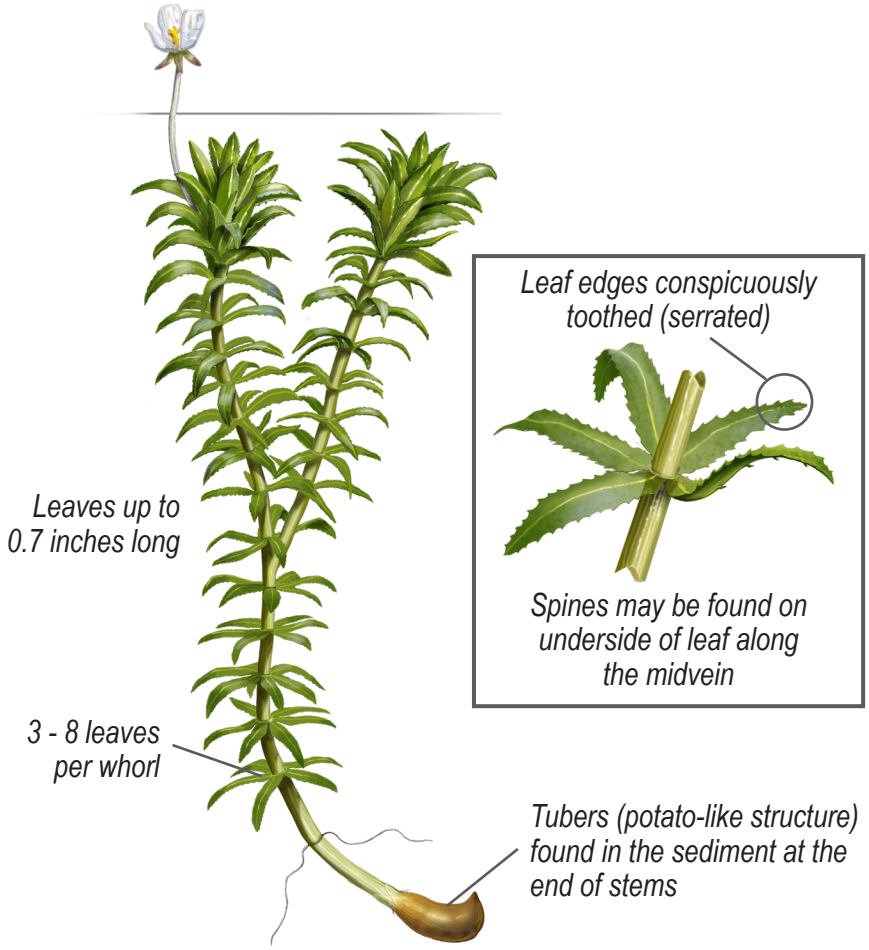
NATIVE | White Water Lily
Nymphaea odorata

Look-alike ID tips: European frog-bit resembles the native white (*Nymphaea odorata*) and yellow (*Nuphar variegata*) water lily. However, white and yellow water lilies are firmly rooted in the sediment. Also, mature water lily leaves and flowers are much larger than European frog-bit. Young white water lilies have pointed lobes and a tuber attached to the petiole, which distinguishes it from European frog-bit.



INVASIVE | Hydrilla
Hydrilla verticillata

Plant type: Submersed
Field notes: A prolific invader outside of its native range, Hydrilla was found in two ponds in Berrien County in 2023. This is the only known occurrence in Michigan as of 2024. Known for tolerating a wide variety of conditions and habitats, Hydrilla can grow in lakes, ditches, marshes, and rivers. Initial occurrences in the United States resulted from aquarium dumping.



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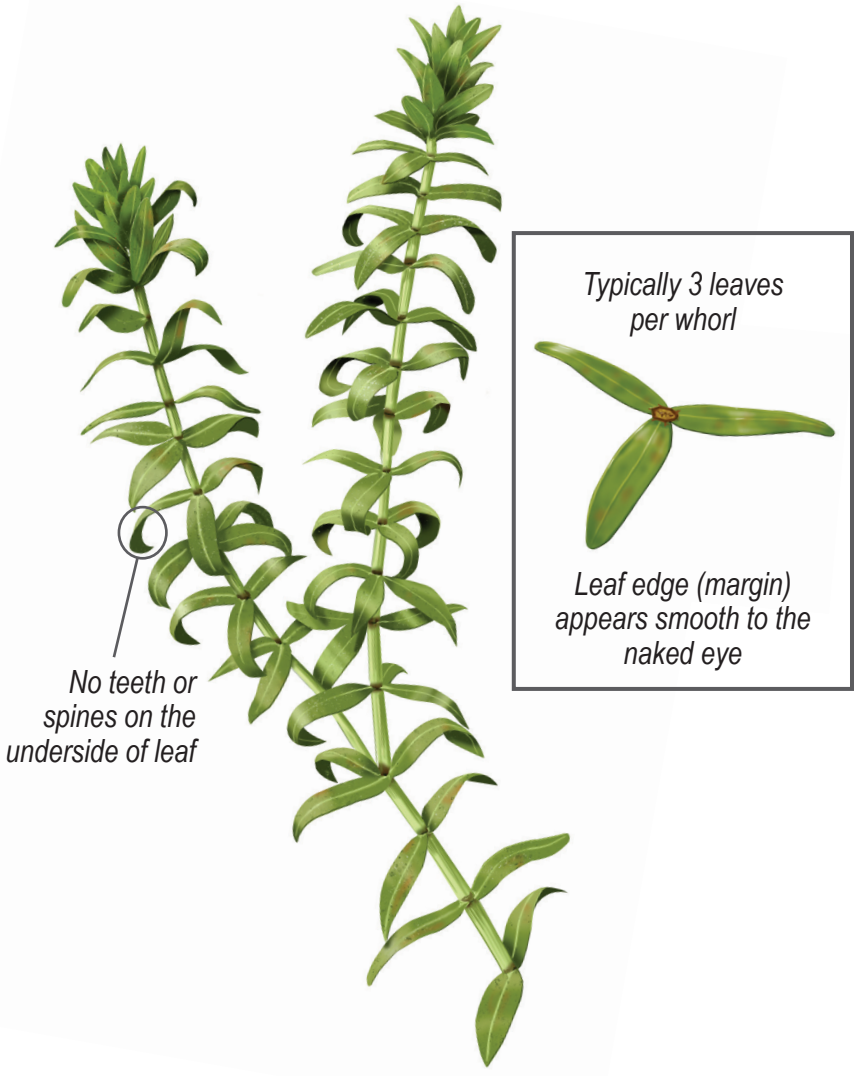
NATIVE | Elodea
Elodea canadensis or Elodea nuttallii

Look-alike ID tips: The two native Elodea species and the invasive Brazilian Elodea (see page 6 for more details) are very similar to Hydrilla. Hydrilla has more leaves per whorl and has obvious teeth along the leaf edge when compared to Elodea. Brazilian Elodea has leaves up to 1.6 inches long, while Hydrilla only measures up to 0.7 inches long. Note that Brazilian Elodea and native Elodea species have serrated leaf edges but their serrations require magnification to see, unlike invasive Hydrilla.

