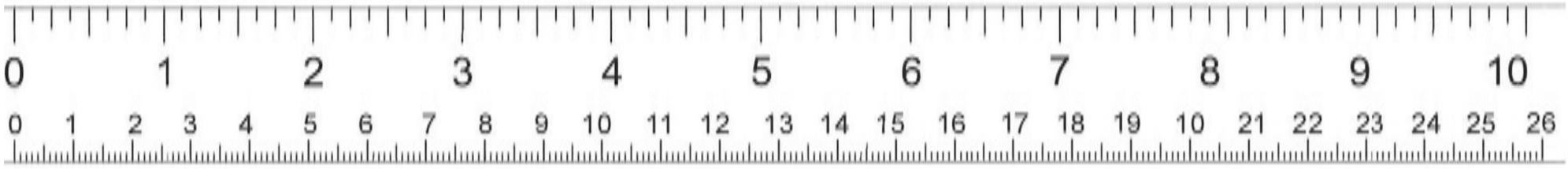
A Key to Common Vermont Aquatic Plant Species

Lakes and Ponds Management and Protection Program

VERMONT

DEPARTMENT OF ENVIRONMENTAL CONSERVATION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The underwater world of aquatic plants is diverse and unique. With the advent of aquatic invasive species taking hold of the aquatic plant discussion, the unfortunate consequence has resulted in a negative philosophy that all aquatic plants are “weeds” and must be managed, controlled, or eradicated. This philosophy is far from the truth as the benefits for native aquatic plants are many. Preferred by wildlife for food and habitat, a stabilizer of lake bed soils, nutrient reduction and oxygen provider, native aquatic plants are truly an essential component of the living landscape.

The Key to Common Vermont Aquatic Plant Species is a brief introduction into some of the more prevalent native aquatic plant species, and with it the invasive aquatic plants that many natives are mis-identified for. As this is a brief introduction into identifying plants and using a key to do so, we hope to encourage the enthusiasm in the budding naturalist to learn more, and take advantage of the field guides with more formal keys that are outlined in the resources page.

We like to thank the aquatic botanists who came before us who developed the original key and provided the illustrations including Susan Warren and Ann Bove. Thank you to those who provided permissions for photographs and for VTDEC staff who have provided photographs. Sincere thanks to Kate Wettergreen for compiling the new information and revising this copy and editors Laurie Callahan and Kimberly Jensen.

VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Vermont Department of Environmental Conservation
Lakes and Ponds Management and Protection Program
June, 2023

Over 120 native aquatic plant species are known to be found in Vermont. In this key, 37 common native aquatic plants and 12 aquatic invasive plants that are identified here. In addition there are 4 aquatic invasive plants of concern that have not yet been confirmed in Vermont and are ones to look out for. The invasive plants covered in this key are outlined in red and labeled so with a "☼". If you believe you have identified an aquatic invasive plant in a new location, take a photo, collect a sample, and notify the Lakes and Ponds Program as soon as possible at 802-828-1115.

To identify a plant using the key, you are asked to make a series of choices between descriptions of different plants. By observing specific characteristics of the plant you are trying to identify and making these choices, you will (hopefully) arrive at an identification of the plant.

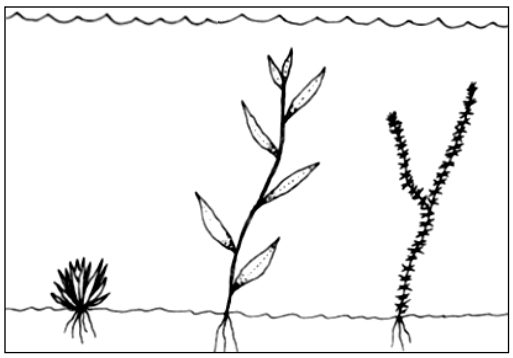
The first step is to go to page 7 where you are asked to decide whether the plant has a **submersed**, **floating-leaved, a combination,** or **emergent** growth habit. The key then directs you to a section and page number, where you will again make a series of choices. In many cases you will need to look closely at the plant in order to be able to decide which description the characteristics best fit. There is a glossary on page 33 should you need help with terminology.

If you have questions or would like the identity of a plant confirmed, you are encouraged to send a plant sample to the Vermont Department of Environmental Conservation. Use the instructions and **Aquatic Plant Sample Submission Form** on page 37.

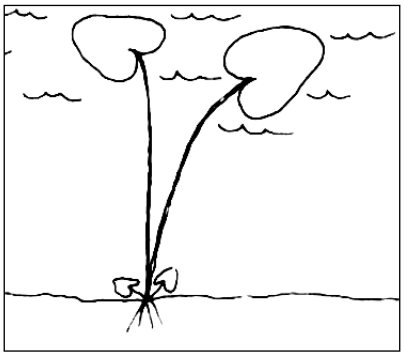
There are a number of aquatic invasive species currently not found in Vermont but of concern if or when they are introduced to water bodies in Vermont. Aquatic invasive plants not yet confirmed in Vermont and listed in this key are Fanwort (*Cabomba caroliniana),* Brazilian Elodea (*Egeria densa),* Hydrilla (*Hydrilla verticillata),* and Parrot Feather (*Myriophyllum aquaticum).* If you suspect you have discovered any of these plants, please contact the Lakes and Ponds Program as ***soon as possible*** at 802-828-1115.

1. <u>Where are the leaves of the plant in relation to the surface of the water?</u>

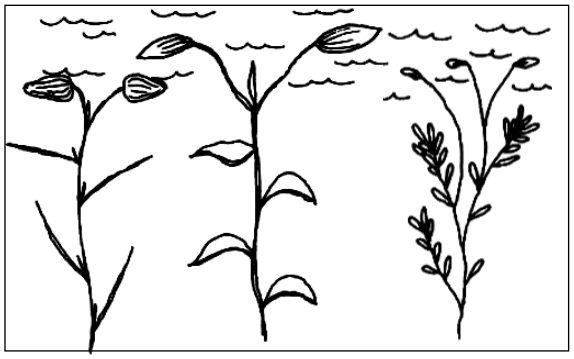
1A. Submersed – Plants are growing almost entirely beneath the water's surface…see part 2 on page 8.

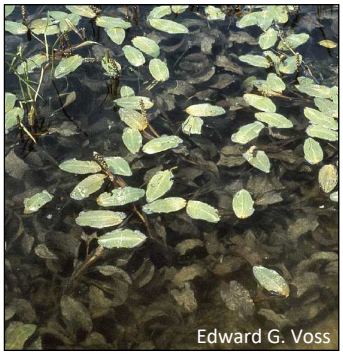


1B. Floating-leaved – Plants have many leaves floating on the water's surface, and the surface of floating leaves shed water…see part 13 on page 21.

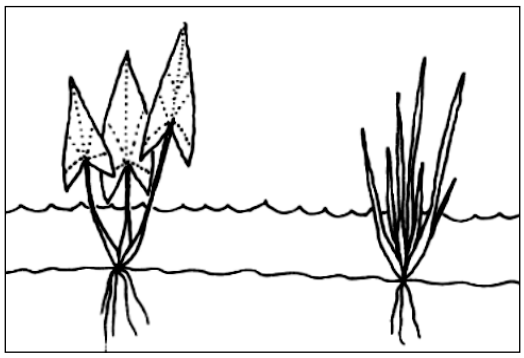


1C. Combination of Submersed and Floating-leaved – Plants have some leaves that that are growing underwater, but have some on or above the surface of the water...see part 22 on page 27.





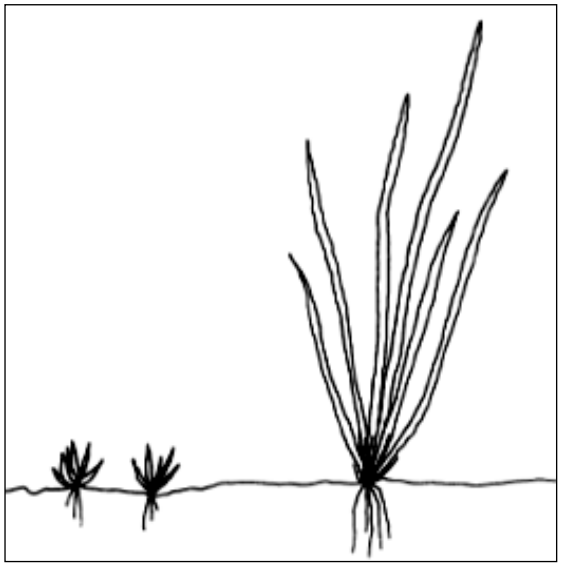
1D. Emergent – Plants are rooted on the pond bottom and extend upright above the water's surface… see part 23 on page 28.



2. <u>Are submersed leaves connected along the stem, or are all leaves basal?</u>

2A. Leaves on the stem – leaves are positioned along the stem…see part 4 on page 10.

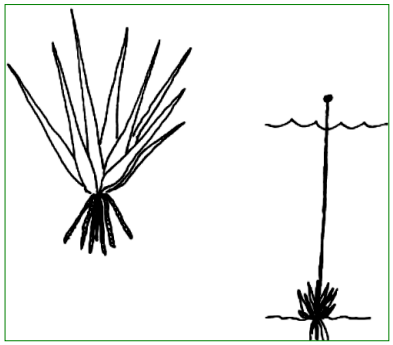
2B. Basal Leaves – all leaves emerge from a single point near the pond bottom…see part 3 on page 9.



