

# MICHIGAN WATCH LIST

## AQUATIC INVASIVE

### PLANTS

A Guide for Identification

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Illustrations by Bruce Kerr

## Table of Contents

Introduction .....	1
Brazilian Elodea .....	3
European Frog-bit .....	5
European Water Clover .....	7
Hydrilla .....	9
Parrot Feather Watermilfoil ....	11
Water Chestnut.....	13
Water Hyacinth.....	15
Water Lettuce.....	17
Water Soldier.....	19
Yellow Floating Heart .....	21


### 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.



**W**elcome 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 Species distribution information can quickly become outdated.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](http://www.MISIN.msu.edu) for current maps.



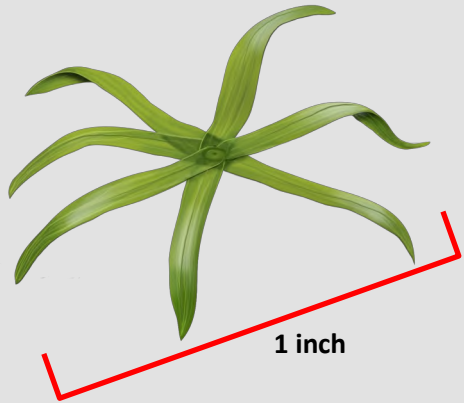
If you observe a watch list aquatic plant in Michigan, please report the location as soon as possible to the Department of Environment, Great Lakes, and Energy at [egle-wrd-anc@mi.gov](mailto:egle-wrd-anc@mi.gov) or 517-284-5593. If possible, please include pictures with reports. They help with species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

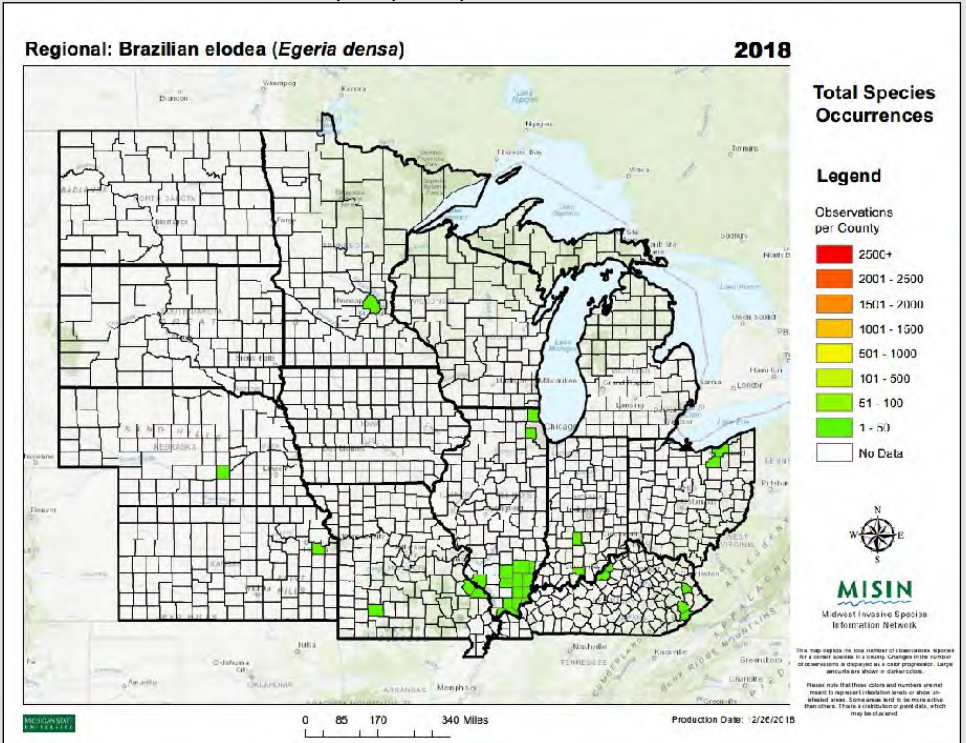
**Native to:** South America

**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](http://MISIN.msu.edu); last accessed January 2019.

## Native Look-a-likes

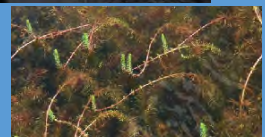
***Elodea canadensis* and *E. nuttallii***

