

MICHIGAN WATCH LIST

AQUATIC INVASIVE

PLANTS

A Guide for Identification



Illustrations by Bruce Kerr

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Notes for Use:

- Species in blue boxes are potential native look-a-likes. There may be additional species not presented.
- If you or your equipment have been in contact with invasive species please be sure to properly decontaminate prior to leaving a site to reduce the risk of spreading the species.

Welcome to the Michigan Watch List Aquatic Invasive Plant Guide. This guide is intended to aid in the identification of aquatic plants found on Michigan's watch list. Watch list species have been identified as posing an immediate or potential threat to Michigan's economy, environment, or human health. These plants have either never been confirmed in the wild in Michigan, or have a limited known distribution.

This guide provides distribution maps for each species using the most up to date information available at the time of the creation of this guide. Species distribution information can quickly become outdated. Please refer to the Midwest Invasive Species Information Network at www.MISIN.msu.edu for current maps.



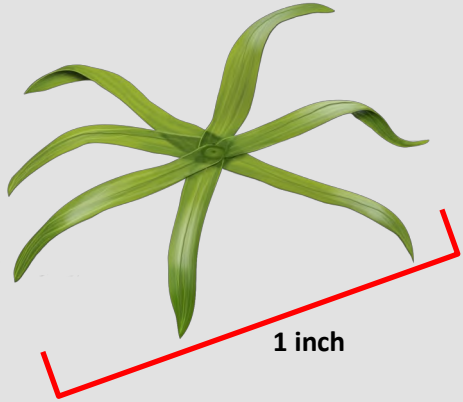
If you observe a watch list aquatic plant in Michigan, please report the location as soon as possible to the Department of Environment, Great Lakes, and Energy at egle-wrd-anc@mi.gov or 517-284-5593. If possible, please include pictures with reports. They help with species identification and may inform possible response actions.

Brazilian Elodea

Egeria densa

Flower

- 3 white petals with yellow center
- At or above water surface



Leaves

- Arranged in a whorl
- 4-8 leaves per whorl
- Leaf edges smooth to the touch

Plant

- Submerged
- Rooted or free-floating

Illustration by Bruce Kerr

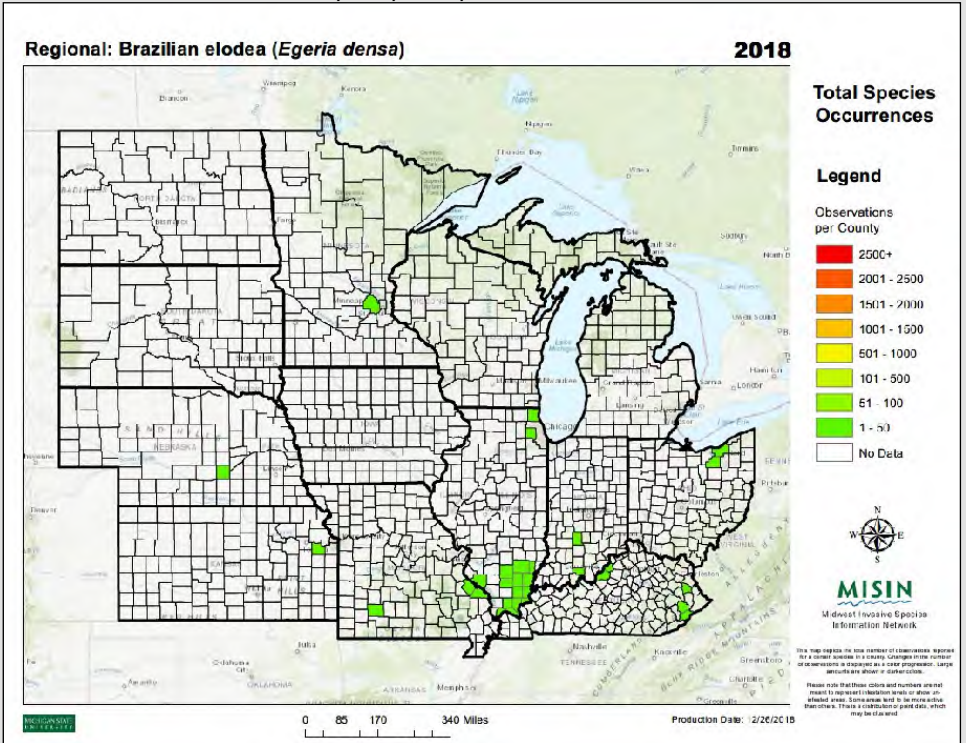
Native to: South America

Date of introduction to US: 1893

High risk pathways: Water garden/aquarium, boating

Legal status in Michigan: **Prohibited**

Known locations: IL, IN, MN, OH



Counties with Brazilian elodea sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

Native Look-a-likes

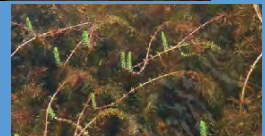
Elodea canadensis* and *E. nuttallii

- 3 leaves/whorl (rarely 4)