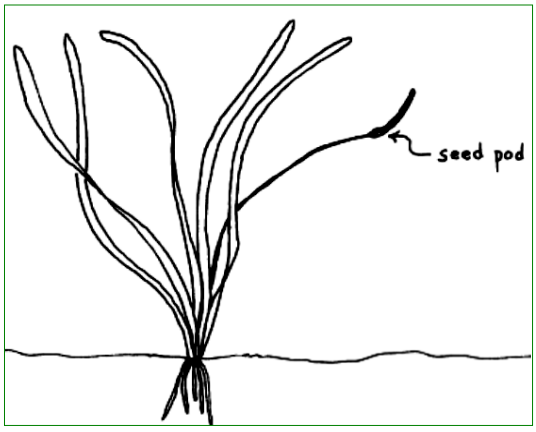
3. Submersed plants with *only* basal leaves.

Pipewort *(Eriocaulon aquaticum)*

In shallow water, Pipewort will grow an emergent "flower" which resembles a button. The leaf is widest at the base, ⅛ to ⅙ inch wide and ¾ to 3¾ inches long, and tapers to a point.



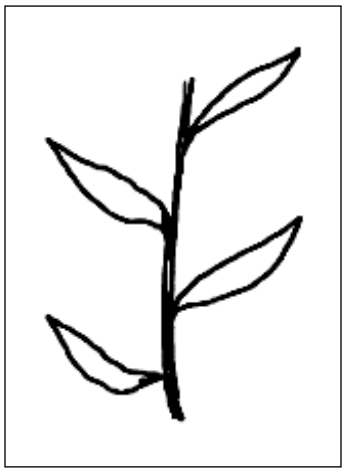
Wild Celery *(Vallisneria americana)*

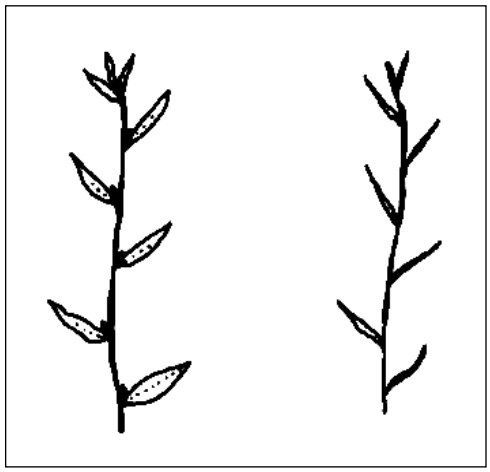


Alternate name is Eel Grass. Leaves are somewhat stiff, ½ - 1 inch wide and 4 inches to 6 feet long depending on the water depth. Leaves are rounded or slightly pointed at the ends. The female plants have a coiling stem which resembles a corkscrew.

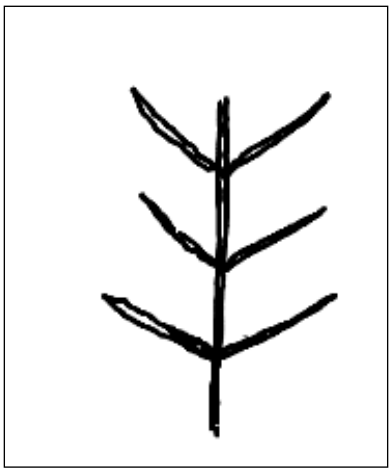
4. <u>Are the leaves alternate, opposite, or in whorls around the stem?</u>

4A. Leaves are alternate - leaves are *not* located across from one another along the stem...see part 5 on page 11.

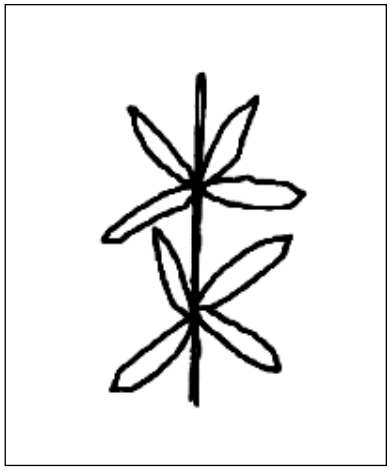


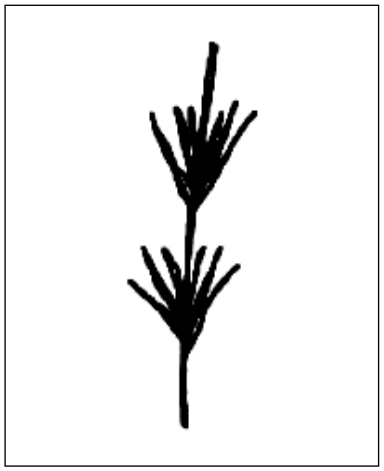


4B. Leaves are opposite - leaves are symmetrical in groups of two along the stem...see part 8 on page 13.



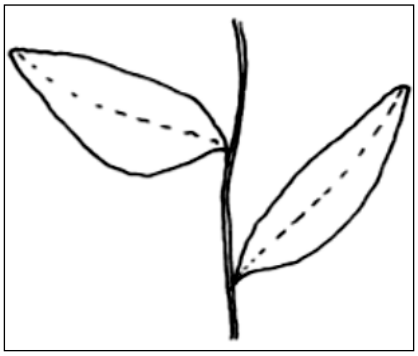

4C. Leaves are in whorls - leaves are grouped in whorls with 3 or more leaves around the stem… see part 9 on page 14.



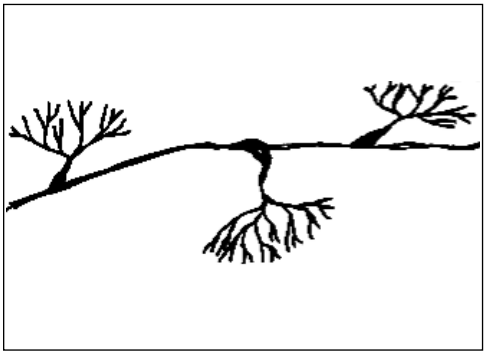


5. <u>Are the alternate leaves entire or divided?</u>

5A. Leaves are entire and may have smooth or toothed edges…see part 7 on page 12.

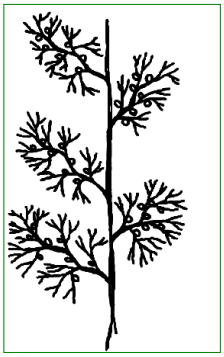


5B. Leaves are divided…see part 6 below.



6. <u>Submersed plant with alternate, divided leaves on the stem.</u>

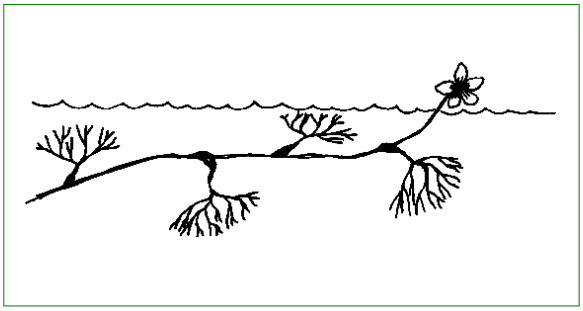
Common Bladderwort *(Utricularia macrorhiza)*



Leaves are branched divided along the stem and have numerous small "bladders" attached along them. Bladders are light green to black. This plant is not rooted to the pond bottom.

There are eight species of bladderworts in Vermont

Water Buttercup *(Ranunculus sp.)*



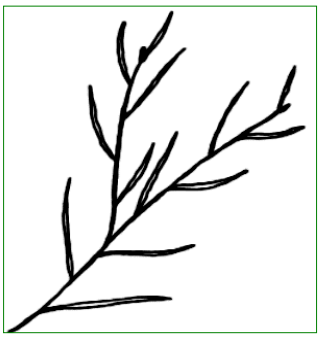
Alternate name is Water Crowfoot. This plant is usually a few feet long, often trailing just below the water surface. No bladders are present. A small yellow or white flower is produced.

7. Do the alternate, entire leaves have a mid-vein?

7A. Alternate leaves with no mid-vein present.

Water Stargrass (*Heteranthera dubia*)

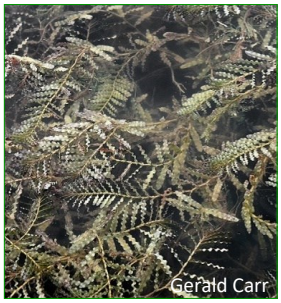
Long, linear leaves have no leaf stalk and no dominant midvein, and are arranged alternately along the stem. Plants can reach up to 3 feet in height.



7B. Alternate leaves with mid-vein present. There are 29 species of Pondweed (Potamogeton) in Vermont.

Curly-leaf Pondweed (*Potamogeton crispus*)

☼ **This is an invasive plant**



Leaves have a distinct wavy appearance and are 3 inches long and ¾ inch wide. This is the only Pondweed with toothed edges, and it can grow 4-5 feet tall. The leaves are often thought to resemble lasagna noodles.

White-stem Pondweed

(*Potamogeton praelongus*)

Round stem has a zig-zag shape and is pale green or white in color. Leaves have a boat-shaped tip. Stipules are translucent.

