

November 20, 2024

City of Framingham – Conservation Commission
 Attention: Rebecca Nau, Conservation Administrator
 150 Concord Street
 Framingham, MA 01702
 Sent via email: rn@framinghamma.gov

Re: Framingham Ponds (Big Farm Pond, Little Farm Pond, Mohawk Pond, Norton Pond, Sudbury River, Gleason Pond, Learned Pond, and Waushakum Pond), Framingham, MA (DEP#158-1573)– 2024 Year End Report

Dear Ms. Nau and Commission Members,

It is our pleasure to present a year end summary report to The City of Framingham regarding the 2024 Aquatic Management Program at The Framingham Ponds. The contracted Framingham waterbodies include Big Farm Pond, Little Farm Pond, Mohawk Pond, Norton Pond, Sudbury River, Gleason Pond, Learned Pond, and Waushakum Pond, all located in Framingham, MA. A small percentage of Waushakum Pond is also contained within the Town of Ashland.

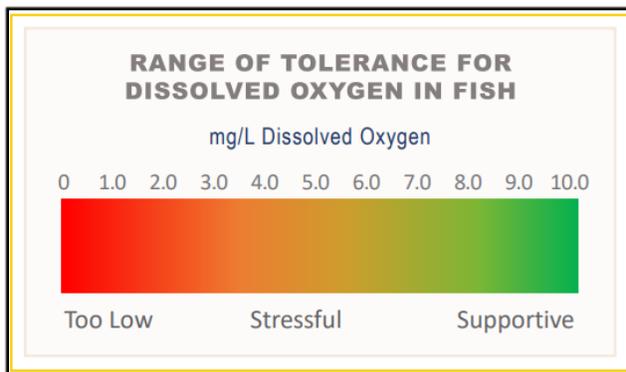


Figure 1: Dissolved Oxygen Table

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. 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, but the figure shown provides 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 (Figure 1). 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.

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, but the figure shown provides 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 (Figure 1). 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. Below the table, each visit/task performed is described in additional detail.

Big Farm Pond

Big Farm Pond (pictured in Figure 2) is approximately 151 acres and located in the center of Framingham. Railroad tracks abut the eastern shoreline (CSX Railroad), while parks and small woodlands run along the western shoreline. The parks that are adjacent to the western shoreline include Farm Pond Park and Framingham Skatepark. Access to the Pond was granted through a public boat launch, located at the northern point of the waterbody (off Lakeview Avenue). Big Farm Pond is a popular recreational waterbody for swimming, fishing, and boating.

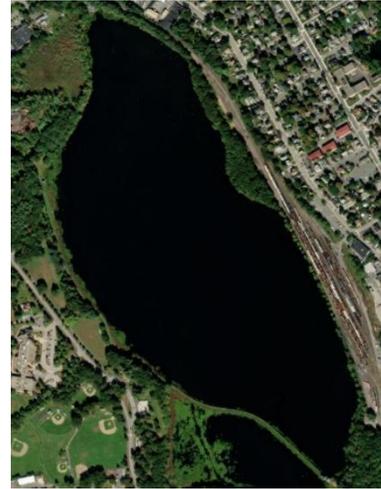


Figure 2: Big Farm Pond – Framingham, MA

Historically, Big Farm Pond has battled several invasive species, including water chestnut (*Trapa natans*), curly-leaf pondweed (*Potamogeton crispus*), and Eurasian milfoil (*Myriophyllum spicatum*), along with nuisance densities of native pondweeds (*Potamogeton sp.*). The goal of the 2024 program was to monitor the invasive growth while examining 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, surveys, and reporting.

All 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present; Water samples collected
September 10, 2024	A survey was conducted to gauge pond conditions; Water samples collected

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Big Farm Pond. During this visit, a survey was conducted, and samples were collected from the 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. Plants documented during the survey are documented in the table below. (*) 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.

Species Identified	
Common Name	Latin Name
Eurasian Milfoil*	<i>Myriophyllum spicatum</i>
Waterlilies	<i>Nymphaeaceae</i>

Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Water Chestnut*	<i>Trapa natans</i>
Common Waterweed/Elodea	<i>Elodea canadensis</i>
Clasping Leaf Pondweed	<i>Potamogeton perfoliatis</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Benthic Algae	-
Coontail	<i>Ceratophyllum demersum</i>

Invasive species documented in Big Farm Pond are consistent with those documented during the 2023 season. The most dominant invasive species was Eurasian watermilfoil (seen in Figure 3). This species was found in varying densities ranging from trace to dense. Curly-leaf pondweed was the second most prevalent invasive species. This was found scattered within the Eurasian milfoil in trace to moderate densities. Water chestnut was found at the northern and southern points of the pond. Native species were also identified throughout the pond. The dominant native species include Robbin's pondweed, coontail, and common waterweed (*Elodea canadensis*). A full list of the species found during the survey is included above. Several swans were noted during the survey.



Figure 3: Eurasian Milfoil found at Big Farm Pond during the May 29th survey

Given the Natural Heritage Endangered Species Program restrictions, no management was to occur in 2024. It is worth considering hand-pulling of water chestnut if NHESP allows. Water chestnut spreads rapidly and requires long-term management given the reproductive cycle of this plant. If managed before further spread, it will help long-term and allow for hand-pulling of this species to continue in lieu of treatment.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the "Water Quality" section of the report.

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	24.7	10.41
1 ft	24.3	9.04
2 ft	24.1	8.42
3 ft	23.8	8.42
4 ft	23.7	8.40
5 ft	23.2	8.12
6 ft	22.6	7.96
7 ft	22.5	7.91

8 ft	21.6	6.98
9 ft	21.2	6.76

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	6'4"



September 10, 2024 – Post-Season Survey/Water Samples Collected

On September 10th, Aquatic Field Assistant, Jake McNary, and Aquatic Field Assistant, Harley Westgate, made a visit to Big Farm Pond. The visit consisted of a survey, the collection of basic water quality data, and water sampling.

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. (*) denotes an invasive species.

Figure 4: Robbins pondweed found at Big Farm Pond during the September 10th survey

Species Identified	
Common Name	Latin Name
Water Chestnut*	<i>Trapa natans</i>
Eurasian Milfoil*	<i>Myriophyllum spicatum</i>
Waterlilies	<i>Nymphaeaceae</i>
Coontail	<i>Ceratophyllum demersum</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Duckweed	<i>Lemna</i>
Tape Grass	<i>Vallisneria americana</i>
Common Waterweed	<i>Elodea canadensis</i>
Thin-Leaf Pondweed	<i>Potamogeton pusillus</i>
Pickerelweed	<i>Pontederia cordata</i>
Curly-Leaf Pondweed*	<i>Potamogeton crispus</i>
Cattails	<i>Typha</i>
Arrowhead	<i>Sagittaria latifolia</i>
Watershield	<i>Brasenia schreberi</i>

No management was conducted at Big Farm during the 2024 season; therefore, invasive species were still prevalent in the pond. Specifically, Eurasian milfoil lined the shoreline of the pond in varying densities.

Overall, both native and invasive species were present within Big Farm Pond during the survey. The Eurasian milfoil, which was present throughout the entirety of the shoreline in densities ranging from just sparse all the way up to dense, appeared to be competing with native Robbin’s pondweed in the shallow sections of the pond. Overall, Robbin’s pondweed was the most dominant native species noted during the survey (Figure 4), though coontail and waterlilies were reaching dense densities in some sections of the pond. Immature curly-leaf pondweed was found growing in some areas. Water chestnut was noted as either single plants or small “clusters.” Seeds had already dropped from the water chestnut plants at the time of the survey.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.

Temperature & Dissolved Oxygen		
Depth	Temp (°C)	DO (mg/L)
Surface	22.2	9.62
1 Foot	22.2	9.6
2 Feet	21.8	8.97
3 Feet	21.7	8.93
4 Feet	21.6	8.03
5 Feet	21.6	7.95
6 Feet	21.4	7.66
7 Feet	21.4	7.24
8 Feet	21.0	6.39
9 Feet	20.9	6.31

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	6’1”

Little Farm Pond

Little Farm Pond (Figure 5) is found due south of Big Farm Pond – separated by a berm used for hiking and fishing. This waterbody is approximately 22.9 acres. The Pond is primarily surrounded by sparse woodlands to the west and south, with the berm separating Big Farm Pond and Little Farm Pond to the north. Access to this waterbody was gained from Big Farm Pond, as the jon boat was carried over the berm. All of Little Farm Pond is considered to be a littoral zone, meaning that sunlight can penetrate the bottom of the entire Pond resulting in potential algae/vegetation growth. Little Farm Pond is a popular recreational waterbody for fishing.



Figure 5: Little Farm Pond – Framingham, MA

Historically, Little Farm Pond has battled invasive species water chestnut, curly-leaf pondweed, and Eurasian milfoil, in addition to nuisance densities of native pondweeds. The goal of the 2024 program was to monitor the invasive species population while examining 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, surveys, and reporting.

All 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present; Water samples collected
September 9, 2024	A survey was conducted to gauge pond conditions; Water samples collected

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Little Farm Pond. An early-season survey was conducted and water samples were taken from the 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. Plants documented during the survey are documented in the table below. (*) 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.

Species Identified	
Common Name	Latin Name
Eurasian Milfoil*	<i>Myriophyllum spicatum</i>
Cattails	<i>Typha</i>
Waterlilies	<i>Nymphaeaceae</i>
Common Waterweed/Elodea	<i>Elodea canadensis</i>
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Water Chestnut*	<i>Trapa natans</i>
Filamentous Algae	-
Benthic Algae	-
Coontail	<i>Ceratophyllum demersum</i>

Species composition appeared to have remained relatively similar to that of the 2023 spring survey. Dominant invasive species included Eurasian watermilfoil and curly-leaf pondweed. These species were documented in varying densities. Water chestnut was scattered throughout the waterlily patches, especially along the southeastern shoreline (Figure 6). The densest areas of cattails were along the western and northern shorelines. The densest area of waterlilies was in the western corner of the pond. Native species such as Robbin's pondweed (*Potamogeton robbinsii*), elodea, and coontail (*Ceratophyllum*

demersum) were found at similar densities to Big Farm Pond. Water samples were collected, preserved, and shipped to the lab for analysis.

Due to Natural Heritage Endangered Species Program restrictions, no management will occur in 2024. At a minimum, consideration should be given to seeking NHESP approval to allow for hand-pulling of the invasive water chestnut. If this approval is gained, this could likely be completed by volunteers.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.



Figure 6: Waterlilies seen on Little Farm Pond during the May 29th visit

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	25.4	8.52
1 ft	25.2	8.47
2 ft	25.2	8.43
3 ft	24.8	8.29
4 ft	24.2	8.14
5 ft	23.6	7.64
6 ft	22.6	6.97
7 ft	21.9	6.14

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	6'9"

September 9, 2024 – Post-Season Survey/Water Samples Collected

On September 9th, Environmental Scientist, Harley Westgate, made a visit to Little Farm Pond. The site visit included conducting a post-management survey and collecting water samples

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Waterlilies	<i>Nymphaeaceae</i>
Duckweed	<i>Lemna</i>
Coontail	<i>Ceratophyllum demersum</i>
Bladderwort	<i>Utricularia</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Common Waterweed/Elodea	<i>Elodea canadensis</i>

Water Chestnut*	<i>Trapa natans</i>
Eurasian Milfoil*	<i>Myriophyllum spicatum</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>



Figure 7: Decreased water levels at Little Farm Pond during the September 9th visit

During the survey, it was noted that one entire portion of the pond was overtaken with dense waterlily cover, though some lanes between dense lily patches were noted. The waterlilies almost completely surrounded the shoreline of the pond in varying densities ranging from sparse to dense. Within the open lanes at the northwestern side and continuing down the northeastern shoreline, coontail and elodea were noted in varying densities ranging from sparse to dense, with some Robbin's pondweed interspersed. Occasionally, floating bladderwort were documented, though no rooted plants were observed.

Closer to the eastern side of the pond, there was a transition from coontail and elodea as the most abundant species to Robbin's pondweed. From there and continuing to the southern shoreline, Robbin's pondweed grew in dense densities, at times surfacing and developing dense mats on the substrate and on the water's surface.

Within the water towards the southeastern portion of the pond, there were occasional clusters of water chestnut (usually between 1-7 plants) and the presence of Eurasian milfoil within the dense waterlily cover. Continuing along the southern shoreline and looking westward, both plants appeared in sparse densities, with water chestnut extending further than the Eurasian milfoil.

Almost all the rooted pondweeds noted throughout the pond were coated in epiphytic algae, indicating decay. This was especially notable along the southeastern shoreline, specifically at a cove where Robbin's pondweed was in abundance. The amount of rooted vegetation with algae on it resulted in clouded water.

Water samples were collected from the pond, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the "Water Quality" section of the report.

It should also be noted that the water level was significantly lower than normal, with waterlilies exposed on the expanded shoreline (Figure 7). Water clarity throughout the pond was to the bottom.

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	22.3	9.03
1 ft	22.3	8.98
2 ft	22.2	8.79
3 ft	22.0	8.52

Secchi Disk Clarity		
Secchi Disk Depth (Feet)		6'1"
4 ft	21.8	8.34
5 ft	21.5	7.68
6 ft	21.4	7.68

Mohawk Pond

Mohawk Pond (pictured in Figure 8) is found at the end of Mohawk Drive in Framingham and is approximately 1.65 acres. The Pond is extremely shallow as the average depth is only roughly 2 feet. Mohawk Pond is primarily surrounded by woodlands, with one developed residential property along the northern shoreline. Access to the waterbody was gained from a walking trail along the western shoreline. This trail is typically gated off to vehicles.