Hippuris vulgaris

- 6-12 leaves/whorl



European Frog-bit

Hydrocharis morsus-ranae

Plant

- Free-floating
- Rosette form
- Develops dense mats

Flower

- 3 white petals
- Yellow center

Turion

- Reproductive structure

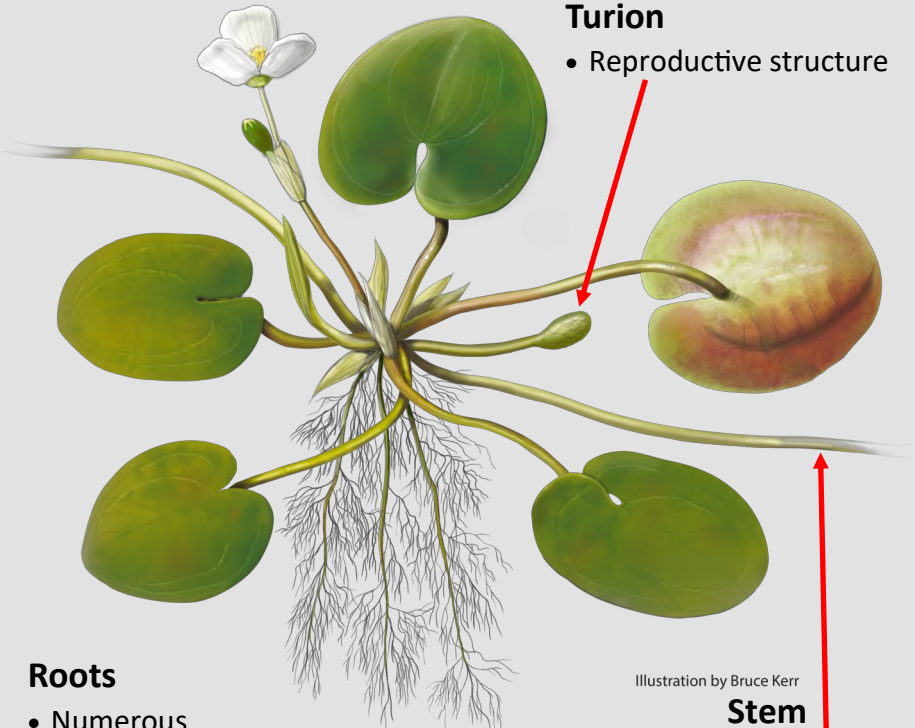


Illustration by Bruce Kerr

Stem

- Horizontal runners
- Produce new plants

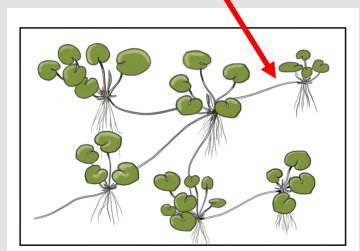
Roots

- Numerous
- Up to 12 inches (30.5cm) long

Leaves

- 0.5-2.25inches (1.3-6.3cm) across
- Round to heart-shaped
- Leathery

Illustrations by Bruce Kerr



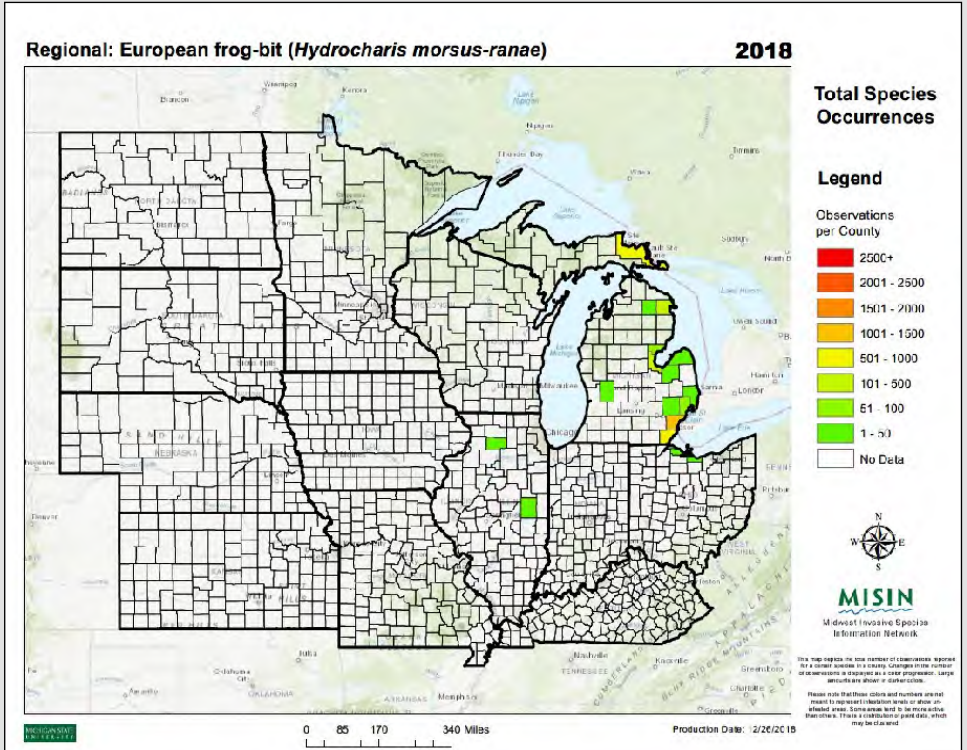
Native to: Europe, Asia, and Africa

Date of introduction to North America: 1932

High risk pathways: boating, hunting

Legal status in Michigan: **Prohibited**

Known locations: Eastern shore of Michigan, Kent County



Counties with European frog-bit sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

