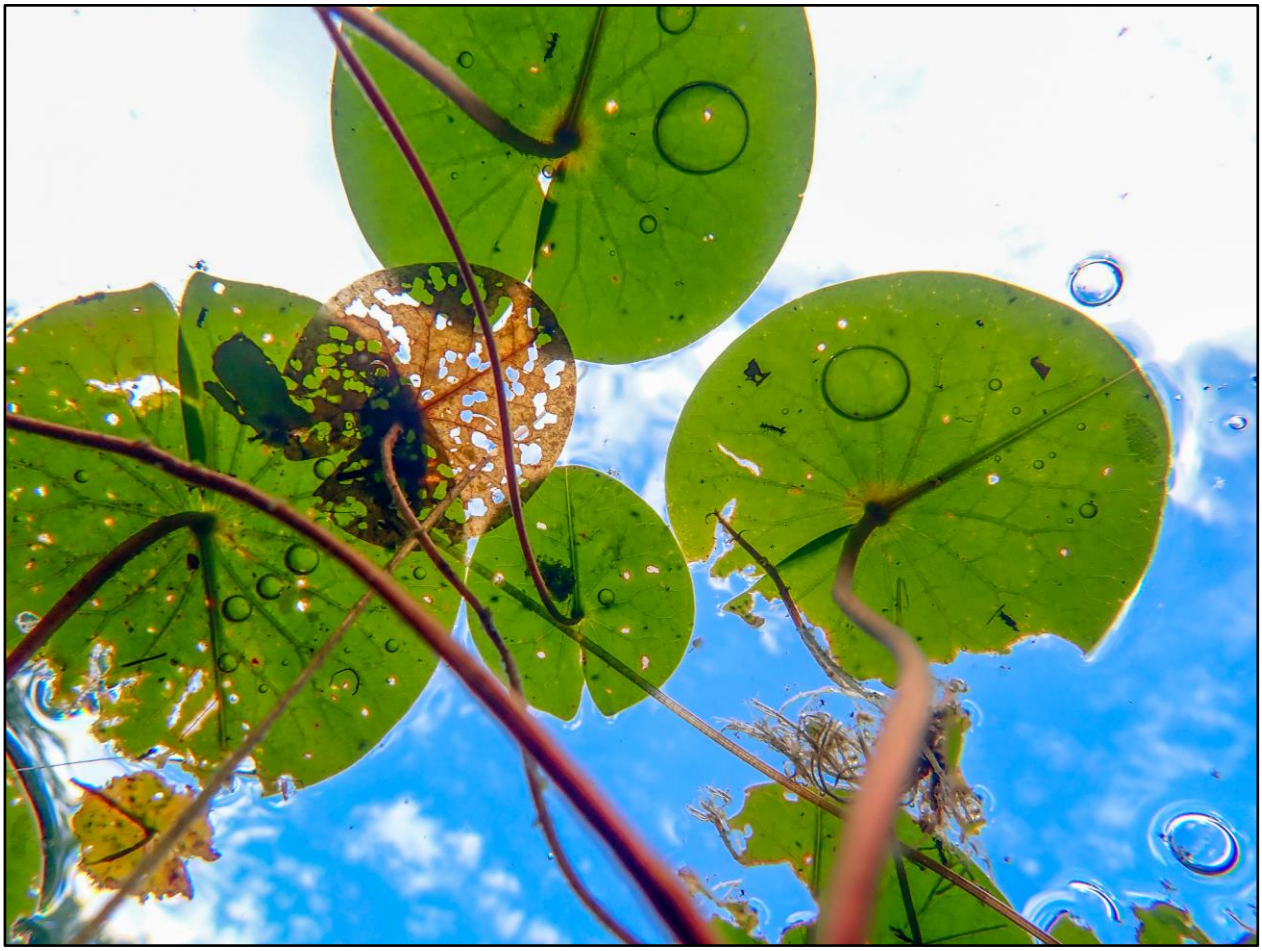
Native Aquatic Plants & Animals of Conway Lake, NH



Aquatic Invasive Species Patrol

April 6, 2022

Conway Lake Conservation Association

Greetings Conway Lake Volunteers

This guide to aquatic plants and animals of Conway Lake was developed to assist you in identifying native species that are known to occur in Conway Lake. All the images here were taken by Patrol volunteers. NH Lakes and ponds host a large variety of aquatic plants and there may be species we have yet to recognize in Conway Lake. For ongoing updates to the list of native species in our lake and additional detailed descriptions and photos **visit the "Blog" on the Conway Lake Conservation Association (CLCA) website (conwaylake.org)**.

Please forward any findings/questions you might have to those of us listed on the Aquatic Invasive Species Patrol landing page, located on the CLCA website.

