

THE BLACK LIST

Where the Bad Plants are Found and
How You Can Find Them

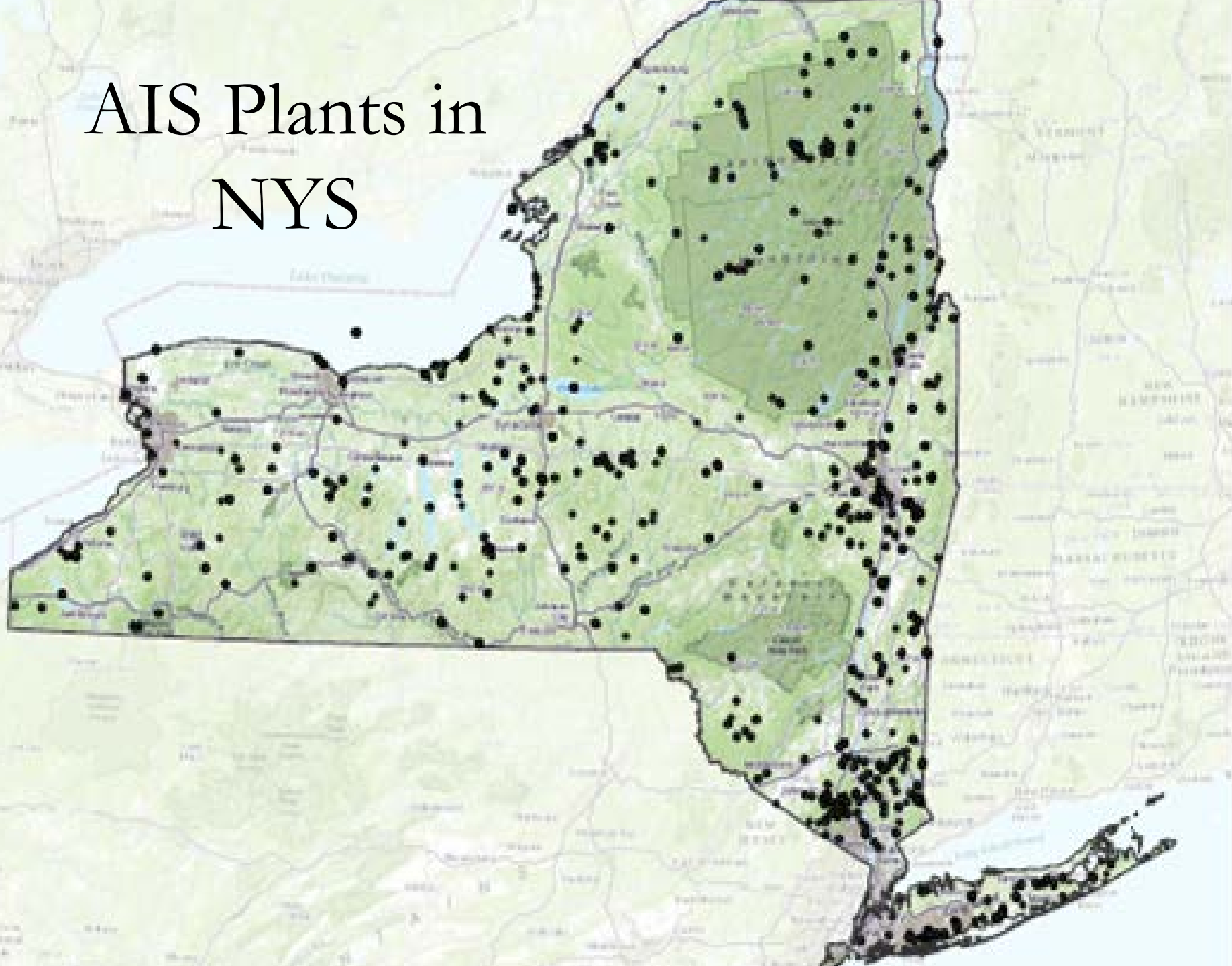


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AIS Plants in NYS



History of AIP Introductions

- Known introductions:
 - Intentional
 - Water chestnut: 1882, Sander Pond
- Unknown introductions:
 - Ports and Marine Pathways
 - Brazilian elodea- 1893, Millneck (Long Island)
 - Fanwort- 1940s, Long Island
 - Canals and Water Pathways
 - Eurasian watermilfoil- Finger Lakes, 1940s
 - Curly leafed pondweed- Finger Lakes, 1890s?
 - European frogbit (St. Lawrence Seaway?)- 1970-1982
 - Water chestnut- Canal and Natural waterways, 1920s-1950s
 - Aquaria
 - Waterfowl



(Black) List bill- invasive aquatic plants

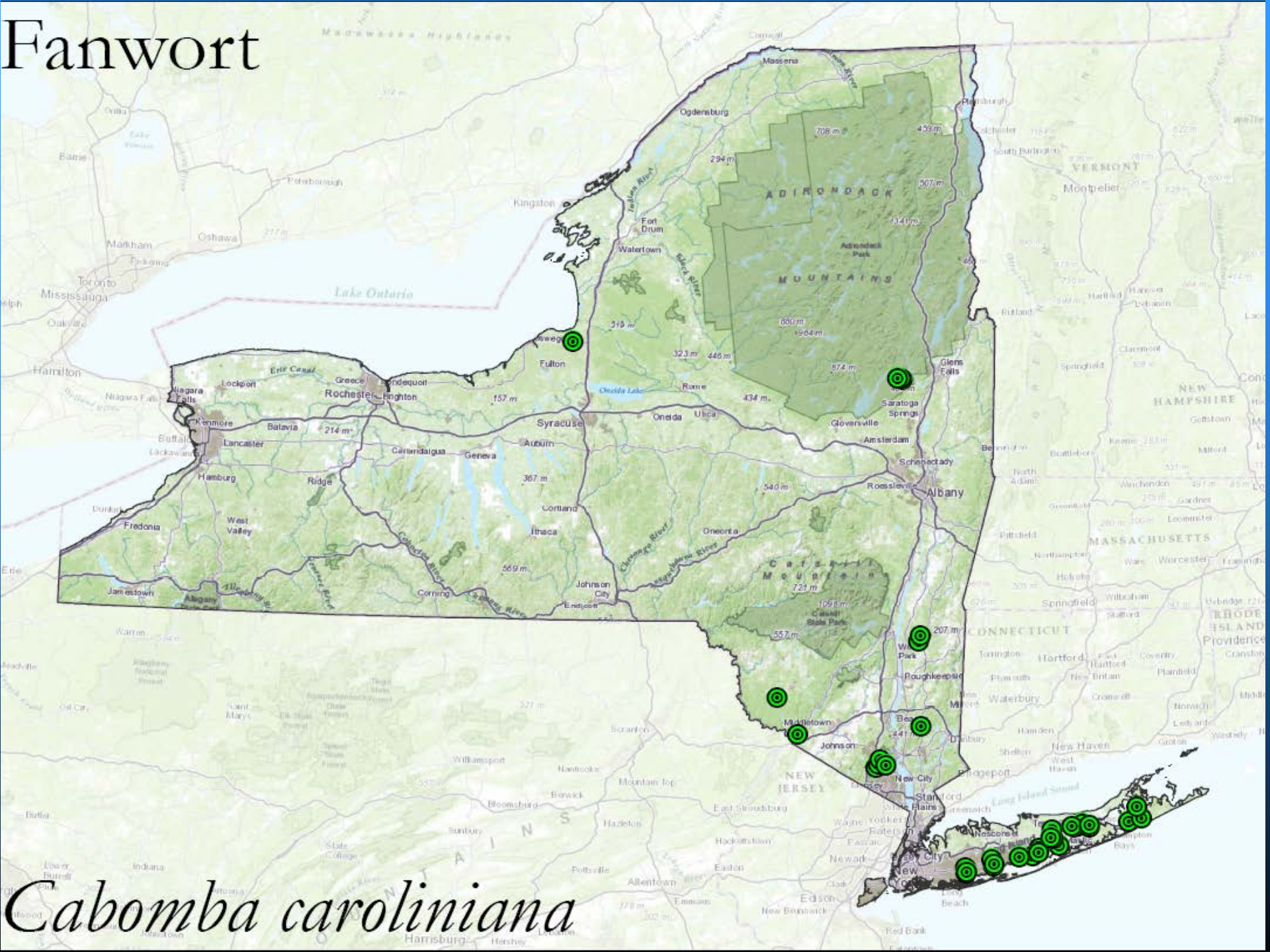
(<http://www.dec.ny.gov/regulations/93848.html>)

- *Cabomba caroliniana*
- *Egeria densa*
- *Hydrilla verticillata*
- *Hydrocharis morus-ranae*
- *Ludwigia peploides*
- *Myriophyllum aquaticum*
- *Myriophyllum heterophyllum*
- *Myriophyllum heterophyllum* × *Myriophyllum laxum*
- *Myriophyllum spicatum*
- *Nymphoides peltata*
- *Potamogeton crispus*
- *Trapa natans*