Historically, Mohawk Pond has battled invasive species variable milfoil (*Myriophyllum heterophyllum*), along with potentially nuisance densities of pondweeds and algae. The goal of the 2024 program was to manage the invasive variable milfoil population while examining basic water quality through a proactive monitoring schedule. This would be accomplished by implementing an Aquatic Management Program that focused on performing all applicable tasks, including planning, permitting, surveys, treatments, and reporting.



Figure 8: Mohawk Pond – Framingham, MA

All permitting, treatments, 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present, and guide future 2024 management; Water samples collected
June 17, 2024	A survey was conducted to reassess the conditions of the pond, and also to note treatment areas; An algaecide treatment was applied; An herbicide treatment was applied
July 30, 2024	An interim survey was conducted to assess the previous management and to determine upcoming/future management needs of the pond
September 10, 2024	A survey was conducted to gauge pond conditions; Water samples collected

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Mohawk Pond. This was an early-season survey, examining distribution and densities of present species, and also to guide future management. Water samples were also collected and were sent to the lab for analysis.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Filamentous Algae	-
Cattails	<i>Typha</i>
Waterlilies	<i>Nymphaeaceae</i>

Consistent with historical records, one invasive species was found during the survey. This included variable watermilfoil which was found scattered in isolated patches. It was still somewhat early in the season, but the milfoil was found in only trace to sparse densities. It did appear, however, that the milfoil presence had increased from 2023. While not dense, the population was documented growing throughout the water column and occasionally surfacing. Filamentous algae and waterlilies were also noted (Figure 9). These species were scattered around the shoreline of the pond. Native cattails were noted along the northwestern shoreline. Pollen was noted on the surface. Based on the survey, management of invasive variable milfoil was recommended.

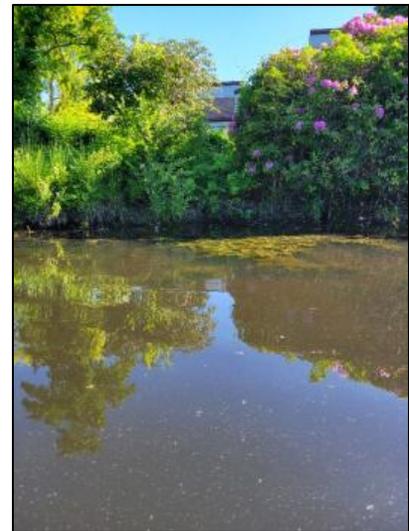


Figure 9: Mohawk Pond during the May 29th Visit

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	19.5	10.48
1 ft	19.5	9.97
2 ft	19.2	8.87

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	1’3”

June 17, 2024 – Survey/Algaecide application/Herbicide application

On June 17th, Senior Aquatic Biologist, Colin Gosselin, and Aquatic Field Assistant, Harley Westgate, made a visit to Mohawk Pond. A survey was conducted to assess treatment areas, followed by an application of algaecide and herbicide.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Filamentous Algae	-
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Cattails	<i>Typha</i>
Waterlilies	<i>Nymphaeaceae</i>

The density of filamentous algae had increased since the pre-management survey. This was noted primarily along the shoreline as well as growing within the water column (Figure 10). Variable milfoil has also increased in density since the survey. It was documented in the same mapped areas; however, in some areas it was surfacing. Sparse waterlilies were also noted in beneficial densities. As planned, the treatment targeted invasive variable milfoil and also incorporated copper-based algaecide based on the survey

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

Prior to the treatment(s), the shoreline was posted with neon signage noting the treatment, affiliated water use restrictions, and Water & Wetland contact information. The signs fulfill permit obligations for shoreline posting.

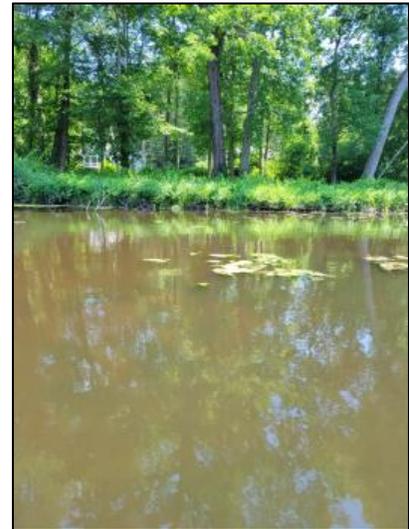


Figure 10: Mohawk Pond during the June 17th Visit

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
24.1	9.61

July 30, 2024 – Interim Survey

On July 30th, Aquatic Biologist, Grace Adams, made a visit to Mohawk Pond. A post-treatment assessment was conducted, with the survey also allowing Water & Wetland to reestablish areas of invasive species growth and future management guidance.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Cattails	<i>Typha</i>
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Waterlilies	<i>Nymphaeaceae</i>



Figure 11: milfoil regrowth at Mohawk Pond during the July 30^h visit

An interim visit was conducted at Mohawk Pond. The purpose of the visit was to assess the previous management and to determine upcoming/future management needs of the pond. The survey confirmed that the previous treatment successfully managed both filamentous algae and variable milfoil. Minimal regrowth of variable milfoil was observed (Figure 11), it did not warrant treatment at this time. The dissolved oxygen measurement indicated that the pond is in good health.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
26.8	7.29

September 10, 2024 – Post-Season Survey/Water Samples Collected

On September 10th, Environmental Scientist, Harley Westgate, made a visit to Mohawk Pond. The site visit included a visual survey and collecting water samples.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Microscopic Algae	-
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Benthic Algae	-
Filamentous Algae	-
Cattails	<i>Typha</i>

During the survey, it was obvious that Mohawk Pond had signs of a microscopic algae bloom. Visibility was greatly reduced due to this and also wind conditions making the water choppy. Due to this, the survey heavily relied on the throw-rake.



Figure 12: Cattails and decreased water levels at Mohawk Pond during the September 10th visit

Around the perimeter of the pond, there were a few areas with reestablished milfoil plants, though they appeared to be juvenile. Late season regrowth is common when contact herbicides are utilized for management. Overall, the milfoil growth was greatly controlled through the 2024 management program. Filamentous algae was observed on the surface in small amounts/low densities. Cattails, although native, appear to be encroaching further into open-water habitat. The water level was down by at least a foot and a half, with no flow in or out of the pond at the time of the survey (Figure 12).

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	1’6”

Temperature & Dissolved Oxygen		
Depth	Temp (°C)	DO (mg/L)
Surface	22.0	9.63
1 Foot	21.7	9.02
2 Feet	21.0	8.98

Norton Pond



Figure 13: Norton Pond – Framingham, MA

Norton Pond (Figure 13) is approximately 3.4 acres and is surrounded between four roadways (Pinewood Drive to the south, Elm Street to the east, Michael Road to the north, and Alfred Road to the west). Sparse woodlands abut each shoreline, as developed residential properties are found along all shorelines except the eastern shoreline. Access to the Pond was granted from Elm Street.

Historically, Norton Pond has battled nuisance densities of pondweeds, algae, in addition to invasive variable milfoil. The goal of the 2024 program was to manage the invasive variable milfoil population and nuisance densities of pondweeds/algae while examining 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, treatments, 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present, and guide future 2024 management; Water samples collected
June 17, 2024	A survey was conducted to assess algae due to abutter concerns
July 1, 2024	A survey was conducted; Herbicide/algaecide treatment conducted
July 30, 2024	Mid-season survey to assess the algae and duckweed/watermeal growth
August 7, 2024	Survey to assess treatment areas; Algaecide treatment; Herbicide treatment
August 29, 2024	Interim survey to assess pond conditions post-treatment
September 10, 2024	A survey was conducted to gauge pond conditions; Water samples collected.

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Norton Pond. An early-season survey was conducted to guide 2024 management, and water samples were collected and shipped to the lab for analysis.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Duckweed	<i>Lemna</i>
Watermeal	<i>Wolffia</i>
Filamentous Algae	

No invasive species were found during the survey. Watermeal, duckweed, and filamentous algae were found around the edges of the pond. Densities varies from sparse to dense. The middle of the pond was all open-water habitat. Pollen was found on the surface at the middle of the pond and also mixed in with the duckweed, watermeal, and algae along the shoreline (seen to the right in Figure 14).

Watermeal, duckweed, and filamentous algae have the ability to cover the majority of shallow pond such as Norton Pond. At this time, densities likely did not warrant management of these native species. We recommended an additional visit in June and potentially additional visits throughout the



Figure 14: Norton Pond during the May 29th visit

summer months. If densities of these species increased, treatment would likely be warranted at that time. The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	21.5	9.59
1 ft	21.1	9.39
2 ft	20.9	8.58
3 ft	20.4	7.94

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	2' 7"

June 17, 2024 – Interim Check-in Visit

On June 17th, Senior Aquatic Biologist, Colin Gosselin, and Aquatic Field Assistant, Harley Westgate, made a visit to Norton Pond. An interim check-in visit was made at the request of the Conservation Commission, primarily to assess the algae population mentioned by abutters.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Duckweed	<i>Lemna</i>
Filamentous Algae	

Based on communication from abutters to Framingham Conservation Commission, an interim visit to Norton Pond was conducted. The purpose of the visit was to assess conditions and to further determine future management needs. During the initial pre-management survey, minimal duckweed and algae were documented. As shown in the photo to the right (Figure 15), coverage of these species had increased fairly significantly since the May survey. Coverage of filamentous algae and duckweed was roughly 15-20%. Most of the growth was along the shoreline with some suspended patches nearing the middle. Based on the survey, treatment was recommended. It is best practice to manage the target species prior to them covering the entirety of the pond. This limits biomass die-off.



Figure 15: Norton Pond during the June 17th visit

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
27.1	9.13

July 1, 2024 – Survey / Treatment

On July 1st, Aquatic Biologist, Grace Adams, made a visit to Norton Pond. The following services were completed during the visit: 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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Duckweed	<i>Lemna</i>
Watermeal	<i>Wolffia</i>
Filamentous Algae	



Figure 16: Norton Pond during July 1st Treatment

Treatment was scheduled based on previous feedback from the city and a subsequent follow-up survey conducted by Water & Wetland's team of biologists. An additional inspection was conducted during this visit, immediately prior to treatment. Consistent with our previous survey, filamentous algae, duckweed, and watermeal were found along the shoreline in moderate densities. The middle of the pond was open and free from these target species. As planned, a treatment was conducted for the control of the species mentioned above. Treatment areas focused on the shoreline where these target species were present.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
25.3	8.44

July 30, 2024 – Survey

On July 30th, Aquatic Biologist, Grace Adams, made a visit to Norton Pond. A mid-season survey was conducted to assess the algae population and species composition of the pond. Treatment recommendations were made.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Duckweed	<i>Lemna</i>
Watermeal	<i>Wolffia</i>
Filamentous Algae	

A site visit was conducted at Norton Pond to determine current condition and any upcoming management needs. Dense mats of filamentous algae were observed around the pond's perimeter, while the center remained largely free of algae with only a few scattered patches (seen in Figure 16 to the right). Additionally, duckweed and watermeal were interspersed with the algae mats. An algae treatment was recommended for the next visit to address the algae bloom, treatment of nuisance watermeal and duckweed would be conducted at the same time.



Figure 17: Norton Pond during the July 30th visit

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
25.9	11.03

August 7, 2024 – Survey/Algaecide Treatment/Herbicide Treatment

On August 7th, Aquatic Biologist, Grace Adams, made a visit to Norton Pond. A survey was conducted to assess treatment areas, followed by two treatments; one for the surfacing filamentous algae, and another for the varying densities of duckweed and watermeal.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Filamentous Algae	-
Duckweed	<i>Lemna</i>
Watermeal	<i>Wolffia</i>



Figure 18: Norton Pond during the July 30th visit

Herbicide was applied to control nuisance duckweed and watermeal, which was mixed in with filamentous algae in moderate densities. Additionally, an algaecide was applied to reduce the surfacing filamentous algae. Secchi disk depth indicated great water clarity.

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.

Prior to the treatment, the shoreline was posted with neon signage noting the treatment(s), affiliated water use restrictions, and Water & Wetland contact information. The signs fulfill permit obligations for shoreline posting.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
24.1	10.4

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	
	2'6"

August 29, 2024 – Interim Check-in Visit

On August 29th, Environmental Scientist, Harley Westgate, made a visit to Norton Pond. A survey to check on the algae population was conducted during this visit.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Duckweed	<i>Lemna</i>
Watermeal	<i>Wolffia</i>
Filamentous Algae	-

The visit consisted of an interim assessment of Norton Pond based on abutter complaints and a subsequent request by Framingham Conservation Commission. The visit was conducted one day after this request. The water level appeared to be significantly lower than normal, leaving several feet of muck/mud along the shoreline. This made the pond inaccessible via boat, so the survey was conducted from the shoreline. Filamentous algae was noted throughout a large majority of the pond. Interspersed with the algae was duckweed and watermeal noted at varying densities ranging from trace to moderate. Aside from this, no other nuisance pondweeds were noted. Much of the algae appeared to be browning and in the process of dying, likely from the previous treatment (Figure 18). The algae also appeared to be trapped in very shallow water in many locations throughout the pond. In some locations, the bottom was exposed, thus making dead filamentous and benthic algae visible on the surface.