- 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

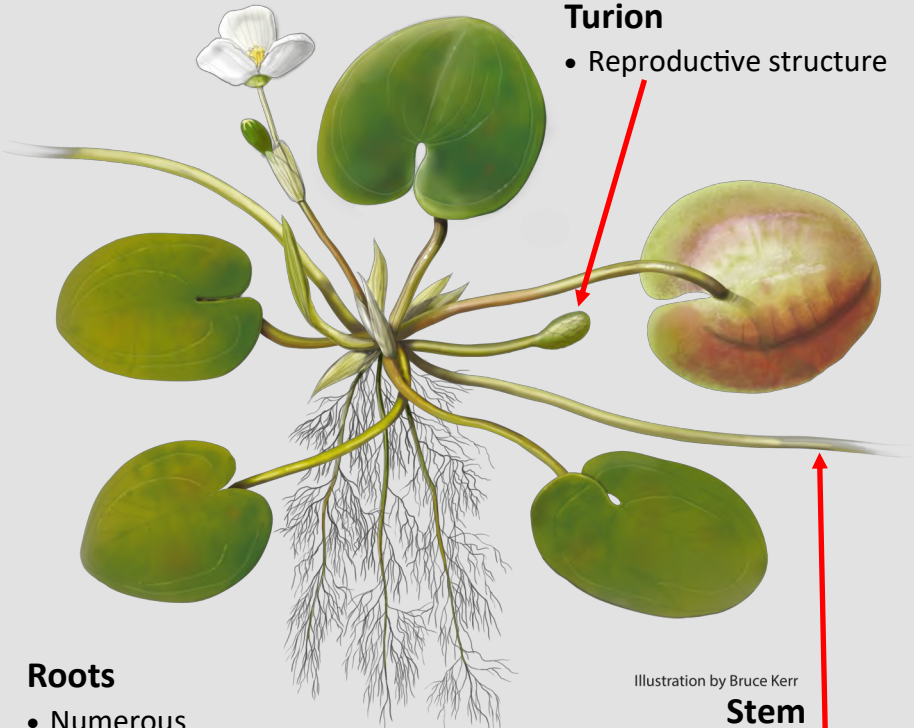


Illustration by Bruce Kerr

## Stem

- Horizontal runners
- Produce new plants

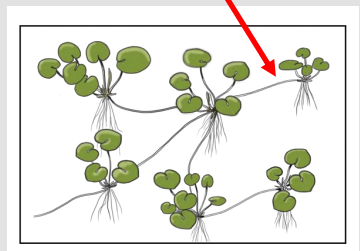
## Roots

- 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





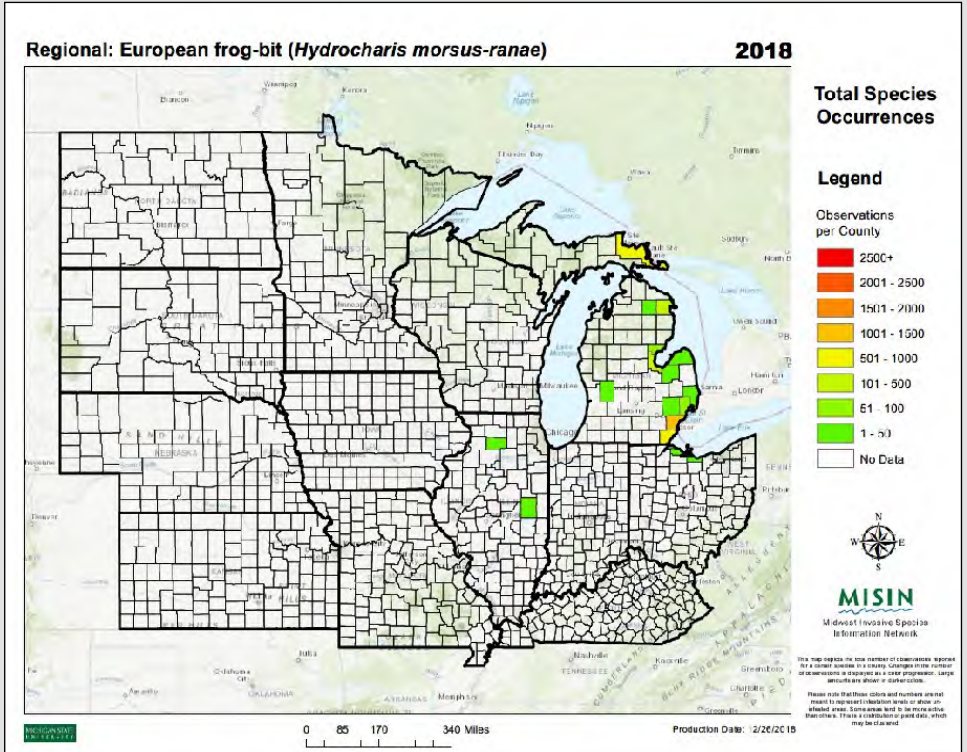
**Native to:** Europe, Asia, and Africa

**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](http://MISIN.msu.edu); last accessed January 2019.

## Native Look-a-likes

### Young water lilies

- Large rhizome



# European Water Clover

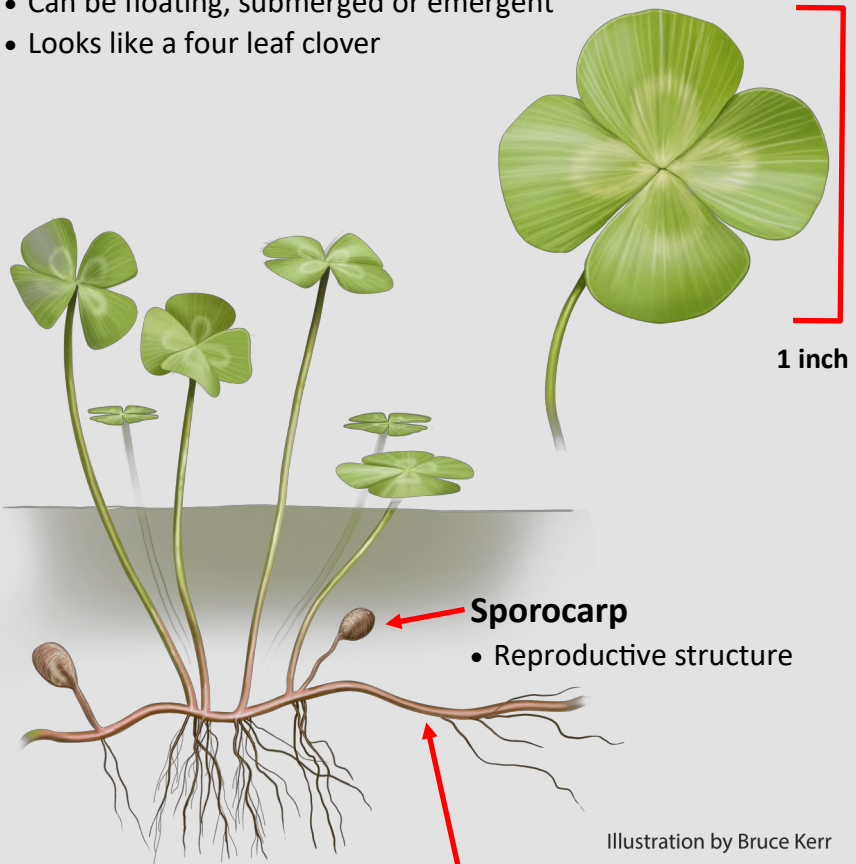
