

What Plants are Growing in the Lake?



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NHDES
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Overview of Topics

- Aquatic plant news and updates
- State and regional aquatic invasive plant updates
- Common aquatic plant assemblages
- A quick review of invasive plants
- Questions

Aquatic Plant Updates

- 2020 drought/2021 early season drought
- New plant of interest (concern?)
 - *Hottonia palustris*
- Hydrilla in the Connecticut River (in Connecticut and Massachusetts)

Drought and Invasives

- Increase in transient boaters and lake visitors when it is hot and dry
- Lower water levels can lead to invasive species colonizing out farther from shore/in what is usually deeper water
- Lower, warmer water can harbor potentially more “tropical” species
- Nearshore species may “creep” into the lake and colonize exposed lake bed

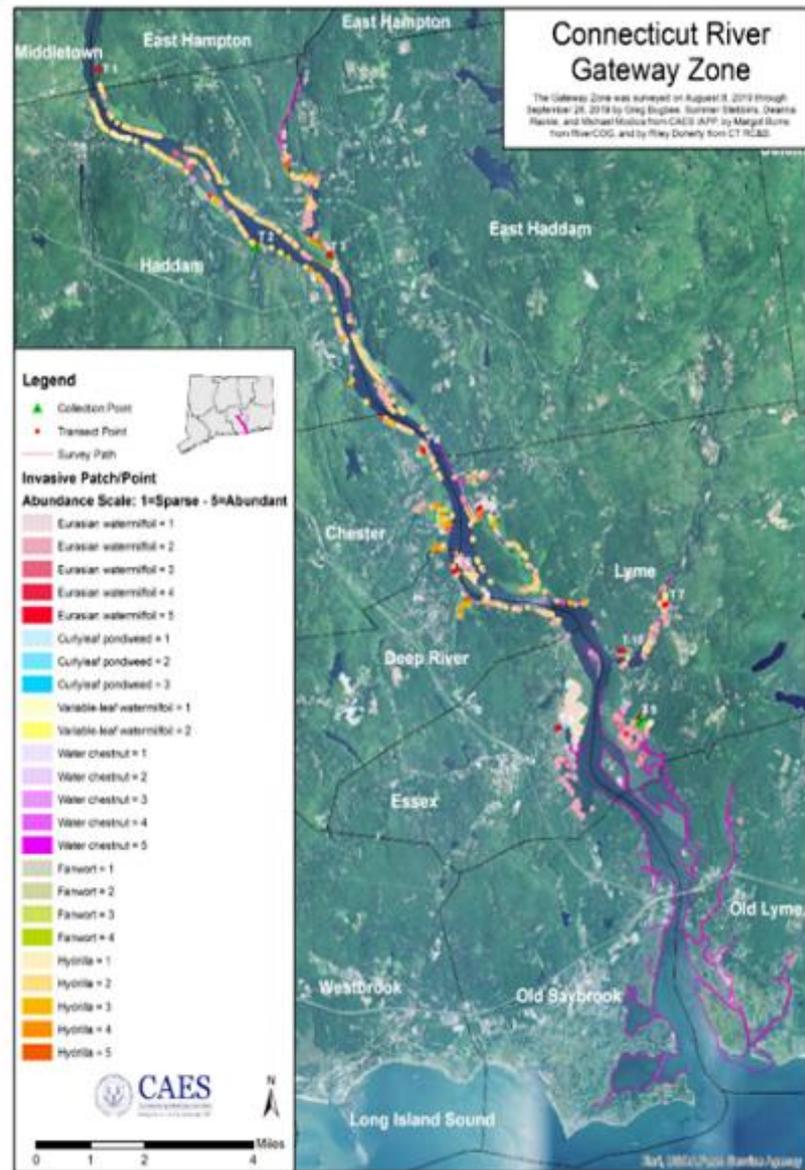
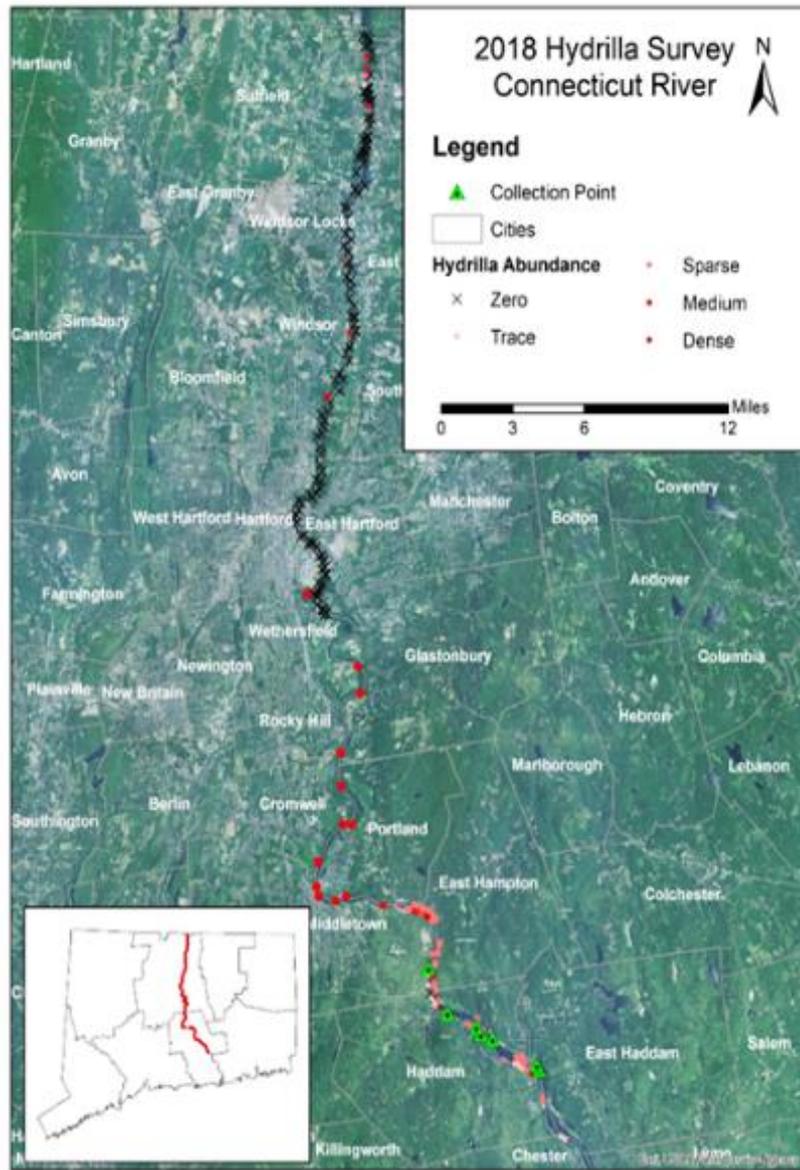


Hottonia palustris



HYDRILLA IN THE CONNECTICUT RIVER A SIGNIFICANT RISK FROM DOWNSTREAM





Common Aquatic Plants in our Lakes

THESE ARE PRESENT IN JUST ABOUT EVERY LAKE!

A solid green horizontal bar at the bottom of the slide.

Aquatic Plant Generalizations

- There are about a dozen plants that are in just about every waterbody in New Hampshire, forming the “backbone” of aquatic plant assemblages
- Most lakes have about one dozen to a few dozen different aquatic plant species in them
- Higher plant diversity and abundance is common in lakes that are more advanced along the “eutrophication” spectrum
- There are always nuances to plant populations related to size, depth, chemistry, and more.