Native Look-a-likes

Young water lilies

- Large rhizome



European Water Clover

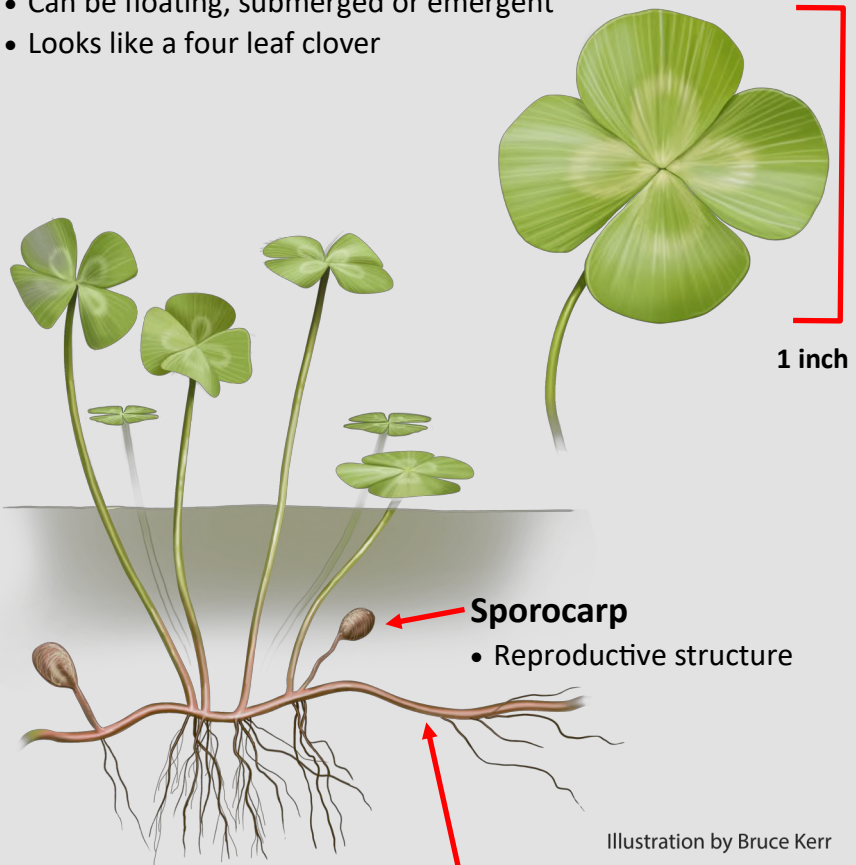
Marsilea quadrifolia

Plant

- Rooted
- Reproduces via spores
- Can grow on shore

Leaves

- Can be floating, submerged or emergent
- Looks like a four leaf clover



Sporocarp

- Reproductive structure

Stems

- Horizontal runners

Illustration by Bruce Kerr

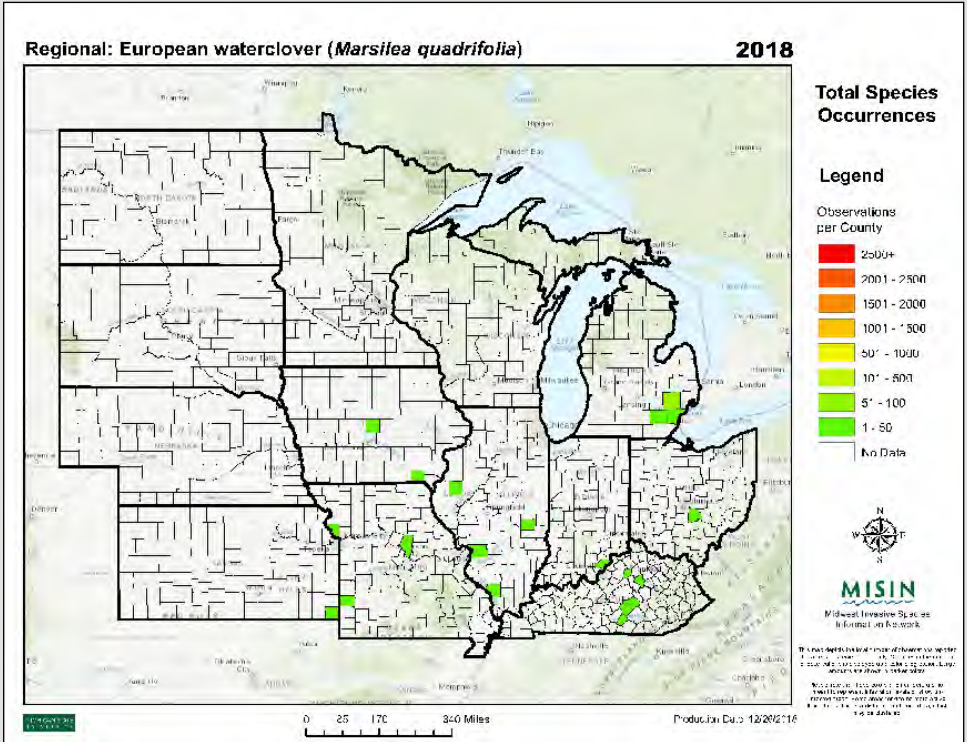
Native to: Europe

Date of introduction to North America: 1862

High risk pathways: Water garden/aquarium, boating

Legal status in Michigan: **Not Regulated***

Known locations: Southeast Michigan, IL, IN, OH



Counties with European water clover sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

No native Look-a-likes

*** This species is legal for sale and possession in Michigan. Please contact the DEQ if this species is observed outside of cultivation.**

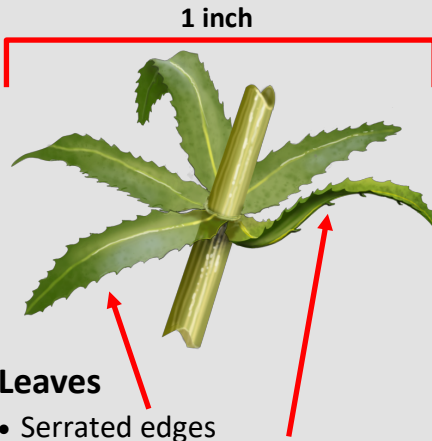
Hydrilla

Hydrilla verticillata



Plant

- Submerged
- Rooted or free-floating



Leaves

- Serrated edges
- Mid-vein has spines
- Arranged in whorls
- 4-8 leaves/whorl



Root

- Tuber

Illustration by Bruce Kerr

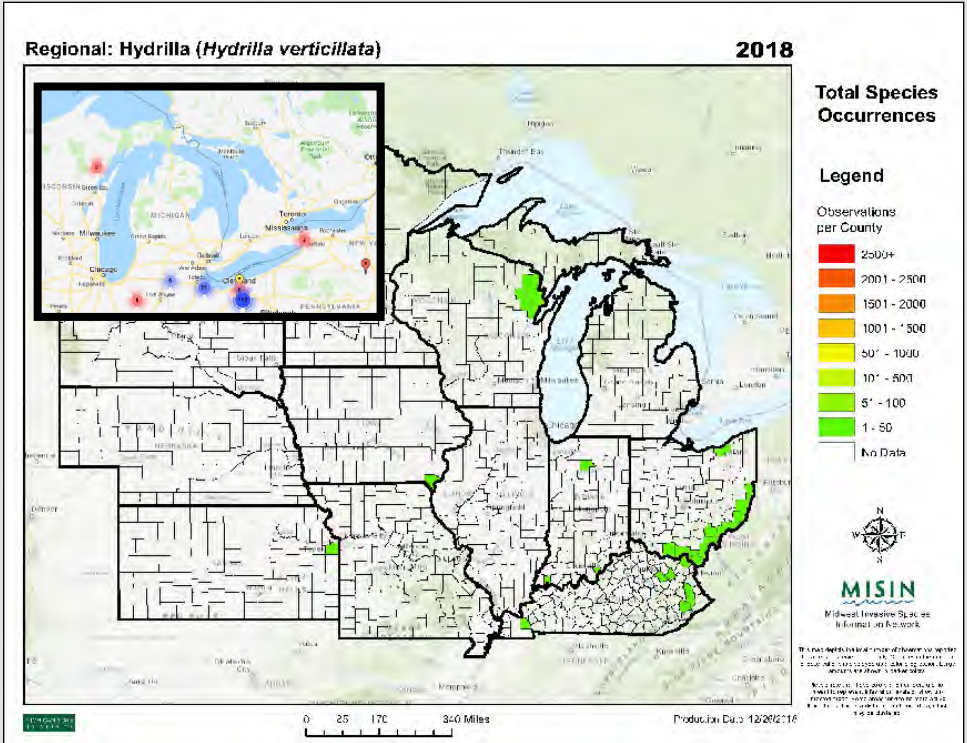
Native to: Asia, Africa, and Australia

Date of introduction to North America: 1950s

High risk pathways: Boating, water garden/aquarium

Legal status in Michigan: **Prohibited**

Known locations: IN, OH, NY, WI



Counties with hydrilla sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019. INSET: EDDMapS. 2019. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at <http://www.eddmaps.org/>; last accessed January 17, 2019.