*Marsilea quadrifolia*

## Plant

- Rooted
- Reproduces via spores
- Can grow on shore

## Leaves

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



## Stems

- Horizontal runners

Illustration by Bruce Kerr



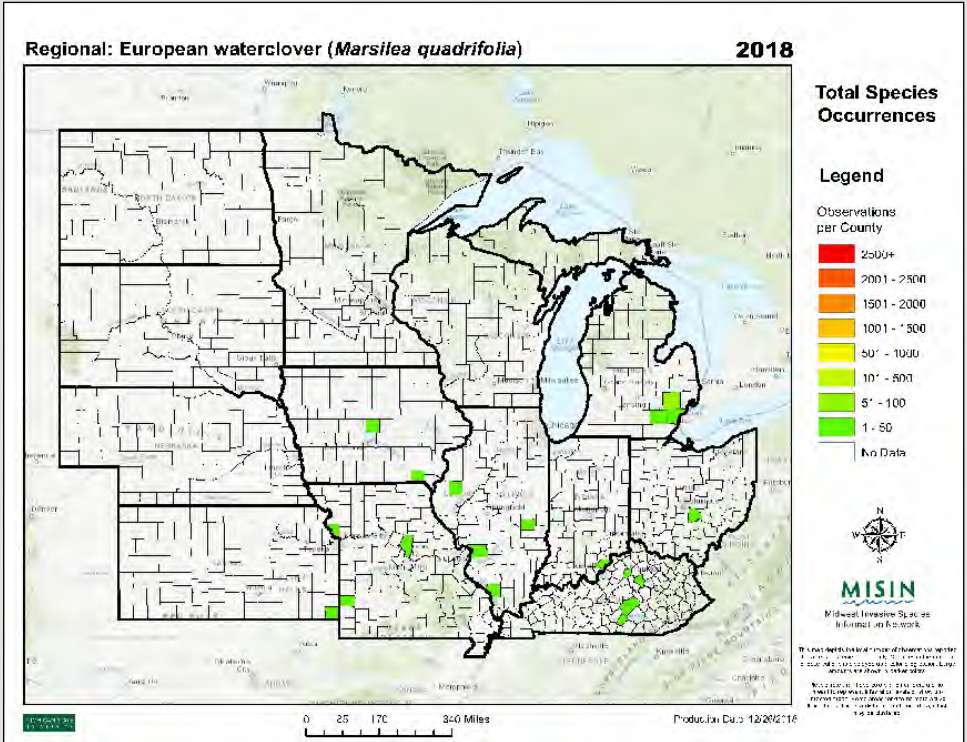
**Native to:** Europe

**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](http://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.**

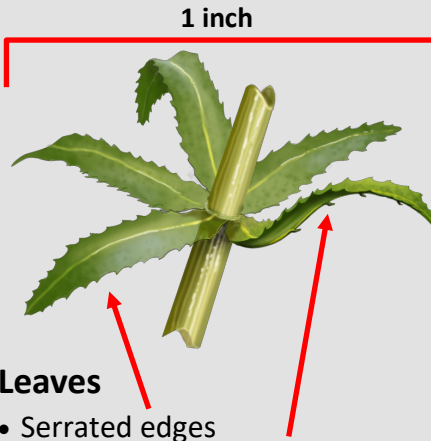
# Hydrilla

*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

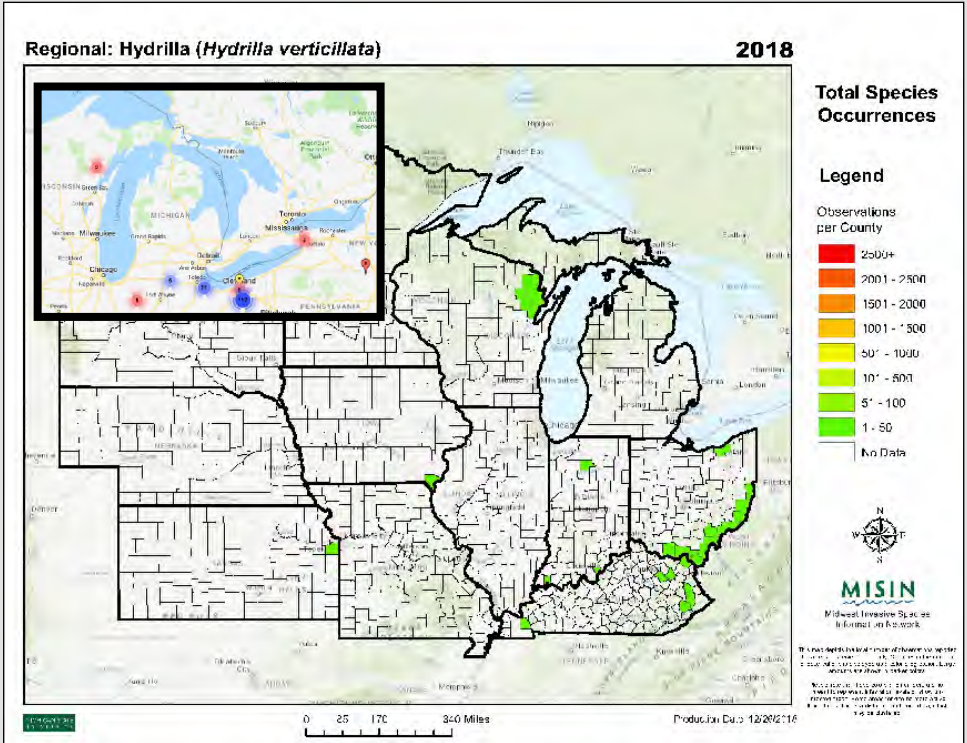
**Native to:** Asia, Africa, and Australia

