

River Runners™

Citizen Science Training Workshop

with support and funding from
New Hampshire Rivers Council
members like you



Exotic Species

❑ **EXOTIC and INVASIVE:** A species that is not native and is introduced to an area either **purposely or accidentally**. *They do not necessarily have to be from a different country to be considered an exotic species.*

While some may consider that both native and exotic species can both be a nuisance; exotic invasive species are not native and can be more problematic.

Parrot feather



Hydrilla

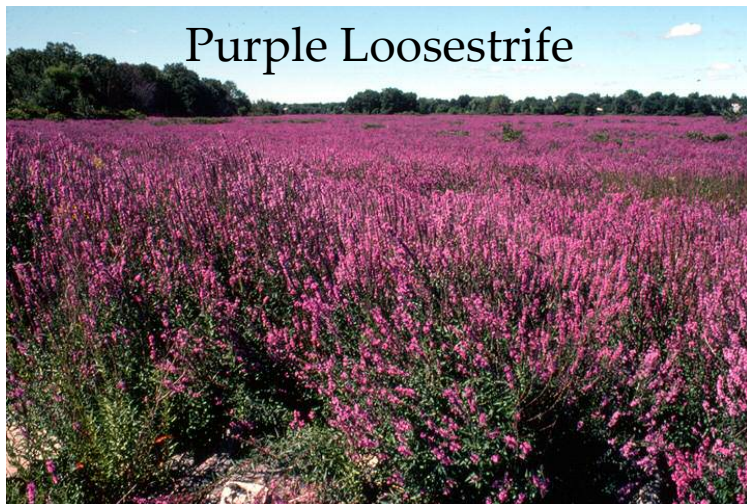


Water chestnut



Characteristics of Invasive Species

- ☐ Grow very quickly
- ☐ Cover large areas in a short time frame
- ☐ Have various strategies for reproduction
- ☐ Survive in a range of habitat conditions (generalists)
- ☐ Have no natural predators to control them



Invasive Species Pathways

Canals and Waterways



Home and Water Gardening



Overland Transport



Aquarium Dumping



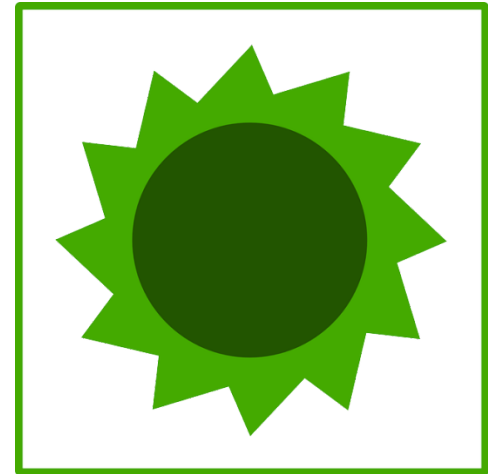
Citizen "wildlife management and stocking"



Exotic Plants Can Create Ecological and Economic Impacts

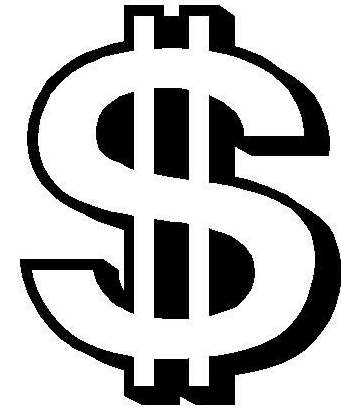
Ecological

- ☐ Threat to and displacement of beneficial native species
- ☐ Second leading cause of loss of biodiversity in the world
- ☐ Reduction of aesthetic quality of water bodies
- ☐ Decreased dissolved oxygen under thick plant mats
- ☐ Increased water temperature
- ☐ Nutrient loading when large biomass degrades



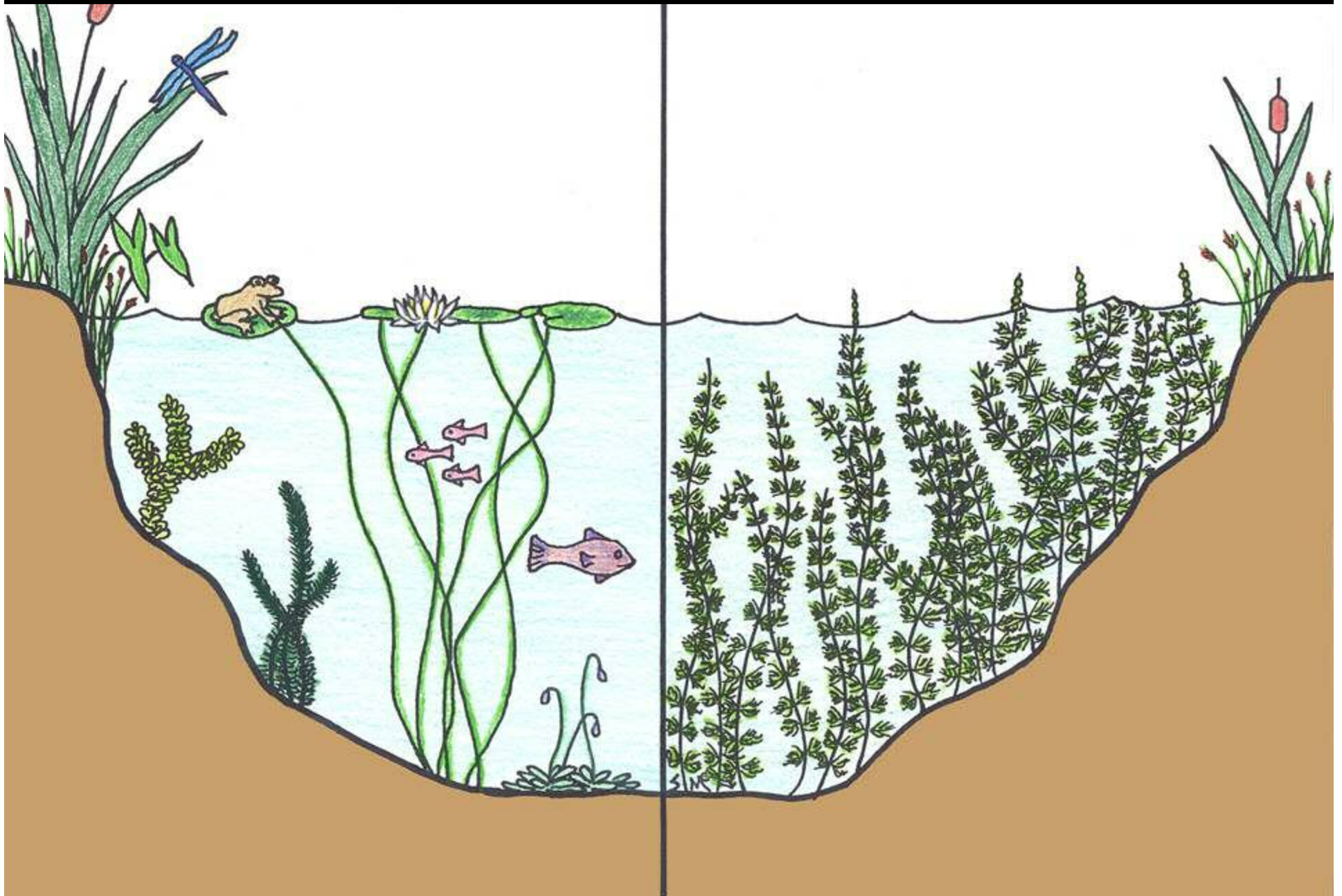
Recreational and Economic

- ☐ Devaluation of waterfront property
- ☐ Hinders swimming: beach and boat
- ☐ Hinders fishing: Snags fish lines, stunts fish growth
- ☐ Hinders boating: Becomes tangled in outboard motor propellers, chokes boat traffic lanes
- ☐ Requires substantial funding for management



Healthy

Unhealthy



Status of Infestations

- ❑ Variable milfoil - 74
- ❑ Fanwort - 9
- ❑ Eurasian milfoil - 6
- ❑ Brittle naiad - 1
- ❑ European naiad - 5
- ❑ Curly-leaf pondweed - 6
- ❑ Water chestnut - 2
- ❑ Brazilian elodea - 1
- ❑ Asian clam - 3
- ❑ Chinese mystery snail – 50+
- ❑ Zebra mussel – 0
- ❑ Spiny water flea - 0

There are 106 infestations on 74 lakes and 11 rivers. Some waterbodies have more than one species.