Native Look-a-likes

Elodea canadensis and *E. nuttallii*

- 3 leaves/whorl (rarely 4)



Hippuris vulgaris

- 6-12 leaves/whorl
- Leaves lack serrated edges
- Stems may emerge



Parrot Feather Milfoil

Myriophyllum aquaticum

Plant

- Grows out of the water
- Sparse submerged leaves

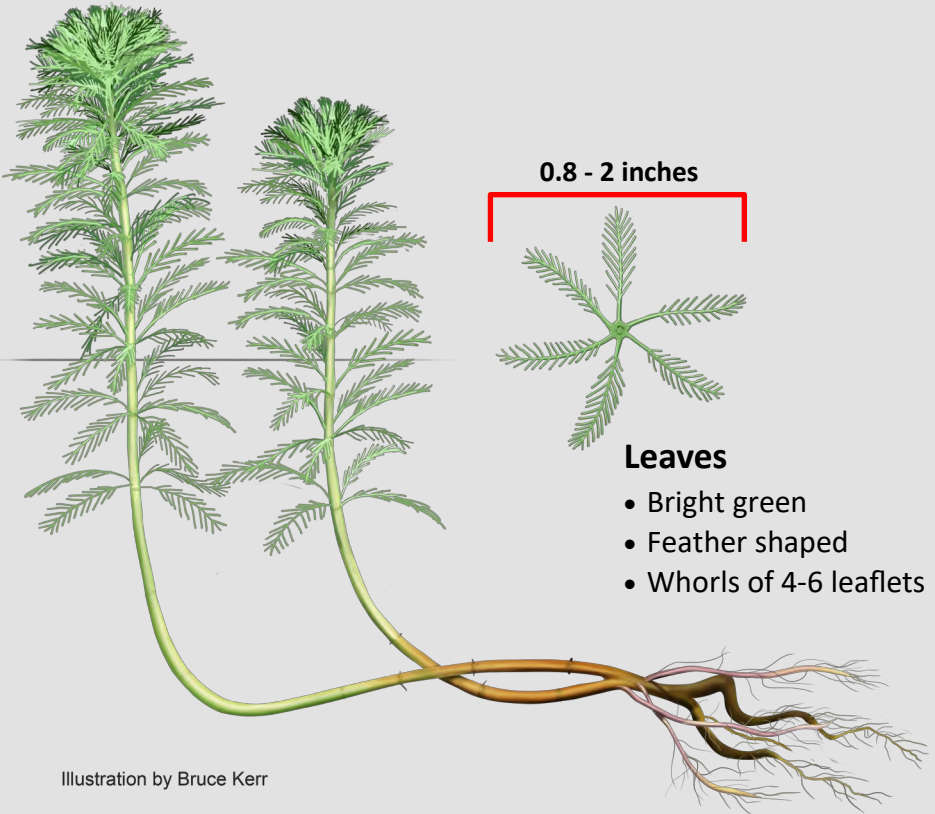


Illustration by Bruce Kerr

Leaves

- Bright green
- Feather shaped
- Whorls of 4-6 leaflets

Stem

- Submerged portion of stem tan to red colored
- Semi-rigid, less flexible than other milfoil species

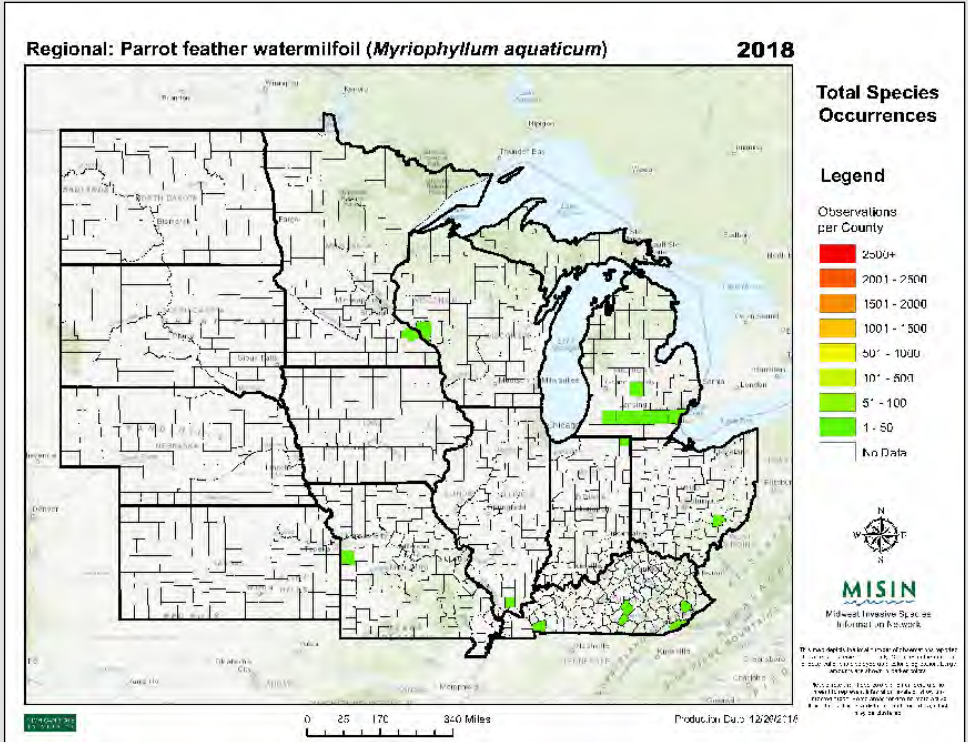
Native to: South America

Date of introduction to North America: 1890

High risk pathways: Water garden/aquarium, boating

Legal status in Michigan: **Prohibited**

Known locations: Southern Michigan, IL, IN, MN, OH, WI

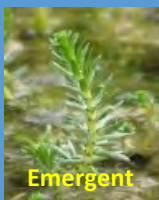


Counties with parrot feather sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