**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](http://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

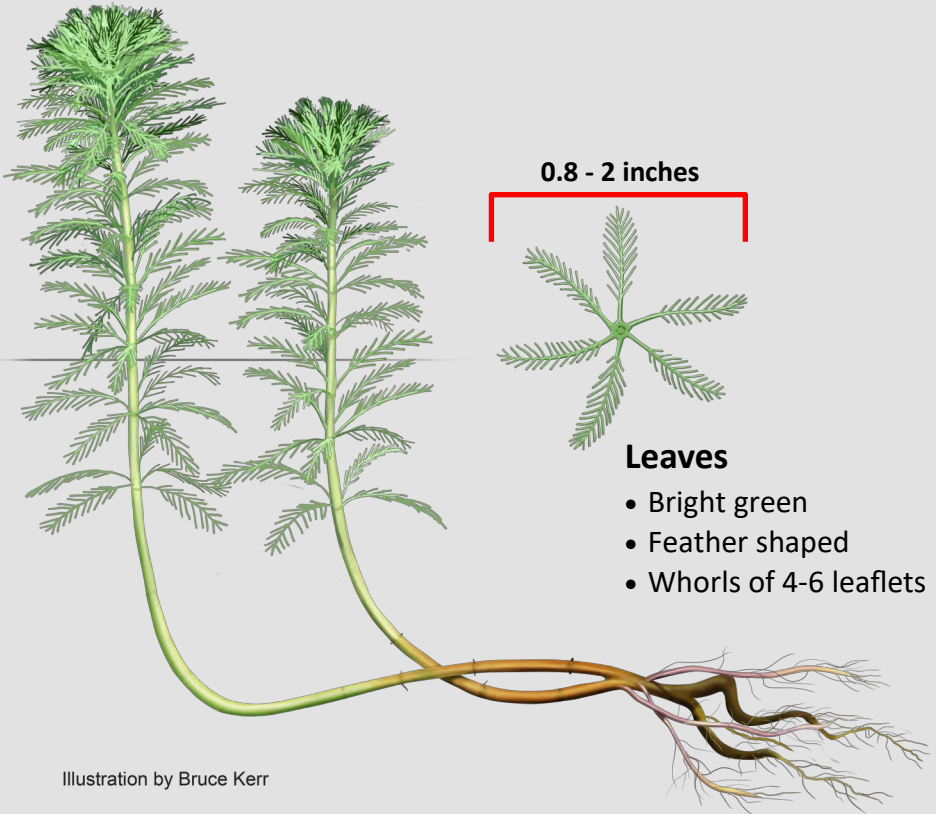


Illustration by Bruce Kerr

## 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

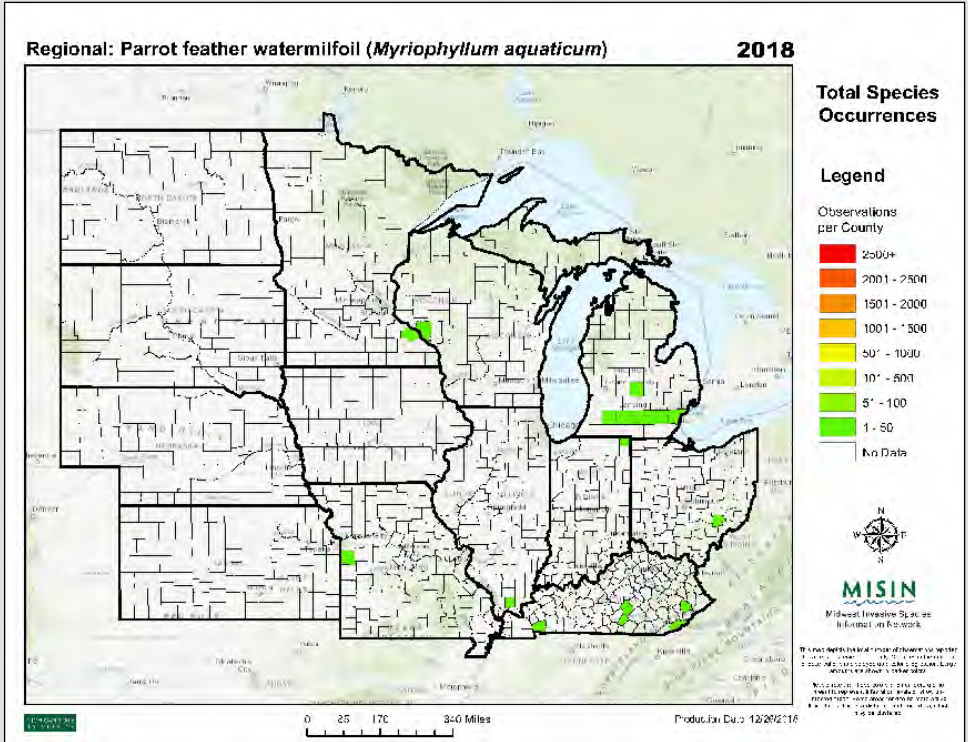
**Native to:** South America

**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

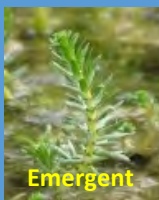


Counties with parrot feather sightings. 2019. Midwest Invasive Species Information Network. Available online at: [MISIN.msu.edu](http://MISIN.msu.edu); last accessed January 2019.

