



November 20, 2023

Littleton Conservation Commission
33 Shattuck Street
Littleton, MA 01460

Re: Order of Conditions Extension Request for Fort Pond – Littleton, MA (MassDEP File # 204-823)

Dear Commissioners:

Water & Wetland was first contracted by Fort Pond Association in late 2022 to take over management of 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. Colin Gosselin is the project manager overseeing all management activities at Fort Pond including monitoring, management, and reporting. As a Senior Aquatic Biologist and Director of Operations of Water & Wetland, it is Colin's utmost priority to ensure compliance with the Orders of Conditions. Through seventeen years working in the lake and pond management industry, Colin has learned that monitoring should be the cornerstone of any integrated pond management program.

Historically, Fort Pond has also been managed for the control of invasive curly-leaf pondweed. 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 which 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. When requesting extensions, and annually, we conduct an updated alternatives analysis. Removal of the turion bed either mechanically or manually 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 continue to recommend the CLP treatments in 2024 and beyond, be conducted in mid-late May. 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 our treatment timing will limit the amount of herbicide needed long term. It is important to note that all management has been and will continue to be based on our survey data. In 2023, approximately 6-acres of the Pond required treatment. A brief follow-up was conducted in less than one-acre. This equates to less than 7% of the water body. This is consistent with previous years. By managing the curly-leaf pondweed, it has stayed confined to small areas.

Nuisance algae has also been documented in Fort Pond in recent years, although it is not a persistent problem. Copper based algaecide use can provide reactive control of potentially harmful algal blooms. This would only be applied if warranted based on survey data.

Our records indicate that the Order of Conditions was due to expire on October 5, 2022, but was tolled due to the emergency act thus extending the expiration date. The tolling period makes the new expiration date January 10, 2024. We are respectfully requesting a three-year extension to this Order of Conditions that was initially proposed as an on-going maintenance project to preserve the health of Fort Pond through management of invasive species and nuisance algae. We commit to compliance with all conditions and will notify the Commission in writing if we see the need for any alteration to the program that was initially approved.

We are certain that you will continue to be impressed by the commitment of both Water & Wetland and Fort Pond Association to being excellent stewards of the environment and our commitment to preserving this beautiful waterbody. Feel free to contact me directly through email or through the cell phone number listed below if you have any questions at all.

Sincerely,



Colin Gosselin
Senior Aquatic Biologist
c: 508-259-3153
o: 888-4WETLAN(D)
colin@waterandwetland.com
www.waterandwetland.com

encl: 2023 Fort Pond Year-End Summary Report, Colin Gosselin Credentials



PERSONAL PROFILE

Colin has been working in the aquatic / invasive species field since 2006. He is a licensed aquatics applicator in MA, RI, and CT. As Director of Operations for Water & Wetland, Colin oversees and is on site for all projects.

SCIENTIFIC FOCUS

- Invasive Species ID
- Invasive Species Management Plans
- Water Quality Programs
- GIS/GPS Mapping
- Invasive Species Control
- Phragmites Management
- Fountains & Aeration Installation, Service and Design

CONTACT INFORMATION

Mobile: (508) 259-3153
Office: (888) 493-8526
Email: Colin@waterandwetland.com
Office Address: 115 South St.
Upton, MA 01568

www.waterandwetland.com

COLIN GOSSELIN

DIRECTOR OF OPERATIONS/AQUATIC BIOLOGIST

CAREER SUMMARY

Director of Operations / Aquatic Biologist

WATER & WETLAND, LLC | JUNE 2020 - PRESENT

- Oversees and project manages all projects, including: aquatic & upland surveys, invasive species control treatments, water quality programs, permitting and more
- Maintains equipment such as: airboats, other treatment boats, pumping systems, backpack sprayers, UTV's
- Project design / alternatives analysis
- Effectively communicates project progress / development with customers, regulatory agencies, etc.

Project Manager / Aquatic Biologist

SOLITUDE LAKE MANAGEMENT | 2006 - JUNE 2020

- Biological surveys and aquatic vegetation mapping
- Reporting and Invasive Species Management Plans
- Water quality monitoring
- Invasive species treatments and other management
- Directing crew and project coordination
- GPS/GIS mapping
- Maintenance of equipment
- Permitting and regulatory compliance
- Communication of project progress with customers and regulatory agencies

ACADEMIC HISTORY

Plymouth State University - Plymouth, NH

B.S. IN ENVIRONMENTAL PLANNING, 2009

- Completed in May 2009
- Focus on sustainability in the environment, GIS mapping
- Senior year internship with Town Engineer, Danvers, MA with focus on sewer mapping, oversight of stormwater projects, culverts, etc.