Thanks for your help! *Maria Gross & Don Yurewicz*

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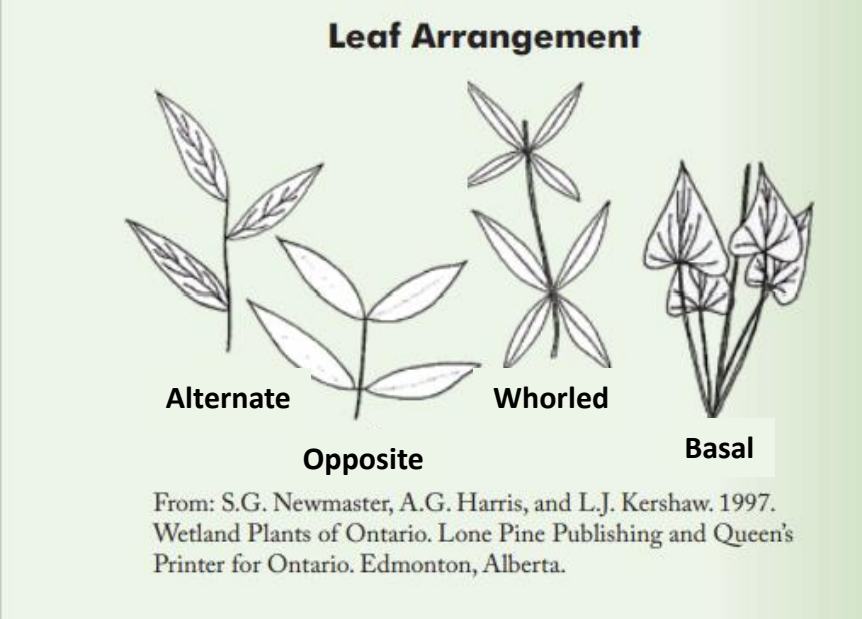
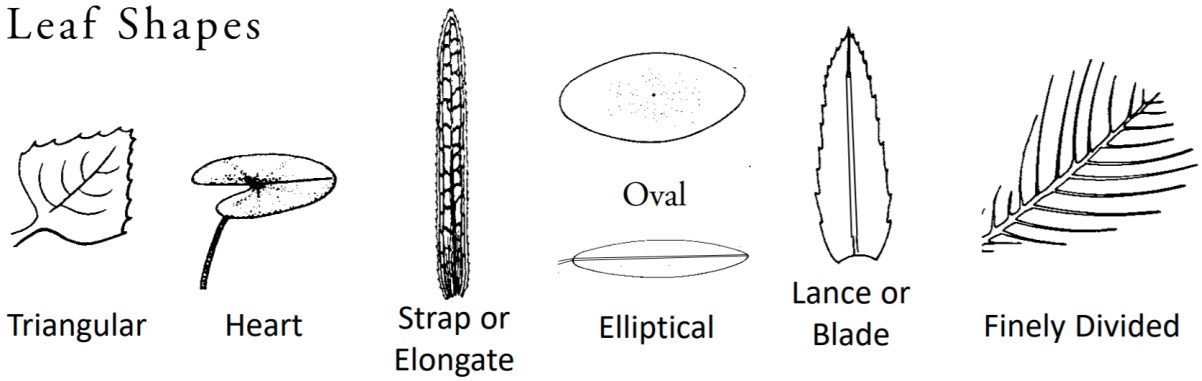
Steps to identify aquatic plants:

1. Observe plant growth habit: **submerged, floating,** or **emergent**.
2. Observe leaf arrangement on the stem: e.g. whorled, alternating, opposite, basal.
    - **Alternating** – leaves alternate along the stem with one leaf per node.
    - **Whorled** – leaves are arranged around the stem in a circular pattern. There can be three or more leaves per node
    - **Opposite Pairs**– leaves are arranged in pairs on either side of the stem with two leaves per node.
    - **Basal** – the plant lacks an erect stem. Leaves are attached around a very short stem located just below the lake bottom.
        - **Rosette** – basal leaves arranged in clusters attached to short stems

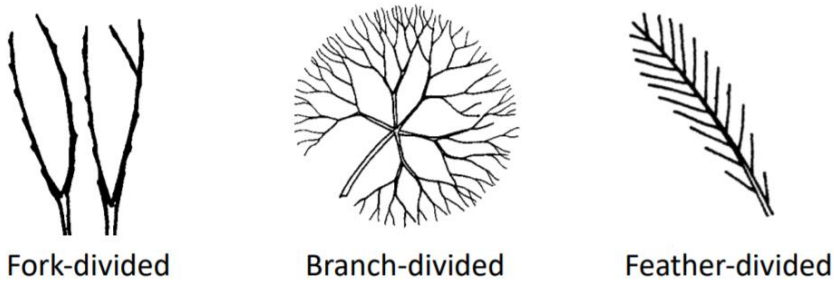


3. Observe leaf size and shape:



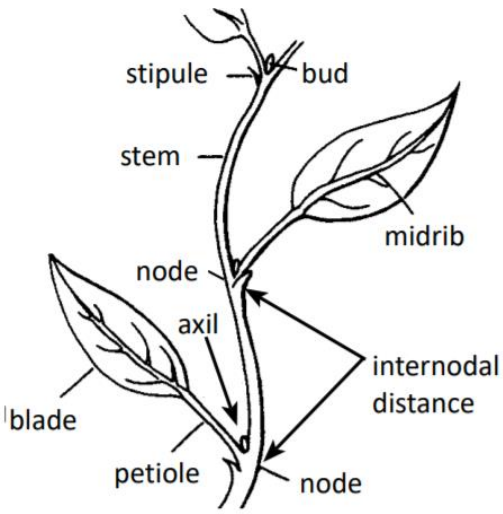
Maine Field Guide to Invasive Aquatic Plants (2018)

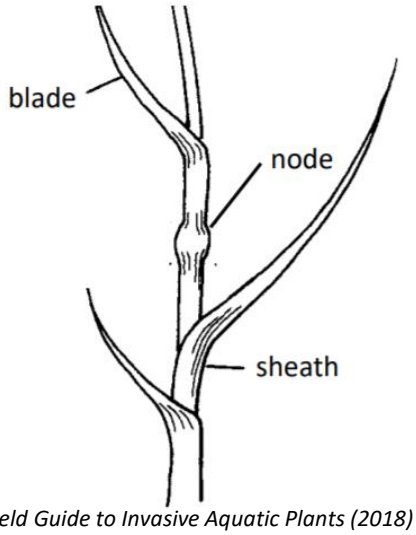
4. Finely divided leaves: observe how the leaflets are arranged:



5. Look carefully at a single leaf and observe the leaf margins (outside edges) – are they smooth, curled, serrated etc..
6. Finally, observe any additional features, such as bladders, flowers, fruits, and root structures.