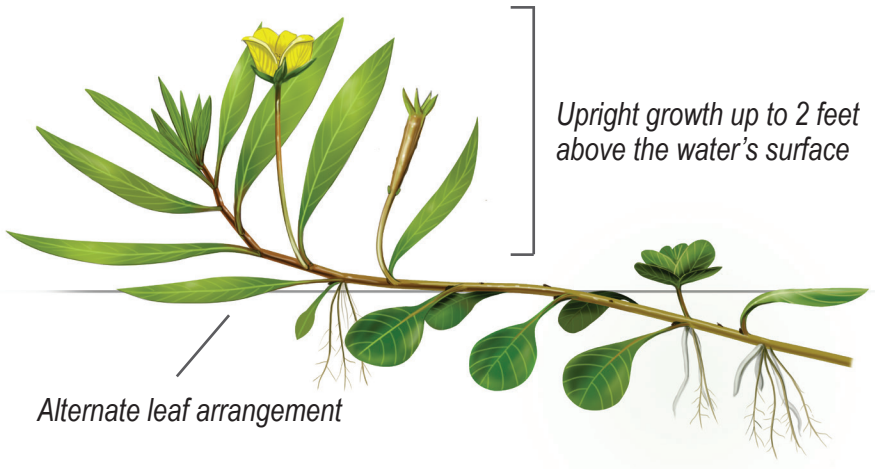


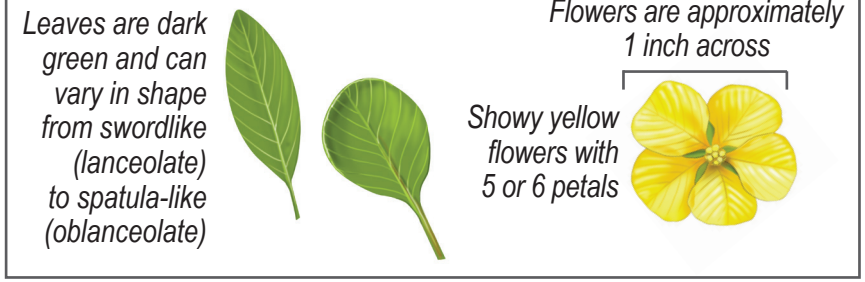
INVASIVE | Invasive Water Primrose

Ludwigia grandifolia, L. hexapetala, and L. peploides

Plant type: Emergent | Rooted floating

Field notes: There are three invasive water primrose species in Michigan (*Ludwigia grandifolia, L. hexapetala, and L. peploides*). They are most commonly observed on the shoreline or in nearshore habitats. Floating horizontal stems may extend into open water with flowers above the water surface. Plants can also grow on the shoreline or in up to 9 feet of water. As of 2024, populations have been confirmed in Wayne, Monroe, Macomb, and Ottawa counties.



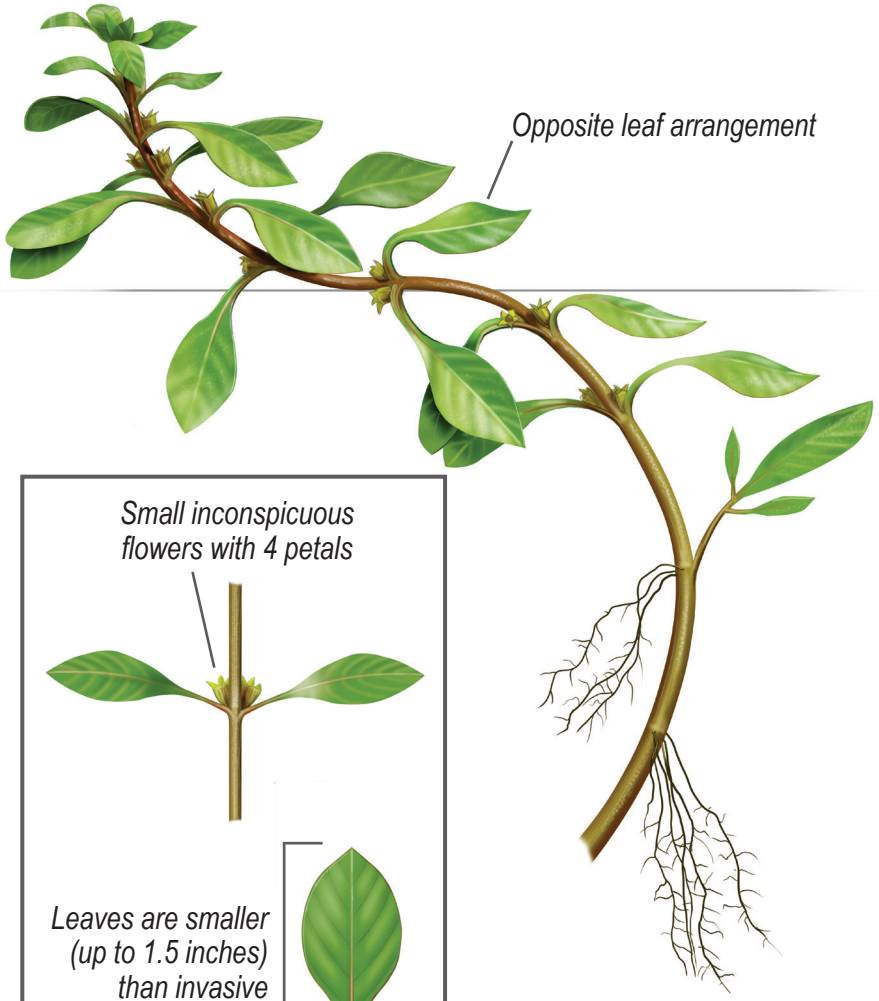


If this species is observed outside of cultivation, report its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, please include pictures with reports.