Figure 19: Norton Pond during the August 29th visit

September 10, 2024 – Post-Season Survey/Water Samples Collected

On September 10th, Environmental Scientists, Jake McNary and Harley Westgate, made a visit to Norton Pond. This visit consisted of collecting water samples and conducting a post-management 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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Filamentous Algae	-
Benthic Algae	-



Figure 20: Mats of decaying algae at Norton Pond

Upon arrival, it was immediately clear that the pond contained surface coverage of filamentous algae across up to 70%. Benthic algae was also noted throughout the pond. Some of the algae was brown and dead, potentially from previous treatments; although the algae had little room to fall from the water column. No rooted or nuisance vegetation was observed during the survey. Water clarity was excellent in areas without algae cover. The water level was very low, as large areas of the shoreline were fully exposed. The low water level was confirmed by beached plant life.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate

lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.

Temperature & Dissolved Oxygen		
Depth	Temp (°C)	DO (mg/L)
Surface	22.7	11.33
1 Foot	22.6	10.99
2 Feet	22.1	10.87

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	1’8”

Sudbury River

The portion of the Sudbury River considered within the management area included from the outlet (a dammed structure), adjacent to Central Street, extending to the area of the Sudbury River that abuts the Mass Pike (Route 90). Access to the River was granted from a boat launch off Centennial Place. Most of this portion of the River is surrounded by woodlands, with developed residential properties scattered throughout the woodlands.



Figure 21: Sudbury River – Framingham, MA

Historically, this portion of the Sudbury River has battled several invasive species including water chestnut, variable milfoil, Eurasian milfoil, fanwort, and curly-leaf pondweed. The goal of the 2024 program was to manage the invasive water chestnut population only, while examining 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, treatments, 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present, and guide future 2024 management; Water samples collected
June 17, 2024	Mid-season survey; Recommendations for invasive species management made
September 10, 2024	A survey was conducted to gauge pond conditions; Water samples collected.

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Sudbury River. An initial survey was conducted to start off the season, allowing an establishment of the species present and to guide 2024 management. Water samples were also collected during the 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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Fanwort*	<i>Cabomba caroliniana</i>
Eurasian Milfoil*	<i>Myriophyllum spicatum</i>
Waterlilies	<i>Nymphaeaceae</i>
Watershield	<i>Brasenia schreberi</i>
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Water Chestnut*	<i>Trapa natans</i>
Yellow Waterlilies	<i>Nuphar variegata</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Filamentous Algae	-
Cattails	<i>Typha</i>
Purple Loosestrife*	<i>Lythrum salicaria</i>
Arrowhead	<i>Sagittaria latifolia</i>
Common Waterweed/Elodea	<i>Elodea canadensis</i>
Floating Leaf Pondweed	<i>Potamogeton natans</i>
Ribbon Leaf Pondweed	<i>Potamogeton epihydrus</i>

Water chestnut densities have been greatly reduced over the years within this stretch of the Sudbury River. Some chestnut was surfaced whereas some was still within the water column. The chestnut was scattered in fairly low density “clumps” or groupings. The water chestnut was predominantly located in the shallow, more stagnant areas. Several water chestnut seeds were observed floating on the surface of the water (Figure 21). Consistent with previous years, several other invasive species are also present within this stretch of the river including variable milfoil, Eurasian milfoil, fanwort, and curly-leaf pondweed. There was a strong presence of native waterlilies along the shoreline. Pollen was noted along the surface in various locations.



Figure 22: Sudbury River during the May 29th visit

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	22.3	7.55
1 Ft	23.2	7.54
2 Ft	22.8	7.47
3 Ft	22.4	7.36

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	2'1" - to the bottom for most of the river

July 30, 2024 – Mid-season Survey

On July 30th, Aquatic Biologist, Grace Adams, made a visit to Sudbury River. This visit included a survey to identify areas of concern for invasive species, specifically water chestnut and fanwort, and to guide recommendations for the rest of the season.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Fanwort*	<i>Cabomba caroliniana</i>
Water Chestnut*	<i>Trapa natans</i>
Purple Loosestrife*	<i>Lythrum salicaria</i>
Thinleaf Pondweed	<i>Potamogeton pusillus</i>
Ribbon Leaf Pondweed	<i>Potamogeton epihydrus</i>
Arrowhead	<i>Sagittaria latifolia</i>
Common Waterweed/Elodea	<i>Elodea canadensis</i>
Waterlilies	<i>Nymphaeaceae</i>
Watershield	<i>Brasenia schreberi</i>

A site visit was conducted at the Sudbury River to evaluate water chestnut populations. The survey focused largely on water chestnut; however, we documented additional species during the visit. The survey indicated that the water chestnut remains at a level where hand pulling is an effective removal method (Figure 22). As the water chestnut seeds continue to develop and drop in August, it is important that removal of the water chestnut occurs as soon as possible. Additionally, fanwort was observed in high densities throughout most of the stretch of river, with some areas experiencing surface mats and flowering. At the time, we recommended hand-pulling efforts be completed by mid-August.



Figure 23: Water Chestnut plants in the Sudbury River during the July 30th visit

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
25.9	7.98

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	
	4'3"

September 10, 2024 – Post-Season Survey/Water Samples Collected

On September 10th Environmental Scientists, Jake McNary and Harley Westgate, made a visit to Sudbury River. The site visit to the designated stretch of the Sudbury River included conducting a survey and collecting water quality data.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Fanwort*	<i>Cabomba caroliniana</i>
Eurasian Milfoil*	<i>Myriophyllum spicatum</i>
Floating Leaf Pondweed	<i>Potamogeton natans</i>
Water Chestnut*	<i>Trapa natans</i>
Filamentous Algae	-
Benthic Algae	-
Tapegrass	<i>Vallisneria americana</i>
Cattails	<i>Typha</i>
Waterlilies	<i>Nymphaeaceae</i>
Coontail	<i>Ceratophyllum demersum</i>
Ribbon-Leaf Pondweed	<i>Potamogeton epihydrus</i>
Arrowhead	<i>Sagittaria latifolia</i>
Pickerelweed	<i>Pontederia cordata</i>



Figure 24: Fanwort on the surface of the water at Sudbury River during the September 10th visit

Due to the reduced densities of water chestnut, no treatments were conducted during the 2024 season. Volunteers conducted hand-pulling of water chestnut during the season. Generally, minimal water chestnut was documented during the survey. As shown on the attached map, water chestnut was still present in some areas but only at trace to sparse densities/cover. Fanwort is overwhelmingly the most dominant invasive species within the stretch of river. This species formed dense walls throughout much of the management area (Figure 23). The fanwort was documented on the sides of the river but in some areas extended well towards the middle of the river. In many cases it was observed as surfacing and forming surface mats. Given the timing of the season, the fanwort appeared to be dying off. Filamentous algae was found stuck on the mats of fanwort. Historically, both variable milfoil, and Eurasian milfoil were found within this stretch of river. Generally, it appears that fanwort is outcompeting both of these species as Eurasian milfoil was only found rooted in one area. Native species including coontail, various pondweeds, and tapegrass were observed during the survey in low densities.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report

Temperature & Dissolved Oxygen		
Depth	Temp (°C)	DO (mg/L)
Surface	19.1	6.47

1 Foot	19.1	6.45
2 Feet	19.0	6.37
3 Feet	19.0	6.34
4 Feet	19.0	5.92

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	4'

Gleason Pond



Figure 25: Gleason Pond – Framingham, MA

Gleason Pond (pictured in Figure 24) is approximately 11.3 acres and is located between Dennison Avenue (to the west and south), Concord Street (to the east), and Prindiville Avenue (to the north). Gleason Pond is primarily surrounded by sparse woodlands, with developed residential properties scattered throughout the woodlands. Gallagher Park abuts the Pond to the east, where access to the Pond was granted. Like other shallow Framingham Ponds, the entirety of Gleason Pond is considered a littoral zone. Gleason Pond is a popular recreational waterbody for fishing.

Historically, Gleason Pond has battled nuisance densities of native pondweeds and invasive species curly-leaf pondweed. The goal of the 2023 program was to monitor the vegetation growth while examining 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, and reporting.

All permitting 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present, and guide future 2024 management; Water samples collected
June 17, 2024	Survey conducted to assess treatment areas; Herbicide treatment applied
September 9, 2024	A survey was conducted to gauge pond conditions; Water samples collected

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Gleason Pond. An initial survey was conducted for the 2024 season, and water samples were collected on site.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Waterlilies	<i>Nymphaeaceae</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Filamentous Algae	
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Coontail	<i>Ceratophyllum demersum</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Bladderwort	<i>Utricularia</i>
White Waterlilies	<i>Nymphaea odorata</i>
Snailseed Pondweed	<i>Potamogeton bicupulatus</i>
Water Chestnut*	<i>Trapa natans</i>

Several native species were documented during the survey. These predominantly included Robbin's pondweed and waterlilies; however, bladderwort was also found. Filamentous algae was mixed in within the vegetation and occasionally on the surface. Two invasive species were documented. These included curly-leaf pondweed which was found along some shorelines in intermittent clusters (see map). Water chestnut was established within the water column along the eastern shoreline. Pollen was noted on the surface along wind-blown shorelines. This is not to be confused with microscopic algae. Water samples were collected, preserved, and shipped to the lab for analysis.

Based on the survey, treatment of curly-leaf pondweed was warranted, given that this species is invasive. We recommended that water chestnut be hand-pulled later in the season, prior to seeds dropping (typically in mid-August). We noted that this could either be accomplished by volunteers, or Water & Wetland could provide a crew to hand-pull the invasive water chestnut.



Figure 26: Curly-leaf pondweed seen in Gleason Pond during the May 29th survey

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report.

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	25.7	8.42
1 ft	25.6	8.4
2 ft	24.7	7.93
3 ft	23.9	7.63
Bottom	23.8	6.75

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	2'4" - to vegetative cover

June 17, 2024 – Survey/Herbicide Application

On June 17th, Senior Aquatic Biologist, Colin Gosselin, and Aquatic Field Assistant, Harley Westgate, made a visit to Gleason Pond. This site visit consisted of a survey and an application of herbicide, specifically targeting invasive and nuisance plant species.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Waterlilies	<i>Nymphaeaceae</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Filamentous Algae	
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Coontail	<i>Ceratophyllum demersum</i>
Thinleaf Pondweed	<i>Potamogeton pusillus</i>
Bladderwort	<i>Utricularia</i>
White Waterlilies	<i>Nymphaea odorata</i>
Snailseed Pondweed	<i>Potamogeton bicupulatus</i>
Water Chestnut*	<i>Trapa natans</i>

Consistent with the pre-management survey, dense waterlilies (native) were documented along the shoreline (Figure 26) with some areas free from waterlilies along the eastern shoreline. Robbin’s pondweed (native) dominated the submersed vegetation population. Curly-leaf pondweed was interspersed within the Robbin’s pondweed. Minimal filamentous algae was documented. As planned, the treatment targeted just invasive curly-leaf pondweed. The liquid contact herbicide was applied using a treatment boat equipped with a calibrated sub-surface injection system. Excellent coverage was achieved within the treatment areas. Curly-leaf pondweed is susceptible to low concentrations of diquat that will likely only minimally impact the native, beneficial Robbin’s pondweed. Posters were hung prior to treatment and Gleason Pond was included within the newspaper notification for the season. The signs fulfill permit obligations for shoreline posting.



Figure 27: Dense waterlily cover seen during the June 17th survey

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
27.1	8.53

September 9, 2024 – Post-Season Survey/Water Samples Collected

On September 9th, Environmental Scientist, Harley Westgate, made a visit to Gleason Pond. The site visit included conducting a post management survey and taking water samples.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Bladderwort	<i>Utricularia</i>
Waterlilies	<i>Nymphaeaceae</i>
Benthic Algae	-
Coontail	<i>Ceratophyllum demersum</i>
Purple Loosestrife*	<i>Lythrum salicaria</i>



Figure 28: Robbins pondweed seen during the September 9th survey

Around the perimeter of the pond, waterlilies appeared in sparse to dense densities, varying from dense areas of coverage to small, scattered patches. Within the water column, Robbins' pondweed was the most common rooted vegetation, though most of the benthic portion of the pond was in various states of decay. Occasional columns of decaying pondweeds rose from the water column and surfaced, most covered in epiphytic algae. Throughout most of the pond, water clarity was to the bottom. No invasive species were documented.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the "Water Quality" section of the report.

Temperature & Dissolved Oxygen		
Depth	Temp (°C)	DO (mg/L)
Surface	21.7	8.94
1 Foot	21.4	8.85
2 Feet	21.2	8.04
3 Feet	20.9	7.68
4 Feet	20.9	7.62

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	4'1" - to the bottom

Learned Pond

Learned Pond (pictured in Figure 28) is approximately 33.9 acres with a maximum depth of roughly 13 feet. Learned Park and Beach compromise most of the eastern shoreline, which is open to the public. The boat launch (where access to the Pond was granted), is adjacent to the Learned Park and Beach, off Shawmut Terrace. Learned Pond is a popular recreational waterbody for activities such as fishing and swimming. The Pond is surrounded by sparse woodlands, with developed properties scattered within the woodlands. The majority of the residential properties are found along the western and northern shorelines.

Historically, Learned Pond has battled nuisance algal blooms and occasionally nuisance densities of native pondweeds. The goal of the 2024 program was to monitor the conditions within the Pond while examining 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, and reporting.