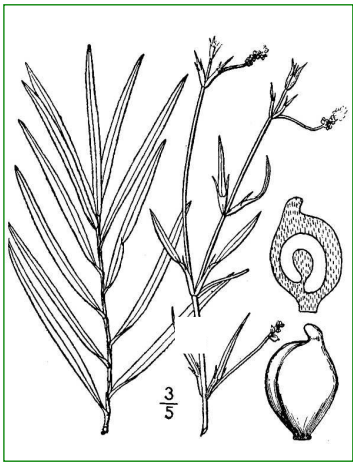
Clasping-leaf Pondweed (*Potamogeton perfoliatus*)

The base of the leaves clasp all the way around the stem. Leaves are oval to lance shaped and are small, generally ¼ - 2 inches in length. The stem is round, long, and branching.

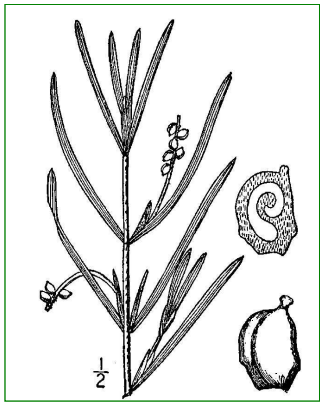
8. Submersed plants with opposite branching.

Fern-leaf Pondweed *(Potamogeton robbinsii)*

Long, pointed leaves are dark green to brown, closely spaced along the stem, with a prominent midvein.



Flat-stem Pondweed (*Potamogeton zosteriformis*)

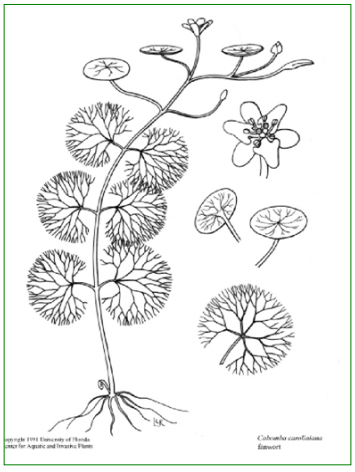


Leaves are slender and submersed, 4-7 inches long, and have one strong mid-vein per leaf. The stem has a distinct zig-zag appearance similar to the White-stem pondweed, however this stem is noticeably flat.

Carolina Fanwort *(Cabomba caroliniana)*

☼ **This is an invasive plant not found in Vermont**

Finely divided fan shaped leaves are opposite and branched along the stem. Small floating leaves, if present, are elliptical or linear with smooth margins. Small white flowers may be present at or above the water.



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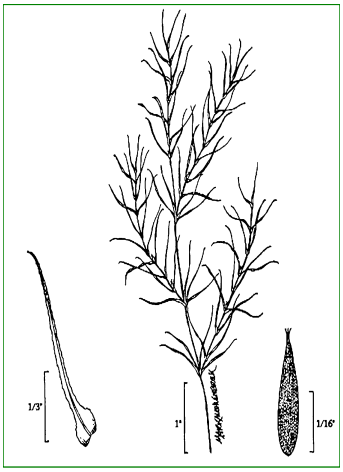
8. Submersed plants with opposite branching (may appear whorled):

Naiad Species: There are five species of Naiads in Vermont

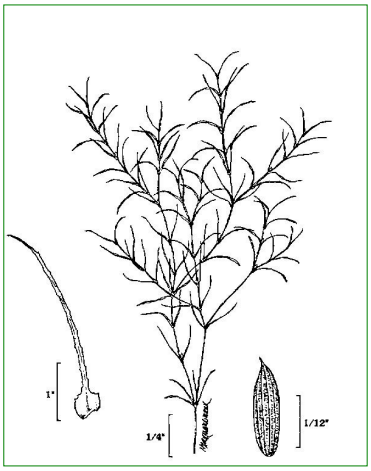
Slender Naiad (*Najas flexilis*)

Alternate names are Slender Waternymph and Nodding Waternymph. Slender leaves are 0.2-1mm wide, and up to 1 inch long. Leaves are somewhat stiff, finely toothed, and tend to bend backwards as they mature.



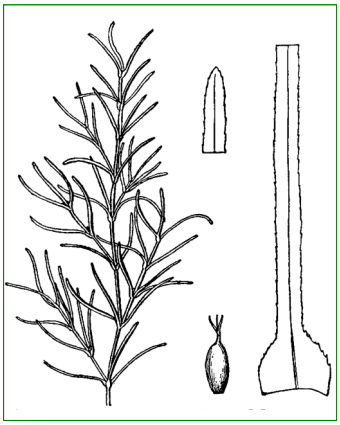
Brittle Naiad (*Najas minor*)

☼ **This is an invasive plant**



Leaves are 0.3-0.5mm wide, and not always aligned. Leaf margins have visible serrations and feel like a stiff Brillo pad.

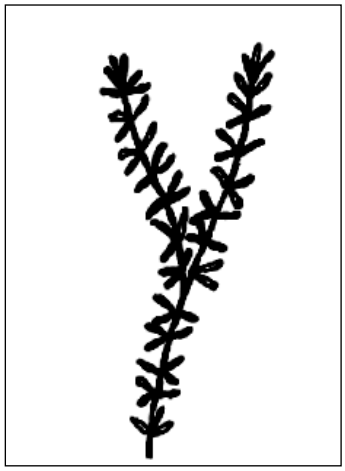
Common Naiad (*Najas guadalupensis*)



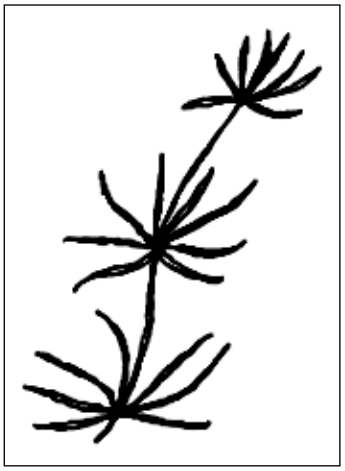
Alternate names are Southern Waternymph and Guppy Grass. Leaves are 1-2mm wide, up to 1 inch long, and flexible. Leaves are either opposite or will occur in whorls of three along the stem.

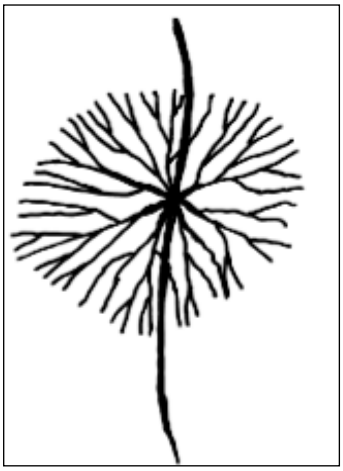
9. <u>Are the whorled leaves rounded, slender, or feathered?</u>

9A. Leaves are entire and rounded...see part 10 on page 16.

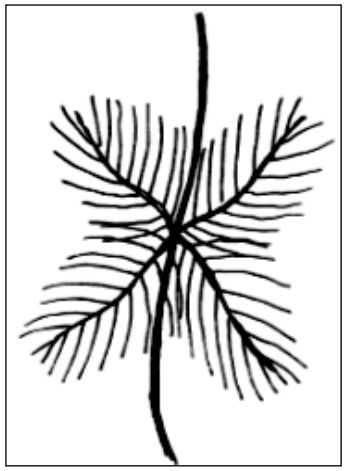




9B. Leaves are slender and look more like branches...see part 11 on page 17.





9C. Leaves are feathered...see part 12 on page 19.


10. Submersed, whorled leaves are entire and rounded.

Common Waterweed *(Elodea canadensis)*

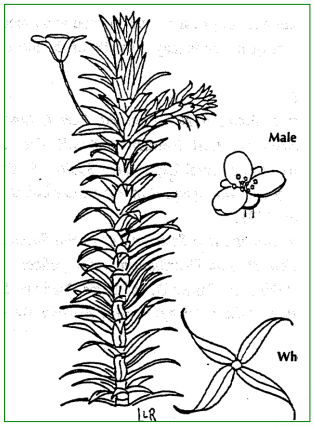
Leaves are usually ½ - 1 inch long, with 3 leaves per whorl (although occasionally 4 may occur). Plants can vary from less than 1 foot high to up to 6 feet high.

Slender Waterweed *(Elodea nuttallii)*

Usually found with 3 leaves per whorl (although occasionally 4 may occur). These leaves are thinner than Common Waterweed, usually with a 3:1, length to width ratio. Leaf margins are entire.

Brazilian Waterweed *(Egeria densa)*

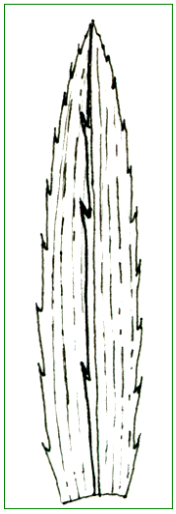
☼ **This is an invasive plant not found in Vermont**



Typically has 4 leaves per whorl, but can range from 3-8. The leaves have an entire, linear shape, typically under 1 inch long.