Ubiquitous Plants

Emergent

- Cattails
- Pickerelweed
- Arrowhead
- Bur-reed
- Grasses/rushes/
sedges

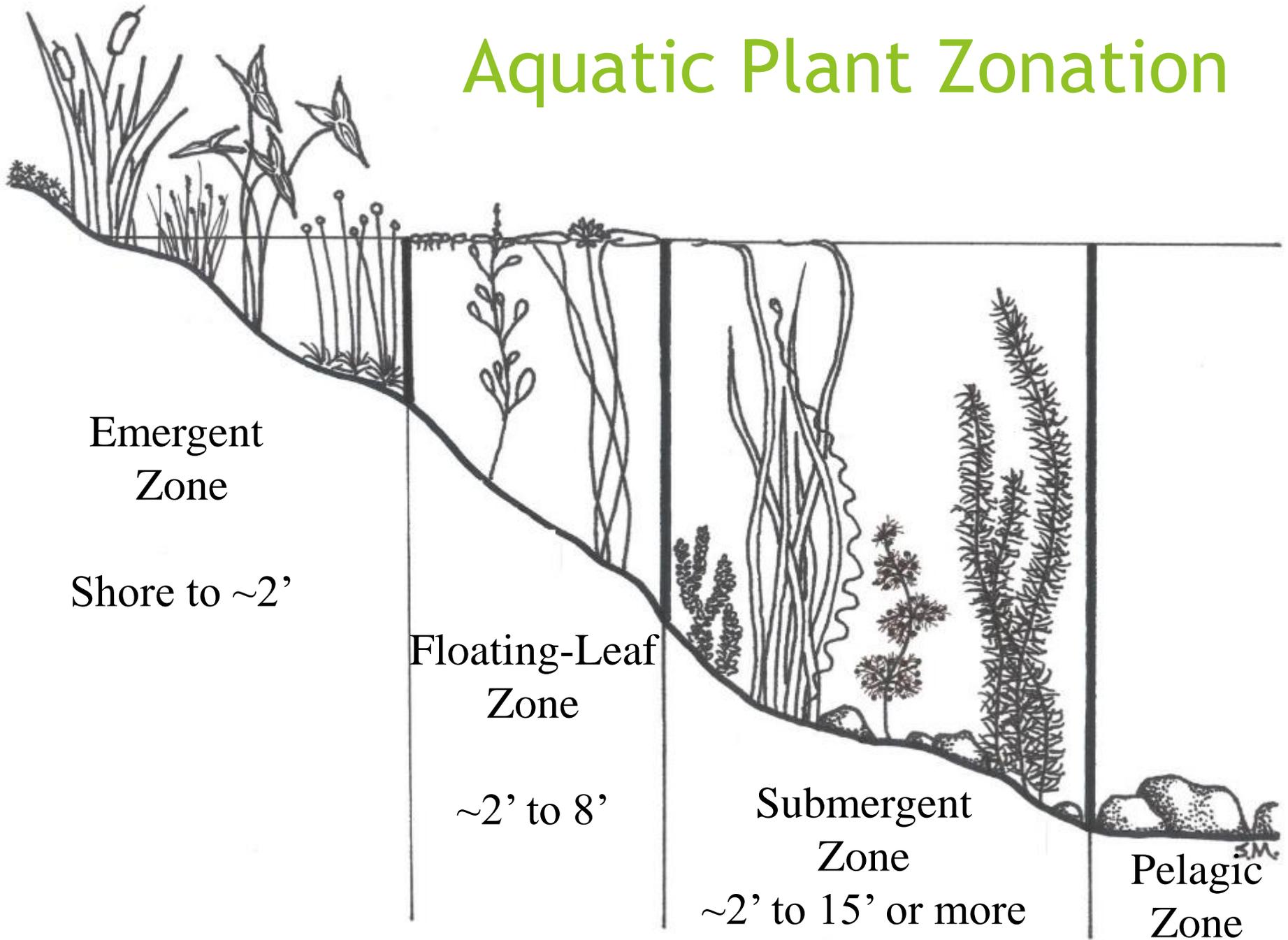
Floating

- White water lily
- Yellow water lily
- Floating heart
- Watershield
- Pondweed(s)

Submergent

- Pondweed(s)
- Bladderwort(s)

Aquatic Plant Zonation



Emergent
Zone

Shore to ~2'

Floating-Leaf
Zone

~2' to 8'

Submergent
Zone

~2' to 15' or more

Pelagic
Zone

Zonation in the lake

Emergents

Floating

Submersed



Emergents





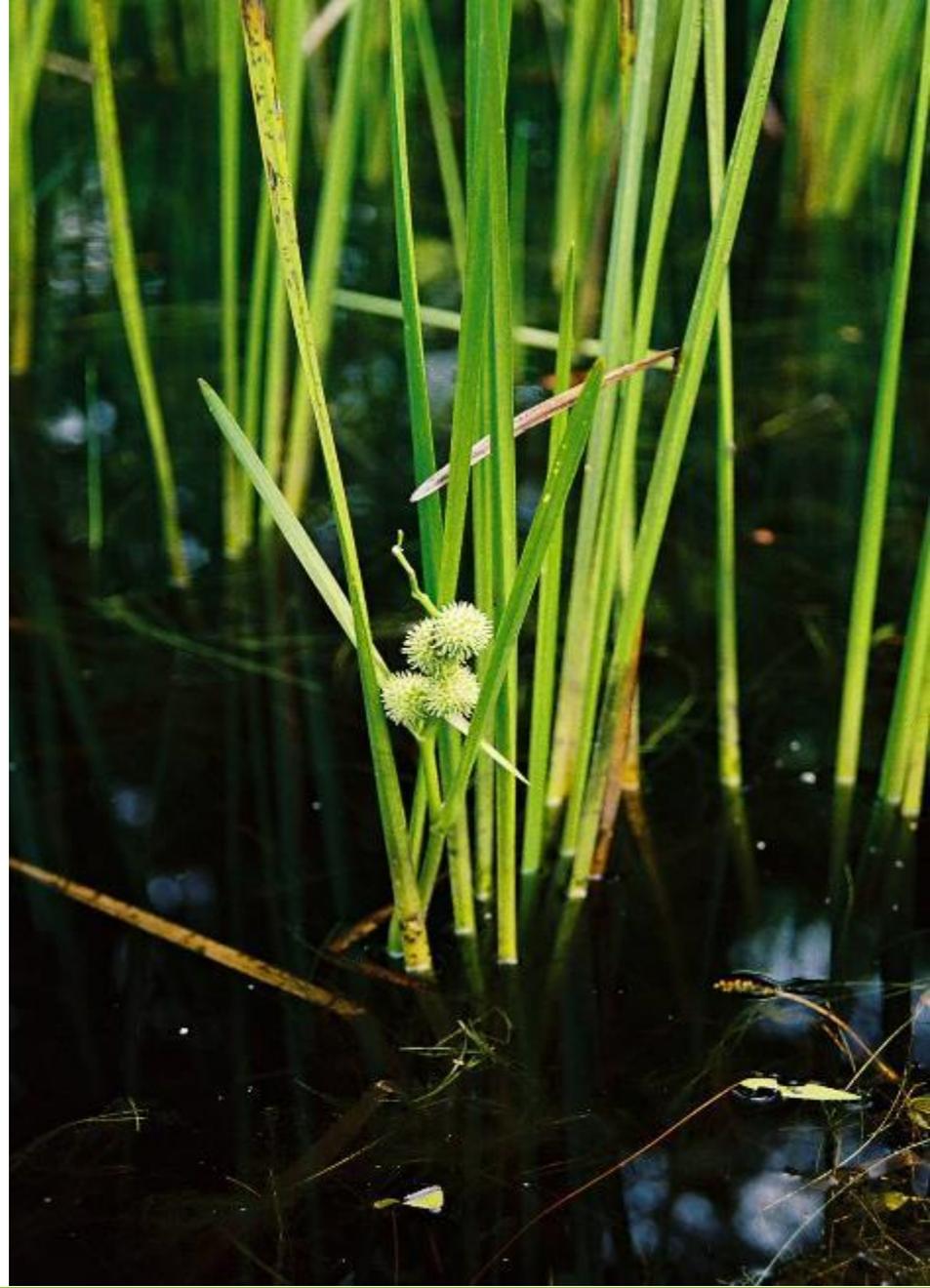
Cattails



Pickerelweed



Arrowhead



Bur-reed



Grasses



Sedges



Rushes

Floating





White water lily



Yellow water lily



Floating heart (white flower)



