

PLANTS OF MICHIGAN'S LAKES AND STREAMS

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AN UNDERWATER FOREST



Photo credit: "Through the Looking Glass"

Michigan fun facts

- 28 pondweed species
- 10 submersed carnivorous species
- 8 milfoil species

FOUNTAIN LAKE, WISCONSIN

JOHN MUIR MEMORIAL PARK THE LAND OF MY YOUTH

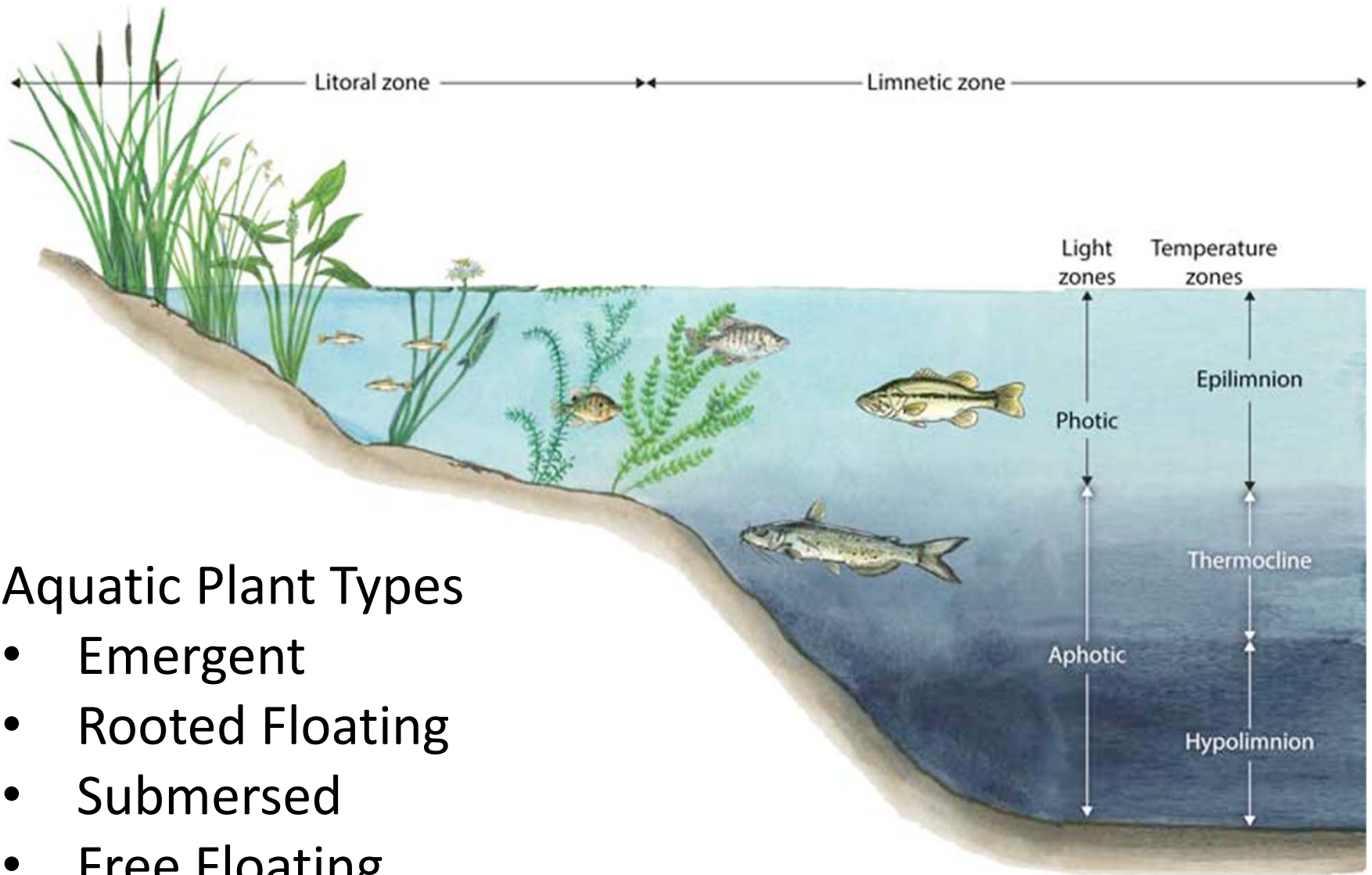
John Muir the Father of America's National Parks lived on the northeast side of this lake from 1849 to 1855. Although he travelled all over the world, Muir never forgot this land, and tried several times to buy and preserve parts of it, remarking:

... "even if I should never see it again, the beauty of its lillies and orchids is so pressed into my mind I shall always enjoy looking back at them in imagination even across seas and continents and perhaps after I am dead."

[The world beneath the waves...](#)

