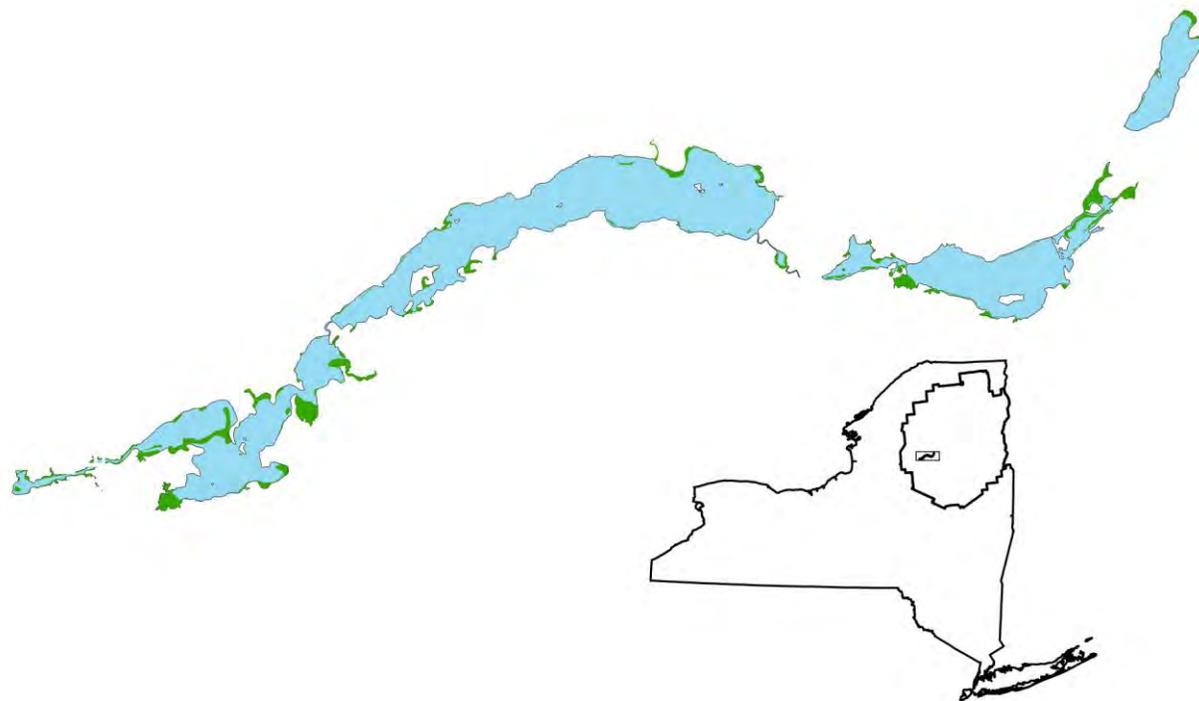


Aquatic Plant Survey of the Fulton Chain of Lakes



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Summary of Findings

This report consists of summary tables, aquatic plant maps, and supplemental reference materials pertaining to the aquatic plant survey performed on the Fulton Chain of Lakes by the Adirondack Watershed Institute of Paul Smith's College. The objectives of this survey were to: (1) document the location and species composition of aquatic plant beds; and (2) determine the location and size plant beds containing aquatic nuisance species (ANS). In addition to providing the lake users with important distribution data for aquatic plants, this survey also detected two previously unknown infestations of Eurasian watermilfoil in Second and Fourth Lakes. Fortunately, these were very small infestations and the milfoil harvesting crew was able to be tasked to these locations for immediate control. This action demonstrates one of the values of detailed aquatic plant surveys.

The field work was carried out during the months of July and August, 2009-2010, by Corey Laxson, Dan Kelting, and Elizabeth Yerger. The surface survey was performed by slowly trolling a motor boat through the entire littoral zone of the lake chain in a zigzag fashion, starting at the shoreline and moving out to a depth of approximately 12 -15 feet then back to the shoreline. The channel between First Lake and Old Forge Pond were surveyed in the same fashion, starting from the southern shoreline to the center of the channel heading east, then from the northern shoreline to the center of the channel heading west. An observer on the bow of the boat identified the visible plants and collected data on bed location, species composition, and percent cover with a Trimble Geo XT global positioning system. A plant rake was periodically tossed to insure proper identification. Data analysis and map production were performed using ArcGIS (ESRI Redlands, CA).

Native Plants of the Fulton Chain

We documented 131 significant plant beds throughout the lakes. The beds were comprised of 25 species native plant species, occupying a minimum area of 431 acres. The most common plants to occur in these beds are members of the pondweed genus *Potamogeton*. The ribbon-leaf pondweed (*P. epihydrus*), clasping-leaf pondweed (*P. perfoliatus*), and bassweed (*P. amplifolius*) are common throughout the lake and make up the majority of the offshore community. Low growing species such as Robin's pondweed (*P. robbinsii*) and water nymph (*Najas species*) were commonly found on the rake; however, it is difficult to map these species due to their hidden growth form. Shallow water species such as the bur-reed (*Sparganium species*), white water lily (*Nyphaea odorata*), spatterdock (*Nuphar variegata*) and watershield (*Brasennia schreberi*) are scattered around the majority of the shoreline, being particularly abundant in the shallow bays. Other common shallow water species include: pipewort (*Eriocaulon species*), grassy arrowhead (*Sagittaria graminea*), and hairgrass (*Eleocharis species*). A complete list of the aquatic plants surveyed in each of the lakes can be found in Table 1. Location of the plant beds can be found in the attached maps.

Aquatic Nuisance Species of the Fulton Chain

We encountered two plant species listed as aquatic invasive species by the New York State Department of Environmental Conservation; Eurasian water-milfoil (*Myriophyllum*

spicatum), and variable leaf milfoil (*Myriophyllum heterophyllum*). Eurasian water-milfoil was documented in 19 locations occupying a minimum area of 107.6 acres. It is rare in Second and Fourth Lakes, and well established in Fifth, Sixth, and Seventh Lakes. Variable leaf milfoil was documented 29 locations occupying a minimum area of 301.8 acres. It is well established in Old Forge Pond, First, Second, Third, Fourth, Fifth, Sixth and Seventh Lakes.

Old forge Pond – Third Lake

- Eurasian water-milfoil is largely absent from this section of the lake chain. A small isolated bed was discovered at the southwestern end of Second Lake (Map 1). At the time of the survey the bed contained only a few stems of milfoil spread over less than 0.1 acre.
- Variable leaf milfoil is found throughout this section, occupying 131.5 acres. Its percent cover was found to be rare (<5%) in 30 acres, occasional (5-15%) in 61.1 acres, present (15-25%) in 22.5 acres, and abundant (>50%) in 17.5 acres (Map 2, Table 3).

Fourth and Fifth Lakes

- Eurasian water-milfoil is largely absent from Fourth Lake, occurring in a small isolated bed in the western basin of the lake. At the time of the survey we only detected two stems of milfoil in an area less than 0.1 acre. It is found throughout Fifth Lake, occupying approximately 6.9 acres in fairly low abundance (Map 4, Table 2).
- Variable leaf milfoil was found at 8 locations in this section of the chain. In Fourth lake it was found exclusively in shallow bays, where its cover was occasional (5-15%) in 12.9 acres, present (15-25%) in 1 acres and abundant (>50%) in 34.7 acres. In Fifth Lake it was found to be common (25-50%) in 6.9 acres (Map 5, Table 3).

Sixth and Seventh Lakes

- Eurasian water-milfoil is established throughout this section of the lake chain, occurring in 16 locations and occupying a minimum area of 100.7 acres (Map 7). It was found to be rare (<5%) in 1.1 acres, occasional (5-15%) in 26.3 acres, present (15-25%) in 57.3 acres, and abundant (>50%) in 16 acres (Table 2).
- Variable leaf milfoil was found in 29 locations occupying a minimum area of 114.8 acres. It was found to be rare (<5%) in 24.2 acres, occasional (5-15%) in 68.3 acres, present (15-25%) in 7.1 acres, common (25-50%) in 7.8 acres and abundant (>50%) in 9.2 acres (Table 3).

Eighth Lake

- No aquatic nuisance species were detected in Eighth Lake.

If you have any questions about the results of this survey, or would like more information on the aquatic plants found in these water bodies please contact us at (518) 327.6213 or email dkelting@paulsmiths.edu.

Scientific Name	Common Name	Old Forge Pond -Third Lake	Fourth Lake	Fifth Lake	Sixth and Seventh Lake	Eight Lake
<i>Brasenia schreberi</i>	water shield	X	X	X	X	X
<i>Eriocaulon aquaticum</i>	pipewort	X	X		X	X
<i>Elodea canadensis</i>	common water weed		X		X	X
<i>Eleocharis species</i>	hair grass	X	X		X	X
<i>Lobelia dortmanna</i>	water lobelia	X	X			X
<i>Myriophyllum heterophyllum</i>	variable leaf milfoil	X	X	X	X	
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil	X	X	X	X	
<i>Myriophyllum tenellum</i>	slender water-milfoil	X	X			
<i>Najas species</i>	water naiad		X	X	X	X
<i>Nuphar variegata</i>	spatterdock	X	X	X	X	X
<i>Nymphaea odorata</i>	white water lily	X	X	X	X	X
<i>Potamogeton alpinus</i>	alpine pondweed	X				
<i>Potamogeton amplifolius</i>	large- leaved pondweed	X	X	X	X	X
<i>Potamogeton epihydrus</i>	ribbon-leaved pondweed	X	X		X	X
<i>Potamogeton gramineus</i>	variable-leaved pondweed		X		X	
<i>Potamogeton natans</i>	floating pondweed	X		X		
<i>Potamogeton perfoliatus</i>	clasping-leaved pond weed	X	X	X	X	
<i>Potamogeton praelongus</i>	white-stemmed pondweed		X			
<i>Potamogeton pusillus</i>	small pondweed					
<i>Potamogeton robbinsii</i>	Robbins pondweed	X	X			
<i>Potamogeton spirillus</i>	spiral-fruited pondweed		X		X	
<i>Potamogeton zosteriformis</i>	flat-stem pondweed		X			X
<i>Sagittaria graminea</i>	grass-leaf arrowhead	X	X		X	X
<i>Sparganium species</i>	bur-reed	X	X	X	X	X
<i>Utricularia minor</i>	lesser bladderwort		X			
<i>Utricularia vulgaris</i>	common bladderwort	X	X	X	X	
<i>Vallisneria americana</i>	eel-grass	X	X		X	X

Table 1. Aquatic plant species detected in the Fulton Chain of Lakes during the surface survey conducted during the summer of 2009-2010.

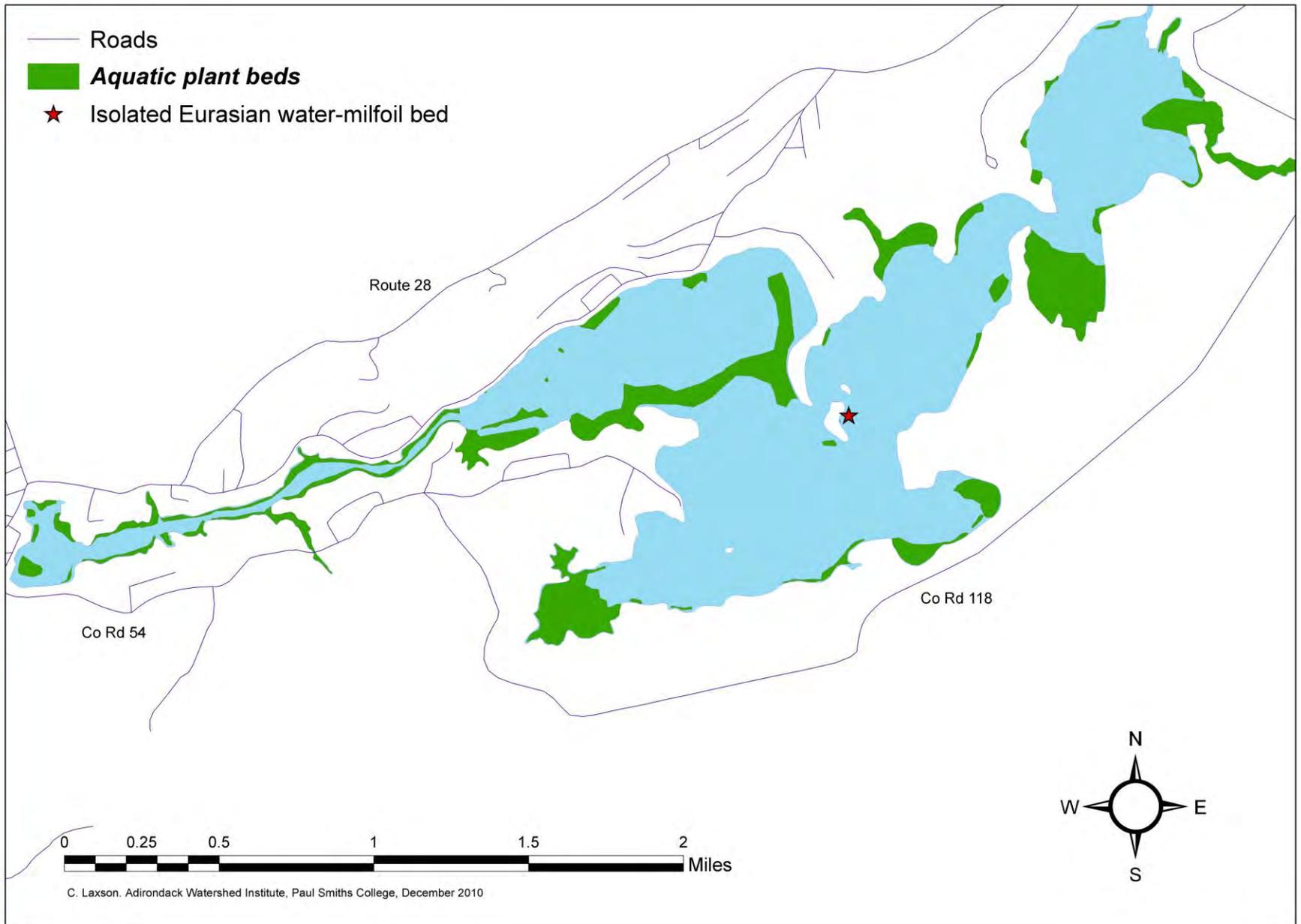
Fulton Chain Section	Rare (<5%)	Occasional (5-15%)	Present (15-25%)	Common (25-50%)	Abundant (>50%)	Water Body Total
Old Forge Pond – 3 rd Lake	<0.1	0	0	0	0	<0.1
4th and 5th Lakes	<0.1	0	6.9	0	0	6.9
6th and 7th Lakes	1.1	26.3	57.3	0	16	100.7
8th Lake	0	0	0	0	0	0
<i>Fulton Chain Total</i>	<i>1.1</i>	<i>26.3</i>	<i>64.2</i>	<i>0</i>	<i>16</i>	<i>107.6</i>

Table 2. Acreage and percent cover of Eurasian water-milfoil in the Fulton Chain of Lakes. Data collected from a surface survey conducted during the summer months of 2009-2010.