Fanwort



Cabomba caroliniana

Fanwort

(Cabomba caroliniana)

Origin: SE USA
Intro to US: Native
Intro to NYS: 1920s (MA)

Plant Type: Submerged

Duration:

Leaf Type:

Submersed:

Pinnate

Floating:

Small Flower

Leaf Arrangement:

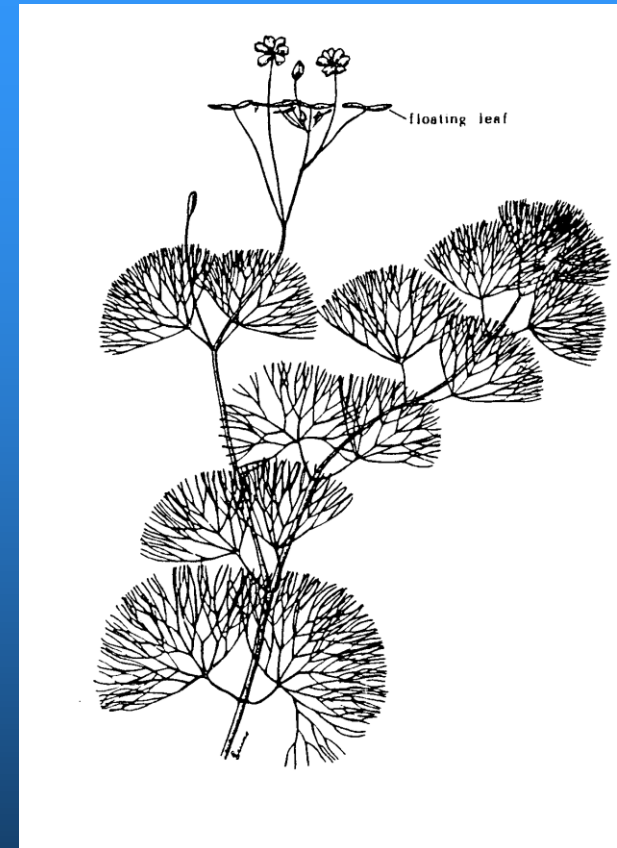
Opposite

Leaf Shape:

Thread

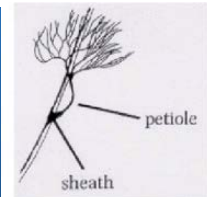
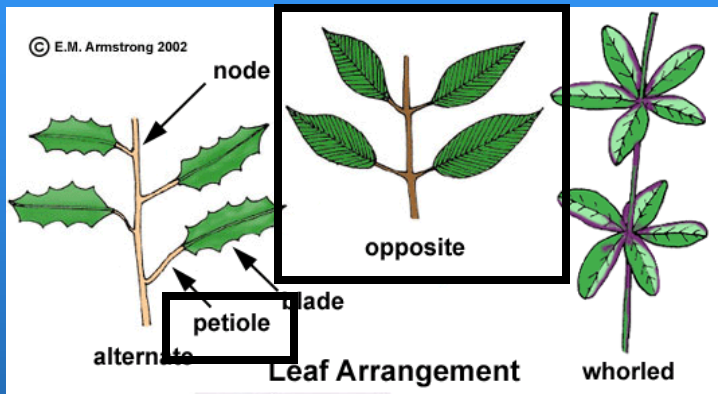
Leaf Margin:

Smooth

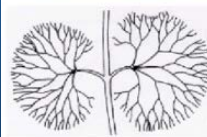


Fanwort-

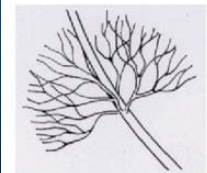
Key Features/Distinguishing from Lookalikes?



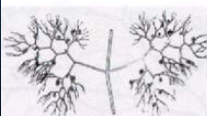
Buttercup (*Ranunculus*): (Native)
Leaves are alternately arranged and attached by a distinct petiole along the stem.



Fanwort (*Cabomba*): (Invasive)
Leaves are arranged in opposite pairs on the main stem. A distinct petiole branches off the main stem of the plant. This petiole supports the finely divided, branched leaves that resemble a fan.



Water Marigold (*Megaladonta*): (Native)
Submersed leaves are finely divided, branched, and opposite but appeared whorled on the stem.



Bladderwort (*Utricularia*): (Native)
Leaves are finely divided in a branching pattern along the main stem of the plant. Small bladders occur along the branches of the leaves.

- *Key Features*
 - Fanlike thread leaves
 - Opposite leaves
 - Petiole
 - Purplish stem
- *How Lookalikes Differ*
 - Buttercup- alternate leaves
 - Water marigold- no petiole
 - Bladderwort- no fan
 - Coontail- serrated margin





Egeria densa

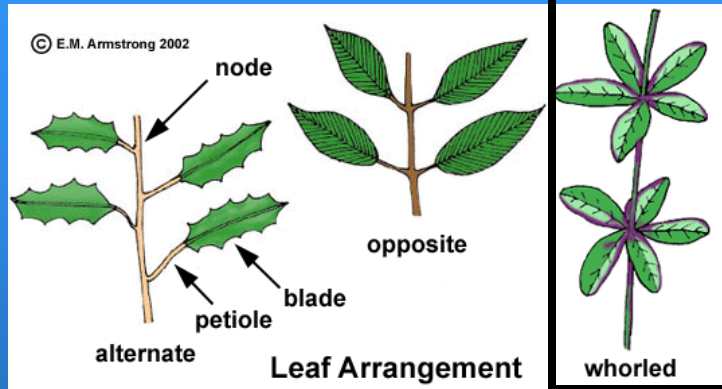
Brazilian elodea (*Egeria densa*)

Origin:	South America
Intro to US:	1893
Intro to NYS:	1893 (Millneck LI)
Plant Type:	Submerged
Leaf Type:	Ribbon
Submersed:	Barely Flower
Floating:	Whorled (4+)
Leaf Arrangement:	Strap
Leaf Shape:	(Very) Finely
Leaf Margin:	Serrated

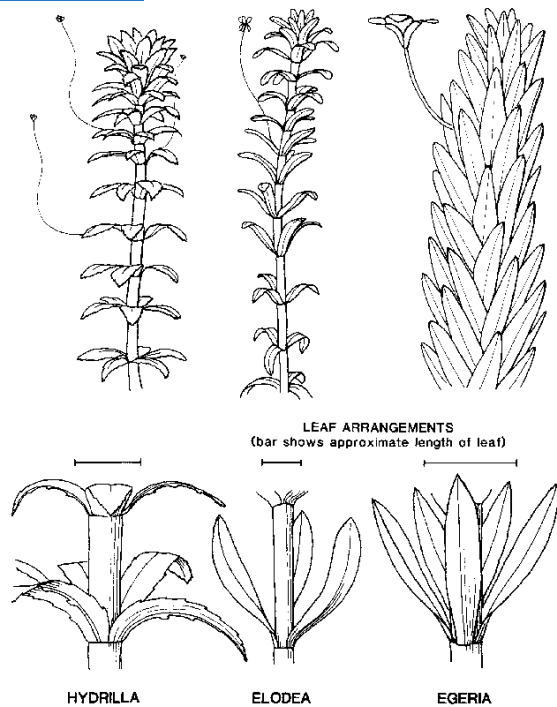


Brazilian elodea-

Key Features/Distinguishing from Lookalikes?