Watershield



Large-leaf pondweed



Much of the
time the
floating
plants will
form a mosaic
of mixed
species on
the surface

Submergent





07/05/2013

Whorled bladderwort



Large bladderwort

A focus on bladderworts

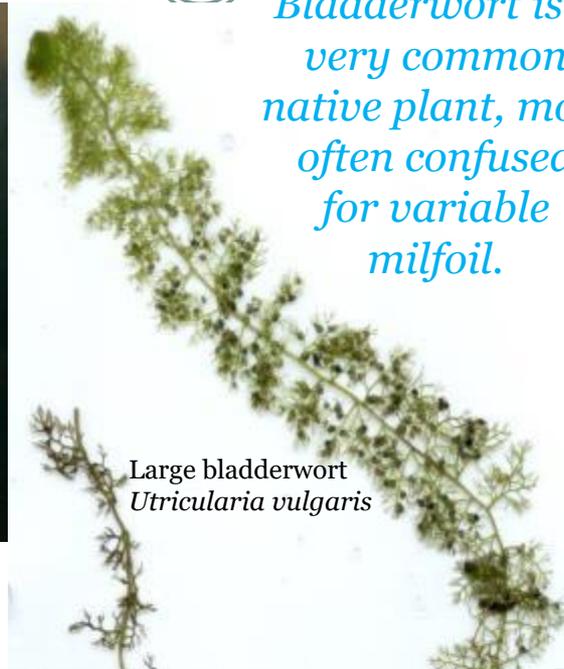


Bladderwort is a very common native plant, most often confused for variable milfoil.

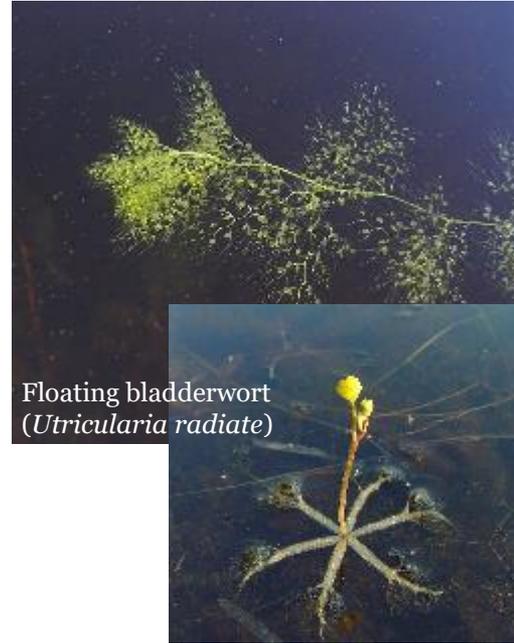
Large bladderwort
Utricularia vulgaris



Large bladderwort
Utricularia vulgaris



Floating bladderwort
(*Utricularia radiata*)



Intermediate bladderwort
Utricularia intermedia



Whorled bladderwort
Utricularia purpurea



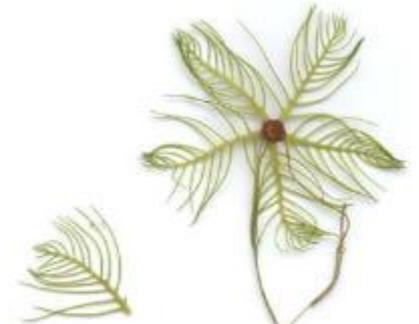
Intermediate bladderwort
Utricularia intermedia



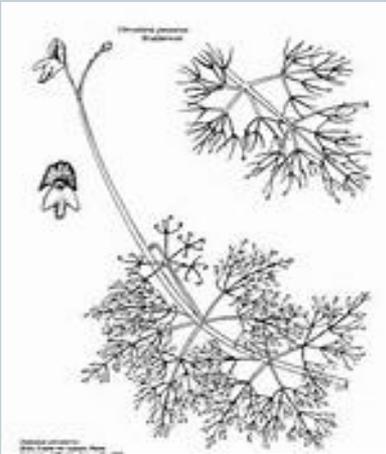
To be sure, check the leaves!



- Bladderwort leaves are more branching or forking, and usually have green, black, or clear “bladders” on them. They alternate.
- Milfoil leaves look like a feather and have no bladders (but beware of the algae globs! Variable milfoil leaves are in whorls).
- *When in doubt, collect a voucher for DES.*



Variable milfoil leaf whorl and single leaf. Note feather-like appearance.



Whorled bladderwort leaves can whorl around the stem, but they are branching, not feather-like.



Large bladderwort leaf with black bladders. Notice it appears like a feather, but not a true feather. It is lacier and branching at the tip.



Large bladderwort leaf that lost bladders. Notice it appears like a feather, but not a true feather. It is lacier and branching at the tip.

