

AQUATIC INVASIVE SPECIES



Amy P. Smagula

Limnologist/Exotic Species Program Coordinator

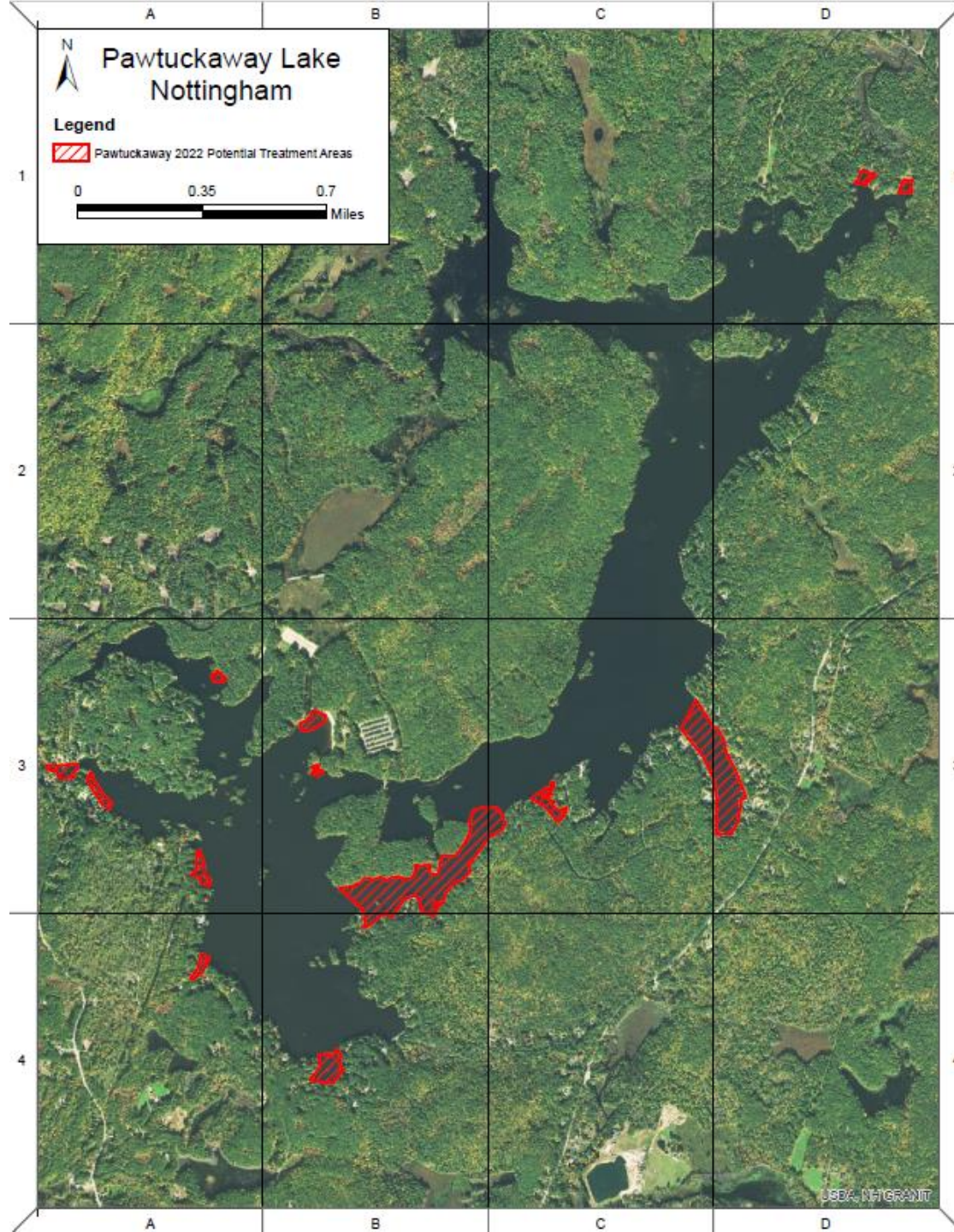
NH Department of Environmental Services

OVERVIEW

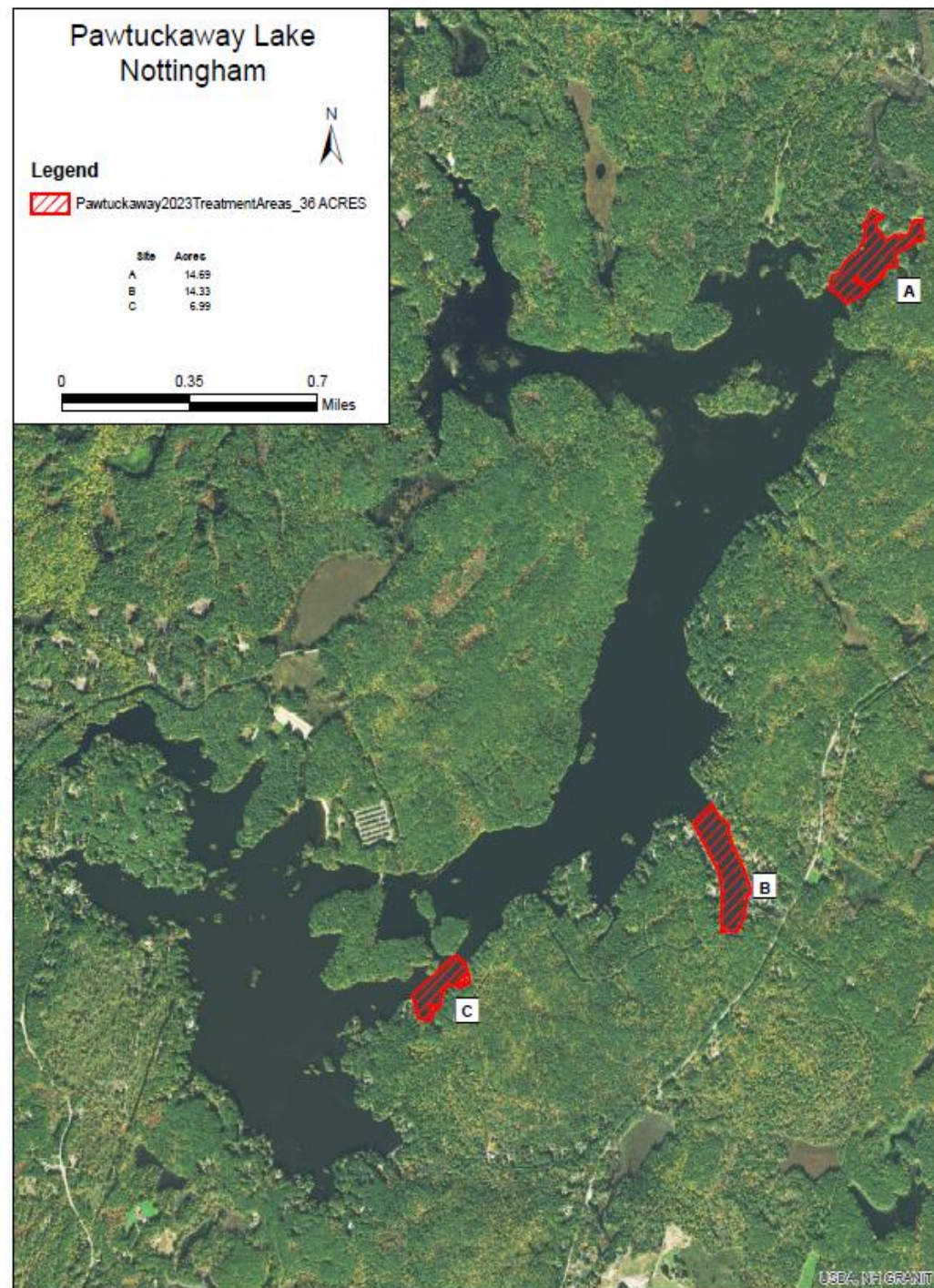
- ▶ Milfoil in Pawtuckaway Lake
- ▶ Weed Watcher Methods Refresher
- ▶ Native Plants
- ▶ Invasives to Monitor For



Pawtuckaway Milfoil Growth Areas



2023 Milfoil Treatment Areas



Why Maintain a Weed Watcher Program?



- ▶ Proactive approach
- ▶ Catch infestations early
- ▶ Facilitate a Rapid Response Action
- ▶ Prevent the further spread

Weed Watching: What is Involved?

- ▶ The methods are simple!
 - ▶ Volunteers are trained to monitor waterbodies for invasive species
 - ▶ Once a month from May to September is recommended
 - ▶ You do NOT need to be an expert in biology, but you might find you are an expert in your waterbody!

