

November 15, 2022

Glen Echo Lake Improvement Association, Inc.
Attn: Jackie Nowak
PO Box 578
Charlton, MA 01508
Sent via email: nowak151@verizon.net

Re: Glen Echo Lake, Charlton, MA – 2022 Year End Report

Dear Ms. Nowak and Association Members:

It is our pleasure to present a year end summary report to Glen Echo Lake Improvement Association, Inc. regarding the 2022 aquatic management program at Glen Echo Lake (pictured in Figure 1 to the right). Glen Echo Lake is approximately 116 acres and is located in Charlton, MA. The Lake is primarily surrounded by sparse woodlands with developed properties located on the majority of the shoreline. Access to the Glen Echo Lake is gained from the Association’s boat launch, which is gated off to the public. This boat launch is found off of Glen Echo Shore Road, along the western shoreline. Glen Echo Lake is a popular waterbody for recreational activities such as boating, swimming, fishing, and water skiing.



Figure 1: Glen Echo Lake - Charlton, MA

Historically, Glen Echo Lake has battled invasive species including fanwort (*Cabomba*) and variable milfoil (*Myriophyllum heterophyllum*). The goal of the 2022 program was to manage the invasive species while monitoring basic water quality through a proactive monitoring schedule. This would be accomplished by implementing an aquatic management program that focused around performing all applicable tasks, including planning, permitting, surveys, treatments, and reporting.

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
May 24 th , 2022	A pre-treatment survey was conducted in order to document baseline conditions of the Lake, note the current vegetation species/densities present, and to guide future 2022 management
June 20 th , 2022	A follow-up survey was conducted to assess recent growth of nuisance and/or invasive species.
July 13 th , 2022	A brief survey was completed to confirm treatment areas; An herbicide treatment was conducted to target invasive species

October 6 th , 2022	A post-treatment inspection was completed to evaluate the effectiveness of the previous treatment and to help guide recommendations for 2023
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Pre-Treatment Survey

On May 24th, Senior Environmental Scientist, James Lacasse, and Field Assistant, Grace Adams, completed a site visit to Glen Echo Lake. The visit consisted of performing a survey and collecting basic water quality data. Conditions during the visit were warm and sunny.

Upon arrival, a survey was conducted using visual observation paired with a standard throw-rake (pictured in Figure 2 to the right) and handheld GPS/ArcGIS Field Maps, as applicable. The water clarity was below average, so the survey relied heavily on rake tosses throughout the waterbody. With the tosses, bladderwort (*Utricularia sp.*), benthic filamentous algae, and minimal fanwort (illustrated in Figure 4), on the western shoreline, were documented. Most of the vegetation was found in the northern portion of the Lake. In addition, there were waterlilies (*Nymphaeaceae*) and watershield (*Brasenia schreberi*) in scattered areas.



Figure 2: Water and Wetland's Field Assistant, Grace Adams, using a throw-rake to document vegetation species/densities



Figure 3: Grace, from Water and Wetland, utilizing meters to note water quality data during the site visit

The majority of the rake tosses (see Figure 2 above), which were consistently collected every 50-75 feet, came up with only leaf debris and algae. The fanwort documented was mapped by inputting points into ArcGIS Field Maps, which was paired with an external GPS.

While on-site, basic water quality was collected using calibrated meters. The pH was 7.1, which is within a standard range for freshwaters and is considered neutral. 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 8' 6", which is good, given that the water clarity and visibility was below average.

As noted above, a small area of fanwort was the only documented invasive species (see map attached). Our recommended approach was to have a late-June/early-July survey conducted to see if any additional fanwort popped up, but at this point, only a small treatment using diquat/flumioxazin in the approximately 1-acre area was recommended, if anything.