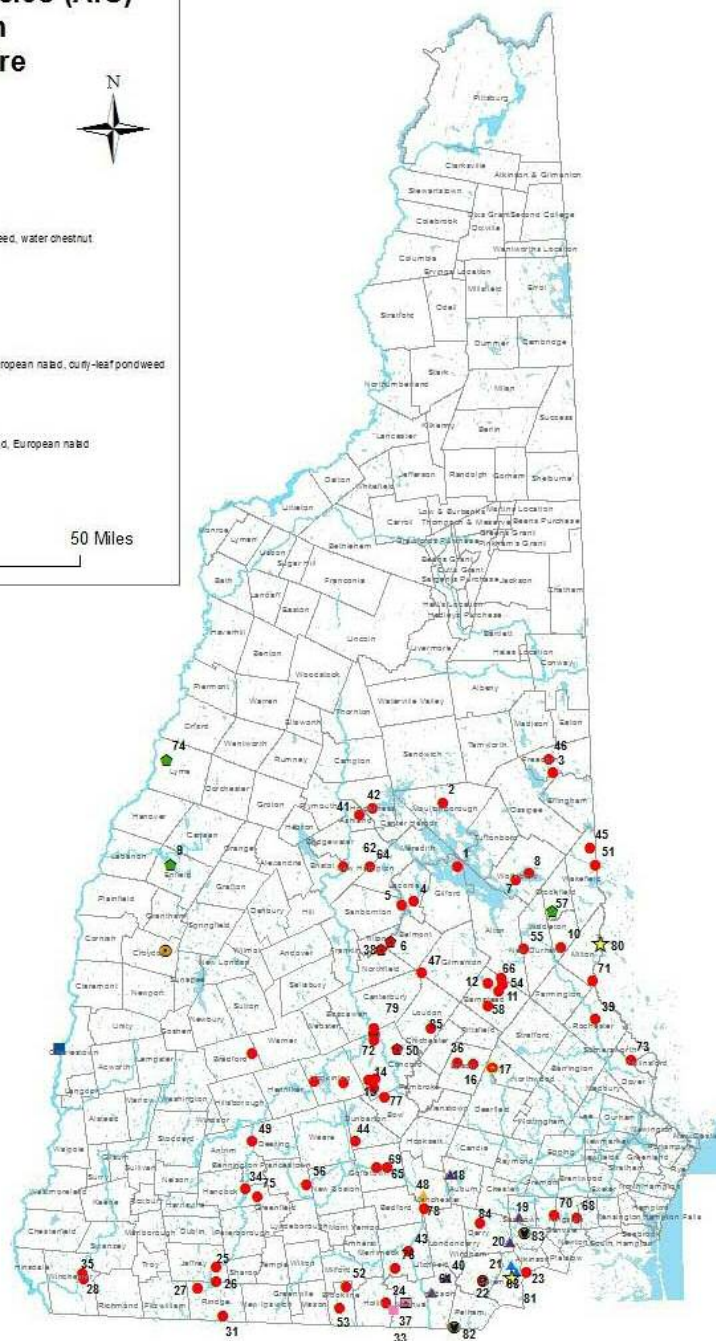
Aquatic Invasive Species (AIS) Infestation in New Hampshire

Legend

AIS Infestations Type

- Asian clam
- Brazilian elodea
- Curly-leaf pondweed
- Eurasian milfoil
- ★ European naiad
- ▲ Fanwort
- Variable milfoil
- Variable milfoil, Asian clam
- Variable milfoil, Curly-leaf pondweed
- Variable milfoil, Eurasian milfoil, fanwort, water chestnut, European naiad, curly-leaf pondweed
- Variable milfoil, European naiad
- Variable milfoil, curly-leaf pondweed
- Variable milfoil, fanwort
- Variable milfoil, fanwort, Eurasian milfoil, curly-leaf pondweed, European naiad
- Town_Boundaries_polygons
- NH_Hydrography_polygons
- State_Boundary

0 12.5 25 50 Miles



Infested Rivers

Waterbody (Town)	Species
Ashuelot River (Winchester)	Variable Milfoil
Cocheco River (Rochester)	Variable Milfoil
Connecticut River (Charlestown)	Eurasian Milfoil
	European naiad
	Didymo (rock snot)
	Curly-leaf pondweed
	Water Chestnut
Contoocook River (Various locations)	Variable Milfoil
Little Suncook River (Epsom/Northwood)	Variable Milfoil
Merrimack River (Boscawen/Canterbury/Concord/Bow)	Variable Milfoil
	Asian Clam (Bow)
Nashua River (Nashua)	Variable Milfoil
	Eurasian Milfoil
	Fanwort
	Water chestnut
	European naiad
	Curly-leaf pondweed
Pemigewasset River (Sanbornton)	Variable Milfoil
Piscataquog River (Goffstown)	Variable Milfoil
Squam Lake (Ashland)	Variable Milfoil
Winnepesaukee River (Tilton)	Variable Milfoil
	Curly-leaf pondweed



Nashua River

Photo Courtesy of
the *Nashua Telegraph*

Emergent Invasive Species

Courtesy of The Nature Conservancy



Courtesy of The Nature Conservancy



Plants in which most of their stems, leaves, and flowers are out of the water. Root systems may be underwater at all times, or out of the water during times of low water. Often found along shorelines and in shallow waters.

Purple Loosestrife

Lythrum salicaria



❑ORIGINATING FROM: Europe

❑HABITAT: Ponds, rivers, lake margins, wetlands, along roadways (wet / poorly-drained soils)

❑STEM: Upright, smooth to slightly downy, square (four-sided), almost woody

❑LEAVES: Opposite or whorled, often with heart-shaped bases somewhat clasping stem, gradually tapering to a point

❑FLOWERS: Dense spike of purple, magenta, or dark pink flowers (July – August)

❑REPRODUCTION: Produces millions of seeds per plant and quickly takes over the landscape when introduced. Also spreads by rhizome

❑CAN BE CONFUSED WITH: Pickerelweed or Swamp Loosestrife

Purple Loosestrife *Lythrum salicaria*



NATIVE LOOK ALIKE

Pickerelweed *Pontedaria cordata*



- ❑ HEIGHT: 1 – 2 feet tall
- ❑ STEM: Upright, smooth, bearing one leaf and one terminal spike
- ❑ LEAVES: Very large, arrowhead to heart-shaped, glossy
- ❑ FLOWERS: 3 inch bluish-purple flower spike on separate stalk (June – August)



NATIVE LOOK ALIKE

Swamp Loosestrife *Decodon verticillatus*



- ❑ **HEIGHT:** Up to 5 feet tall
- ❑ **STEM:** Smooth to slightly downy, rooting tips giving rise to new arching stems
- ❑ **LEAVES:** Opposite, whorled, lance-shaped, tapering to a point
- ❑ **FLOWERS:** Pinkish-purple, forming showy clusters in axils of the middle to upper leaves



Purple Loosestrife (Exotic)



Pickerelweed (Native)



Swamp Loosestrife (Native)



Common Reed *Phragmites* spp.



