



Far Hills Association, Inc., 13 Blueberry Road, Ashburnham, MA 01430-1049

**Sunset Lake
Aquatic Vegetation
April 2019**

Like most of the relatively shallow lakes in the region, Sunset Lake maintains populations of aquatic vegetation species, some of which are invasive and others that are native and beneficial but if left unchecked, can become a nuisance and impede recreational enjoyment of the lake. We perform annual surveys to determine the presence, general abundance, and geographic distribution of aquatic vegetation in the lake to aid in lake management. This report describes the species that have been observed during the vegetation surveys.

While the specific species observed vary from year to year, this is most likely more reflective of survey effectiveness than actual year-to-year variations in species composition. Therefore, it is assumed that any species that has been detected in at least one survey is most likely still present in Sunset Lake, even if it was not detected in subsequent surveys.

Bladderwort

Common bladderwort (*Utricularia vulgaris*) is the most widespread submerged aquatic vegetation species found in Sunset Lake. Also present are two closely related species, humped bladderwort (*U. gibba*) and purple bladderwort (*U. purpurea*). These native, beneficial species are found in many shallow lakes in up to 4-6 feet of water. Bladderwort is consistently found in Sunset Lake's shallow coves as well as along the shoreline of the main part of the lake.

Bladderworts are long, slender, free-floating plants with branched stems and leaves, with distinctive small bladders in the forks of the leaves (see Figure 1). Common and humped bladderwort flowers, which grow above water, are yellow, two-lipped with a forward-facing spur on the lower lip (see Figure 2). Purple bladderwort flowers are very similar, but as the name would imply, purple (see Figure 3). Flowering occurs between July and August.

Bladderworts are remarkable aquatic carnivorous plants. The bladders are used to capture and digest tiny animals such as insect larvae, aquatic worms, and water fleas. Hairs at the opening of the bladders serve as triggers, and when contacted, mechanically cause the trap to spring open, drawing in water and tiny aquatic organisms like a vacuum. Enzymes and bacteria inside the bladders digest the captured organisms, releasing nutrients for use by the plant.

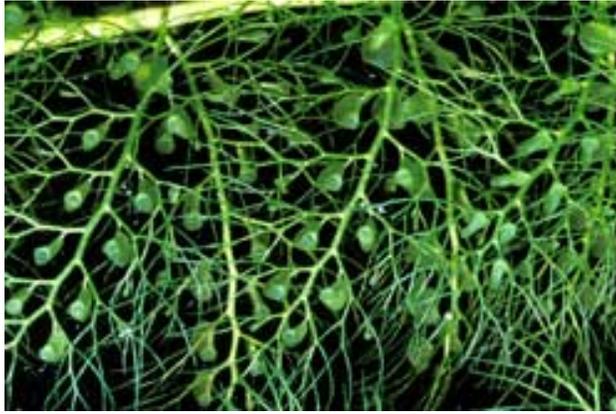


Figure 1. Common Bladderwort



Figure 2. Humped Bladderwort



Figure 3. Purple Bladderwort

Bladderworts are native, beneficial plants that offer shade, invertebrate habitat, and foraging opportunities for fish. However, when there is an excess of nutrients in the lake, these plants can form extensive, dense mats that can impair boating, fishing, and swimming.

Variable Watermilfoil

Variable Watermilfoil (*Myriophyllum heterophyllum*) is an invasive submerged aquatic plant that has densely packed whorled leaves (see Figure 4). It is usually found along the shorelines of lakes and ponds. Variable watermilfoil has been consistently found in the cove north and west of Sunset Island and occasionally in the small cove west of Lollipop Beach. Watermilfoil can grow in water depths of up to 10-12 feet, forming dense mats near the surface of the water. The plant produces a spike-like flower that grows above the water's surface from mid to late summer.



Figure 4. Variable Watermilfoil

An aggressive invasive, variable watermilfoil was most likely introduced into Sunset Lake attached to a boat from another waterbody or through the dumping of a home aquarium (variable watermilfoil has historically been used as an ornamental plant in aquariums). Variable watermilfoil grows very rapidly, reproducing primarily by fragmentation. The plant can break apart very easily due to wave action produced by boats. The introduction of one single fragment of this plant can result in the infestation of an entire lake. Once introduced into a lake, variable watermilfoil is extremely difficult to eradicate. Watermilfoil spreads rapidly and usually outcompetes beneficial, native plants, often forming dense mats making swimming and boating difficult.

In its native environment, insects and fish feed on this plant at a rate sufficient to control its growth. In Sunset Lake, however, variable watermilfoil has no natural predators to keep its population in check. Nevertheless, its presence in the lake has thus far been limited to a sparse population in the cove north and west of Sunset Island and the small cove west of Lollipop Beach.

Watershield

Watershield (*Brasenia schreberi*) is a rooted aquatic plant that floats on the surface similar to water lilies, but with much smaller leaves. Watershield leaves are typically between 1-2 inches across, oval in shape with smooth edges, usually with a rust colored underside. The watershield stem is attached to the middle of the leaf. A dull purple flower develops in early summer (see Figure 5).