AQUATIC PLANT COMMUNITIES

A TRANSITION FROM LAND TO WATER



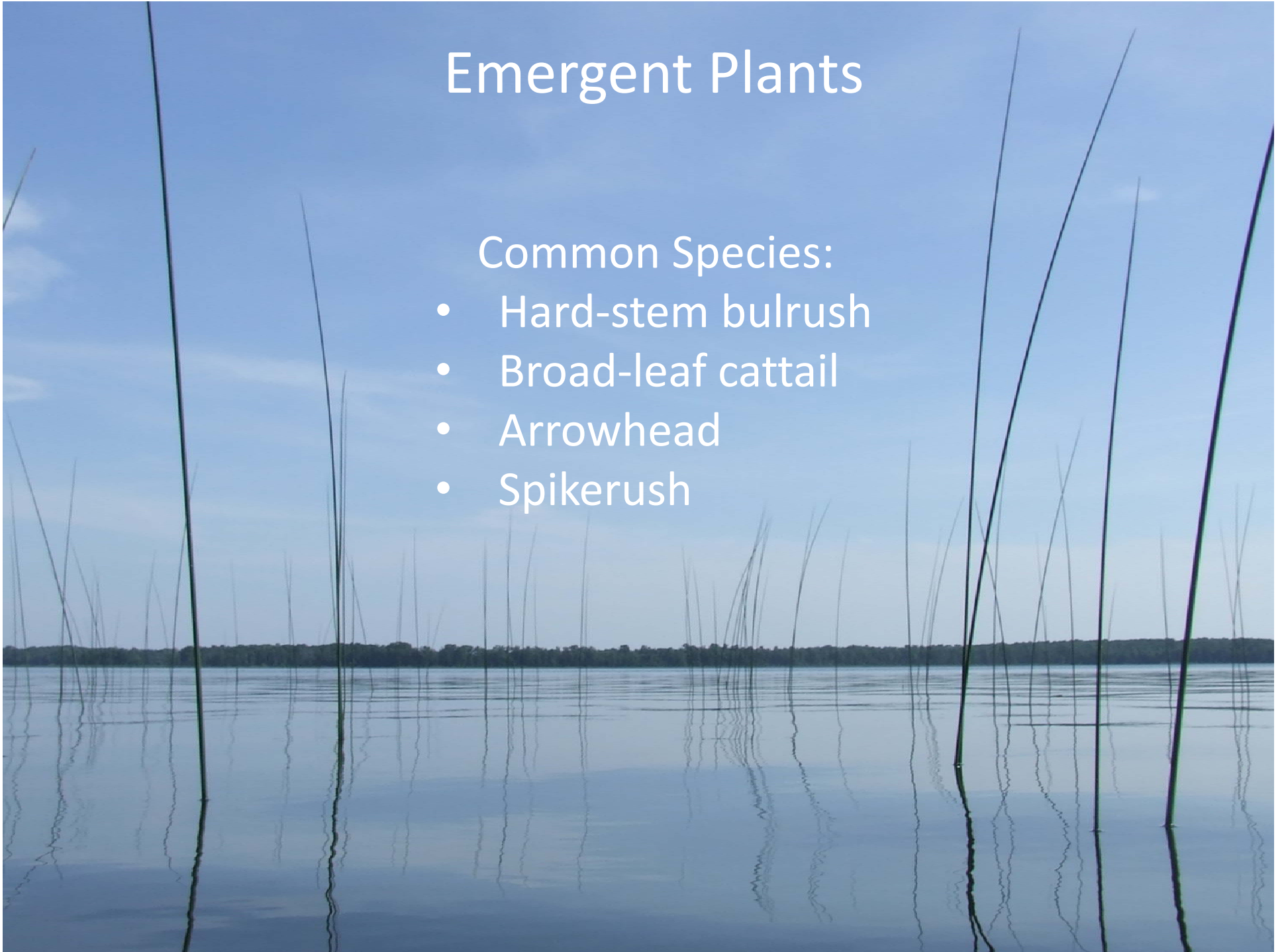
Aquatic Plant Types

- Emergent
- Rooted Floating
- Submersed
- Free Floating

Emergent Plants

Common Species:

- Hard-stem bulrush
- Broad-leaf cattail
- Arrowhead
- Spikerush



Floating-Leaf Plants

Common Species:

- Yellow water lily
- White water lily
- Water shield
- Floating leaf pondweed



Submersed Plants

Common Species:

