

December 13, 2021

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

Re: Lake Nipmuc, Mendon, MA – 2021 Year End Report

Dear Commission Members:

It is our pleasure to present the 2021 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

Historically, Lake Nipmuc has battled invasive species variable milfoil (*Myriophyllum heterophyllum*), in addition to nuisance densities of native pondweeds and filamentous algae. The water clarity has also been decreasing over the past few years; therefore, a watershed assessment was conducted by ESS Group this year. The goal of the 2021 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 2021 Management Activities

Date	Task/Description
June 5, 2021	MA-DEP Permit #WM04-0000486 is obtained
May 28, 2021	Pre-treatment survey conducted to determine vegetation species and densities present
June 8, 2021	Treatment is performed to target variable milfoil, bushy pondweed, and algae
July 27, 2021	Post-treatment inspection completed

Monitoring Site Visit / Pre-Treatment Survey – May 28, 2021

On May 28th, Co-Owner and Aquatic Biologist, Colin Gosselin, visited Lake Nipmuc for a routine inspection. The site visit consisted of performing a vegetation survey in order to assess the current species and population densities throughout the Lake. During the site visit, visual observation was paired with the use

of a throw-rake, as necessary. Observed near Nipmuc Marina, the cove just west of Alicante Restaurant, and the southeastern corner near the outlet, was predominately variable milfoil with bushy pondweed just beginning to develop. Near Nipmuc Marina was largely bushy pondweed. Waterlilies and ribbon-leaf pondweed (both native) were also documented growing in various densities throughout Lake Nipmuc. Conditions during the visit were sunny and calm.

While on-site surface temperature and dissolved oxygen readings were collected using a calibrated YSI meter. The temperature was consistent with what we'd expect to see and was consistent with what we had been seeing at other lakes and ponds while in the field. The dissolved oxygen (11.51 mg/l) was at a healthy level sufficient to support fish and wildlife.

Treatment Conducted – June 8, 2021



Figure 2: Variable milfoil and algae begin to surface at Lake Nipmuc

On June 8th, Co-Owner/Aquatic Biologist, Colin Gosselin, and Environmental Scientist, James Lacasse, visited Lake Nipmuc to perform a treatment of variable milfoil (invasive), bushy pondweed (native), and algae. The treatment applied contact herbicide diquat and algaecide Captain XTR using a jon boat equipped with a calibrated sub-surface injection system. Also noted during the treatment was floating waterlilies throughout the Lake (native). Conditions during the treatment were hot with a light rain. Water clarity was great throughout the Pond with the exception of the cove by Nipmuc Marina.

Prior to the treatment, neon green posters noting water use restrictions and Water & Wetland's contact information were posted around the shoreline. Also prior to treatment, surface temperature and dissolved oxygen readings were collected using a calibrated YSI meter. The water temperature was consistent with what we were seeing at other area lakes, following the previous consecutive stretch of hot weather. Dissolved oxygen was sufficient (12.02 mg/l) to support fish and wildlife. It is important to note that a small fish kill was reporting to us by ESS Group days prior to the treatment. While we can only speculate, we assume this was related to spawning stress.

Post-Treatment Survey – July 27, 2021

On July 27th, Co-Owner/Aquatic Biologist, Colin Gosselin, performed a post-treatment survey at Nipmuc Lake. The survey was conducted using a 12' jon boat and included visual observation paired with a standard throw-rake, as necessary. The Lake looked excellent as the June diquat treatment worked extremely well. No target species (variable milfoil or bushy pondweed) were observed within the treatment areas. Waterlilies were documented at sparse densities throughout the Lake. Lilies at these densities provide valuable habitat and cover and do not warrant management at this time. Water clarity was slightly above average and conditions during the survey were calm and sunny.



Figure 3: Overlooking Lake Nipmuc



Dissolved oxygen readings were collected, as well as temperature. The dissolved oxygen was excellent (10.91 mg/l) and more than sufficient to support fish and wildlife. The water temperature was similar to what we were seeing at other similar lakes and ponds.

Summary / 2022 Recommendations

Overall, the 2021 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 2022, we recommend continuing milfoil and bushy pondweed management using the most appropriate MA/EPA approved aquatic herbicides. Diquat worked extremely well in Lake Nipmuc during the 2021 season (and 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.

All treatments should be accompanied by pre- and post-treatment monitoring. As briefly noted above, ESS Group has conducted a much more comprehensive survey and watershed assessment and will likely be providing recommendations specific to other issues facing Lake Nipmuc, such as intermittent spikes in e. Coli levels.

According to our records, the most recent Order of Conditions Extension for Lake Nipmuc was valid until 11/6/2021. On March 10, 2020, Governor Baker, acting pursuant to the powers provided by Chapter 639 of the Acts of 1950 and Section 2A of Chapter 17 of the General Laws, declared a state of emergency due to the outbreak of COVID-19. Following the declaration of the state of emergency, the Governor issued a number of orders intended to prevent the spread of COVID-19 and minimize the economic disruption



caused by the pandemic, including COVID-19 Order No. 42, “Order Resuming State Permitting Deadlines and Continuing to Extend the Validity of Certain State Permits” issued on July 2, 2020 (“COVID Order No. 42”). The Governor ended the state of emergency on June 15, 2021, thus order number 42 expired on that date. Most importantly under this Act, pertaining to permit tolling. Tolling (essentially pausing the clock) applies to approvals that have a stated expiration date that occurs after the end of the state of emergency, assuming the approval was issued prior to March 10, 2020. The new expiration date of these permits is calculated by adding 462 days, which is equivalent to the number of days of the state of emergency, to the expiration date. If the new expiration falls on a holiday or weekend, the new expiration is moved up to the next non-holiday weekday. Based on this logic, we have calculated the new expiration date of the Lake Nipmuc Order of Conditions as February 11, 2023. We are hopeful that the Conservation Commission will be able to confirm our math in writing, so that we may keep this in our file and plan to request an extension accordingly.

We hope you have found the information provided in the 2021 year-end report helpful. We look forward to working with the Mendon Conservation Commission in 2022 and beyond, to continue to improve the health of Lake Nipmuc.

Sincerely,

A handwritten signature in blue ink, appearing to read "Colin Gosselin". The signature is fluid and cursive, written in a professional style.

Colin Gosselin

Director of Operations

Senior Aquatic Biologist

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