PROFESSIONAL AFFILIATIONS

- NALMS - North American Lake Management Society
- NEAB - New England Association of Environmental Biologist
- NEAPMS - Northeast Aquatic Plant Management Society
- APMS - Aquatic Plant Management Society

October 30, 2023

Fort Pond Association
Littleton, MA 01460
(978) 501-7295
Sent via email: John.Bergeron8@gmail.com

Re: Fort Pond, Littleton, MA – 2023 Year End Report – DEP File #204-823

Dear Mr. Bergeron and Association Members,

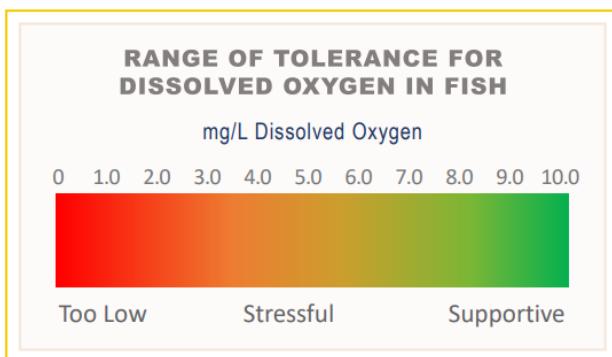


Figure 1: Fort Pond, Littleton, MA

It is our pleasure to present a year end summary report to the Fort Pond Association and the Littleton Conservation Commission, regarding the 2023 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.

Historically, Fort Pond has battled nuisance densities of invasive Curly Leaf Pondweed (*Potomageton Crispus*). The goal of the 2023 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.

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. 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. 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 2023 Management Activities

Date	Task/Description
May 17 th , 2023	Pre-Treatment Survey
May 24 th , 2023	Survey and Treatment of Curly Leaf Pondweed
July 6 th , 2023	Post-Treatment Survey / Additional Spot Treatment of Curly Leaf Pondweed Within a Small Area

May 17, 2023 - Monitoring Site Visit

On May 17th, Aquatic Biologist, Scott Conrade, completed a site visit to Fort Pond. The visit consisted of conducting a survey and collecting basic water quality data. Conditions during the visit were sunny, windy, and 64 degrees.

Upon arrival, a survey was conducted using visual observation paired with a standard throw-rake and handheld GPS/ArcGIS Field Maps, as applicable. During the survey, Curly Leaf Pondweed was observed in multiple locations throughout Fort Pond. Most of these locations were within the areas buoied by the Association; however, some areas were found outside of them as well. Waterlilies were also noted almost all the way around the shoreline of the Pond at moderate densities. Phragmites were also documented around the shoreline; because this species is invasive it is also noted in the included survey map. Additionally, the following species were observed in varying densities; Ribbon Leaf Pondweed, Benthic Filamentous Algae, and Muskgrass. The purpose of the survey was to document the need for treatment as well as to confirm treatment timing and areas.

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 lake until it can no longer be seen by the observer. This depth of disappearance, called the Secchi depth, is a measure of the transparency of the water. The Secchi reading was 5ft 1 in. As you'll see in Figure 2 above, water was generally clear and only slight densities of cold-water algae species were documented in wind-blown areas. The treatment of algae was not recommended at this time, as the amount of algae present did not warrant treatment.

Based on the survey, we confirmed the need for treatment due to the presence of invasive Curly Leaf Pondweed.



Figure 2: Fort Pond on May 17th

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
17.6	12.13



WATER & WETLAND

LAKE, POND & WETLAND MANAGEMENT

May 24, 2023 - Site Visit/Herbicide Treatment



Figure 3: Curly Leaf Pondweed

On May 24th, Aquatic Biologist, Scott Conrade, completed a site visit to Fort Pond. The visit consisted of performing a survey, collecting basic water quality data, and conducting a treatment. Conditions during the visit were sunny and 54 degrees.

Upon arrival, a survey was conducted using visual observation paired with a standard throw-rake and handheld GPS/ArcGIS Field Maps, as applicable. Curly Leaf Pondweed was observed in moderate densities near the middle of the pond. It was also observed at various places around the perimeter of the pond. Additionally, the following species were observed in varying

densities; Water Lilies, Phragmites, Ribbon Leaf Pondweed, Benthic Filamentous Algae, and Muskgrass. The water clarity was high at this time, showing no signs of an algae bloom. There was, however, some Filamentous Algae located scattered within some areas containing Waterlilies. This was not concerning at the time of the survey. Overall, conditions during the visit were consistent with the pre-management survey conducted approximately one week prior.

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. The Secchi reading was 5ft 4in.

As planned, based on the previous pre-management survey, and further confirmed by this survey, a treatment was conducted for the control of invasive Curly Leaf Pondweed. The liquid herbicide, Diquat, was applied utilizing a treatment boat equipped with a calibrated sub-surface injection system. This application methodology allows for even coverage within the treatment areas. Treatment areas consisted of all areas documented on the previously provided survey map and additional areas noted by John Bergeron (Fort Pond Association) prior to the treatment. The treatment was conducted without issue.