Hydrilla *(Hydrilla verticillata)*

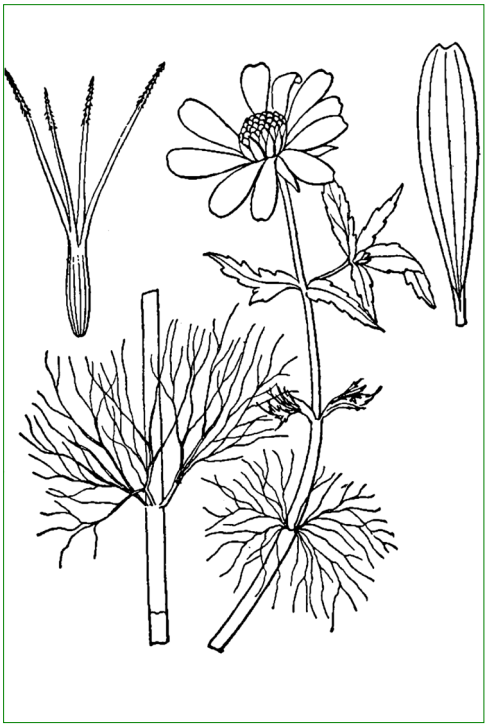
☼ **This is an invasive plant not found in Vermont**



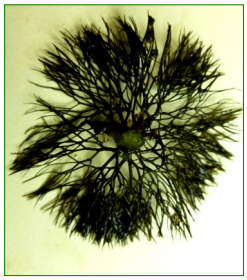
Hydrilla typically has 5-8 leaves per whorl. Each strap -like leaf is visibly serrated and pointed at the tip of the leaf.

11. Submersed, whorled, branching plants:

Water Marigold *(Bidens beckii)*



Each of the branched leaves are divided repeatedly and are growing in whorls around the stem. The plant can have a small, emergent yellow flower.



Coontail *(Ceratophyllum demersum)*

Leaves are branch divided in whorls along the stem and clustered at the ends of the branches, giving the plant the appearance of a raccoon's tail. There are two species of Coontail n VT.

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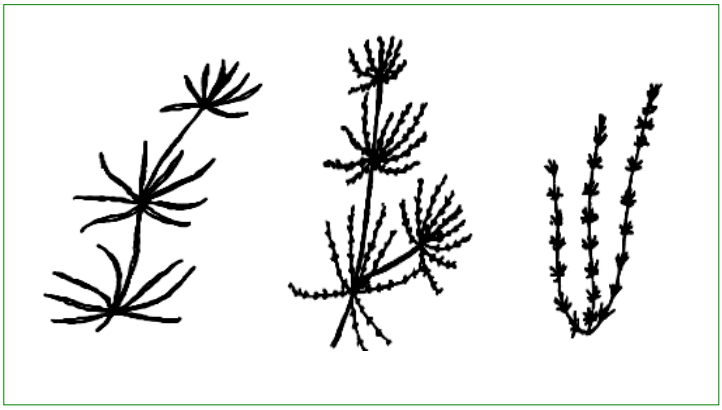
11. Submersed, whorled, branching plants.

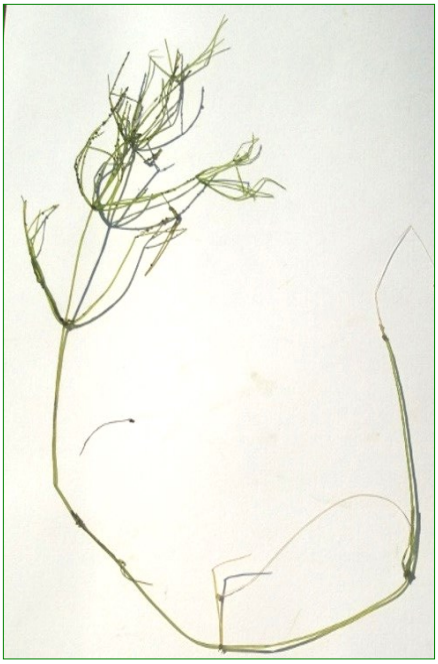
Muskgrass (*Chara sp. or Nitella sp.)*



Muskgrasses are actually large upright forms of algae. Muskgrass branchlets "leaves" are linear. These plants usually grow in tangled masses along the pond bottom.

Starry Stonewort *(Nitellopsis obtusa)*

☼ **This is an invasive plant**

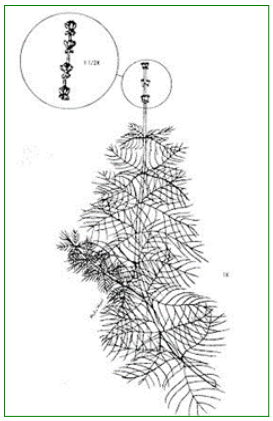


Starry Stonewort is a macro algae that can grow up to 6 feet tall. There are 5-8 branchlets per whorl that have visible serrated edges. There may be white, star-shaped bulbils 1-2 mm long.

12. Submersed, whorled, feather-like leaf plants:

Watermilfoils: There are eight species of Watermilfoil in Vermont

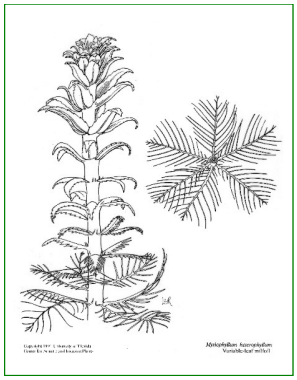
Northern Watermilfoil *(Myriophyllum sibiricum)*



Typically 4 leaves per whorl with 4-12 leaflets on each side of the stout white or tan mid-stem.

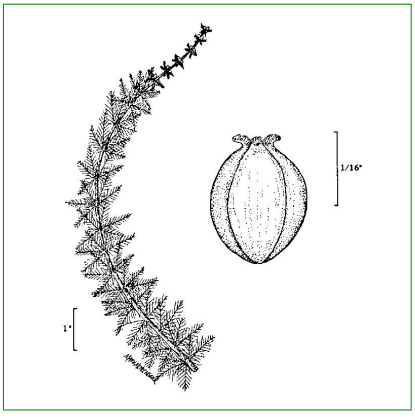
Variable-leaf Watermilfoil *(Myriophyllum heterophyllum)*

☼ **This is an invasive plant**



4-6 leaves per whorl with each leaf feather divided with 6-14 leaflets on each side of the mid-stem. Plant has an emergent flower spike that has 4-6 leaves per whorl. Each of these leaves is ½ inch long, entire, and minutely serrated.

Whorl-leaved Watermilfoil *(Myriophyllum verticillatum)*



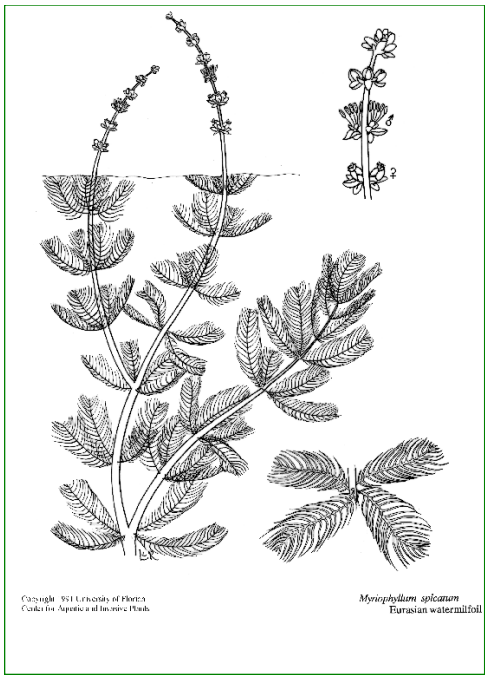
Each whorl has 4-5 leaves that are finely divided with 5-14 leaflets per leaf. Stem is green or brown.

Continued next page...

Watermilfoils:

Eurasian Watermilfoil *(Myriophyllum spicatum)*

☼ **This is an invasive plant**

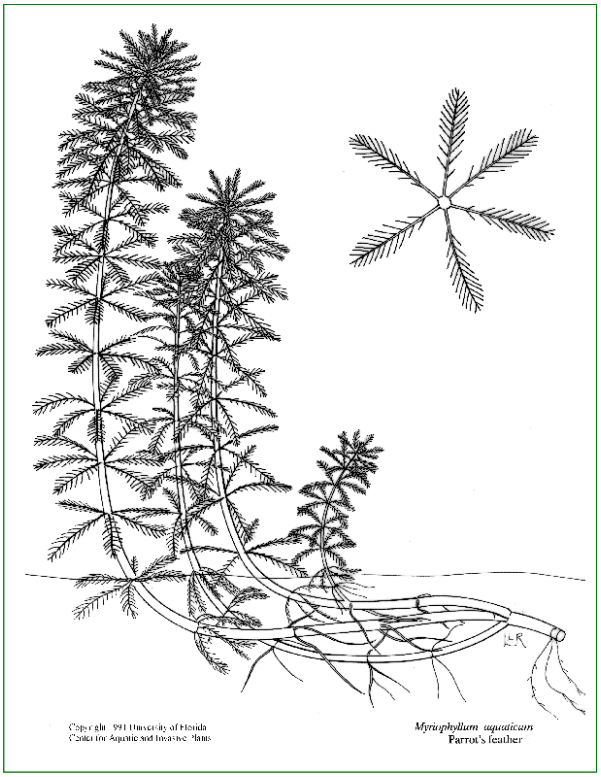


Usually 4 leaves per whorl with 12-20 leaflets on each side of midstem. Tips of leaves often have redish color.

Parrot Feather *(Myriophyllum aquaticum)*

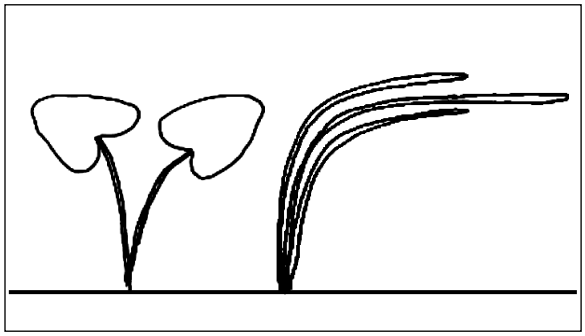
☼ **This is an invasive plant not found in Vermont**

Parrot feather has not yet been observed in Vermont. It has 4-6 leaves per whorl with each leaf feather divided with 10-18 leaflets per side of the med-stem. Plant can emerge to stand 1 foot above the surface of the water.