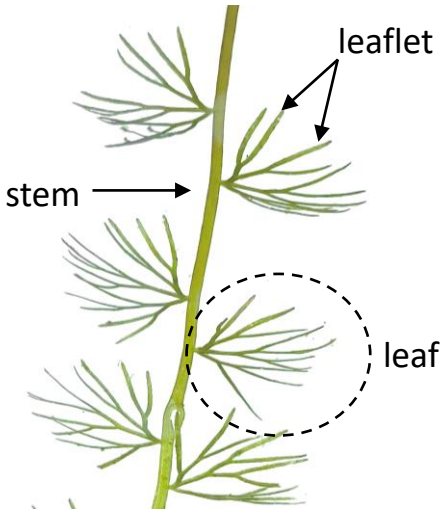
Guide to Stem and Leaf Terminology





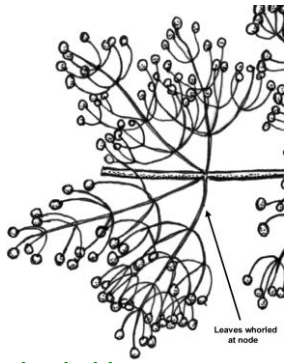
Maine Field Guide to Invasive Aquatic Plants (2018)

Leaf Terminology for Divided Leaves



Flat-leaf Bladderwort – alternating branch-divided leaves

Cross-sections of Submerged Plants With Feathery Leaves

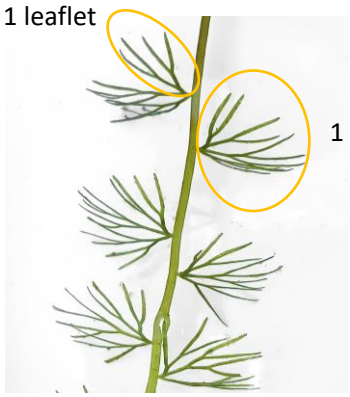


Purple Bladderwort

- Leaves are arranged in whorls and the leaves are openly spaced along the stem. The whorls at the growing tip curl upward (feather-divided leaves).
- Bladders are on the tips of leaflets.

Common Bladderwort

- Leaves are tightly arranged giving the plant a coarse appearance.
- Bladders are attached along the edges of divided leaves

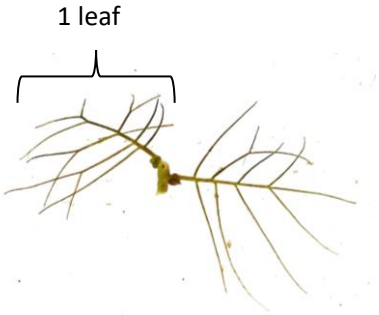


Flat-leaf Bladderwort

- Leaves alternate on the stem.
- Leaves are divided near their base into 2 or 3 main divisions (branch-divided leaves).
- Bladders are only at the leafless bottom part of its stem.

Water Marigold

- Whorls of fine branch-divided leaves.



Water-Milfoil

- Whorls of fine feather-divided leaves.
- 8-7 pairs of leaflets per leaf.

Water Crowfoot – Native

- Leaves can be branching, dissected, and fan-like, or lobed.

Coontail

- Whorls of fork-divided leaves.
- 5 to 12 leaves per whorl.

Waterweed – Native

- 3-4 leaves/whorl.

Brazilian Elodia - Exotic

- 4 or more leaves/whorl.

Hydrilla - Exotic

- 4 or more leaves/whorl.

Submerged Plants With Whorled Leaves - Bladderworts

Purple Bladderwort *(Utricularia purpurea)*

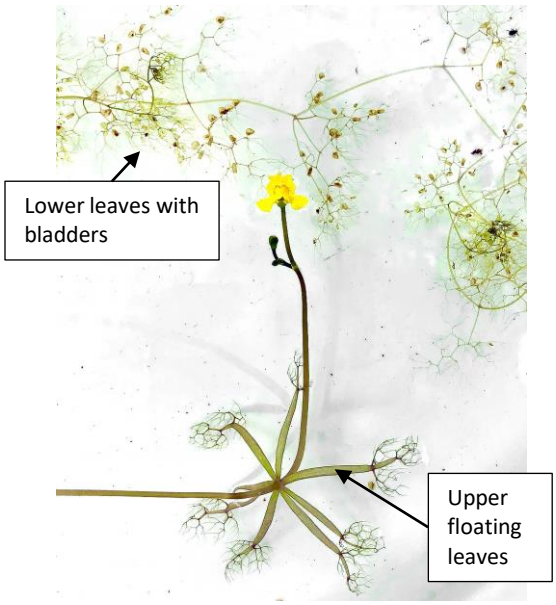
- Leaves are arranged in whorls and the leaves are openly spaced along the stem (feather-divided leaves). The whorls at the growing tip curl upward.
- Bladders are on the tips of leaves.
- Stems are unrooted, commonly tangled on other vegetation.
- Small purple flowers.
- Very common in Conway Lake.

Common Bladderwort *(Utricularia vulgaris)*

- Leaves are tightly arranged giving the plant a coarse appearance.
- The central stalk often zig-zags between alternating branches of leaves.
- Bladders are attached along the edges of divided leaves.
- Common in portions of Conway Lake.