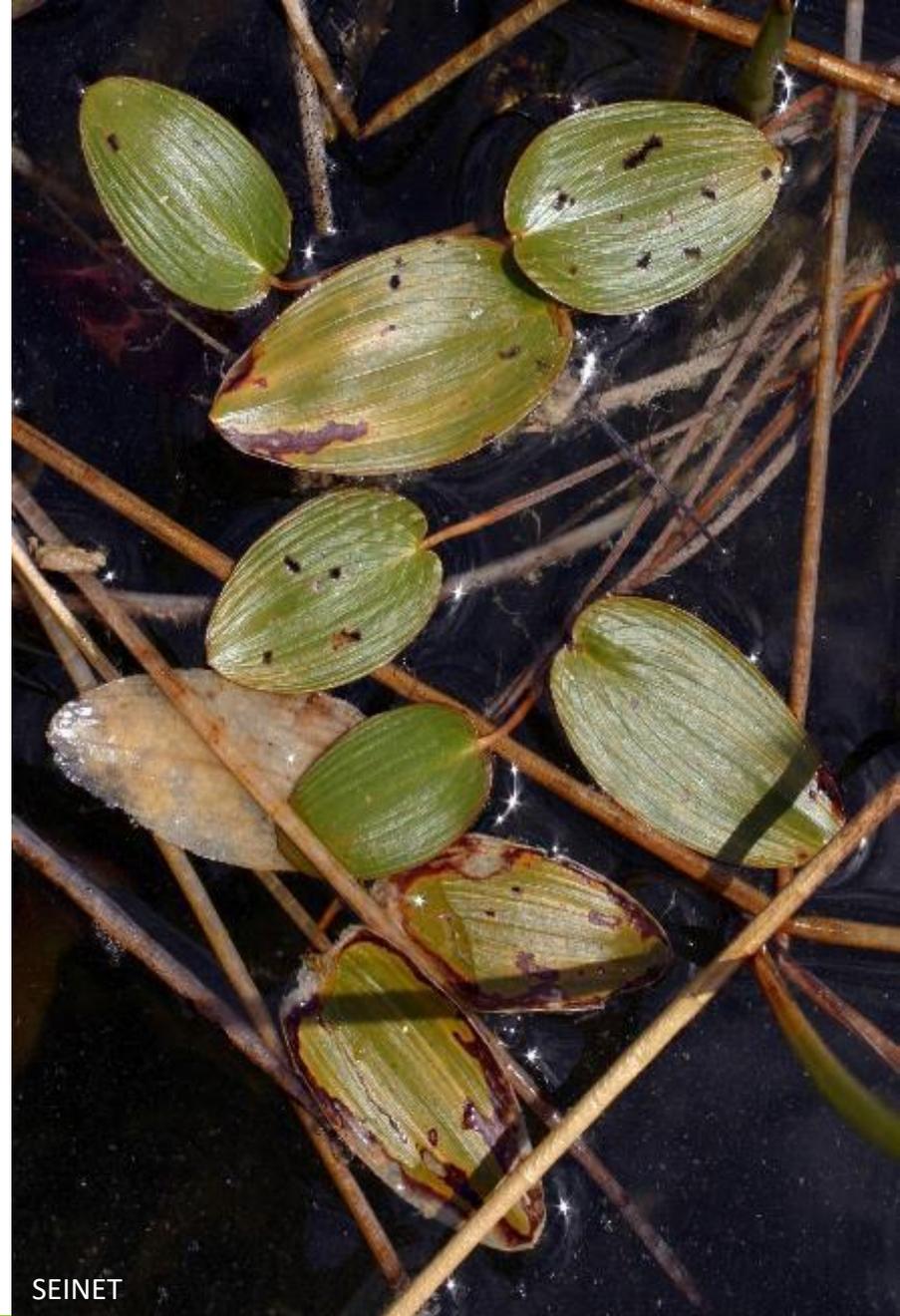


Intermediate bladderwort leaves are alternate along stem. Bladders are on a separate stem.



5595770

Snail seed pondweed



SEINET

Large-leaf pondweed



2017 © Peter M. Dziuk

Bassweed pondweed



Wikipedia

Plants of the world online

Claspingleaf pondweed



Ribbon-leaf pondweed



2017 © Peter M. Dziuk

Robb's pondweed



Grassy pondweed

Other plants that mix
in...

The right side of the slide features a decorative graphic composed of several overlapping, semi-transparent green shapes. These shapes are primarily triangles and quadrilaterals, creating a layered, abstract effect. The colors range from a light, pale green to a darker, more saturated green. The shapes are positioned on the right edge, extending from the top to the bottom of the frame.



Pipewort



Water lobelia



Go Botany

Grassy spike rush



Smartweed



Native milfoil(s)



Aquatic Moss



Water marigold

(C) Paul Skawinski, 2009

E. canadensis

E. nuttallii



©2005 Gary Fewless

Waterweeds

Hedge hyssop



Go Botany

Nodding water nymph

Water naiads

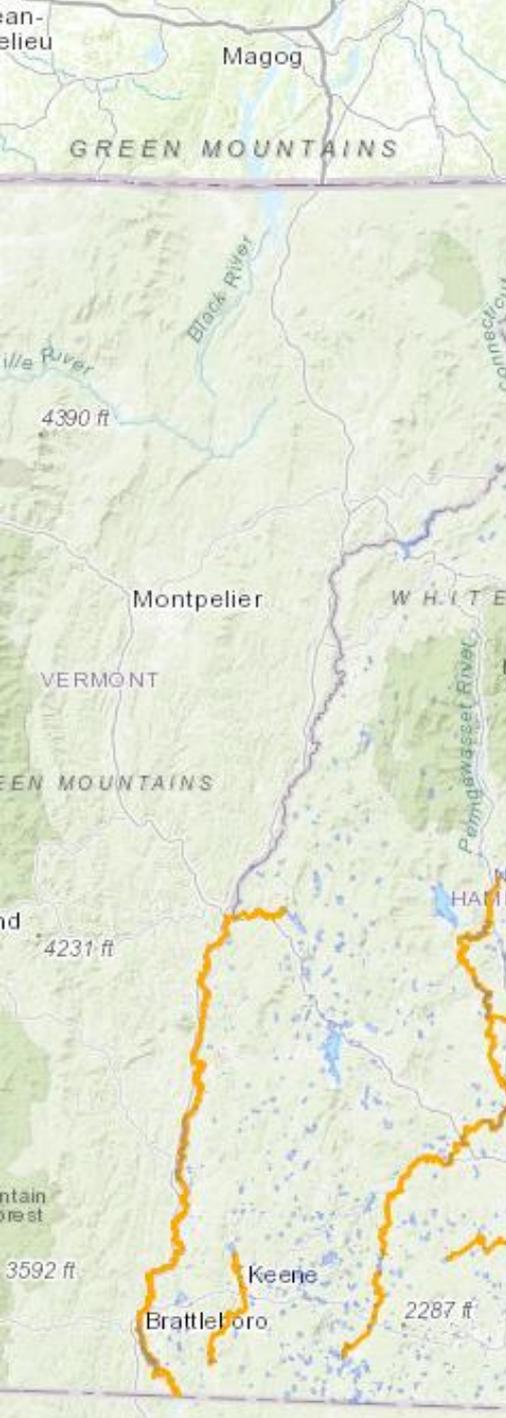
(C) Paul Skawinski, 2009



Thread-like naiad

Finding plant lists for your lake

- Most waterbodies greater than 10 acres in size have had biologist visits, which include plant surveys
- To find your lake's map (and lake assessment reports), visit the NHDES "Lake Mapper" App
- Simply go online and type "NHDES Lake Mapper" into your search engine, or visit <https://www.arcgis.com/apps/webappviewer/index.html?id=1f45dc20877b4b959239b8a4a60ef540>



Crystal Lake

Enfield



EAST HILL
1200 ft
Moose Brook
1200 ft
1200 ft
Brook

CRYSTAL LAKE

NHLAK801060104-01
Class: Oligotrophic
State: Connecticut
Year: 70

Survey Report (LTS)
Year: 1978 1987 2005 ...
Listed in LTS Reports:
CRYENF-GEN

Assessment Program

Category(s): ... This waterbody
Category in VLAP:
Reporting Port:

Daily Load (TMDL)

Mercury

More generalizations about aquatic plant communities

- Native aquatic plant communities are fairly stable for many years in a waterbody (species, distribution, etc), but they do tend to “creep” outward and expand slowly, taking up more space. This is normal.
- Some plants have boom and bust years, meaning that they can be bigger, more widespread and more obvious one year, and then less the next.
 - *This happens a lot with bladderworts, waterweed and some pondweeds*

Help with identification

If you find something that you would like identified:

- Take a digital picture of the plant in the lake, and then scoop some out and take a picture of it on a piece of white paper/paper towel, and email that to Amy.Smagula@des.nh.gov
- Hold on to the specimen (in a jar or bag in the fridge) until you receive an email back with an identification....we may need the actual plant to look at more closely to do an identification.

Permits (almost always) Required!