Native Look-a-likes

Variable leaf watermilfoil

- Emergent leaves not feathery
- Whorls <1cm apart



Hippuris vulgaris

- 6-12 leaves/whorl

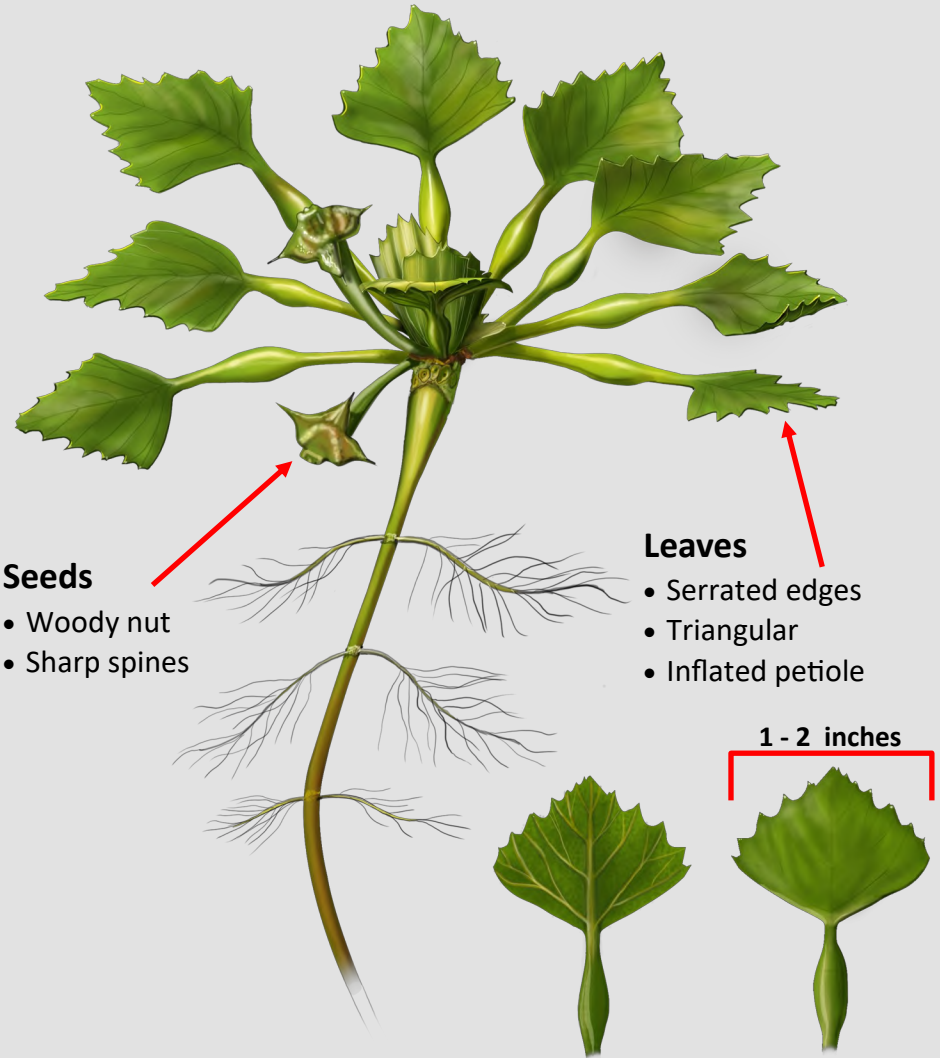


Water Chestnut

Trapa natans

Plant

- Floating Leaf
- Rosette



Seeds

- Woody nut
- Sharp spines

Leaves

- Serrated edges
- Triangular
- Inflated petiole

1 - 2 inches

Illustration by Bruce Kerr

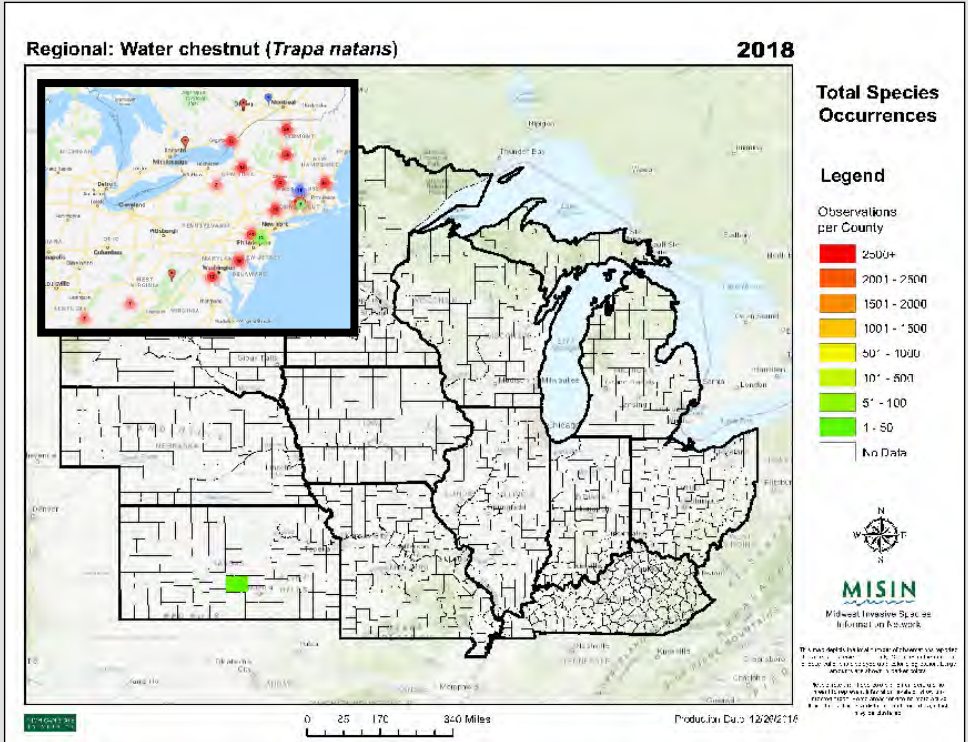
Native to: Europe, Asia, and Africa

Date of introduction to North America: 1932

High-risk pathways: Water garden, boating

Legal status in Michigan: **Prohibited**

Known locations: Canada, NY, PA



Counties with water chestnut sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

INSET: EDDMaps. 2019. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at <http://www.eddmaps.org/>; last accessed January 17, 2019.