Figure 4: Fanwort documented during the survey at Glen Echo Lake

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
23.0	8.5

Interim Survey



Figure 5: Thin-leaf pondweed documented during the survey

As noted above, an interim survey was conducted based on the previous survey. On June 20th, Senior Environmental Scientist, James Lacasse returned to Glen Echo Lake to conduct a survey specific to invasive species. The survey was conducted from a motored boat and utilized visual observation and a standard throw-rake. Invasive species data was collected using ArcGIS Field Maps and a hand-held GPS for added accuracy. Several native species were documented including snailseed pondweed (*Potamogeton bicupulatus*), thin-leaf pondweed (*Potamogeton pusillus* – Figure 5), bladderwort, waterlilies, and watershield. Fanwort and variable milfoil had expanded to several small areas, which are noted on the attached survey map. Based on the survey, we recommended that a small treatment be conducted for the control of the invasive milfoil and fanwort. Contact herbicides were most appropriate as they work quickly and are great for spot-treating small areas.

Survey/Herbicide Treatment

On July 13th, Senior Environmental Scientist, James Lacasse, completed a site visit to Glen Echo Lake. The visit consisted of collecting basic water quality data and conducting a treatment. Conditions during the visit were sunny and calm.

While on-site, basic water quality was collected using calibrated meters. The pH was 7.0, which is within a standard range for freshwaters and is considered neutral. 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 7'1", which illustrated the above average water clarity. The water clarity had visually significantly improved since the previous visits to the Lake.

As planned, and based on the survey, a treatment was conducted for the control of variable milfoil and fanwort (noted in Figure 6). The liquid 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. Posters stating the restrictions associated with the treatment were posted around the Lake prior to the treatment by the Association.

During the treatment, several native species were also noted as the Lake was traversed. Snailseed pondweed and thin-leaf pondweed were the most dominant, documented throughout the majority of the shoreline. These populations, despite being native species, were approaching nuisance densities.



Figure 6: Variable milfoil treated at Glen Echo Lake

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
27.1	7.02

Post-Treatment Survey



Figure 7: Organic debris and trace densities of fanwort noted

On October 6th, Senior Environmental Scientist, James Lacasse, completed a site visit to Glen Echo Lake. The visit consisted of performing a survey and collecting basic water quality data. The survey was initially scheduled and started on October 4th, however upon starting the survey it was quickly realized that weather conditions were not favorable for the survey due to remnants of Hurricane Ian. Based on this, a call was placed to the Association and the survey was rescheduled for October 6th. Conditions during this visit were sunny with a slight breeze, overall, near perfect survey conditions.

Upon arrival, a survey was conducted using visual observation paired with a standard throw-rake (see Figure 7) and handheld GPS/ArcGIS Field Maps, as applicable. Rake tosses were thrown throughout the littoral zone, paired with visual observations. When encountered GPS points were collected within ArcGIS Field Maps. This approach allows for accurate collection of invasive plant locations. Once the field data was collected, it was mapped within ArcGIS Online. Two invasive species were documented during the survey, which included fanwort (pictured in Figure 9) and variable watermilfoil. Fanwort was the most prevalent invasive species documented, noted most problematic along the two "larger" western coves. It is important to note on the map that each dot represents fanwort found - the dots do not signify densities documented (see map attached). The majority of the fanwort observed was found in trace to sparse densities. Many rake tosses included just one fanwort plant (trace densities, one stalk, illustrated in Figure 7). There were a few small isolated patches that were observed that were moderate densities (along the northwestern and mid-western shorelines). There was no fanwort noted along or near the surface as it was found along the bottom or within the water column (fanwort along the bottom noted in

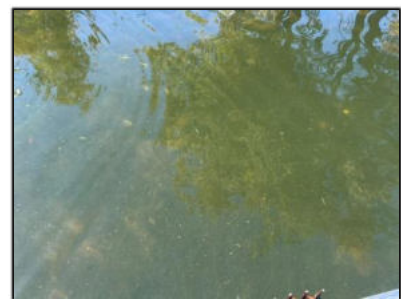


Figure 9: Microscopic algae bloom visible within the water column and on the surface