- ▶ For physical/mechanical removal Wetlands Bureau Permits are required (NH Department of Environmental Services)
 - ▶ *Call 603-271-2147 to inquire about if a permit is needed before you do any work*
- ▶ For herbicide/chemical control activities a Special Aquatic Permit is required (NH Department of Agriculture, Division of Pesticide Control) and state-licensed aquatic herbicide applicators must do the work.
 - ▶ *SOLitude Lake Management is the only firm in the region that does herbicide treatment or larger physical removal of aquatic plants in bigger lakes or ponds. Call them at 508-865-1000 for a site inspection, recommendations, and quotes.*

There are no state dollars for native plant management.

We do not recommend native plant management, nor do we fund native plant management.

With that said, a shorefront property owner, lake association, or other entity could seek to manage them under appropriate permits, with local funding.

State of the State of Aquatic Invasive Plants in NH

Aquatic Invasive Species (AIS) Infestation in New Hampshire

Legend

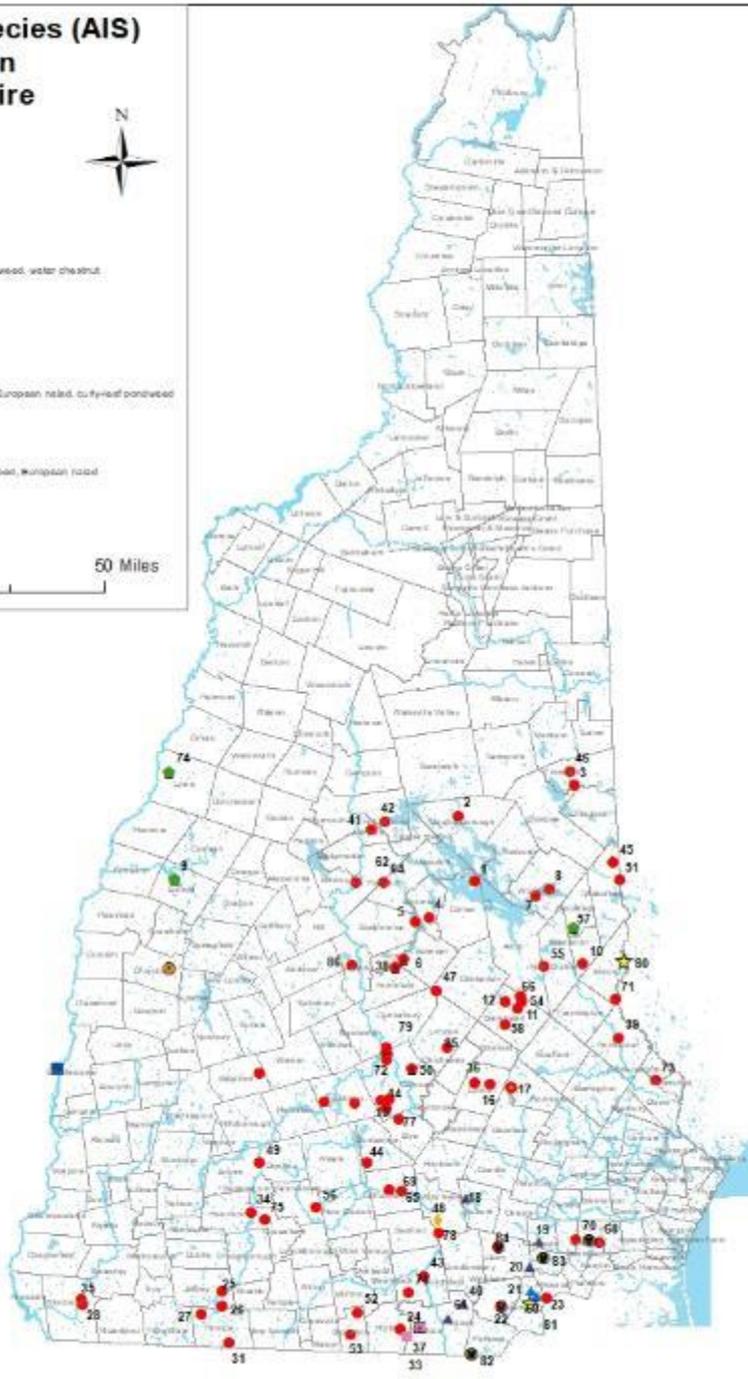
AIS Infestations

Type

- Asian clam
 - Brazilian elodea
 - Curlyleaf pondweed
 - Kurilian nitella
 - European related: European niletil, D. demo, curlyleaf pondweed, water chestnut
 - European related
 - Porwort
 - Variable nitella
 - Variable nitella, Asian clam
 - Variable nitella, Curlyleaf pondweed
 - Variable nitella, European niletil, tenoset, water chestnut, European related, curlyleaf pondweed
 - Variable nitella, European related
 - Variable nitella, curlyleaf pondweed
 - Variable nitella, tenoset
 - Variable nitella, tenoset, Kurilian nitella, curlyleaf pondweed, European related
- Town boundaries polygons
NH Hydrography polygons
State Boundary



0 12.5 25 50 Miles



Map prepared by NH DES
Exotic Species Program
Updated October 2017

Numbers correspond to separate
key which lists waterbody
name and town.

Exotic Aquatic Species in NH

91 infested waterbodies

- 11 Rivers
- 80 Lakes and Ponds

118 infestations

- Some waterbodies have more than one species, a few have as many as 6 different invasives

Key Species of Concern

Emergent/Shoreline Plants



Stalks of small purple flowers form in July and persist until September. One plant can produce up to 2.5 million seeds.

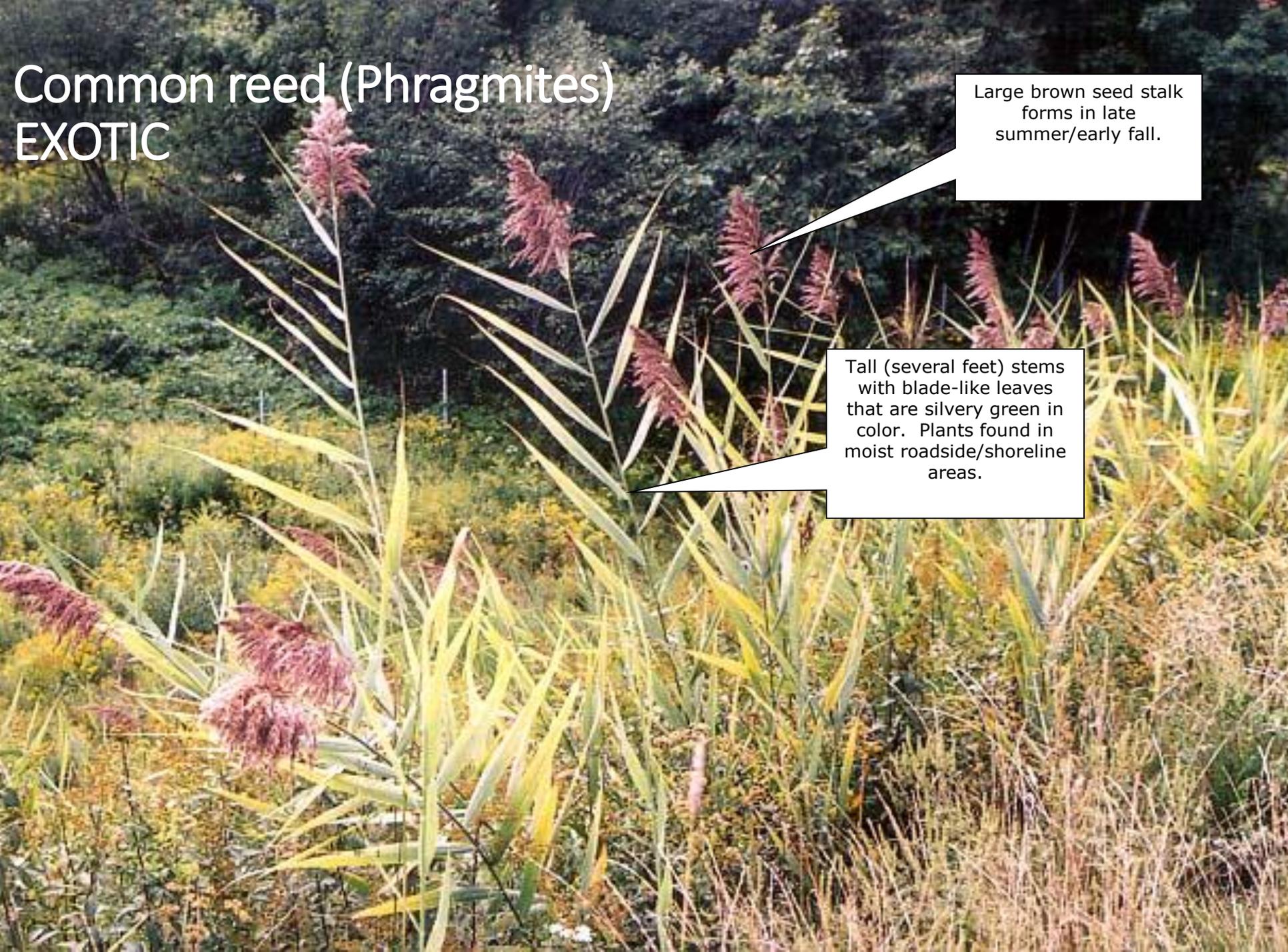
Leaves opposite or whorled on a square stiff stem, rooted in moist, not wet or standing water soils