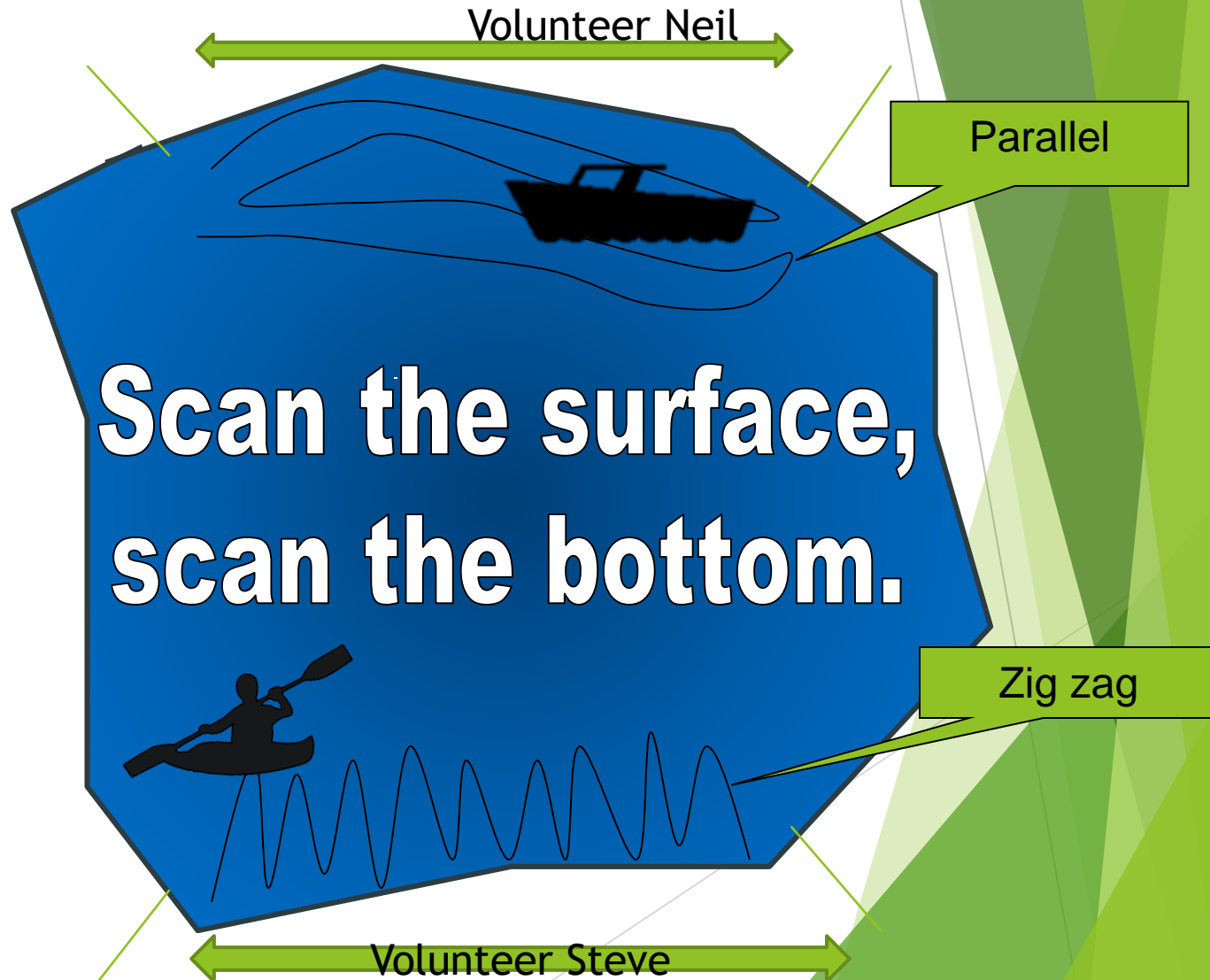


NHDES Provided Resources

- ▶ Weed Watcher Kit
- ▶ Suggested methods for Weed Watching
- ▶ Pictures of key invasive species
- ▶ Fact sheets
- ▶ Maps of the subject lake/pond, including depth and plant maps

On the Water

- Break the shoreline into sections and have volunteers sign up for each section
- In your section, from shore move in a zig-zag or parallel pattern out to deeper water to maximize how much area you cover in your survey.



What You Are Looking For?

- ▶ Anything in the water that is new or out of place
 - ▶ was not there last month, last year, etc
- ▶ Anything that appears to be growing quickly and taking over
 - ▶ appearing bigger each month
- ▶ For plants, if you see a lot of fragments drifting around a waterbody it could be a sign of an invasive
- ▶ Any animals like mussels or clams or snails that appear to be very high in number
- ▶ Any animals like clams or mussels that are stuck to surfaces

If you find something...

- ▶ *Carefully* collect a voucher specimen
 - ▶ If an animal, take only one, preferably photograph it and return it in case it is a rare species
 - ▶ If a plant, be careful not to let pieces float off, collect all pieces that break off
 - ▶ Collect any representative stems/leaves/flowers/fruits that may be present as it helps greatly with identification

What to do with your voucher specimen:

BEST

Email a digital photo

- Place the specimen on a piece of white paper/paper towel
- Arrange it so leaves/flowers or animal etc can be seen clearly
- Place a coin, pen or ruler next to the specimen
- Take a digital picture
- Email it to
Amy.Smagula@des.nh.gov
for identification

Alternate

Snail Mail

- Wrap the specimen in a moist paper towel
- Seal it in a specimen bag/resealable bag
- Mail that in an envelope to
Amy Smagula, NH DES, 29
Hazen Drive, Concord, NH
03301

Zonation in the lake

Emergents

Floating

Submersed





Bur-reed



Sedges



Pipewort



Arrowhead



Rushes

Common EMERGENT Plants



Pickerelweed



Cattails



White water-lily



Floating heart



Watershield

Common FLOATING-LEAVED Plants



Pondweeds
(appearance may vary by species)



