Aquatic plants vs native plants found in Pleasant Lake

By Dawn Tanner
Contributing Writer

A priority for VLAWMO, NOHOA, and SPRWS during the 2023 growing season was to learn and share more information about aquatic plants and their distribution in Pleasant Lake. In the spring, we conducted a survey for Curly-leaf pondweed. Curly-leaf pondweed is invasive and grows early in the season, often starting to grow even under the ice and before native aquatic plants. Curly-leaf pondweed dies back in the summer. Other plant species, especially natives, grow where Curly-leaf pondweed was found early in the season. Later in the summer, we came back and did a plant survey that was focused on native plant species and also included Eurasian watermilfoil, which is invasive but tends to grow along with Minnesota native plants. Early- and late-season plant surveys combined together provide a more complete picture of vegetation in a lake.

The white water lily is recognized by its large, floating, circular leaves and large, white flowers. The flower can be up to 5 inches wide with numerous white petals and is attached to a separate stem from the leaf.

To conduct plant surveys, VLAWMO staff work with Ramsey County Soil and Water Conservation Division (RCSWCD). RCSWCD provides staff, expertise, and equipment for standardized surveys that can be compared across the watershed. Those surveys include using a rake head that is tied to a rope to sample vegetation throughout the lake at regular intervals. This type of survey at standardized points is a "point-intercept survey." A special GPS unit is also used to capture the bottom contours of the lake and measure where and how thick the plants are. The output from that unit allows RCSWCD to build a map of the vegetation in the lake. This map doesn't tell us what kind of plants are there; it tells us how much of the water is filled with plants.

Here is a sampling rake for surveys.

The actual relationship is a little more complicated than a simple density measure. Stay with me here. It is a measure of "biovolume," which means the amount of plant height in a pixel of water column. The output spectrum ranges from blue to red. Blue shows no plant height compared to the bottom, while red shows plants that are growing close to the surface and filling the water column.

The biovolume spectrum is measured along a continuum that has smaller increments and ranges from blue to green (no plants to sparse plants in the water column), then yellow (medium), orange (fairly dense plants that approach the surface), to red. Red is plants that fill the water column from the bottom of the lake to the surface of the water. When we add the information that we get from throwing the rake and directly sampling the plants, we can say more about species diversity and distribution.

As we've discussed in previous articles this fall in North Oaks News, native aquatic plants take up nutrients in the lake and make the water more clear. Native plants are good for water quality. Without them, algae, especially blue-green algae, take up those nutrients, making the water murky and green. These algae can produce harmful toxins that are dangerous for humans and pets.

We often see increased plant growth as water quality improves in a lake. This happens because the algae are no longer capturing so much of the nutrients and sunlight to fuel their growth. But, you may be wondering, do these plants grow everywhere?

This is where the GPS survey of the lake is especially helpful. When we look at Pleasant Lake (see the attached figure), we see that a fairly large area doesn't have plants filling the water column at all. This occurs in the deeper-water areas, where plants are unable to reach the sunlight because it is filtered out by the water. The figure shows contour lines with depth in feet. Deeper water filters out more light than shallow water. Plants tend to be abundant in shallow water and grow to the surface, from the shore to 10-15 feet of water, depending upon water quality. Beyond that, plants can't reach the light and aren't found or are only very sparse.

Looking closely at Pleasant Lake, this pattern holds. The middle of the lake is solid blue, without plants filling the water column. The blue range on the map is 61% of the lake, or 368 acres out of 603 acres that were surveyed. When we throw the rake in these areas, we pull up an empty rake, which reinforces what we learn by measuring biovolume.

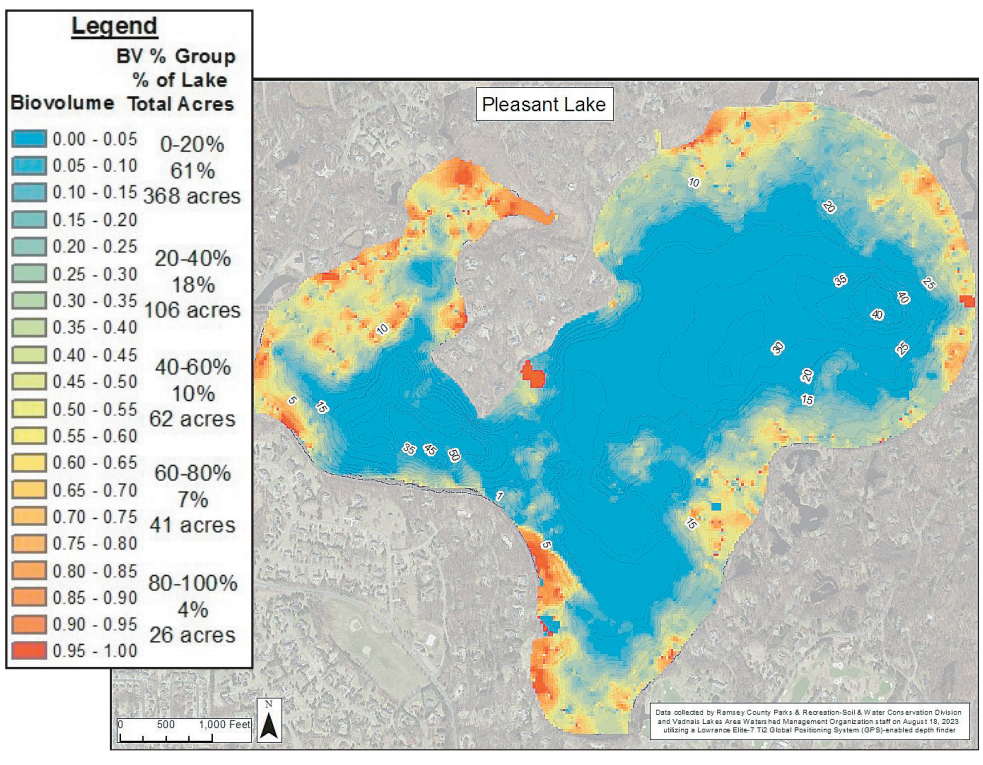
As we move along the continuum from blue, there is a large area of green that is sparsely filled with plants. The green and blue areas combined are 79% of the lake. Looking close to the shoreline areas around the lake and where the water is most shallow, plants are abundant, and this is where we see areas shaded in yellow, orange, and red. Combined yellow, orange and red constitutes 21% of the lake. Very thick areas of plants that often reach the surface account for only 11% of the lake and the shallowest areas. Those plants in shallow water provide important habitat for wildlife. These areas are some of the best places for watching fish, birds, muskrats, and, if you're very lucky, the occasional family of otters.

Check the VLAWMO website for aquatic vegetation survey results and reports for Pleasant Lake and other lakes in the watershed.

Dawn Tanner is the VLAWMO Program Development Coordinator. Submitted in partnership with the North Oaks Homeowners' Association (NOHOA) and St. Paul Regional Water Services (SPRWS)

A plant community from under water to the surface.

A family of otters.



PHOTOS CONTRIBUTED

The figure shows contour lines with depth in feet. Deeper water filters out more light than shallow water.