Purple loosestrife (EXOTIC)

Common reed (Phragmites) EXOTIC

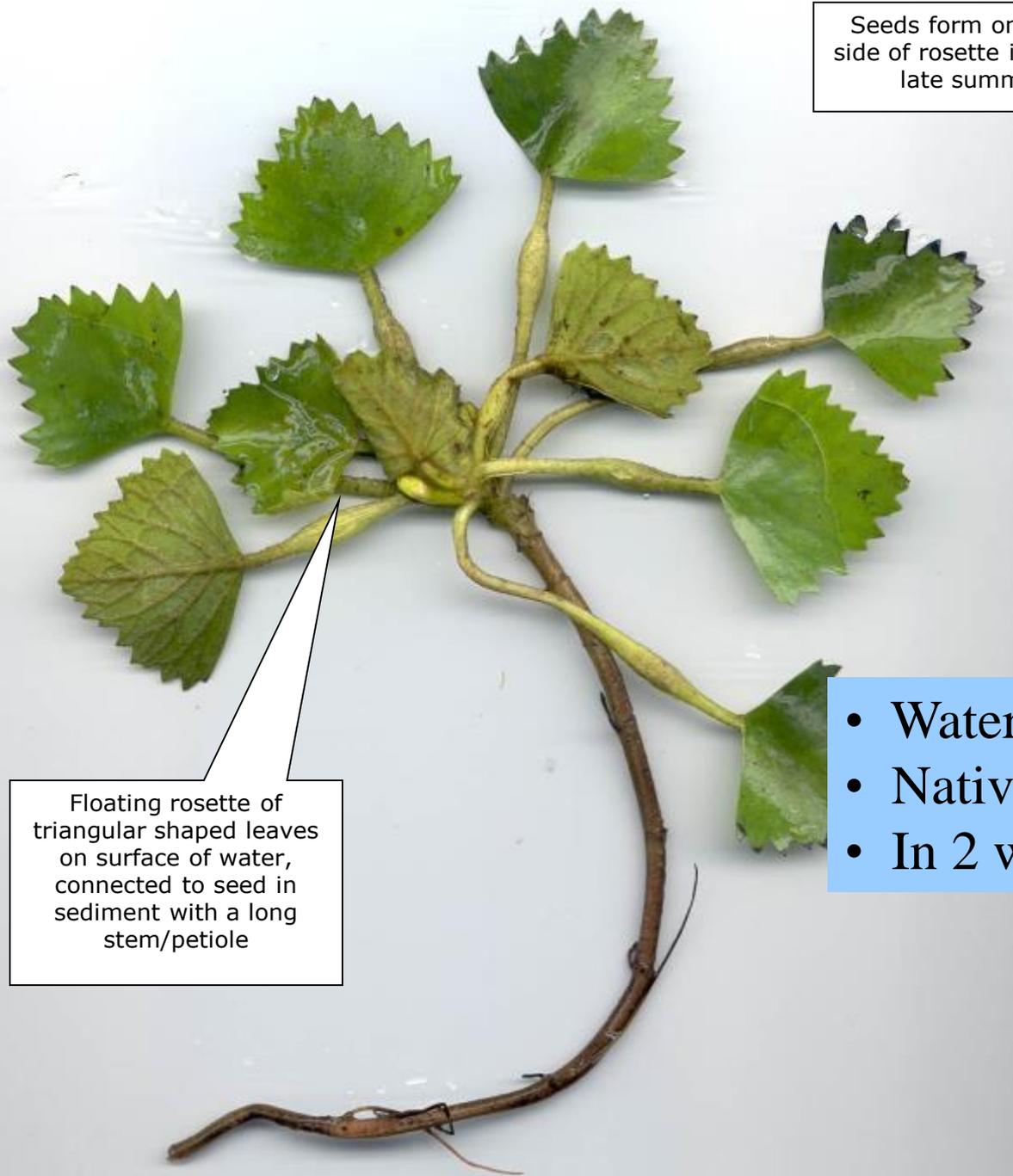
Large brown seed stalk forms in late summer/early fall.

Tall (several feet) stems with blade-like leaves that are silvery green in color. Plants found in moist roadside/shoreline areas.

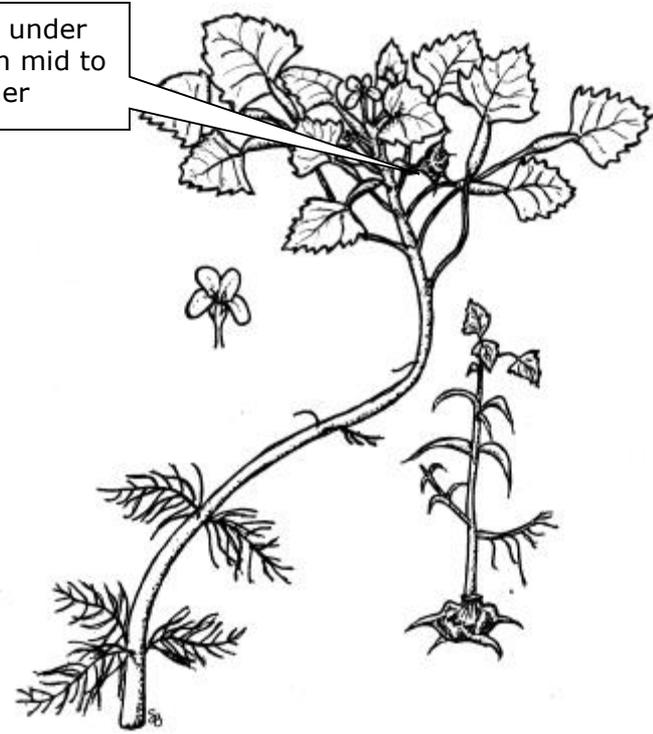




Floating Leaved Invasive Plants



Seeds form on under side of rosette in mid to late summer



Floating rosette of triangular shaped leaves on surface of water, connected to seed in sediment with a long stem/petiole