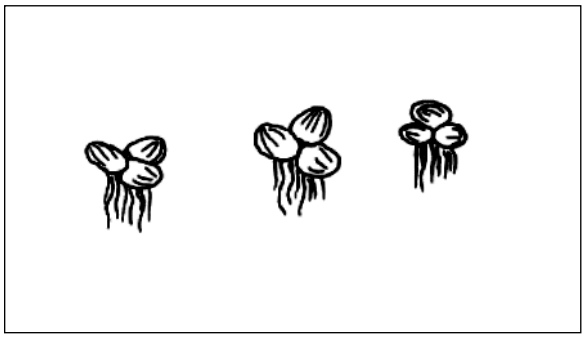


13. **Is the plant rooted to the bottom?**

13A. Plants are rooted to the bottom…see part 15 on page 22.

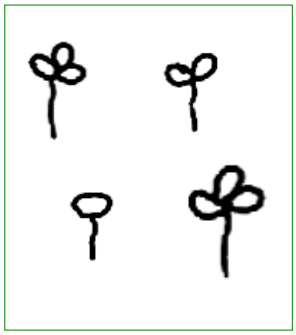


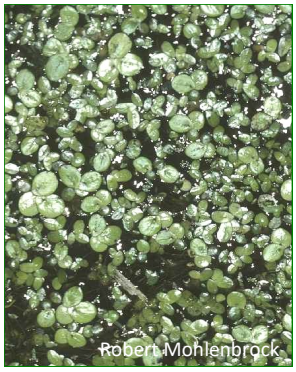
13B. Plants are not rooted to the bottom…see part 14 below.



14. Floating-leaved plants are not rooted to the bottom.

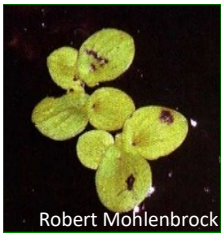
Duckweed (*Lemna minor*)





Small, free-floating leaves are less than 5 mm long with a single root and a smooth top. Often found in clusters forming a mat on the surface of the water.

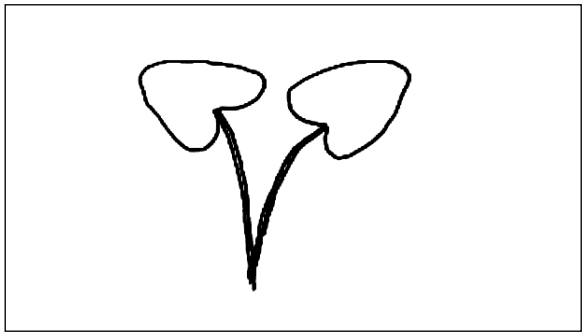
Big Duckweed (*Spirodela polyrhiza*)



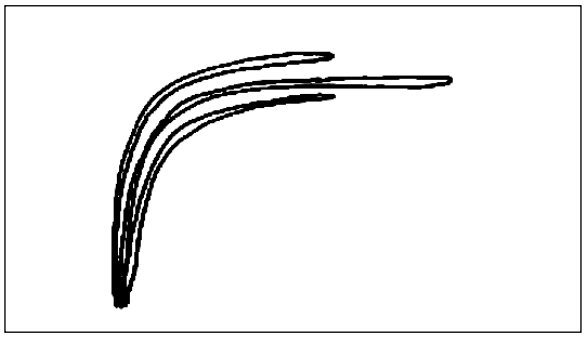
Small, free-floating leaves have 5-15 veins, are 3-8 mm long, and often green on the top and slightly purple on the bottom. There are usually multiple roots per frond. Multiple fronds often form a floating cluster.

15. Are the leaves broad or thin and grass-like?

15A. Leaves broad…see part 17 on page 23.

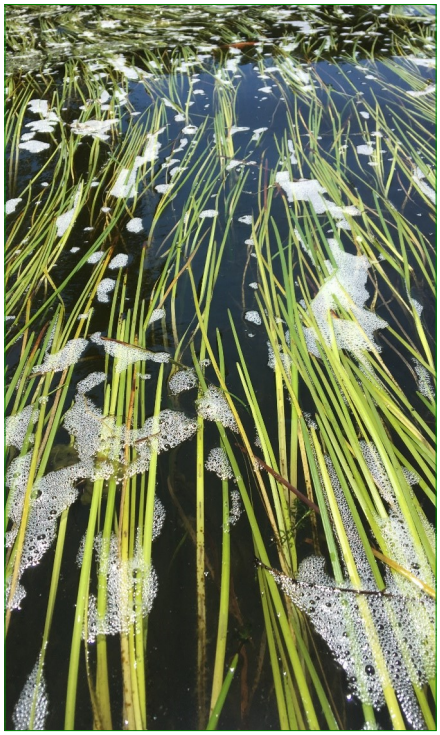


15B. Leaves are thin and grass-like…see part 16 below.

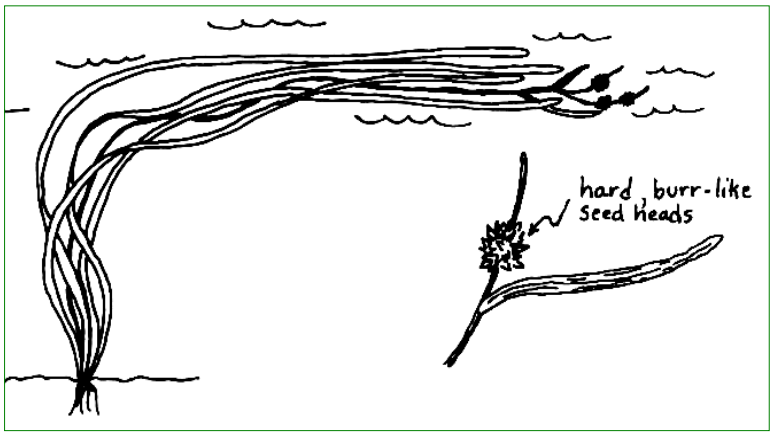


16. Floating-leaved, Rooted, Grass-like.

Bur-reed (*Sparganium sp.)*

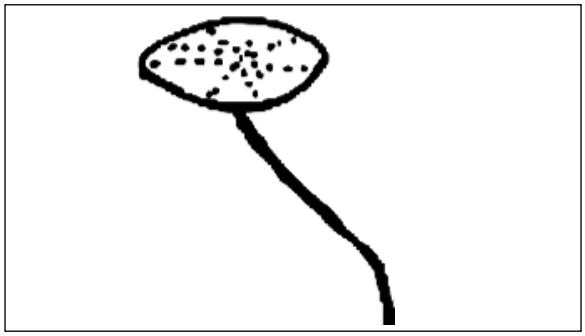


Leaves reach the surface and float horizontally along it .There are 3 species of bur-reed with floating leaves in Vermont in addition to species with sturdy, emergent leaves.

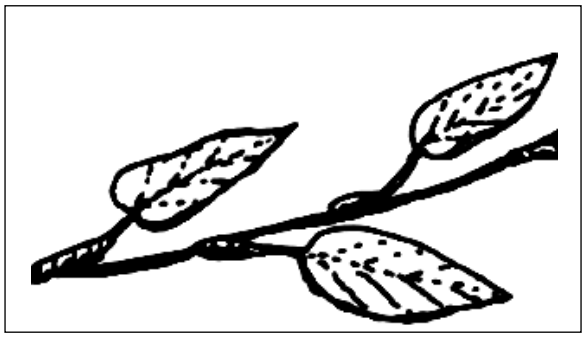


17. Are the broad leaves rounded or pointy at the tips?

17A. Broad rounded leaves…see part 19 on page 24.



17B. Broad pointy leaves…see part 18 below.



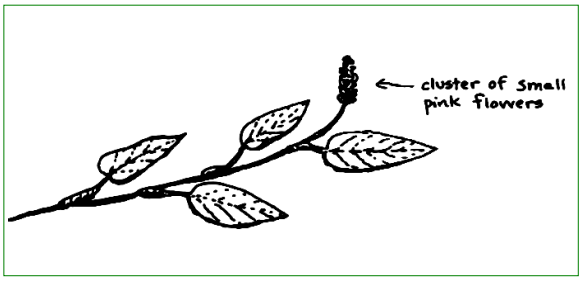
18. Floating-leaved, Rooted, Broad, Pointy Leaves.

Water Chestnut (*Trapa natans*)

☼ **This is an invasive plant**

Leaves are toothed, triangular and radiate off of the stem to form a circular, floating rosette. Nuts are green to black with 4 sharp spines.