Yellow water-lily

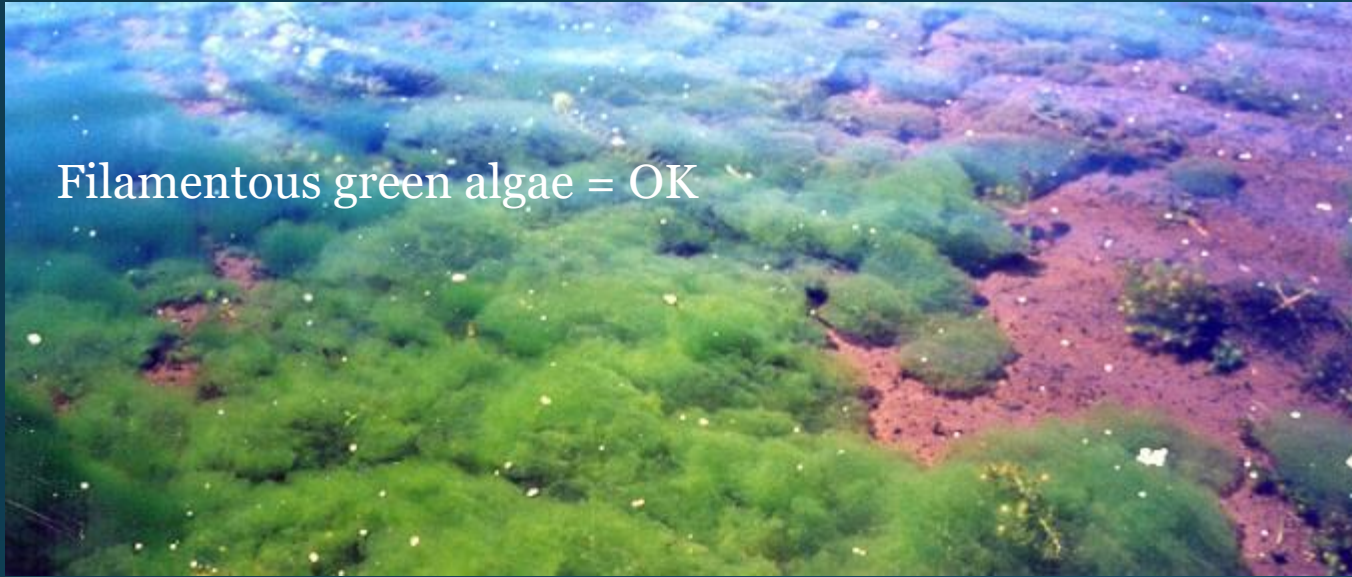


**Common
SUBMERGENT
Plants**



Algae

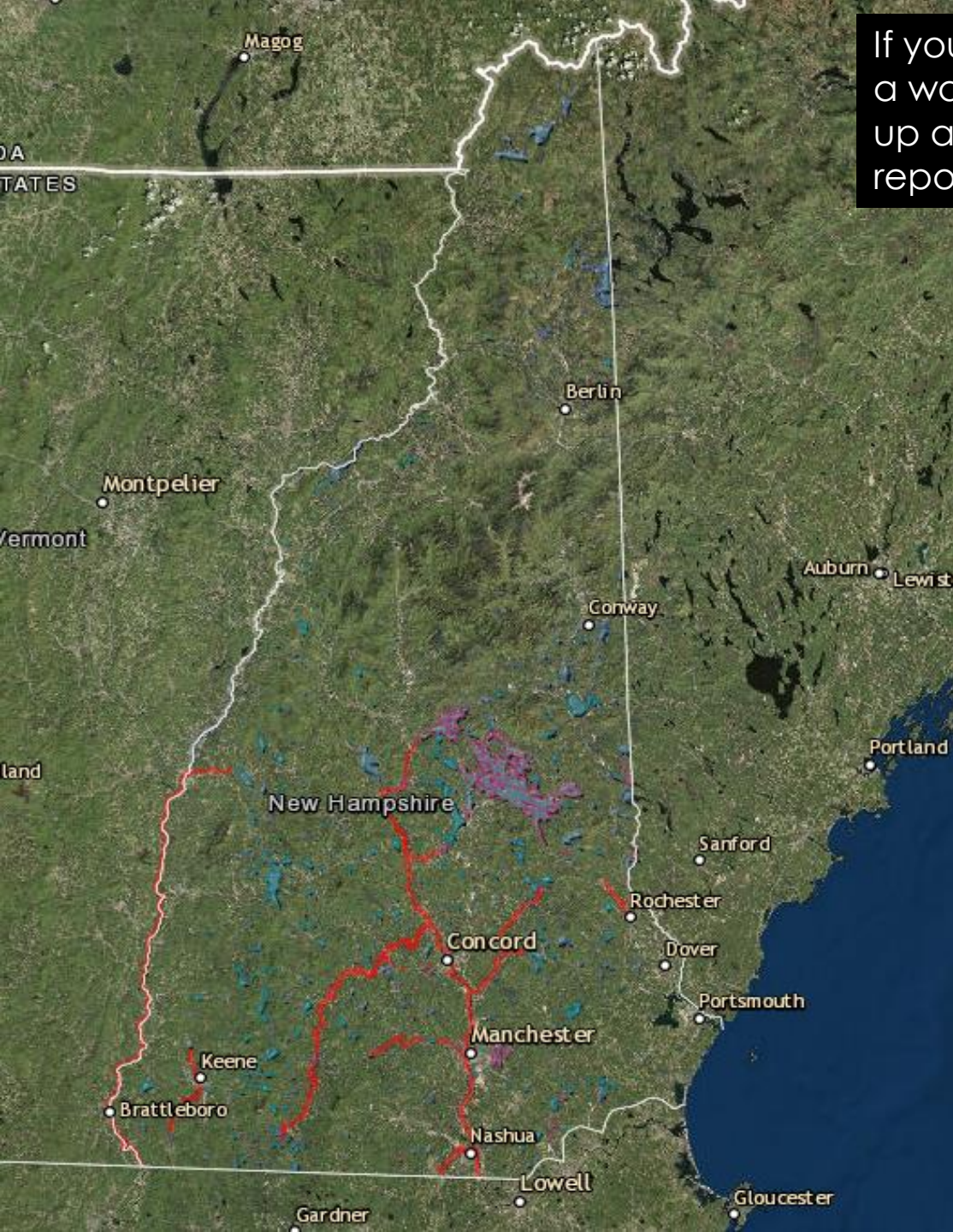
Filamentous green algae = OK



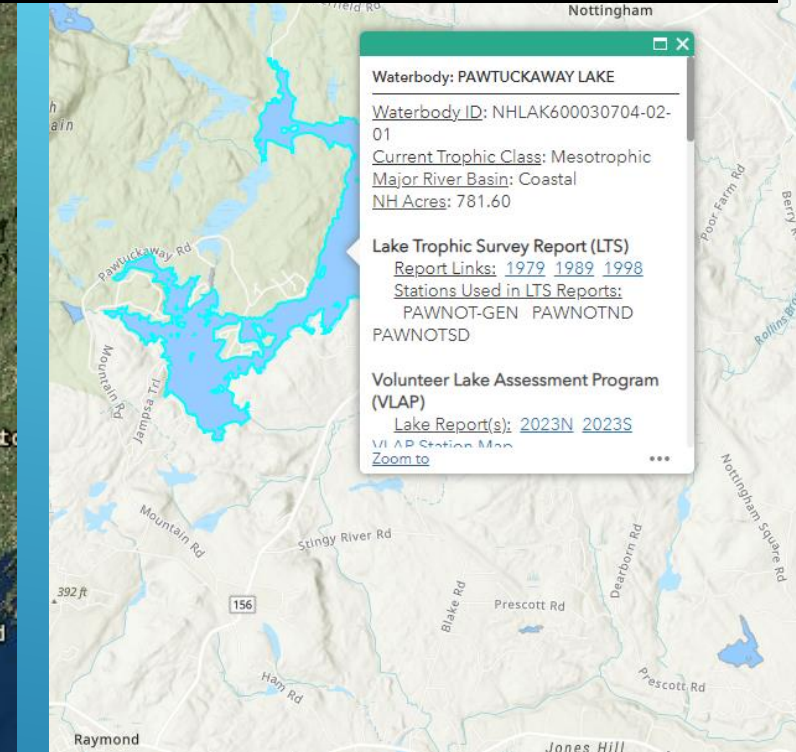
Cyanobacteria (bottom three photos) = concerns