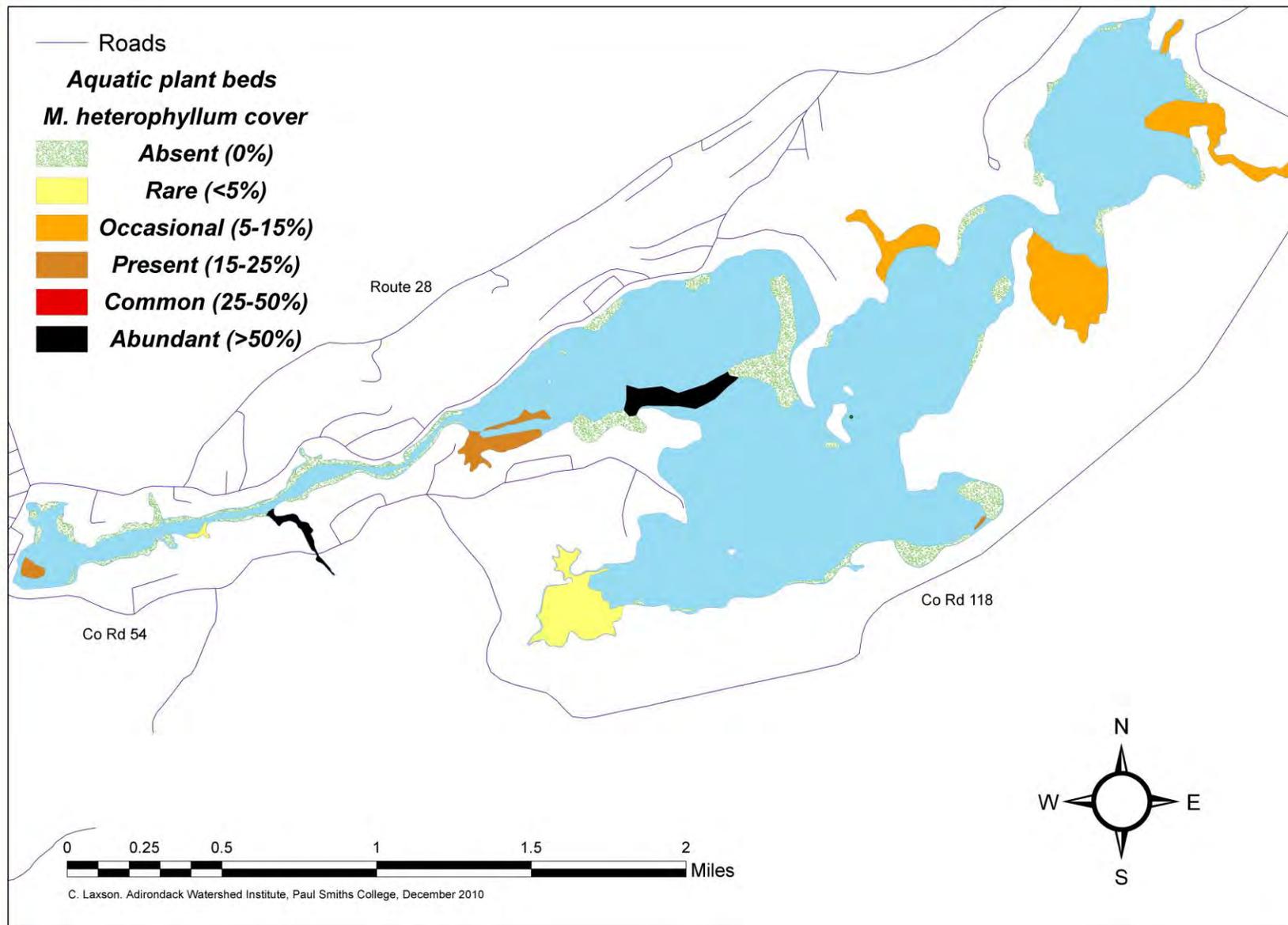
Fulton Chain Section	Rare (<5%)	Occasional (5-15%)	Present (15-25%)	Common (25-50%)	Abundant (>50%)	Water Body Total
Old Forge Pond – 3 rd Lake	30.4	61.1	22.5	0	17.5	131.5
4th and 5th Lakes	0	12.9	1.0	6.9	34.7	55.5
6th and 7th Lakes	22.4	68.3	7.1	7.8	9.2	114.8
8th Lake	0	0	0	0	0	0
<i>Fulton Chain Total</i>	<i>52.8</i>	<i>142.3</i>	<i>30.6</i>	<i>14.7</i>	<i>61.4</i>	<i>301.8</i>

Table 3. Acreage and percent cover of variable leaf milfoil in the Fulton Chain of Lakes. Data collected from a surface survey conducted during the summer months of 2009-2010.

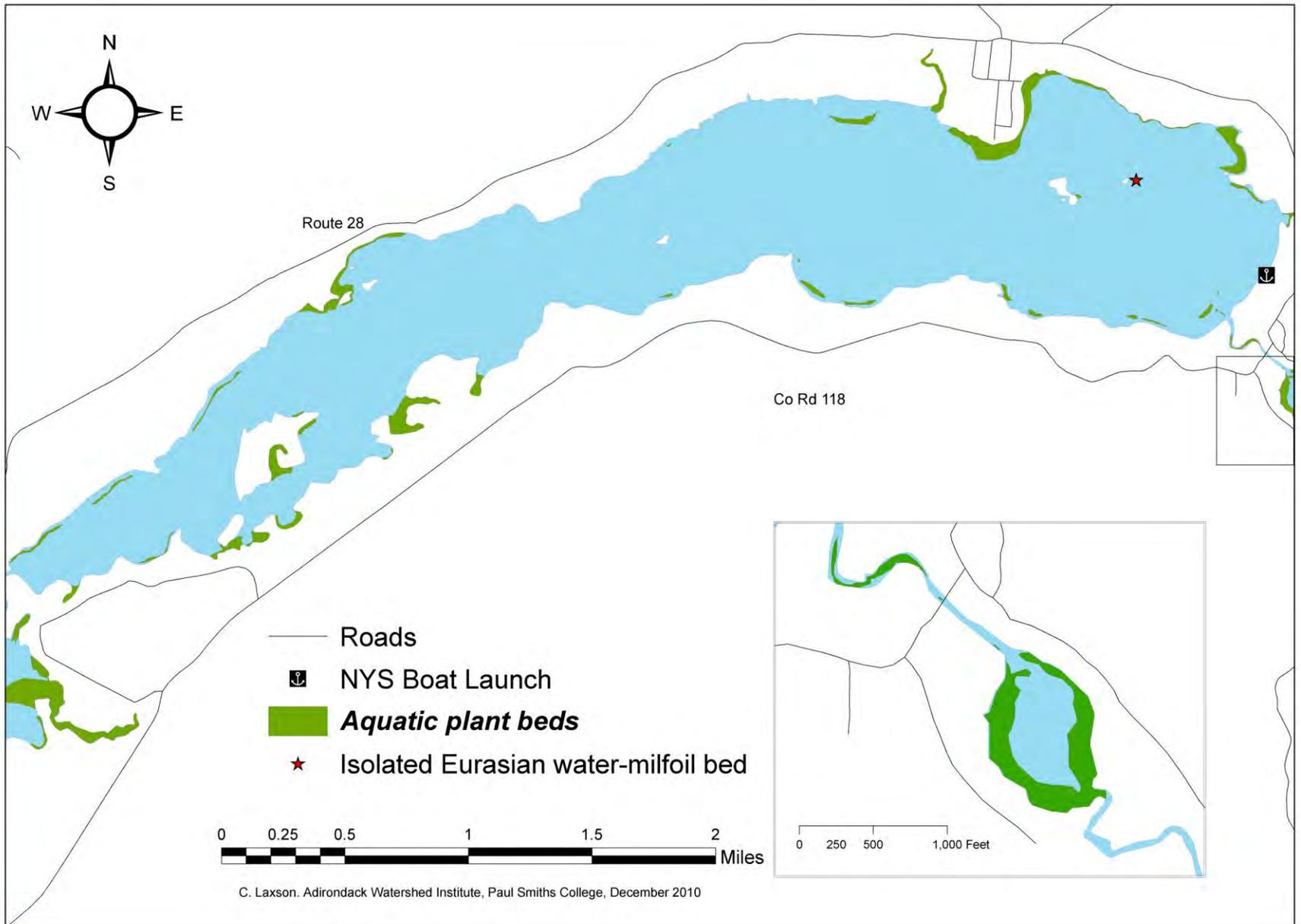
Fulton Chain of Lakes:
Map 1. Aquatic Plants of First through Third Lakes.



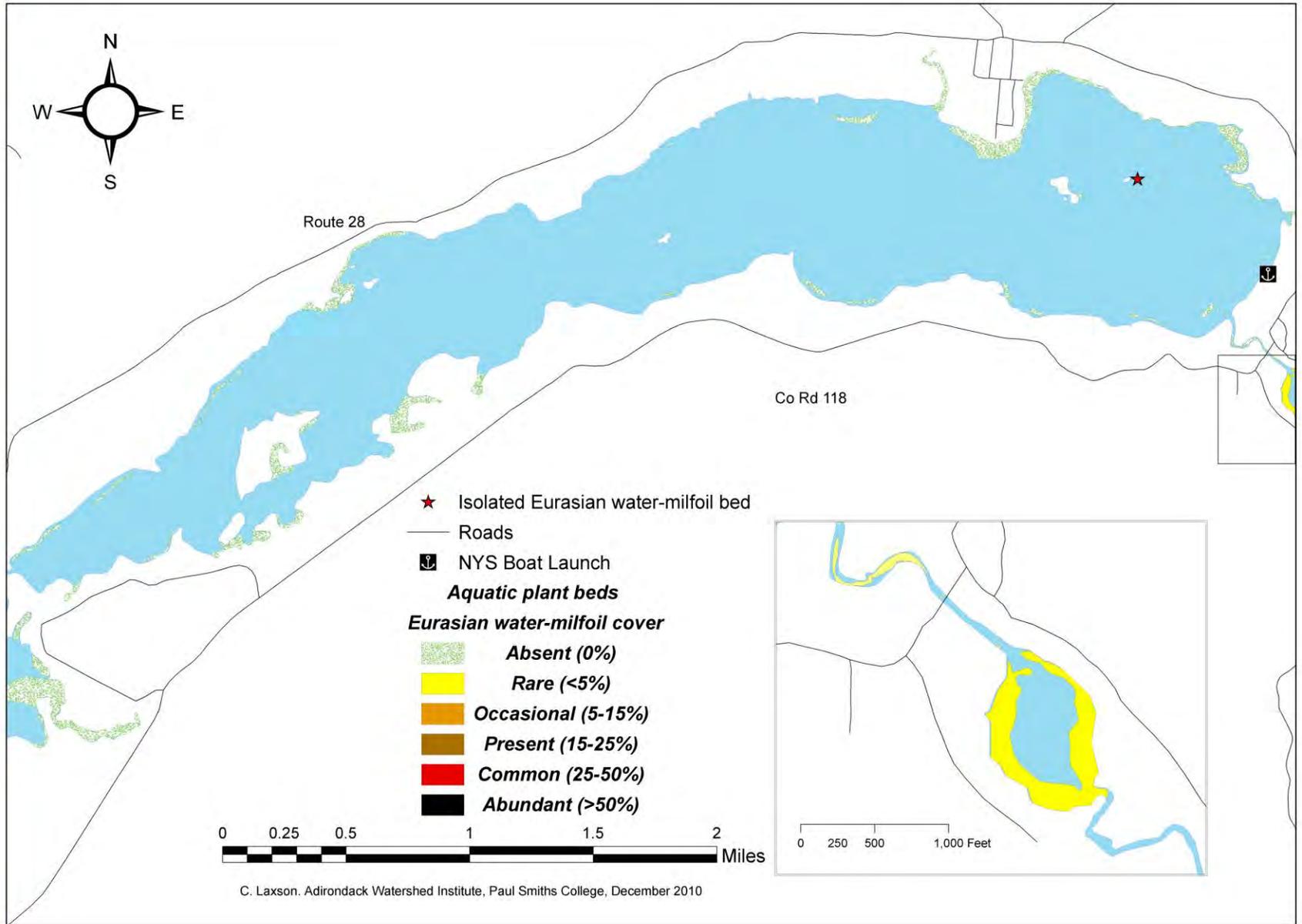
**Fulton Chain of Lakes:
Map 2. Variable-leaf milfoil of First through Third Lakes.**