Flat-leaf Bladderwort *(Utricularia intermedia)*

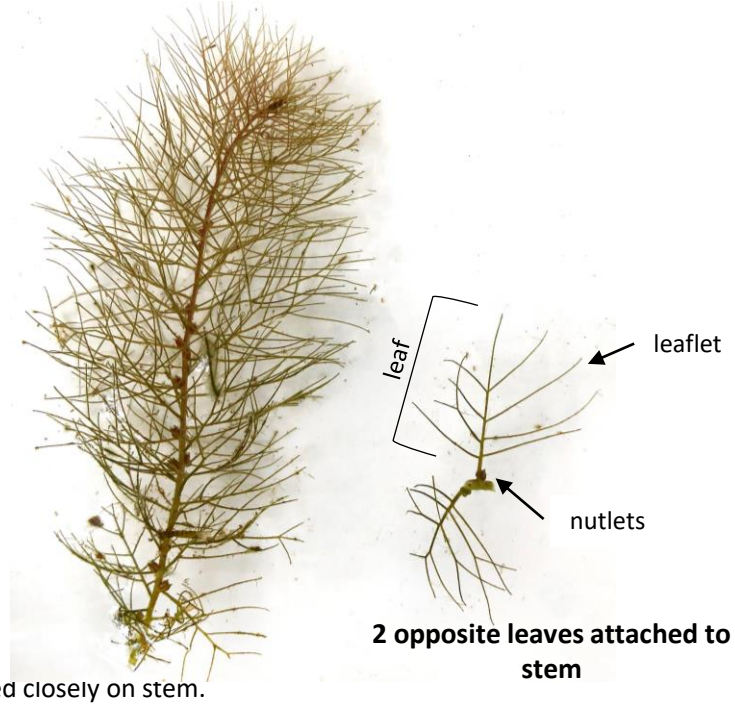
- Stems are short – less than 1 ½ ft long.
- Alternating compound leaves divided near the base into 2 or 3 main divisions (branch-divided).
- Bladders are only at the leafless bottom part of its stem.
- Common in Smith and Greeley coves (southern portion of South Cove).



Floating Bladderwort *(Utricularia inflata)*

- There are two quite different types of leaves. The lower leaves alternate on the stem, are up to 3 cm long, and are divided many times into hair-like leaflets, each bearing many tiny bladders.
- The upper leaves immediately below the flowering stem are in whorls of 4-7, 1-4 cm long, and inflated, serving as "floats" so that they ride on the water surface.
- The flowers are yellow.

Submerged Plants With Whorled Leaves



Native Water-Milfoil *(Myriophyllum spp.)*

- Whorls of compound feather-divided leaves packed closely on stem.
- 1-2 compound leaves per node.
- Leaves have 2 or more pairs of leaflets.
- Stems are reddish, brown or dark green.
- There are 4 species of native water-milfoil in NH – to date we have only identified *Myriophyllum humile* (pictured here) in Conway Lake (identified in Dolloff Cove, Paige Brook and South Cove).
- Does not flower above the water, but produces nutlets above the underwater leaves (see above).

Water Marigold *(Bidens beckii)*

- Leaves occur in whorls of 2-3 attached directly to the stem.
- Submerged leaves are finely divided into many thread-like segments, round to fan-shaped in outline.
- Yellow daisy-like flower.
- Commonly confused with the exotic water-milfoils and fanwort, but the leaves are attached directly to the maim stem.

Coontail *(Ceratophyllum demersum)*

- Whorl of leaves around the stem - the leaves are fork-divided and arranged in whorls of 5 to 12 leaves.
- Whorls of leaves are more closely spaced towards the end of branches giving the plant a raccoon tail appearance.
- The leaves are relatively stiff to the touch and typically hold their shape and position when pulled from the water (feels stiff).
- Look Alikes: may be confused with other plants that have finely divided leaves including fanwort, bladderworts, water marigold, and leafy water-milfoils.
- Only found in the inlet to Wiley Brook to date (summer 2020).

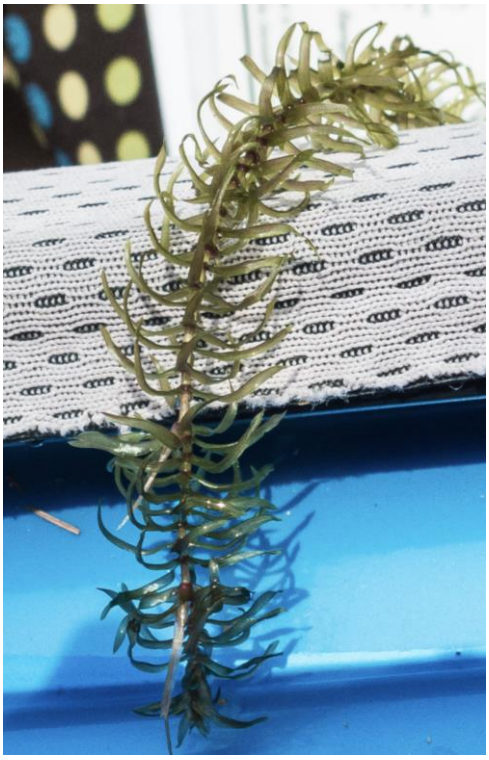
Submerged Plants With Whorled Leaves

Water Naiad
Note – leaves attached to stem in whorled tufts.

Spiral Pondweed
Note – individual leaves attached to stem rather than in whorled groups. Not shown here but spiral pondweeds also have small oval floating leaves.

