

October 25, 2024

Fort Pond Association

Littleton, MA 01460

(978) 501-7295

Sent via email: John.Bergeron8@gmail.com

Re: Fort Pond, Littleton, MA – 2024 Year End Report – DEP File #204-823

Dear Mr. Bergeron and Association Members,

It is our pleasure to present a year end summary report to the Fort Pond Association and the Littleton Conservation Commission, regarding the 2024 Aquatic Management Program at Fort Pond. Fort Pond is approximately 102 surface acres and is located in Littleton, MA. The inlet, Long Pond Brook, is located at the northwestern corner of the Pond. The Pond is primarily surrounded by woodlands with residential properties scattered around each shoreline. Nashoba Day Camp is found within the northeastern cove, in which Water and Wetland utilized to launch the equipment necessary for each site visit.



Figure 1: Fort Pond, Littleton, MA

Historically, Fort Pond has battled nuisance densities of invasive curly-leaf pondweed (*Potomageton crispus*). The goal of the 2024 program was to manage the infestation of curly-leaf pondweed in Fort Pond while monitoring basic water quality. This was to be accomplished by implementing an aquatic management program that focused on performing all applicable tasks, including planning, permitting, surveys, treatments, and reporting.

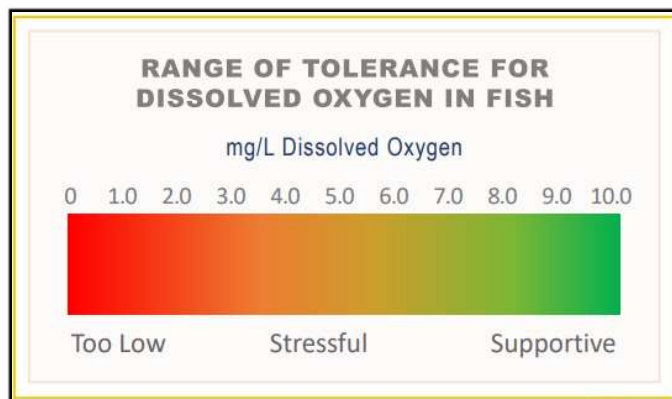


Figure 2: Dissolved Oxygen Table

During each visit to the Pond, a survey was conducted using visual observation paired with a standard throw-rake and handheld GPS/ArcGIS Field Maps, as applicable. Plants documented during the surveys are documented in tables corresponding to each visit. (*) denotes an invasive species. Invasive species are non-native to the ecosystem and are likely to cause economic harm, environmental harm, or harm to human health.

Additionally, dissolved oxygen (DO) and temperature readings were collected throughout the season using a calibrated YSI meter with optical sensor. Dissolved oxygen is the amount of oxygen in water that is available to aquatic organisms. DO is necessary to support fish spawning, growth, and activity. Tolerance varies by species, please see the figure provided for a general range of fish tolerance (Source: epa.gov). Dissolved oxygen can be affected by many outside factors, such as: temperature, time of day, and pollution. Dissolved oxygen levels are typically lowest early in the morning. Healthy water should generally have concentrations of about 6.5-8+ mg/L. 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. All readings are included in the tables throughout this report.

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. Additional details of each visit/task can be found beneath the table.

Summary Of 2024 Management Activities

Date	Task/Description
May 8, 2024	A pre-treatment survey was conducted to assess Pond conditions and species present
May 22, 2024	A brief survey was completed to confirm potential treatment areas and species present; An herbicide treatment was performed targeting invasive curly-leaf pondweed
June 20, 2024	A treatment was completed within Camp Nashoba Day beach targeting nuisance pondweeds and algae growth
August 30, 2024	A post-treatment survey was conducted to assess the effectiveness of the treatment and to help guide/determine recommendations for the 2025 season



Figure 3: Fort Pond during the May 8th visit

May 8, 2024 – Pre-Treatment Survey/ Site Visit

On May 8th, Co-Owner/Senior Aquatic Biologist, Colin Gosselin, made a visit to Fort Pond. The site visit consisted of collecting basic water quality and completing a survey.

Upon arrival to the site, a survey was conducted using visual observation paired with a standard throw-rake and handheld GPS/ArcGIS Field Maps, as applicable. Plants documented during the survey are documented in the table below.

Curly-leaf pondweed was found ~6 inches under the surface. In some areas curly-leaf pondweed was seen closer to the surface. Bladderwort (*Utricularia sp.*), a native species commonly mistaken for milfoil, was

observed in trace to sparse densities scattered in the shallow coves. This species was documented at non-problematic densities. Some Waterlilies were at the surface while others were seen in the water column. The water was slight tannic which is normal and non-concerning.

Species Identified	
Common Name	Latin Name
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Waterlilies	<i>Nymphaeaceae</i>
Common Bladderwort	<i>Utricularia vulgaris</i>

Water Quality Data		
Surface Temp (°C)	Surface DO (mg/L)	Secchi Disk Depth (Ft)
17.7	9.87	5'7"

May 22, 2024 - Site Visit / Herbicide Treatment

On May 22nd, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Jake McNary, made a visit to Fort Pond. The site visit consisted of collecting basic water quality data, completing a brief survey, and performing a treatment.

Conditions were sunny with a slight breeze and the water clarity was good, there were no visual signs of an algal bloom. The survey was conducted in order to confirm all potential treatment areas. All areas identified during the pre-management survey were targeted for treatment. This included the areas identified by the Association, as well as any other areas found during the pre-management survey.