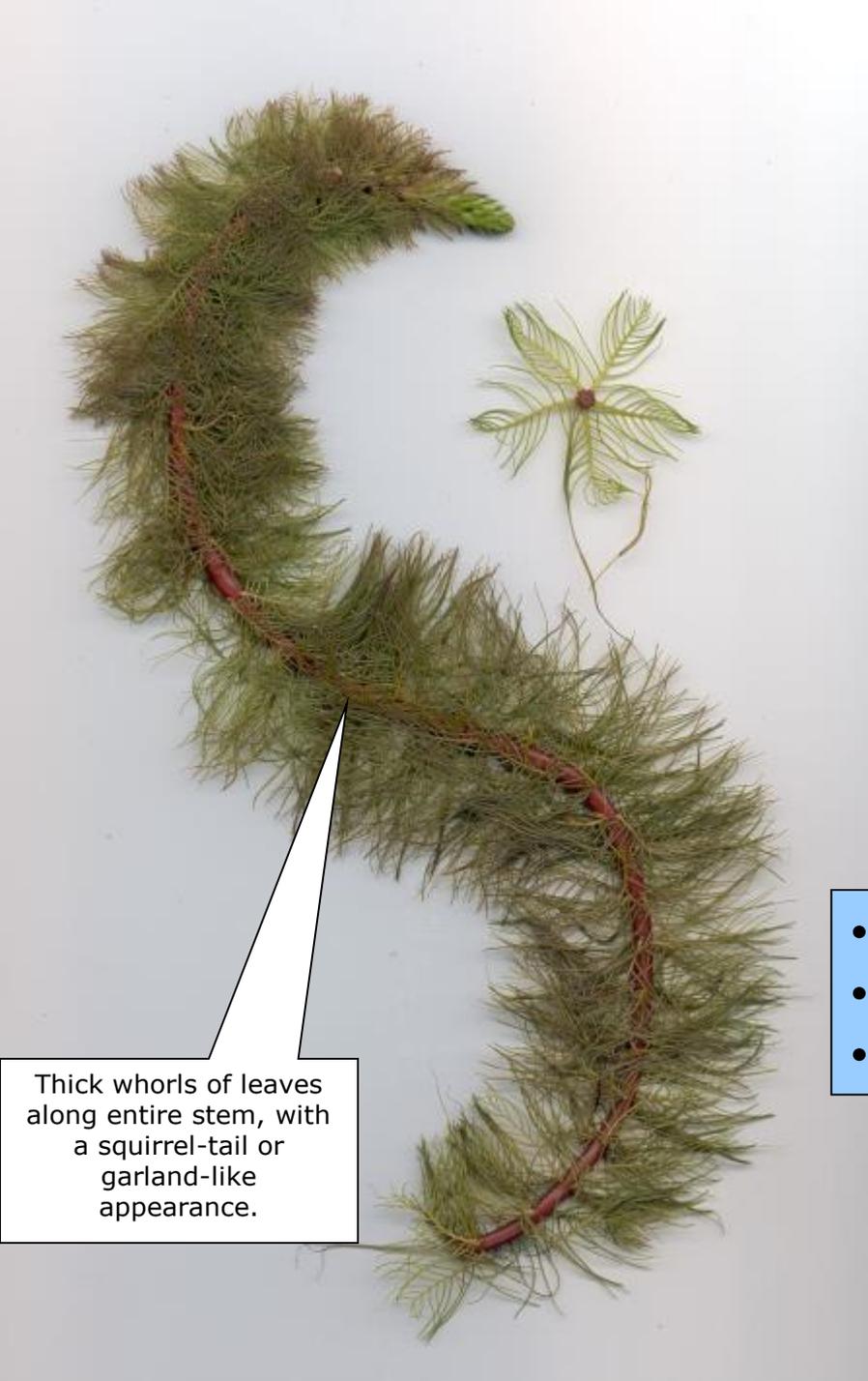
- Water chestnut- *Trapa natans*
- Native to Asia
- In 2 waterbodies in NH



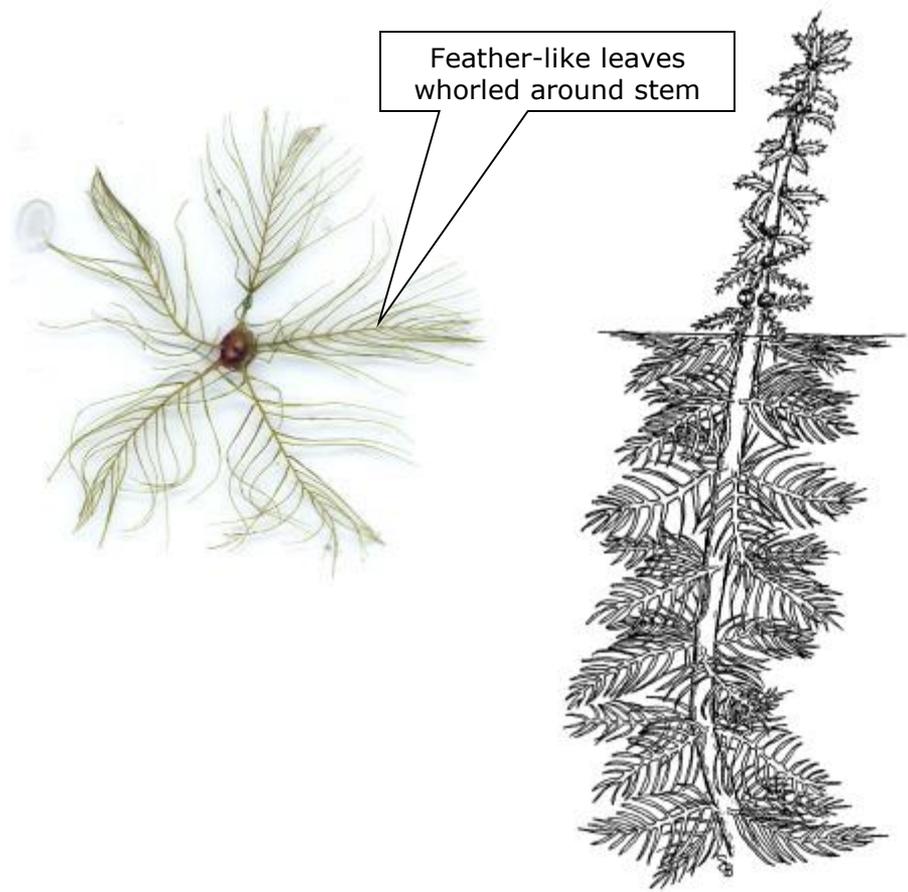


Water chestnut- EXOTIC

Submergent Invasive Plants



Thick whorls of leaves along entire stem, with a squirrel-tail or garland-like appearance.