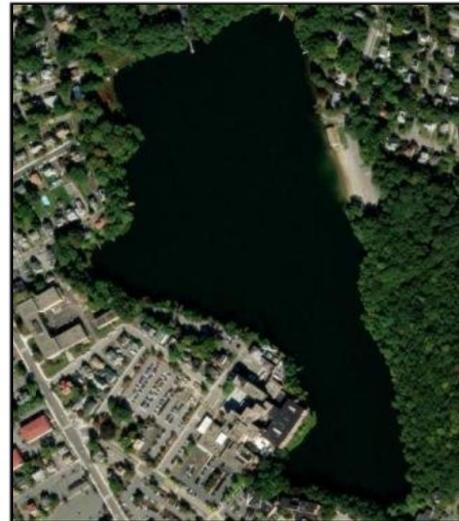


Figure 29: Learned Pond – Framingham, MA

All permitting 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 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present, and guide future 2024 management; Water samples collected
September 9, 2024	A survey was conducted to gauge pond conditions; Water samples collected

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Learned Pond. An initial survey was conducted for the 2024 season, and water samples were collected on site.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Cattails	<i>Typha</i>
Waterlilies	<i>Nymphaeaceae</i>
Filamentous Algae	-
Low-water milfoil	<i>Myriophyllum humile</i>
Ribbon Leaf Pondweed	<i>Potamogeton epihydrus</i>
Benthic Algae	-

Consistent with previous years at Learned Pond, no invasive species were found. The water clarity was excellent. A healthy assemblage of native species was documented. One patch of low-water milfoil was found (pictured in Figure 29 to the right). This is a native milfoil. Cattails were documented along the shoreline in healthy densities. Pollen was found along the surface in wind-blown areas, which is common this time of year. This is not to be confused with microscopic algae.



Figure 30: Native low-water milfoil seen in Learned Pond during the May 29th

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	23.9	9.33
1 ft	23.7	9.29
2 ft	23.5	9.27
3 ft	23.1	9.14
4 ft	23.0	9.12
5 ft	22.9	9.05
6 ft	22.9	8.99
7 ft	22.4	8.87
8 ft	22.1	8.45
9 ft	21.5	8.02
Bottom	20.9	7.97

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	10'10" - to bottom

September 9, 2024 – Post-Season Survey/Water Samples Collected

On September 9th, Environmental Scientist, Harley Westgate, made a visit to Learned Pond. The site visit to Learned Pond included conducting a survey and collecting water quality samples.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Bladderwort	<i>Utricularia</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Waterlilies	<i>Nymphaeaceae</i>
Robbin's Pondweed	<i>Potamogeton robbinsii</i>
Tapegrass	<i>Vallisneria americana</i>
Cattails	<i>Typha</i>



Figure 31: Conditions during the September 9th survey

Overall, Pond clarity was low due to an apparent microscopic algae bloom. The pond's perimeter contained patches of native waterlilies varying from sparse to dense densities. Floating, decaying pondweeds could be seen across the waterbody, species included bladderwort, thin-leaf pondweed, and tapegrass. The beach appeared to be largely clear of rooted vegetation, though some uprooted and decaying plants were seen in the water in that area.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the "Water Quality" section of the report.

Temperature & Dissolved Oxygen		
Depth	Temp (°C)	DO (mg/L)
Surface	22.1	7.98
1 Foot	22.1	7.97
2 Feet	21.9	7.82
3 Feet	21.6	7.61
4 Feet	21.6	7.59
5 Feet	21.4	7.46

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	3'7"

Waushakum Pond

Waushakum Pond (pictured in Figure 31 below) is located in both Framingham and Ashland and is approximately 80 acres. Most of the waterbody falls within Framingham city boundaries, as only the southern cove is in Ashland (town boundaries fall at the end of Shore Road on the western shoreline and between Willis Avenue and Waushakum Avenue along the eastern shoreline). The Pond is primarily surrounded by sparse woodlands, shrubbery, and developed residential properties. Waushakum Beach is located along the northern shoreline. Waushakum Pond is a popular recreational waterbody for activities such as fishing, boating, and swimming. Access to the Pond is granted from the southern cove, on the corner of Washington Avenue and Lakeside Drive.



Figure 32: Waushakum Pond – Framingham/
Ashland, MA

Historically, Waushakum Pond has battled invasive species variable milfoil along with nuisance densities of pondweeds. The Pond has also battled potentially harmful algae, including in 2024. The goal of the 2024 program was to manage the invasive variable milfoil population and nuisance densities of pondweeds while examining basic water quality through a proactive monitoring schedule. This would be accomplished by implementing an Aquatic Management Program that focused on performing all applicable tasks, including planning, permitting, surveys, treatments, and reporting.

All permitting, treatments, 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. In addition to these tasks, algae samples were collected at frequent intervals throughout the 2024 season. These results are included within the water quality section of this report.

Summary of 2024 Management Activities

Date	Task/Description
May 29, 2024	An early-season survey was performed to document baseline conditions of the Pond, note the current vegetative species/densities present, and guide future 2024 management; Water samples collected
June 17, 2024	A survey was conducted to affirm treatment areas on both the Framingham and Ashland sides, herbicide treatments were applied for the control of nuisance/invasive pondweeds
September 10, 2024	A survey was conducted to gauge pond conditions; Water samples collected

May 29, 2024 – Early-Season Survey/Water Samples Collected

On May 29th, Senior Environmental Scientist, James Lacasse, and Aquatic Field Assistant, Harley Westgate, made a visit to Waushakum Pond. An initial survey was conducted for the 2024 season, and water samples were collected on site.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Common Waterweed/Elodea	<i>Elodea canadensis</i>
Waterlilies	<i>Nymphaeaceae</i>
Filamentous Algae	-
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Coontail	<i>Ceratophyllum demersum</i>
Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Benthic Algae	-
Clasping Leaf Pondweed	<i>Potamogeton perfoliatis</i>
Cattails	<i>Typha</i>

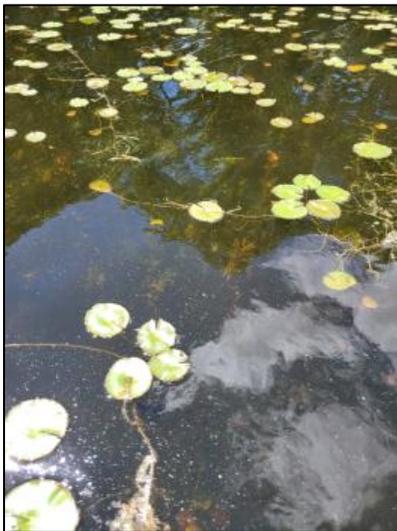


Figure 33: Waushakum Pond during the May 29th visit

Consistent with historical records, two invasive species were documented during the survey. These include curly-leaf pondweed (see Figure 33) and variable milfoil. These species have expanded since 2023. Curly-leaf pondweed was the primary invasive species located throughout the littoral zone (see map). Many native species were observed including thin-leaf pondweed, elodea, clasping leaf pondweed, waterlilies, and coontail. Clasping leaf pondweed, coontail, and elodea were the most prominent species documented. Waterlilies were seen around the perimeter of the pond. Cattails were also noted at the shoreline in a handful of locations. Water samples were collected, preserved, and shipped to the lab for analysis. There were no signs of an algal bloom. Pollen was seen along wind-blown shorelines and should not be confused with microscopic algae.

Although two invasive species were documented, the most nuisance species in Waushakum Pond have historically been native species. These include clasping leaf pondweed, elodea, and coontail. Only triclopyr herbicide is allowed for use in Waushakum for nuisance/invasive aquatic weed control. Triclopyr works somewhat slowly but will impact both milfoil and curly-leaf pondweed. We also anticipated some impacts to the nuisance native species. Our plan was to target the

usual amount of acreage in both Framingham and Ashland. Areas will include the densest areas of nuisance and invasive species.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report

Temperature & Dissolved Oxygen		
Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	25.2	10.08
1 ft	25.0	9.96
2 ft	24.8	9.85
3 ft	24.5	9.65
4 ft	23.6	8.74
5 ft	22.9	8.34
6 ft	22.7	8.25
7 ft	21.8	7.87
8 ft	20.9	7.62
9 ft	20.1	6.97
10 ft	19.2	7.62

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	8'6"

June 17, 2024 – Survey/Herbicide Application

On June 17th, Senior Aquatic Biologist, Colin Gosselin, and Aquatic Field Assistant, Harley Westgate, made a visit to Waushakum Pond. During this site visit, a survey was conducted to assess treatment areas, and an herbicide application was made using approved herbicide Triclopyr.

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Common Waterweed/Elodea	<i>Elodea canadensis</i>
Waterlilies	<i>Nymphaeaceae</i>
Filamentous Algae	-
Variable Milfoil*	<i>Myriophyllum heterophyllum</i>
Coontail	<i>Ceratophyllum demersum</i>

Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Curly-leaf Pondweed*	<i>Potamogeton crispus</i>
Benthic Algae	-
Clasping Leaf Pondweed	<i>Potamogeton perfoliatis</i>
Cattails	<i>Typha</i>

Consistent with the pre-management survey, the Ashland portion of Waushakum contained heavy growth of variable milfoil and elodea. Densities have increased since the May pre-management survey. The majority of the plants were just below the water’s surface. On the Framingham side, the densest areas were along the beach, and in the shallow areas. This predominantly included clasping leaf pondweed, which although native, was topped out in many areas. Thin-leaf pondweed was also fairly dense in certain areas. There were no visible signs of a potentially harmful algal bloom, although based on the most recent algae sampling results, which documented cyanobacteria counts > 10,000 cells/mL, another sample was collected from the beach.

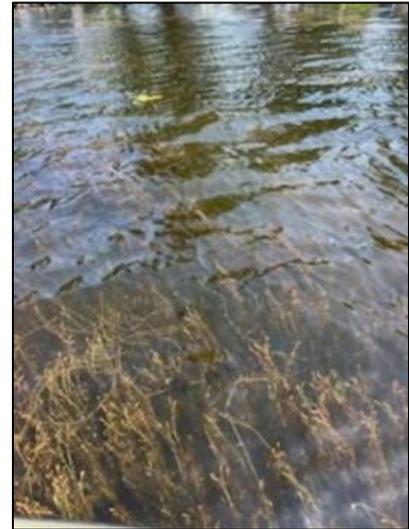


Figure 34: Pondweeds in Waushakum Pond during the June 17th visit

The treatment area focused on the shoreline of the Ashland portion along with a channel up the middle of the Ashland side (contract with Ashland – 5 acres), and on the Framingham side the treatment area focused on the shoreline of the eastern cove near the beach and a portion of the northwestern cove (contract with Framingham – 10 acres). The treatment utilized triclopyr herbicide as this is the only herbicide allowed by Natural Heritage Endangered Species Program (NHESP) at this time. Triclopyr is only labeled for some of the targets in Waushakum Pond, although it has historically worked fairly well at controlling many of the nuisance species in the pond. Prior to the treatment, Framingham’s contracted botanist, John Burns, collected the required pre-treatment information and submitted it to NHESP. Additionally, a newspaper ad was posted, and neon-colored signs with Water & Wetland contact information were posted in English, Spanish, and Portuguese according to guidelines.

The liquid herbicide, triclopyr, 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.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
22.0	8.91

September 10, 2024 – Post-Season Survey/Water Samples Collected

On September 10th, Environmental Scientists, Harley Westgate and Jake McNary, made a visit to Waushakum Pond. The site visit included conducting a survey and collecting water quality data

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. (*) denotes an invasive species.

Species Identified	
Common Name	Latin Name
Benthic Algae	-
Waterlilies	<i>Nymphaeaceae</i>
Clasping Leaf Pondweed	<i>Potamogeton perfoliatis</i>
Tapegrass	<i>Vallisneria americana</i>
Microscopic Algae	-
Curly-Leaf Pondweed*	<i>Potamogeton crispus</i>



Figure 35: Water clarity in Waushakum Pond during the September 10th visit

The majority of the pond was free from nuisance rooted vegetation and much of the littoral zone was occupied by benthic algae. The northern shoreline contained the most abundant rooted plant growth; however, densities only reached moderate. Species in this area included tapegrass and clasping leaf pondweed. To the side of the beach, clasping-leaf pondweed was the most dominant species. Throughout the entirety of the waterbody, clasping-leaf pondweed and waterlilies appear to be the most dominant species. Variable milfoil was not found during the survey and only a handful of immature curly-leaf pondweed plants were found in one area (see attached map). The triclopyr (the only herbicide allowed in Waushakum Pond) treatment appeared to have reduced densities of clasping-leaf pondweed, and consistent with what we expected, controlled variable milfoil, curly-leaf pondweed, as well as reduced/controlled coontail and elodea.

We were pleased to see good water clarity throughout the littoral zone of the pond (Figure 34). The water did have a slight green tint; however, the previous microscopic algae bloom appeared to have subsided. There was no evidence of surface scum.

The water samples were collected, properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab analyzed the samples for the contracted/required parameters. The results are listed in a table in the “Water Quality” section of the report

Temperature & Dissolved Oxygen

Depth	Surface Temp (°C)	Surface DO (mg/L)
Surface	23.0	8.26
1 ft	23.0	8.27
2 ft	22.8	8.25
3 ft	22.8	8.21
4 ft	22.4	8.19
5 ft	22.1	8.12
6 ft	21.6	8.05
7 ft	21.4	7.89
8 ft	21.0	7.64
9 ft	20.7	7.47
10 ft	20.4	7.43

Secchi Disk Clarity	
Secchi Disk Depth (Feet)	11'4"

Water Quality Sampling Results

During the May 29th and September 9th–10th survey events, water samples were collected from each of the Framingham Ponds mentioned above. Samples were collected from the middle of the ponds, preserved and immediately shipped to a certified laboratory where they were analyzed for the specific contracted parameters. The samples were analyzed for Alkalinity, Chlorophyll a, Conductivity, Hardness, Nitrates & Nitrites, Nitrogen – Total (Kjeldahl), pH, Phosphorus – Free Reactive, Phosphorus – Total, Turbidity, and E. Coli colony counts. All samples collected were “surface grabs.” Dissolved oxygen and temperature were measured using a calibrated meter during each site visit; these values are located within the details of each visit listed above.