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>



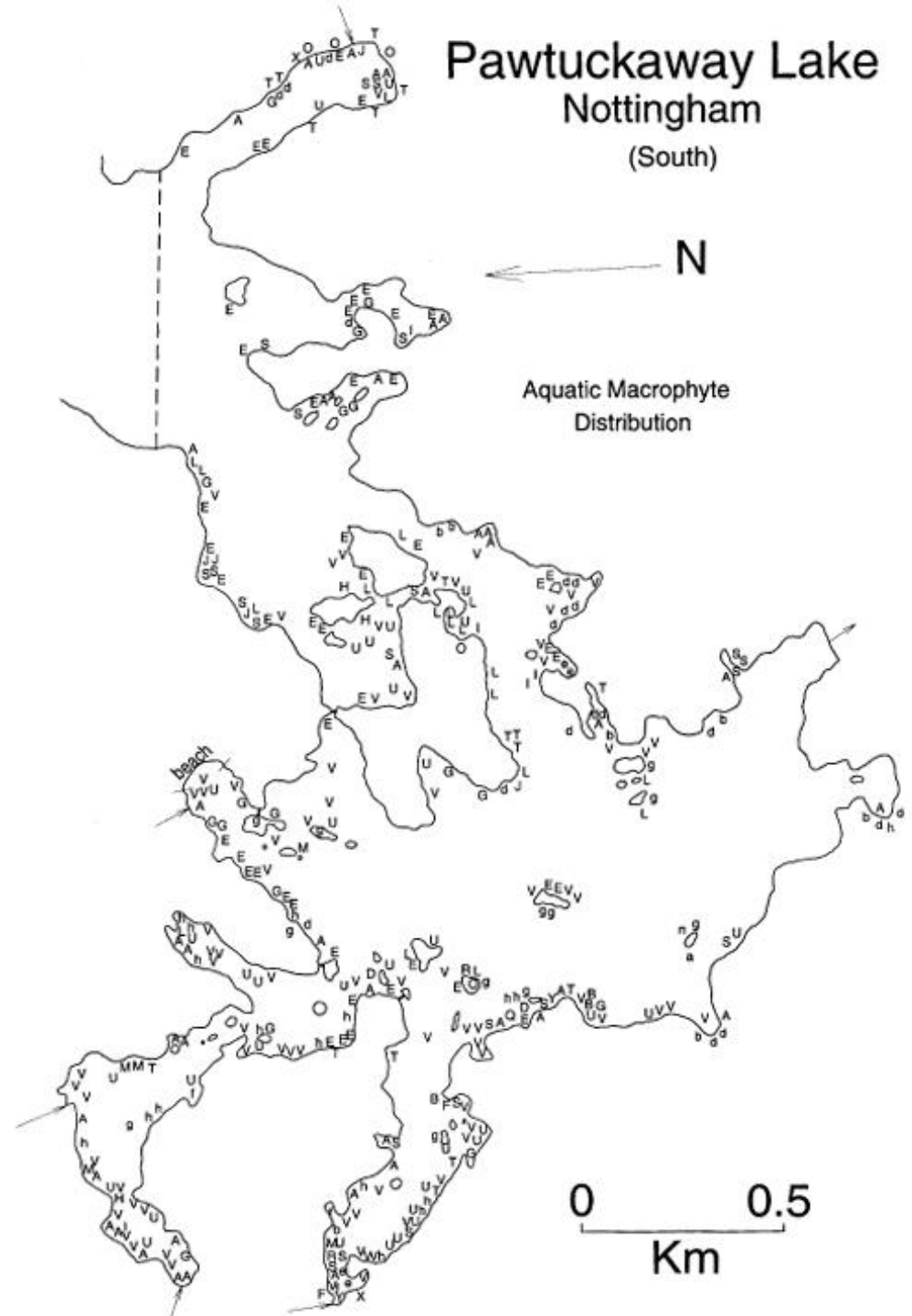
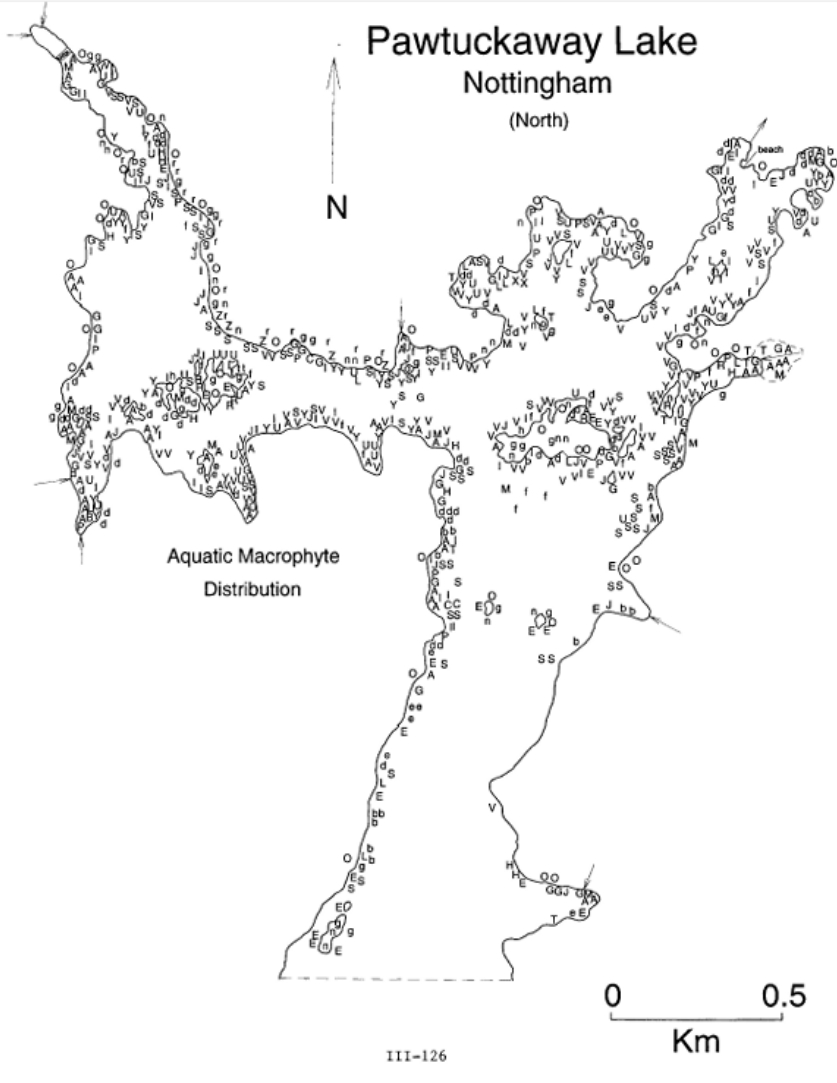
If you zoom in on the map and click on a waterbody, a dialogue box will pop up and show list of infestations and reports.