The treatment went well, and excellent coverage was achieved. The liquid contact herbicide 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. The treatment was completed without issue. Littleton Conservation Commission was notified in advance and was sent the required MA-DEP WM04 Permit. Prior to the treatment, the shoreline was posted with neon signs noting the treatment, affiliated water use restrictions, and Water & Wetland contact information. The signs fulfill permit obligations for shoreline posting.



Figure 4: Conditions on May 22nd

Water Quality Data		
Surface Temp (°C)	Surface DO (mg/L)	Secchi Disk Depth (Ft)
22.6	9.66	7'4"

June 20, 2024 – Site Visit / Follow-up Treatment

On June 20th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Jake McNary, made a visit to Fort Pond, specifically to Camp Nashoba Day Camp. The site visit consisted of completing a brief survey and performing a treatment.

A treatment was conducted for the control of target nuisance/invasive plant growth and algal growth. The liquid contact herbicide and algaecide 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. The treatment was completed without issue. We anticipated plant and algae die-off within just a few days to a few weeks.

August 30, 2024 – Post-Treatment Survey



Figure 5: Fort Pond during August 30th visit

On August 30th, Aquatic Biologist, Grace Adams, made a visit to Fort Pond. The site visit consisted of collecting basic water quality data and performing the post-treatment survey.

Upon arrival at the site, a survey was conducted using visual observation paired with a standard throw-rake and handheld GPS/ArcGIS Field Maps, as applicable. Plants documented during the survey are documented in the table below.

Species Identified	
Common Name	Latin Name
Waterlilies	<i>Nymphaeaceae</i>
Tape Grass	<i>Vallisneria americana</i>
Watershield	<i>Brasenia schreberi</i>
Purple Loosestrife*	<i>Lythrum salicaria</i>
Slender Naiad	<i>Najas flexilis</i>
Cattails	<i>Typha</i>
Common Reed*	<i>Phragmites australis</i>

The purpose of the survey was to assess the efficacy of the treatment for curly-leaf pondweed performed in the Spring. Completion of the visual survey revealed no curly-leaf pondweed, and there appeared to be a minor microscopic algae bloom at the time of the visit. The two most prominent native species found along the shoreline were tapegrass (*Vallisneria americana*) and waterlilies (*Nymphaeaceae*). Water clarity appeared below average, likely connected to the apparent bloom. The shoreline also contained patches of invasive species, including purple loosestrife (*Lythrum salicaria*) and phragmites (*Phragmites australis*). Overall, the treatment targeting curly-leaf pondweed appeared to have been successful.



Water Quality Data		
Surface Temp (°C)	Surface DO (mg/L)	Secchi Disk Depth (Ft)
25.0	9.45	3'9"

Summary / 2025 Recommendations

All management at Fort Pond during the 2024 season was conducted without issue and at proper times. Looking forward to 2025 and beyond, we recommend continued management of curly-leaf pondweed in Fort Pond. Curly-leaf pondweed (CLP) is typically found in colder water and is usually present in New England only in the Spring and Fall. CLP typically reproduces through turions and can form dense mats that inhibit recreation, overtake habitat, and outcompete beneficial native vegetation, thus lowering diversity. CLP turions can survive at least five years of dormancy in ponds, annual control is recommended to gain extensive control over time. Removal of the turion bed is virtually impossible, so management of the plants using an EPA/MA approved herbicide is still the recommended approach. Several herbicide options are available for treatment of CLP, such as endothall, fluridone, and diquat. Diquat has been the herbicide of choice for Fort Pond in the past. Diquat is a contact herbicide that works quickly and has an extremely short half-life. This also makes diquat an excellent tool for spot-treatment. Timing is an extremely important component to the success of any invasive species management control program. We recommend the CLP treatments in 2025 and beyond, be conducted in late April or May (similar to the timing of 2024), based on survey data. This will reduce the amount of biomass die-off, but most importantly, studies have shown that early treatments have shown positive effects on suppressing turion production. Eradication of the invasive species following introduction is virtually impossible and some level of management will be necessary moving forward, but ideally the adjustment of treatment timing will limit the amount of herbicide needed long term.

Algae has also been documented in Fort Pond in recent years including filamentous algae within but not limited to the beach area of Camp Nashoba Day. Copper based algaecide use can provide reactive control of potentially harmful algal blooms. Ultimately, we recommend taking a proactive management approach towards algae control. The first step in this approach is to understand nutrients within the Pond. Unfortunately, this process can get expensive, so a phased approach to data collection likely makes the most sense. In 2025, we recommend that a baseline water quality suite be analyzed, at a minimum. Parameters should include nutrients (total phosphorus, free reactive phosphorus, TKN, nitrates/nitrites, etc.). From there, we can make further recommendations specific to nutrient remediation, and/or further sampling, as applicable.

We hope that you were impressed with the communication, expertise, and follow-through provided by Water & Wetland over the course of the 2024 season. We look forward to working with you in 2025 and beyond to continue improvement of the health of Fort Pond.



Sincerely,

A handwritten signature in black ink, appearing to read 'James Lacasse', with a long, sweeping horizontal line extending to the right.

James Lacasse

Branch Manager

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cc: Littleton Conservation Commission