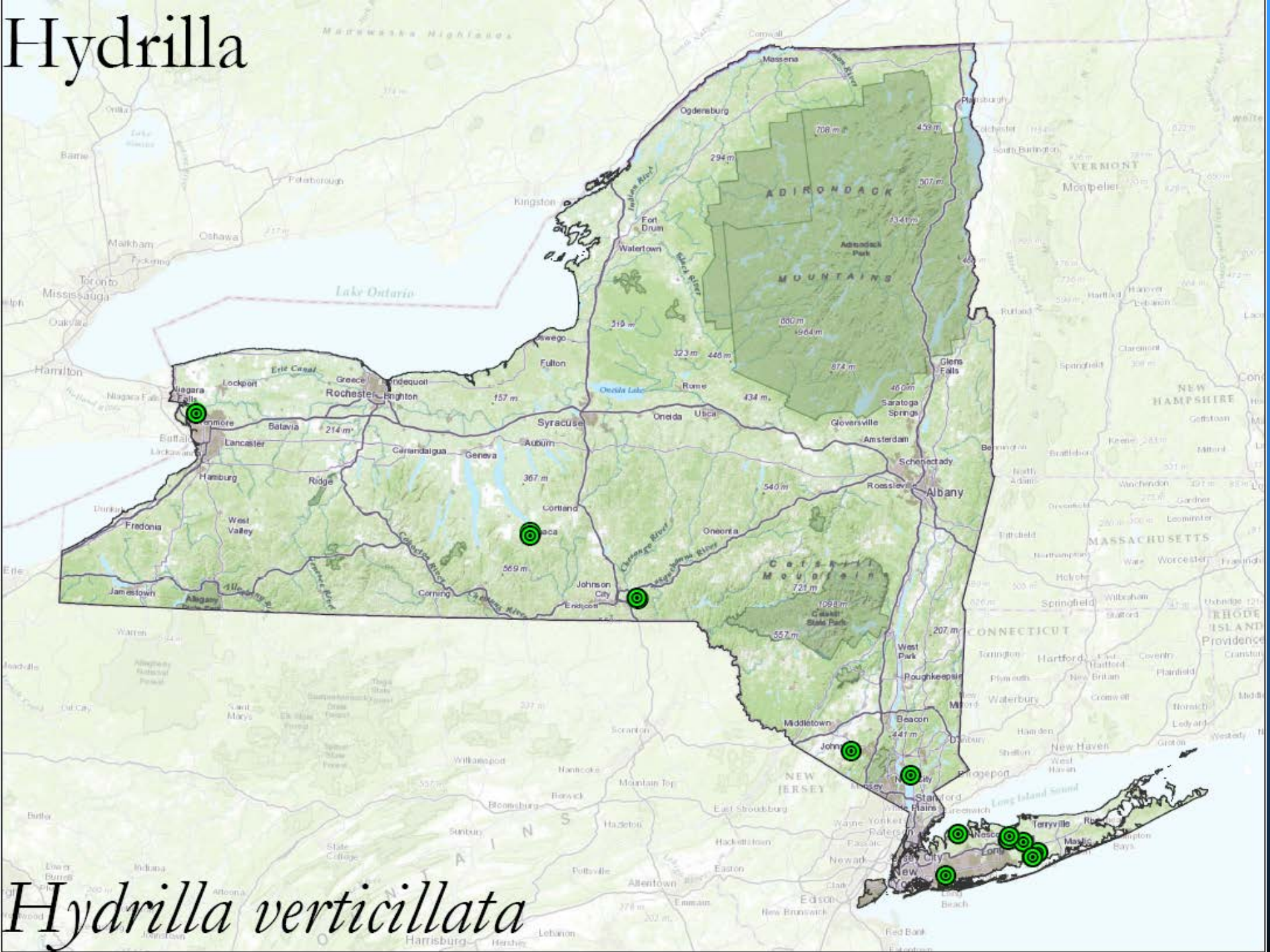


- *Key Features*
 - 4+ leaves in whorl
 - No tubers or turions
 - Smooth margin to naked eye
- *How Lookalikes Differ*
 - Elodea- < 4 leaves in whorl
 - Hydrilla
 - Tubers and turions
 - Serrated margin (hook-like under scope)





Hydrilla



Hydrilla verticillata

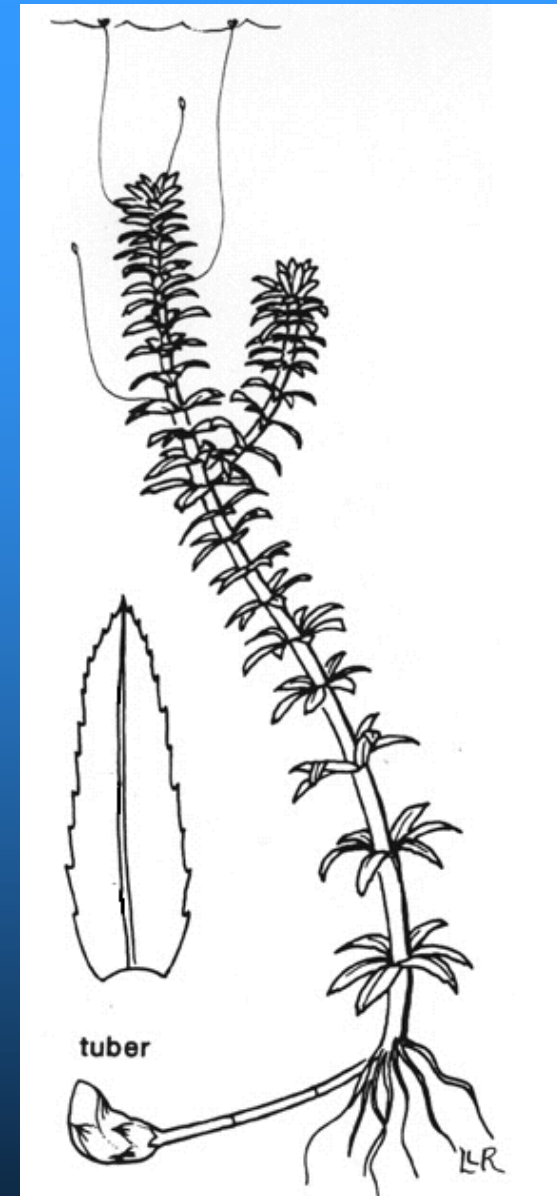
Hydrilla

(Hydrilla verticillatum)

Origin: India/Korea
Intro to US: 1950/60
Intro to NYS: 2008?

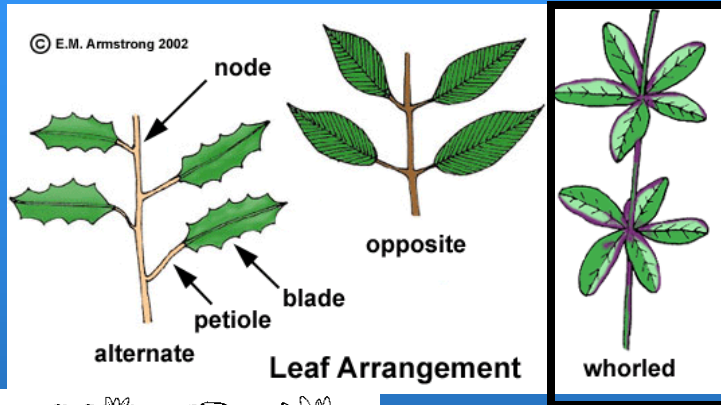
Plant Type: Submerged

Leaf Type: Ribbon
Submersed:
Floating: Barely Flower
Leaf Arrangement: Whorled (4-8)
Leaf Shape: Strap
Leaf Margin: Saw Toothed

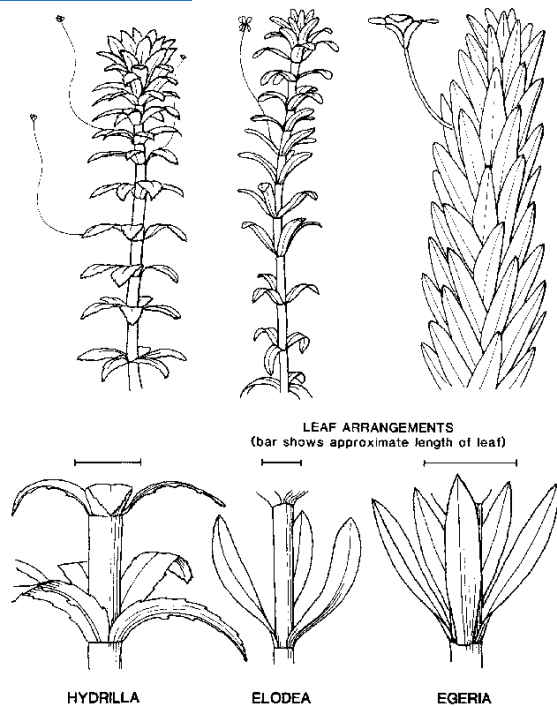


Hydrilla-

Key Features/Distinguishing from Lookalikes?