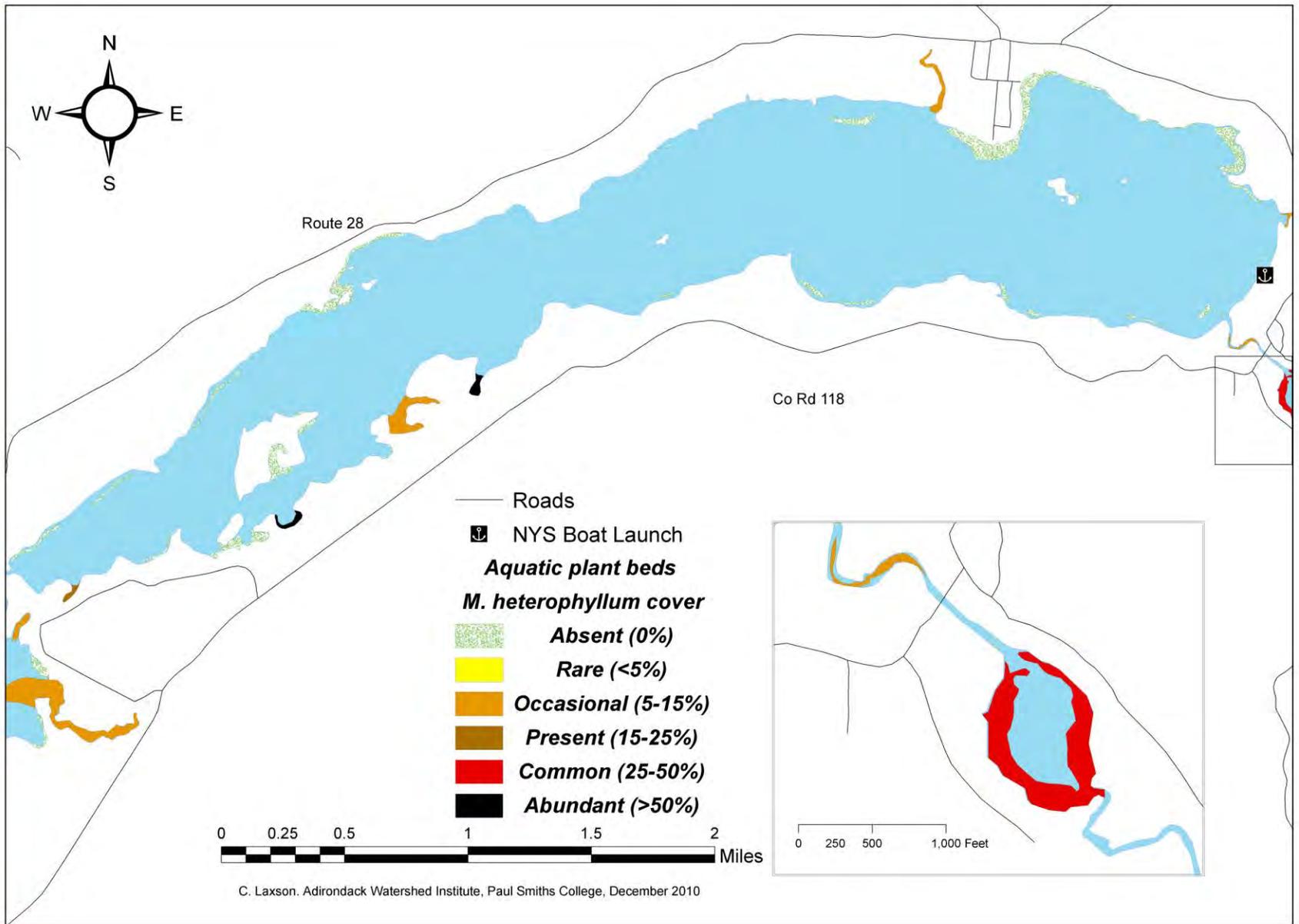
**Fulton Chain of Lakes:
Map 3. Aquatic Plants of Fourth and Fifth Lakes**



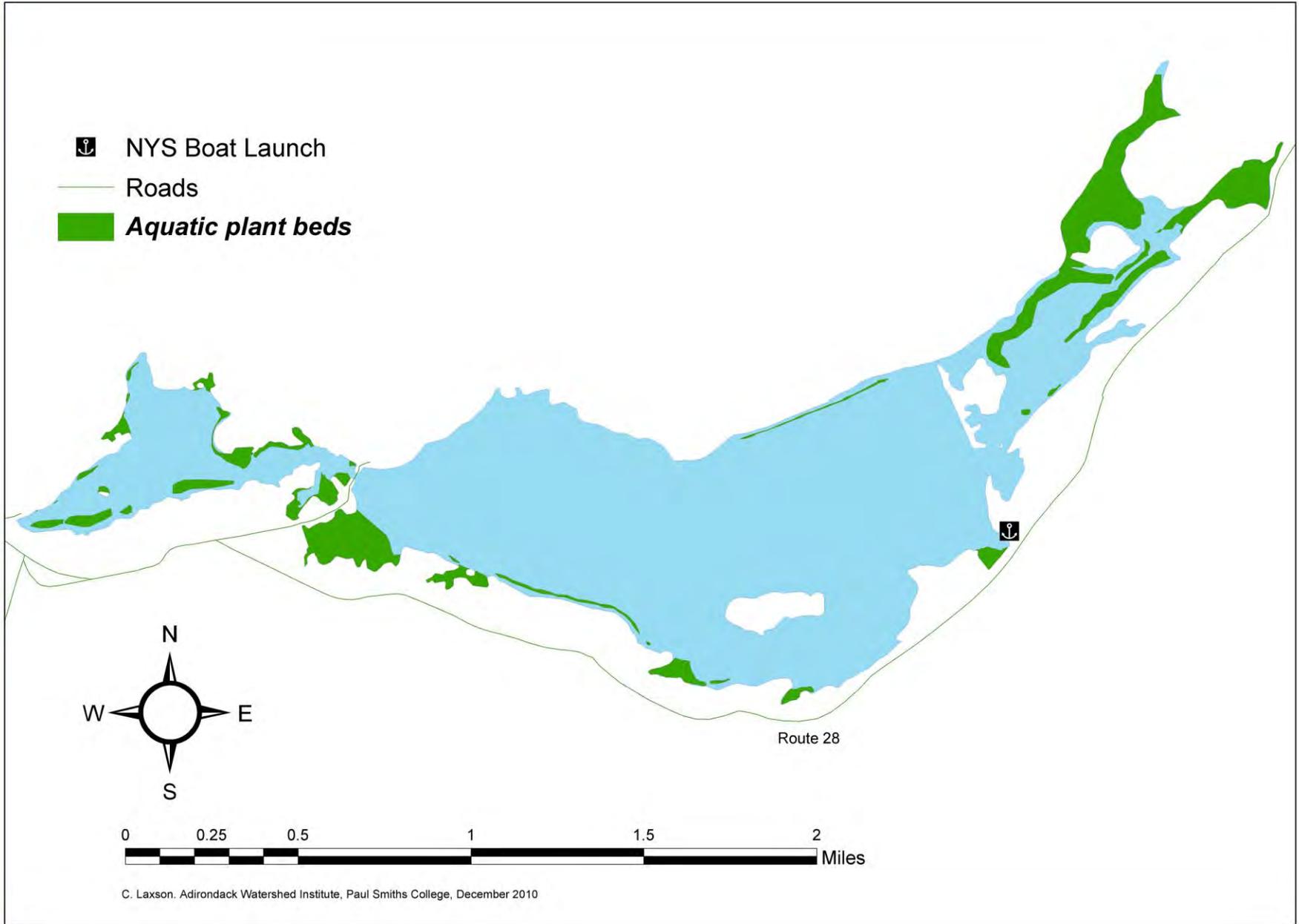
**Fulton Chain of Lakes:
Map 4. Eurasian water-milfoil of Fourth and Fifth Lakes**



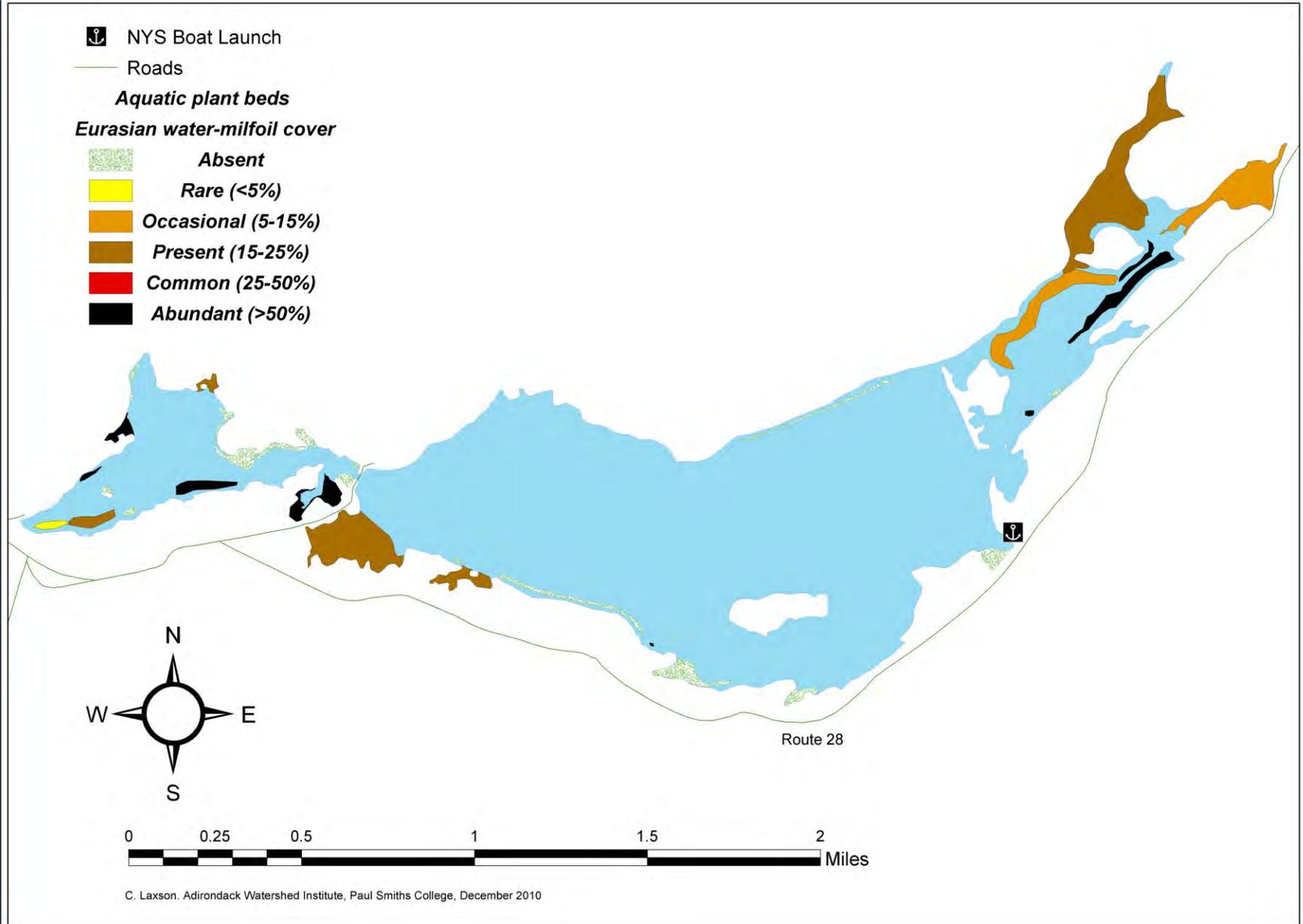
**Fulton Chain of Lakes:
Map 5. Variable-leaf milfoil of Fourth and Fifth Lakes**



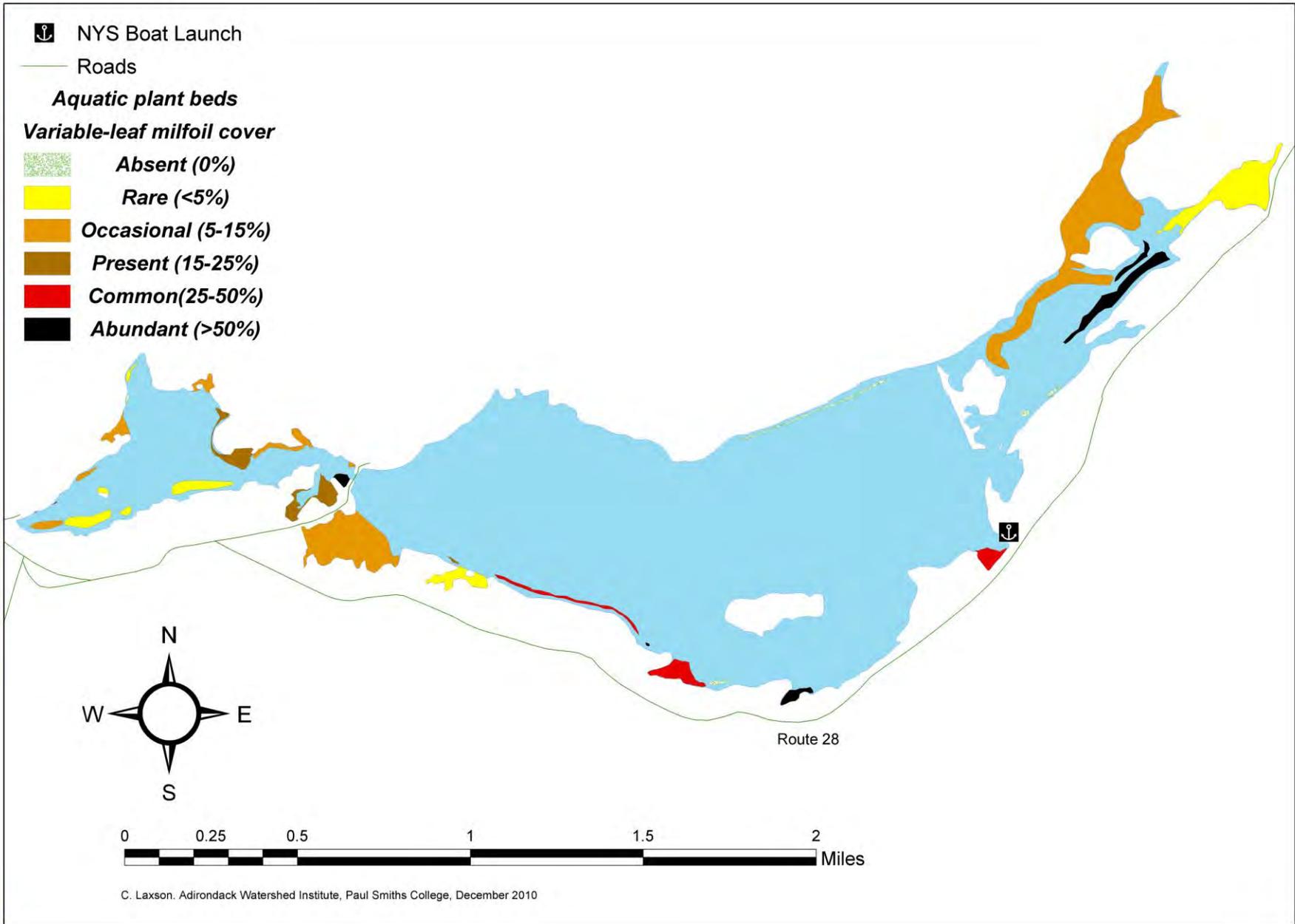
Fulton Chain of Lakes:
Map 6. Aquatic Plants of Sixth and Seventh Lake