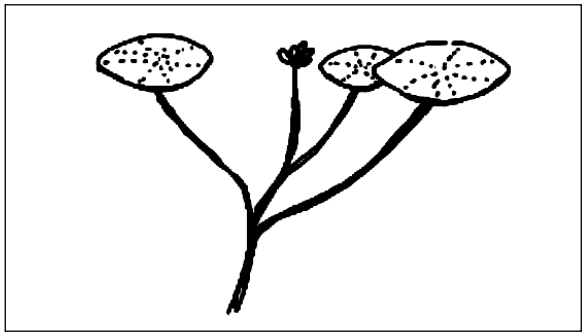
Water Smartweed (*Polygonum amphibium*)



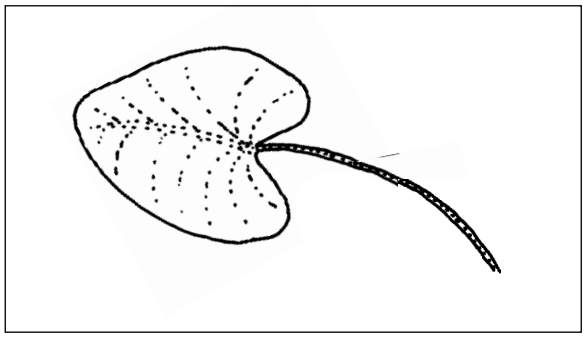
Leaves are entire and are alternately arranged along the stem. The stem is tipped with a cluster of small pink flowers. This is the only aquatic smartweed in Vermont.

19. Are the broad, rounded leaves on the stem or basal?

19A. Leaves are on the stem…see part 21 on page 25.

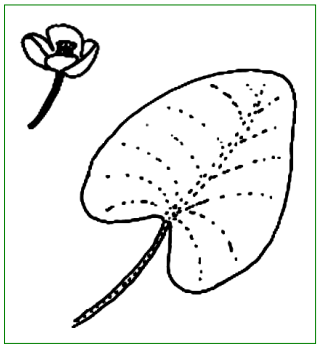


19B. Leaves are basal or only one leaf per stem…see part 20 below.



20. Floating-leaved, Rooted, Broad, Rounded, Basal Leaves:

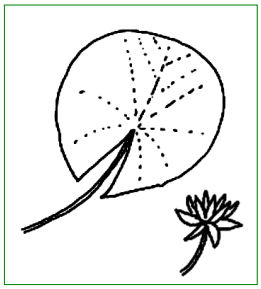
Cow Lily (*Nuphar variegata*)



Large round floating leaves have round lobes and yellow flowers. There are 2 other species of cow lily in Vermont.

White Water Lily (*Nymphaea odorata*)

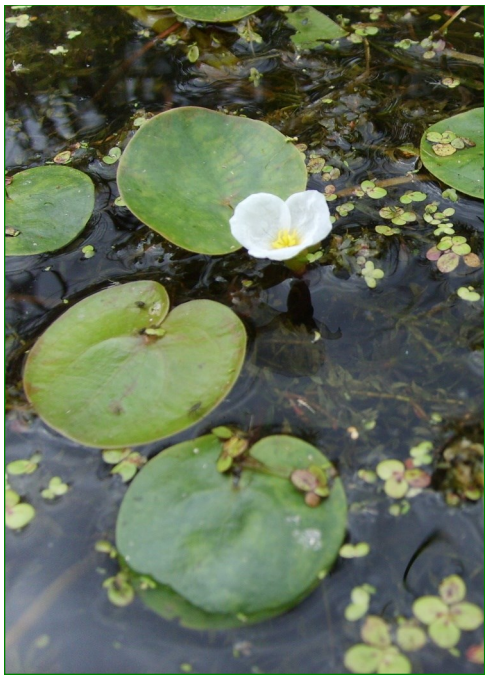
Large round floating leaves with pointed lobes and white flowers. There are 2 other species of white water lily in Vermont.



21. Floating-leaved, Rooted, Broad, Rounded Leaves on the Stem:

European Frogbit *(Hydrocharis morsus-ranae)*

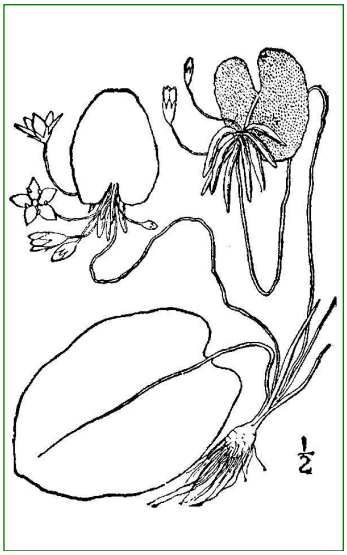
☼ **This is an invasive plant**



Leaves are ½ - 2 ½ inches wide and rounded to heart-shaped. Plant produces small white flowers with three petals and yellow center.

Little Floating Heart *(Nymphoides cordata)*

Leaves are small, 1-3 inches, and are rounded to heart shaped. The leaf bottoms are purple-red in color, leaf tops are light to dark green. Flowers have five petals, and are white with a yellow center.



Continued next page...

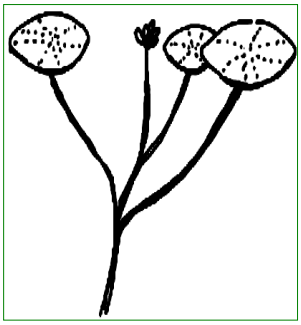
21. Floating-leaved, Rooted, Broad, Rounded Leaves on the Stem.

Yellow Floating Heart *(Nymphoides peltata)*

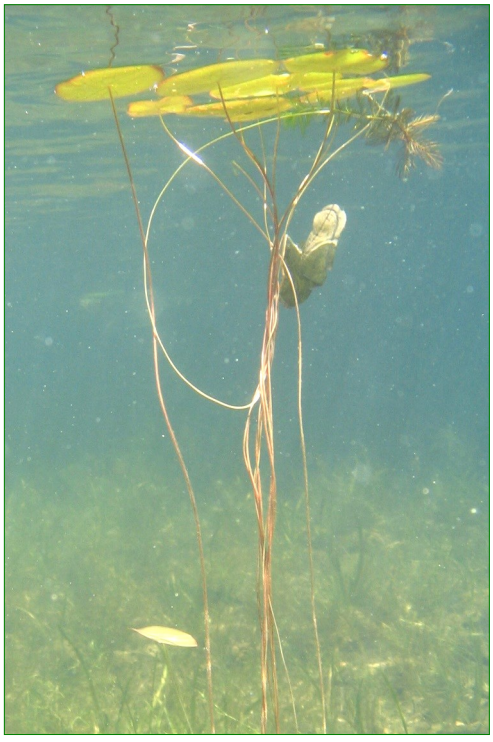
☼ **This is an invasive plant**

Light to dark green leaves are 2-6 inches wide and long, with an wavy but entire leaf margin. Plant produces yellow, five petaled flowers.

Watershield *(Brasenia schreberi)*

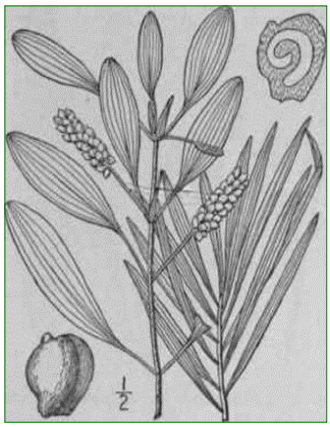


Elliptical shaped leaves with the stem attached to the middle of the leaf. Leaves are usually 2-3 inches long. The stem and underside of the leaf are often covered with a clear jelly-like material.



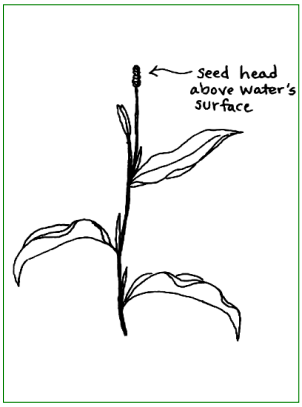
22. <u>Combination of floating and submersed leaves.</u> There are 29 species of Pondweed in Vermont.

Ribbon-leaf Pondweed *(Potamogeton epihydrus)*



Submersed leaves are slender with a strong midvein and up to 7 inches long. Often numerous floating leaves are elliptical with a long petiole and 11-41 veins. The stem is slender, branched, and somewhat flattened, growing up to 6 feet high.

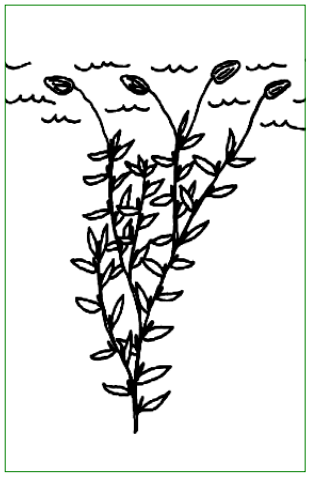
Big-leaf Pondweed *(Potamogeton amplifolius)*



Large arched leaves with wavy edges are often brown, 3-7 inches long, and up to 2 inches wide. This plant can grow 6-7 feet high.

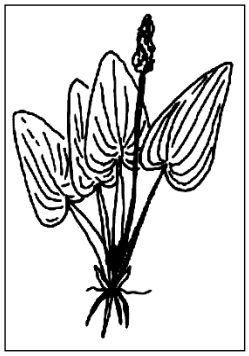
Variable-leaf Pondweed *(Potamogeton gramineus)*

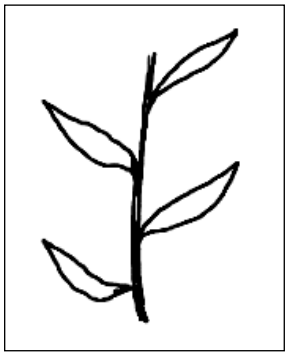
Often heavily branched, submersed leaves have smooth margins and 3-7 veins. Floating leaves may be small and clustered. Stipules are 1-3 cm and keeled.



23. <u>Are the leaves broad or long and narrow?</u>

23A. Leaves are broad…see part 25 on page 29.