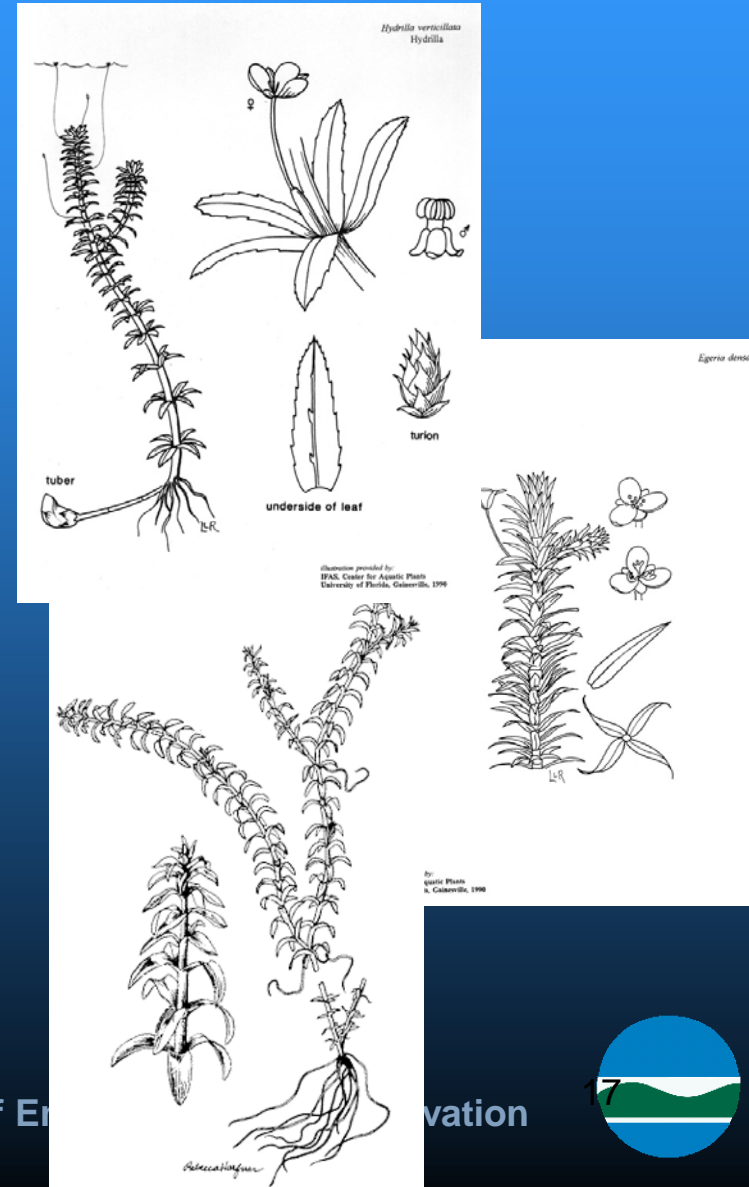


- *Key Features*
 - 4+ leaves in whorl
 - Tubers, turions, & rhizomes
 - Serrated margin to naked eye
- *How Lookalikes Differ*
 - Elodea- < 4 leaves in whorl
 - Brazilian elodea
 - No tubers or turions
 - Smooth margin (saw-like under scope)



Differences: Hydrilla v. Egeria v. Elodea

- Hydrilla:
 - Leaf whorls in 4-6
 - Leaf margins serrate (“hook” under scope)
 - Tuber as “foot” of plant
 - Turion near growing tip
 - White rhizomes (roots)
- Egeria:
 - Leaf whorls in 4-6
 - Leaf margins smooth (“saw” under scope)
 - No tubers, turions or rhizomes
- Elodea:
 - Leaf whorls in 3 (usually)
 - Smooth margin
 - No tubers, turions or rhizomes

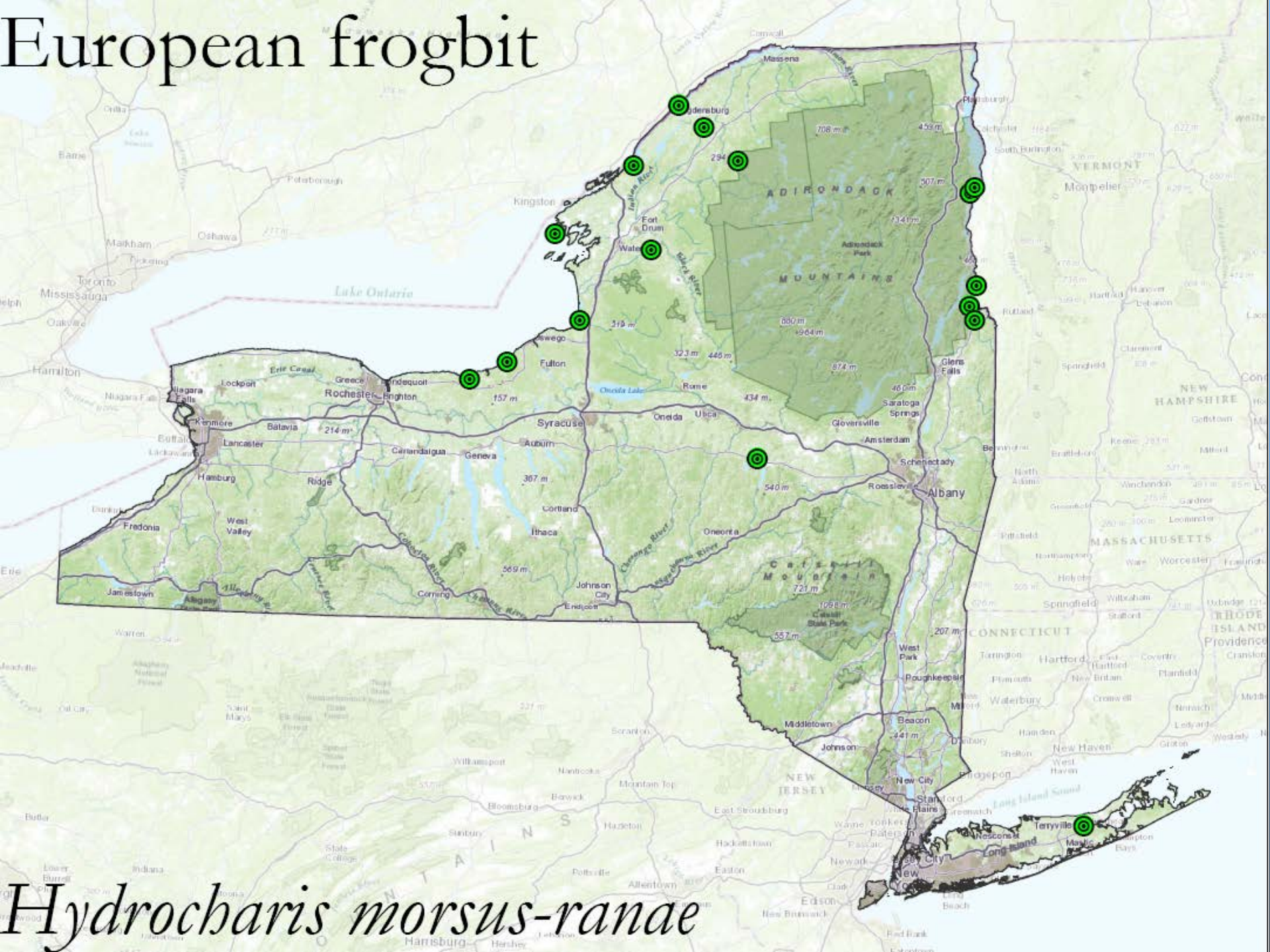


Hydrilla Hunt

- Learn about hydrilla
- Help us find hydrilla as early as possible
 - Look for and collect any suspicious plants
 - Document through photos and plant collections
 - Report your findings through iMapInvasives
- Work with NYS and your PRISM to eradicate the population found in your waterbody
- Educate others about hydrilla



European frogbit



Hydrocharis morsus-ranae

European Frog-Bit

(Hydrocharis morsus-ranae)

Origin: Europe to Canada
Intro to US: 1930s?
Intro to NYS: 1970? (1982)

Plant Type: Floating

Leaf Type:
Submersed: None
Floating: Ovate

Leaf Arrangement: Basal

Leaf Shape: Heart

Leaf Margin: Smooth



European frogbit-

Key Features/Distinguishing from Lookalikes?



- *Key Features*
 - Small flower with three white petals, yellow center
 - Dense tangle of stems below surface
- *How Lookalikes Differ*
 - Lily- Large yellow or white flower on thick stem
 - Watershield- Single football shape leaf with gelatinous underside



