

December 20, 2022

Town of Mendon – Conservation Commission
20 Main Street
Mendon, MA 01756
Sent via email: concom@mendonma.gov

Re: Lake Nipmuc, Mendon, MA – 2022 Year End Report

Dear Commission Members:

It is our pleasure to present the 2022-year end summary report to the Town of Mendon regarding Lake Nipmuc. Lake Nipmuc is approximately 85 surface acres and is located in Mendon, MA (adjacent to Route 16, Uxbridge Road). The Lake is primarily bordered by small woodlands mixed in with residential houses along each shoreline. The majority of the shoreline has a natural buffer. Water and Wetland used a small, private boat launch at the intersection of Uxbridge Road and Old Taft Avenue to launch the boat for each site visit.



Figure 1: Lake Nipmuc - Mendon, MA

Historically, Lake Nipmuc has battled invasive species variable milfoil (*Myriophyllum heterophyllum*), in addition to nuisance densities of native pondweeds and filamentous algae. The goal of the 2022 program at Lake Nipmuc was to manage the variable milfoil, bushy pondweed (*Najas flexilis*), and filamentous algae while monitoring basic water quality data.

All permitting, treatment and survey tasks were completed without issue and at the proper times. The table below provides the specific dates of each task. Below the table, each visit/task performed is described in additional detail.

Summary Of 2022 Management Activities

Date	Task/Description
June 10, 2022	Pre-treatment survey conducted to determine vegetation species and densities present / Treatment is performed targeting predominantly variable milfoil

June 10, 2022 - Monitoring Site Visit / Treatment

On June 10th, Co-Owner/Senior Aquatic Biologist, Colin Gosselin, and Field Assistant, Grace Adams, completed a site visit to Lake Nipmuc. The visit consisted of performing a survey, collecting basic water quality data, and conducting a treatment. Conditions during the visit were warm and slightly breezy.



Figure 2: Overview of Lake Nipmuc

Upon arrival, a survey was conducted using visual observation. The eastern portion of the pond had trace densities of milfoil, while the coves had moderate to dense densities of milfoil. Native species observed were cattails, waterlilies, watershield, and ribbon leaf pondweed in trace to dense densities.



Figure 3: Measurements at Lake Nipmuc

While on-site, basic water quality was collected using calibrated meters. The water temperature was consistent with other similar waterbodies we manage in the area, and the dissolved oxygen was sufficient to support fish and wildlife. Water clarity was also assessed using a Secchi disk. A Secchi disk is a disk with alternating black and white quadrants. It is lowered into the water of a pond or lake until it can no longer be seen by the observer. This depth of disappearance, called the Secchi depth, is a measurement of the transparency of the water. The Secchi reading, in one of the deeper portions of the pond was 20 feet 10 inches, which is indicative of excellent water clarity.

As planned, and based on the survey, a treatment was conducted for the control of milfoil. The liquid herbicide, diquat, was applied using a treatment boat equipped with a calibrated sub-surface injection system. This application methodology allows for even coverage within the treatment areas. Prior to treatment, signs noting the treatment and affiliated water use restrictions were posted by Mendon Parks & Recreation Department.

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
23.7	7.2

Summary / 2023 Recommendations

Overall, the 2022 program was successful as the overall health of Lake Nipmuc improved, and each of the tasks was performed successfully in accordance with the contractual obligations and the Order of Conditions. A proactive aquatic management program designed for Lake Nipmuc worked well as we were



able to monitor and control vegetation species and algae blooms as necessary throughout the entirety of the season. Open water habitat and recreational fishing areas were created following the application of the treatment.

When making management recommendations, we always conduct an internal alternatives analysis to determine the most appropriate approach. Mechanical removal of milfoil is not only expensive, but typically promotes the spread of this invasive species through fragmentation. Triploid grass carp, a fish species commonly used for vegetation control, are prohibited in Massachusetts. Small scale techniques such as diver assisted suction harvesting and benthic mats were considered, however the milfoil and bushy pondweed distribution and density in Lake Nipmuc is well beyond what could reasonably be controlled using these approaches. For 2023, we recommend continuing milfoil and bushy pondweed management using the most appropriate MA/EPA approved aquatic herbicides. Diquat worked extremely well in Lake Nipmuc in previous years and is a cost-effective approach. Given that diquat is a contact herbicide, it only provides seasonal control and should be repeated annually.

One other option for treatment of milfoil is Procellacor (florpyrauxifen-benzyl) herbicide and was heavily considered but ultimately ruled out. ProcellaCOR is a highly selective systemic herbicide used for the management of freshwater aquatic vegetation. ProcellaCOR is highly selective and impacts milfoil with minimal impact to native pondweeds. While ProcellaCOR provides multiple year systemic control of milfoil, it also acts much like a contact herbicide in that it makes spot-treatment possible, yet also has a very short half-life in water (roughly 9 hours). Usage of ProcellaCOR allows for less product in the water. Due to its selective formulation, ProcellaCOR can be applied at very low concentrations. The cost of Procellacor is considerably higher than that of diquat but would provide multiple years of nuisance level milfoil control. The rationale for ruling out this specific product is due to its' selectivity. Particularly near Nipmuc Marina, bushy pondweed has become the most nuisance target plant. Procellacor will have very minimal impacts to this species, vs. diquat which is effective on both milfoil and bushy pondweed.

We hope you have found the information provided in our 2022 year-end report helpful. We look forward to working with the Mendon Conservation Commission in 2023 and beyond, to continue to improve the health of Lake Nipmuc.

Sincerely,

A handwritten signature in blue ink, appearing to read "Colin Gosselin".

Colin Gosselin

Director of Operations

Senior Aquatic Biologist

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