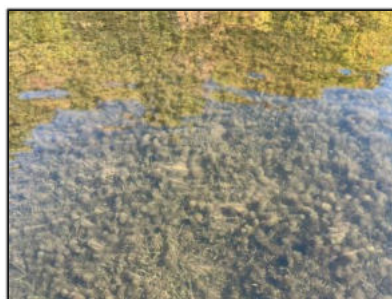


Figure 8: Small, immature fanwort noted in the northeastern portion of the Lake; covered in epiphytic algae

Figure 9). Variable milfoil was found in a few areas within the northern coves. All of the variable milfoil found and roughly 30% of the fanwort was covered in epiphytic algae (see Figure 9), which indicates that the plant is dying or decaying. The remainder of the fanwort population did not appear healthy (Figure 9 - this could be impacts from treatment or timing of the season). The fanwort was documented at varying in heights/maturity, from small shoots to larger, more mature plants. It is common to notice regrowth in vegetation towards the end of the season when using contact herbicides as these products only provide temporary control.

Native species noted during the survey include large-leaf pondweed, waterlilies, ribbon-leaf pondweed, callitriche, thin-leaf pondweed, duckweed, snailseed pondweed, aquatic grasses, and bladderwort (two species: common bladderwort and purple bladderwort). There were also a few different algae species present: filamentous algae (Figure 10 - benthic algae), chara (macro-algae), microscopic algae (Figure 8), and epiphytic algae (described above). The benthic algae was noted primarily in the shallow depths,

primarily towards the northern half of the Lake. This was found on the bottom of the Lake or within the lower section of the water column. Chara was found throughout the majority of the littoral zone varying in densities on the bottom of the Lake. There was a microscopic algae bloom also observed throughout the Lake, visible within the water column and on the surface, specifically noticeable within the wind-blown areas (Figure 8). While the only true way to know if a bloom may be potentially harmful, no visual signs of cyanobacteria (swirling, etc.) were noted during the survey.



Figure 10: Benthic algae documented during the survey

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 8'8", which illustrated slightly above average water clarity.

Surface Temp (°C)	Surface Dissolved Oxygen (mg/l)
21.1	7.2

Summary / 2023 Recommendations

The Town of Charlton has historically funded pre-management surveys at various Charlton Lakes. Based on this survey, the individual Associations are able to make decisions regarding management. This is the approach taken at Glen Echo Lake during the 2022 season. The early season survey found very little invasive species despite an intense search throughout the entire littoral zone. Based on direct communication and feedback from our Association contact, a survey was again conducted later in the season. This survey showed expansion of the invasive variable milfoil and fanwort. Despite the expansion, these invasive species were still confined to several small areas.

Based on the survey, a treatment using contact herbicides was recommended. There are two available treatment options for fanwort control, Sonar (fluridone) and Clipper (flumioxazin). Sonar is best suited for whole lake applications but does provide systemic control of fanwort. In many cases 2-3 years of nuisance level control of this species. Because the areas of invasive species were small and scattered (see attached maps), taking a Lake wide systemic approach is not warranted from either an ecological or a cost perspective. Contact herbicides work quickly and allow for little to no impacts to native species outside of the small treatment areas. A similar approach is recommended for 2023 as monitoring is the key to success at Glen Echo Lake. Additionally, keeping a direct line of communication open with the Association is also an important part of the program. We recommend budgeting for a similar program in 2023 consisting of surveys, a treatment with contact herbicides, and reporting. The post-treatment survey in Glen Echo Lake found new areas of fanwort and milfoil, although all was at extremely low densities and low within the water column. This makes monitoring of the Lake all the more important in 2023 and beyond.

We have greatly enjoyed working with Glen Echo Lake Improvement Association, Charlton Conservation Commission, and the Charlton Lakes & Ponds Committee during the 2022 season We hope that you were impressed with the level of communication, expertise, and follow-through provided by Water & Wetland,



LLC this year. We look forward to working with you in 2023 and beyond to continue to improve the health of Glen Echo Lake.