Prior to the treatment, a MA DEP BRP WM04 Permit was obtained. A copy of the permit was sent to Littleton Conservation Commission in advance of the treatment, as required within the Order of Conditions. Immediately prior to treatment, neon pink posters were hung around the shoreline noting the treatment, affiliated water-use restrictions, and Water & Wetland contact information.

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
18.6	9.72

July 6, 2023 – Post-Treatment Survey / Follow-up Treatment

On July 6th, Aquatic Biologist, Scott Conrade, and Aquatic Field Assistant, Brian Sweeney, made a visit to Fort Pond. 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. The plants that were documented during this visit include: Curly Leaf Pondweed, Ribbon Leaf Pondweed, Benthic Filamentous Algae, Planktonic Algae, Waterlilies, and Phragmites.

A treatment was conducted for the control of target nuisance/invasive plant growth in and around Camp Nashoba Day Beach. 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. We anticipated plant die-off within just a few days to a few weeks.

Prior to the treatment, the shoreline was posted in the immediate treatment area with neon pink signs noting the treatment, affiliated water use restrictions, and Water & Wetland contact information. The signs fulfill permit obligations for shoreline posting. Due to the small treatment area, a recreational use restriction was not placed on the treatment as this is not required on the product label. All other label restrictions applied only within 200' of the treatment area.

The pH of the pond was 7.9, which is within standard range for freshwater and is considered neutral leaning towards basic. Upon arrival we saw Benthic Filamentous and Surface Filamentous Algae. We also observed Ribbon Leaf Pondweed and Curly Leaf Pondweed within the swimming area. A Planktonic Algae bloom was observed throughout the entire pond which made visibility difficult. An additional survey was conducted throughout the remainder of the Pond, with a priority focus on previously treated areas. We identified additional Ribbon Leaf Pondweed and white Waterlilies around the rest of Fort Pond, as well as some patches of Phragmites (invasive). No curly-leaf pondweed was found outside of Camp Nashoba Day beach or the previously treated area. The purpose of this survey was to aid in 2024 recommendations.

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
32.1	9.36



Figure 4: Fort Pond on July 6th

Summary / 2024 Recommendations

2023 marked the first full year of Water & Wetland conducting management at Fort Pond. All management was conducted without issue. Looking forward to 2024 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 2024 and beyond, be conducted in late April or May (similar to the timing of 2023), 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. 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 2024, 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 plan to request an extension to the Fort Pond Order of Conditions (OOC) in the coming weeks. The OOC is due to expire on January 10, 2024. Ultimately, the recommendations we have following our current alternatives analysis led to a similar program as that proposed to and subsequently approved by the Conservation Commission during the Notice of Intent process.

We hope that you were impressed with the communication, expertise, and follow-through provided by Water & Wetland over the course of the 2023 season. We look forward to working with you in 2024 and beyond to continue improvement of the health of Fort Pond.

Sincerely,

Scott Conrade

Aquatic Biologist

c: 607-267-7103

Scott@waterandwetland.com

www.waterandwetland.com

Enclosures: Pre-Management Survey Map, 2023 MA-DEP Permit

cc: Littleton Conservation Commission

Legend

- Phragmites
- Curly-leaf Pondweed





Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs

Department of Environmental Protection

100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

License No.: **WM04-0001045**

LICENSE TO APPLY CHEMICALS FOR CONTROL OF NUISANCE AQUATIC VEGETATION

Applicant: COLIN J GOSSELIN

Name of Waterbody: FORT POND

Location of Waterbody: LITTLETON

Municipality: FORT POND ASSOCIATION

AMENDED AUTHORITY FOR ISSUANCE

Pursuant to the authority granted to the Department of Environmental Protection, by Massachusetts G.L.c. 111, s5E, the following license is hereby issued to **COLIN GOSSELIN, WATER & WETLAND, LLC** (hereinafter called the "licensee"), authorizing the application of chemicals for the control of nutrients, algae or aquatic plants to **FORT POND, LITTLETON**; such authorization being expressly conditional on compliance by the licensee with all terms and conditions of the license hereinafter set forth. This license shall become effective on the date of the Director's signature and shall expire on the **12/31/2023**.