Water quality in lakes and ponds is constantly changing and is altered by many environmental factors. The samples collected during the two site visits provide a baseline and the results depict a “snap-shot” of the results specific to the sampling date. The results from the two sampling events, as well as a description of each parameter are included in the tables below.

As shown below, one table for each waterbody is included. We understand that this is quite a bit of data. For ease, we have highlighted any results which we have deemed as being outside of a standard range. These parameters are described below and their matching results are highlighted in each pond’s specific table.

Big Farm Pond – The only notable outlier in Big Farm Pond was slightly high pH during the Spring sampling. This indicates notably basic water.

Little Farm Pond – The water quality in Little Farm Pond is generally desirable, although the total phosphorus during the Spring sampling was slightly elevated at 33.5 ppb. The September sample however,

documented reduced total phosphorus and nearly half of the total phosphorus compared to the September 2023 sample.

Mohawk Pond – The Chlorophyll a results for the September sampling indicated increased algae production. Total phosphorus during both samplings was elevated; however, the total phosphorus results were lower than the 2023 results during both samplings.

Norton Pond – Results were similar to that of the 2023 samplings. The total phosphorus was elevated during both sampling results, most notably in the Spring. This is also consistent with the 2023 samplings. TKN was slightly elevated during both samplings.

Sudbury River – Total phosphorus was slightly elevated during the Spring sampling. This result is nearly identical to the 2023 Spring sampling result. The September total phosphorus result was much more favorable and nearly half the total phosphorus of the 2023 September sampling.

Gleason Pond – Total phosphorus was slightly elevated during both samplings. The results were very consistent with the 2023 results.

Learned Pond – Total phosphorus was slightly elevated during the September sampling only. During the 2023 sampling, alkalinity results were low; however, this year they were much more within a desirable range.

Waushakum Pond – Total phosphorus was elevated during the Spring sampling. The results during the September sampling were much more within a desirable range, and lower than the 2023 September sampling results.

2024 Water Quality Results – Big Farm Pond			
Parameter	Units	5/29/2024	9/10/2024
Alkalinity	mg/L	40.3	49.5
Chlorophyll a	µg/L	<10	<10
Conductivity	uS/cm	1338.1	1167.9
Hardness	mg/L CaCO ₃	80.1	90.5
Nitrates + Nitrites	mg/L	0.11	0.08
Nitrates	mg/L	0.11	0.08
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	<5	<5
Phosphorus (Total)	µg/L	12.6	12.5
Turbidity	NTU	3.2	2.8
E. Coli	CFU/100mL	<1	8.6
Total Kjeldahl Nitrogen	mg/L	0.29	0.67
pH	S.U.	9.7	7.2

2024 Water Quality Results – Little Farm Pond			
Parameter	Units	5/29/2024	9/9/2024
Alkalinity	mg/L	43.5	64.5
Chlorophyll a	µg/L	<10	<10
Conductivity	uS/cm	1316.2	1068.7
Hardness	mg/L CaCO ₃	80.1	91.4
Nitrates + Nitrites	mg/L	0.09	0.08
Nitrates	mg/L	0.09	0.08
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	<5	<5
Phosphorus (Total)	µg/L	33.5	24.3
Turbidity	NTU	3.4	3
E. Coli	CFU/100mL	4.1	4.1
Total Kjeldahl Nitrogen	mg/L	0.68	0.36
pH	S.U.	8.8	7.3

2024 Water Quality Results – Mohawk Pond			
Parameter	Units	5/29/2024	9/9/2024
Alkalinity	mg/L	26	24.2
Chlorophyll a	µg/L	13.1	105.3
Conductivity	uS/cm	312.8	246.4
Hardness	mg/L CaCO ₃	41.8	35.6
Nitrates + Nitrites	mg/L	0.52	0.06
Nitrates	mg/L	0.52	0.06
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	<5	5.3
Phosphorus (Total)	µg/L	35.5	70.1
Turbidity	NTU	4	6.6
E. Coli	CFU/100mL	178.2	7.4
Total Kjeldahl Nitrogen	mg/L	0.62	1.08
pH	S.U.	6.9	7.6

2024 Water Quality Results – Norton Pond			
Parameter	Units	5/29/2024	9/10/2024
Alkalinity	mg/L	37	32.4
Chlorophyll a	µg/L	22.3	<10
Conductivity	uS/cm	364.2	242.3
Hardness	mg/L CaCO ₃	40.1	32.5
Nitrates + Nitrites	mg/L	0.42	<0.02
Nitrates	mg/L	0.42	<0.02
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	6.0	<5
Phosphorus (Total)	µg/L	73.6	25.7
Turbidity	NTU	3.7	2.9
E. Coli	CFU/100mL	17.1	19.5

Total Kjeldahl Nitrogen	mg/L	1.08	1.08
pH	S.U.	7.1	8.4

2024 Water Quality Results – Sudbury River			
Parameter	Units	5/29/2024	9/10/2024
Alkalinity	mg/L	23.7	29.1
Chlorophyll a	µg/L	<10	<10
Conductivity	uS/cm	470.1	417.4
Hardness	mg/L CaCO ₃	38.5	44.1
Nitrates + Nitrites	mg/L	0.36	0.1
Nitrates	mg/L	0.36	0.1
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	5.2	<5
Phosphorus (Total)	µg/L	35.3	18.3
Turbidity	NTU	3.5	3.1
E. Coli	CFU/100mL	68.3	31.8
Total Kjeldahl Nitrogen	mg/L	0.55	0.59
pH	S.U.	7.1	6.7

2024 Water Quality Results – Gleason Pond			
Parameter	Units	5/29/2024	9/9/2024
Alkalinity	mg/L	26.7	38.1
Chlorophyll a	µg/L	20.3	10.1
Conductivity	uS/cm	987.2	877.5
Hardness	mg/L CaCO ₃	33.0	37.2
Nitrates + Nitrites	mg/L	0.12	0.08
Nitrates	mg/L	0.12	0.08
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	<5	6.8
Phosphorus (Total)	µg/L	41.3	30.2
Turbidity	NTU	3	3.4
E. Coli	CFU/100mL	1.0	18.5
Total Kjeldahl Nitrogen	mg/L	0.58	0.39
pH	S.U.	7	6.9

2024 Water Quality Results – Learned Pond			
Parameter	Units	5/29/2024	9/9/2024
Alkalinity	mg/L	<10	12.5
Chlorophyll a	µg/L	<10	56.8
Conductivity	uS/cm	609.7	491.0
Hardness	mg/L CaCO ₃	17.6	18.0
Nitrates + Nitrites	mg/L	0.18	0.07
Nitrates	mg/L	0.18	0.07
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	5.1	<5

Phosphorus (Total)	µg/L	14.3	31.7
Turbidity	NTU	2.5	7.2
E. Coli	CFU/100mL	3.0	206.4
Total Kjeldahl Nitrogen	mg/L	0.3	0.82
pH	S.U.	7	7

2024 Water Quality Results – Waushakum Pond			
Parameter	Units	5/29/2024	9/10/2024
Alkalinity	mg/L	26.2	34.9
Chlorophyll a	µg/L	11.5	<10
Conductivity	uS/cm	496.5	401.1
Hardness	mg/L CaCO ₃	43.0	18.8
Nitrates + Nitrites	mg/L	0.18	0.07
Nitrates	mg/L	0.18	0.07
Nitrites	mg/L	<0.02	<0.02
Phosphorus (Free Reactive)	µg/L	<5	<5
Phosphorus (Total)	µg/L	49.9	17.8
Turbidity	NTU	2.9	3.0
E. Coli	CFU/100mL	3.1	5.2
Total Kjeldahl Nitrogen	mg/L	0.55	0.55
pH	S.U.	9.1	7

Water Quality Parameter Table
<p>Turbidity: Turbidity is either planktonic organisms or suspended solid particulates (algae, clay, silt, dead organic matter) in the water column that interfere with the penetration of light. The more suspended material throughout the water column, the higher the turbidity.</p> <p><i><10 NTU drinking water standards; 10-50 NTU is considered moderate; >50 NTU potentially impactful to aquatic life.</i></p>
<p>Total Alkalinity: Measure of the buffering capacity of water, primarily consisting of carbonate, bicarbonate, and hydroxide in typical freshwater. Waters with lower levels are more susceptible to pH shifts.</p> <p><i>>20 mg/l is considered healthy; ~50 mg/l illustrates the water is resistant to change.</i></p>
<p>Hardness: Measure of the concentration of divalent cations, primarily consisting of carbonate, bicarbonate, and hydroxide in typical freshwaters. Waters with lower levels are more susceptible to pH shifts.</p> <p><i>0-60mg/L as CaCO₃ soft; 61-120 moderately hard; 121-180 very hard</i></p>
<p>Conductivity: Measure of the waters ability to transfer an electrical current, increases with more dissolved ions.</p>

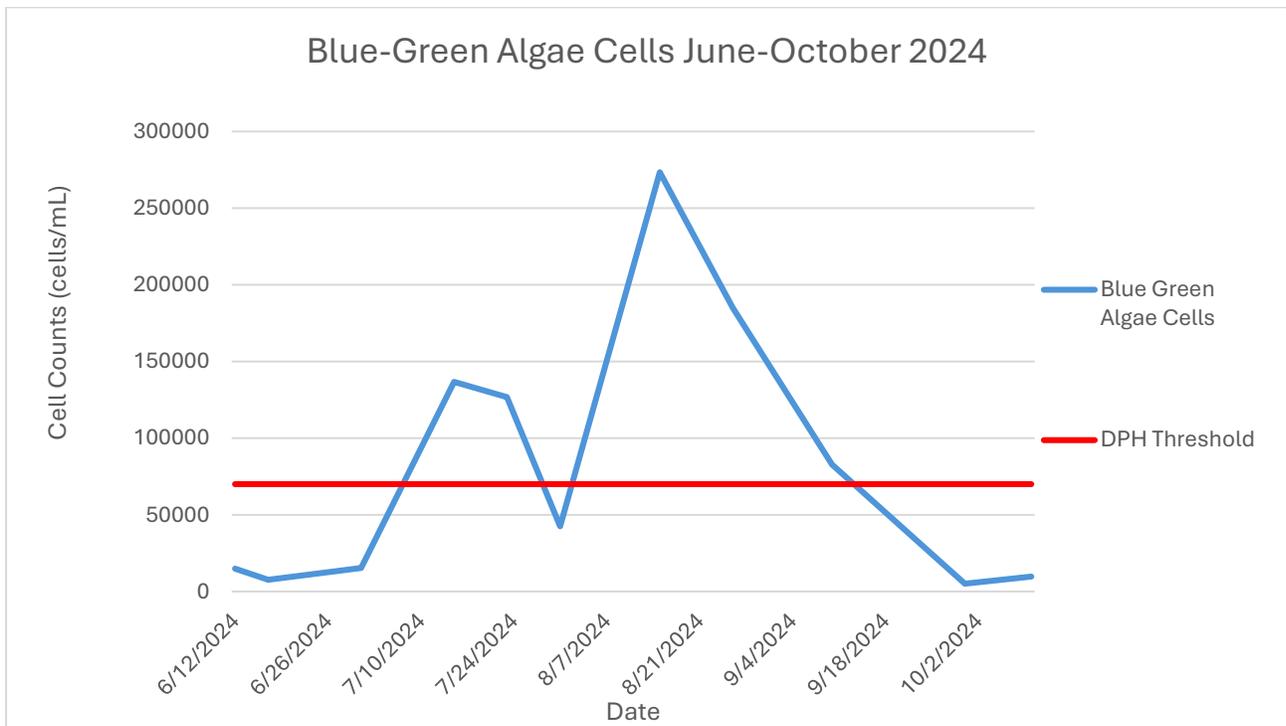
<p><i>50 uS/cm relatively low concentration may not provide sufficient dissolved ions for ecosystem health; 50-1500 typical freshwaters; >1500 may be stressful to some freshwater organisms, though not uncommon in many areas</i></p>
<p>Nitrogen, Nitrate: Nitrate nitrogen is important to the growth of algae. Nitrate is the oxidized nitrogen and is often readily free for algae uptake.</p>
<p><i><1 mg/l typical for freshwater; 1-10 mg/l is potentially harmful; >10 mg/l possibly toxic.</i></p>
<p>Chlorophyll a: Chlorophyll a is the primary light harvesting pigment found in algae and a measure of the algal productivity and water quality in a system.</p>
<p><i>0-2.6 ug/L oligotrophic; 2.7-20 ug/L mesotrophic; 21-56 ug/L eutrophic; >56 ug/L hypereutrophic.</i></p>
<p>Total Kjeldahl Nitrogen (TKN): Total Kjeldahl Nitrogen (TKN) is the organic and ammonia forms of nitrogen. Nitrogen is essential for living organisms to live in a pond.</p>
<p><i>Generally, concentrations below 1.0 mg/l are considered desirable.</i></p>
<p>Total Phosphorus: Total phosphorous is a nutrient that is essential for plants and algae to grow. Typically, a value of .03 mg/l, or 30 parts per billion, is sufficient enough to stimulate excessive plant and algae growth. This sample measures all forms of phosphorus in the water column.</p>
<p><i><12 ppb is considered nutrient deficient or oligotrophic; 12-24 ppb is considered a moderate amount of nutrients, or mesotrophic; 25-96 ppb is nutrient rich, or eutrophic; >96 ppb is considered excessive nutrients, or hypereutrophic.</i></p>
<p>Soluble Phosphorus: Soluble phosphorous is the measure of filterable soluble and inorganic phosphorus. This form of phosphorus is directly taken up by plant cells.</p>
<p>pH: the measure of how acidic or basic the water is.</p>
<p><i><6 notably acidic; 6-9 standard for freshwaters (7 is neutral); >9 notably basic.</i></p>
<p>Temperature: the amount of dissolved oxygen a pond can hold is largely determined by water temperature. When the water temperature is cooler, it can hold more oxygen. Generally, water cannot hold oxygen at a level that supports fish and aquatic life when above 85 degrees Fahrenheit.</p>
<p>Dissolved Oxygen: amount of diatomic oxygen dissolved in the water. Dissolved oxygen can be affected by many outside factors, such as: temperature, time of day, and pollution. Fish and other aquatic organisms typically require a minimum of four to five milligrams per liter (mg/l) of oxygen.</p>
<p><i>< 2 mg/l likely toxic with sufficient exposure duration; <5 mg/l stressful to many aquatic organisms; >5 mg/l able to support most fish and invertebrates.</i></p>

Waushakum Pond Algae Sampling Results

Throughout the season, samples were collected, preserved and shipped on ice via FedEx overnight to SePro Labs in North Carolina, where they were identified for algae species and enumeration.