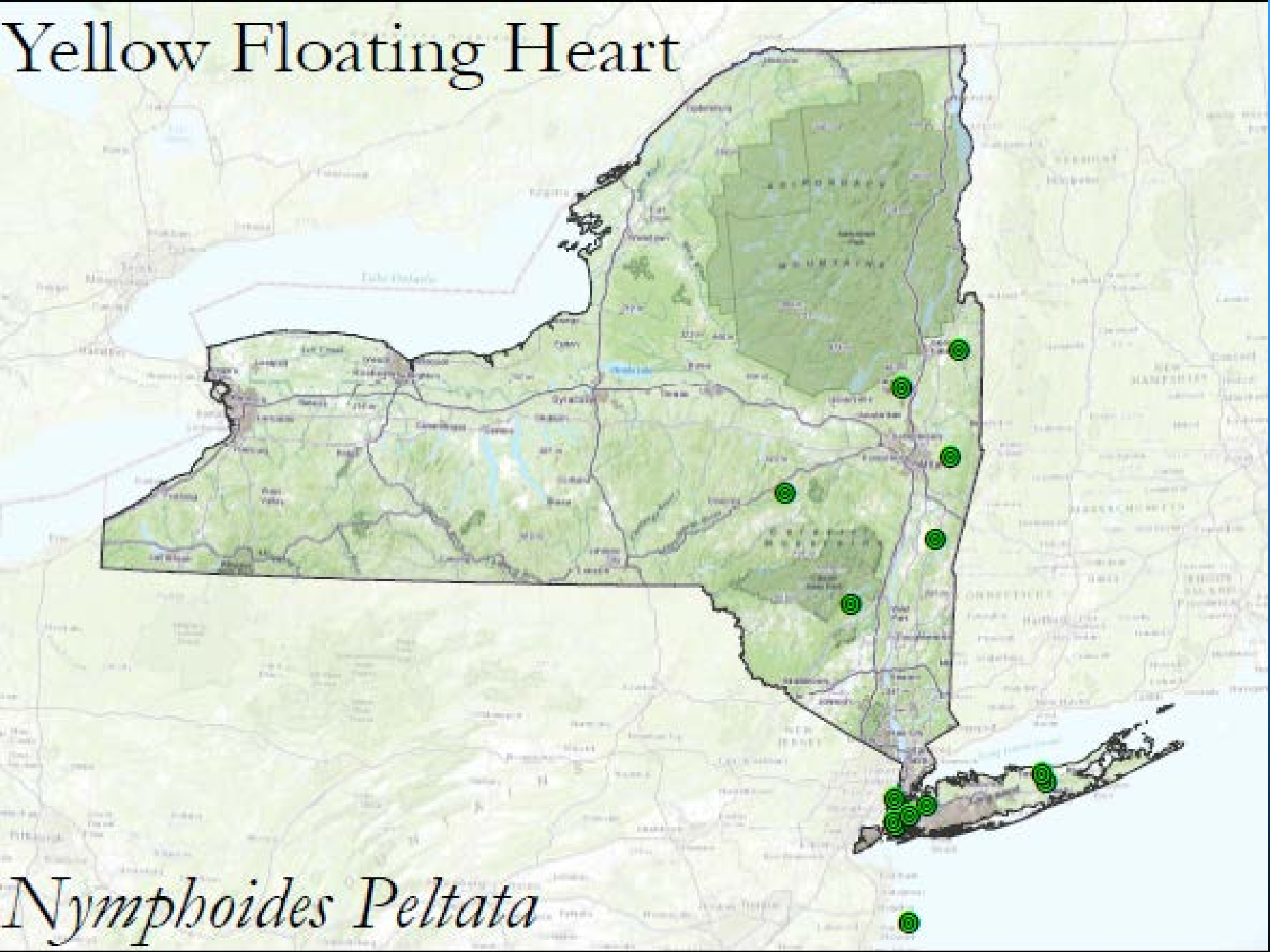


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Yellow Floating Heart

Nymphoides Peltata



Yellow floating heart (*Nymphoides peltata*)

Origin: Eurasia
Intro to US: 1880s?
Intro to NYS: 1880s-1929

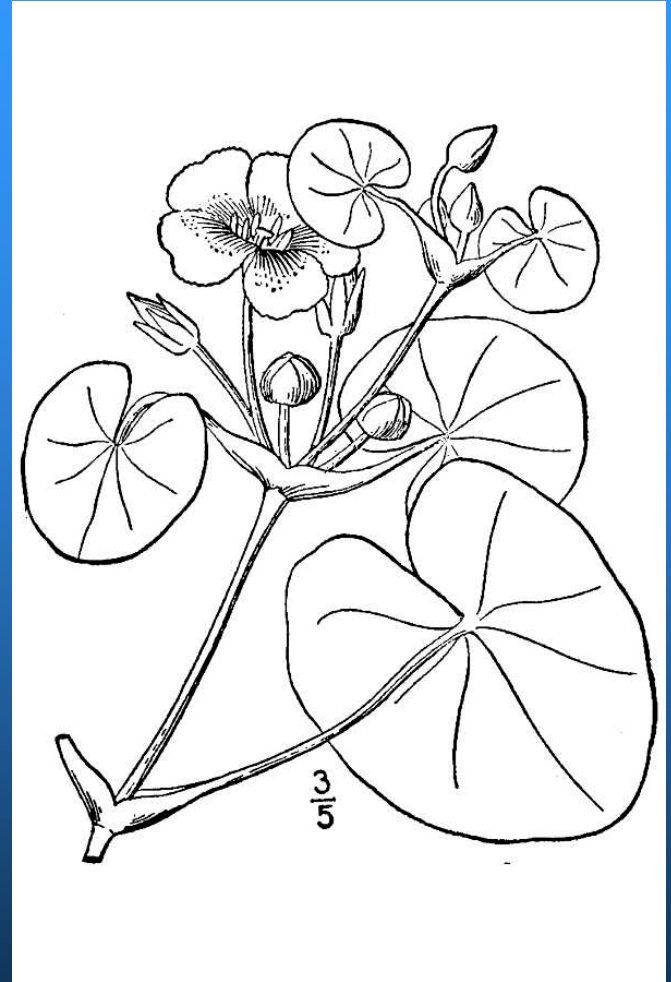
Plant Type: Floating

Leaf Type:
Submersed: None
Floating: Ovate

Leaf Arrangement: Basal

Leaf Shape: Heart

Leaf Margin: Smooth



Yellow floating heart-

Key Features/Distinguishing from Lookalikes?



- *Key Features*

- Small yellow flower extended on thin, long petiole above surface
- Wavy leaf margin, purple-ish underside

- *How Lookalikes Differ*

- Lily- Large yellow or white flower on thick stem
- Watershield- Single football shape leaf with gelatinous underside





Water primrose



Ludwigia peploides

Floating water primrose (*Ludwigia peploides*)

Origin: South America

Intro to US: 1890

Intro to NYS: early 1900s

Plant Type: Floating

Leaf Type: None

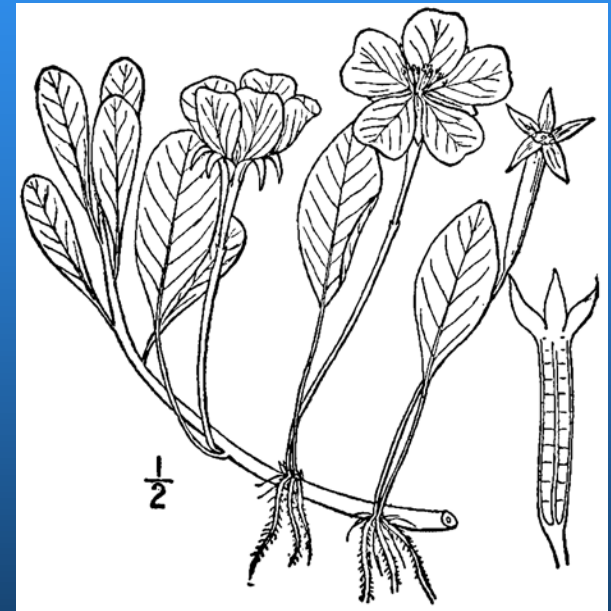
Submersed: Willow-like

Floating:

Leaf Arrangement: Alternate

Leaf Shape: Elliptic/oblong

Leaf Margin: Smooth



Floating water primrose-

Key Features/Distinguishing from Lookalikes?



- *Key Features*

- Bright, yellow flowers; normally with 5 petals
- Alternately-arranged, willow-like leaves
- Dense sprawling, tangled mat