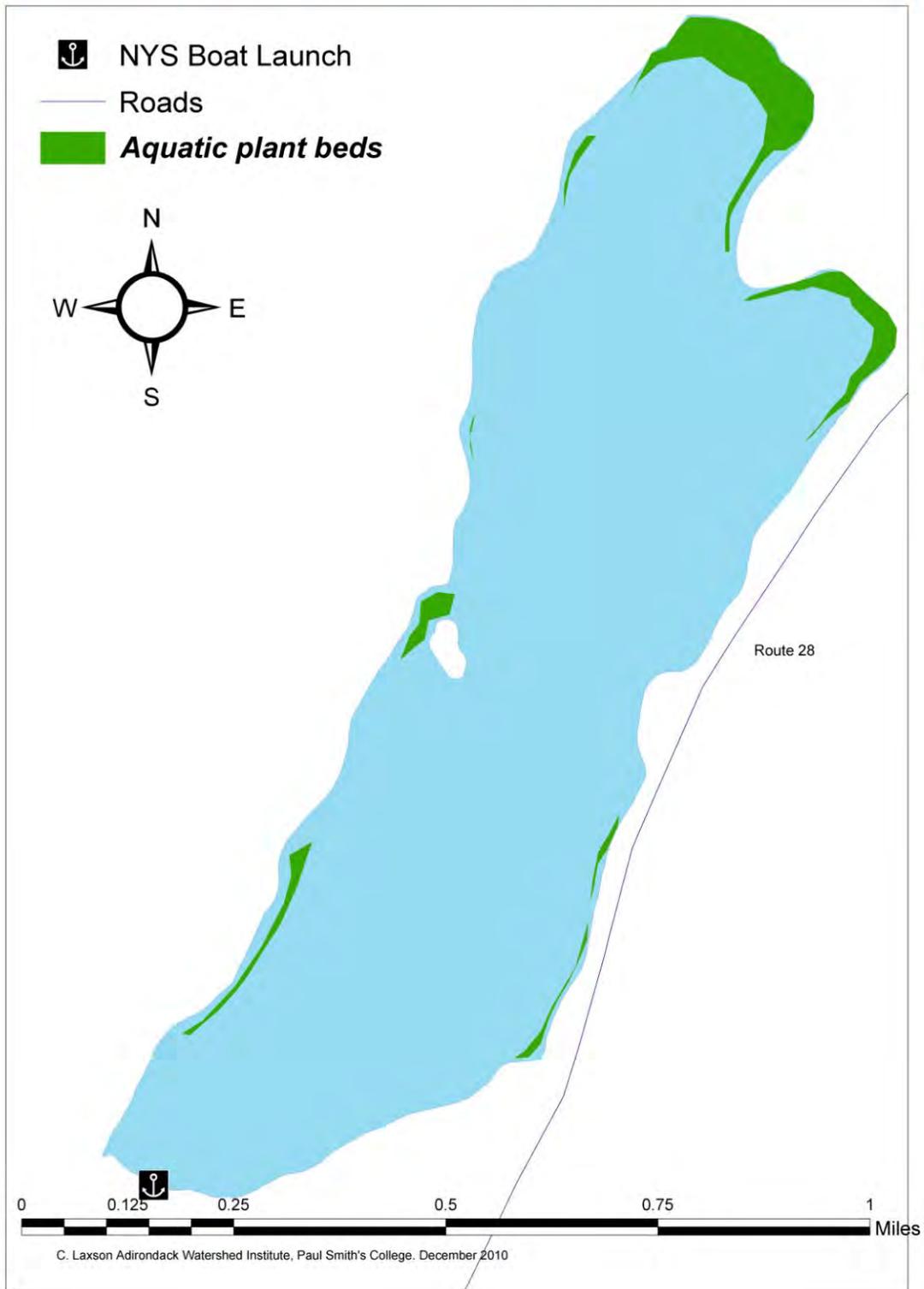
**Fulton Chain of Lakes:
Map 7. Eurasian water-milfoil of Sixth and Seventh Lake**



**Fulton Chain of Lakes:
Map 8. Variable-leaf milfoil of Sixth and Seventh Lake**



Fulton Chain of Lakes: Map 9. Aquatic Plants of Eighth Lake.



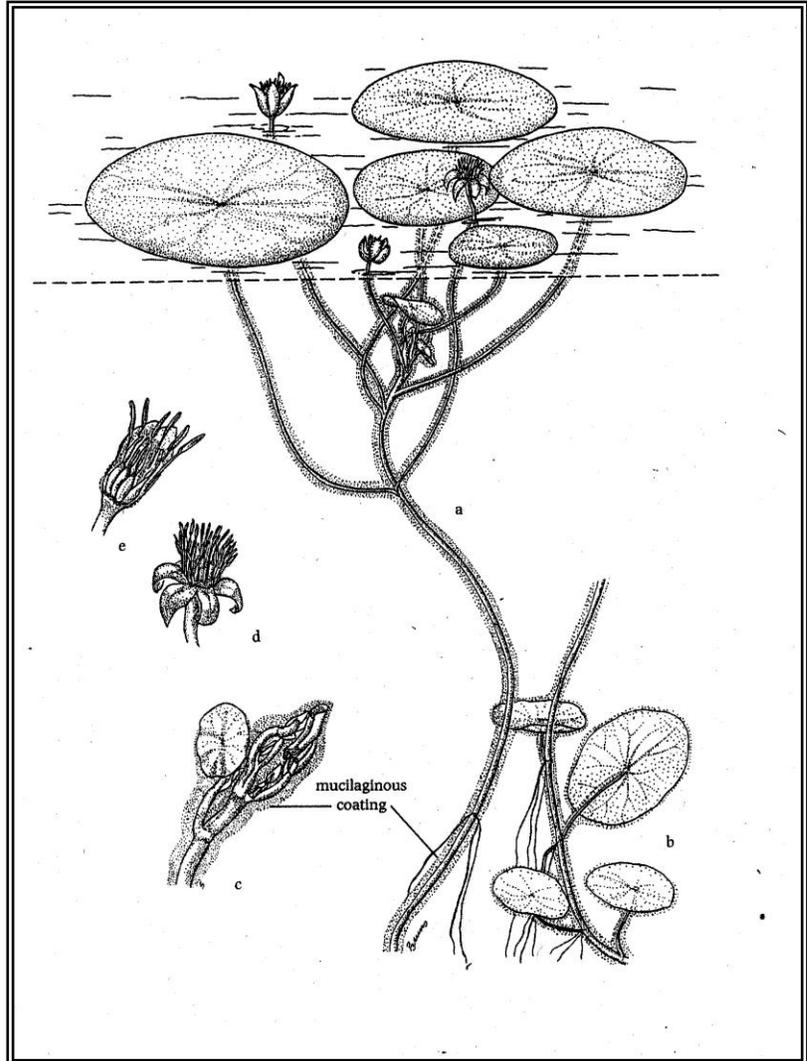
Brasenia schreberi

(Image from Crow and Hellquist 2000)

Common name: Water shield

Description: Water shield has an oval leaf blade up to 10 cm long, which floats on the surface of the water. The leaf is entire, and does not have a cleft at the base like the water lilies do. The petiole is attached at the center of the leaf blade. All submersed parts are covered in a thick, colorless mucus coating. Flowers are small, purple and relatively inconspicuous. The blades turn bright red in late summer.

Habitat and range: Water shield is pervasive along shorelines of neutral to highly acidic Adirondack lakes, pond bogs and slow moving rivers. Typically they occur in shallow water less than 5 feet.



May be confused with: Water lilies (*Nymphaea*)

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern Northamerica*. University of Wisconsin Press, Madison WI

Rierner, D.N. 1984. *An introduction to Freshwater Vegetation*. AVI , Westport, CT.

Elodea canadensis
Elodea nuttalia

(Image from Crow and Hellquist 2000)

Names: Common waterweed

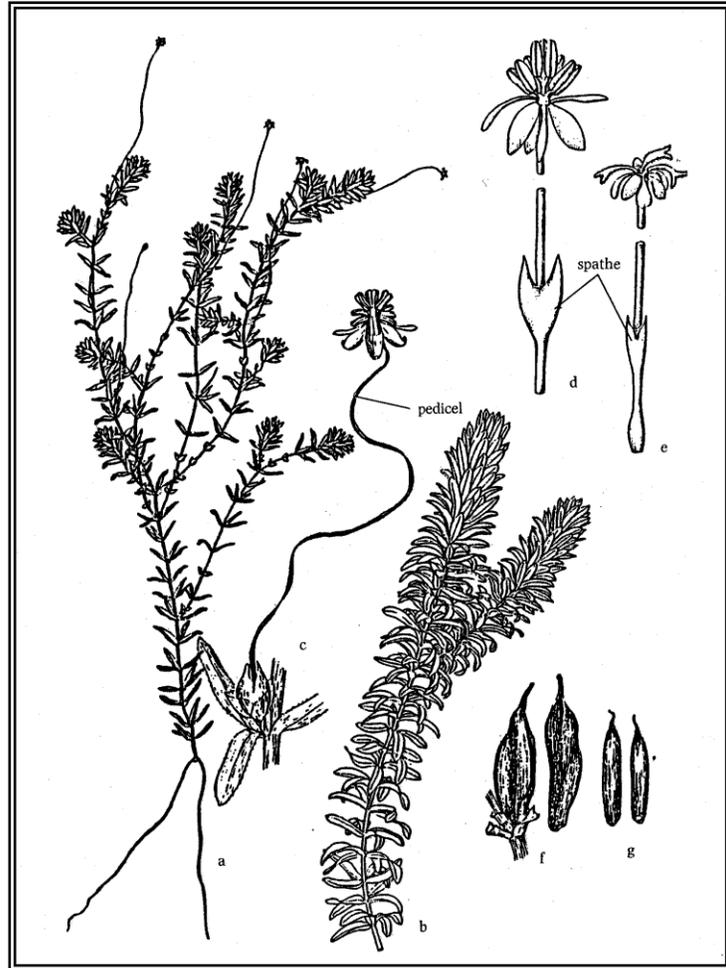
Description: Leaves of the common waterweed are mostly arranged in whorls of 3 (occasionally 4), but sometimes opposite on the lower portions of the stems. Leaves very finely toothed along the edges, but evident only with magnification.

canadensis: 6-15 mm long and 1.5-4 mm wide; leaf tip tapered to a blunt point.

nuttalia: 6-13 mm long and less than 1.5 mm wide; leaf tip tapered to a slender point.

Stem is long, trailing and generally unbranched. Often does not produce flowers.

Small (8 mm across), white flowers occur at the ends of long, thread-like stalks and have 3 petals and usually 3 sepals. Male and female flowers occur on separate plants, but male flowers are rarely produced. Blooms from July to September.



Habitat and range: Common throughout North America. In the Adirondacks it is very common at various depths in lakes, ponds, rivers and ditches.

May be confused with: Coontail (*Ceratophyllum species*)

Sources:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

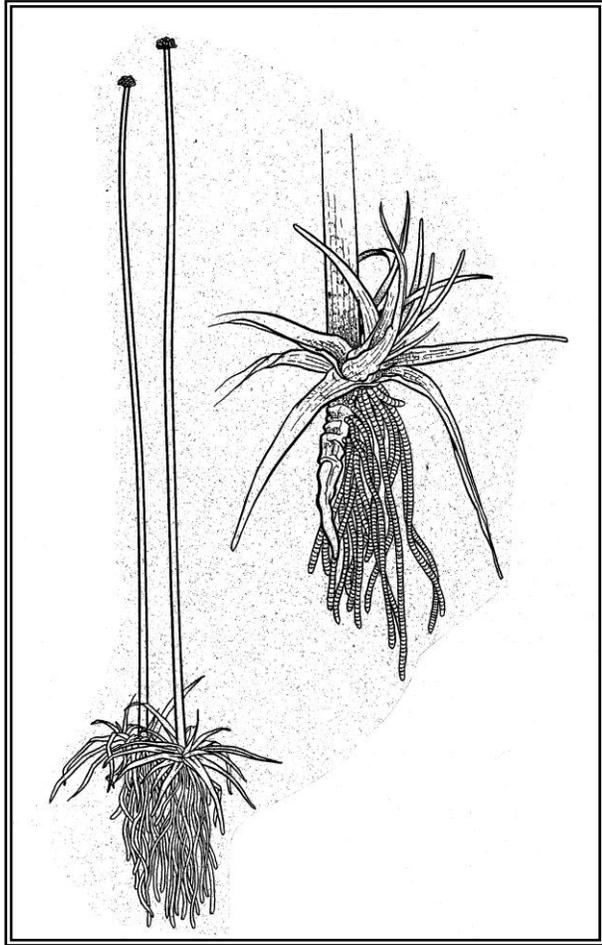
Eriocaulon Aquaticum
(Image from Bormann et. al.)

Name: Pipewort

Description: Pipewort has translucent green leaves (2-5 cm long, 2-10 cm wide) that grow in a basal rosette. The leaves taper from the base to the tip and have a checkerboard appearance created by many short cross-veins. Each rosette produces a single flower stalk that ranges in size from a few cm to a couple of meters in length, depending on water depth. The flower head is small and round (4-6 mm) with many small flowers packed together.

Habitat and Range: Pipewort is common to low alkaline lakes throughout the Adirondacks, it is usually found on sandy shorelines of clear water bodies.

May be confused with: water lobelia (*Lobelia dortmanna*), grass-arrowhead (*Sagittaria graminea*)



Sources:

Borman, S., Korth, R., and J. Temte. 1997. *Through the Looking Glass – A field Guide to Aquatic Plants*. Wisconsin DNR, Merrill, WI

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Lobelia dortmanna

(Image from Crow and Hellquist 2000)

Names: Water lobelia

Description: Low growing rosettes of cylindrical tubular leaves with an erect, unbranched flower-stalk. The leaves originate from a central base and are often curved. The leaf is actually two side-by-side hollow leaves in cross-section. White or pale blue flowers (1-2 cm long) are attached individually by short stalks to the stem. The flowers have 5 sepals and the base of the 5 petals is fused into a tube. The 2 shorter upper petals fold up. Several well-spaced flowers grow from each stem.

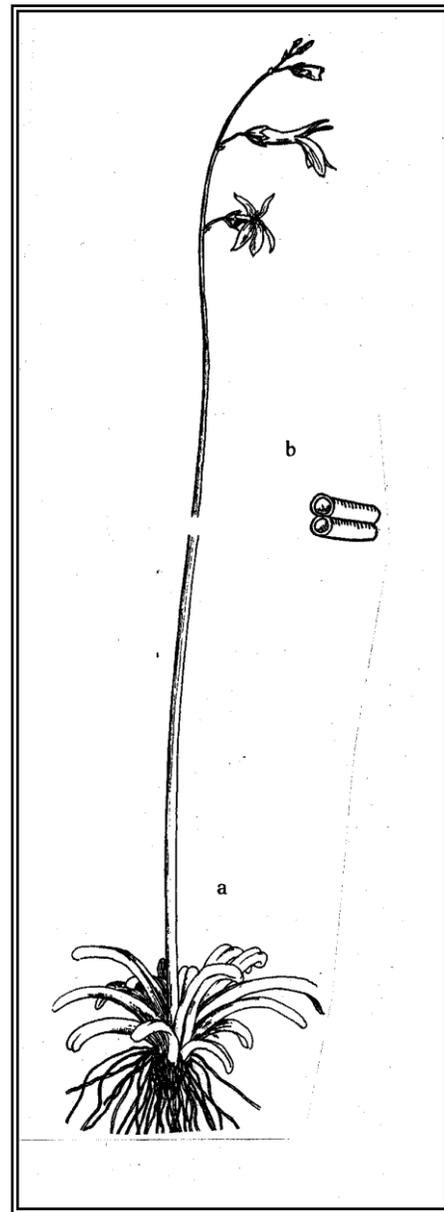
Habitat and range: Lobelia is native to northern North America and Western Europe. In the Adirondack area it grows in shallow sandy areas of lakes and ponds

May be confused with: Quilwort (*Isoetes species*)

Sources:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online: <http://www.ecy.wa.gov/ecyhome.html>



Myriophyllum heterophyllum
(Image from Crow and Hellquist 2000)

Common name: Variable-leaf milfoil

Description: The leaves of *M. heterophyllum* are finely divided into 7-10 pairs of thread-like leaflets. Most of the leaves are arranged in whorls with 4-6 leaves in a whorl. However, some leaves may be scattered throughout the stem, giving the plant its common name. The stem of the plant is very hardy. Flowers are clustered in a spike that emerges out of the water and are tinted red to pink.