- ❑ STATUS: Most stands exotic / invasive
- ❑ ORIGINATING FROM: Europe
- ❑ HABITAT: Fresh and brackish water margins, ditches, and wetland areas. Also common to waste and fill areas
- ❑ HEIGHT: Up to 15 feet tall
- ❑ STEM: Large, hollow
- ❑ LEAVES: Bluish-green, lance-shaped
- ❑ FLOWERS: Tuft of long, silky hairs on top of stalk. Purple when young. Whitish and fluffy when old (July – October)
- ❑ CAN BE CONFUSED WITH: Reed canary grass, but reed canary grass can be distinguished by its shorter and narrower leaves, spikelets with only one flower, and shorter height

Common Reed *Phragmites* spp.



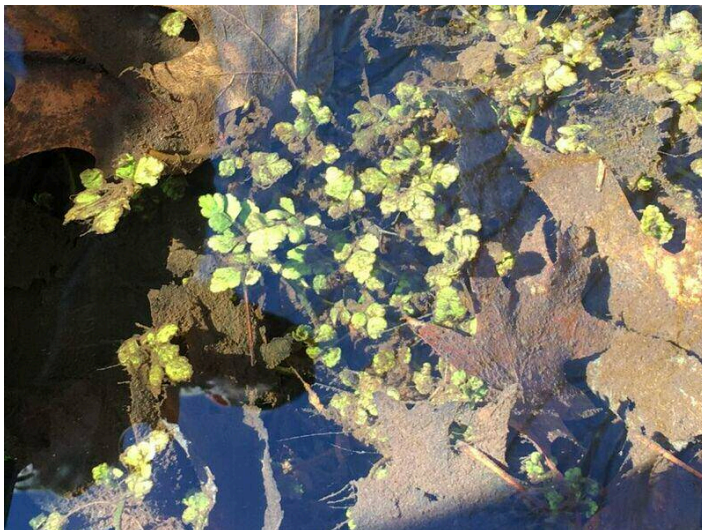
Reed Canary Grass *Phalaris arundinacea*



- ❑ ORIGINATING FROM: Europe
- ❑ HABITAT: Swales, marshes, edges of lakes, ponds, streams, rivers. Although not a shoreline plant, can survive in knee-deep water by sprouting “water roots” on submersed portion of stem
- ❑ HEIGHT: Up to 7 feet tall
- ❑ STEM: Upright, stiff
- ❑ LEAVES: Long, narrow
- ❑ FLOWERS: Green to greenish-purple spikelets up to 7 inches long (June – August)
- ❑ CAN BE CONFUSED WITH: Common reed, since they both form dense stands at disturbed sites. Reed canary grass can be distinguished by its shorter and narrower leaves, spikelets with only one flower, and shorter height. Both, though, are invasive species

Japanese Parsley or Chinese Celery

Oenanthe javanica



- ❑ **ORIGINATING FROM:** Eastern Asia, likely introduced through water gardening practices
- ❑ **HABITAT:** Ditches, ponds, wetlands, marshes, lakeshores and muddy stream banks
- ❑ **HEIGHT:** Perennial to 1 meter
- ❑ **FLOWERS:** Flowers from June to August and the seeds ripen from August to October. Flower are hermaphrodite
- ❑ **CONCERNS:** Although no specific mention of toxicity has been seen for this species, it belongs to a genus that contains a number of poisonous plants

Floating-Leafed Invasive Species



Plants in which all or most of the plant is found floating on the surface of the water and are usually found in shallow water.

Yellow Floating Heart

Nymphoides peltata



- ❑ ORIGINATING FROM: Eastern Asia. Not yet found in NH (closest infestation is Lake Champlain, VT)
- ❑ HABITAT: Lakes, ponds, rivers, and streams near coastal regions
- ❑ SIZE: Larger than native floating heart and is approximately 3 to 5 inches in length
- ❑ FLOWER: Yellow, does not produce “banana-like” clusters like the native
- ❑ ID TIP: Plant has leathery leaves and yellow flowers versus delicate leaves and white flowers of native



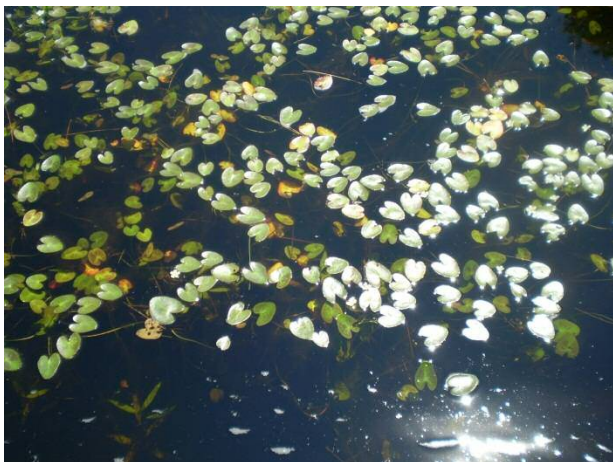
Yakima County Noxious Weed Control Board

NATIVE LOOK ALIKE

Floating Heart *Nymphoides cordata*



- ❑ HABITAT: Lakes, ponds, slow-moving rivers and streams
- ❑ LEAVES: Small, approximately 1 – 1.5 inches across and heart-shaped, reddish to purplish in color
- ❑ FLOWERS: White



European Water-Clover

Marsilea quadrifolia



- ❑ **ORIGINATING FROM:** Europe and Asia
- ❑ **US DISTRIBUTION:** Not present in NH; reported infestations in OH, IL, IA, MI, MO and occurrences in the northeastern states
- ❑ **HABITAT:** This aquatic fern anchors into sediments in shallow, slow-moving waters. Prefers sandy and loamy soil environments with semi-shade to full sun.
- ❑ **SIZE:** Maximum height 8 inches
- ❑ **LEAVES:** Smooth and can be floating, submerged, or emergent
- ❑ **FLOWER:** Thin green stalks bear a single leaf
- ❑ **ID TIP:** As the name suggests it resembles a four-leaf clover

Submerged Invasive Species



Plants that have most of their vegetative structures (stem and leaves) growing underwater; some floating leaves may also be present. They are found as deep as sunlight can penetrate the water column.

Variable milfoil (*Myriophyllum heterophyllum*)