- Pondweeds
- Milfoils
- Bladderworts
- Chara



2018 © Peter M. Dziuk

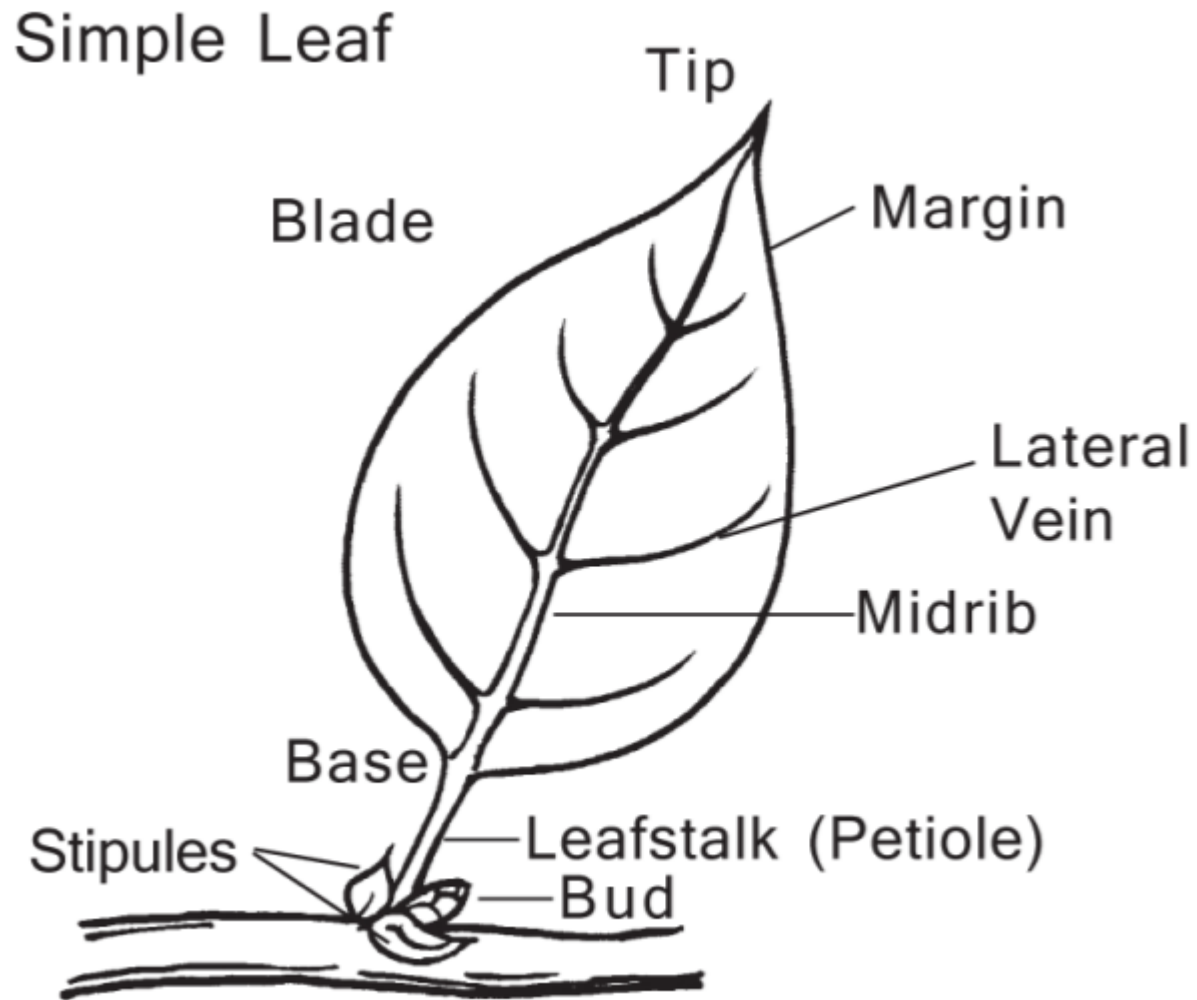


Free Floating

Common Species:

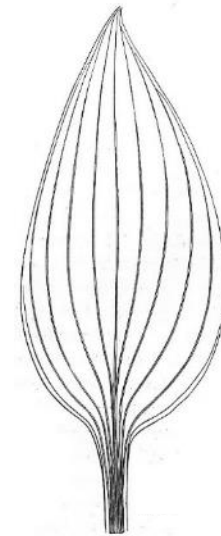
- **Duckweed**
- **Watermeal**

General Plant Identification

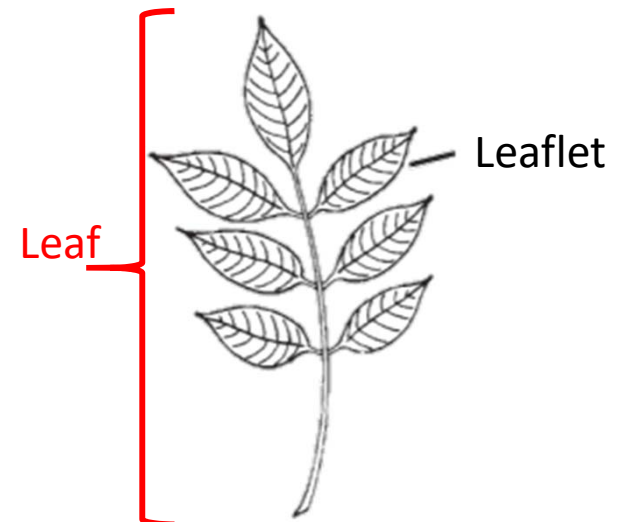
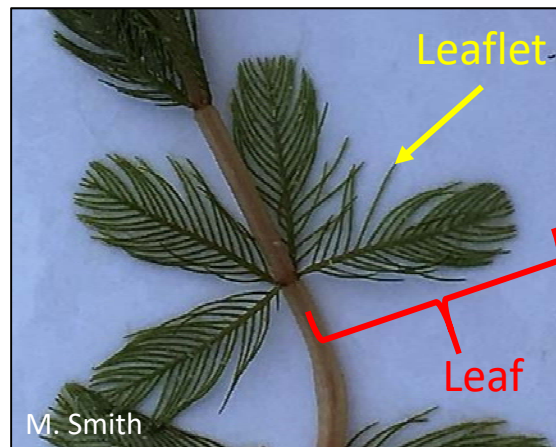


AQUATIC PLANT ANATOMY – LEAF TYPE

- Simple



- Finely Divided (compound)



Finely Divided Leaves



Feather-like
or
Christmas Tree like



Forked

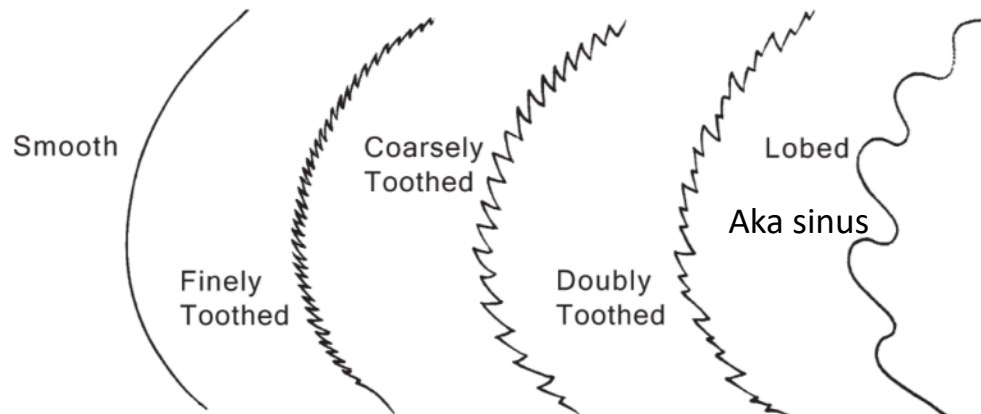


Branched (forked multiple times)