NATIVE | Water Purslane

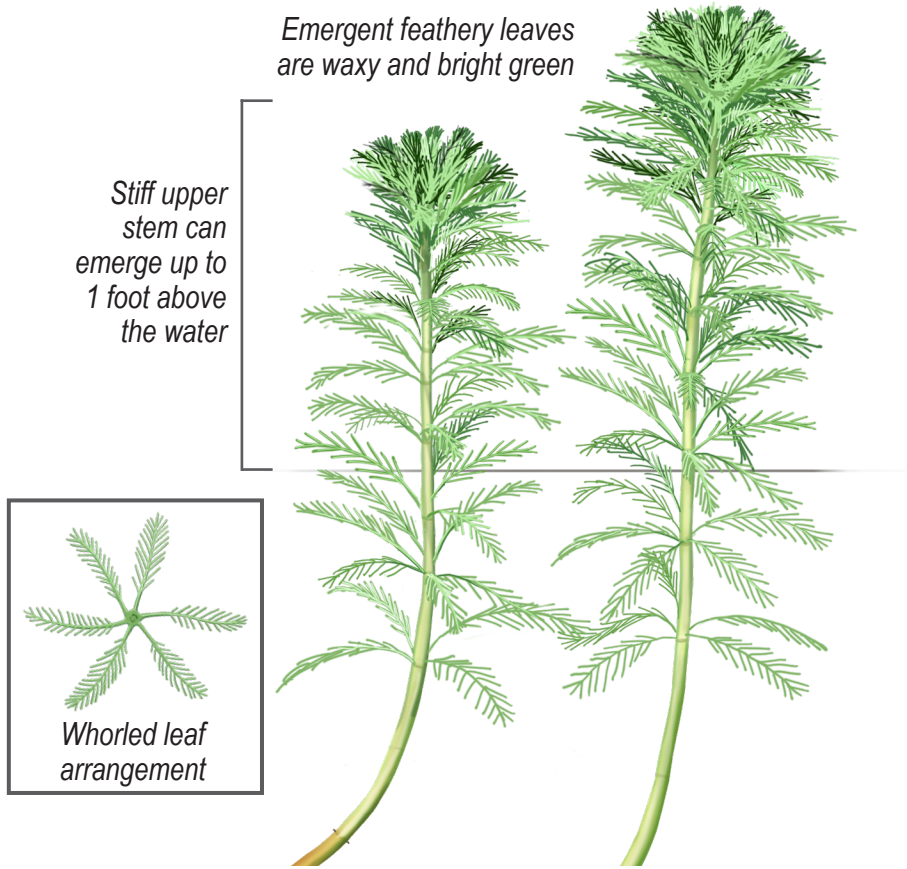
Ludwigia palustris

Look-alike ID tips: There are multiple native water primrose species (*Ludwigia* spp.) in Michigan. All native water primrose species have flowers with four petals. In some cases, the flowers are very inconspicuous, as in *L. palustris*, pictured below.



INVASIVE | Parrot Feather
Myriophyllum aquaticum

Plant type: Emergent | Submersed
Field notes: Found sporadically in the southern half of Michigan, parrot feather occurrences are likely a result of discarded aquarium and water garden plants. It prefers shallow, nutrient-rich and slow-moving waters like canals, ponds, and lakes. There are many other names used for parrot feather including red stemmed parrot feather, *Myriophyllum brasiliensis, Myriophyllum brasiliense, Myriophyllum proserpinacoides* and *Enydria aquatica.*



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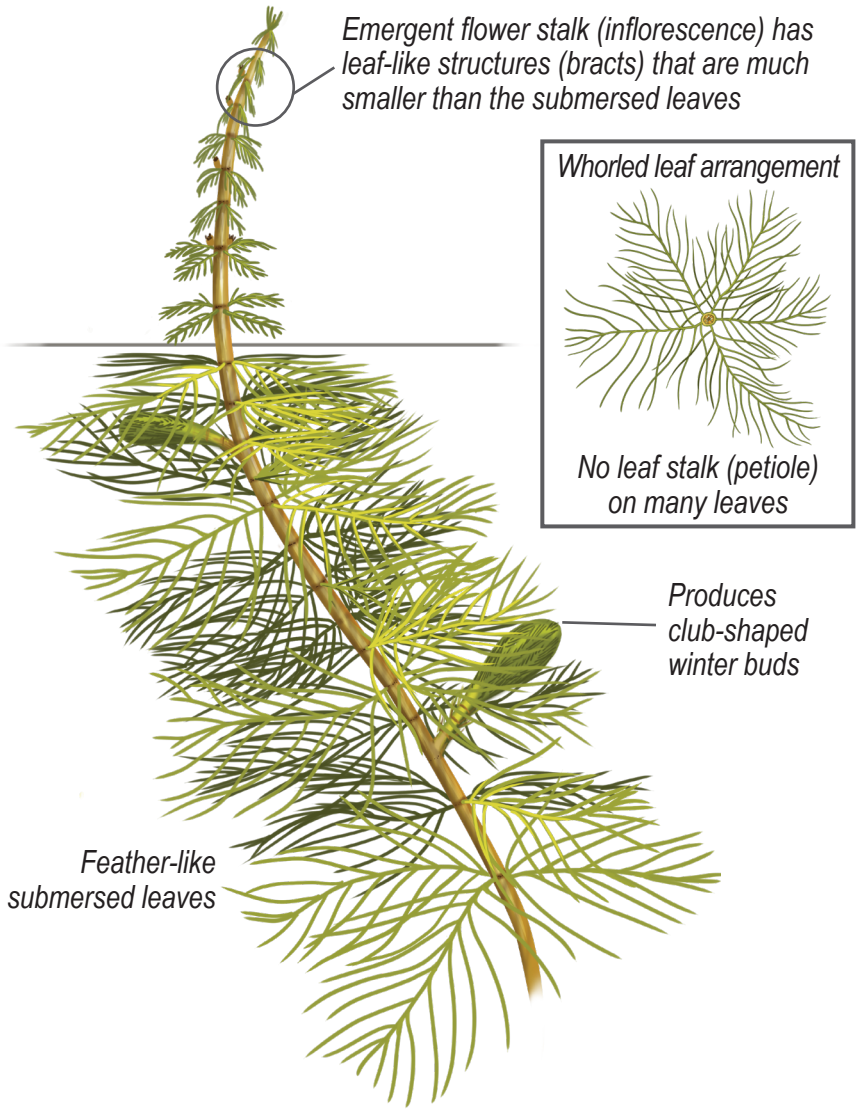
NATIVE | Whorled Watermilfoil
Myriophyllum verticillatum

Look-alike ID tips: As part of the watermilfoil genus, parrot feather can be mistaken for both the invasive and native watermilfoil species. However, parrot feather is the only watermilfoil in Michigan that emerges out of the water with fully formed feathery leaves. The native whorled watermilfoil does have leaf-like structures (bracts) that emerge above the water, but these bracts are much smaller than its submersed leaves.