Native Water Naiad *(Najas spp.)*

- Narrow thread-like leaves originating in whorls off the central stem.
- **Looks very similar to spiral pond weed** – but spiral pondweed has small oval floating leaves originating from the stem individually rather than in whorls.
- **Looks very similar to the invasive water naiad (*Najas minor*). The invasive species is distinguished from the native water naiad by its thicker and broader leaves with serrated edges.**



Waterweed *(Elodea spp.)*

- Whorls of 3 leaves (sometimes 4 leaves).
- Leaves do not have visibly toothed edge.
- Leaf vein is smooth underneath.
- Leaves feel stiff.
- **Very similar to invasive *Brazilian elodea* and *Hydrilla but native waterweed typically has 3 leaves per whorl while the invasives have 4 or more leaves per whorl.***

Submerged Plants

"Grassy" Spike Rush (aka sterile thread-like leaf)

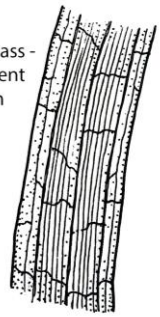
- This is a submerged, thread-like, sterile version of the emergent spike rush plant.
- Forms large areas of "grassy" bottom growth, with stems reaching lengths of 1-2 feet.
- "Grassy" spike rush is very common in shallow portions of the lake.

Thin-leaf Pondweed *(Potamogeton pusillus, P. berchtoldii, and P. gemmiparus)*

- Leaves are narrow and thread-like (1 to 7 cm long and 0.2 to 2.5 mm wide) and attach directly to the stems at their base (no petioles).
- There are no floating leaves as in some pondweeds.

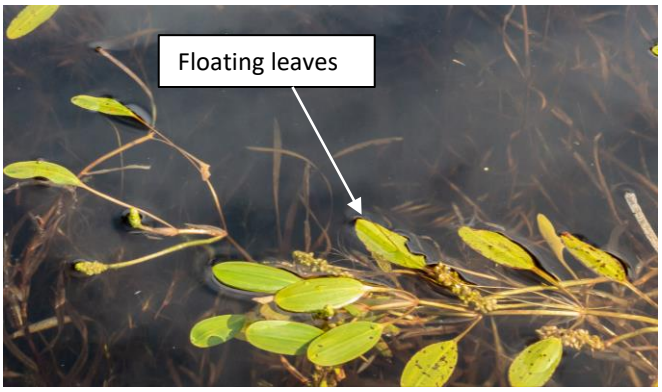
Tape Grass (aka Eel Grass) *(Vallisneria americana)*

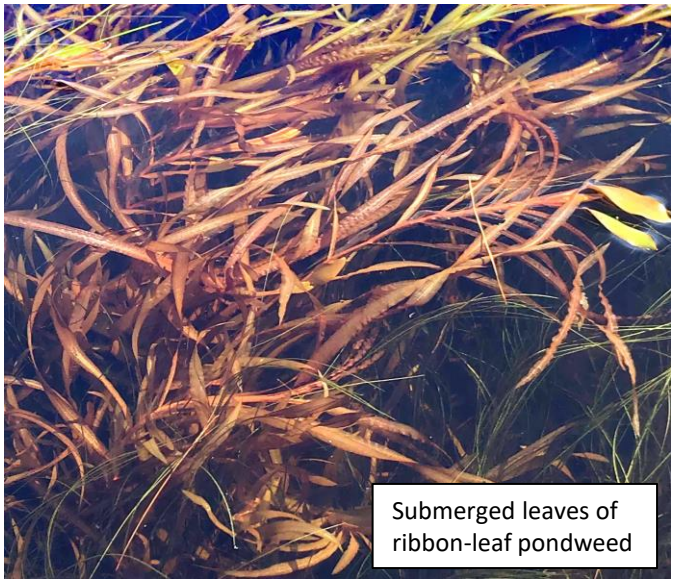
- Multiple ribbon-like leaves that grow in clusters from the base of the plant.
- Leaves are about ½ inch wide and can be up to several feet long and have a distinct cellar band in the middle of the leaf.
- The upper leaf parts are sometimes found floating across the water surface similar to bur-reed (see page 11).
- This plant is often confused with bur-reed. Tape grass leaves have heavy air-filled, vertically veined centers and lightly veined edges and lack the keel or rib that is found on the back of bur-reed leaves.



Leaf detail

Submerged Plants with Small Floating Leaves





Ribbon Leaf Pondweed *(Potamogeton epihydrus)*

- Floating leaves are elongate oval – 1-3” long.
- Submersed leaves are light brown, ribbon-like, 2 to 8 inches long, 3/8 inch wide, bluntly to sharply pointed at the tip.
- Fairly common in the lake.

Spiral Pondweed *(Potamogeton spirillus)*

- The floating leaves (there are only a few) are firm, green, oval-elliptic, less than 1½ inches long, up to ½ inch wide.
- Submerged leaves are more or less spirally arranged, with one leaf per node along the stem. Leaves are green to reddish, linear and thin (0.5 to 2 mm wide), often arching or coiled, up to 3” inches long.
- Stems are flattened and branched.
- **Looks very similar to native water naiad but spiral pondweed has small floating leaves and the submerged leaves originate individually in alternating positions around the stem rather than in whorls of multiple leaves.**

Submerged Plants

Robbins pondweed (aka fern pondweed)

Potamogeton robbinsii-

- Submersed – forms large colonies in deep water
- This pondweed has stiff leaves that alternate on opposite sides of the stem – very distinctive feature
- No floating leaves, grows to 1-1.5 feet in height.
- Found in Zone 5 by Brad Gaudreault and a fragment was found floating in Zone 7 by Maria Gross