## Native Look-a-likes

### Variable leaf watermilfoil

- Emergent leaves not feathery
- Whorls <1cm apart



### Hippuris vulgaris

- 6-12 leaves/whorl

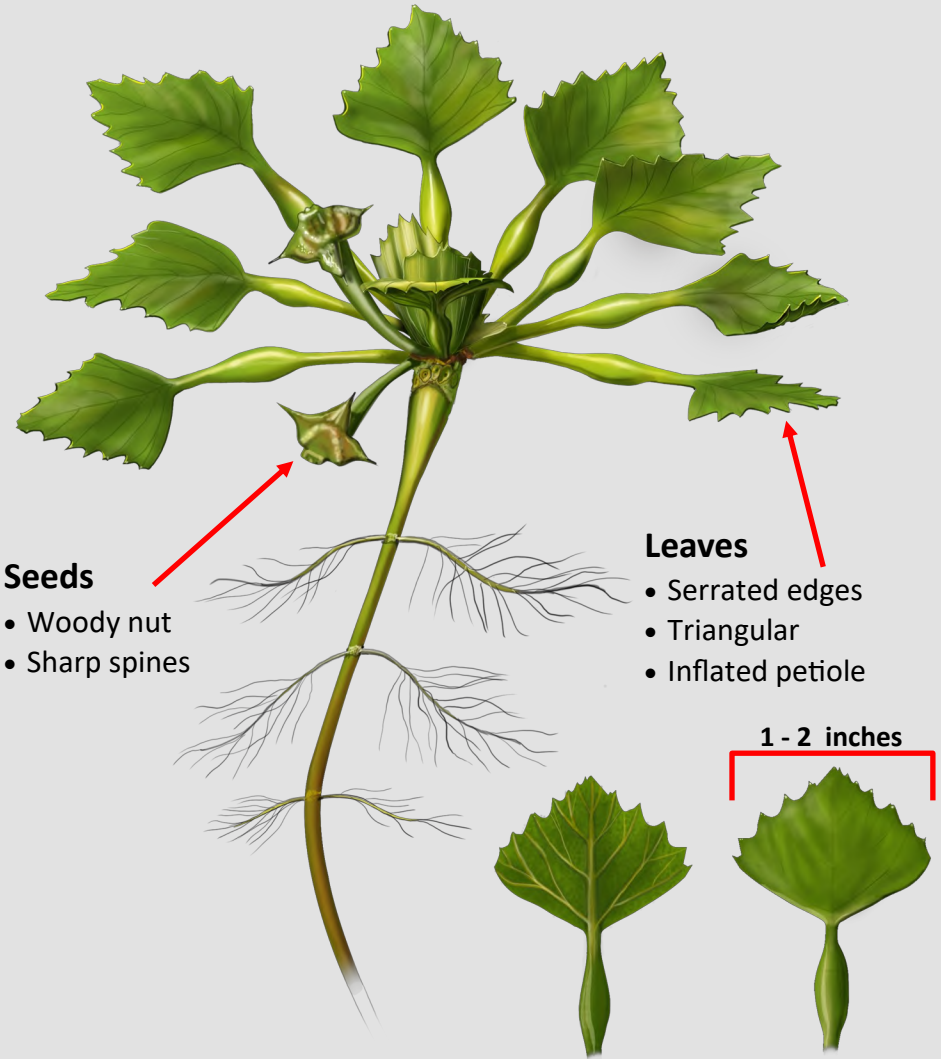


# Water Chestnut

*Trapa natans*

## Plant

- Floating Leaf
- Rosette



## Seeds

- Woody nut
- Sharp spines

## Leaves

- Serrated edges
- Triangular
- Inflated petiole

1 - 2 inches

Illustration by Bruce Kerr



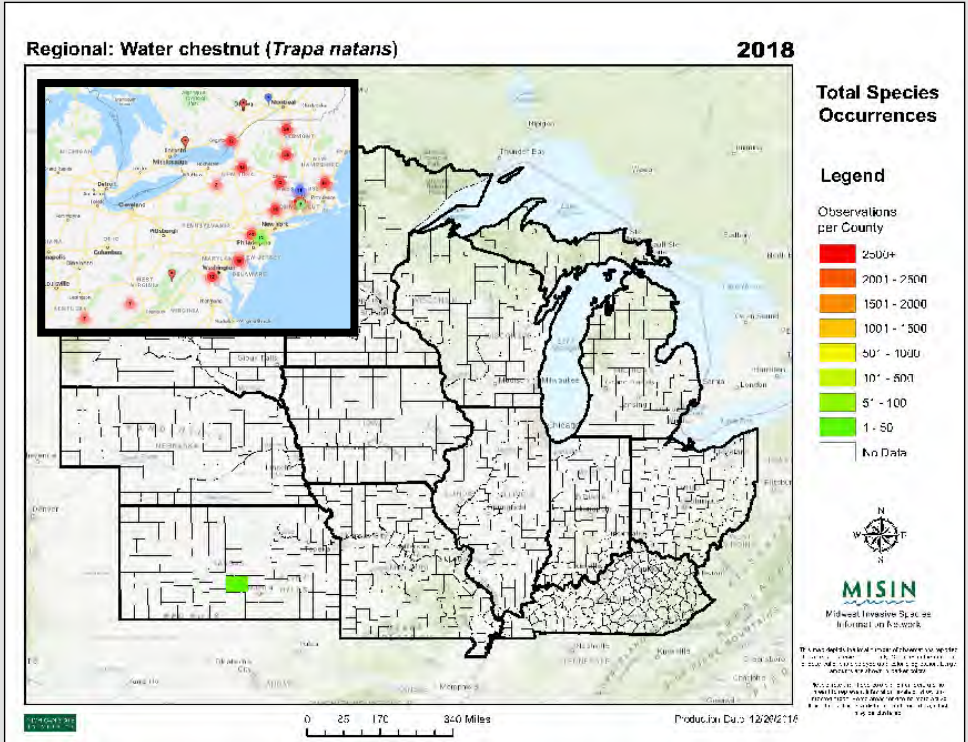