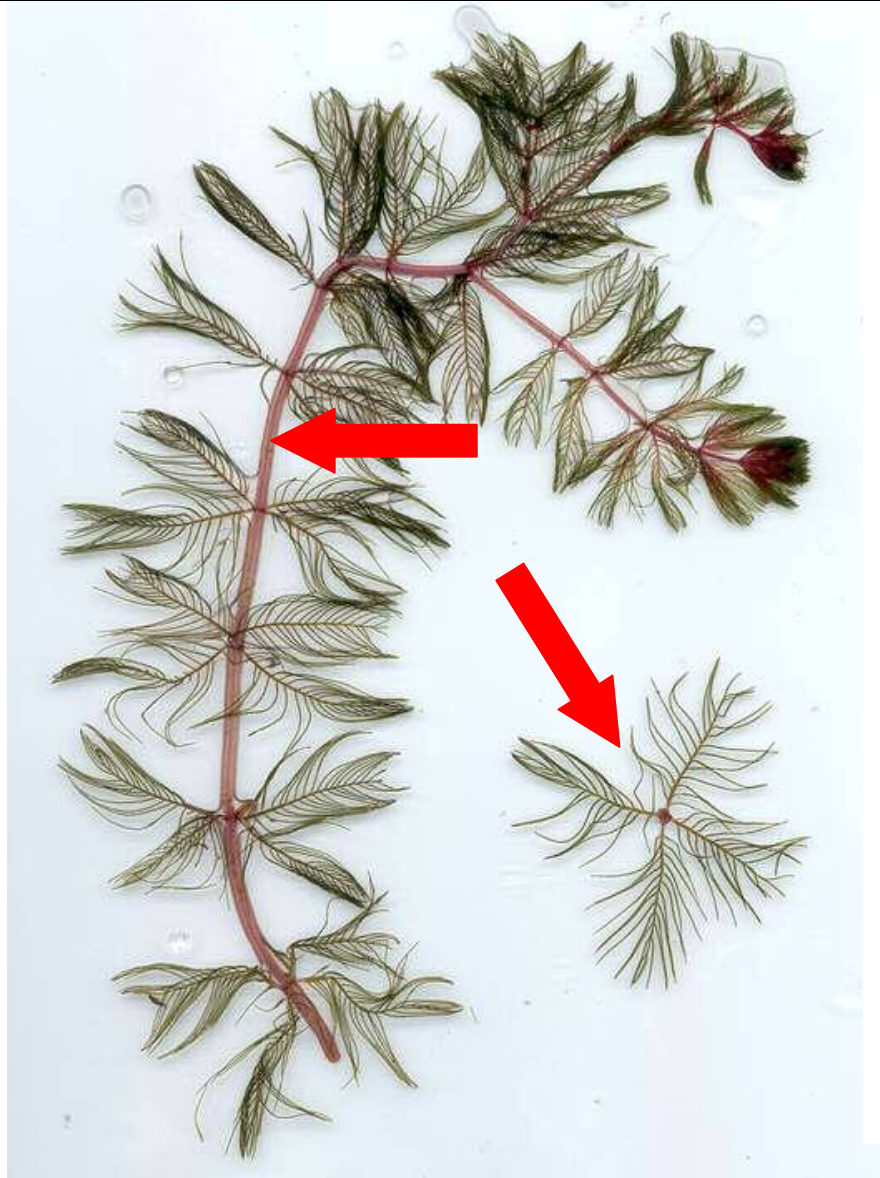
- ❑ **ORIGINATING FROM:** Southern and central US
- ❑ **INFESTATION:** 74 waterbodies in NH
- ❑ **HABITAT:** Lakes, ponds, slow-moving streams and rivers, mud
- ❑ **HEIGHT:** Slender, flexible, long, up to 15 feet long
- ❑ **STEM:** Round, thick, reddish
- ❑ **LEAVES:** Thick, feather-like, whorled around stem, with a squirrel-tail or garland-like appearance
- ❑ **FLOWERS:** Emerge from water in July and are in spikes up to 6 inches tall with distinct, oval-shaped, toothed bracts



Variable milfoil
Myriophyllum heterophyllum



Eurasian milfoil *Myriophyllum spicatum*



- ❑ **ORIGINATING FROM:** Eurasia
- ❑ **INFESTATION:** Six waterbodies in NH
- ❑ **HABITAT:** Lakes, ponds, slow-moving streams and rivers
- ❑ **HEIGHT:** Up to 16 feet long
- ❑ **STEM:** Round, pinkish
- ❑ **LEAVES:** Feathery, in whorls of 4 around stem, concentrated near the upper portion of the plant, with gaps of ½ inch or more between whorls
- ❑ **FLOWERS:** Green, emergent, fairly inconspicuous

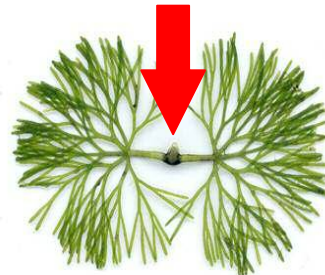
Eurasian milfoil *Myriophyllum spicatum*



Fanwort *Cabomba caroliniana*



- ❑ **ORIGINATING FROM:** Europe / Asia
- ❑ **INFESTATION:** 9 waterbodies in NH
- ❑ **HABITAT:** Lakes, ponds, rivers, streams
- ❑ **HEIGHT:** 1 – 2 feet long
- ❑ **LEAVES:** Branching leaves of opposite pairs on the stem, finely dissected and fan-shaped. Small floating leaves form before flowering. Leaf is attached by a short-stem to main stem of plant
- ❑ **FLOWERS:** Emergent, white
- ❑ **ID TIPS:** Two opposite leaves that have distinct stem from which leaflets fan outward



Fanwort *Cabomba caroliniana*)



NATIVE LOOK ALIKE

Bladderwort *Utricularia vulgaris*



- ❑ **HABITAT:** Lakes, ponds, rivers, streams. Free-floating and rootless, though it may give the appearance of being rooted
- ❑ **ID TIP:** Easily distinguished by its small bladders found on branched leaves
- ❑ **FLOWERS:** Emergent, ranging from pink to yellow, white, and green
- ❑ **SOMETIMES CONFUSED WITH:** Milfoils, but Bladderwort has bladders on the leaves and branching-forking leaflets whereas the leaves on milfoil are feather-like leaves with nearly opposite unbranched leaflets
- ❑ **FUN FACT:** One of three carnivorous plants in NH. Has trigger hairs on each bladder that open a trap-door and suck in water and organisms and then digest

NATIVE LOOK ALIKE

Coontail *Ceratophyllum spp.*

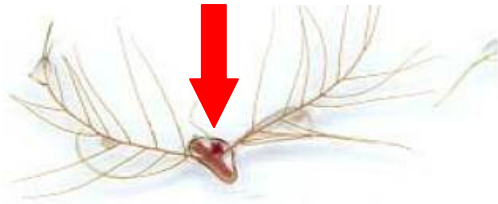


- ❑ **HABITAT:** Lakes, ponds, slow-moving rivers, and streams. Free-floating with no roots, although it often lies across the bottom giving the appearance of being rooted
- ❑ **LEAVES:** Whorled, highly forked, clustered toward tips of stem
- ❑ **FLOWERS:** Purplish-green found where the leaf attaches to the stem and stay entirely submerged
- ❑ **CAN BE CONFUSED WITH:** Milfoil, but leaves of coontail completely whorled around the stem and forked; milfoil leaves are distinctly feathered
- ❑ **INSIDER TIP:** A clear indicator of Coontail is its plastic-like texture



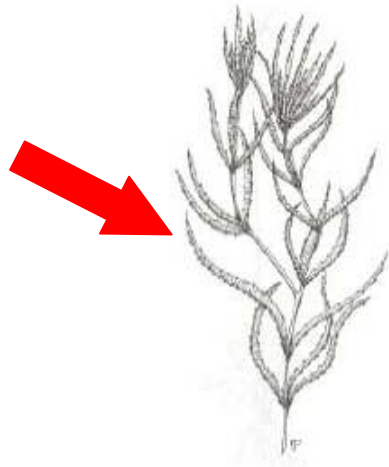
NATIVE LOOK ALIKE

Native Water Milfoil *Myriophyllum humile*



- ❑ Six species of native water milfoils in NH
- ❑ Most have similar habitats and characteristics
- ❑ Tend to grow in small clumps or patches, rarely grow to dominate the shallows of a waterbody
- ❑ *Myriophyllum humile*, one of more common native species in NH
- ❑ **SIZE:** Smaller than other native water milfoils, reaching only about 1 – 1 ½ feet long
- ❑ **STEMS / LEAVES:** Brownish in color
- ❑ **LEAVES:** Alternate along main stem
- ❑ **FRUITS:** Located in axils of the leaves
- ❑ Important food sources to wildlife and aquatic insects, serve as habitat for fish and other aquatic life