No native Look-a-likes

Water Hyacinth

Eichhornia crassipes

Plant

- Floating
- Up to 3 feet tall

Leaves

- 2-6in (5-15cm) across
- Leathery
- Short bulbous petiole

Flower

- Terminal spike
- Blue to violet petals
- Yellow spot

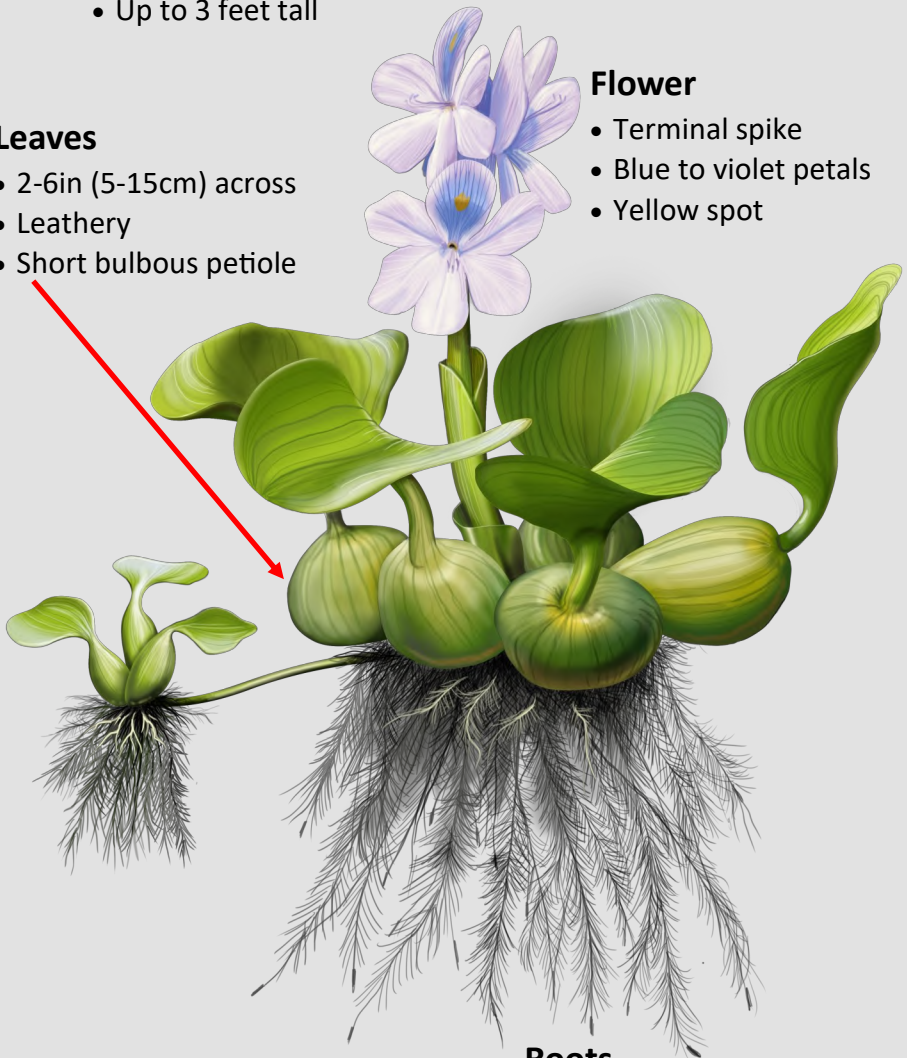


Illustration by Bruce Kerr

Roots

- Dense
- Feathery

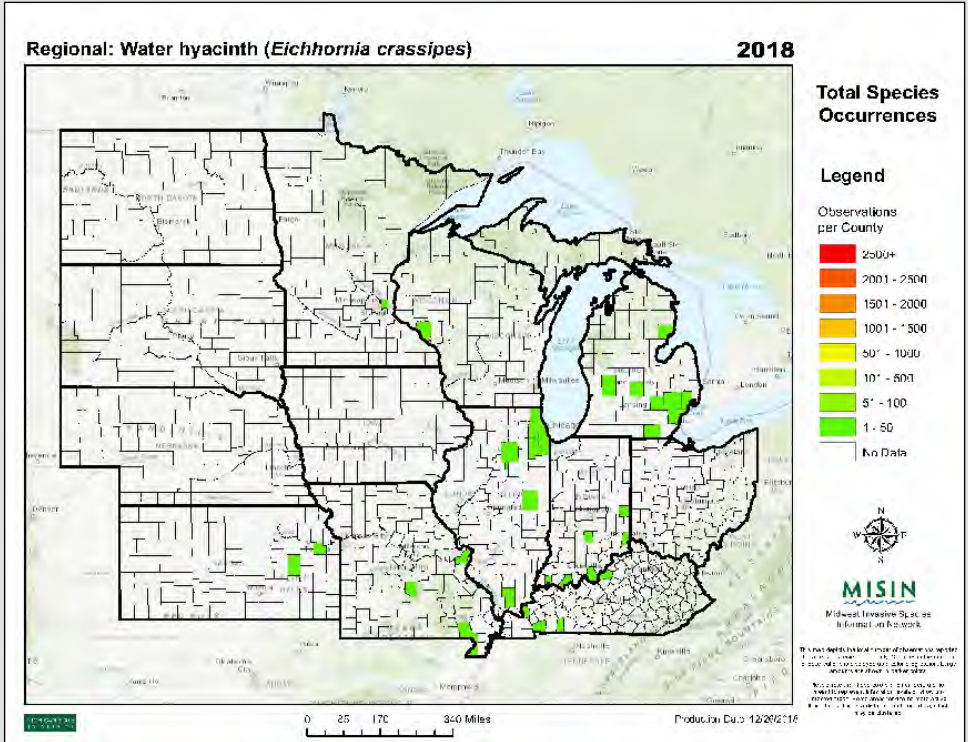
Native to: Brazil

Date of introduction to North America: 1884

High-risk pathways: Water garden/aquarium

Legal status in Michigan: **Not Regulated***

Known locations: Lower Michigan, IL, IN, MN, WI



Counties with water hyacinth sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

Native Look-a-likes

Pickerel weed

- Rooted emergent plant
- Pointed leaves
- Lacks bulbous petiole



* This species is legal for sale and possession. Please contact the DEQ if this species is observed outside of cultivation.

Water Lettuce

Pistia stratiotes

Plant

- Floating
- Up to 12 inches (30cm) across

Leaves

- Covered by soft white hairs
- Fan-shaped with 6-15 ribs
- Pale yellow-green

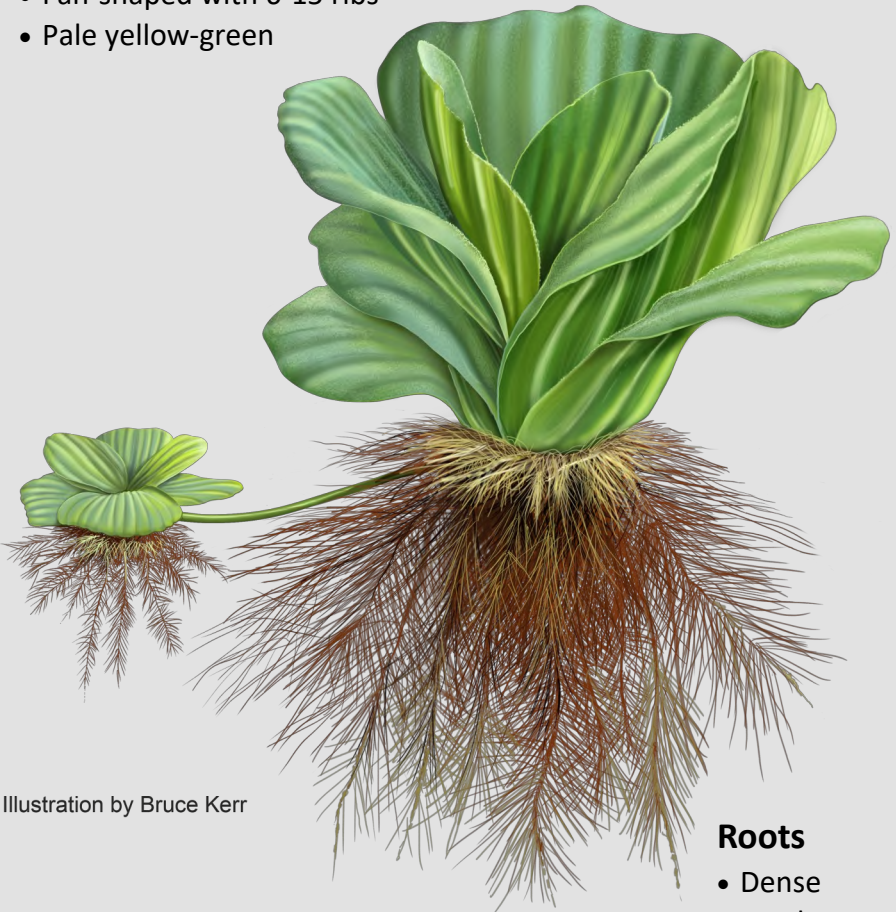
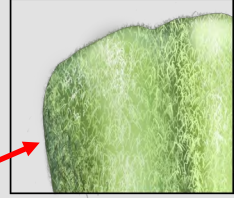