**Native to:** Europe, Asia, and Africa

**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](http://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

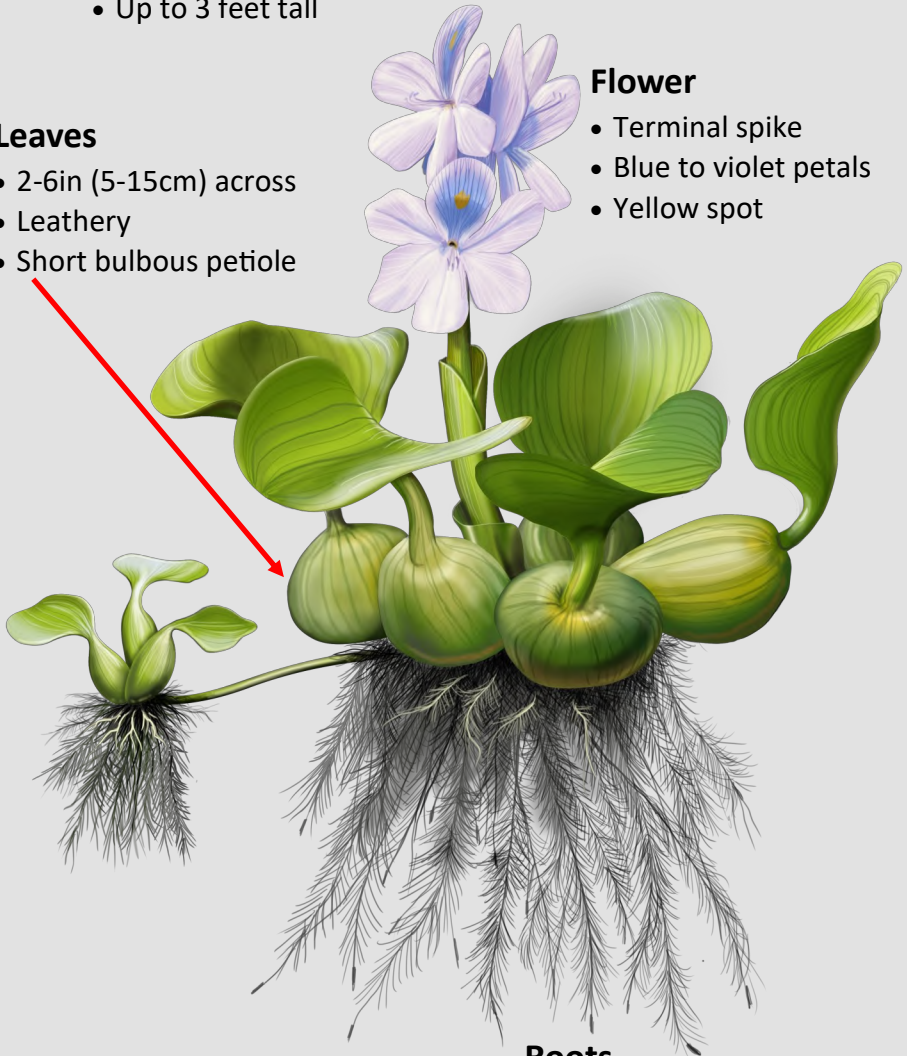


Illustration by Bruce Kerr

## Roots

- Dense
- Feathery

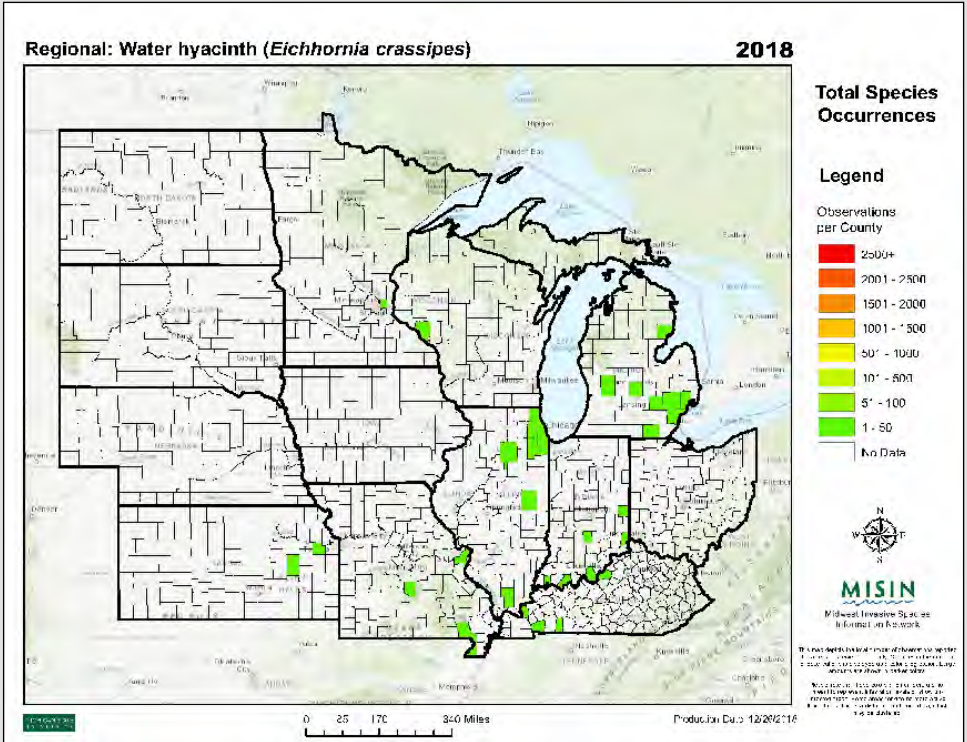
**Native to:** Brazil

**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](http://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

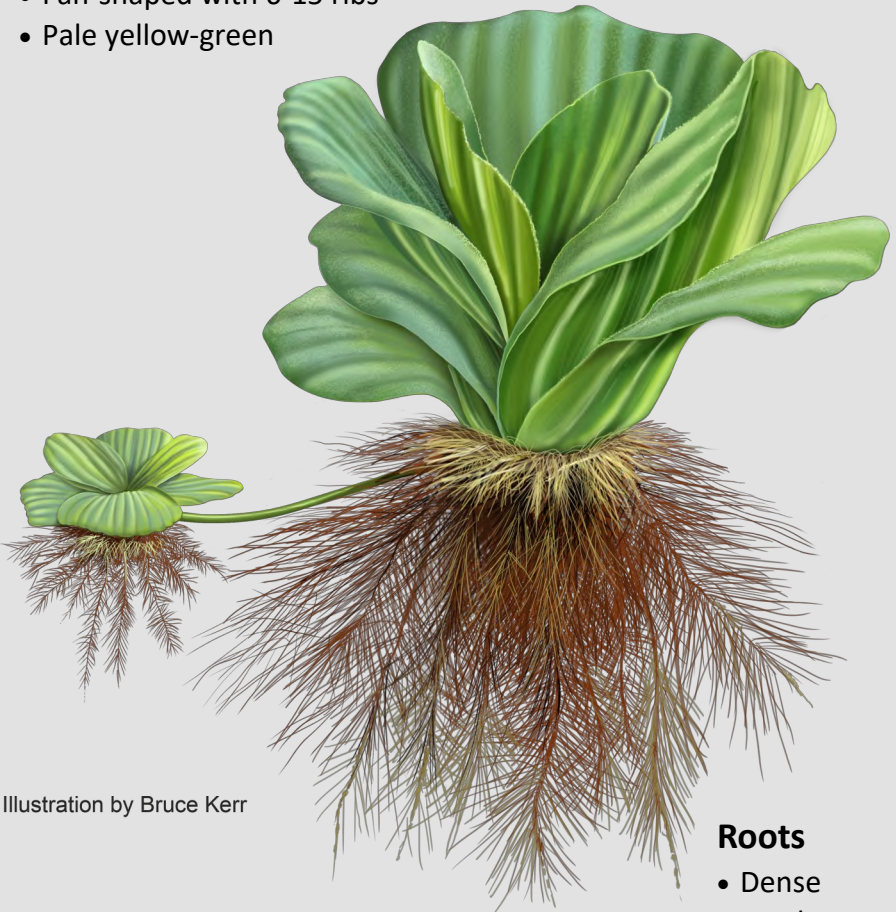
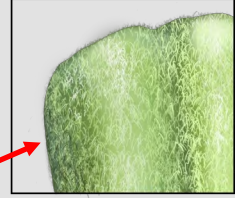