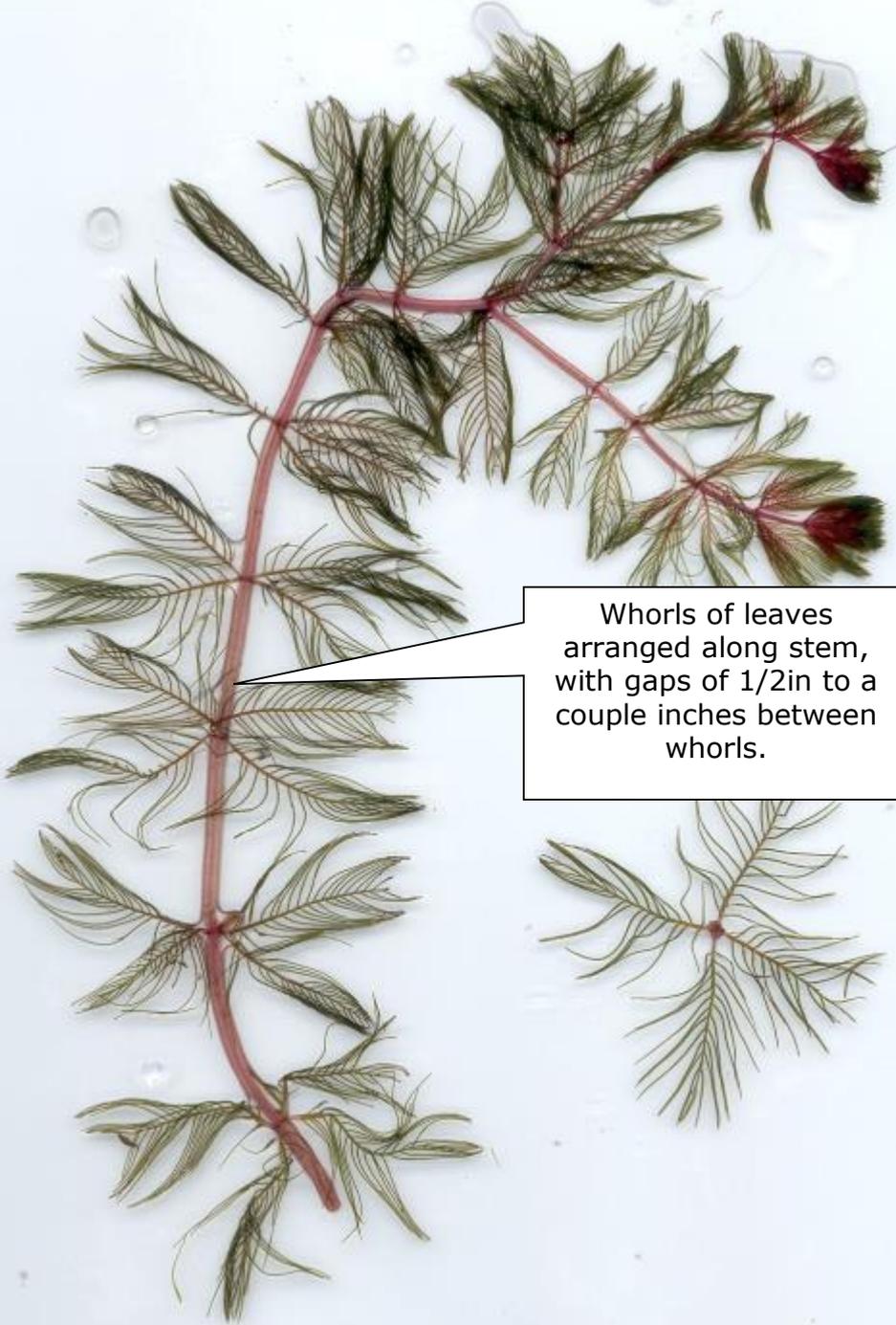
- Variable milfoil- *Myriophyllum heterophyllum*
- Native to southern and central U.S., not to NH
- In over seventy waterbodies in NH

Variable milfoil ID tips

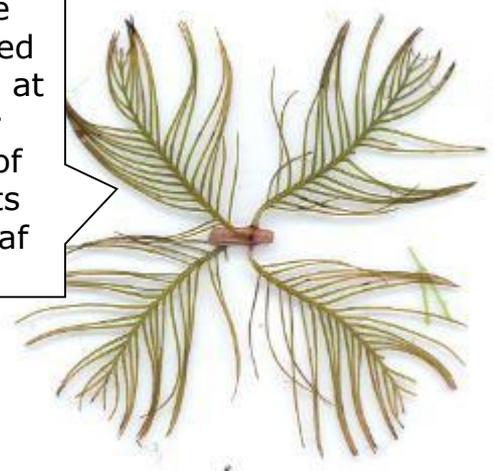
An underwater photograph showing a dense thicket of milfoil plants. The plants have thin, feathery stems and small, pointed leaves. A central stem is highlighted with a callout box. The callout box is a light green speech bubble with a tail pointing to the stem. The background is dark blue-green, suggesting an underwater environment.

Think of a “squirrel’s tail” when you look at the stems of growth. You will often see the stem and then the fluffy tubular growth around it. There may be a single stem, or a few in a clump.





Feather-like leaves whorled around stem, at least 12 or more pairs of small leaflets along one leaf



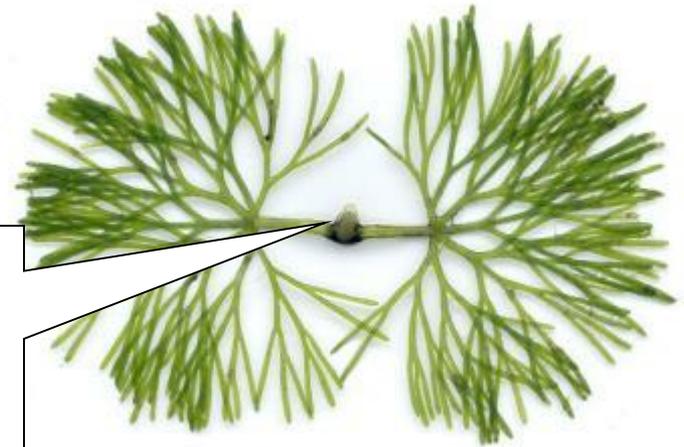
Whorls of leaves arranged along stem, with gaps of 1/2in to a couple inches between whorls.

- Eurasian milfoil- *Myriophyllum spicatum*
- Native to Asia
- In 5 waterbodies in NH

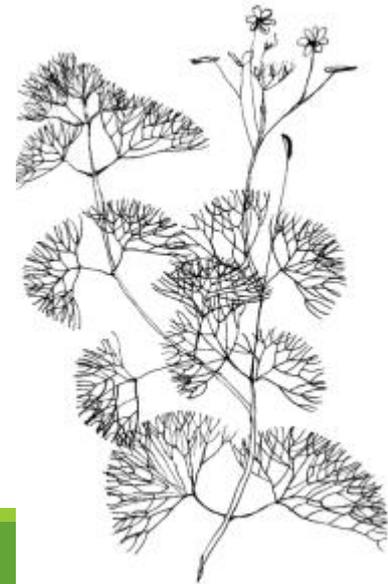




Branching leaves arranged opposite along stem. Note leaf is attached by a short stem to main stem of plant.



- Fanwort- *Cabomba caroliniana*
- Native to Europe/Asia
- In 9 waterbodies in NH





Fanwort (EXOTIC)



Leaves narrow with teeth on edges, very brittle and low growing plant





Small narrow leaves whorled around stem. Note teeth on leaf edge for hydrilla.



- Hydrilla- *Hydrilla verticillata*
- Native to South America
- Not yet found in NH (but found in MA and ME)

Questions/ Discussion

For specific follow up questions please reach out to
Amy P. Smagula, NHDES, Limnologist/
Exotic Species Program Coordinator
Amy.Smagula@des.nh.gov