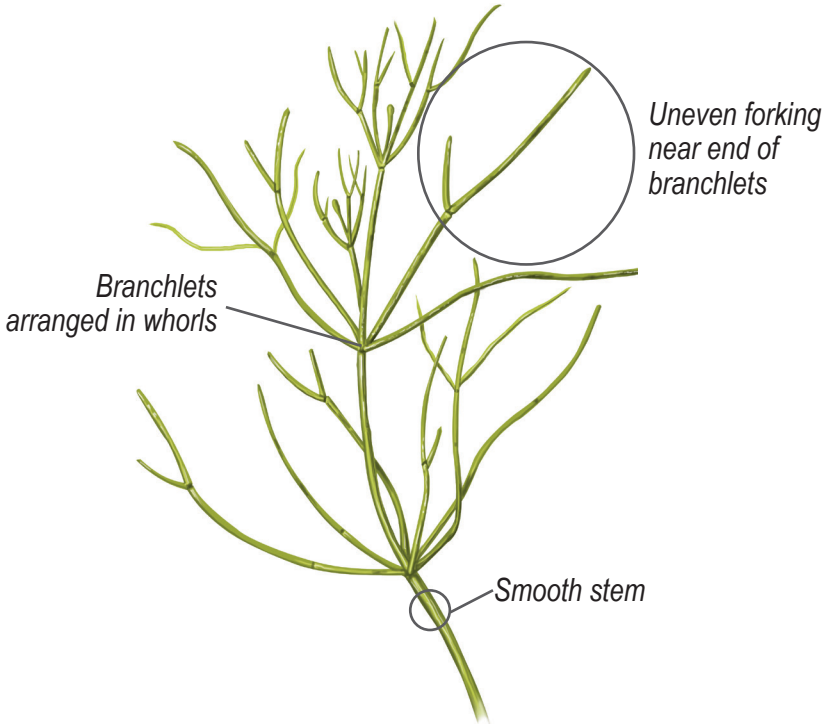


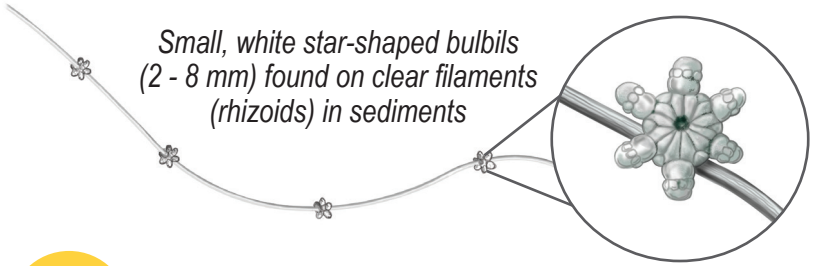
INVASIVE | Starry Stonewort

Nitellopsis obtusa

Plant type: Submersed

Field notes: Starry stonewort is a macroalga. It is in the same family as native *Chara* (muskgrass), a common group of macroalgae found across Michigan. Starry stonewort can create dense mats below the water's surface and can be difficult to identify without the star-shaped bulbils. Only male starry stonewort has been documented in the United States.



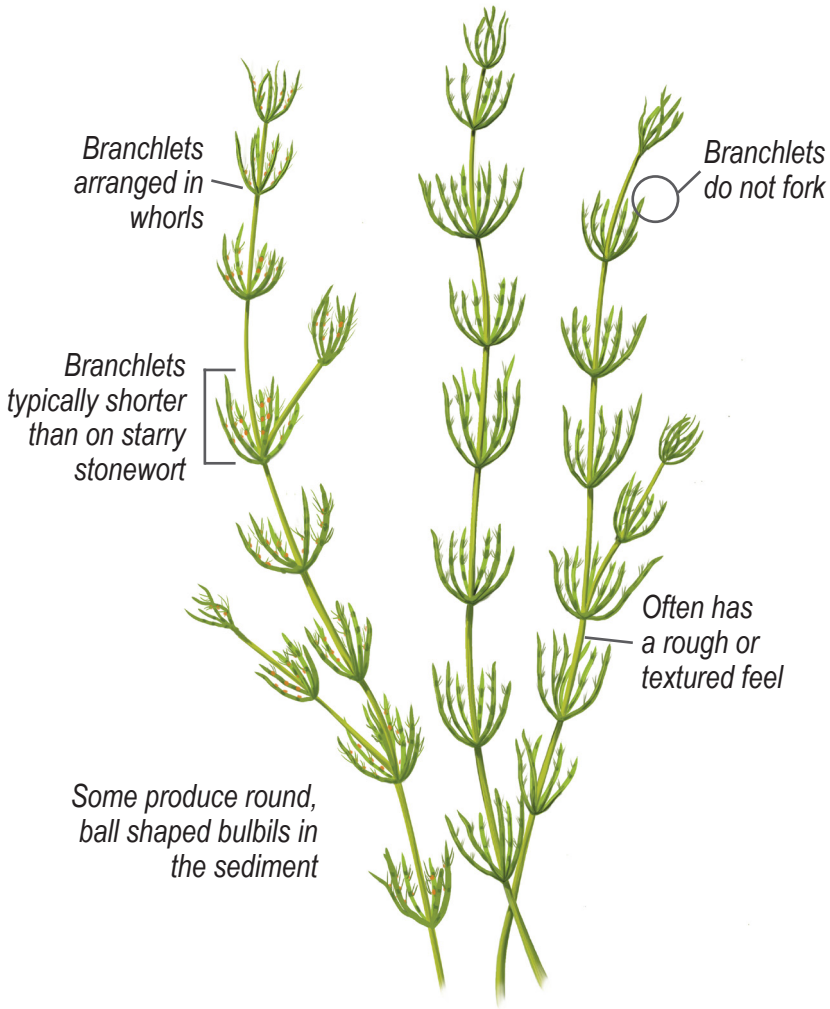


Report this prohibited species to the Midwest Invasive Species Information Network (misin.msu.edu).