Common water-primrose - *Ludwigia palustris*

- Submersed to floating
- Leaves are simple and opposite, 1 to 1½ inches long and up to ¾ inch wide, spoon-shaped with a blunt tip, the lance to egg-shaped blade abruptly tapered to a winged stalk.
- Leaf color ranges from dull to bright green to reddish bronze, especially in the stalks.
- Surfaces are glossy smooth and edges are toothless.
- Stems are succulent and weak, 3 to 12 inches long, smooth and often reddish, and many branched.
- Found along the mouth of Snow Brook in Zone 12

Hedge-hyssop - *Gratiola aurea)*

- Submersed to emergent
- Description: Leaves opposite, slightly succulent on stem reaching 4-6 inches in height. Flower yellow, tubular in shape, originating from leaf axils.
- Submersed form is more common. It is difficult to identify without flower, but opposite leaves and short stature of plant are distinctive. Its slightly succulent character also helps with identification. Plants generally only flower when emergent.
- Found along the shoreline in Turtle Cove – Zone 1

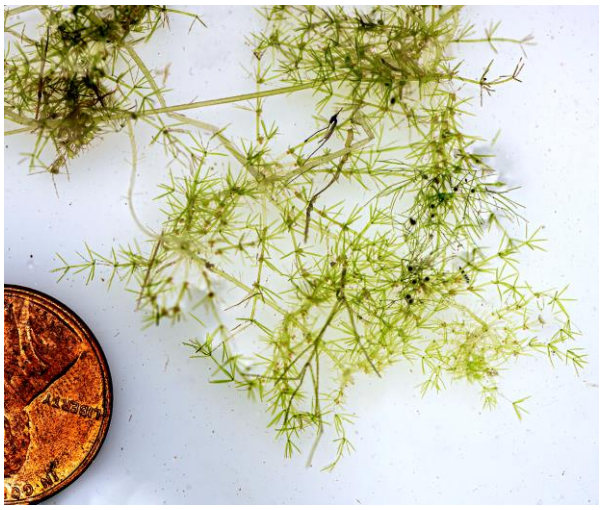
Submerged Plants

Filamentous Green Algae

- Made up of intertwined green-algae filaments.
- Grows as a soft mat on the lake floor.
- May create floating mats from oxygen bubbles created by photosynthesis.
- Common throughout shallow portions of the lake.

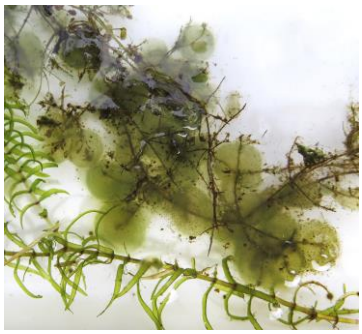
Aquatic Moss

- Dark green non-vascular plant that attaches to submerged rocks or logs.
- The stems branch and are entirely covered by tiny, sharply pointed, ridged leaves.
- Found in Zones 7 and 15 (a very large area of growth in Zone 15).



Stonewort *(Nitella sp.)*

- A macro-algae that looks like an aquatic plant.
- Has whorls of small, fine branches coming off the main stem.
- Nitella branches are very smooth and translucent.
- One sample has been found near the public beach.



Rivularia next to native waterweed

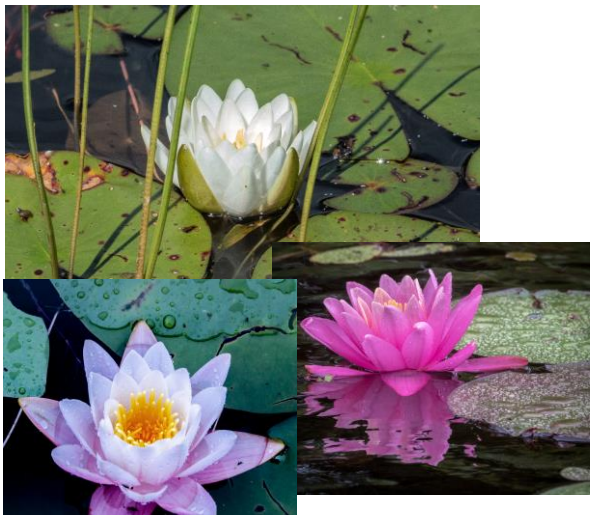
Cyanobacteria - *Rivularia*

- A species of cyanobacteria that occurs as small (pearl-size) globular masses attached to other plants or as unattached small irregular blobs.
- Can be easily confused with *Ophrydium* (a colonial protozoan). *Microscopic identification is needed to tell them apart.*
- Has been identified in Dolloff and South coves.

Floating Plants

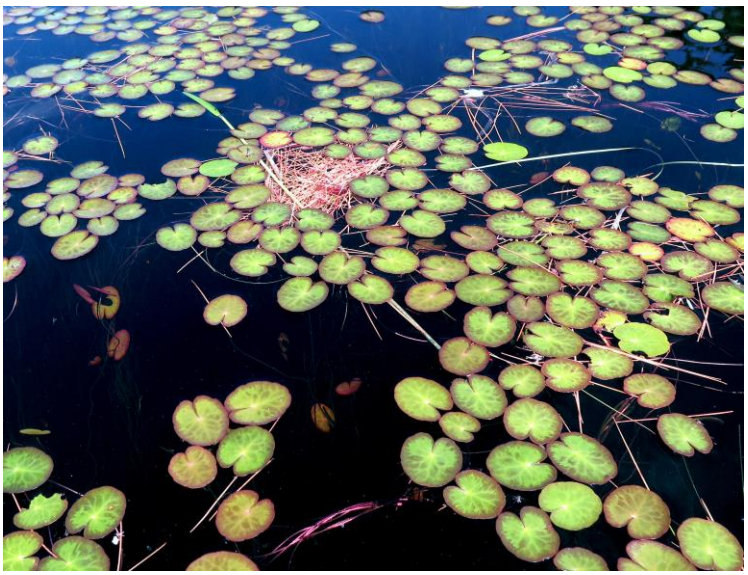
Yellow Water Lily *(Nuphar variegatum)*

- Oval leaf up to 14” long with the stem protruding from the notched end of the leaf.
- Compact yellow flower – usually the first flower seen on the lakes in the spring.
- Common throughout the littoral zone of the lake.