Sincerely,

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

James Lacasse

Project Manager

Senior Environmental Scientist

c: 774-276-6098

o: 888-4WETLAN(D)

james@waterandwetland.com

www.waterandwetland.com

Attachments Include

- **2022 WM04 Approval**
- **Pre-Management Survey(s) Maps**
- **Treatment Area Maps**
- **Post-Treatment Survey Map**

CC: Charlton Conservation Commission



Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Bethany A. Card
Secretary

Martin Suuberg
Commissioner

License No.:

WM04-0001026

**LICENSE TO APPLY CHEMICALS FOR CONTROL OF
NUISANCE AQUATIC VEGETATION**

Applicant: COLIN J GOSSELIN

Name of Waterbody: GLEN ECHO LAKE

Location of Waterbody: CHARLTON

Project Proponent: GLEN ECHO LAKE IMPROVEMENT ASSOCIATION, INC

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 and Wetland** (hereinafter called the “licensee”), authorizing the application of chemicals for the control of nutrients, algae or aquatic plants to **GLEN ECHO LAKE, CHARLTON**; 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 **12/31/2022**.

Sincerely,

License Effective Date: **07/04/2022**

Stephanie Moura
Director, Division of Wetlands and Waterways
Department of Environmental Protection



Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

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License No.: **WM04-0001026**

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	67.5	gal	45	1.5 gal/acre	
Clipper	Dry	105	lbs	25	4.2 lbs/acre	
Copper Sulfate	dry	460	lbs	115	0.8 lbs/acrefoot	

Treatment Method: The treatments will be conducted using a jon boat equipped with a subsurface injection system. The copper sulfate is permitted based off of an average depth of 5 feet.

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 (David.W.Wong@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.

D. Special Condition(s)

Flumioxazin Special Treatment Conditions:

In addition to label instructions, the MDAR, MADFW and MassDEP have developed special treatment conditions that supersede some label restrictions.

- 1) The maximum permissible application concentration is 200 ug/L.
- 2) In order to limit the spatial extent of non-target damage from the toxicity of flumioxazin, no more than ¼ of the water body may be treated in any one year.
- 3) Treated areas may not be retreated with flumioxazin or any herbicide with a similar mode of action (i.e., light dependent peroxidizing herbicide) for three consecutive years in order to prevent the development of herbicide resistance in treated plants and allow for the recolonization of mussels and other native biota. The exception to this restriction is repeat targeted treatments in consecutive years in the immediate vicinity around shoreline structures (e.g., boat launches, docks, swimming beaches, dams, water intake pipes) and drainage ditches, ponds entirely internal to golf courses, etc.



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4) Flumioxazin is excluded from use in State-listed aquatic species habitats, unless otherwise authorized in writing on a case-by-case basis by the MA Division of Fisheries and Wildlife pursuant to the Massachusetts Endangered Species Act, MGL c.131A and its implementing regulations 321 CMR 10.00.

General Conditions

- A. 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.
- B. 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.
- C. The licensee shall obtain either a final Order of Conditions or a negative Determination of Applicability from the **CHARLTON** Conservation Commission(s) prior to application of chemicals authorized under this license.
- D. 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.
- E. 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.
- F. 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.
- G. 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.
- H. Issuance of this license does not release the licensee from liability resulting from the use of chemicals or from negligent



Department of Environmental Protection

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License No.:

