

## 2021 Annual Summary Report Vegetation Evaluation Massapoag Lake Sharon, MA 02067

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### Introduction

SOLitude Lake Management was contracted by the Sharon Lake Management Committee in 2021 to conduct an evaluation of the existing aquatic vegetation growth within Lake Massapoag. The survey focused on documenting the occurrence, extent, and density of non-native aquatic species that have historically existed in the lake. In addition, the composition of the native plant assemblage was also characterized during the assessment. An outline of the 2021 survey observations and associated management recommendations are provided in the following sections.

### Site Description

Lake Massapoag is a 385-acre waterbody located in Sharon, MA with a maximum reported depth of 45 ft. and average depth of 13 ft. The lake bottom is primarily rocky, with two underwater plateaus in the north central portion of the lake. The lake is fed primarily through groundwater springs, and streams including periodic high flow from a lagoon adjacent to the southern cove of the waterbody.

### Vegetation Survey

A vegetation survey was conducted by a SOLitude Biologist at Lake Massapoag and the adjacent lagoon on October 8, 2021. The survey utilized a Jon boat from which visual inspection occurred as well as bottom sampling using a "throw-rake" where water depth or other factors impaired visual inspection. The survey focused on invasive vegetation, specifically fanwort (*Cabomba caroliniana*) and variable watermilfoil (*Myriophyllum heterophyllum*), the two species that have been the focus of much of the ongoing aquatic plant management at the lake over the years. Special attention was paid to areas noted to have supported the growth of these invasive species in prior surveys. Most of the lake bottom was limited in aquatic vegetation which can be attributed to the rocky substrate.

A variety of native submersed plant growth was documented during the course of the survey. All of the native growth observed was scattered in low density patches throughout the littoral zone (lake area extending from the shoreline to the maximum depth where rooted vegetation growth is supported). The dominant species,

consistent with most prior years, were Tapegrass (*Vallisneria americana*), waterweed (*Elodea canadensis*), Naiad (*Najas spp.*), Bladderwort (*Utricularia spp.*), spike rush (*Eleocharis spp.*) and watershield (*Brasenia schreberi*).

In addition to the fanwort and variable milfoil that have been documented in the past, a new non-native species was identified this year. Brittle naiad (*Najas minor*) was noted in the small shallow cove along the central portion of the western shoreline (Figure 1 - 2021 Vegetation Assemblage). Brittle naiad is native to Europe and western Asia and likely was first introduced into the United States through contaminated cargo ship ballast water in the Great Lakes. The plant is an annual that reproduces through both seed production and vegetative fragmentation. It is a prolific spreader, like all invasives, leading to the displacement of native species. Although the current infestation is small and confined, it is important that this growth be closely monitored like fanwort and variable milfoil.

The fanwort and milfoil growth was located in the areas that have typically supported their growth - small cove on western shoreline and southern end of the lake (Figure 1). The extent of both of these areas of growth had expanded significantly from the beds observed in 2020. In 2020 the extent of the fanwort and milfoil growth was mapped to be in the range of 8 acres and in 2021 it has more than tripled to a total of 25 acres. It was also noted that the density of the fanwort had increased since last year (2020).

### **Recommendations for 2022**

Given the documented expansion of the non-native plant growth it is critical that this growth be aggressively managed in 2022 to prevent further spread and the need for more “lake-wide” management strategies in the future. Despite the expansion of these species, however, we feel that localized management is still an effective and viable strategy. Given the species composition, target plant density, and the extent of the current infestation we believe that treatment with aquatic herbicide is the only means of effective control. The two potential treatment options are discussed in more detail below.

The presence of dense fanwort dictates what management strategies will provide effective control, as there are only two aquatic products registered for use that have a high level of activity on this plant.

- Sonar (fluridone) is a systemic herbicide that can provide very effective long-term control of all the target species in this case (fanwort, variable milfoil, and brittle naiad). The one potential barrier to achieving control with Sonar is the requirement to maintain a lethal concentration for an extended period of time (30+ days). As such, the potential for dilution in a partial lake treatment scenario can make achieving this required concentration exposure time difficult. Although this represents a potential barrier, the configuration of the management areas and past successful use of this approach suggests that proper exposure times can be maintained if slow release pellet formulations of the product are used and the treatment dose is split over multiple lower dose applications.

A Sonar One and Sonar H4C (pellet formulations) treatment program to address the two areas of non-native plant growth (total of 25 acres) would cost in the range of \$. This would include pre & post-treatment surveys, herbicide residue monitoring, all treatments and final reporting. The use of Sonar is the preferred approach, given that it provides systemic control (kills both the vegetative portion of the plant and the roots) that will provide multiple years of effective control from a single treatment program. Sonar, at the rates necessary to control these target species, will also have limited impacts on other native plants that are intermixed or adjacent to the treatment areas.

- A combination of diquat (Tribune) and flumioxazin (Clipper) will provide effective control of the three non-native species currently found in Lake Massapoag. Both of these herbicides provide contact level

control (kill only the vegetative portion of the plant, not roots), which is not ideal for perennial plants (regrowth from the same root each year) like variable milfoil and fanwort, but should provide more long-term impacts to the brittle naiad that regrows from seeds each spring. As a result of this mode of action, annual treatment would be required to prevent spread and little to no reduction in the current invasive plant footprint would occur. The primary benefit to this approach is cost, as annual treatment costs for 25 acres using this approach would be in the range of \$. Although this is a more attractive and sustainable annual management budget, the cost works out to be about the same when compared to Sonar over a three year period, which is a common term of acceptable control following a successful treatment. Due to the lack of long-term control and the increased level of disturbance associated with annual treatment, we feel that although this is a viable management option, Sonar represents a better approach in this case.

We hope that you find this information useful in making your future management decisions. As always we appreciate your continued business. If you have any questions regarding this information or would simply like to discuss things in more detail, please do not hesitate to contact our office.

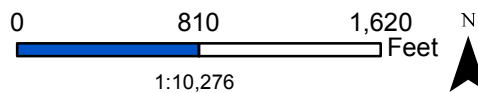
FIGURE 1: 2021 Vegetation Assemblage (10/8/2021)



Lake Massapoag  
Sharon, MA



Lake Massapoag



Map Date: 10/12/21  
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