Sincerely,

License Effective Date: **05/21/2023**

Stephanie Moura



Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs

Department of Environmental Protection

100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

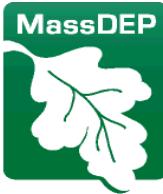
Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

License No.:

WM04-0001045

Director, Division of Wetlands and Waterways
Department of Environmental Protection



Department of Environmental Protection

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Governor

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Lieutenant Governor

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Secretary

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Commissioner

License No.: **WM04-0001045**

A. Application Condition(s)

Chemical Information

Product Brand Name/Trade Name	Chemical Form (dry/liquid)	Total Weight/Volume Applied	Units of Measurement (lbs/gallons)	Acres Treated	Application Rate	Planned Maximum Concentration (ppm)
Tribune	Liquid	40	gallons	20	2 gallons/acre	
EarthTec	liquid	208	gallons	104	2 gals/surface acre	
Captain XTR	liquid	144	gallons	20	1.2 gals/ac ft.	
copper sulfate	dry	499.2	lbs	104	.8 lbs/ac. ft.	

Treatment Method: Treatments will be applied from a treatment boat equipped with a calibrated sub-surface injection system. Algaecide treatments will include no more than 1/2 of the pond at a time. We are requesting two 1/2 lake treatments with copper sulfate, and two 1/2 lake treatments with EarthTec, as the actual chosen algaecide will depend on the species/density of algae at the time of treatment. All treatments will be preceded by a survey.

Another contractor had previously been issued a permit for this pond, however the lake association has recently switched to Water & Wetland for the algaecide treatments.

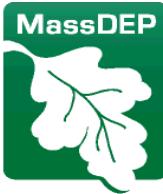
B. Application Report

By December 31st of the year of this treatment, the licensee shall submit a written report to the Department certifying the treatment date, application rate and the total weight/volume for each chemical used in the treatment, in accordance with requirements of Section I.A. of this license.

Please send the report to the Massachusetts Department of Environmental Protection (robert.kubit@mass.gov).

C. Modification of Application Conditions

The licensee shall not apply chemicals in a manner contrary to, or inconsistent with, the application conditions set forth in Section I.A. of this license without the prior written approval of the Department.



Department of Environmental Protection

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Commissioner

License No.: **WM04-0001045**

General Conditions

- i. The licensee is hereby notified that chemical treatments to control aquatic nuisances in public or private lakes and ponds of the Commonwealth involve the alteration of wetland resource areas protected under both Massachusetts G.L.c. 131, s40, the Wetlands Protection Act and 310 CMR 10.00, Massachusetts Wetlands Protection Regulations.
- ii. The licensee is hereby notified that issuance of this license does not in any way constitute the Department's approval of the chemical treatment as it related to the provisions of the Wetlands Protection Act.
- iii. The licensee shall obtain either a final Order of Conditions or a negative Determination of Applicability from the **LITTLETON** Conservation Commission(s) prior to application of chemicals authorized under this license.
- iv. Shoreline areas of the lake or pond must be posted with signs warning the general public of any water use restrictions stated on the chemical label minimum for one week. This is especially important at bathing beaches and other areas of common access. These signs shall clearly state that the chemical treatment is being conducted pursuant to a license issued by the Department of Environmental Protection, "DEP". A new sign shall be posted for each treatment event.
- v. The Department may require the licensee to cease application of chemicals to a body of water at any time following the issuance of a license if the Department determines that the chemical treatment will be ineffective, or will result in unreasonable restrictions on current water uses, or will produce unnecessary adverse side effects on nontarget flora or fauna.
- vi. Chemical applications shall be performed in accordance with the manufacturer's label directions, existing pesticide use laws, and any conditions imposed by other local or state agencies.
- vii. Chemical treatments to water using general use pesticides shall only be performed by an applicator currently licensed by the Massachusetts Department of Agricultural Resources Pesticide Program in the aquatics category. Chemical treatments to Bordering Vegetated Wetlands (310 CMR 10.55(2)(a)) and Salt Marsh (310 CMR 10.32(2)) using general use pesticides and techniques that insure chemicals are not applied to water shall only be performed by an applicator currently licensed in Massachusetts Department of Agricultural Resources Pesticide Program. Chemical treatments using restricted use pesticides shall only be performed by an applicator currently certified by the Massachusetts Department of Agricultural Resources Pesticide Program.
- viii. Issuance of this license does not release the licensee from liability resulting from the use of chemicals or from



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negligent or reckless application of chemicals specified in Section I.A of this license.

- ix. Electronic notification of treatment must be made to the Massachusetts Division of Fisheries and Wildlife (caleb.slater@mass.gov, peter.hazelton@mass.gov and colleen.hubbard@mass.gov). Notification that the treatment was performed shall be made within 24 hours of treatment. The notification message should include waterbody, town, license number and chemicals used.
- x. No chemical treatment shall be conducted while a Massachusetts Department of Public Health advisory is in effect.
- xi. In general, less than 1/3 of the lake area and less than ½ of the littoral zone should be targeted for herbicide treatment when native plants (particularly low growth forms) are dominant.