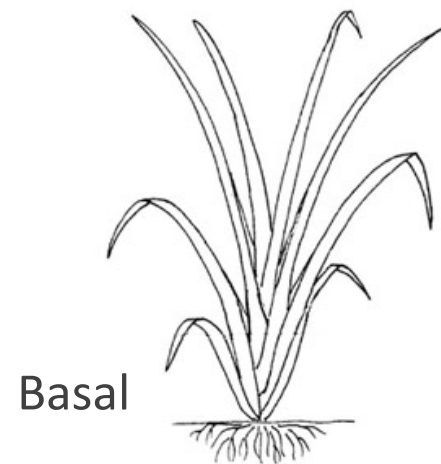
Aquatic Plant Anatomy – Leaf Margin



Leaf Margins

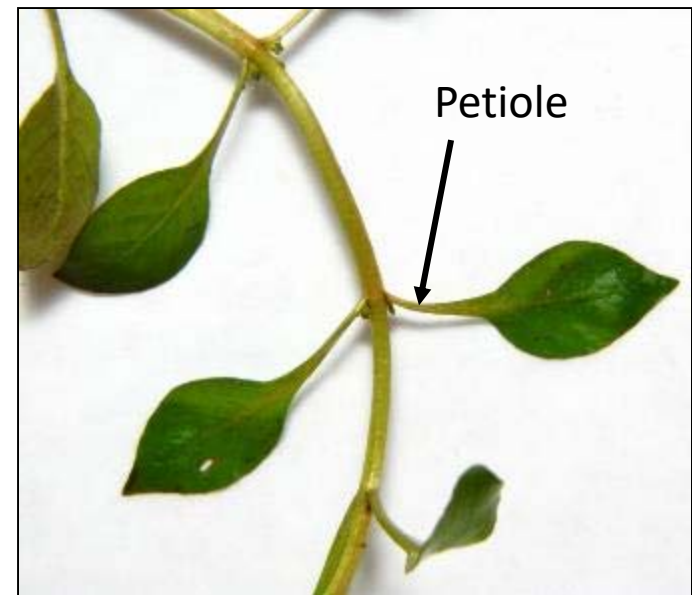


Aquatic Plant Anatomy – Leaf Arrangement



Aquatic Plant Anatomy – Leaf Attachment

Clasping



Sessile



STEP BY STEP PLANT ID

WHITESTEM PONDWEED

Key Characters:

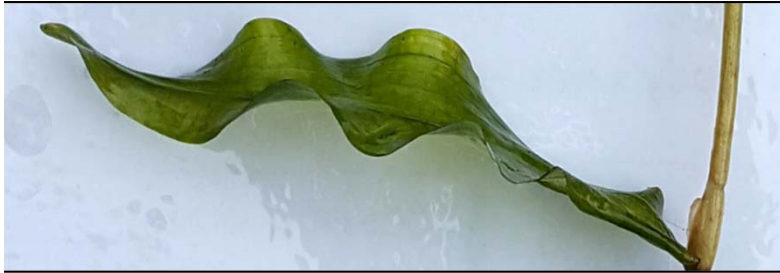
Simple leaves

Obvious midvein

Alternate leaf arrangement

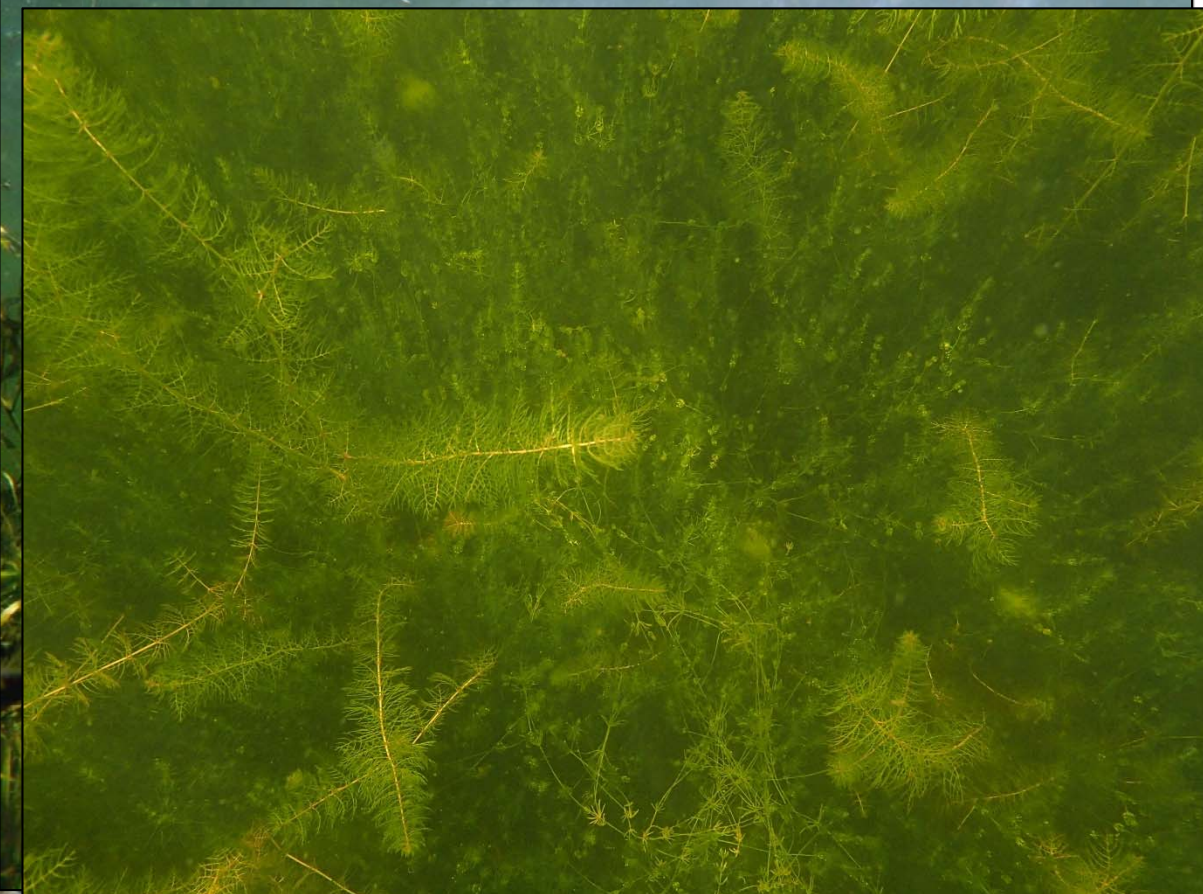
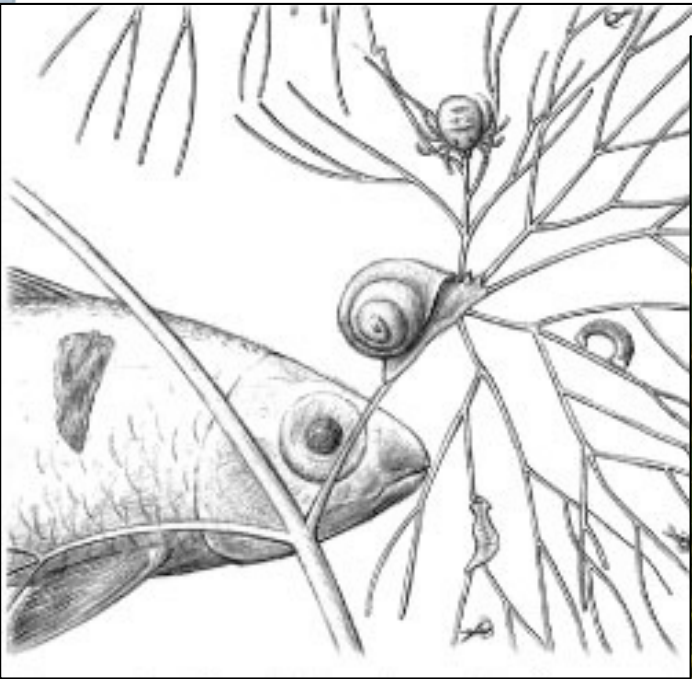
Leaf is hugging the stem