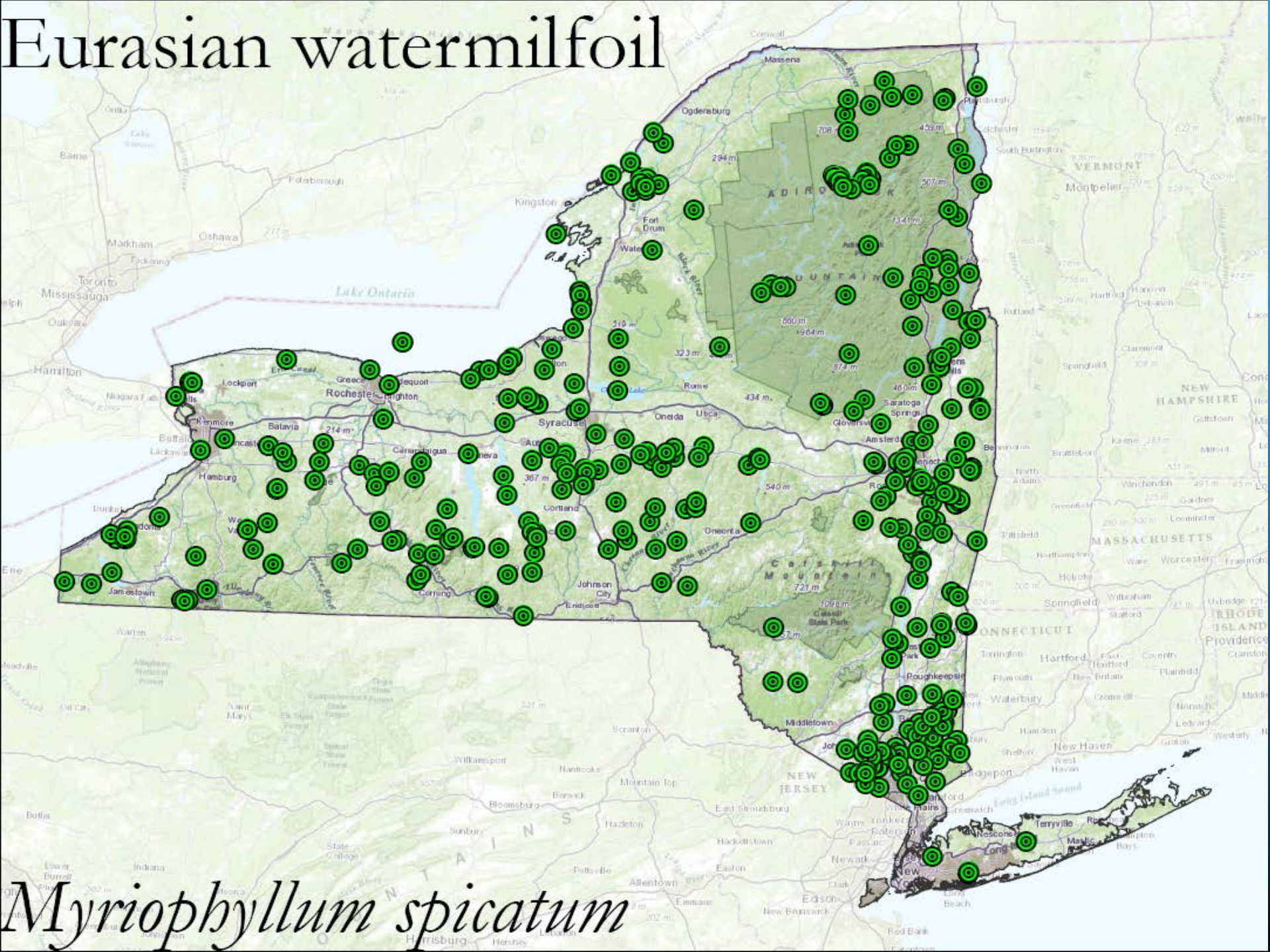
- *How Lookalikes Differ*

- Lily- Large yellow or white flower on thick stem
- Yellow floating heart- heart-shaped leaf





Eurasian watermilfoil

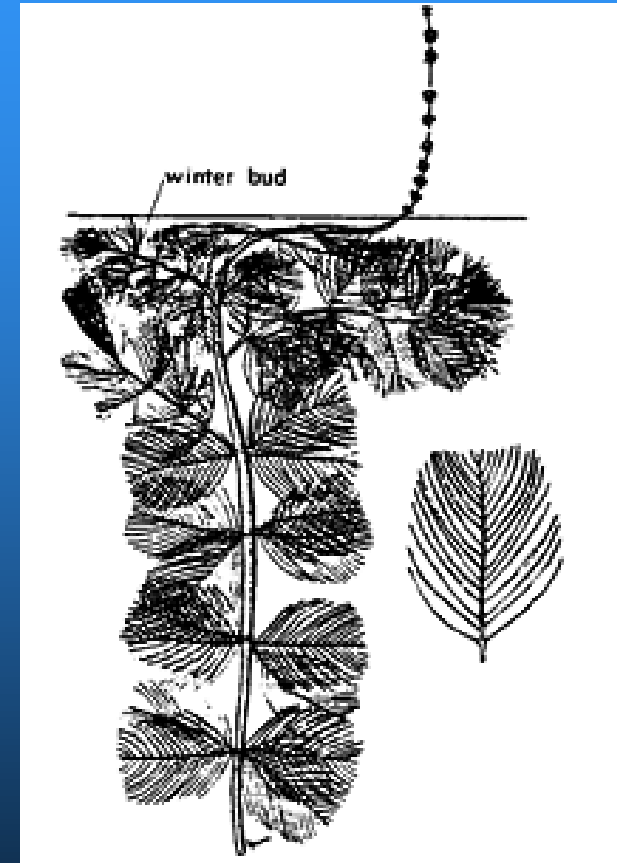


Myriophyllum spicatum

Eurasian Watermilfoil

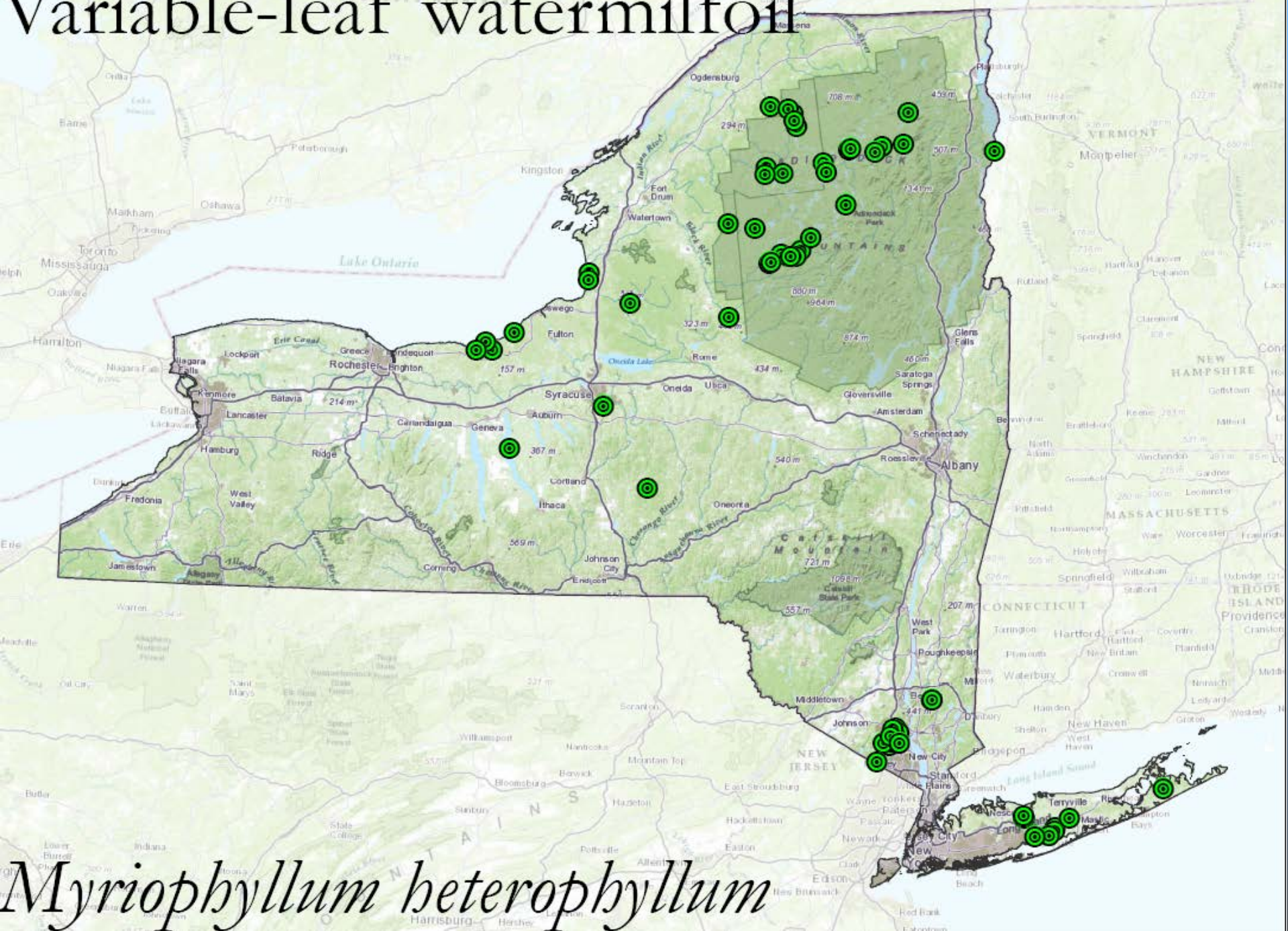
(*Myriophyllum spicatum*)

Origin:	Eurasia
Intro to US:	1940?
Intro to NYS:	1940s
Plant Type:	Submerged
Leaf Type:	
Submersed:	Pinnate
Floating:	None (Spike)
Leaf Arrangement:	Whorled
Leaf Shape:	Thread
Leaf Margin:	Smooth





Variable-leaf watermilfoil



Variable Watermilfoil

(*Myriophyllum heterophyllum*)

Origin: SE United States

Intro to US: Native

Intro to NYS: Native?