Illustration by Bruce Kerr

## Roots

- Dense
- Feathery

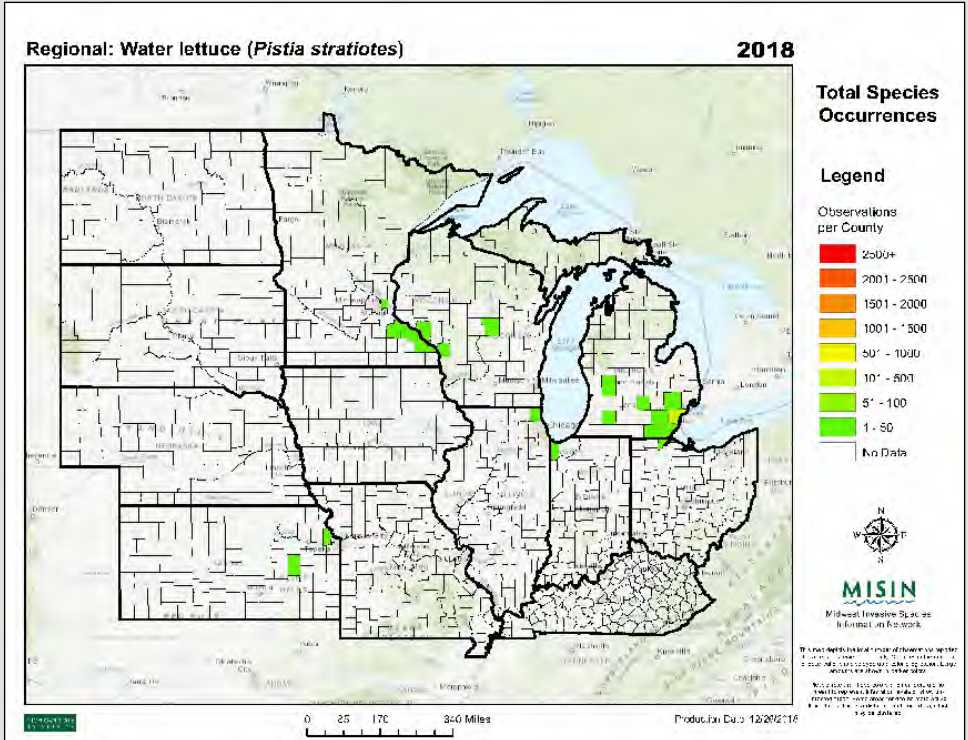
**Native to:** South America, Asia, and Africa