Water Naiad *Najas minor*



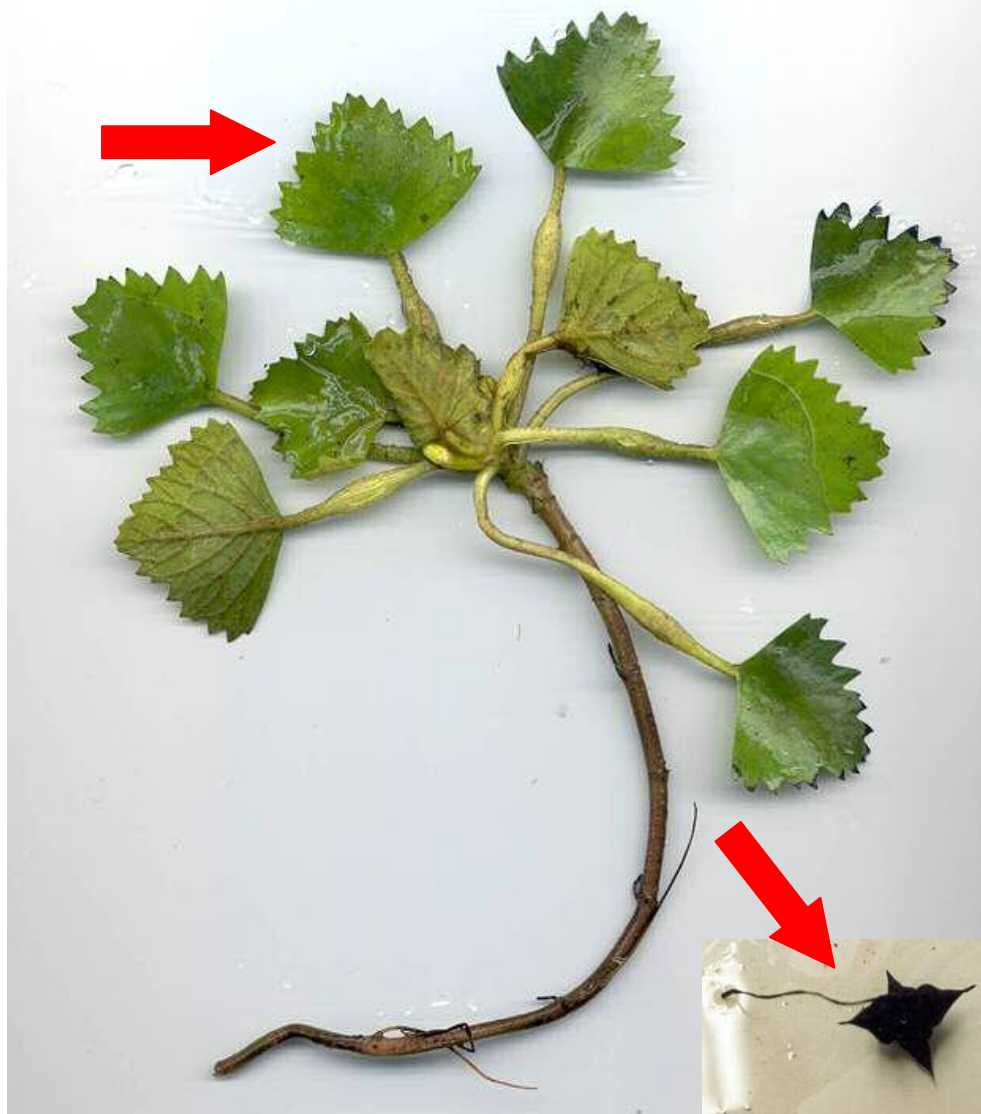
- ❑ **ORIGINATING FROM:** Europe
- ❑ **INFESTATION:** Five locations including the Connecticut River in NH
- ❑ **HABITAT:** Generally found in eutrophic or alkaline lakes, ponds, rivers, streams
- ❑ **STEM:** Very brittle and fragments easily
- ❑ **LEAVES:** Toothed
- ❑ **FLOWERS:** Inconspicuous, found at leaf axils
- ❑ **REPRODUCTION:** Fragmentation or seeds deposited in sediment when plant dies in fall

Curly-leaf Pondweed *Potamogeton crispus*



- ❑ **INFESTATION:** Six waterbodies in NH
- ❑ **HABITAT:** Lakes, ponds, backwater areas of rivers and streams
- ❑ **LEAVES:** ¼ inch wide, 4 inch long curly-edged, with teeth on the margins
- ❑ **FRUIT:** Thick, hard fruiting body on the top of the plant
- ❑ **CAN BE CONFUSED WITH:**
Potamogeton perfoliatus (native) because its leaves are also curly. Difference is presence of teeth on the margins of the leaves of curly-leaf pondweed
- ❑ **INSIDER TIP:** It looks like lasagna

Water Chestnut *Trapa natans*)



- ❑ **ORIGINATING FROM:** Asia
- ❑ **INFESTATION:** Two waterbodies in NH
- ❑ **HABITAT:** Lakes, ponds, slow-moving river systems
- ❑ **FLOATING LEAVES:** Triangular-toothed in rosettes found floating on the surface of a waterbody
- ❑ **SUBMERSED LEAVES:** On stem
- ❑ **FRUIT (CALTROP):** Single-seeded, four horns that are sharp with several barbs protruding off of them
- ❑ **FLOWERS:** Small, hidden, found underneath rosettes of leaves
- ❑ **ID TIP:** Distinctive rosette of leaves. Triangular shaped toothed leaves



Water Chestnut *Trapa natans*



Brazilian elodea *Egaria densa*



- ❑ **ORIGINATING FROM:** Asia and South America
- ❑ **INFESTATION:** One waterbody in NH
- ❑ **HABITAT:** Lakes, ponds, rivers, streams
- ❑ **STEM:** Can surpass 6 feet long
- ❑ **LEAVES:** Narrow, whorled around stem. Teeth present on leaf edges, but need magnifying lens to see
- ❑ **FLOWERS:** White with three spreading peals and bright yellow centers
- ❑ **CAN BE CONFUSED WITH:** Hydrilla. Distinguished by rich green color, robust size, smaller teeth on leaf margins

Brazilian elodea *Egaria densa*



NATIVE LOOK ALIKE

Waterweed *Elodea canadensis*



- ❑ **HABITAT:** Lakes, ponds, rivers, streams
- ❑ **HEIGHT:** Up to 2 feet long
- ❑ **LEAVES:** In whorls of 3 with smooth leaf margins
- ❑ **FLOWERS:** 3 petals, green or white
- ❑ **CAN BE CONFUSED WITH:** Invasive relative Brazilian elodea or Hydrilla. Can be distinguished by its smooth leaf margins

Hydrilla (*Hydrilla verticillata*)



❑ **ORIGINATING FROM:** Africa

❑ **NOT YET FOUND IN NH**

❑ **HABITAT:** Lakes, ponds, rivers, streams

❑ **STEM:** Can grow 20+ feet long.