Illustration by Bruce Kerr

Roots

- Dense
- Feathery

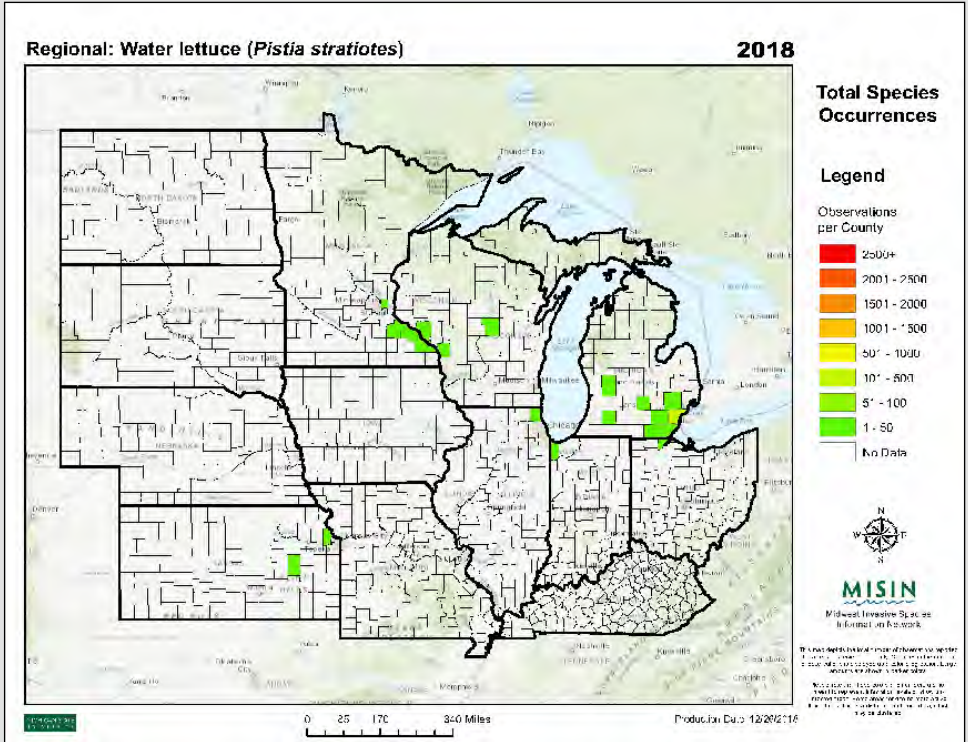
Native to: South America, Asia, and Africa

Date of introduction to North America: 1765

High-risk pathways: Water garden/aquarium

Legal status in Michigan: **Not Regulated***

Known locations: Lower Michigan, IL, IN, MN, WI



Counties with water lettuce sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

No native Look-a-likes

* This species is legal for sale and possession. Please contact the DEQ if this species is observed outside of cultivation.

Water Soldier

Stratiotes aloides

Plant

- Submerged or floating
- Large rosette

Leaves

- Up to 15 inches (38 cm) long
- Sharply serrated edges



Flower

- White
- Three petals

Illustration by Bruce Kerr

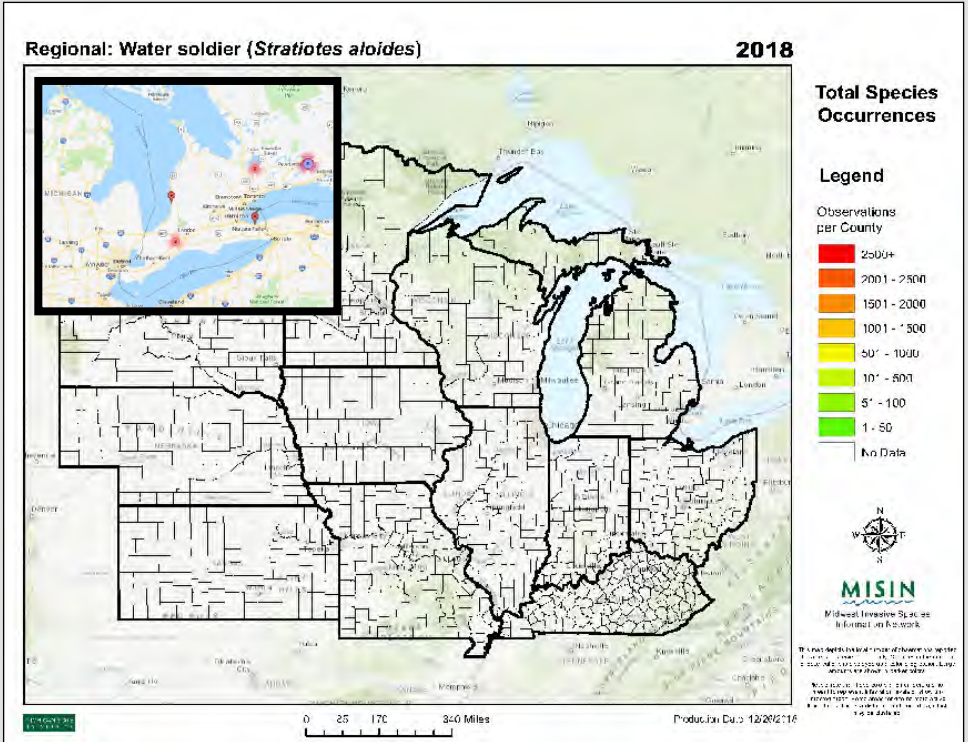
Native to: Europe and Asia

Date of introduction to North America: 2008

High-risk pathways: Boating, Water garden

Legal status in Michigan: **Prohibited**

Known locations: Canada



Counties with water soldier sightings, 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

INSET: EDDMaps. 2019. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at <http://www.eddmaps.org/>; last accessed January 17, 2019.