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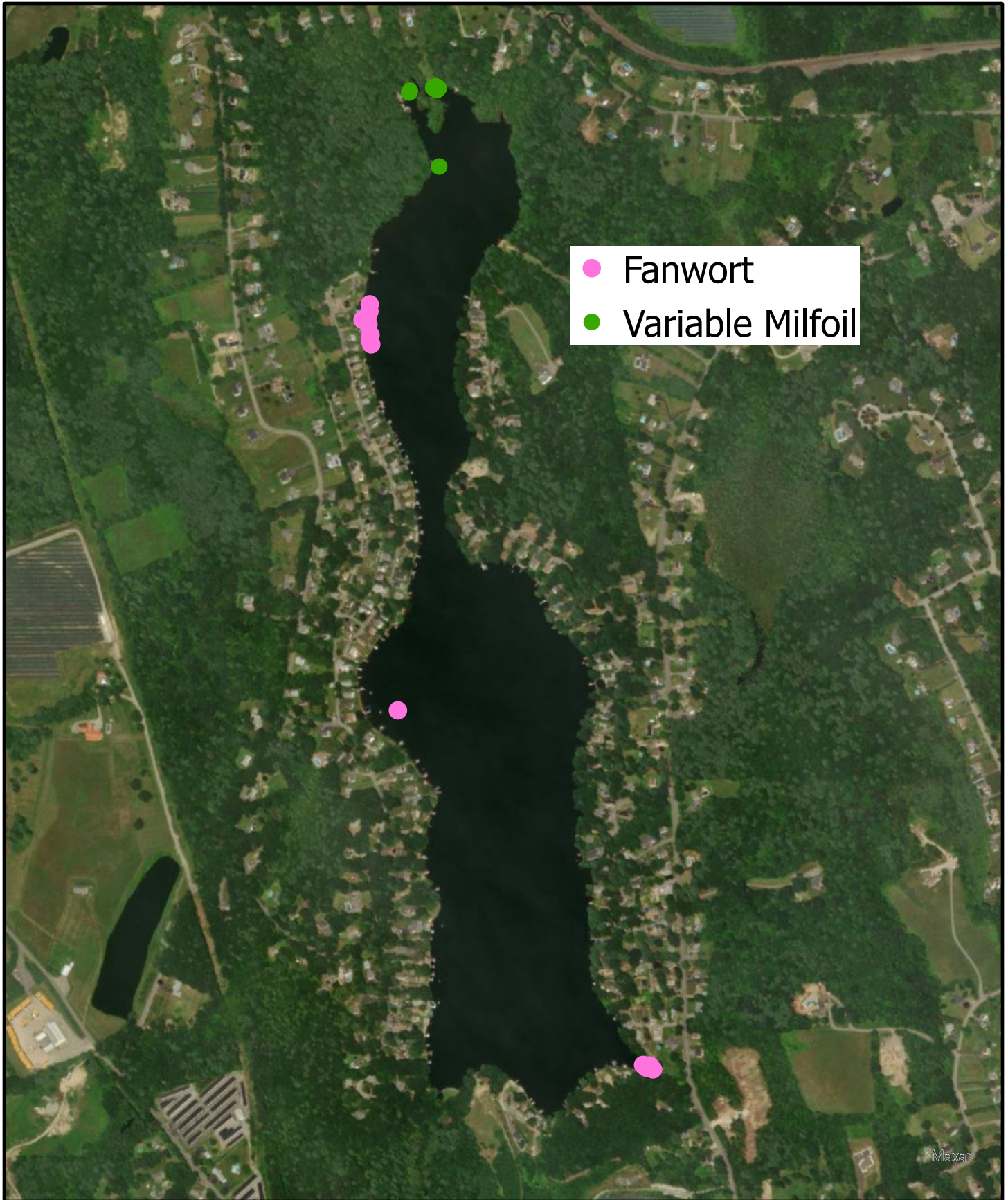
or reckless application of chemicals specified in Section I.A of this license.