NATIVE | Chara

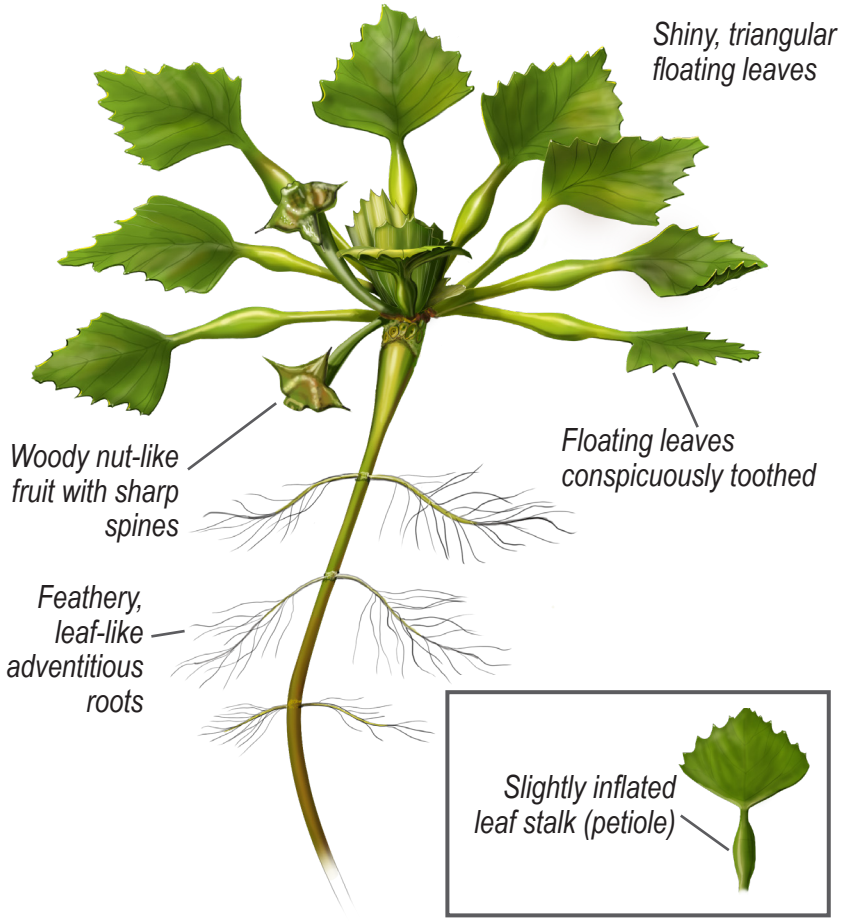
Chara spp.

Look-alike ID tips: Starry stonewort can be confused with native *Chara* (muskgrass) and *Nitella* species, but both lack star-shaped bulbils. Many *Chara* species also have a distinct musky odor. *Nitella* species have smooth stems like starry stonewort, but have symmetrical forking at the tips of the branchlets.



INVASIVE | Water Chestnut
Trapa natans

Plant type: Free-floating | Rooted floating
Field notes: Water chestnut has not been found in Michigan as of 2024. It was first introduced to the Northeastern United States for water gardening in the 1800s. This plant is not the same species that produces water chestnuts available at the grocery store. There are no native look-alike species.



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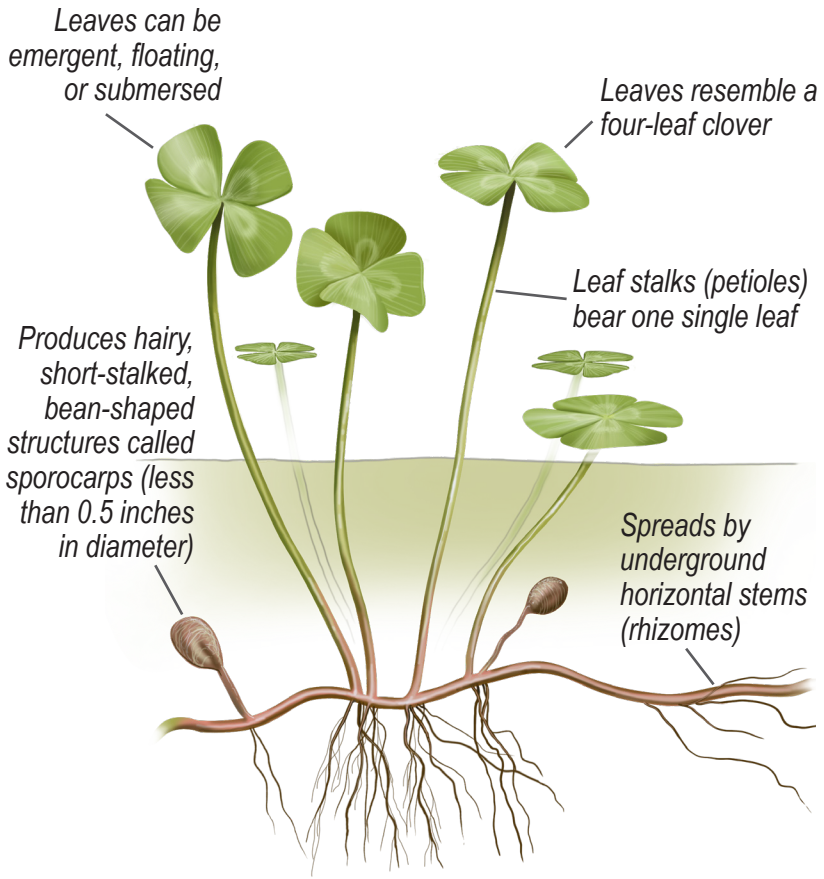
INVASIVE | Water Clover
Marsilea quadrifolia

Plant type: Emergent | Rooted floating
Field notes: Water clover is a popular aquarium and water garden plant and has been found in ponds and slow-moving rivers in southeast Michigan. This aquatic fern was first documented in 1961 in Washtenaw County. It can be found emergent, along the waters edge, or in a floating form in open water. There are no native look-alike species.