Blue-green algae/cyanobacteria occur in aquatic ecosystems and have the ability to produce toxins. These toxins can pose a risk to human and animal health. The Massachusetts Department of Public Health (MA DPH) recommends an advisory when cell counts exceed 70,000 per mL of water. Dense blooms and scum can contain millions of cells/mL and toxin levels in the parts per million. They can form near embankments and in areas suitable for swimming and other forms of recreation. They can also move around in the water body and grow quickly, making management of them difficult. The results for the algae sampling program were all well below the concerning threshold of 70,000 counts/mL.

As shown in the table below, cyanobacteria cell counts peaked at 273,440 cells/mL in August. This is very concerning, given the risks associated with high populations of cyanobacteria/blue-green algae described above. Waushakum Pond spent a portion of the summer closed to the public. Treatments are prohibited when a public health advisory is in place. Additionally, copper sulfate was not approved for use in Waushakum Pond during the 2024 season. Recommendations specific to algae/nutrient management are included within the recommendations section below.



Summary / 2025 Recommendations

The 2024 season was successful as all tasks were completed without issue, and great lines of communication between the City (specifically Conservation) and Water & Wetland were kept open at all times. The 2024 season again brought challenging conditions. Significant drought was experienced during the 2024 season, leading to much lower water levels than normal. In Norton Pond specifically, much of the shoreline was exposed, algae was excessive and despite the treatments, the dead algae was unable to

fall from the water column. Generally, the extreme conditions with high water and air temperatures, paired with little flow and low water levels promoted excessive weed and algae growth within many area waterbodies. Waushakum Pond specifically again faced challenges throughout the Summer. Given this, recommendations are bulleted below; however, similar to last year, we provided additional recommendations and narrative specific to Waushakum Pond.

Learned Pond – 2025 Recommendations

- Pre-Management survey to document conditions and to guide the need for any potential management. All management should be based on survey data.
- Late-Season/post-management survey to document conditions, update the management plan, and to assess any management conducted, if applicable.
- Continued water quality analysis, to be paired with surveys.

Gleason Pond – 2025 Recommendations

- Pre-Management survey to document conditions and to guide the need for any potential management. All management should be based on survey data.
- Late-Season/post-management survey to document conditions, update the management plan, and to assess any management conducted, if applicable.
- Continued water quality analysis, to be paired with surveys.
- Potential need for waterlily treatment in August or September, to be based on survey data.
- Treatment of curly-leaf pondweed, which is an invasive species (May).

Big Farm Pond & Little Farm Pond – 2025 Recommendations

- Whole Pond Sonar (fluridone) treatment programs to provide overall weed control. In lieu of Sonar, use of contact herbicides paired with treatment of water chestnut with Imazamox.
- Waterlily treatment (Little Farm Pond only)
- Prior to any management, proper approvals from Natural Heritage Endangered Species Program (NHESP) will need to be obtained.
- Continued early and late season surveys paired with water quality collection.

Mohawk Pond – 2025 Recommendations

- Pre-Management survey to document conditions and to guide the need for any potential management. All management should be based on survey data.
- Late-Season/post-management survey to document conditions, update the management plan, and to assess any management conducted, if applicable.

- Continued water quality analysis, to be paired with surveys.
- Interim monitoring visits to document changing conditions and to assess the need for management throughout the season.
- Treatments of nuisance and invasive species based on survey data. Consider Procellacor herbicide for milfoil control.

Norton Pond – 2025 Recommendations

- Pre-Management survey to document conditions and to guide the need for any potential management. All management should be based on survey data.
- Late-Season/post-management survey to document conditions, update the management plan, and to assess any management conducted, if applicable.
- Continued water quality analysis, to be paired with surveys.
- Interim monitoring visits to document changing conditions and to assess the need for management throughout the season.
- Treatments of nuisance and invasive species based on survey data.
- Polyaluminum chloride treatments to bind phosphorus within the water column.
- Add AquaSticker, an adjuvant which can be paired with algaecide treatments. This product made by NaturaLake assists with the breakdown of the algae post-treatment. Although much of the algae died through treatments during the 2024 season, the shallow conditions led to dead floating algae mats throughout large portions of the season.

Sudbury River – 2025 Recommendations

- Pre-Management survey to document conditions and to guide the need for any potential management.
- Late-Season/post-management survey to document conditions, update the management plan, and to assess any management conducted.
- Continued water quality analysis, to be paired with surveys.
- Hand-pulling of water chestnut, and treatments with imazamox if densities exceed those which can be reasonably controlled through hand-pulling alone.
- Consider future management of other invasive species as water chestnut continues to decrease. Species include fanwort, variable milfoil, Eurasian milfoil, curly-leaf pondweed. Treatments are most applicable; however, herbicide choice should consider target species, flow, and control provided.

- Fanwort is by far the most dominant invasive species within this stretch of the Sudbury River. Fanwort spreads through fragmentation. Mechanical removal with machines such as a mechanical harvester or hydro-rake would not only be tremendously expensive but would not provide multi-year control. Most importantly, heavy equipment allows fragments to escape which promotes the spread of the invasive fanwort. Stocking of triploid grass carp was considered, however grass carp will typically eat many beneficial native species prior to turning to species such as fanwort and milfoil. Additionally, grass carp are prohibited in Massachusetts. Benthic mats shade sunlight which will control the target invasive species, but they are 1) non-selective, 2) costly (roughly \$40,000-\$60,000 per acre) and 3) require maintenance. For the reasons listed, benthic mats are great for small beach or swimming areas but not to control invasive species throughout entire waterbodies. Lastly, manual control such as diver assisted suction harvesting (DASH) was considered. DASH is the process of lake weed removal in which a diver visually identifies the plant being targeted, removes it by the root system, and deposits it into a containment bag at the surface via a suction hose, allowing for bulk removal. By Removing the invasive or nuisance species that is causing the problem, the capability of native plants to repopulate the areas that they have been pushed out of increases, giving the system a chance to return to a natural balance. The extraction of each plant by its root system is important as it provides carry-over control into subsequent years. As areas extend beyond smaller areas (>.25 acres) or greater than sparse to moderate density, DASH becomes not only difficult and time consuming but also extremely cost prohibitive. Typically, densities that exceed 100 stems per acre become difficult to manage through DASH, this will be considered annually when determining the most appropriate techniques for spot-management of invasive species regrowth. Based on the above alternatives analysis, the use of EPA/MA approved aquatic herbicides is not only the most cost-effective management approach for the initial management of fanwort and milfoil within the stretch of Sudbury River, but also the most effective. Based on the vegetation assemblage and target invasive plants, several herbicides were considered. Only two MA/EPA approved herbicides provide effective control of fanwort. The first is flumioxazin (Clipper, Schooner, or equivalent). Clipper is a contact herbicide that provides season long control. It works very quickly, which makes it a good choice for spot-treatment. Unfortunately, flumioxazin has restrictions to the amount of treatment in Massachusetts and it does not provide carry over control. Sonar (fluridone) is an aquatic herbicide that was initially registered with the Environmental Protection Agency (EPA) in 1986 and has been used throughout Massachusetts and the United States for decades. The herbicide inhibits the photosynthesis process by stopping plants from making a protective pigment that keeps chlorophyll from breaking down in the sunlight. Fluridone moves quickly throughout a waterbody and is therefore usually applied as a whole lake/basin treatment. as is This type of approach typically provides 2-3 seasons of nuisance level control of fanwort, potentially more. Sonar also provides rate specific selectivity with minimal impact to many non-target native pondweeds. Unfortunately, Sonar requires maintaining a concentration of the fluridone. This means that the flow of the Sudbury River may be limiting to use of Sonar. We will continue to work with SePro, manufacturer of Sonar, to determine if pelletized Sonar, which emits the active ingredient over a period of several weeks, would be sufficient to build and maintain

concentration within the stretch of River. Aside from this, a drip system may be a potential option. Either of these options will be significantly costly. Aside from Sonar, Clipper could be considered to spot-treat fanwort in select areas.

Waushakum Pond – 2025 Recommendations

The focus of the 2024 management program at Waushakum Pond was again on the control of nuisance and invasive aquatic weeds through the application of triclopyr herbicide only. New for 2024, algae was frequently monitored and sampled. Unfortunately, Waushakum Pond has strict requirements through Natural Heritage Endangered Species Program. Currently, the only approved herbicide is triclopyr. The use of this herbicide must be paired with additional monitoring and reporting, which was again provided by John Burns. Specific targets at Waushakum Pond include two invasive species, variable milfoil, and curly-leaf pondweed, in addition to nuisance native species, elodea, clasping leaf pondweed, and coontail. Both elodea and clasping leaf pondweed tend to be most dense. Waterlilies are also dense in some area of Waushakum Pond. As noted within the report, triclopyr is not labeled for the control of many of these targets. We anticipated control of the two invasive species using triclopyr; however, we anticipated only marginal control of the other target species when using this herbicide. Triclopyr also works slower than many contact herbicides, so results are not immediately visible. Overall, the 2024 treatment was extremely successful as virtually all target plants were controlled to some degree. Nearly 100% control of the invasive species was achieved. This treatment was also able to be completed earlier in the season than it had been in 2023. Similar to our previous recommendations for aquatic plant management in Waushakum Pond, it may make sense to try to obtain approval for additional herbicides at Waushakum Pond. Options may include diquat and endothall, to start. These herbicides are more applicable to the assemblage of target species in Waushakum Pond than triclopyr.

Although no management of cyanobacteria is currently allowed in Waushakum Pond, it was a focus of the 2024 program through regular monitoring. Closures again plagued Waushakum Pond throughout the season. Looking forward to future management, we've included several management thoughts below. Many are similar to our previous year's recommendations.

Cyanobacteria is typically driven by phosphorus. The limited nutrient sampling in Waushakum Pond did not show alarmingly high phosphorus levels. This was consistent with the 2023 sampling. Despite this, it is clear that phosphorus is sufficient to promote potentially harmful algal blooms. Copper sulfate has been a topic of discussion when it comes to management of algae/cyanobacteria in Waushakum Pond; however, it is currently not approved for use in the pond. Copper sulfate is frequently used in lakes, ponds, and even drinking water reservoirs for the control of cyanobacteria. This tool can be useful moving forward in Waushakum Pond as a reactive approach, specifically to ensure safety of the pond's users. The regular algae sampling was extremely informative this season. Any use of copper sulfate should be paired with continued algae sampling. This allows actual algae species identification and cell counts to guide when copper sulfate is applicable/warranted. As cyanobacteria counts approach 20,000 cells/ml we typically recommend treatment. This approach will ideally keep counts below the 70,000 cells/ml threshold which would warrant an advisory. For this to be accomplished, approval from both Framingham Conservation and Ashland Conservation Commission will need to be in place. Additionally, approval from NHESP must

also be in-hand. A good example from this season were the results from July 1st which showed 15,280 cells/ml of blue-green species. Typically, we would implement a treatment based on those results. Unfortunately, this was not possible and within two weeks, cell counts were already over 136,000 cells/ml. This is nearly double the MA-DEP threshold.