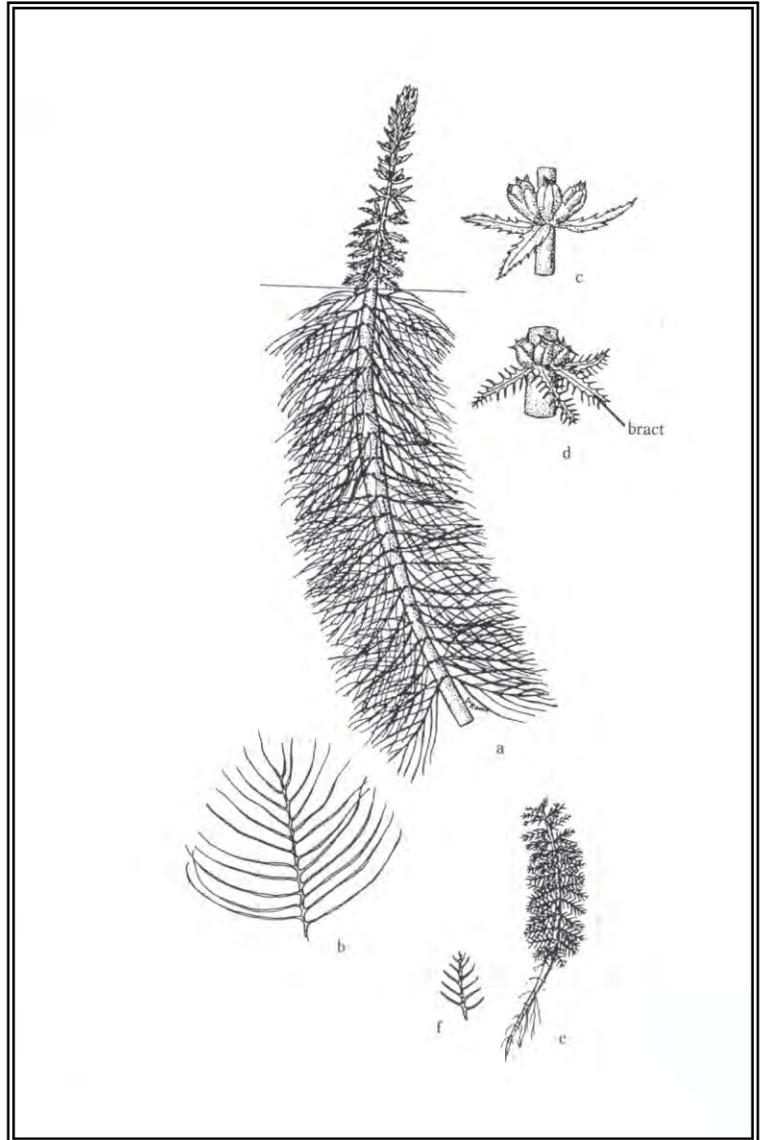
Habitat and range: typically grows in dense stands in neutral to acidic waters of the Adirondacks. May be considered nuisance in thick stands

May be confused with: up to 7 other species of milfoil, some native some exotic.

Sources:

Crow, C.E and Hellquist, C.B.
(2000) *Aquatic and Wetland Plants of Northeastern North America*.
University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washingtons Freshwater Plants*. Available online: <http://www.ecy.wa.gov/ecyhome.html>



Myriophyllum spicatum
Myriophyllum sibiricum
(Image from Crow and Hellquist 2000)

Common names:

Spicatum = Eurasian water milfoil

Sibiricum = Northern water milfoil

Description: Eurasian water milfoil has long stems that often branch as they approach the water surface. The leaves are finely divided into 14-20 pairs of leaflets. The tip of the leaf is flat, like it was cut with scissors. The actively growing meristem is bright red. Northern water milfoil branches sparingly, has 5-12 pairs of leaflets and the meristem is not red. The tip of the leaf is rounded, not flat.

Habitat and range: Both species do well in acidic and alkaline water bodies.

Eurasian watermilfoil is a highly invasive aquatic nuisance species that occurs in nearly 50 Adirondack lakes.

Sources

Borman, S., Korth, R., and J. Temte. 1997. *Through the Looking Glass – A field Guide to Aquatic Plants*. Wisconsin DNR, Merrill, WI

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

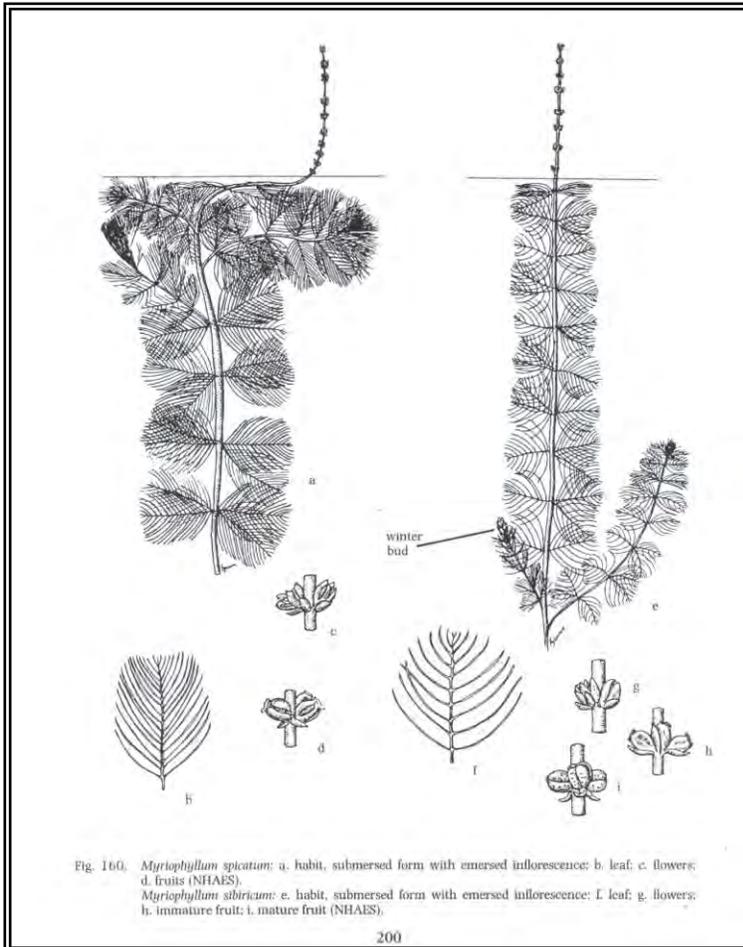


Fig. 160. *Myriophyllum spicatum*: a. habit, submersed form with emerged inflorescence; b. leaf; c. flowers; d. fruits (NHAES).
Myriophyllum sibiricum: e. habit, submersed form with emerged inflorescence; f. leaf; g. flowers; h. immature fruit; i. mature fruit (NHAES).

Najas flexis

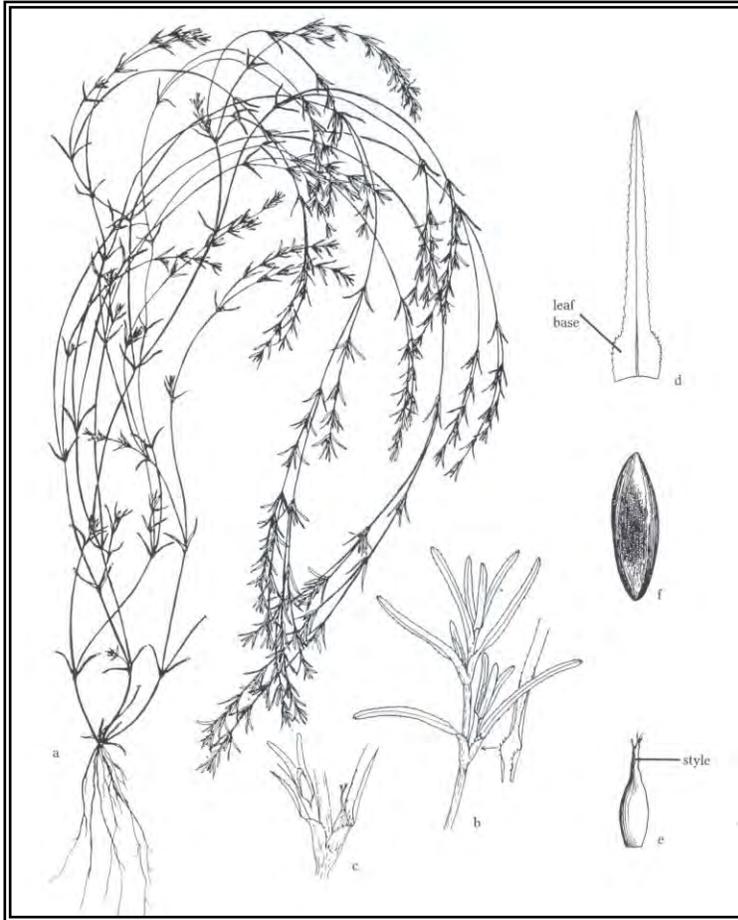
(Image from Crow and Hellquist 2000)

Common names: Naiad,
slender water nymph

Description: The leaves are glossy green, finely toothed and are oppositely arranged, but appear to be whorled near ends of the stems. The leaves are long and narrow with broad bases that clasp the stem. The leaves of *N. flexis* taper to a long point and are 1-3 cm long and 1-2 mm wide. These plants have inconspicuous flowers and fruits that are almost completely hidden by the leaf bases.

Habitat and range:

Native to Northern North America and Northern Europe. *N. flexis* is common in various depths of lakes and ponds, July – October.



May be confused with: Southern water-nymph (*Najas guadalupensis*)

Sources:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

Nuphar variegata

(Image from Crow and Hellquist 2000)

Common name:

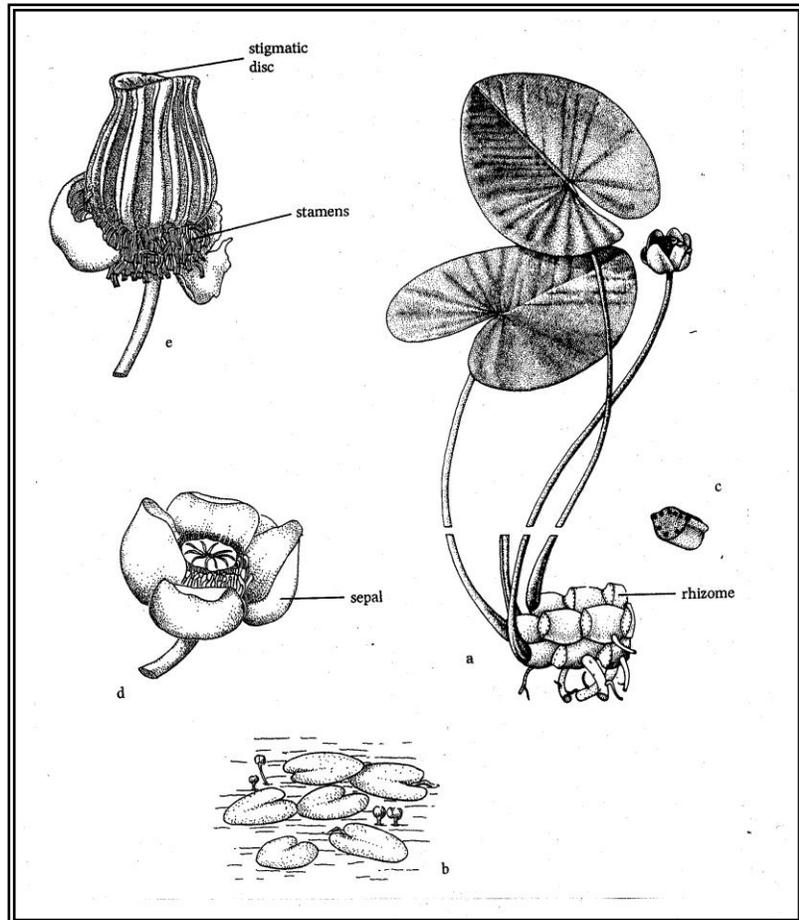
Spatterdock, bullhead pond lilly, yellow water lilly

Description:

Leaf blades are leathery, heart shaped with a deep cleft. The venation on the leaf is pinnate, with the majority of veins originating off a central mid-rib. Flowers are large, globular and yellow on the inside. The leaf stalk is slightly winged in cross-section.