NHDES Lake Mapper App:

<http://nhdes.maps.arcgis.com/apps/webappviewer/index.html?id=1f45dc20877b4b959239b8a4a60ef540>

or simply Google NHDES Lake Mapper



- Google: *DES Lake Mapper*
- Find the waterbody of interest
- Click on it
- Find the report with plant maps and lists

AQUATIC PLANT SURVEY

LAKE: PAWTUCKAWAY LAKE

TOWN: NOTTINGHAM

DATE: 08/11/1998

Key	PLANT NAME		ABUNDANCE
	GENERIC	COMMON	
A	Sagittaria	Arrowhead	Scat/Common
B	Brasenia schreberi	Water shield	Sparse
T	Typha	Cattail	Scattered
d	Dulichium arundinaceum	Three-way sedge	Scattered
D	Elodea nuttallii	Waterweed	Sparse
f		Filamentous algae	Scat/Common
G	Gramineae	Grass family	Common
F	Nymphoides cordatum	Floating heart	Sparse
M	Scirpus validus	Softstem bulrush	Sparse
O	Cephalanthus occidentalis	Buttonbush	Common/Abun
E	Ericcaulon septangulare	Pipewort	Common/Abun
Q	Isocetes	Quillwort	Sparse
b	Scirpus	Bulrush	Scattered
S	Sparganium	Bur reed	Abundant
V	Vallisneria americana	Tape grass	Abundant
U	Utricularia	Bladderwort	Abundant
a	Myrica asplenifolia	Sweet fern	Sparse
h	Gratiola	Hedge hyssop	Sparse
R	Potamogeton robbinsii	Robbins pondweed	Scattered
g	Myrica gale	Sweet gale	Common/Abun
n	Vaccinium corymbosum	High-bush blueberry	Scattered
K		Unknown woody flower	Sparse
e	Eleocharis	Spike rush	Scattered
I	Potamogeton nodosus	Pondweed	Scattered