We continue to recommend that ideally, sources of algae, specifically nutrients, be addressed. Externally, we are aware that the city's engineering department is continually working on improvements to limit/minimize phosphorus input to Waushakum Pond. These recommendations should generally be considered prior to or in conjunction with internal nutrient management. Generally speaking, we recommend that the stakeholders educate not only direct abutters but also property owners within the watershed to Waushakum Pond on best management practices. This may include dialogue specific to fertilization practices, beneficial buffers, and other landscaping best management practices. Nutrient input can be limited through utilization of these best management practices. Not fertilizing is always recommended, however using fertilizers without nitrogen or phosphorus when not fertilizing is not an option. Fertilizer packaging typically contains three numbers separated by dashes. These numbers note nutrient content, with the first number being nitrogen, the second number being phosphorus, and the third number being potassium. Packaging with 10-5-20 on it would contain 10% nitrogen content, 5% phosphorus content, and 20% potassium content by weight. Not fertilizing in a watershed is always recommended to limit nutrient input into the pond. If this is not an option, choosing a fertilizer with either no nitrogen and phosphorus, or very little nitrogen or phosphorus is also recommended. Buffer management may consist of specific planting, or even simply not mowing directly down to the shoreline if a direct abutter.

An additional recommendation pertaining to the watershed may be the selective use of EutroSORB filters. EutroSORB filters are fairly new technology and approval from Conservation would be necessary. We recommend that use and potential locations be guided by information provided by the city engineers and any watershed information available. SePro (manufacturer of many aquatic management technologies) recently developed a variety of phosphorus binding technologies. One of which is EutroSORB filters. EutroSORB filters are a novel technology specifically designed for intercepting phosphorus from moving water. EutroSORB provides water resource managers with an efficient and economical solution to reduce phosphorus inputs, slow down or stop the eutrophication process, and restore water quality. EutroSORB filters rapidly remove phosphorus from moving water after being deployed in a water resource. EutroSORB reactive filter media has a high affinity and capacity for phosphorus and will continue to bind soluble reactive phosphorus until all binding sites have been exhausted. This technology is best suited for areas where phosphorus has been found to enter Waushakum Pond, including stormwater outfalls and/or tributaries. These filters cost approximately \$250 each (installed), but ultimately the deployment will depend on the watershed assessment, size, and depth of the area, etc. We recommend this, because EutroSORB filters provide a fairly low-cost solution to phosphorus filtration from the watershed. This strategy could be implemented as the city's BMPs are put in place or prior.

Beyond watershed improvements, internal phosphorus loading is likely contributing to the current blooms. One internal approach would be through the use of aluminum sulfate (alum). While copper sulfate is an

algaecide, alum targets source phosphorus, as phosphorus is considered the limiting nutrient driving nuisance plant and algae growth. Alum is commonly used in ponds, lakes and drinking water reservoirs to remove phosphorus through precipitation, forming a heavier than water particulate known as floc. This floc settles to the bottom of the waterbody to create a barrier that slows sediment phosphorus release. Alum dosing can vary greatly. A low dose treatment can be used to strip phosphorus from the water column but may need to be repeated annually or more. Higher doses are typically needed to inactivate sediment phosphorus reserves. Higher doses also typically require buffering with sodium aluminate. Additional testing should be implemented to further explore alum feasibility, dosing, and costs. By conducting these specialized tests, accurate dosing can be determined, which will ensure an effective alum treatment. Alum costs can also vary greatly depending on how much alum is necessary to inactivate the phosphorus in the pond's bottom sediments, and dosing may vary in different areas of the pond. This is why properly dosing alum is so crucial. We understand that the city has been in contact with TRC and a plan for an alum feasibility study may already be in the works for Waushakum Pond. This will be a great first step, in conjunction with the watershed work the city's engineering department is conducting.

Above, we noted EutroSORB filters. SePro has also recently received EPA approval for additional EutroSORB products including EutroSORB WC and EutroSORB G. These proprietary blend of phosphate binding materials do not impact water chemistry, are safe for fish, invertebrates, and personnel, and do not carry any water use restrictions. Much like alum, the EutroSORB products noted above are applied directly to the water column using specialized treatment equipment. Unfortunately, these products are not approved in Massachusetts at this time. SePro is developing another product, however, called EutroSORB SI, which is anticipated to receive Massachusetts approval in the coming year or so. While not currently an option, we feel these products are applicable to Waushakum Pond and should be considered as regulatory approval occurs.

All recommendations for Waushakum Pond detailed above are subject to approval by Framingham Conservation Commission, Ashland Conservation Commission, and Natural Heritage Endangered Species Program. These approvals must be obtained in advance of any management differing from the approved triclopyr treatment.

Water quality collection should continue to occur at Waushakum Pond. In addition to the water quality collected this year, parameters specific to the alum feasibility study should be implemented including sediment sampling specific to phosphorus fractions. Finally, we recommend that the regular algae sampling program continue in 2025. If copper sulfate is approved for use in Waushakum Pond, the algae sampling results should guide any algaecide applications.

We hope that you were impressed not only with the results of the 2024 Aquatic Management Program, but also the communication, expertise, sense of urgency, and follow-through provided by Water & Wetland over the course of the year. We look forward to working with the city of Framingham in 2025 and for many years to come.

Sincerely,



Colin Gosselin

Director of Operations

Senior Aquatic Biologist

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Attachments Include: June Survey Maps, September Survey Maps, Lab Water Quality Results

●Spring Survey Maps

- Water Chestnut
- Curly-leaf Pondweed
- ▽ Scattered Eurasian Milfoil and Curly-leaf; Sparse to Dense Robbins' Pondweed, Thin-leaf Pondweed, Coontail, and Clapsing-Leaf Pondweed
- ▨ Sparse to Dense Eurasian Milfoil
- Sparse to Moderate Clapsing-leaf Pondweed



Maxar, Microsoft



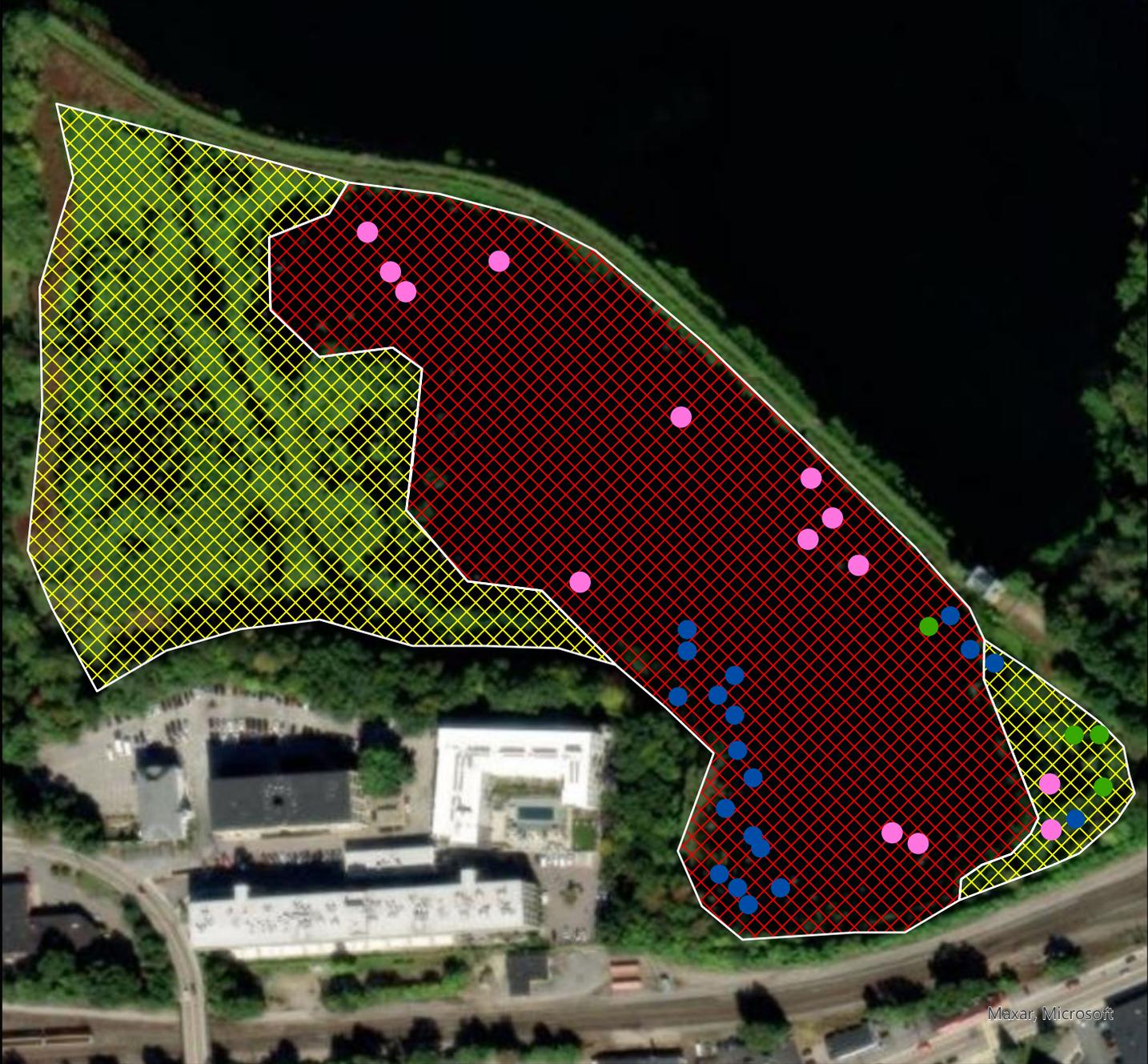
Big Farm Pond
 Vegetation Assemblage
 Framingham, MA

Survey Date
 5/29/2024

Map Date
 5/30/2024



- Water Chestnut
- Curly-leaf Pondweed
- Eurasian Milfoil
- ⊠ Moderate to Dense Elodea, Coontail, and Robbins' Pondweed
- ⊠ Moderate to Dense Waterlilies



Maxar, Microsoft



Little Farm Pond
 Vegetation Assemblage
 Framingham, MA

Survey Date
 5/29/2024

Map Date
 5/30/2024



- ✘ Moderate to Dense Robbins' Pondweed mixed with Coontail, Bladderwort, and Thin-leaf Pondweed
- ✘ Moderate to Dense Waterlilies





- Waterlilies
- Low-water Milfoil
- ◇◇◇ Scattered Trace Densities of Robbins' Pondweed