**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](http://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



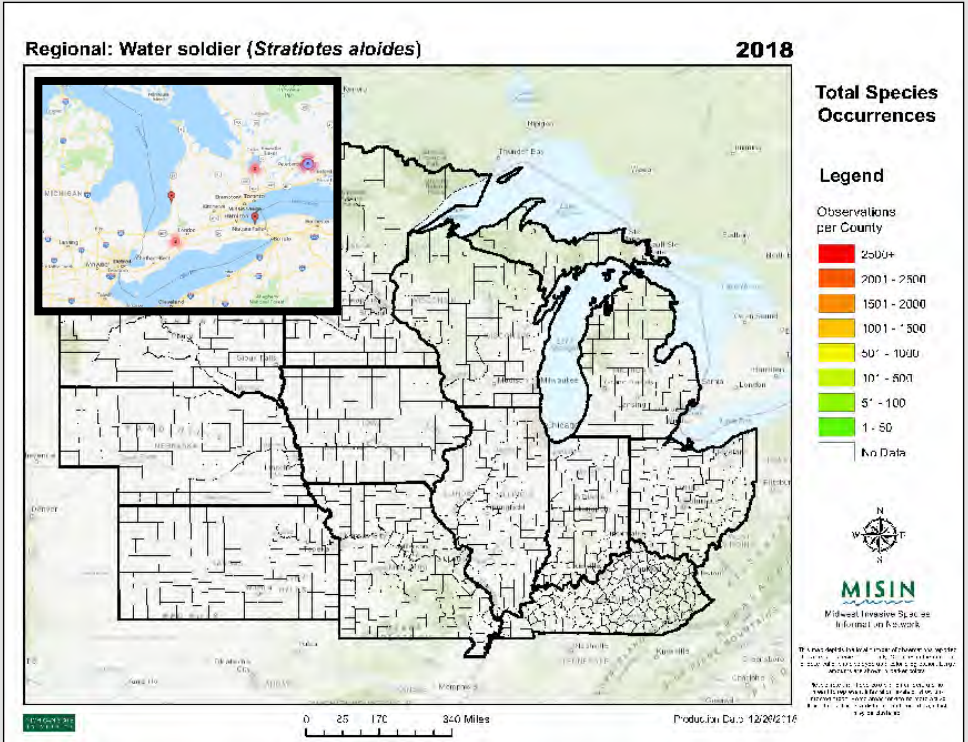
**Native to:** Europe and Asia

**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](http://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

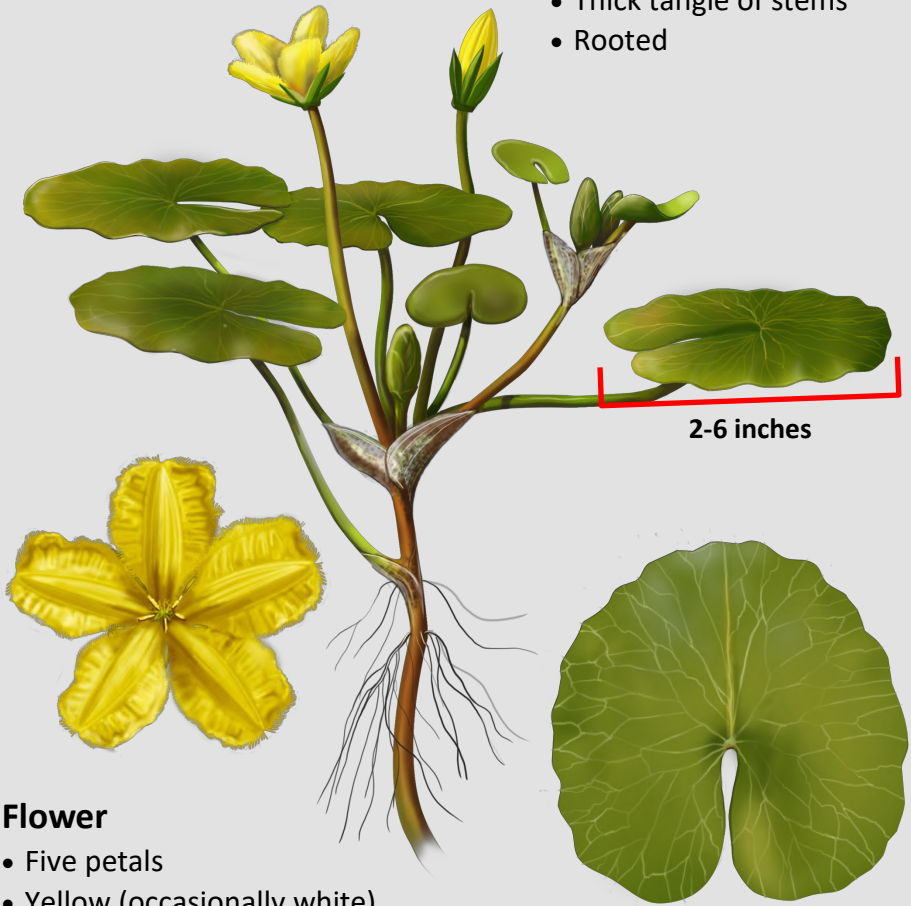
- Lack serrated leaf edges

# 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

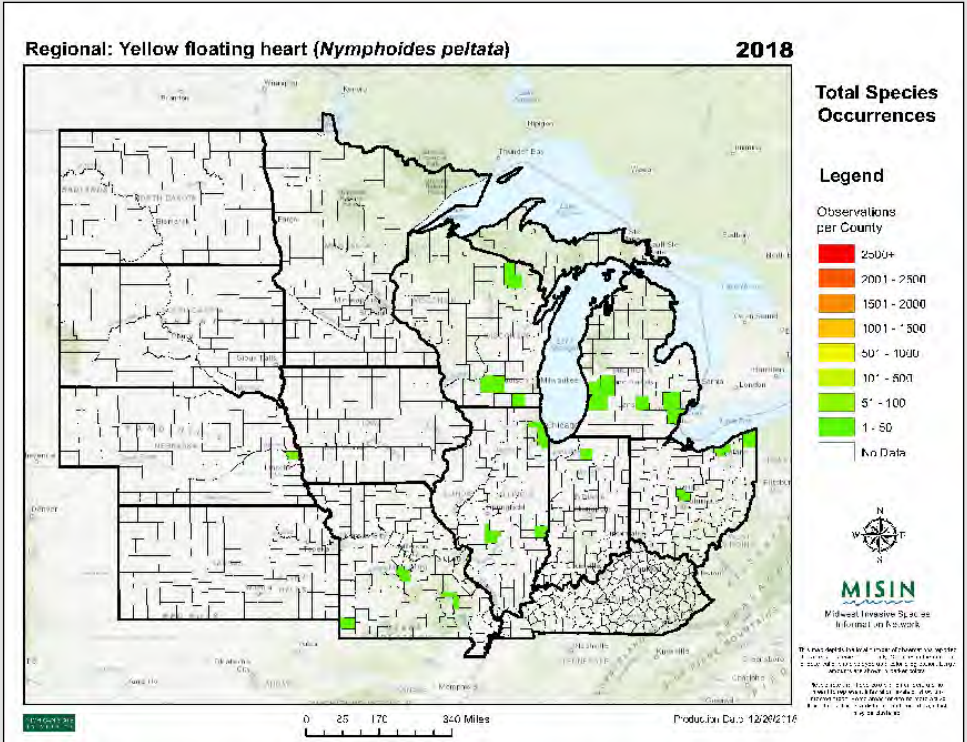
**Native to:** Asia and Mediterranean

**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



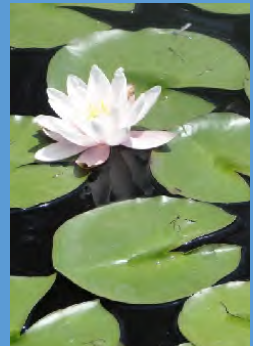
Counties with yellow floating heart sightings. 2019. Midwest Invasive Species Information Network. Available online at: [MISIN.msu.edu](http://MISIN.msu.edu); last accessed January 2019.

## 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](http://michigan.gov/invasives/0,5664,7-324-74328-368671--,00.html)

## Native plant image credits

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

Hippuris vulgaris: [www.michiganflora.net](http://www.michiganflora.net)

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

Variable leaf watermilfoil: [flora.nhm-wein.ac.at](http://flora.nhm-wein.ac.at), [biodiversite.wallonie.be](http://biodiversite.wallonie.be)

Pickerel weed: [gobotany.newenglandwild.org](http://gobotany.newenglandwild.org)

Bur-reed: [davislaz.files.wordpress.com](http://davislaz.files.wordpress.com)

Grass-leaved arrowhead: [greenaqua.hu](http://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](http://michigan.gov/invasives). 800-662-9278