OVERALL ABUNDANCE: Common/Abun

AQUATIC PLANT SURVEY

LAKE: PAWTUCKAWAY LAKE

TOWN: NOTTINGHAM

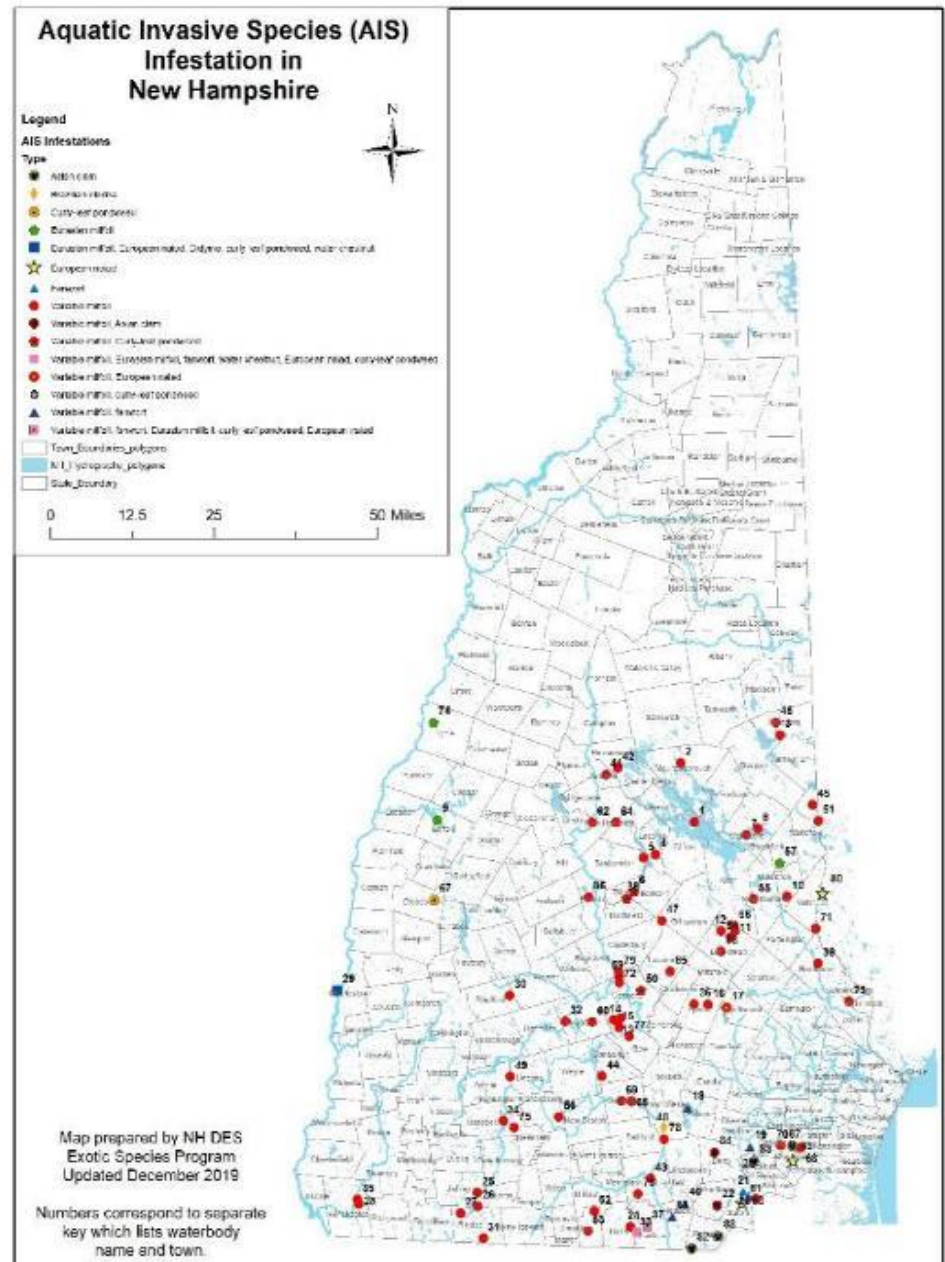
DATE: 08/11/1998

Key	PLANT NAME		ABUNDANCE
	GENERIC	COMMON	
Y	Nuphar	Yellow water lily	Sparse
P	Pontederia cordata	Pickernelweed	Sparse
k	Scutellaria	Skullcap	Sparse
Z	Solanum	Nightshade	Sparse
t	Ceratophyllum demersum	Coontail	Sparse
r	Clethra alnifolia	Sweet pepperbush	Scattered
C	Cyperaceae	Non-flowering sedge	Sparse
H	Hypericum	St. John's-wort	Sparse
X	Carex	Sedge	Sparse

Aquatic Invasive Species

Status of Infestations

- ▶ 70+ variable milfoil infestations
- ▶ 5 Eurasian water milfoil infestations
- ▶ 9 fanwort infestations
- ▶ 2 water chestnut infestations
- ▶ 1 Brazilian elodea infestation
- ▶ 8 water naiad infestations
- ▶ 6 curly-leaf pondweed infestations
- ▶ 7 Asian clam infestations
- ▶ >80 Chinese mystery snail infestations



High Risk Species for Pawtuckaway Area

- ▶ Based on water chemistry and geographic location

- ▶ Plants

- ▶ Purple loosestrife
 - ▶ Common reed
 - ▶ Variable milfoil
 - ▶ Water violet
 - ▶ Hydrilla

- ▶ Animals

- ▶ Asian clam
 - ▶ Chinese mystery snail
 - ▶ Spiny water flea

Aquatic Invasive Plant and Animal Refresher

- ▶ Following are photos of the more common species to keep an eye out for while on the water

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern, layered effect. The text is centered in a clean, sans-serif font.

Emergent Invasive Plants



Purple loosestrife (EXOTIC)

Common reed (Phragmites)

EXOTIC





New phragmites growing along shore and sending runners out into the water

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.