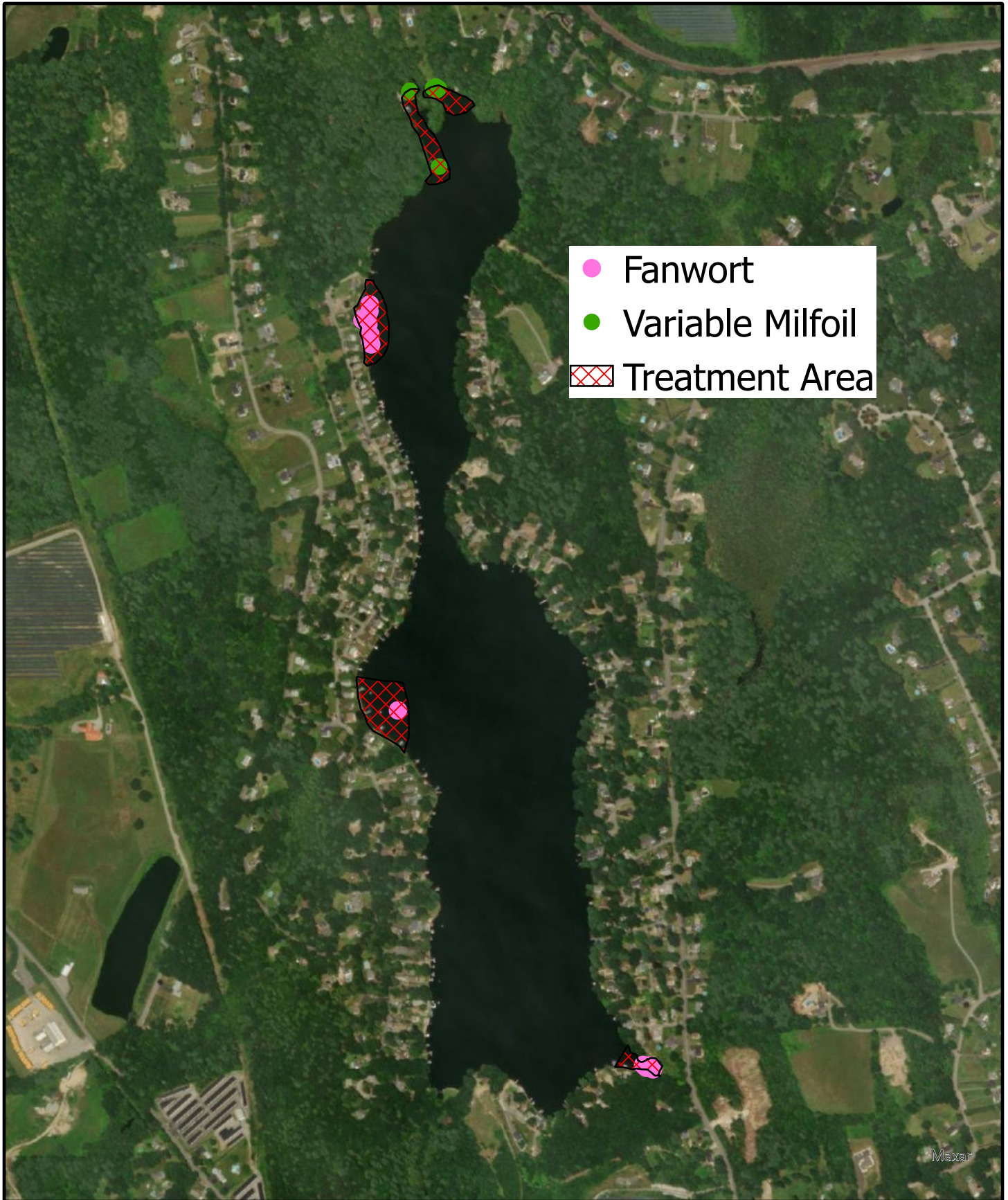
- I. Electronic notification of treatment must be made to the Massachusetts Division of Fisheries and Wildlife (jason.stolarski@mass.gov, jason.carmignani@mass.gov). Notification that the treatment was performed shall be made within 24 hours of treatment. The notification message should include waterbody, town, license number and chemicals used.
- J. No chemical treatment shall be conducted while a Massachusetts Department of Public Health advisory is in effect.
- K. In general, less than 1/3 of the lake area and less than 1/2 of the littoral zone should be targeted for herbicide treatment when native plants (particularly low growth forms) are dominant.



• Fanwort







- Fanwort
- Variable Milfoil
- ▨ Treatment Area