23B. Leaves are long and narrow…see part 24 below.



24. <u>Are the narrow leaves smaller than one foot or larger?</u>

24A. Leaves are smaller…see part 26 on page 30.

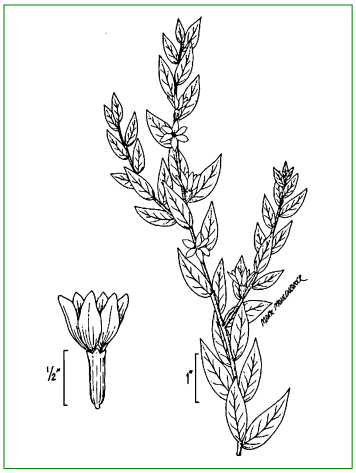

24B. Leaves are larger…see part 27 on page 31.


25. Emergent, Broad Leaves.

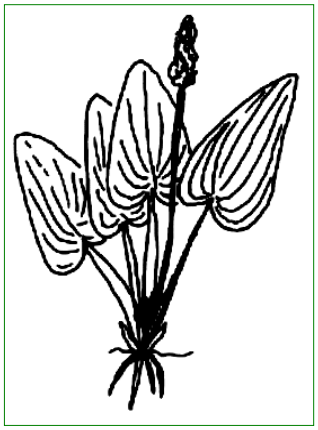
Purple Loosestrife *(Lythrum salicaria)*

☼ **This is an invasive plant**

Leaves are opposite along the stem with a dense spike of purple flowers at the top



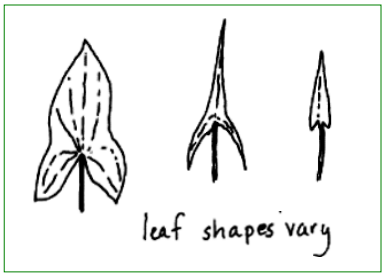
Pickerel Weed *(Pontederia cordata)*

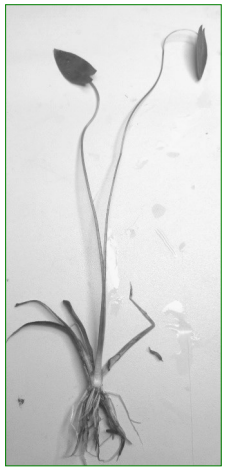


Smooth leaves have rounded or pointed lobes. Small purple flowers form in a cluster. Plants are usually 1-2 feet tall.

Arrowhead *(Sagittaria sp.)*

There are 4 species of arrowhead in Vermont. Leaf shapes and sizes are variable.

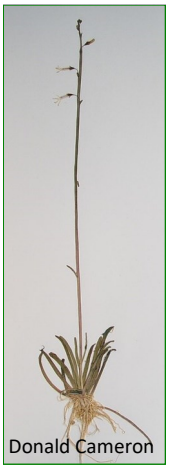


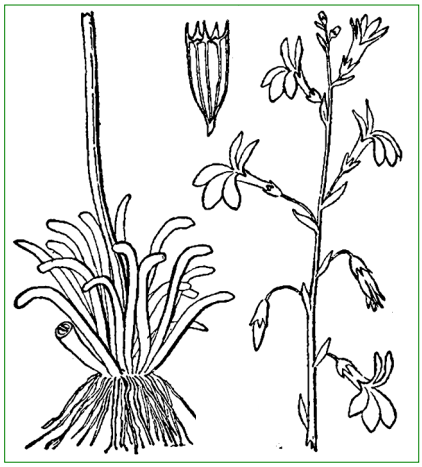


26. Emergent, Narrow, Smaller Leaves:

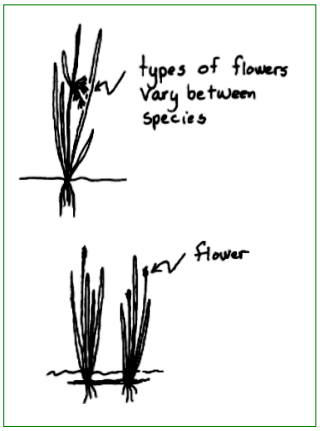
Water Lobelia *(Lobelia dortmanna)*

Basal leaves range from light to dark green, are stiff, curl back, and have a blunt tip. The hollow flower stalks have pale blue or white flowers.



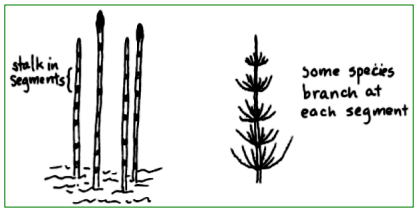


Sedge (*Cyperaceae Family)*



There are many species of sedges in Vermont. Different species stems can vary between sharply 3 sided to nearly round. They can vary in height from a few inches to several feet high.

Horsetail *(Equisetum sp.)*



Plant consists of round, hollow stalks often 1-2 feet high; rough in texture. There are 3 species of aquatic horsetail in Vermont.

27. Emergent, Narrow, Larger Leaves:

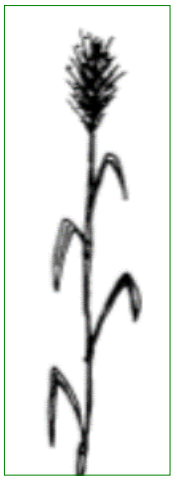
Cattail *(Typha sp.)*

There are two species of cattail in Vermont. Leaves are up to 5 feet tall. Dark brown "catkins" are 5-6 inches long.

Reed Grass *(Phragmites australis)*

☼ **This is an invasive plant**

Plants are over 6 feet tall with a large plume at the top. Usually grows in dense stands in water or damp soil.



Flowering Rush *(Butomus umbellatus)*

☼ **This is an invasive plant**

Leaves are sword shaped and triangular in cross section. There are numerous rose colored flowers in an umbel. Commonly found along muddy shores growing 1-4 feet high.

Continued next page...

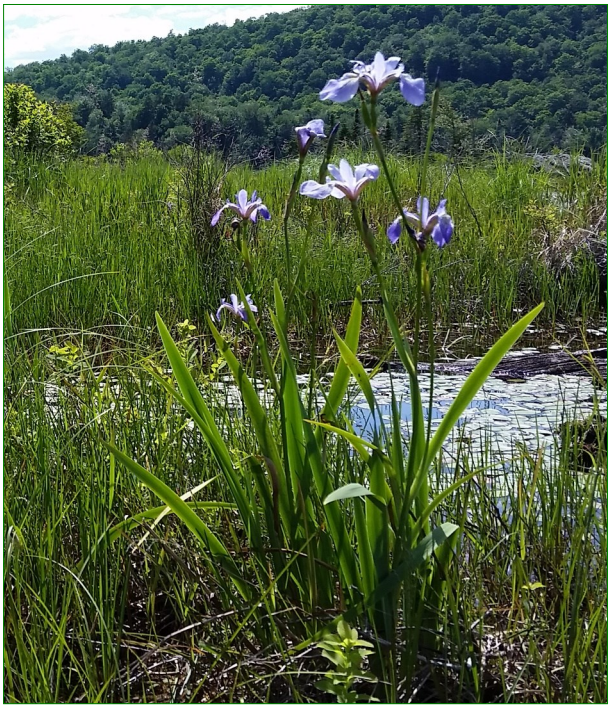
27. Emergent, Narrow, Larger Leaves:

Yellow Iris *(Iris pseudacorus)*

☼ **This is an invasive plant**

Leaves are sword shaped and between 20-40 inches long with a raised midvein. Flowers are yellow and 3-4 inches. In Vermont this plant can be confused with the native blue iris which has a blueish purple flower, see below.

Blue Flag Iris *(Iris versicolor)*



This plant reaches 2-3 feet tall. The leaves are sword shaped, 1 inch wide and up to 2 feet long. Flowers are blue to purple with yellow at the center of the petals.

alternate – leaves situated singly from a point along the stem

axil – the junction between a stem and a leaf or branch

bulbil– a small bulblike structure, especially in the axil of a leaf or at the base of a stem, that may form a new plant.

divided leaf – a leaf which is cut into small divisions

branched divided – a leaf that divides repeatedly

feather divided – a leaf with leaflets lining a mid-stem which resembles a feather

forked divided – a leaf that divides two to three times into divisions of more or less equal size

entire – leaves with a continuous unbroken margin

lobe – a partial division of a leaf

marl – an encrustation of lime on the surface of a plant, resulting in a plant which is rough to the touch

midvein – the main or central vein of a leaf; not all plants have leaves with midveins

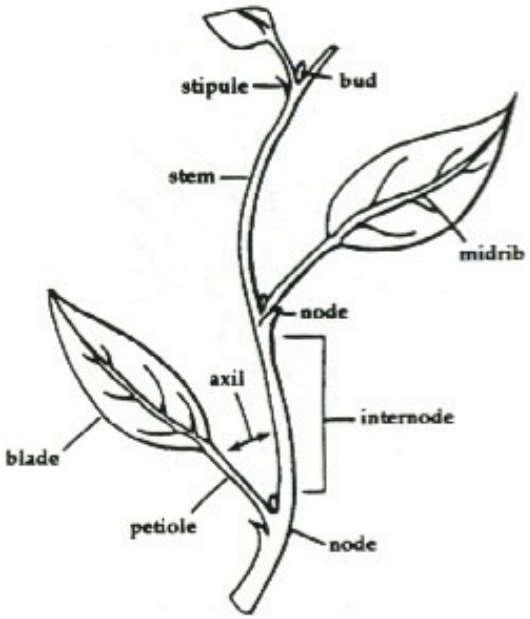
opposite – leaves situated across from each other from the same point along the stem