Habitat and range:

Common along shorelines of lakes, ponds and slow moving streams. Shows a preference for soft sediment and shallow water



May be confused with: Yellow pond lily (*Nuphar advena*), Water shield (*Brasenia*)

Source:

Borman, S., Korth, R., and J. Temte. 1997. *Through the Looking Glass – A field Guide to Aquatic Plants*. Wisconsin DNR, Merrill, WI

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Nymphaea odorata

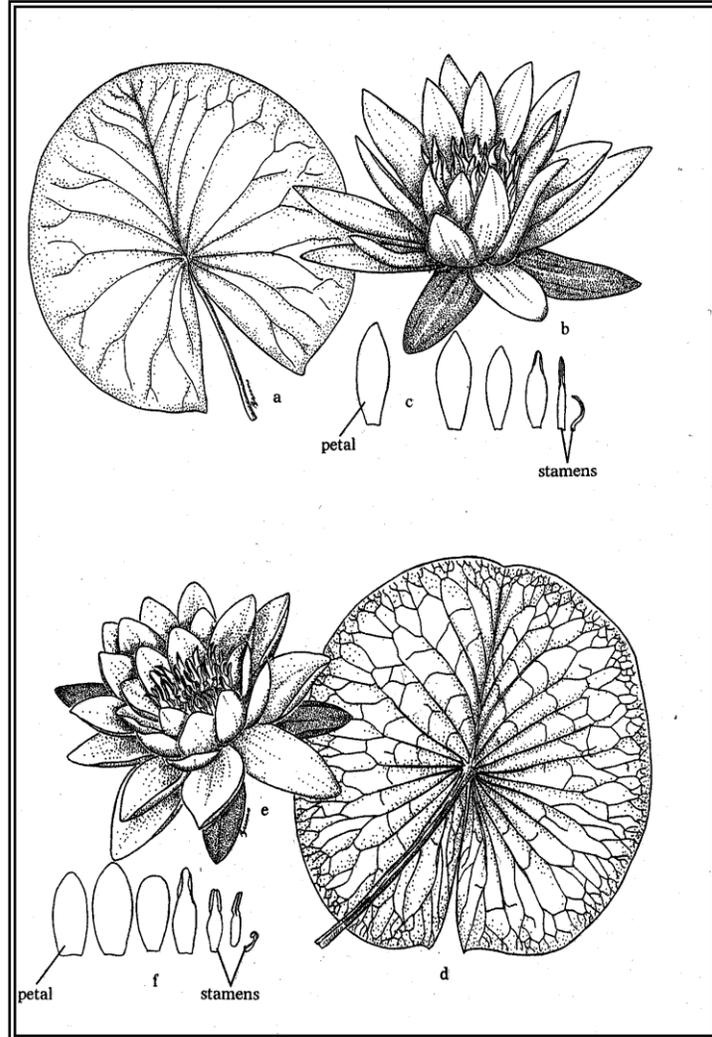
(Image from Crow and Hellquist 2000)

Common name: White water lily

Description: Leaf blades are circular or nearly circular and may be up to 40 cm in diameter. Veination on the leaf is palmate, with the majority of the veins radiating from a central point. The leaf is deeply cleft at the base. Underside of the leaf is red or brown and is rarely green. Flowers are showy and are typically white, but may be yellow, pink, or blue.

Habitat and range: Very common along the shoreline of lakes and ponds, may also be encountered in slow moving rivers and ditches.

May be confused with:
Spatterdock (*Nuphar sp.*),
Water shield (*Brasenia*).



Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Riemer, D.N. 1984. *An introduction to Freshwater Vegetation*. AVI , Westport, CT

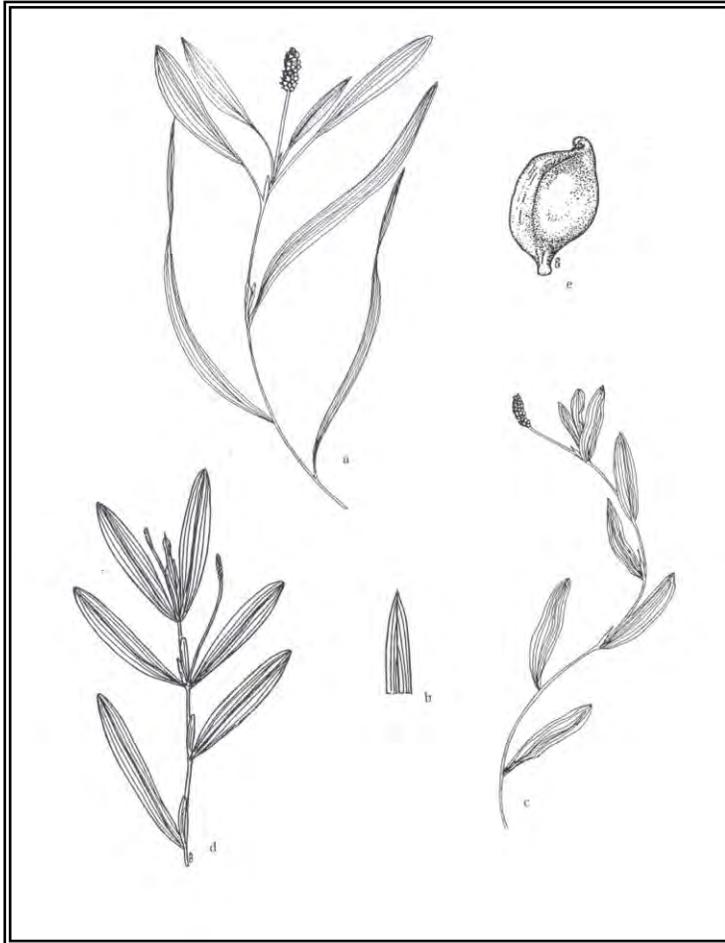
Potamogeton alpinus

(Image from Crow and Hellquist 2000)

Common Names: Alpine pondweed, reddish pondweed

Description: Submersed leaves are long, fairly narrow, reddish, to 20 cm long and 1-2 cm wide, have rounded tips, usually 7 veins, and lack petioles. Transitional leaves are often present. Floating leaves are often absent to 6 cm long by 2.5 cm wide are on short stalks. Sheaths (stipules) are free from the leaf base, to 3 cm long, and break apart easily. Stems are reddish and rarely branch.

Habitat and range: Northern North America, mountainous regions of the West and Europe. In the Adirondack it appears to be somewhat rare, occurring in shallow cool ponds and lakes.



May be confused with: variable leaf pondweed (*Potamogeton gramineus*)

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

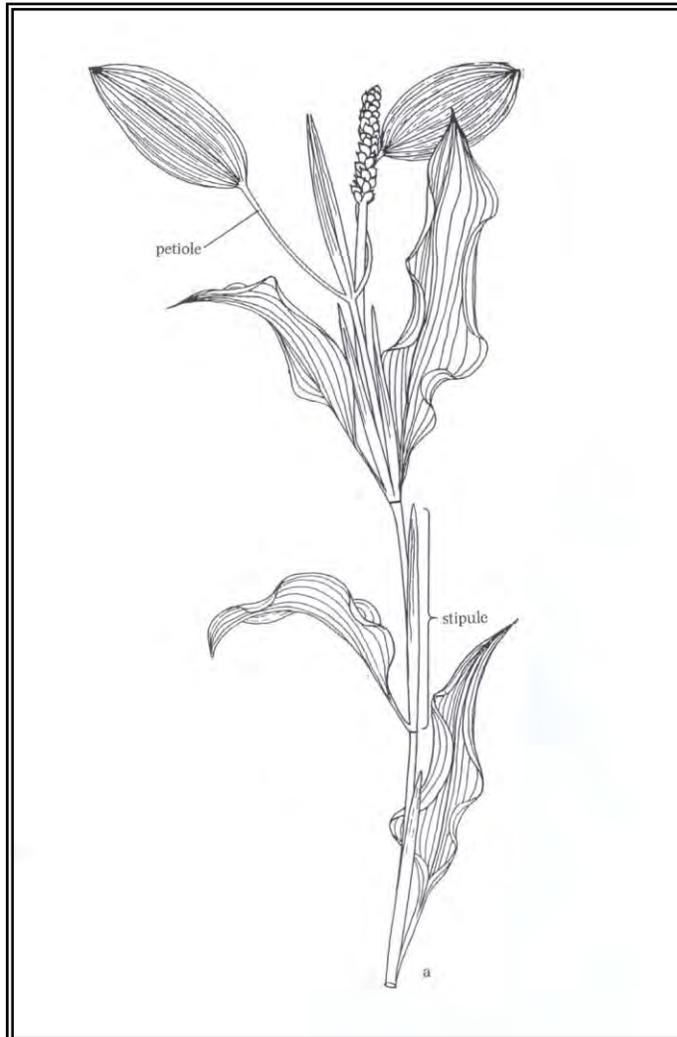
Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

Potamogeton amplifolius
(Image from Crow and Hellquist 2000)

Common name: Bassweed,
big-leaf pondweed

Description: Submersed leaves: bright to dark green, translucent, 8-20 cm long and 2-7.5 cm wide, folded along the midrib, curved backwards into a banana-shape, and sometimes with wavy margins. They have short stalks (1-2cm) and 19-45 lengthwise veins. These leaves often decay in late summer. Floating leaves are often absent. The opaque, leathery, oval leaves taper at both ends and are 5-10 cm long and 2.5-5 cm wide. They have 25-45 veins and 3-10 cm long stalks that are generally longer than the floating leaves. Sheaths (stipules) are up to 10 cm long, whitish, translucent, occur at leaf bases, but are not attached to the leaves. They become stringy with age. Stem may be long (up to 5 m) and is usually un-branched.



Habitat and range: Common through out all of North America with the exception of the Southeast. This pondweed is very common in acidic lakes and ponds of the Adirondack region, rarely found in flowing water.

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

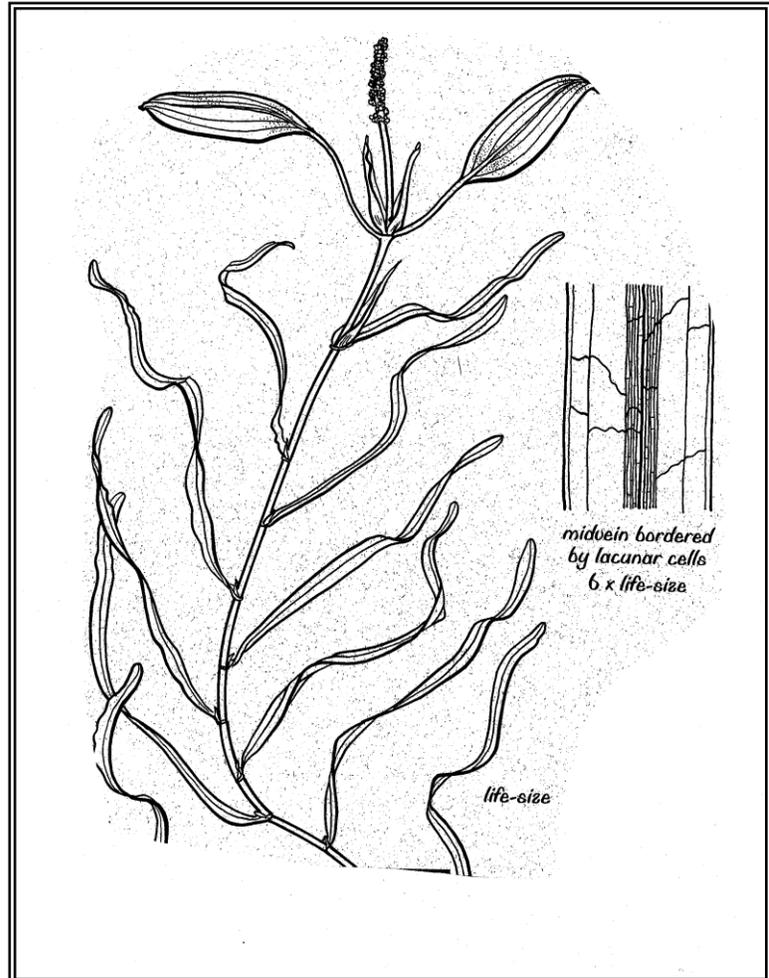
Potamogeton epihydrus
(Image from Crow and Hellquist 2000)

Common names: Ribbon-leaf pondweed

Description: Leaves alternate, limp, ribbon-like, 5-25 cm long, 0.2-1 cm wide, light-green to brown with a light colored center stripe (1-1.5 mm broad), submersed leaves lack petioles. Floating leaves: leathery, appear opposite, 2-8 cm long and 1.5-3.5 cm wide on long flattened leaf stalks. The stem is simple and typically does not branch.

Habitat and range: Common across most of North America. In the Adirondacks it is common in slow moving stream as well as lakes and ponds.

May be confused with: Flat stem pondweed (*Potamogeton zosteriformes*)



Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

Robert W. Feckman Herbarium, University of Wisconsin, Stevens Point.

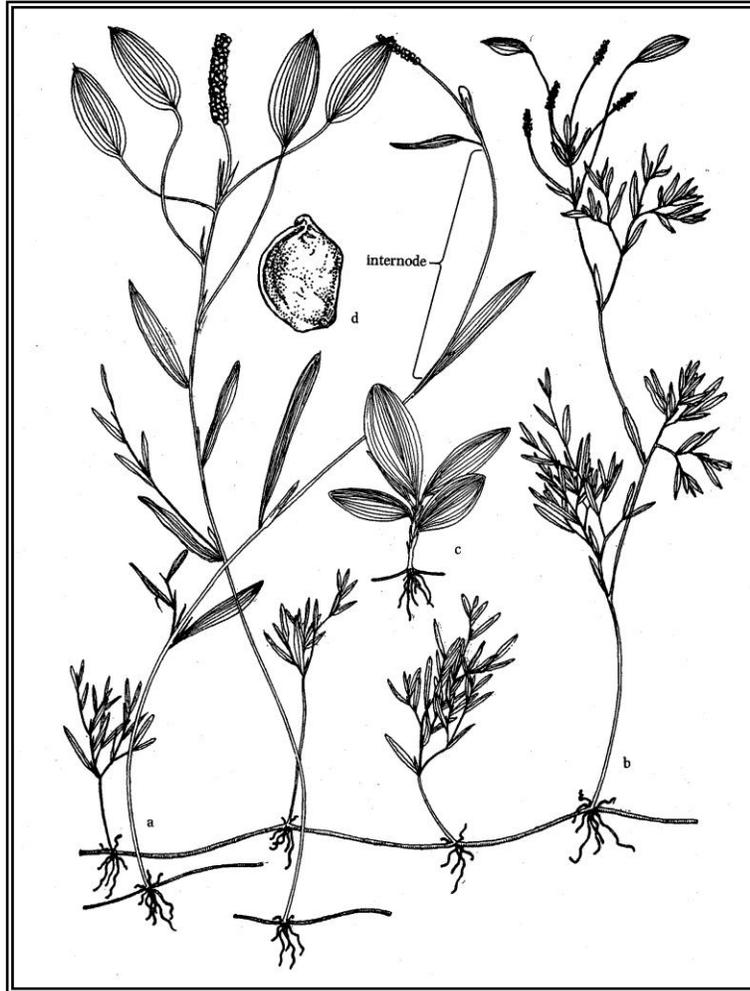
<http://wisplants.uwsp.edu/index.html>

Potamogeton gramineus
(Image from Crow and Hellquist 2000)

Common Name: Grass-leaved pondweed, variable pondweed

Description: The submersed leaves are green-to-reddish, 13 cm long by 1.2 cm wide, have pointed tips, 3-9 veins and no petiole. Floating leaves: 1.5-7 cm long and 1-3 cm wide are on stalks longer than the blades. Sheaths (stipules) to 3 cm long are persistent and free of the leaf base. Stem is green and usually forms many short branches.

Habitat and range: Occurs throughout the northern hemisphere. In the Adirondacks it is found in alkaline to acidic lakes and ponds.