Leaf tip splits when pressed



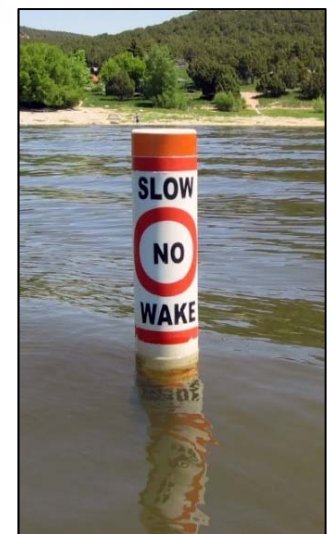
IMPORTANCE OF AQUATIC PLANTS

- Shoreline & Sediment Protection



AQUATIC PLANT STEWARDSHIP

1. Protect native plants
 - Reduce disturbance & removal
 - Avoid hardening shorelines
 - Enjoy them!
 - Snorkel
 - Fishing
2. Properly manage invasive species

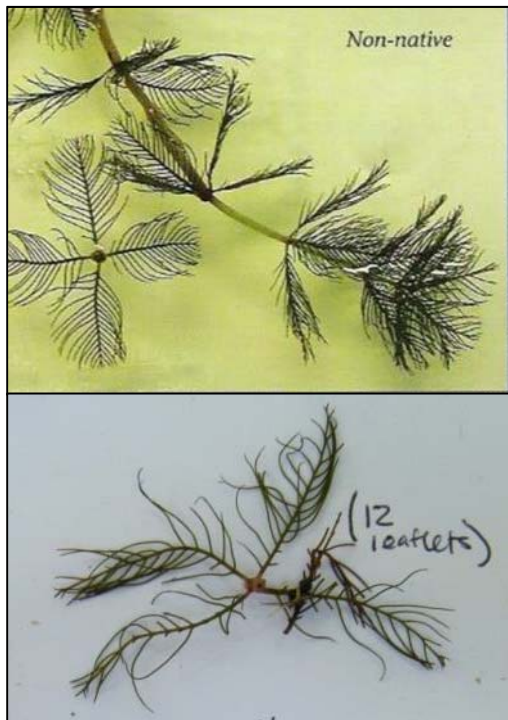


INVASIVE SPECIES



ESTABLISHED SUBMERSED AQUATIC INVASIVE PLANTS IN MICHIGAN

Eurasian milfoil
Myriophyllum spicatum



Curly-leaf pondweed
Potamogeton crispus



Starry stonewort
Nitellopsis obtusa



Modified from MiCorps Exotic Aquatic Plant Watch

EURASIAN WATERMILFOIL

MYRIOPHYLLUM SPICATUM

Photo by
Richard Old
www.kidservices.com



Key Characters:

- Feather-like leaves
- Leaves with **12 – 21** pairs of leaflets
- Leaves limp out of water
- Pinkish stem

Trivia:

- Originally from Europe
- First described by Carlos Linnaeus in 1753
- Reproduces readily by fragmentation
- Has difficulty invading lakes with well developed native plants

IS THIS EURASIAN MILFOIL?



CURLY-LEAF PONDWEED

POTAMOGETON CRISPUS



Key Characters:

Simple leaves

Obvious midvein

Alternate leaf arrangement

Serrated leaf margin

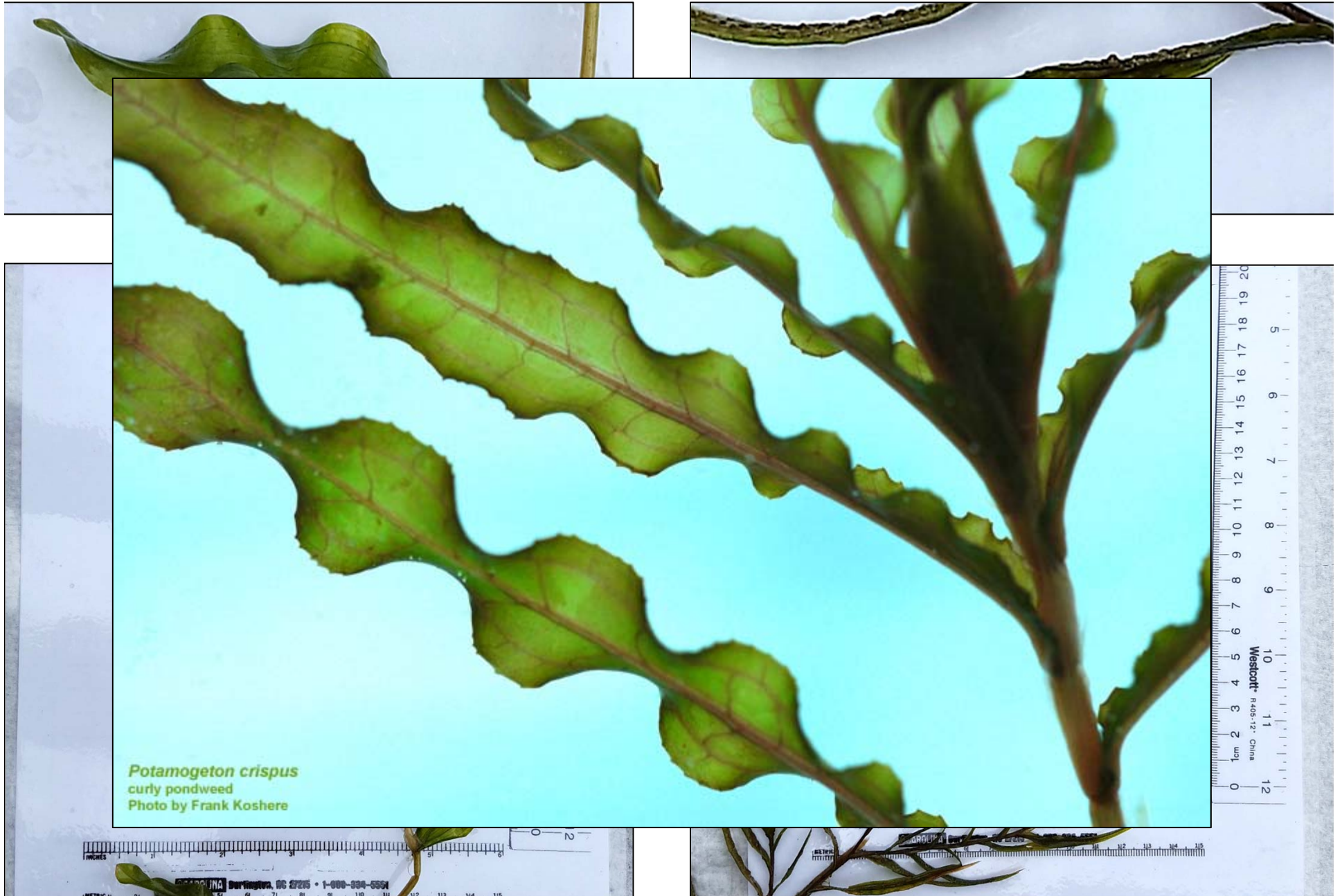


P. Skawinski

Trivia:

- Native to Eurasia, Africa, and Australia
- First discovered in North America in 1880

IS THIS CURLY-LEAF PONDWEED?



Starry stonewort – *Nitellopsis obtusa*

- Tiny star-shaped, tan or white **bulbils** produced on rhizoids (clear filaments)
- Long, **uneven** length branchlets
- Smooth stem
- Brittle





Scott Brown

STARRY LOOK-A-LIKE: NATIVE MUSKGRASS (*CHARA*)

- Macroalgae
- **No star bulbils**
- “Smells skunky”
- **Shorter ‘branching’**
(i.e. reach) of the plant compared to Starry
- Rough feel



STARRY LOOK-A-LIKE: NATIVE *NITELLA*



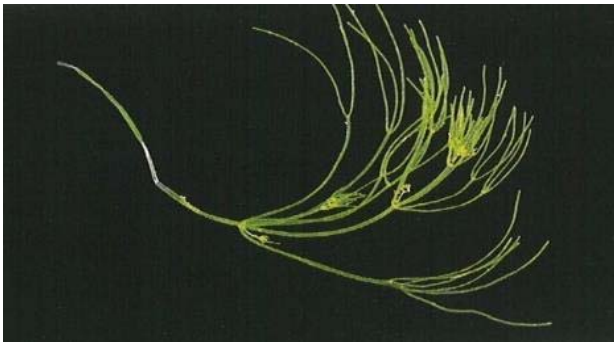
Nitella furcata stem section.

J. M. DiTOMASO



Nitella clavata stem section.

J. M. DiTOMASO



- Macroalgae
- No star bulbils
- Even branching
- Shorter 'branching' (i.e. reach) of the plant compared to Starry



Nitella mucronata

EMERGING THREAT: EUROPEAN FROG-BIT

Hydrocharis morsus-ranae

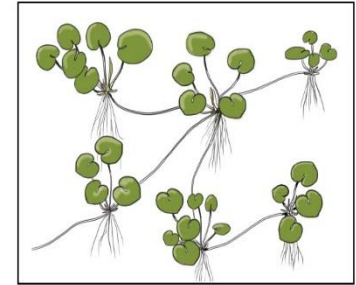


Illustration by Bruce Kerr

EUROPEAN FROG-BIT IDENTIFICATION



Narrow-leaf cattail

European Frog-bit

White Water Lily

WATCH FOR THESE Aquatic Invaders!

HYDRILLA



Leaves are whorled in groups of 4-8
Leaves are rough and have visible saw-toothed margins

Photo: Robert Vidéki, Doronicum Kft., Bugwood.org

WATER CHESTNUT



Green, floating leaves with sharply serrated edges
Small, white 4-petaled flowers

Photo: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

BRAZILIAN ELODEA



Generally 4 leaves per whorl
Submerged

Photo: V. Morgan, PSU-CLR

EUROPEAN FROGBIT



Leathery, heart-shaped leaves
Free-floating
Leaf size: 1/2 - 2 1/4 in. across

Photo: V. Morgan, PSU-CLR

WATER HYACINTH



Rounded, shiny green leaves with spongy stalks
Lavender flowers with central yellow fleck
Free-floating

Photo: MDNR

WATER SOLDIER



Leaves are 16 in. long, sword-shaped, sharply serrated edges, bright green
Leaves may be emergent or submerged

Photo: Branko Bakan

WATER LETTUCE



Free-floating — forms a rosette of leaves that resembles an open head of lettuce
Fuzzy light green leaves with long feathery roots

Photo: MDEQ

PARROT FEATHER



Spikes of stiff, feathery leaves grow in whorls of 4-6
Bright green upper stem emerges up to 1 foot above water

Photo: MDEQ

EUROPEAN WATER CLOVER



Resembles a four leaf clover
Leaves are smooth and can be floating, submerged, or emergent
Leaf size up to 1 in. across

Photo: MDEQ

YELLOW FLOATING HEART



Flowers are bright yellow with 5 petals
Leaves are 2-6 in. across with scalloped edges

Photo: MDNR

These 3 species are legal for sale and possession.
Please only report sightings outside of cultivation.