White Water Lily *(Nynphaea odorata)*

- Leaves are round to oval and are up to 15” long with a **sharp notch where the stem attaches to the leaf.**
- Flowers are <u>white</u> to <u>pink</u> (hybrid).
- Common throughout the littoral zone of the lake.



Floating Heart *(Nymphoides cordata)*

- Small oval heart-shaped leaves that are up to 3” diameter.
- Common throughout the littoral zone of the lake.

Floating Plants

Floating Pondweed *(Potamogeton natans)*

- Leaves are elongate and up to 8” long.
- There is a pronounced mid leaf vein with finer parallel veins on either side.
- Common in Conway Lake

Watershield *(Brasenia schreberi)*

- Symmetrical oval leaves – about 4” long.
- It’s stem (petiole) attaches in the middle of the leaf.
- Common in the lake

Floating Bur Reed *(Sparganium fluctuans)*

- Elongate floating leaves up to 40-inches long and approx. ½-1 inch wide.
- May seed fruits develop in a bur-covered ball about ½ inch in diameter.
- Can be confused with floating leaves of tape grass.
- Common in Conway Lake

Emergent Plants

Pipewort *(Eriocaulon aquaticum)*

- Pipewort flowers appear on long stalks (6-36" tall) and are button-like and white.
- The leaves form a basal rosette with spiky leaves 1/8 to 1/6 inch wide and ¾ to 3¾ inches long.
- Common in the shallow littoral portion of the lake.

Three-way Sedge *(Dulichium arundinaceum)*

- This is a common sedge in shallow water along the margins of the lake.
- Spiked leaves come off the stem at three angles.
- The stems are round and it grow to about a foot high
- Common along the margins of the lake.

Spike Rush *(Eleocharis spp.)*

- Spike rush is easily identifiable by brown spiked seed heads at the top of the plant which are eaten by ducks and other waterfowl (photo on right).
- Rushes are common along the shallow-water margins of the lake.
- Rushes are derived from rhizomes and are identifiable by their generally round stems, the presence of setae, and lack of nodes (which grasses have) or edges (which sedges have).

Clue to differentiating sedges, rushes and grasses: sedges are triangular in cross-section, rushes are round and grasses are hollow with joints.

Emergent Plants

Pickerelweed *(Pontedaria cordata)*

- Leaves are arrowhead to heart-shaped.
- Deep blue flowers appear on a spike about 6" long.
- The leaves form a basal rosette with spiky leaves 1/8 to 1/6 inch wide and ¾ to 3¾ inches long.
- Found in shallow water on the edge of the lake – often grows to 3 ft tall.

Bur-Reed *(Sparganium spp.)*

- This plant is easily identified by its spiky burr-like fruit found on a stalk between its long leaves.
- Plants can be 2-3 feet tall along the shallows of waterbodies. It can also be found submerged in up to 4 feet of water, forming ribbon-like leaves. Can also be found floating on the water (floating bur-reed).
- Common along the shallow margins of the lake.

Common Arrowhead *(Sagittaria latifolia)*

- Arrow-shaped leaves which point downwards at the base of the leaf. Leaves can be broadly or narrowly arrow-shaped, lance-shaped, or tape-like.
- Leaves appear to clasp the base of the flowering stalk.
- Leaf veins originate from the point where the stem connects to the leaf and radiate from that point (see image above).
- White flowers with a yellow center.

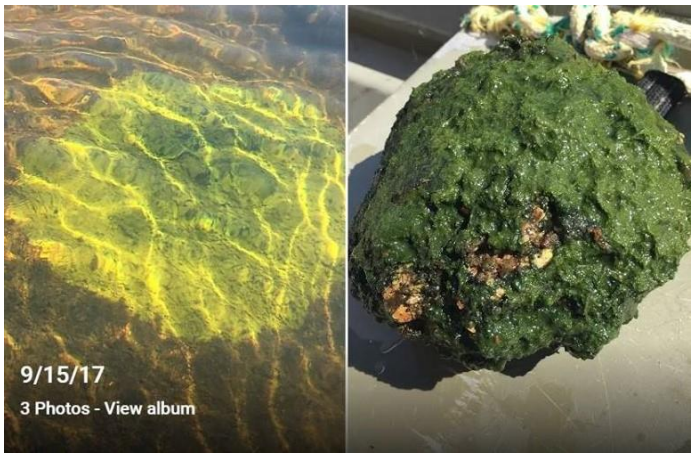
Invertebrate Animals

Red Water Mites *(Hydracarina spp.)*

- Tiny red arthropods (typically 2-3 mm across) with 4 pairs of legs (immature stages have 3 pairs).
- Use their legs equipped with rows of swimming hairs to move through the water.
- Feed on insect larvae and small crustaceans.
- Distinct red color is defensive – it reminds predators of their bad taste.

Fresh Water Mussels

- Found in shallow sandy bottoms on the shallow edge of the lake.
- Living mussels burrow through the sand leaving a shallow trail – you might spot inhale and exhale siphons exposed along the top edge of the shell.