❑ **LEAVES:** Narrow, whorled around main stem. Conspicuously toothed along the margins of the leaves. Leaves in whorls of 4 – 6 and are approximately 1/3 – 2/3 inches long

❑ **FLOWERS:** Small, white, often detaching from plant and drifting (July)

❑ **CAN BE CONFUSED WITH:** Brazilian elodea, but Hydrilla has a rough texture and larger teeth on its leaf margins

Hydrilla Invasion on West Lake Tohopekaliga, Florida



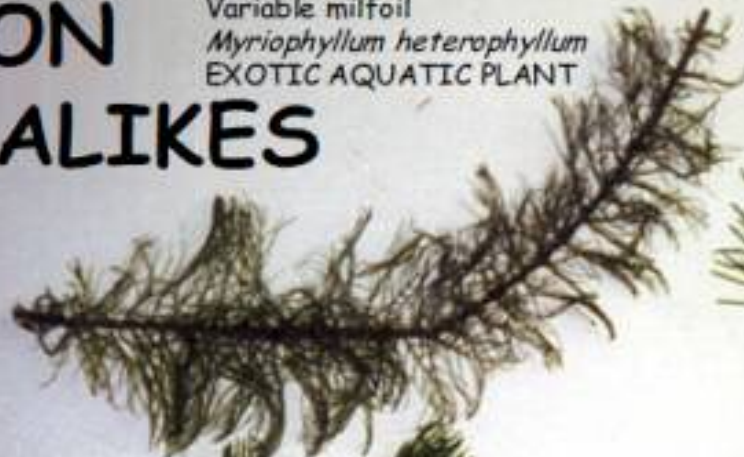
COMMON LOOK-ALIKES

Variable milfoil
Myriophyllum heterophyllum
EXOTIC AQUATIC PLANT

Fanwort
Cabomba caroliniana
EXOTIC AQUATIC PLANT



Coontail
Ceratophyllum
NATIVE AQUATIC PLANT



Bladderwort
Utricularia spp.
NATIVE AQUATIC PLANT



Hydrilla Look-Alikes

These plants all look very much alike. If you see anything that looks like the plants below, always contact NH DES for positive identification. If you see these please call DES at 603-271-2248 or mail specimens to Limnology Center, NH DES, 6 Hazen Drive PO Box 95, Concord, NH 03302-0095

Hydrilla- EXOTIC
Hydrilla verticillata



Tuber in sediments

Leaves in 3s or 5s
whorled around stem with
curling tips, very toothed or
serrated on edges

Brazilian elodea- EXOTIC
Egeria densa



Leaves in 4s or 8s
whorled around stem with
broader leaves, slightly
toothed at edges

Waterweed- NATIVE
Elodea nuttallii



Leaves in 3s whorled around
stem with narrow leaves, no teeth
on margins of leaf

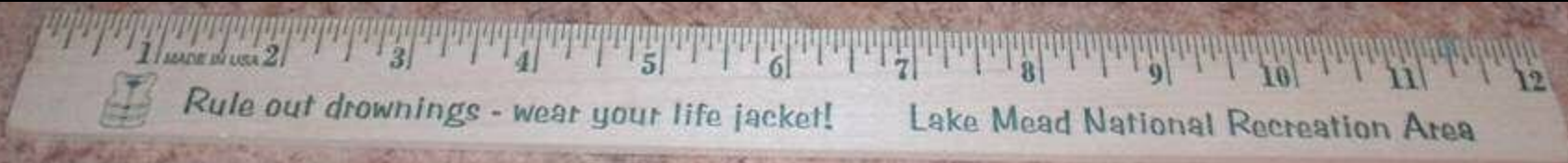
Waterweed- NATIVE
Elodea canadensis



Leaves in 3s whorled around
stem with broader leaves, no
teeth on margins of leaf



Invasive Aquatic Critters



Zebra mussels *Dreissena polymorpha*



CHARACTERISTICS

- ☐ Named for the striped pattern on its shell - Black or brownish shell with cream or white stripes
- ☐ Maximum size less than 2 inches long; often less than 1 inch.

HABITAT

- ☐ Lakes, estuaries, streams
- ☐ Attached to hard surfaces such as rocks, wood, and plants and to manmade structures of concrete, metal, and fiberglass
- ☐ Tolerate salinity to 6 ppt, temperatures to approximately 29 °C.



Photos courtesy of the
Northeast Aquatic Nuisance Species Panel

Zebra mussels *Dreissena polymorpha*



IMPACTS

- ☐ Voracious filter feeders, removing microscopic plants and animals from the water, reducing food available to other aquatic animals
- ☐ Clog intakes for power plants, industrial facilities, and public drinking water supplies
- ☐ Foul boat and ship hulls
- ☐ Economic impacts in the billions of dollars

Photos courtesy of the
Northeast Aquatic Nuisance Species Panel

Zebra mussels washed up on shore



Asian clam *Corbiculata fluminea*



CHARACTERISTICS

- ☐ Shells greenish-yellow to brown with thick concentric rings
- ☐ Thick symmetrical shell
- ☐ Up to 2 inches long
- ☐ Inside of shell is smooth and polished with a light purple tinge



HABITAT

- ☐ Large rivers and lakes
- ☐ Prefer sandy or silty sediments into which they burrow up to 6-8 inches

Photos courtesy of the
Northeast Aquatic Nuisance Species Panel

Asian clam *Corbiculata fluminea*



Photos courtesy of the
Northeast Aquatic Nuisance Species Panel

THREE POPULATIONS IN NH

- ☐ Merrimack River, South Bow
- ☐ Cobscook Bay, Windham
- ☐ Long Pond, Pelham

IMPACTS

- ☐ Clogging of power plant and industrial water systems, irrigation canals and pipes and drinking water supplies
- ☐ Competes with native species for limited resources
- ☐ May promote algae blooms due to localized nutrient loading from dense clam beds (observed in Lake Tahoe, CA)

Spiny Water Flea *Bythotrephes longimanus*



Photos courtesy of the
Northeast Aquatic Nuisance Species Panel

ORIGINATES FROM: Europe and Asia

**KNOWN DISTRIBUTION IN THE
NORTHEAST:** New York, Lake Champlain,
Great Lakes

CHARACTERISTICS

- ☐ Small predatory crustacean
- ☐ Grows up to ½ inch in size
- ☐ Long, straight tail spine is twice as long as body
- ☐ Spiny tail prevents predation leading to large populations

Spiny Water Flea *Bythotrephes longimanus*



Photos courtesy of the
Northeast Aquatic Nuisance Species Panel

HABITAT

- ☐ Estuaries, lakes, wetlands
- ☐ Upper water column of large and small temperate lakes
- ☐ Can tolerate brackish water
- ☐ Limited to regions where water temperature is 4-30 degrees C. and salinity is 0.04-8.0‰

IMPACTS

- ☐ Feeds on native zooplankton that are important food sources for native fish, thus reducing native populations
- ☐ Clumps can ruin fishing gear

Chinese Mitten Crab *Eriocheir sinensis*



Photo courtesy of
Christian Faucher

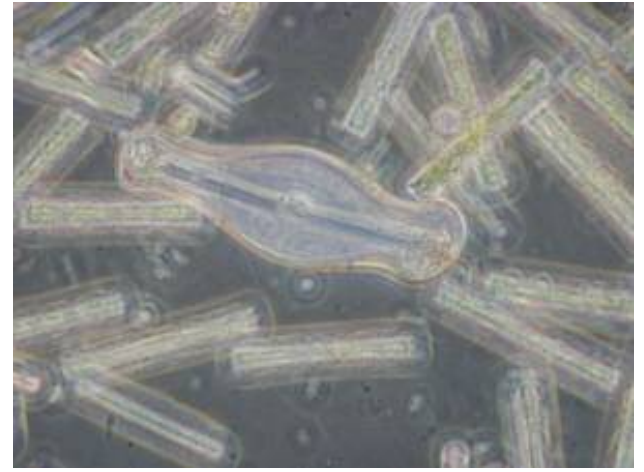
HABITAT

- ☐ Marine areas including adjacent freshwater habitats such as rivers and lakes, estuaries
- ☐ Pollution tolerant
- ☐ Moves around on land and around barriers

IMPACTS

- ☐ Weaken streambanks where they burrow
- ☐ Clogs pipes and other infrastructure

Didymo
maybe native what
should we do?