Watershield is found throughout Sunset Lake, with a prominent stand located in the small cove west of Lollipop Beach.

Watershield is a native, beneficial plant that provides excellent habitat for largemouth bass and sunfish. However, watershield can grow and reproduce rapidly when there is an excess of nutrients in the lake. Dense growth of watershield in shallow areas can interfere with boating and swimming.



Figure 5. Watershield

Water Starwort

Water Starwort (*Callitriche palustris*) is a native submerged aquatic plant. Its leaves are small and pinnately lobed. Each submerged leaflet is about $\frac{1}{2}$ inch long, with a pointed tip and arranged in a dense pattern along the leaf stem (see Figure 6).

Water starworts are annuals that reproduce by seed and stem fragments. Because the plants are adapted to cool water, growth begins early and flowers bloom in early summer. Seeds are mature by mid to late summer. Water Starworts can be found along natural shorelines in Sunset Lake.

Water Starwort is native and beneficial, and not considered a nuisance species for Sunset Lake. Ducks and other waterfowl eat the leaves and fruit. It also provides protective habitat for fish.



Figure 6. Water Starwort

Slender Pondweeds

Thin-leaf Pondweed (*Potamogeton pusillus*) (see Figure 7) and Leafy Pondweed (*P. foliosus*) (see Figure 8), collectively referred to as slender pondweeds, have long, thin, grass-like leaves along slender, branching stems. These pondweeds thrive in deeper, darker water and are consistently found in soft sediments in water depths up to about 10 feet. Although consistently found in annual vegetation surveys, their populations are relatively sparse in Sunset Lake.

Slender pondweeds are a native and beneficial plant, providing an important food source for a variety of waterfowl as well as food and cover for fish. Deer, beaver, and moose are all known to feed upon this plant.



Figure 7. Thin-leaf Pondweed



Figure 8. Leafy Pondweed

Stonewort

Stoneworts (*Nitella spp.*) are macro algae that resemble higher plants (see Figure 9). Their stems are composed of chains of single tube-shaped cells. Instead of true roots, they have a simple rhizoid structure. Stoneworts have slender "branches" of cells arranged in whorls along the main stem.

Found in most of the shallow coves in Sunset Lake, stoneworts are natural, beneficial species providing food for waterfowl and insects that in turn become food for fish and other wildlife. The rhizoids on these algae stabilize the bottom sediments. However, with excessive nutrients, stoneworts can reach nuisance levels.



Figure 9. Stonewort

Filamentous Algae

Filamentous algae are single algae cells that form long visible chains, threads, or filaments. When attached to a substrate, such as the lake bottom, submersed or emergent vegetation, or rocks, they are referred to as "benthic filamentous algae."

Benthic filamentous algae are found throughout Sunset Lake, providing benefits to the lake ecosystem, including stabilizing sediment, acting as a nutrient sink, and providing invertebrate and fish habitat. However, when concentrations of nutrients become too great, benthic filamentous algae can reach lengths of several feet and create a dense carpet on the bottom of the lake. As pieces of benthic filamentous algae break apart, they can form dense mats that float on the surface, called “floating filamentous algae,” more commonly referred to as “pond scum” (see Figure 10). This can obviously become a nuisance in shallow areas such as beaches.

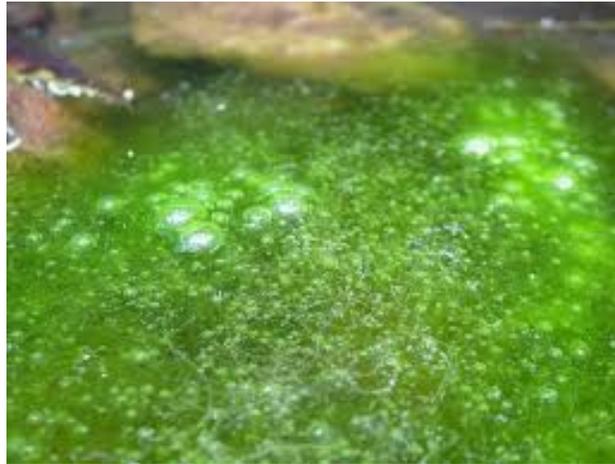


Figure 10. Filamentous Green Algae

Cyanobacteria (blue-green algae)

Commonly called “blue-green algae,” cyanobacteria are not algae, but microscopic bacteria found in freshwater lakes and streams as well as other habitats. Although cyanobacteria are too small to be seen by the naked eye, they can form blooms that are clearly visible (see Figure 11).

Cyanobacterial blooms can lead to a depletion of oxygen in the water and a release of toxins, as well as taste and odor problems.

Cyanobacteria have not been detected in Sunset Lake. However, other lakes in our region have experienced cyanobacterial blooms that have necessitated closing the waterbodies to boating, swimming and fishing for extended periods.



Figure 11. Cyanobacteria (blue green algae)