Plant Type: Submerged

Leaf Type: Pinnate

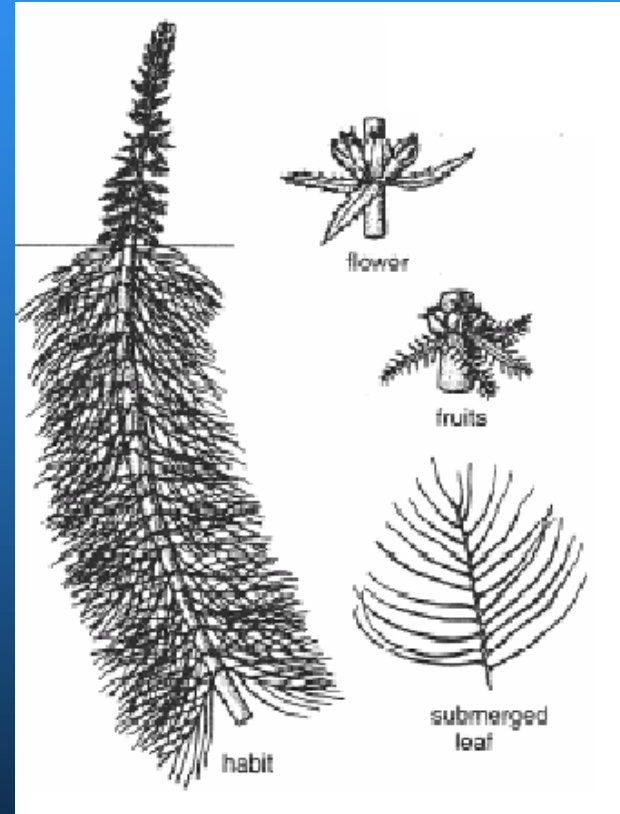
Submersed: Spike

Floating: Whorled

Leaf Arrangement: Thread

Leaf Shape: Smooth

Leaf Margin: Smooth





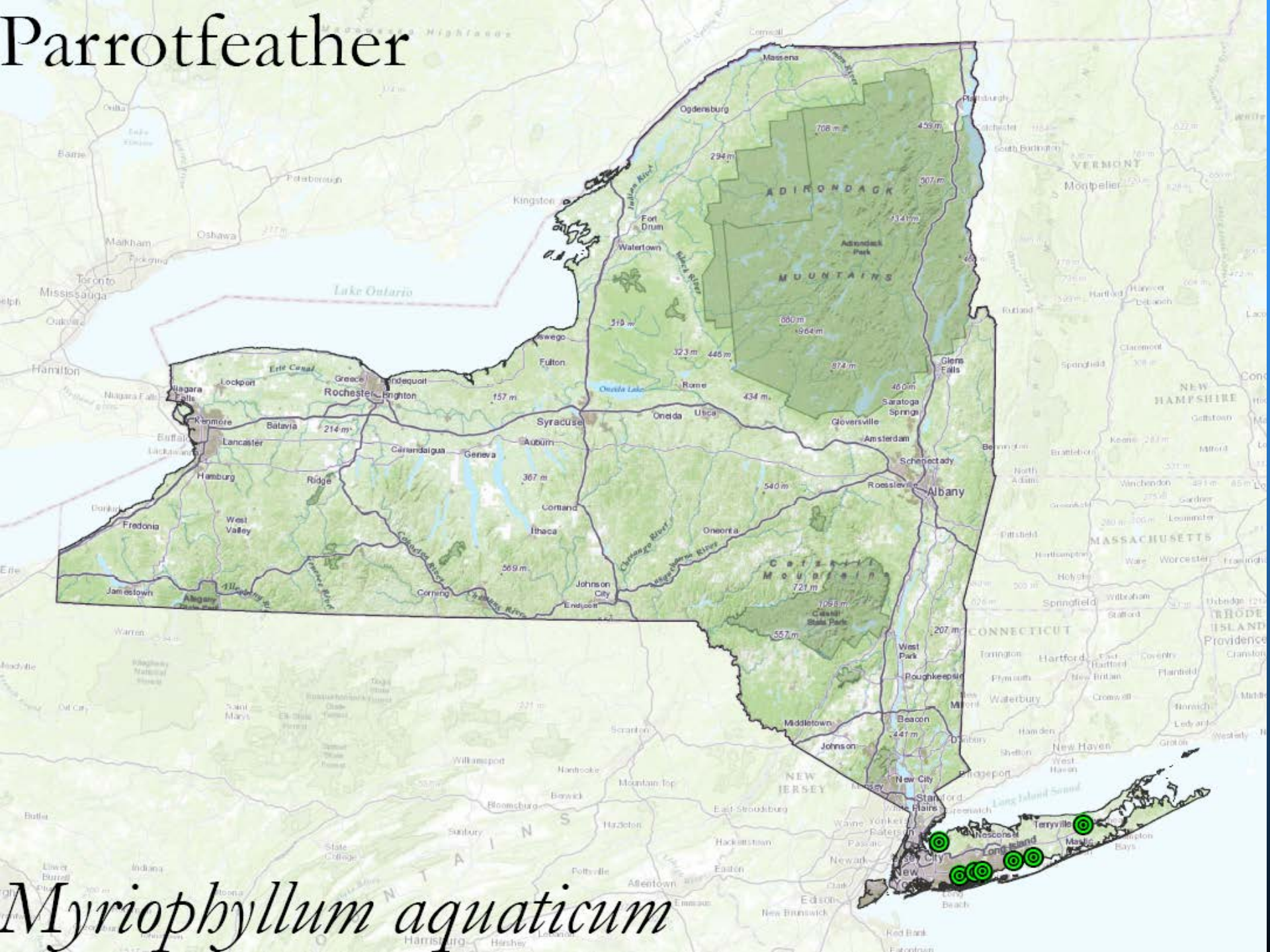
Myriophyllum aquaticum

Photo by Alison Fox

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Parrotfeather



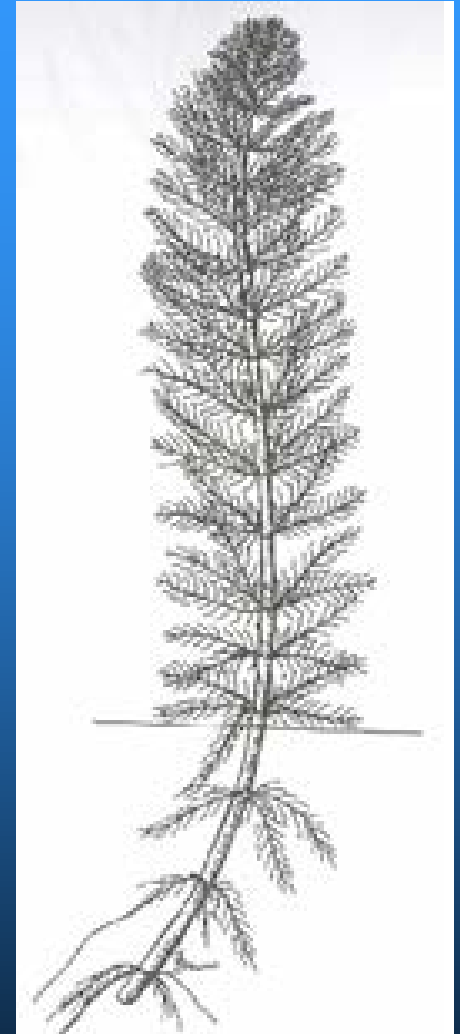
Parrotfeather

(Myriophyllum aquaticum)

Origin:	South America
Intro to US:	1890
Intro to NYS:	early 1900s

Plant Type:	Submerged
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Leaf Type:	
Submersed:	Pinnate
Floating:	None (Spike)
Leaf Arrangement:	Whorled
Leaf Shape:	Thread
Leaf Margin:	Smooth



Distinctions among the milfoils

Type,	Submerg. Tip	Whorls	Rachis (leaflets)	Emergent Spikes, Other Characteristics	Winter Buds?
Eurasian	Blunt, Red	V. Wide (>>1cm)	12-24	Pipecleaner, droops, tan/pink stem	No
Variable	Bowed (obtuse)	Close (<5mm)	5-14	Serrated, maroon stem	Yes
Parrotfeather	Limp	Wide (> 1cm)	10-18	Lime w/30cm stems, white flowers in axils	No
Northern	Bowed	Wide	5-14	Whorled bract/flower, finely serrated bract	Yes
Whorled	Acute	Wide	5-14	Whorled spike, bract long/pinnately lobed	Yes
Farwells	Variable	Close whorl & scatter	5-12	No spike, flowers in submerged axil, red stem and leaves	Yes
Low	Variable	Close scatter	5-12	Same as Farwelli, but bracts smooth	No
Alternate	Bowed	Wide	3-7	Small spike alternate bract/flower, tiny	Yes



Exotic milfoils-

Key Features/Distinguishing from Lookalikes?