Didymo a.k.a. Rock Snot

Didymosphenia geminata



CHARACTERISTICS

- ☐ Tan, light brown, brown clumps or ropey strands
- ☐ Feels rough, cottony or fibrous; does *not* feel slimy
- ☐ Can form thick solid mats (1-4 inches) on rocks or stream bottoms, or may appear clumpy or feathery
- ☐ Dried stalk material on shore may look like dried cardboard or toilet tissue
- ☐ Definitive identification requires microscopic examination



Didymo a.k.a. Rock Snot

Didymosphenia geminata



KNOWN DISTRIBUTION IN THE NORTHEAST: Various rivers and streams in QC and NB in Canada as well as VT, NH, NY, and CT in the US

HABITAT: Clear, swift-flowing rivers and streams with rocky bottoms. Occasionally found in large lakes with continuous wave action

Didymo a.k.a. Rock Snot

Didymosphenia geminata



IMPACTS

- ❑ Alters the composition of aquatic insect communities in areas of heavy infestation
- ❑ Degrades aesthetic quality of pristine streams
- ❑ Heavy infestations may impact infrastructure such as clogging irrigation intake pipes
- ❑ Chokes river bottom and can smother fish eggs and other aquatic life

What Do We Do?

Prevention

- ☐ Outreach
- ☐ Education
- ☐ Inspections
- ☐ Legislation/Regulation

Early Detection

- ☐ Weed / Scum / Animal Watching
- ☐ Report anything suspicious immediately

Rapid Response

- ☐ Containment
- ☐ Control

Long-Term Management



How Can You Help?



Be a River Runner™

Report presence of new suspicious species!
Report expansion / status of existing infestation!

How do I become a citizen scientist?

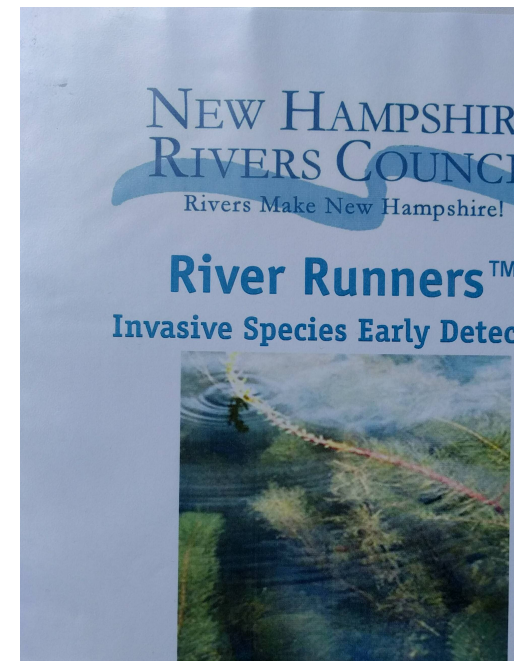
The New Hampshire Rivers Council provides

Training

- ☐ Volunteers trained to monitor waterbodies for exotic species

Resources

- ☐ Identification guides
- ☐ Reporting forms and guidance
- ☐ Specimen collection bags



Resources needed for River Runners™

- ☐ Small boat with short shaft motor, canoe, kayak, or row boat
- ☐ Driver and one or more observers
- ☐ Reporting forms and pens/pencils
- ☐ Identification guides
- ☐ Specimen collection bags
- ☐ Polarized sunglasses



What do you do on the water?

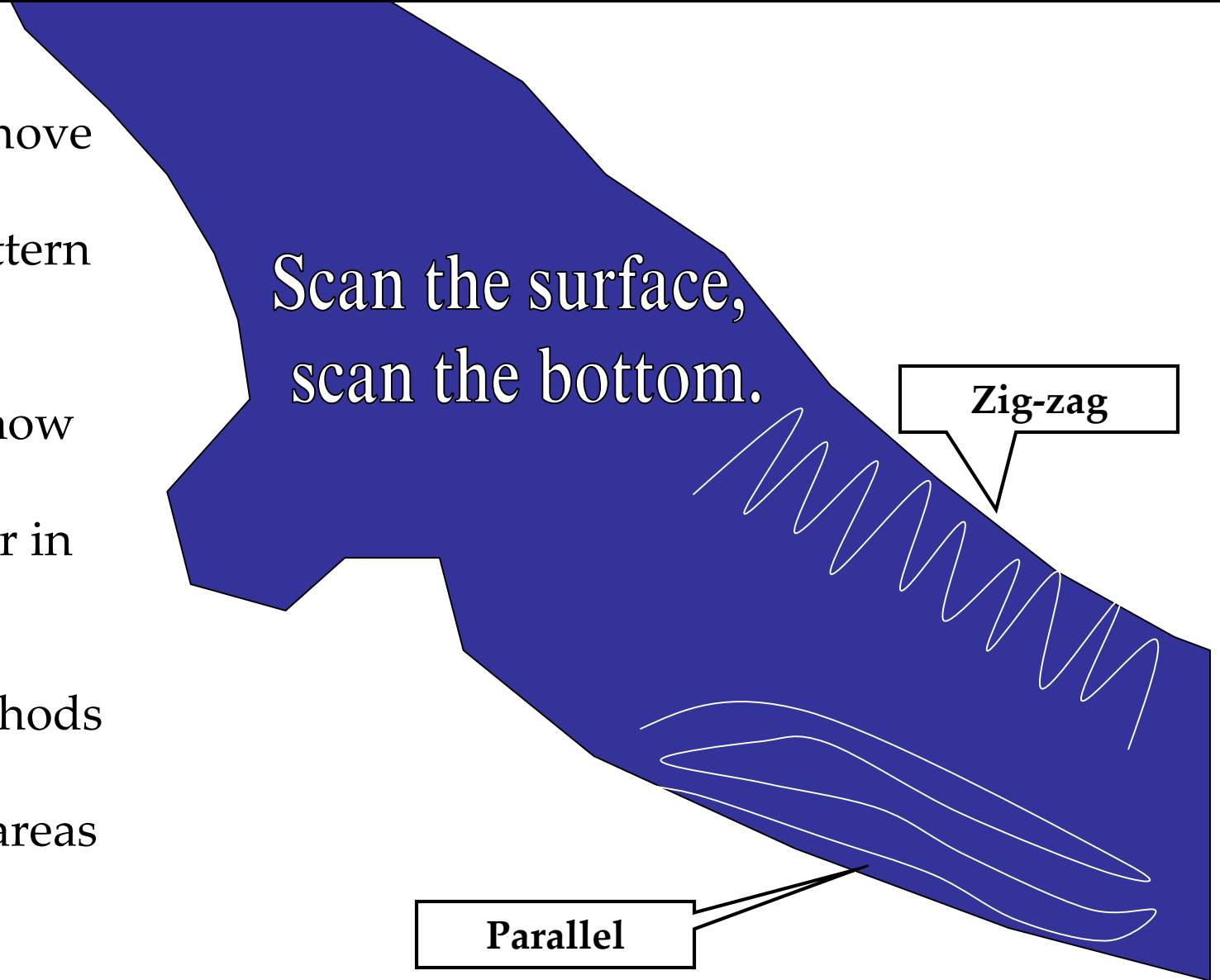
From shore, move in a zig-zag or parallel pattern out to deeper water to maximize how much area you cover in your survey.

Alternate methods each month to cross over areas for thorough checking.

Scan the surface,
scan the bottom.

Zig-zag

Parallel



Where do you look?