Native Look-a-likes



Bur-reed

- Lack serrated leaf edges



Grass-leaf arrowhead

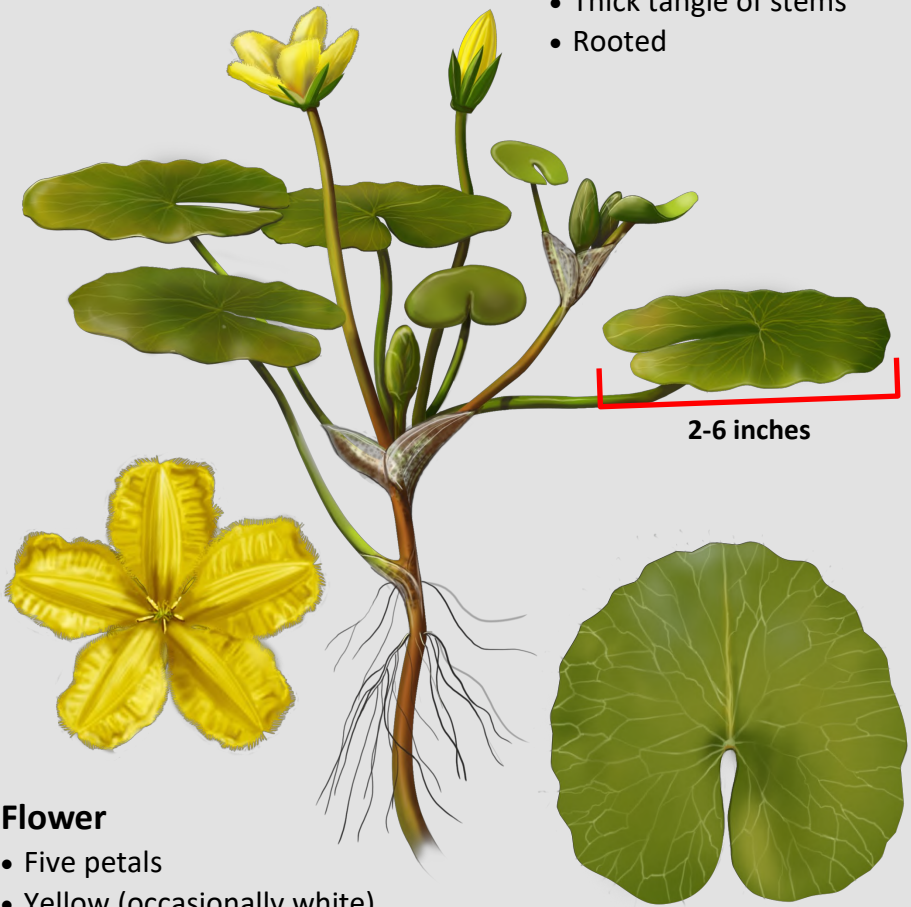
- Lack serrated leaf edges

Yellow Floating Heart

Nymphoides peltata

Plant

- Floating leaves
- Thick tangle of stems
- Rooted



Flower

- Five petals
- Yellow (occasionally white)
- Often with fringed petals

Leaves

- Round or heart-shaped
- Scalloped edges

Illustration by Bruce Kerr

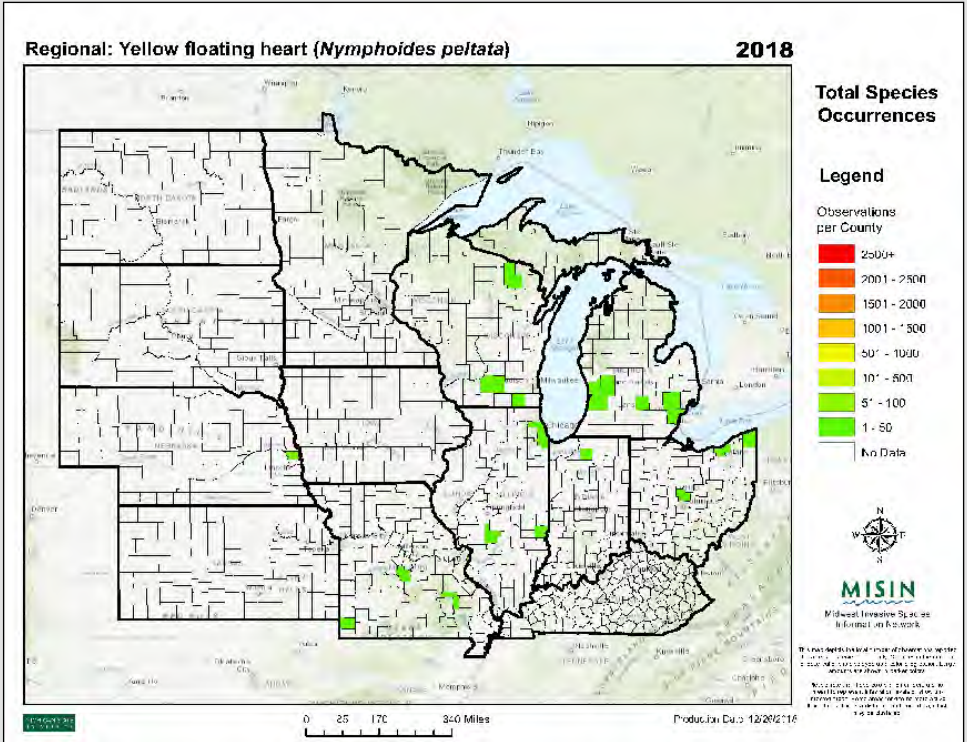
Native to: Asia and Mediterranean

Date of introduction to North America: 1890

High-risk pathways: Water garden/aquarium

Legal status in Michigan: **Prohibited**

Known locations: Southern Michigan, IL, IN, OH, WI



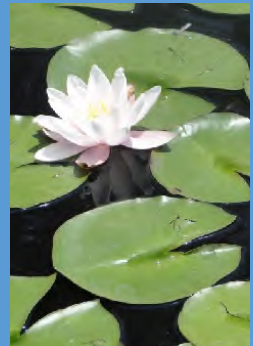
Counties with yellow floating heart sightings. 2019. Midwest Invasive Species Information Network. Available online at: MISIN.msu.edu; last accessed January 2019.

Native Look-a-likes



Native water lilies

- Lack scalloped edges
- Flowers



Tips to Reduce Invasive Species Spread

1. Proper fieldwork planning
 - Visit non-infested sites first
 - Work from the headwaters downstream
2. Avoid coming in contact with invasive species
 - Park on impervious surfaces
 - Use existing paths, sidewalks, and roads
3. Decontaminate all gear and vehicles on-site
 - Visually inspect & remove dirt, plants, and debris
 - Drain bilge, live wells, etc.
 - Disinfect using dilute bleach solution. Being sure not to allow bleach solution to enter waterbodies

To learn more about decontamination visit:

michigan.gov/invasives/0,5664,7-324-74328-368671--,00.html

Native plant image credits

Elodea: commons.wikimedia.org, [Wikipedia.com](https://www.wikipedia.com)

Hippuris vulgaris: www.michiganflora.net

Water lilies: commons.wikimedia.org, [flickr.com](https://www.flickr.com), austinbotany.wordpress.com

Variable leaf watermilfoil: flora.nhm-wein.ac.at, biodiversite.wallonie.be

Pickerel weed: gobotany.newenglandwild.org

Bur-reed: davislaz.files.wordpress.com

Grass-leaved arrowhead: greenaqua.hu



Michigan's Invasive Species Program is cooperatively implemented by the Michigan Department of Agriculture and Rural Development, Department of Natural Resources, and Department of Environment, Great Lakes, and Energy, and Natural Resources. For more information, visit michigan.gov/invasives. 800-662-9278