- *Key Features*

- EWM- blunt tip, tan/pink stem, “neat”, large internodal spacing, pipe cleaner above surface
- VLM- thick brown stem, “bottle brush”, tight whorls
- Parrotfeather- lime green leaves above water

- *How Lookalikes Differ*

- Coontail: serrated edge, forked leaves, many branches





Curly leaf pondweed
Potamogeton crispus
Vermont, USA
Photo by A. Bove
Copyright 2002 Ann Bove



Potamogeton crispus

Curly-Leaved Pondweed

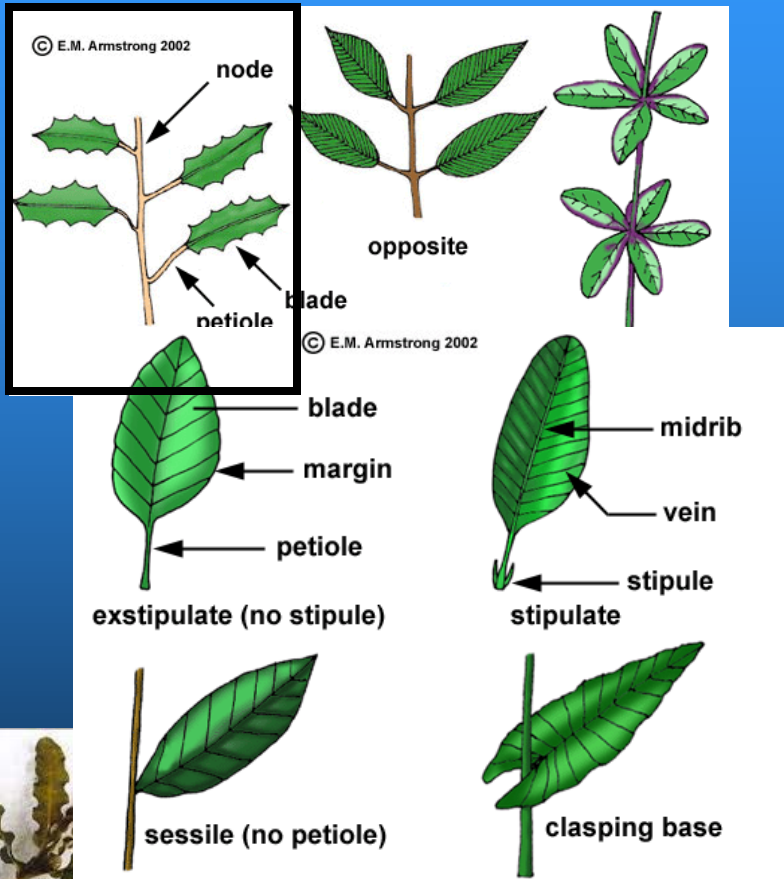
(*Potamogeton crispus*)

Origin:	Eurasia
Intro to US:	early 1880s
Intro to NYS:	1890s?
Plant Type:	Submerged
Leaf Variation:	
Submersed:	Ribbon
Floating:	None (Spike)
Leaf Arrangement:	Alternating
Leaf Shape:	Oblong, Rounded Tip
Leaf Margin:	Serrated



Curly-leaved pondweed

Key Features/Distinguishing from Lookalikes?



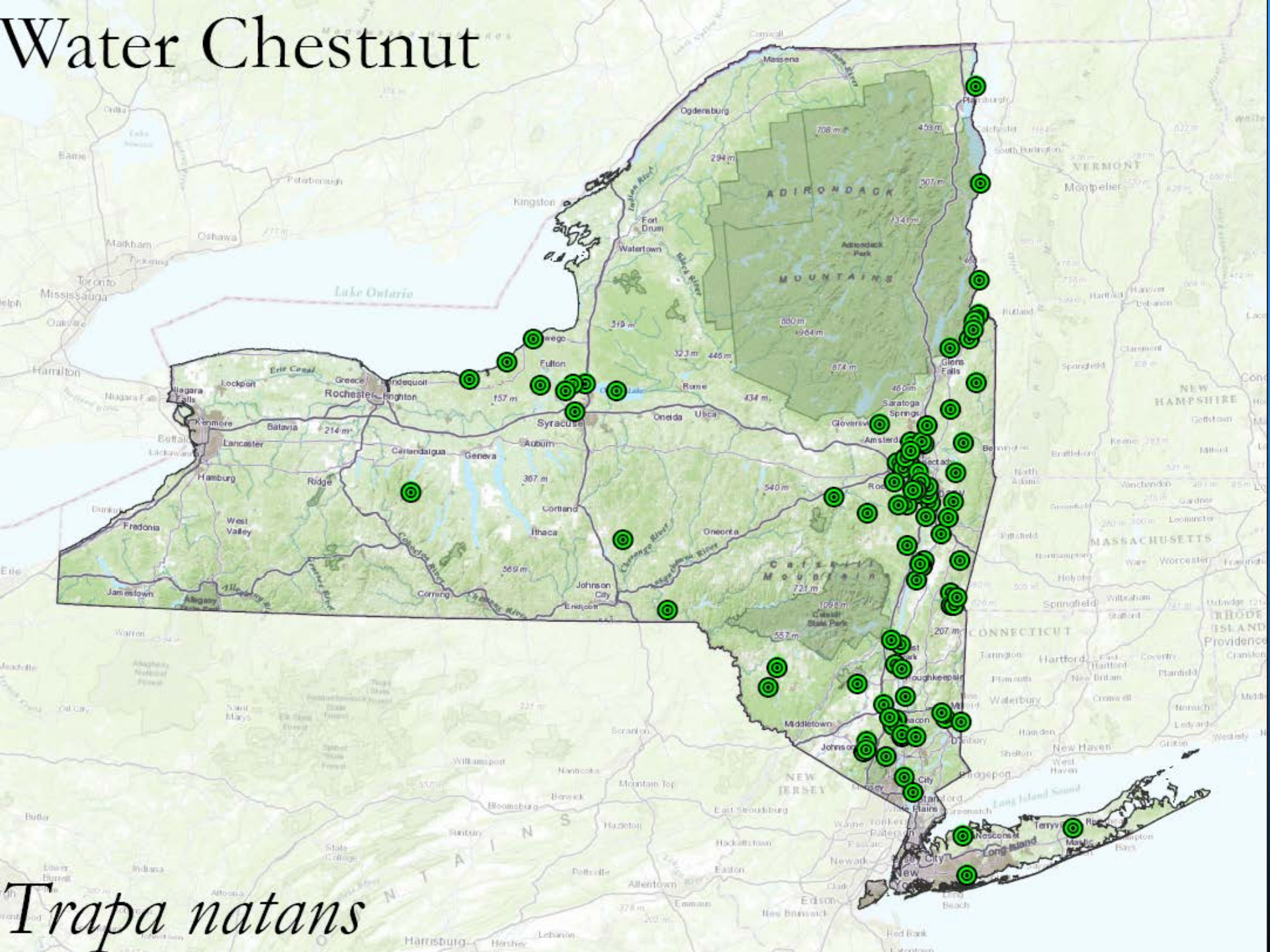
- *Key Features*
 - Alternating leaves
 - No stipule, sessile, weak clasp
 - Oblong, round tip; red mid vein
 - Floating turion
 - Curling, serrated margin
- *How Lookalikes Differ*
 - Other pondweeds- none with oblong shape, round tip, serrated margin
 - No others like lasagna





Water Chestnut

Trapa natans



Water Chestnut (*Trapa natans*)

Origin: Eurasia
Intro to US: 1874
Intro to NYS: 1882

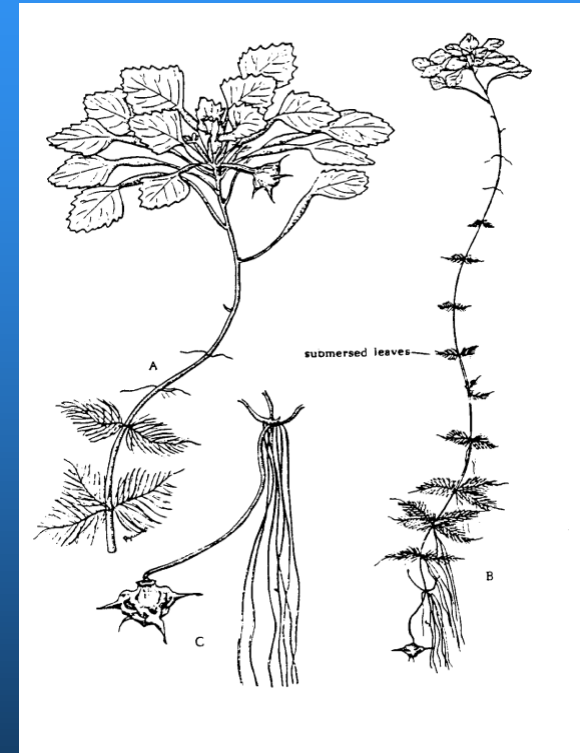
Plant Type: Floating

Leaf Type:
Submersed: Pinnate
Floating: Palmate

Leaf Arrangement: Whorled, Rosetta

Leaf Shape: Triangle

Leaf Margin: Serrated



Water chestnut-

Key Features/Distinguishing from Lookalikes?



- *Key Features*
 - Triangular serrated leaves
 - Swollen bladders
 - Hard spiky black seed
 - Found in shallow water
- *How Lookalikes Differ*
 - Lilies, all other floaters
 - no triangle
 - no bladders
 - no spiky seeds



NYS AIS(P) Frequency

- *Myriophyllum spicatum*- 340 waterbodies
- *Potamogeton crispus*- 171 waterbodies
- *Trapa natans*- 73 waterbodies
- *Myriophyllum heterophyllum*- 63 waterbodies
- *Cabomba caroliniana*- 39 waterbodies
- *Najas minor*- 32 waterbodies
- *Hydrilla verticillata*- 15 waterbodies
- *Hydrocharis morsus-ranae*- 15 waterbodies
- *Egeria densa*- 13 waterbodies
- Total number of infested waterbodies (as of 2013) = >520