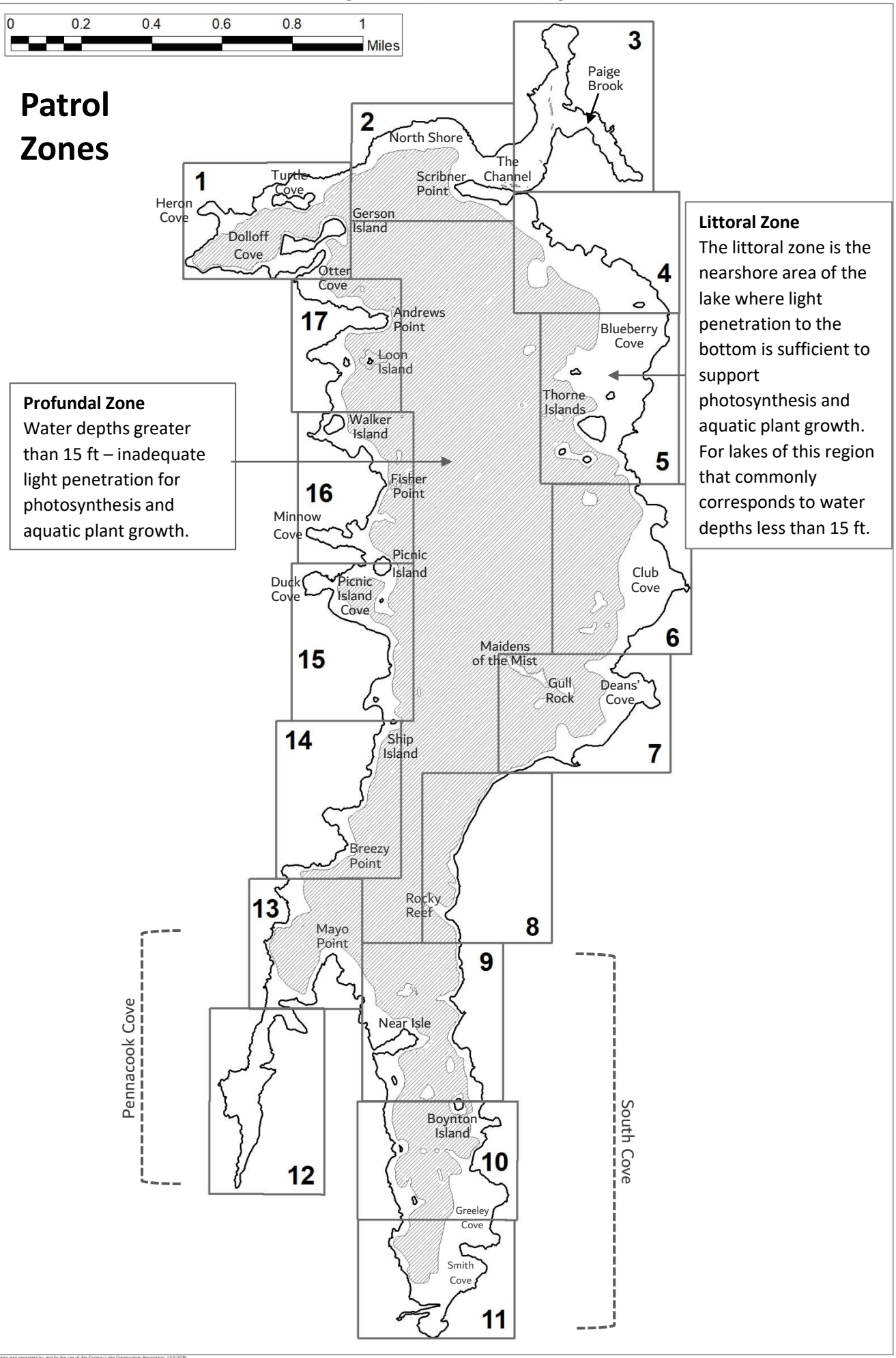
Fresh Water Sponges

- Freshwater sponges are usually pencil-shaped green structures attached to underwater brush or logs. They can also be shapeless green "spongy" masses covering rocks like the sponge shown here.
- Sponges are filter feeders. They obtain food from the flow of water through their bodies and from symbiotic algae. Their green coloration usually comes from the encapsulated algae cells. For this reason, many people mistake freshwater sponges for algae, but sponges have a coarse texture, and are not slimy like algae.
- Sponges have been identified in Zone 7.

Fresh Water Bryozoans

- Bryozoans are sessile filter-feeding colonial animals. The gelatinous colonies are made up of hundreds to thousands of microscopic animals, called zooids. In some species the zooids grow in a unique rosette pattern - each rosette containing several zooids. They form a firm and slimy base which attaches to anything stationary below the surface of the water.
- They can range in color from clear to green to a brown-red and resemble a brain, usually around 2 – 4 inches in diameter, with some colonies growing to 2 feet or more.
- Bryozoan colonies have been identified in Dolloff and Pennacook coves.

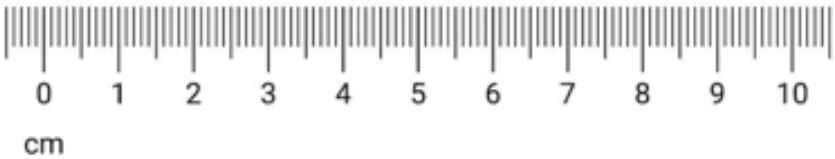
Patrol Zones



Profundal Zone
Water depths greater than 15 ft – inadequate light penetration for photosynthesis and aquatic plant growth.

Littoral Zone
The littoral zone is the nearshore area of the lake where light penetration to the bottom is sufficient to support photosynthesis and aquatic plant growth. For lakes of this region that commonly corresponds to water depths less than 15 ft.

This map was generated by, and for the use of, the Conway Lake Conservation Association, 12-5-2020



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