- ☐ Slow flow areas-except for Didymo.
- ☐ Backwaters.
- ☐ Above impoundments / dams.
- ☐ Along banks of rivers.
- ☐ Floodplain areas.
- ☐ Mucky-bottom areas.
- ☐ Areas where native vegetation has been disturbed.
- ☐ Boat launches.

For what are you looking?

- ☐ 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)
- ☐ Anything very bright green in color
- ☐ There are 29 invasive aquatic plants of concern, but the biggest threats to most waterbodies are from variable milfoil (although some regional concerns exist)



**Find something?
Mark it, then report it!**



Collect a representative or “voucher” specimen

Drop-off or mail

- ☐ Wrap specimen in a moist (not dripping) paper towel
- ☐ Put in specimen collection bag with information in the reporting form



Email

- ☐ Take a digital picture of the specimen laid out on plain white paper or a paper towel (use a coin or pen for scale)
- ☐ Email it to ContactUs@NHRivers.org



Management



What is in a management plan?

- ❑ Evaluate the problem
- ❑ Examine the physical, chemical, biological, and ecological characteristics of the waterbody
- ❑ Determine goals for project (eradicate, manage, contain)
- ❑ Strategically plan actions
- ❑ Implement, monitor, follow-up



What is integrated pest management?

- ❑ Multi-strategy technique that involves a number of different applications to minimize the unwanted effects of pests
- ❑ Through a number of interdisciplinary approaches, pests and their damaging effects can be managed
- ❑ Utilizes the most appropriate cultural, biological, mechanical, and physical strategies for managing plant pests
- ❑ Chemical products are used as a last resort and the least toxic chemicals are preferred



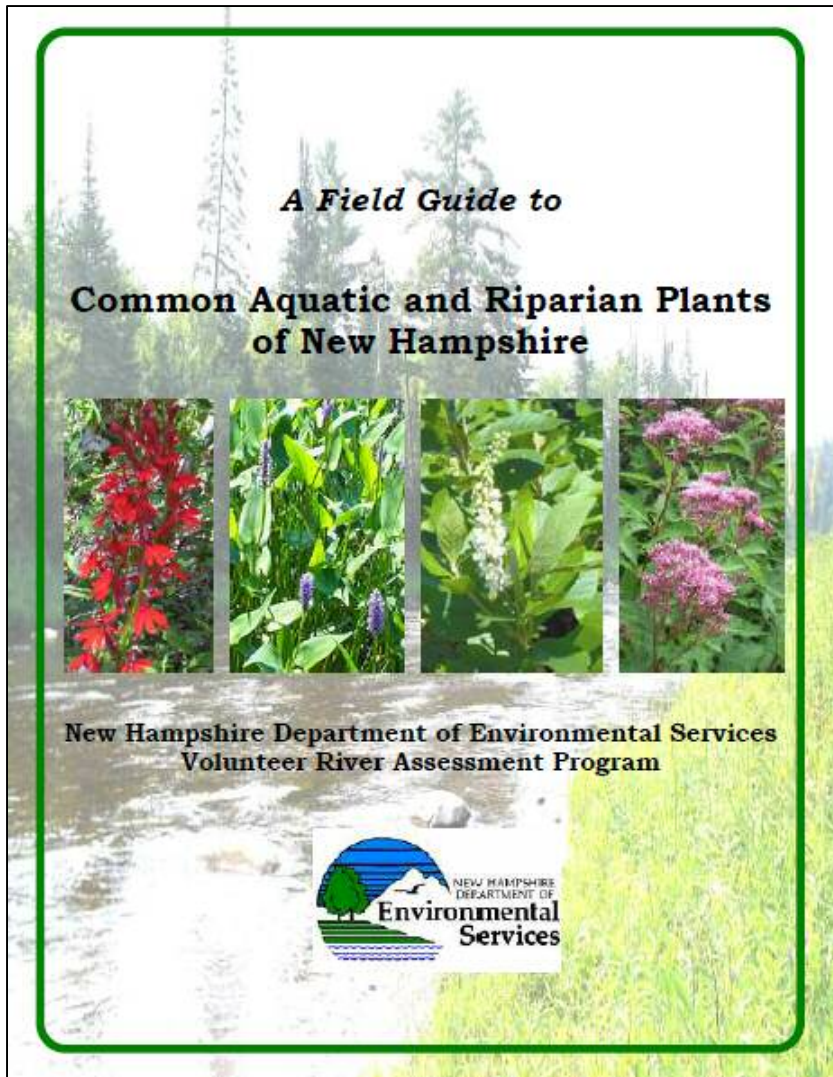
Courtesy of
Neponset River Watershed Association



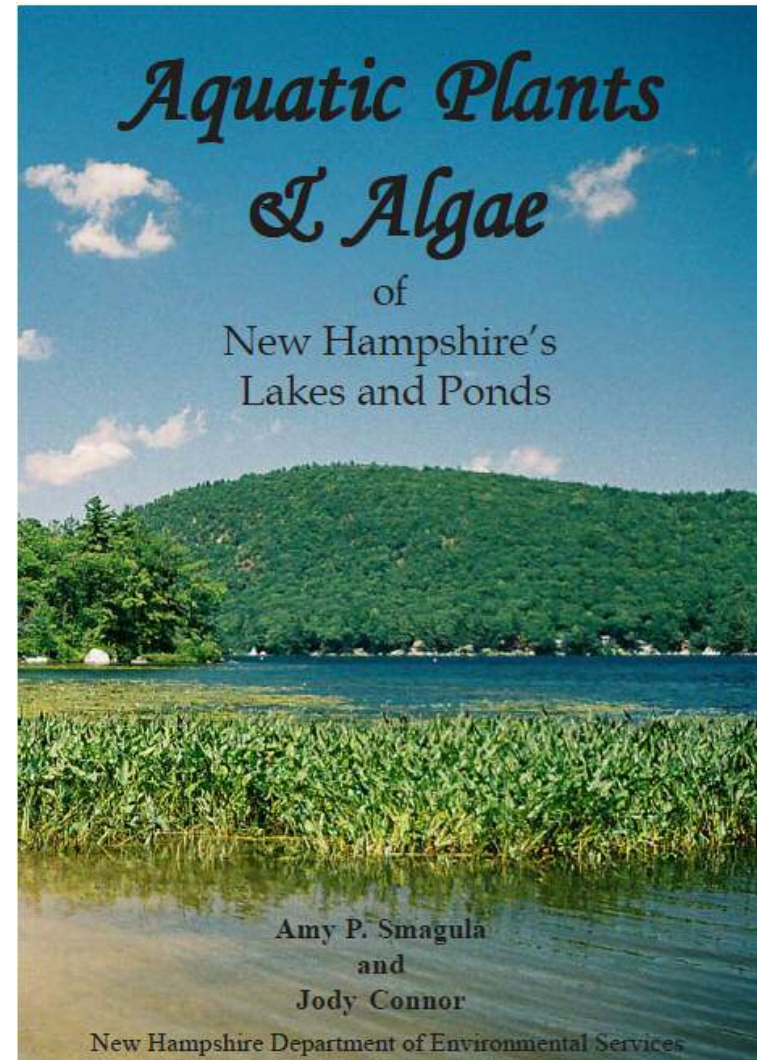
Galerucella spp.



Helpful NHDES Plant ID Guides



Jen Drociak



Amy Smagula and Jody Connor

Visit our website for resources

- For further information on invasive species visit <http://nhrivers.org/river-runners/>
 - You will find this presentation, brochures, data sheets, and the most current infestations map
- Become a member
- Receive our electronic newsletter
- Visit www.nhrivers.org
- Like us on Facebook
- Follow us on Twitter and LinkedIn

Questions?



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