May be confused with: Grass-leaved pondweed is a variable species that hybridizes freely. Much disagreement and confusion exists regarding this plant among taxonomists. Each will hybridize with other pondweeds, forming plants with intermediate characteristics.

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

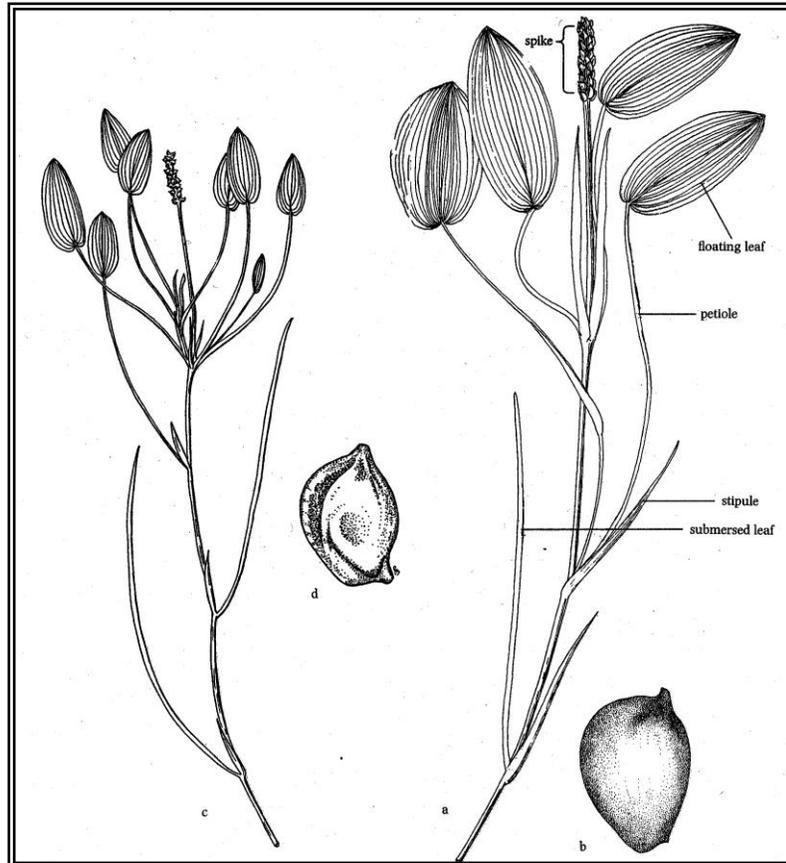
<http://www.ecy.wa.gov/ecyhome.html>

Potamogeton oakesianus / *Potamogeton natans*

(Image from Crow and Hellquist 2000)

Common Names: *P. oakesianus* –Oak's pondweed (left image), *P. natans* – floating pondweed (right image).

Description: Both *P. oakesianus* and *P. natans* are easily identified by their phylloidal submersed leaves. *P. natans* has larger submersed leaves (0.8-2 mm), the floating leaves are typically cordate, heart shaped at the base with a petiole that is pale at the junction of the blade. *P. oakesianus* submersed leaves are smaller (0.3-1 mm), the pale petiole at the blade junction is absent.



Habitat and range: Both of these species are considered to be circumpolar, and are particularly prevalent in the Northeastern North America. In the Adirondack region they are found in low alkaline slow moving rivers, ponds and bogs.

May be confused with: These two species are unique in that they possess phylloidal submersed leaves.

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI.

Flora of North America. <http://www.efloras.org/index.aspx>

Potamogeton perfoliatus
(Image from Crow and Hellquist 2000)

Common name: Clasp leaf pondweed, redhead grass

Description: Clasp leaf pondweed is highly variable in its appearance and, in fact, two stems on a single plant may appear to be separate species. Leaves are flat and oval-shaped, 1-7 cm long and 1-4 cm wide with parallel veination. Leaf margins are slightly crisped and basal parts of leaves clasp the stem. Floating leaves are completely absent from this species.

Habitat and range: *P. perfoliatus* exists throughout North America and Europe. In the Adirondacks it is incredibly abundant in lakes, ponds and rivers of various alkalinities.

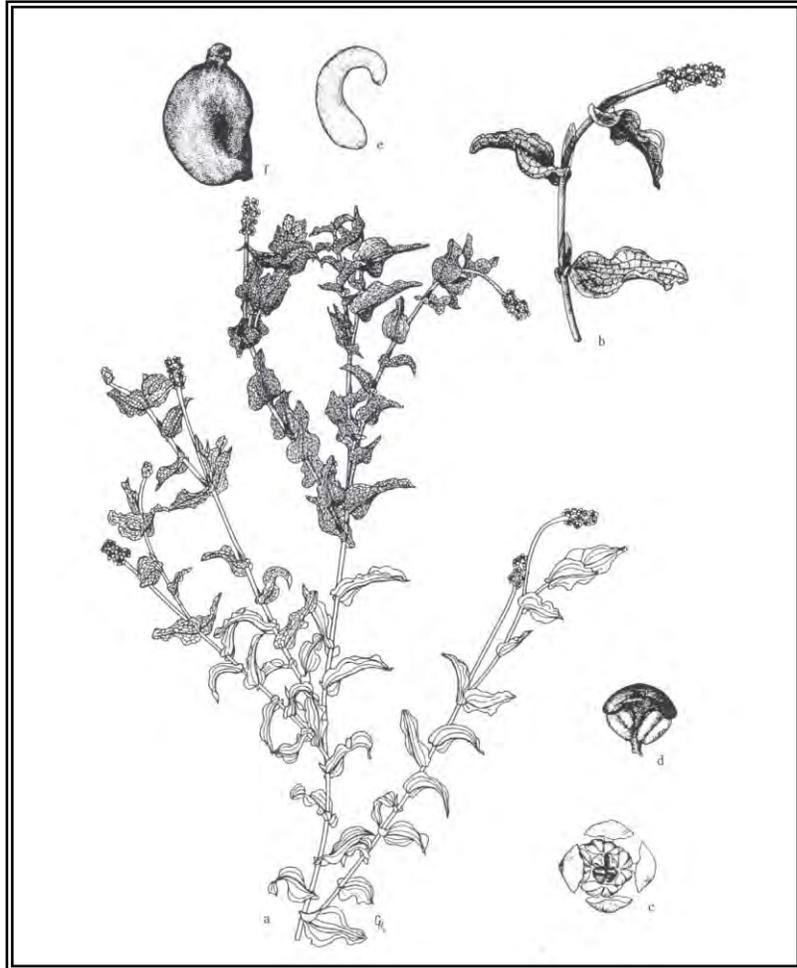
May be confused with:
curly pondweed (*Potamogeton crispus*)

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Bay grass Key, Maryland Department of Natural Resources.

<http://www.dnr.state.md.us/bay/SAV/key/>



Potamogeton prealongus
(Image from Crow and Hellquist 2000)

Common name: White-stemmed pondweed

Description: This plant has shiny green leaves; 5-35 cm long and 1.5-2.5 cm wide, often appear wavy or twisted with a boat shaped apex. There are no floating leaves present with this species. The leaf stipules persist throughout the season and are translucent to white and very large (3-10 cm long). The stem is whitish, zig-zag and often branches near the top.

Habitat and range: White-stemmed pondweed is common through out North America. In the Adirondack region it is fairly common in acidic water and has the ability to form small but dense beds in relatively deep water.

May be confused with: This plant is distinct, other pondweeds with clasping leaves posses floating leaves.



Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

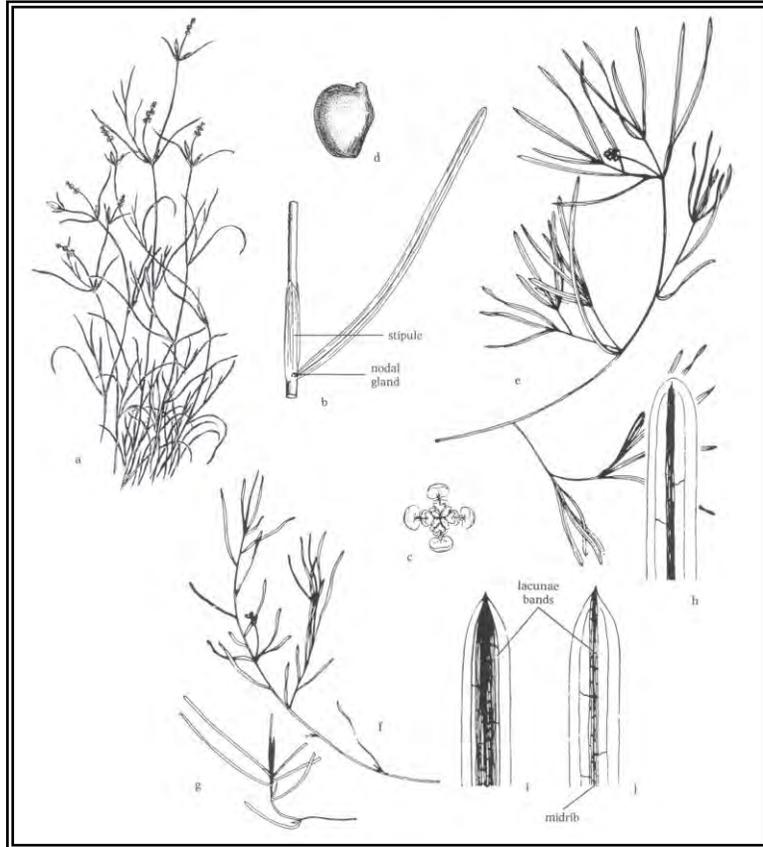
Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

Potamogeton pusillus
(Image from Crow and Hellquist 2000)

Common name: Slender pondweed

Description: Submersed, alternate, lacking a petiole. Linear leaves, 2-7 cm long, 0.5-2 mm wide, have pointed to rounded tips and 3 veins. Leaves have two broad bands or two narrow bands of lacunae on either side of the midrib. Membranous tubular or open sheaths (stipules) are 1-3 cm long, free of the leaf base, and usually disintegrate before the leaves. Stem is slender and profusely branched, often with small paired yellowish nodal glands at leaf base.



Habitat and range: *P. pusillus* is widespread though the northern hemisphere. In the Adirondacks it is widespread in both alkaline and acidic waters.

May be confused with: Slender pondweed may be confused with other species of small leafed pondweeds, particularly *P. spirillus*; presence of nodal glands and careful examination are needed

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

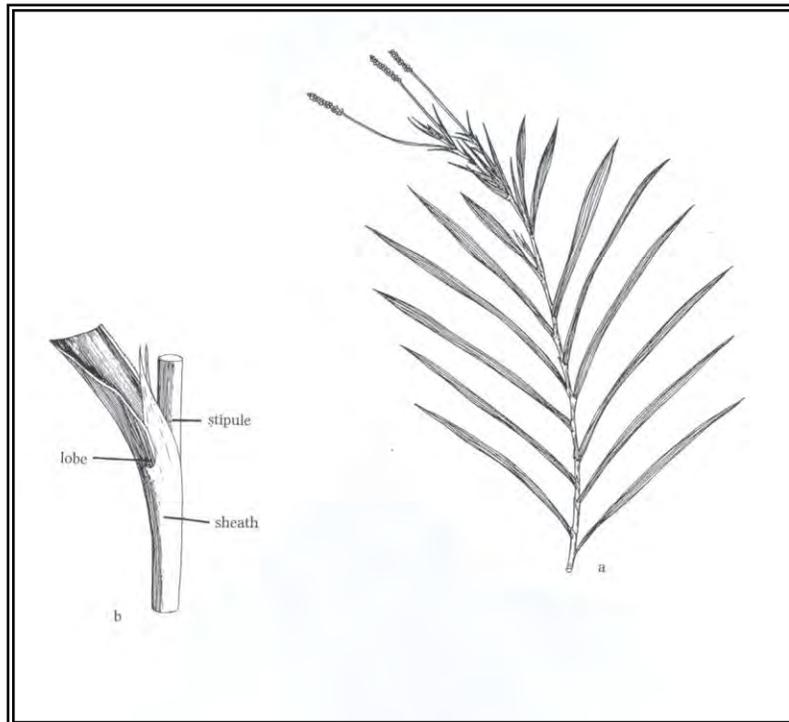
Potamogeton robinsii

(Image from Crow and Hellquist 2000)

Common Name:

Robin's Pondweed,
fern-like pondweed

Description: Robin's pondweed is easily recognized because its dark green, closely spaced leaves are arranged in a rigid, flattened spray, giving it a fern-like appearance. The plant usually a low-growing plant and only approaches the water surface when flowering. The flowering stalks have more widely spaced leaves that are less fan-like in



appearance. Like other pondweeds, fern-leaf pondweed has membranous appendages (stipules) at the leaf bases. Stipules form a short sheath around the stem and are partially fused to the leaf blades causing the leaves to seem jointed or bent at the base if they are pulled from the stem.

Habitat and range: Native to Northern North America. In the Adirondacks is very abundant in lakes and ponds of low alkalinity.

May be confused with: The dark leaves, adnate stipules and fern like appearance separate this pondweed species from other pondweeds. .

Sources:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

Potamogeton spirillus
(Image from Crow and Hellquist 2000)

Common name: Spiral fruit pondweed,
snail seed pondweed

Description: A small highly branching pondweed with lax leaves, stipules that are adnate to the leaf base for half of their length. Seeds develop in clusters at the attachment of the blade and stem. The seeds are small, keeled and shaped like a snail shell.

Habitat and range: Native to Northeastern North America. In the Adirondacks it is common in acidic to slightly alkaline waters at various depths.