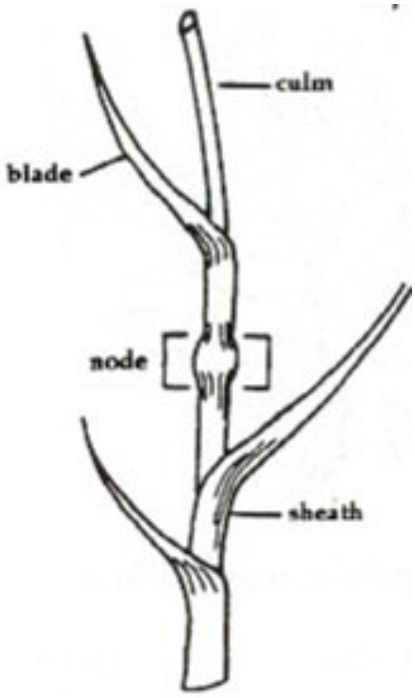
petiole – small stalk attaching a leaf blade to the stem

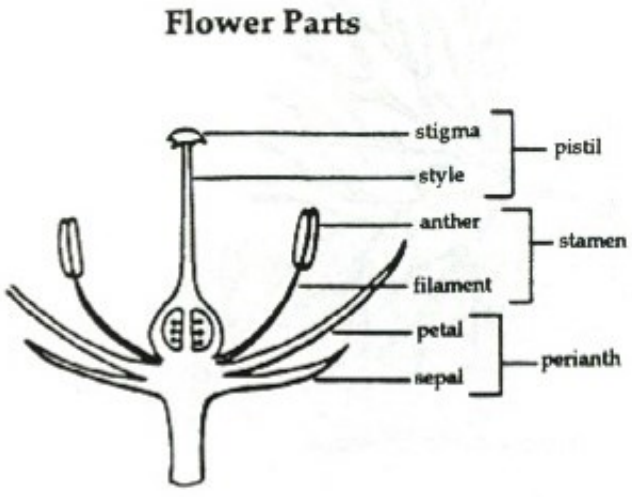
stipule – a small leaf-like structure borne in the axil of leaves in some species

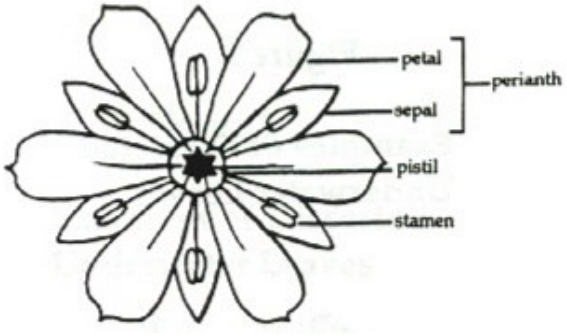
toothed – serrations along the leaf margin

whorl – a circle of three or more leaves arising from the same point on a stem









Aquatic Plant Species Keys:

Fassett, Norman C. *A Manual of Aquatic Plants.* University of Wisconsin Press. Madison, 1957.

A key to aquatic plants. A good reference for getting beyond the beginner level. It is somewhat out of date and is no longer highly accurate down to the species level, but excellent for identifying family and genus.

Hellquist, C.B., and G.E. Crow. *Aquatic Vascular Plants of New England – Parts 1-8.* New Hampshire Agricultural Experiment Station. University of New Hampshire, 1980-1985.

Technical key to New England's aquatic plants. To use these keys, you must already know the family to which the plant belongs.

Hotchkiss, Neil. *Common Marsh, Underwater and Floating-leaved Plants of the United States and Canada.* Dover Publications, Inc. New York, 1972.

Magee, Denis W. *Freshwater Wetlands – A Guide to Common Indicator Plants of the Northeast.* University of Massachusetts Press. Amherst, 1981.

Covers marsh and swamp plants primarily, with some pond plants also. Contains a key and many pages of good illustrations.

Skawinski, M. Paul. 2018. *Aquatic Plants of the Upper Midwest*. 3rd ed. Wisconsin, USA., 2018.

A simple key for beginners, but includes an advanced dichotomous key for plant family groups. An excellent guide with helpful hints and photographs.

Aquatic Plant Species Guides:

Borman, Susan, and Robert Korth, and Jo Temte. *Through the Looking Glass: A Field Guide to Aquatic Plants.* 2nd ed. Wisconsin Lakes Partnership. University of Wisconsin-Extension Lakes, College of Natural Resources, Stevens Point, Wisconsin. Reindl Printing Inc., Merrill, WI, 2014.

Maine Volunteer Lake Monitoring Program. *Maine Field Guide to Invasive Aquatic Plants and Their Common Native Look Alikes.* Maine Center for Invasive Aquatic Plants, Auburn, Maine. J.S. McCarthy Printers, Augusta Maine, 2007.

Credits:

Photos throughout this guide were taken by Vermont Department of Environmental Conservation staff. Additional photos and permissions were provided by Jennifer Anderson (hosted by the USDA-NRCS PLANTS Database), Donald Cameron (hosted by GoBotany), Joe F Duft (hosted by the USDA-NRCS PLANTS Database), John Hilty (Illinois Wildflowers), Marilee Lovit (hosted by GoBotany), Robert H. Mohlenbrock (hosted by the USDA-NRCS PLANTS Database), Ray Schulenberg (hosted by the USDA-NRCS PLANTS Database), Edward G. Voss (hosted by the USDA-NRCS PLANTS Database), and the IFAS Center for Aquatic Plants at the University of Florida. Drawings and illustrations were created by Susan Warren with additional illustrations provided by the IFAS Center for Aquatic Plants at the University of Florida, and Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions, hosted by the USDA-NRCS PLANTS Database.

Scientific Name

Common Name

Protocol for Submitted a Plant Specimen

If you can, use the guidance materials provided by the State of Vermont to identify the plant. Sources include this Key to Vermont Aquatic Plants, the **Vermont Invasive Patrollers (VIP) Manual** and the **Vermont's Gallery of Invaders** found at the Aquatic Invasive Species Program Website.

1. If you determine or suspect that the plant is an aquatic invasive species, cross reference it with the list of Vermont Infested Waterbodies (see Appendix C) known to have aquatic invasive species. If the plant came from a location where its establishment is known, record the incident, but no further action is required. If the plant is not found in the listed waterbody on the list, or if you think the specimen is a new species threatening Vermont, continue to Step 2.

2. If you identified a plant species that is not on the list of waterbodies known to have aquatic invasive species, or may be a species new to Vermont, or are unsure of the identification, within two days either:

   a. Take several photographs of the plant. Include a view of the entire plant as well as a close-up of the leaves or other relevant information. Please include a ruler, or a common object within the photo to demonstrate the scale of the specimen (see photos on right).

   b. Email these pictures to kimberly.jensen@vermont.gov, or text photos to (802) 490-6120. In your message, include the suspected identification and the name of the water body it came from. Press or freeze the plant in the event its identity needs to be confirmed at a later date if the plant cannot be identified from the photographs. Or,

   c. Mail the plant. Wrap the plant specimen in a wet paper towel and place it into a sealable plastic bag. If there is more than one species, wrap them individually. Fill out a sample submission form (see Appendix D) and follow the mailing directions on the form. Mail samples Monday through Wednesday only. Keep the sample(s) in a cool place until mailing can occur. Sample submission forms can be downloaded from the Vermont Aquatic Invasive Species webpage.

View of the entire plant

Close-up of a cross section of a plant stem with leaves

Aquatic Specimen Submission Form

Keep the sample in a cool place until it is mailed, then follow the directions below to mail this completed form with the sample (Monday – Wednesday only) at the address below. Questions? Call (802) 828-1115.

ATTN: Plant Sample, VTDEC – Watershed Management Division
1 National Life Drive, Davis 3, Montpelier, VT 05620-3522.

Name: _____ **Phone:** _____
Email Address: _____

Are you a: ☐ VIP ☐ Greeter ☐ Other **Waterbody:** _____ **Town:** _____

If a Greeter, was this sample collected during a boat inspection? ☐ Yes ☐ No

If **yes**, name of previously visited water body: _____
If **no**, description of the location of collection: _____

Suspected Species ID: _____Date Collected: _____

Have you contacted VTDEC? ☐ Yes ☐ No If **yes**, with whom did you speak:

Sample Packaging Directions:

- Please wrap a representative piece (collect 8 – 12 inches of a plant specimen, including any flowers or fruit, if possible) in a wet paper towel and place it into a sealable plastic bag.
- If there is more than one species obtained per waterbody, individually wrap them.
- If there are samples from more than one water body, divide the samples into separate plastic bags and clearly mark the different locations on the bags.
- Place the plastic bags in a manila envelope and mail the sample to the address above or use the mailing label below.

_____

_____

_____

ATTN: Aquatic Specimen
VTDEC – Watershed Management Division
1 National Life Drive, Davis 3
Montpelier, VT 05620-3522

Are you a: ☐ **VIP** ☐ **Greeter** ☐ **Other**

Aquatic Invasive Species Management

Lakes and Ponds Management and Protection Section

Department of Environmental Conservation

Watershed Management Division

1 National Life Drive, Davis 3, Montpelier, VT 05620-3522

Phone: (802) 828-1115

dec.vermont.gov/watershed/lakes-ponds