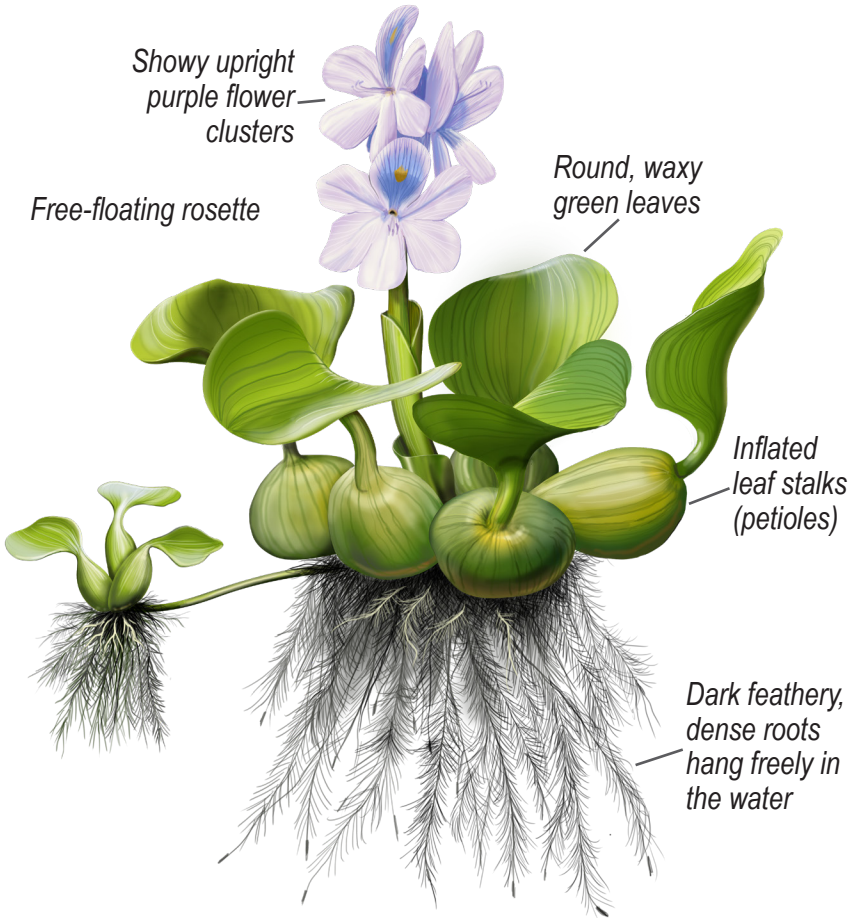
If this species is observed outside of cultivation, report its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, please include pictures with reports.

INVASIVE | Water Hyacinth

Eichhornia crassipes

Plant type: Free-floating

Field notes: Found occasionally in the Lower Peninsula of Michigan, water hyacinth occurrences are likely the result of discarded water garden plantings.

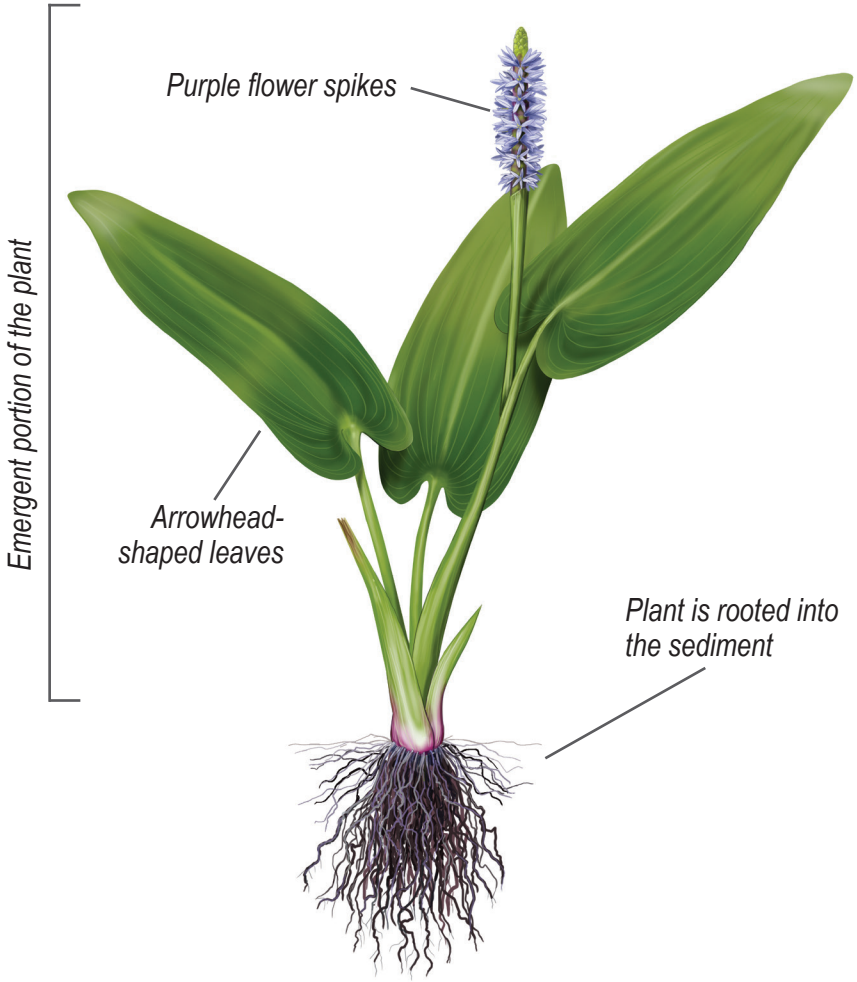


If this species is observed outside of cultivation, report its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, please include pictures with reports.

NATIVE | Pickerelweed

Pontederia cordata

Look-alike ID tips: Pickerelweed is a common rooted plant along the shorelines of Michigan lakes. The leaf stalks (petioles) are not inflated and the bases of the leaves are heart shaped.



INVASIVE | Water Lettuce

Pistia stratiotes

Plant type: Free-floating

Field notes: Found occasionally in the southern Lower Peninsula of Michigan, water lettuce occurrences are likely a result of discarded aquarium and water garden plantings. The velvety leaves and free-floating rosette make this plant unique among all other aquatic plants in Michigan.

Fuzzy, thick, ridged leaves

Free floating rosette up to 1 foot in diameter

New plants are produced on horizontal stems (stolons) from the parent plant

Feathery, dense roots hang freely in the water

If this species is observed outside of cultivation, report its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, please include pictures with reports.

INVASIVE | Water Soldier

Stratiotes aloides

Plant type: Free-floating | Submersed

Field notes: Water soldier floats on the water surface in summer and is submersed in winter. Some native bur-reeds may be confused with water soldier, but water soldier's sharp serrated leaves and basal leaf arrangement are unique. There are no occurrences of water soldier in Michigan as of 2024. The nearest occurrence is in southern Ontario.