Submergent Invasive Plants




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



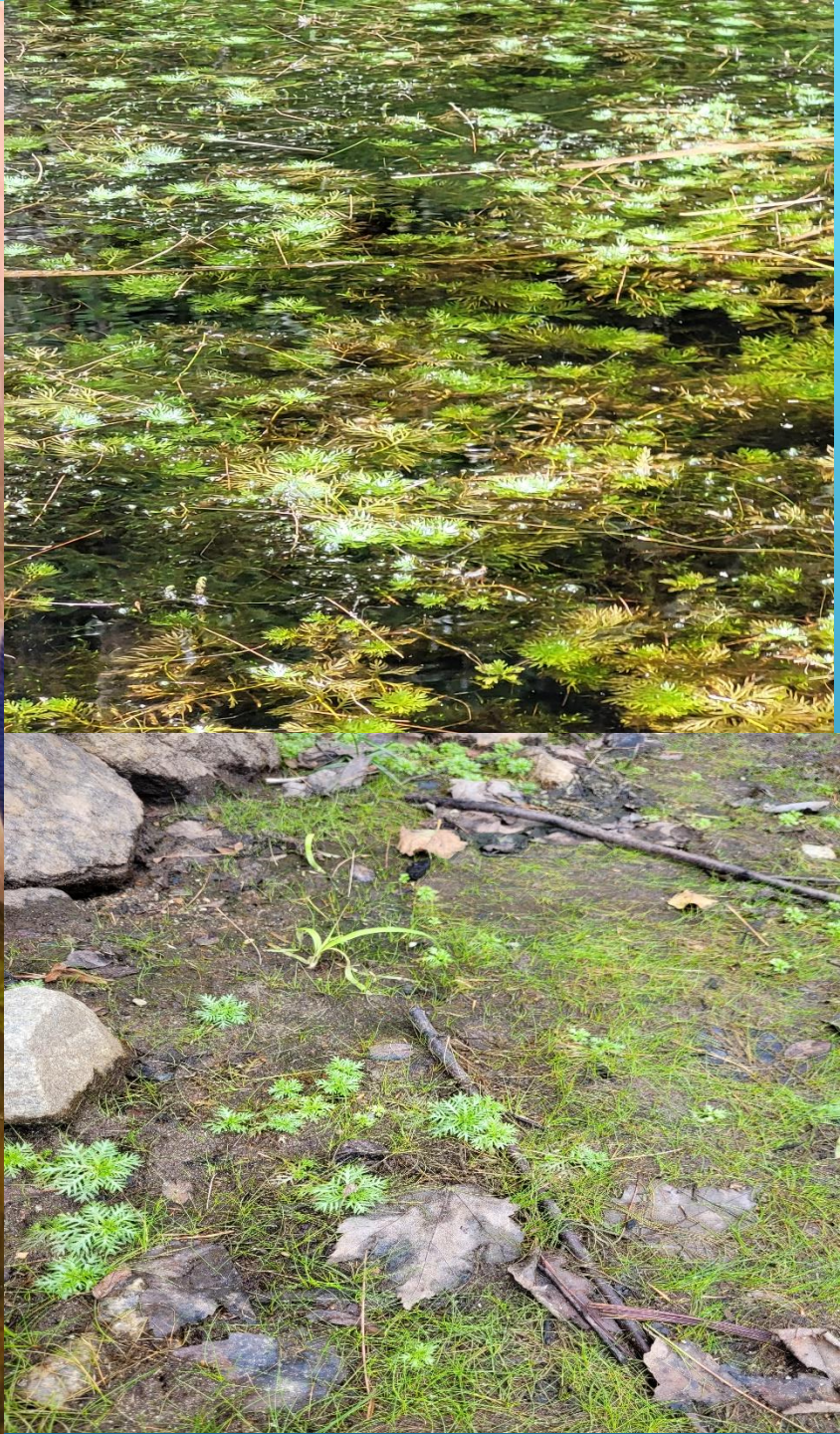
Variable milfoil ID tips

An underwater photograph showing several variable milfoil plants. The plants have long, thin, feathery stems that branch out. A callout box points to one of the stems. The water is slightly murky, and the background is filled with more of the same plant life.

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.



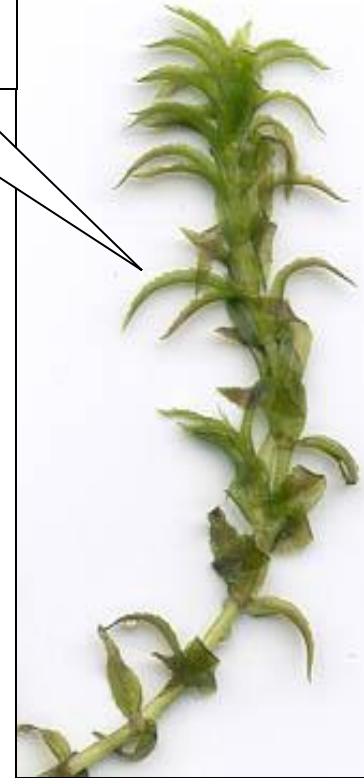
The plants often
have bright green
tips, or whole
stems





Looks a lot like native
waterweeds (*Elodea*)

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)

Invasive Aquatic Animals

Asian Clam

- ▶ Roughly the diameter of a dime,
- ▶ sometimes a quarter





Asian clam shells littered on the bottom of Cobbett's Pond, Windham

An aerial photograph of a pond, likely Cobbetts Pond in Windham, showing several fish beds. The fish beds are visible as darker, irregular patches of water. Accumulated Asian clam shells are seen as numerous small, light-colored, circular objects scattered across the pond's surface, particularly concentrated in certain areas. The water has a greenish-brown tint, possibly due to algae or sediment.

Asian clam shells accumulated in fish beds in Cobbetts Pond, Windham

Chinese Mystery Snail

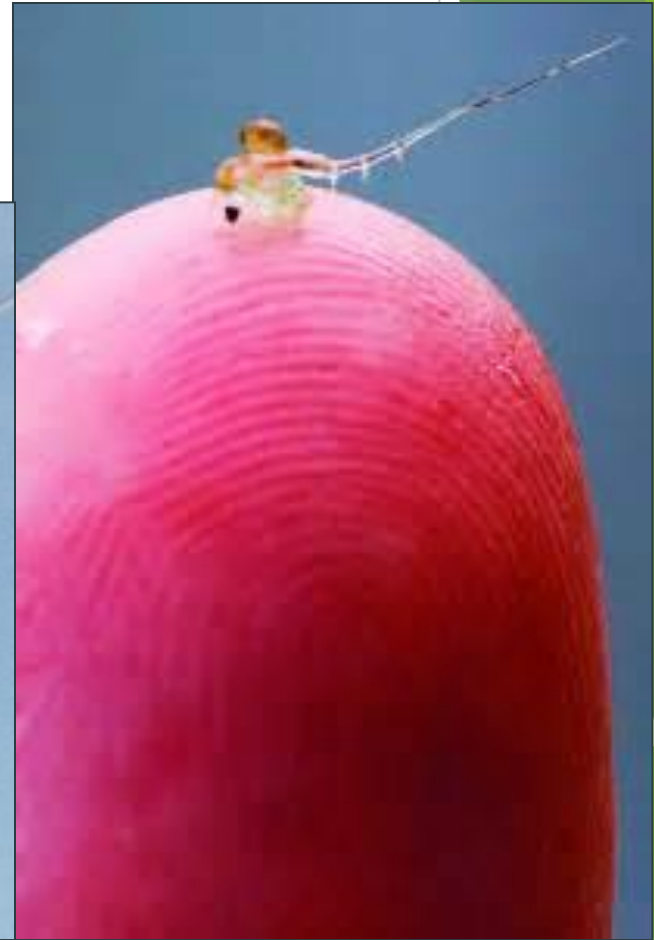


These are about the size of an apricot or golf ball!

Spiny Water Flea



Several spiny water fleas on fishing line



Spiny water flea on fingertip

Thank you!

Amy P. Smagula – Amy.Smagula@des.nh.gov



THANK YOU!

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