For more information and to report sightings, visit michigan.gov/invasives

DECONTAMINATION



BASIC STEPS

1. Inspect

2. Physical removal

- a. Hand remove
- b. Brush, sweep, or vacuum
- c. Drain
- d. Flush or pressure wash

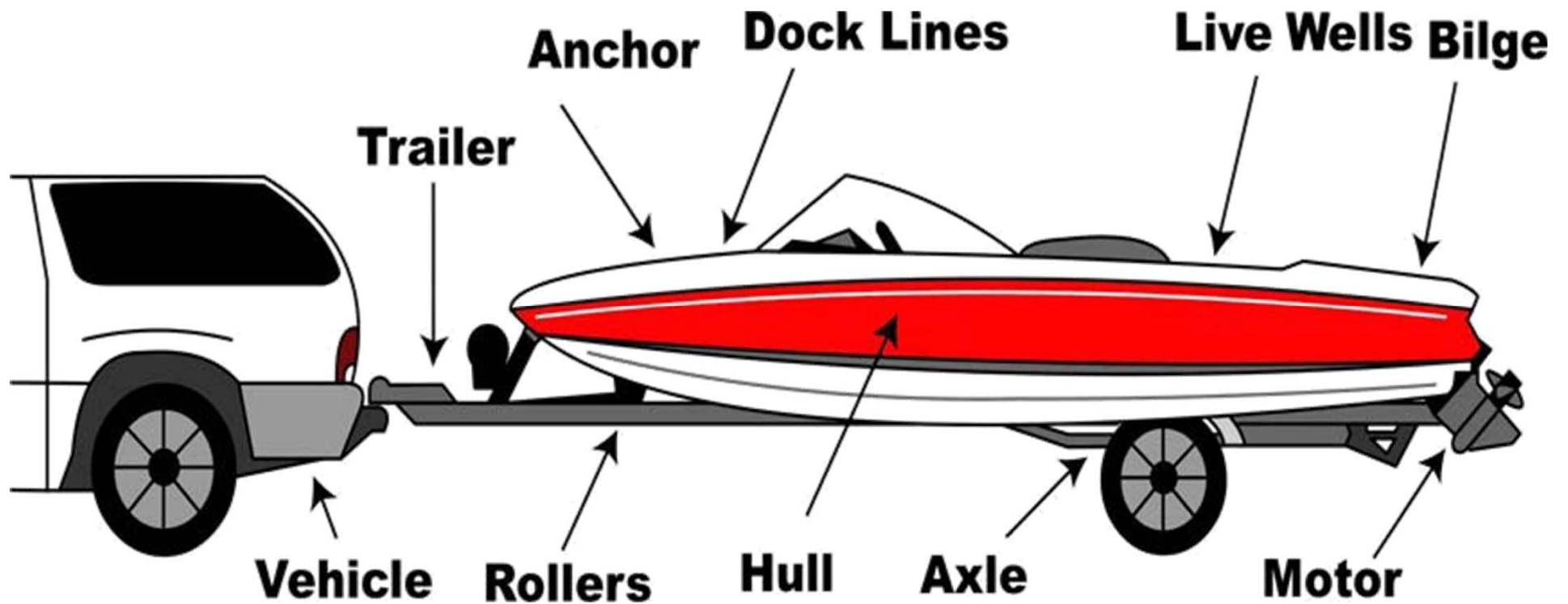
3. Sanitize

- a. Dry
- b. Disinfect
- c. Heated pressure wash



INSPECT

Trailers and boats



DETERMINING RISK

- Actions based on risk level



STEP BY STEP PLANT ID

CURLY-LEAF PONDWEED

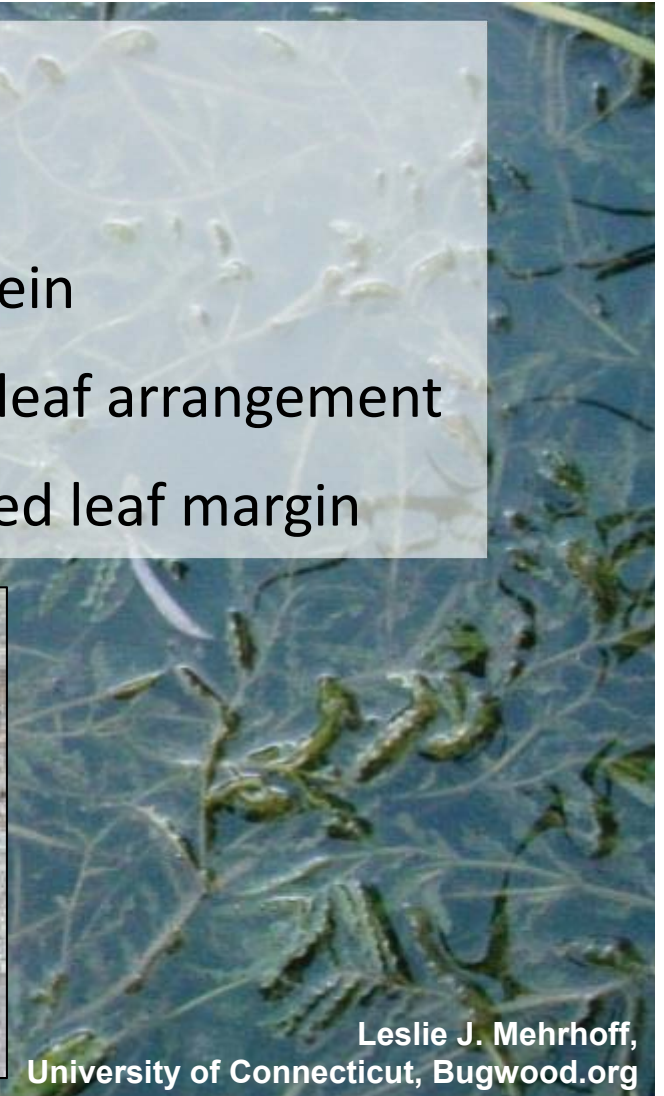
Key Characters:

Simple leaves

Obvious midvein

Alternate leaf arrangement

Serrated leaf margin



HANDS-ON ACTIVITY: PLANT ID



QUESTIONS?