Sharp serrated leaf edges

Stiff emergent leaves resemble aloe or pineapple leaves

Flowers with 3 white petals and 3 green sepals

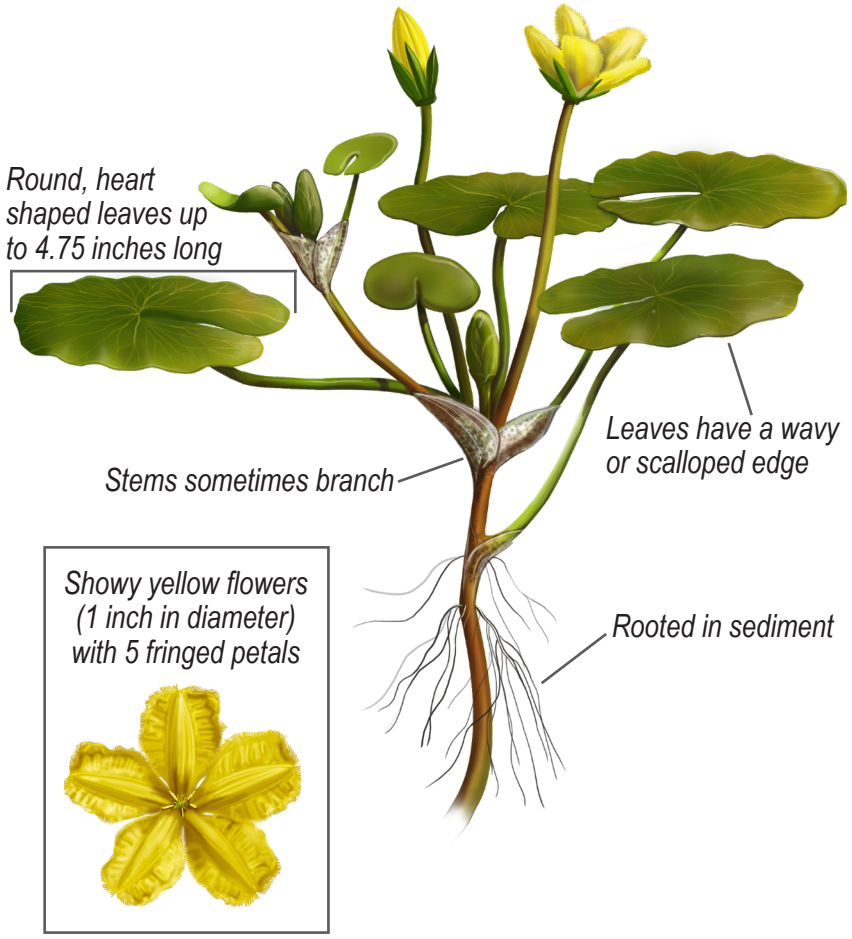
Basal (rosette) leaf arrangement

Can grow both submersed and floating

Report this prohibited species and its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, include pictures with reports.

INVASIVE | Yellow Floating Heart
Nymphoides peltata

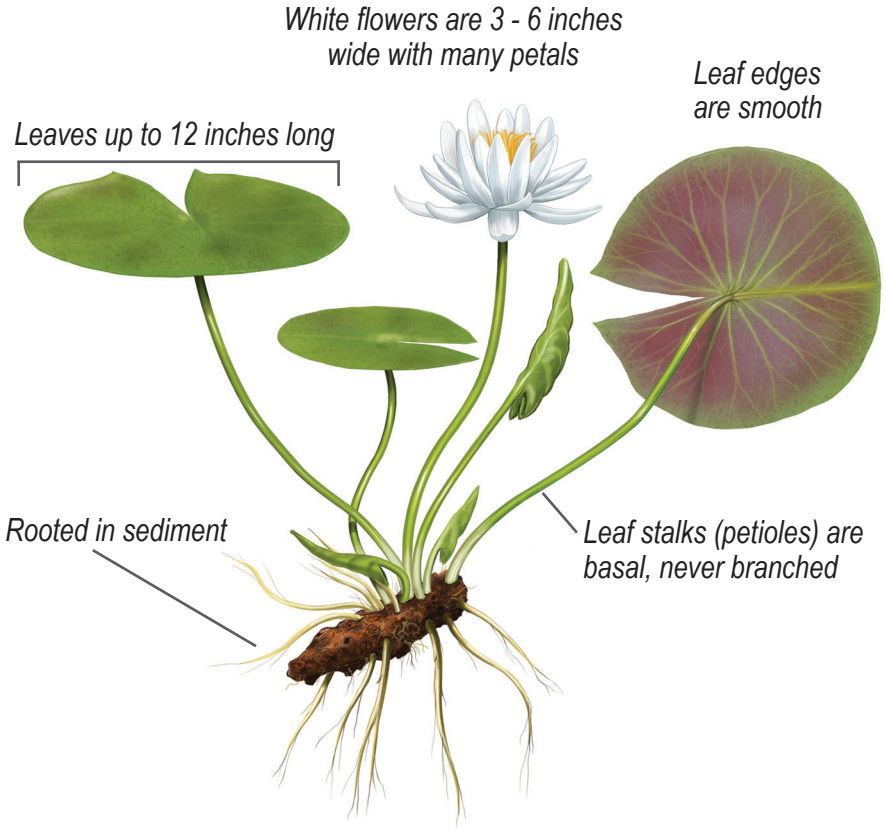
Plant type: Rooted floating
Field notes: Yellow floating heart, now prohibited, was once a popular water garden plant. It has been found in a few locations throughout southern Michigan, usually in private ponds.



Report this prohibited species and its location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-aip@mi.gov. If possible, include pictures with reports.

NATIVE | White Water Lily
Nymphaea odorata

Look-alike ID tips: Yellow floating heart is very similar to the native Michigan white and yellow (*Nuphar variegata*) water lilies. However, neither of these plants have a branched petiole or wavy/scalloped leaf edges with yellow fringed flower petals.



INVASIVE | Flowering Rush
Butomus umbellatus

Plant type: Emergent | Submersed
Field notes: Flowering rush is found in lakes, wetlands, and along river edges. It can grow in a fully submersed and sterile form with very flexible leaves. The emergent form produces umbrella-shaped pink flower clusters. Small, distinct bulbils are found at the base of the plant. Common native look-alikes include bur-reed species and three-square bulrush.

Small bulbils can be found at the base of the plant

- *Emergent swordlike leaves (around 3 feet tall) have a triangular cross-section and tend to twist near the tip*
- *Clusters of 20 - 50 white to light pink flowers are arranged in an umbrella-like shape*
- *Entire plant can be fully submersed*

Report this restricted species to the Midwest Invasive Species Information Network (misin.msu.edu).

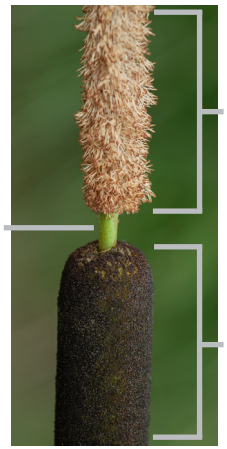
INVASIVE | Narrow-leaf Cattail
Typha angustifolia

Plant type: Emergent
Field notes: Michigan has one native cattail, broad-leaf cattail (*Typha latifolia*) and two invasive cattail, narrow-leaf cattail (*Typha angustifolia*) and hybrid cattail (*Typha* x *glauca*). To distinguish native broad-leaf cattail from the two invasive cattail species, look for the gap between the female and male flowers. Broad-leaf cattail does not have a gap.