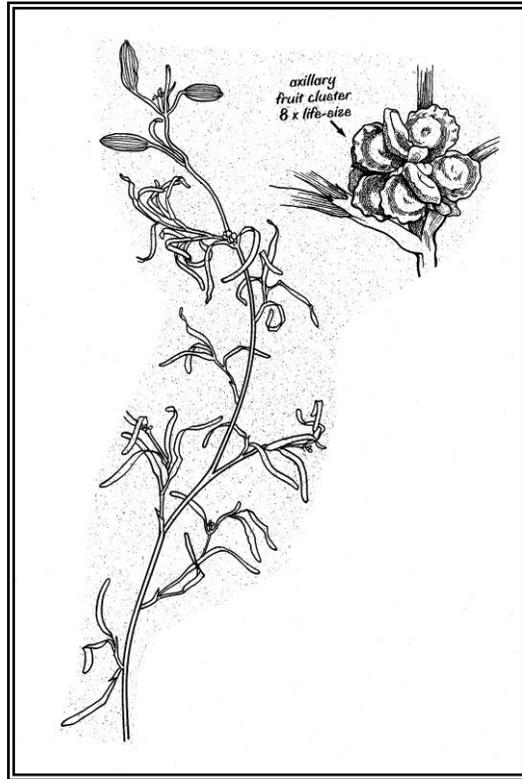
May be confused with: small pondweed (*Potamogeton pusillus*)

Source:

Crow, C.E and Hellquist, C.B. (2000)
Aquatic and Wetland Plants of

Northeastern North America. University of Wisconsin Press, Madison WI

Flora of North America. <http://www.efloras.org/index.aspx>



Potamogeton zosteriformis
(Image from Crow and Hellquist 2000)

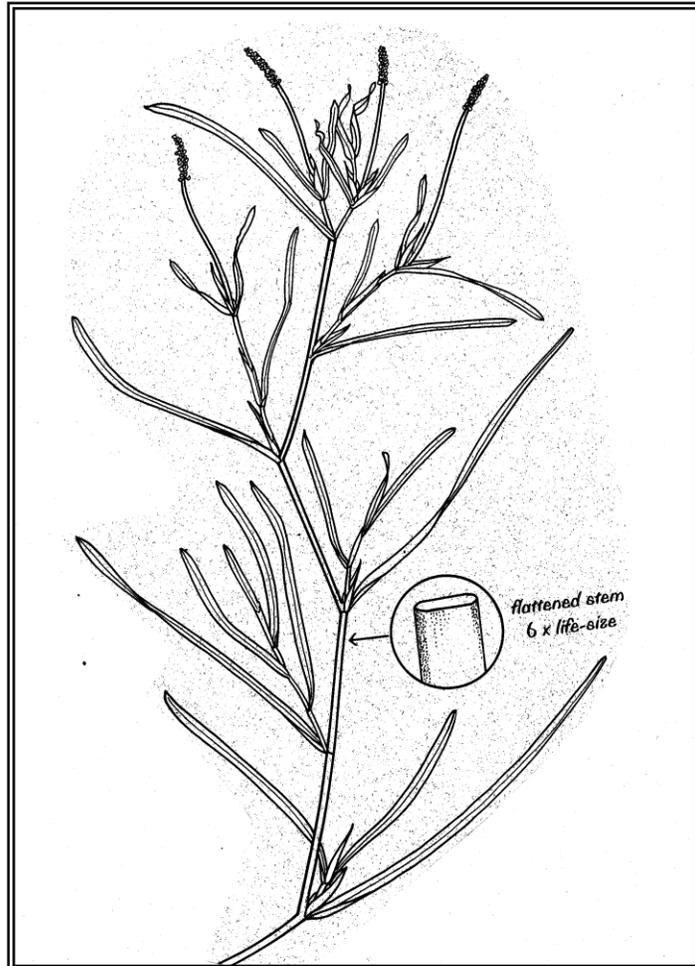
Common Names: Flat-stem pondweed, eelgrass pondweed

Description: This alternate leaf perennial herb has a distinctly flat stem that grows in an angled or zigzag appearance. The leaves are linear, flat and have a prominent midvein.

Habitat and range: *P. zosteriformes* is native to Northern North America. It is common in lakes and ponds in the Adirondack up to depths of 5 meters.

May be confused with: Robins pondweed (*Potamogeton robinsii*)

Source:
Crow, C.E and Hellquist, C.B.
(2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI.



Robert W. Feckman Herbarium, University of Wisconsin, Stevens Point.
<http://wisplants.uwsp.edu/index.html>

Sagittaria species

(Image from Crow and Hellquist 2000)

Common Name: Duck potato,
grassy arrowhead

Description: submerged leaves are
a rosette of flat linear leaves with
sharp tips 1-5 cm long, typically
growing in small but dense beds,
roots with uniformly spaced
horizontal striations.

Habitat and range: *Sagittaria* is
native to central and eastern North
America. In the Adirondack region
it is common in shallow water,
shorelines, and slow moving rivers.

May be confused with: Bur-reed
(*Sparganium species*), duck
potatoes (*Sagittaria species*)

Source:

Crow, C.E and Hellquist, C.B.
(2000) *Aquatic and Wetland Plants
of Northeastern North America.*
University of Wisconsin Press,
Madison WI



Washington State Department of
Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants.*
Available online: <http://www.ecy.wa.gov/ecyhome.html>

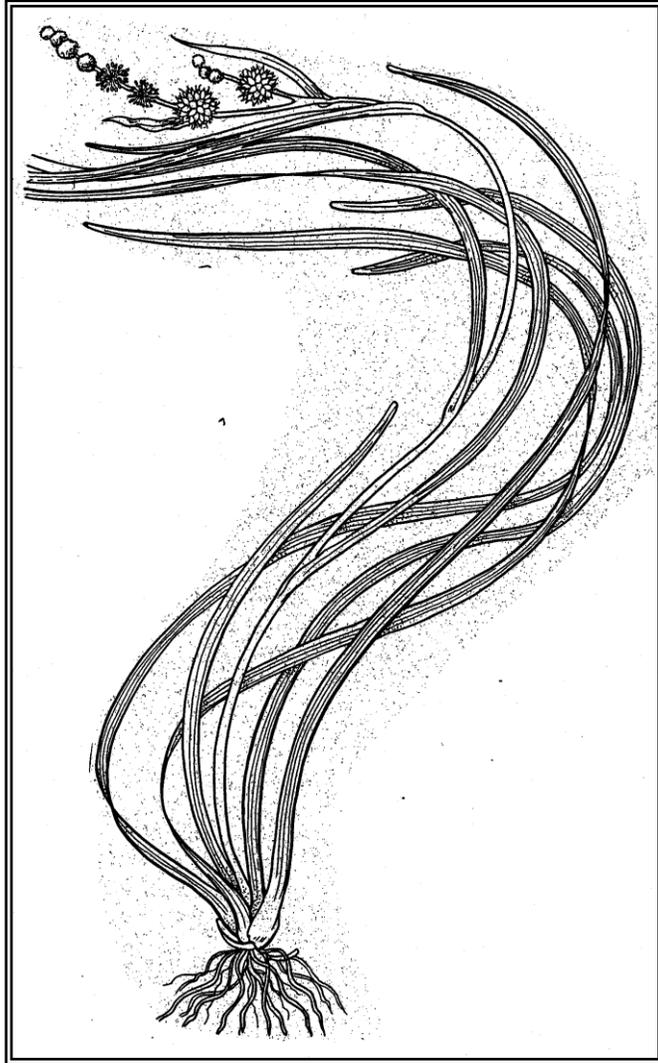
Sparganium species
(Image from Crow and Hellquist 2000)

Common names: Bur-reed, *Sparganium* is derived from the Latin word *sparganon* “a swaddling band”, named for the strap-shaped leaves.

Description: Long (0.5-2 m) strap like leaves that are somewhat convex, keeled or v-shaped. The leaves lack a lacunae band and have a spongy consistency at the margins and near the base. Submersed leaves typically bent at the water surface and float. Female flower heads are spiny, round balls that turn from green to brown as they mature. Small male flower heads are located above female heads.

Habitat and range: *Sparganium* species are widespread in the Northern Hemisphere. In the Adirondacks it is common in shallow water (1-2.5 m) of streams and lake margins.

May be confused with: Duck potatoes (*Sagittaria species*), eel grass *Vallisneria americana*



Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

Utricularia geminiscapa and *minor*

(Image from Crow and Hellquist 2000)

Common names:

Geminiscapa = twin-stemmed bladderwort

Minor = small bladderwort

Description: *Geminiscapa* looks very much like a smaller version of the common bladderwort. The key differences between the two species is that *Geminiscapa* has smaller flowers, some of which are non-opening and spines only occur at the tip of leaf divisions. *U. minor* has leaf-like branches that are flattened with a midrib. The leaf-like branches are small, usually around 1 cm in diameter and only have spines at the tip of the leaf division.

Habitat: Found in lakes, ponds, bogs, and roadside ditches throughout the Adirondacks.

May be confused with: numerous other species of *Utricularia*, milfoil

Sources:

Borman, S., Korth, R., and J. Temte. 1997. *Through the Looking Glass – A field Guide to Aquatic Plants*. Wisconsin DNR, Merrill, WI

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

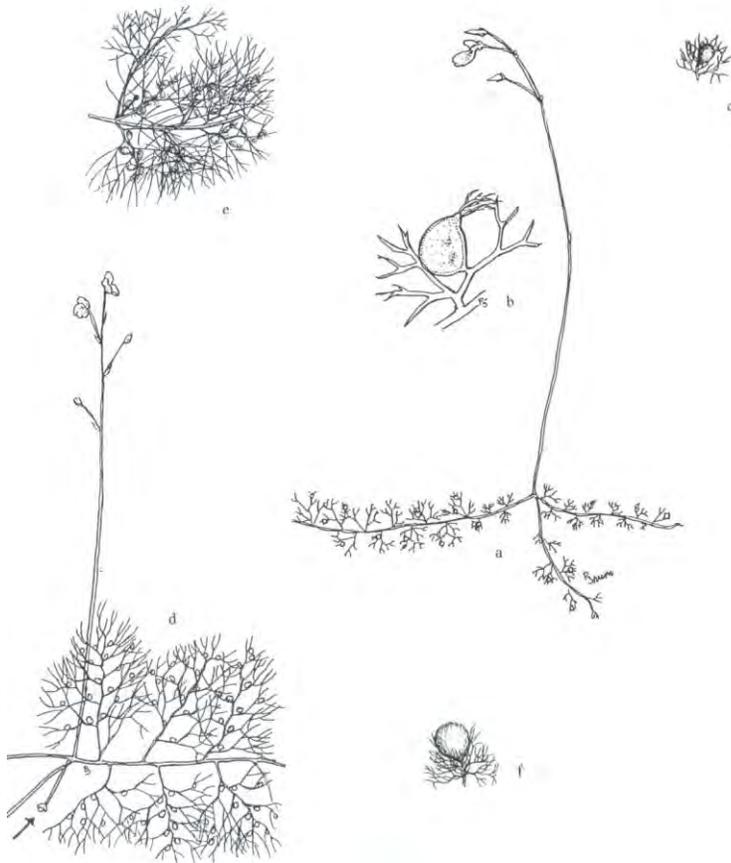
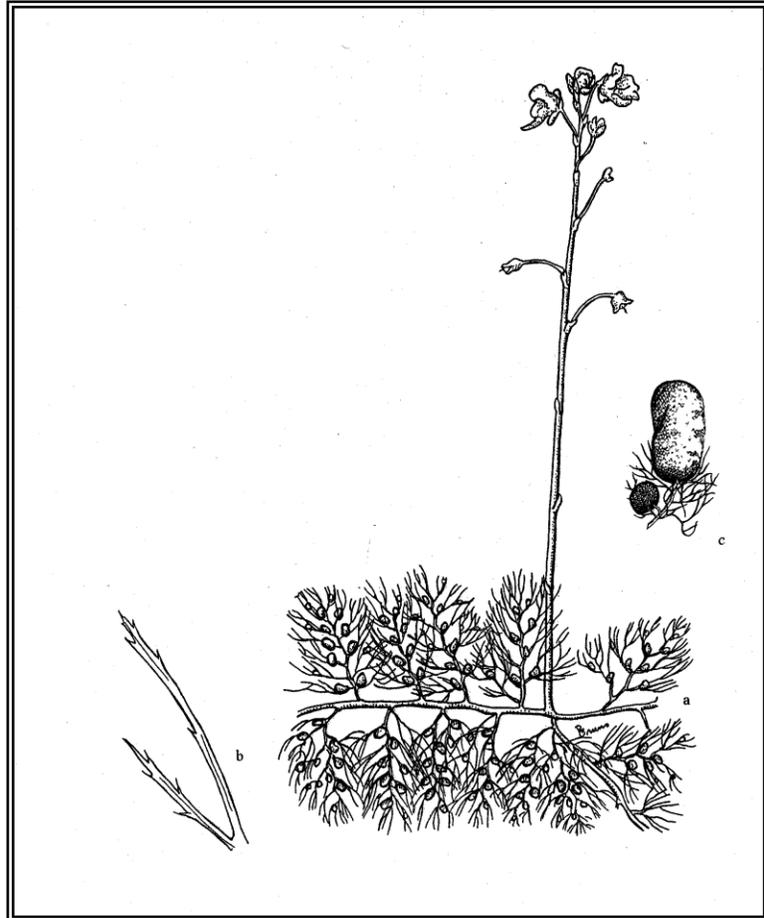


Fig. 284. *Utricularia minor*: a. habit (NHAES); b. bladder (NHAES); c. winter bud (F).
Utricularia geminiscapa: d. habit, section of plant with cleistogamous flower, at arrow (NHAES);
e. branch (F); f. winter bud (F).

Utricularia vulgaris
(Image from Crow and Hellquist 2000)

Common name: Common bladderwort, great bladderwort

Description: This rootless plant has floating stems and can reach lengths of 2 – 3 meters. Along the stem are leaf-like branches that fork 3-7 times, are round in cross-section and have no midrib. The branches have fine spines scattered along their margins. Bladders are scattered throughout the plant and are transparent to green when young, and dark brown to black when old. The yellow flowers two-lipped flowers are produced on stalks that protrude above the water surface. Winter buds are typically seen on plants by late summer.



Habitat and range:

Common bladderwort is found throughout the Adirondack region. It is quite common in still, nutrient rich, water and bogs

May be confused with: Milfoil (*Myriophyllum* species) Coontail, (*Ceratophyllum*)

Sources:

Borman, S., Korth, R., and J. Temte. 1997. *Through the Looking Glass – A field Guide to Aquatic Plants*. Wisconsin DNR, Merrill, WI

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Vallisneria americana
(Image from Crow and Hellquist 2000)

Common names: Eelgrass, tapegrass, watercelery

Description: *Vallisneria* is a completely underwater perennial macrophyte with long, narrow, ribbon like leaves growing from underwater rhizomes. The leaves end in a blunt tip and have a broad white band along the midvein (lacunae band). Plants occur as either males or females. Male flowers are small (1 mm) and produced near the bottom of the plant, when they are mature they are released and float at the water's surface. Female flowers float on the surface attached to long thin stalks that coil up after pollination has occurred.

Habitat and range:

Vallisneria is native to the eastern North America, Central America and the Caribbean. In the Adirondack region it is very common in ponds, lakes and quiet streams.

May be confused with: Bur-reed (*Sparganium species*), duck potatoes (*Sagittaria species*)

Source:

Crow, C.E and Hellquist, C.B. (2000) *Aquatic and Wetland Plants of Northeastern North America*. University of Wisconsin Press, Madison WI

Washington State Department of Ecology: *Aquatic Plant Identification Manual for Washington's Freshwater Plants*. Available online:

<http://www.ecy.wa.gov/ecyhome.html>