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EARLY DETECTION OF INVASIVE PLANTS

STOP Starry Stonewort

Nitellopsis obtusa



P. Skawinski

The unique star-shaped bulbil of starry stonewort. These structures are used by the plant for reproduction.

Quick Facts:



A. D. Dow

10+ lakes discovered Starry Stonewort in Oakland County for the first time using the Exotic Aquatic Plant Watch in 2018

STEP BY STEP PLANT ID

WHITE WATER BUTTERCUP

2004 © Peter M. Dziuk



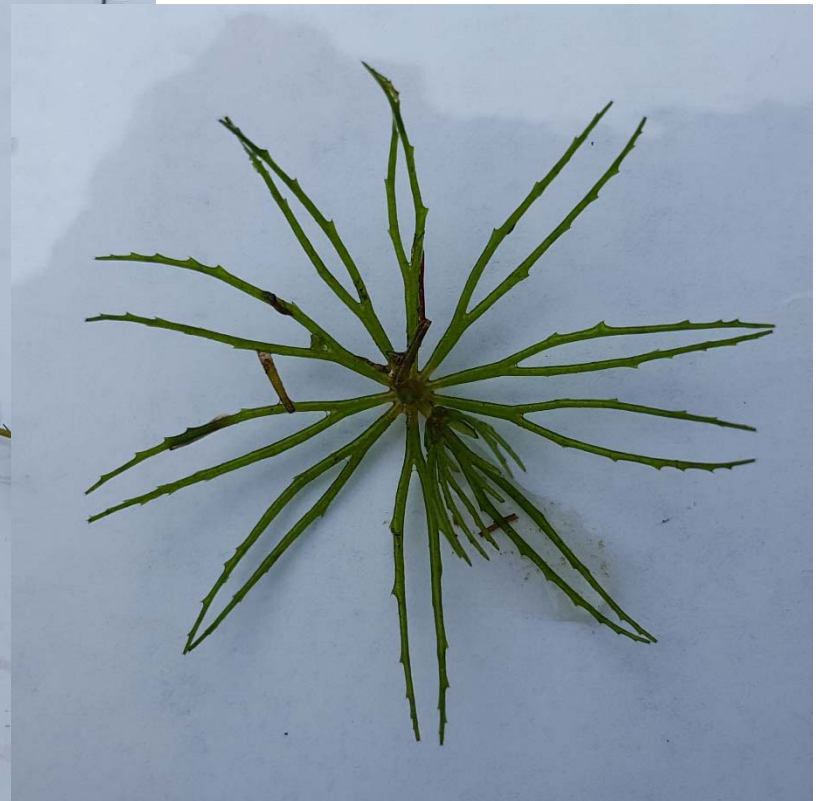
Key Characters:

Finely divided leaves

Alternate leaf arrangement

Has a leaf stalk



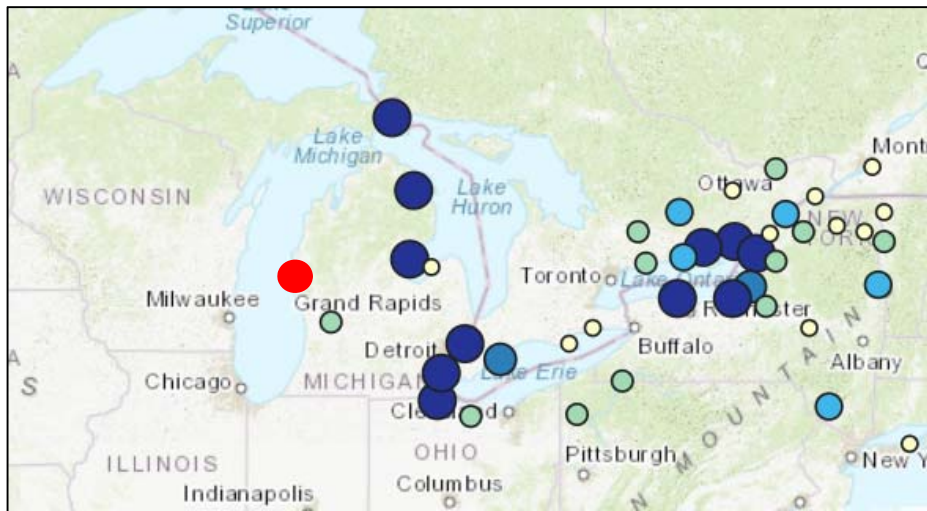
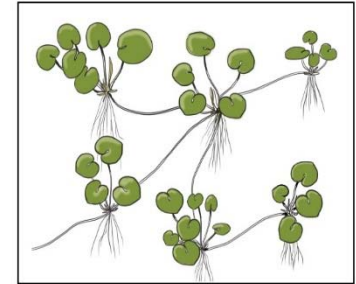


NEW THREAT

EUROPEAN FROGBIT

Hydrocharis morsus-ranae

- **Free-floating rosette**, roots hang below
- Small, heart-shaped leaves (**2-3"**)
- Small, white flower, 3 petals



EUROPEAN FROG-BIT IDENTIFICATION

Narrow-leaf cattail

European Frog-bit

White Water Lily

Michigan Department of Natural Resources Wildlife Division