Invasive cattails grow up to 10 feet tall

Dark green, swordlike leaves are 0.25 - 0.5 inches wide

Invasive cattail: Gap between male and female flowers is 0.75 inches or more



Male flowers form spike above female flowers

Female flowers form brown velvety cylindrical spike

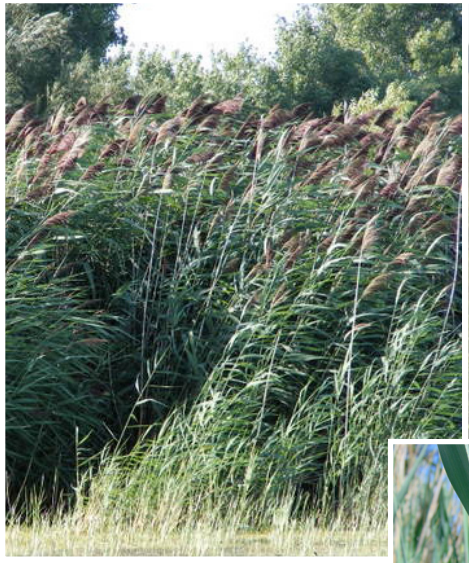
Report this species to the Midwest Invasive Species Information Network (misin.msu.edu).

INVASIVE | Phragmites

Phragmites australis subsp. *australis*

Plant type: Emergent

Field notes: This prolific wetland grass is widespread in Michigan and may grow in vast stands. It can grow alongside the native strain (*Phragmites australis* subsp. *americanus*). Leaf sheaths on native Phragmites are loose and will not be retained through the winter while invasive Phragmites leaf sheaths are tight and will remain on dead stalks. The leaves of native Phragmites are also yellow-green compared to the darker leaves of invasive Phragmites. Seed heads on the invasive are typically larger than those on the native.



- *6 - 20 feet tall*
- *Large, puffy seedhead*
- *Rigid, hollow stem*
- *Leaf sheaths typically remain on dead stems through winter*

Live stems of invasive Phragmites are dull tan-green

Live stems of native Phragmites appear reddish or purpleish

Report this restricted species to the Midwest Invasive Species Information Network (misin.msu.edu).

INVASIVE | Purple Loosestrife

Lythrum salicaria

Plant type: Emergent

Field notes: Purple loosestrife was introduced to the United States in the early 1800s as an ornamental plant and is now widespread in Michigan. It grows in dense stands in wetlands, ditches, and shoreline areas and blooms between July and September. Purple loosestrife readily branches and has multiple stems coming from the base of the plant, giving it a bushy appearance.

- *2 - 8 feet tall*
- *Purple-pink flowers with 5 - 7 showy petals*
- *Flowers on a spike, blooming from the bottom up*
- *Sword-shaped (lanceolate) leaves with smooth edges (margins)*
- *Leaves opposite or whorled on 4- to 6-sided angular stems*

Report this restricted species to the Midwest Invasive Species Information Network (misin.msu.edu).

INVASIVE | Yellow Iris

Iris pseudacorus

Plant type: Emergent

Field notes: Yellow iris is a perennial plant found along the edges of lakes, ponds, and rivers throughout Michigan. When not in bloom, yellow iris can be mistaken for the native blue flag iris (*Iris versicolor*). The most obvious difference between these two species is flower color. Yellow iris also tends to form denser clumps and is generally taller than blue flag iris.

- *Basal leaf arrangement*
- *Yellow-green leaves with a raised mid-rib*
- *Blooms in May and June and has 2 - 3 bright yellow flowers*
- *Each flower has 3 downward sepals and 3 upward petals*
- *Seeds grow in buoyant oblong shaped capsules*
- *Long, swordlike leaves are flattened and arranged in fanned clusters*

Report this species to the Midwest Invasive Species Information Network (misin.msu.edu).

Glossary

Alternate leaf arrangement – leaves arranged with one leaf per node
Basal leaf arrangement – leaves arising from the base of the plant
Branchlets – branch-like structures in the macroalgae family Characeae
Bulbils – small asexual reproductive structures in the macroalgae family Characeae that form on rhizoids at the base of the macroalgae
Emergent plant – rooted plant that grows mostly above the water's surface
Finely divided leaf – leaf blade with numerous distinct divisions
Free-floating plant – plants that are not attached to the bottom of a water body
Hybridization – the process by which two different species interbreed to form a new species
Internode – the portion of a plant stem between leaf nodes
Lanceolate – shaped like a sword
Leaf arrangement – the way leaves are arranged on the stem and in relation to other leaves
Leaflet – one division of a finely divided or compound leaf
Margin – edge of leaf
Midvein – the central and usually the most prominent vein of a leaf
Node – the place on a plant stem where a leaf is attached
Opposite leaf arrangement – two leaves arranged opposite to one another on a stem
Perennial – living for more than two growing seasons
Petiole – the stalk of a leaf that attaches the leaf blade to the stem
Rhizoid – root-like structure in the macroalgae family Characeae
Rhizome – a modified root-like stem that is found underground
Rooted floating plant – plants with leaves floating on the water's surface with roots in the sediment
Rosette – a radiating cluster of leaves at the base of the plant
Sepals – outermost part of the flower, often green in color
Serrated leaf – toothed or saw-like edge of a leaf
Sessile – leaf attaches directly to the stem without a petiole
Sporocarp – a structure in aquatic ferns that produces and releases spores
Stolon – stem (often called runners) that grows horizontally from a plant above the sediment surface
Submersed plant – plants that grows mostly or entirely under the water
Tuber – root or stem structure produced to store nutrients, survive harsh conditions, or reproduce asexually
Turion – a vegetative dormant bud used for reproduction
Whorled leaf arrangement – leaves or other plant parts that radiate from a single point and surround or wrap around the stem

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Shaun Winterton, Aquarium and Pond Plants of the World, Edition 3, USDA APHIS PPQ S&T, via Bugwood.org ITP Node (pg. 36)

The Michigan Clean Water Corps (MiCorps) is Michigan's statewide volunteer lake and stream monitoring program. The program collects high-quality meaningful data, educates and informs the public, and fosters water stewardship. Training on aquatic plant identification and monitoring is available through this program.

For more information visit micorps.net

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