Maxar, Microsoft



Learned Pond
Vegetation Assemblage
Framingham, MA

Survey Date
5/29/2024

Map Date
5/30/2024



● Variable Milfoil



Maxar, Microsoft



Mohawk Pond
Invasive Species Distribution
Framingham, MA

Survey Date
5/29/2024

Map Date
5/30/2024

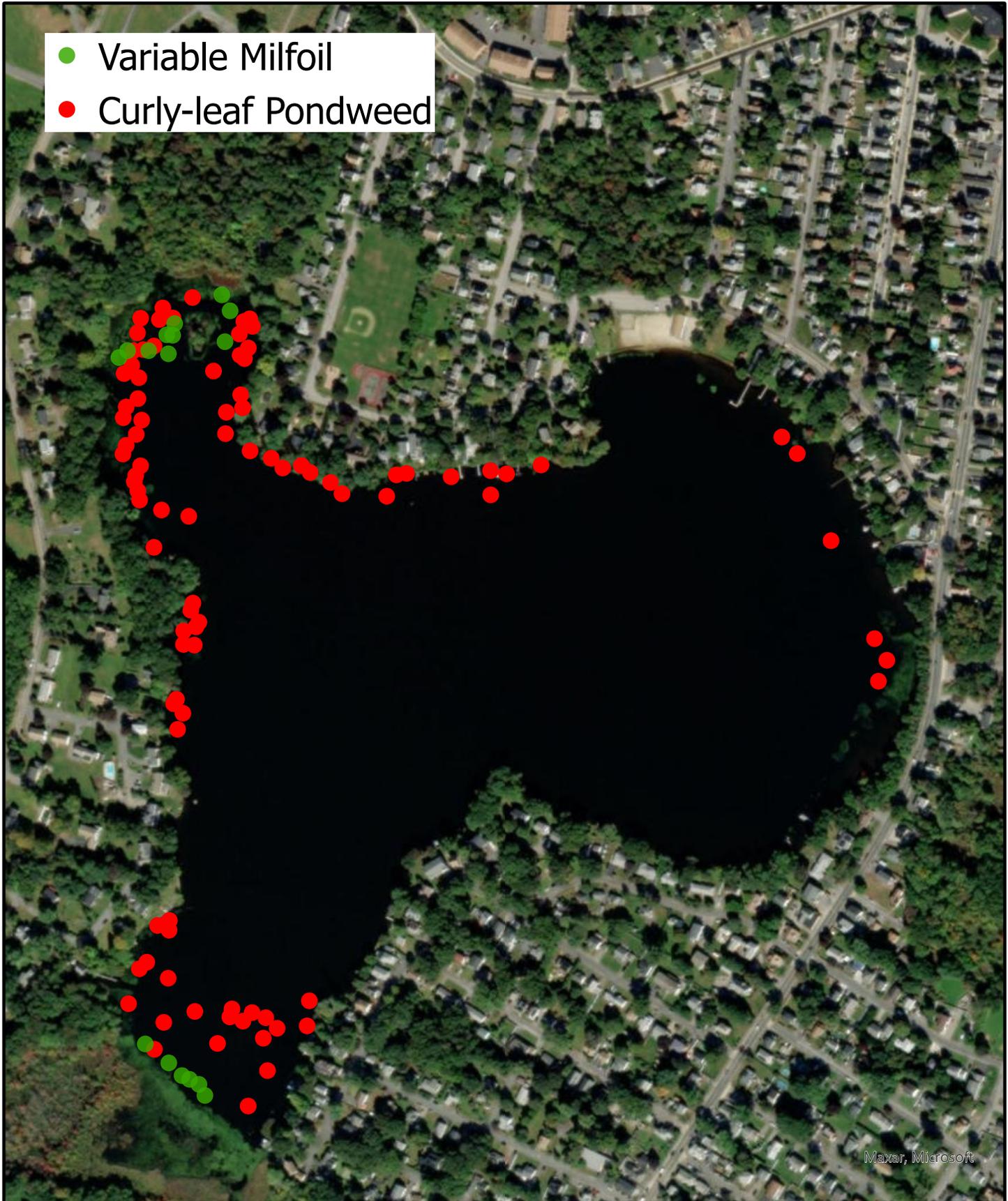


×× Sparse to Dense Densities of Mixed Filamentous Algae, Duckweed, and Watermeal

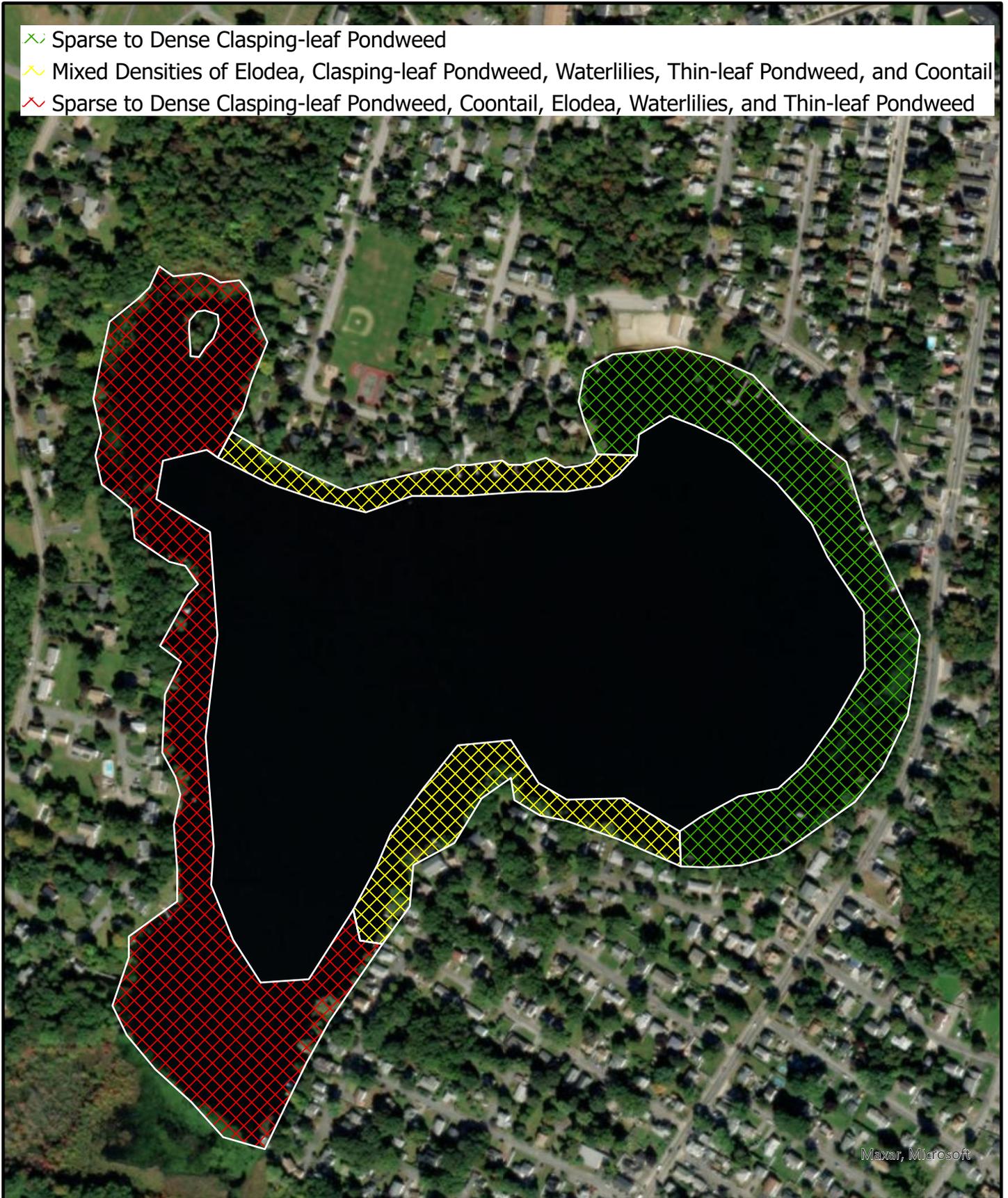


Trace to Sparse Water Chestnut
● Water Chestnut





-  Sparse to Dense Clasping-leaf Pondweed
-  Mixed Densities of Elodea, Clasping-leaf Pondweed, Waterlilies, Thin-leaf Pondweed, and Coontail
-  Sparse to Dense Clasping-leaf Pondweed, Coontail, Elodea, Waterlilies, and Thin-leaf Pondweed



Maxar, Microsoft



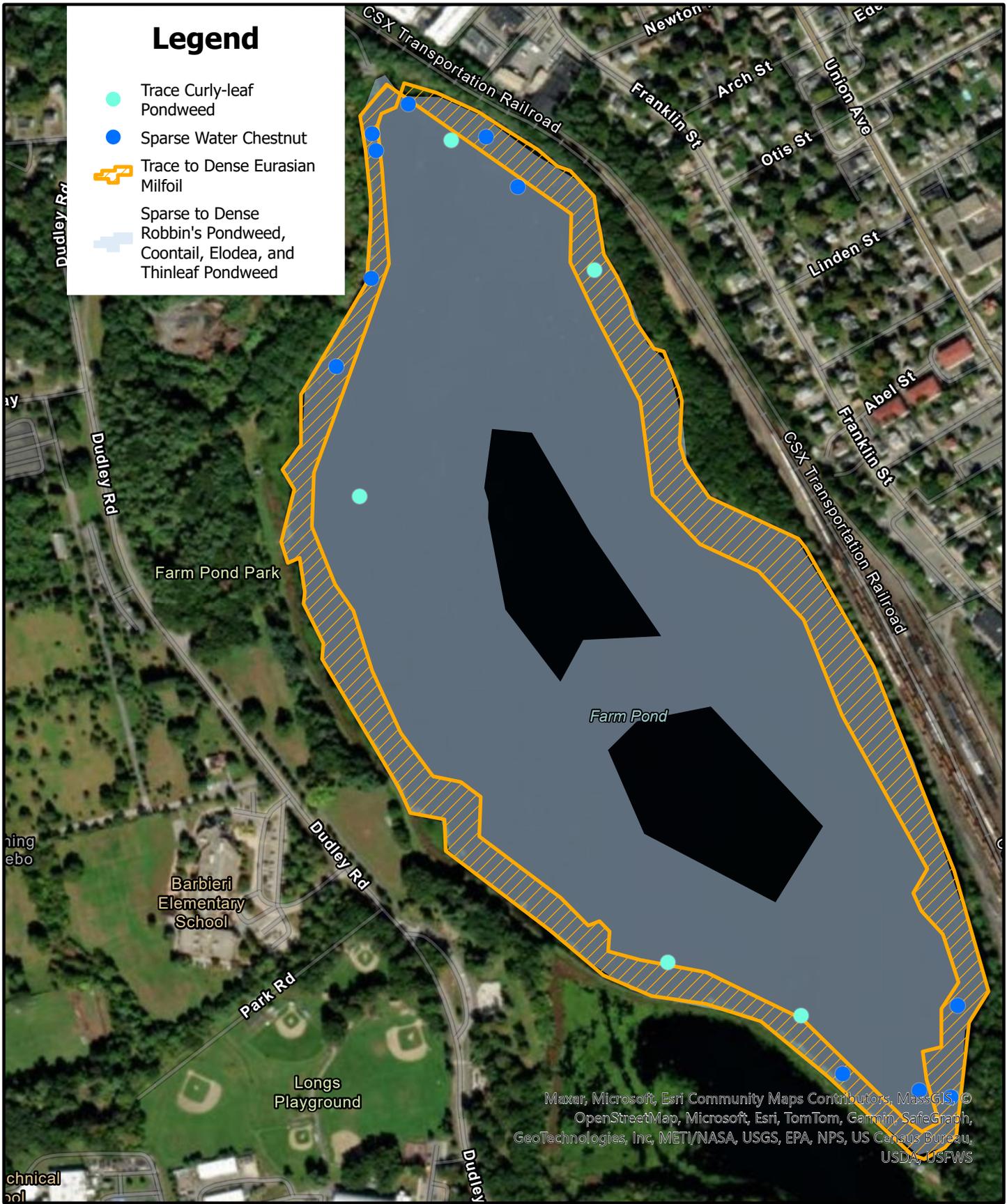
Waushakum Pond
 Native Species Distribution
 Framingham/Ashland, MA

Survey Date
 5/29/2024

Map Date
 5/30/2024



● Fall Survey Maps



Legend

- Trace Curly-leaf Pondweed
- Sparse Water Chestnut
- Trace to Dense Eurasian Milfoil
- Sparse to Dense Robbin's Pondweed, Coontail, Elodea, and Thinleaf Pondweed

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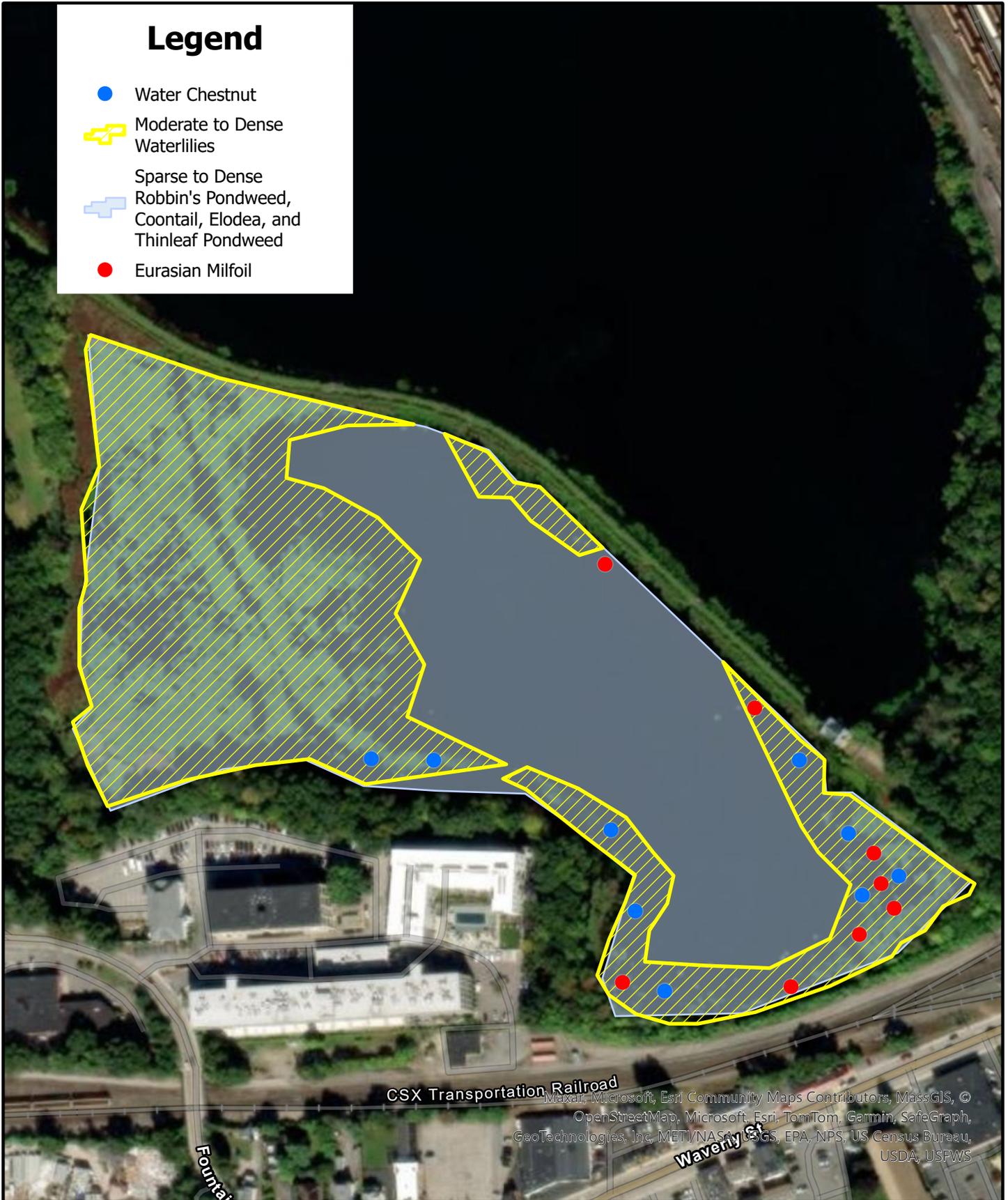
Big Farm Pond
 Aquatic Vegetation Distribution
 Framingham, MA

Survey Date	
Map Date	9/18/2024



Legend

- Water Chestnut
- ▨ Moderate to Dense Waterlilies
- ▨ Sparse to Dense Robbin's Pondweed, Coontail, Elodea, and Thinleaf Pondweed
- Eurasian Milfoil



Little Farm Pond
Aquatic Vegetation Distribution
Framingham, MA

Survey Date

Map Date
9/18/2024





Legend

 Moderate to Dense Waterlilies

 Sparse to Dense Robbin's Pondweed, Coontail, and Bladderwort

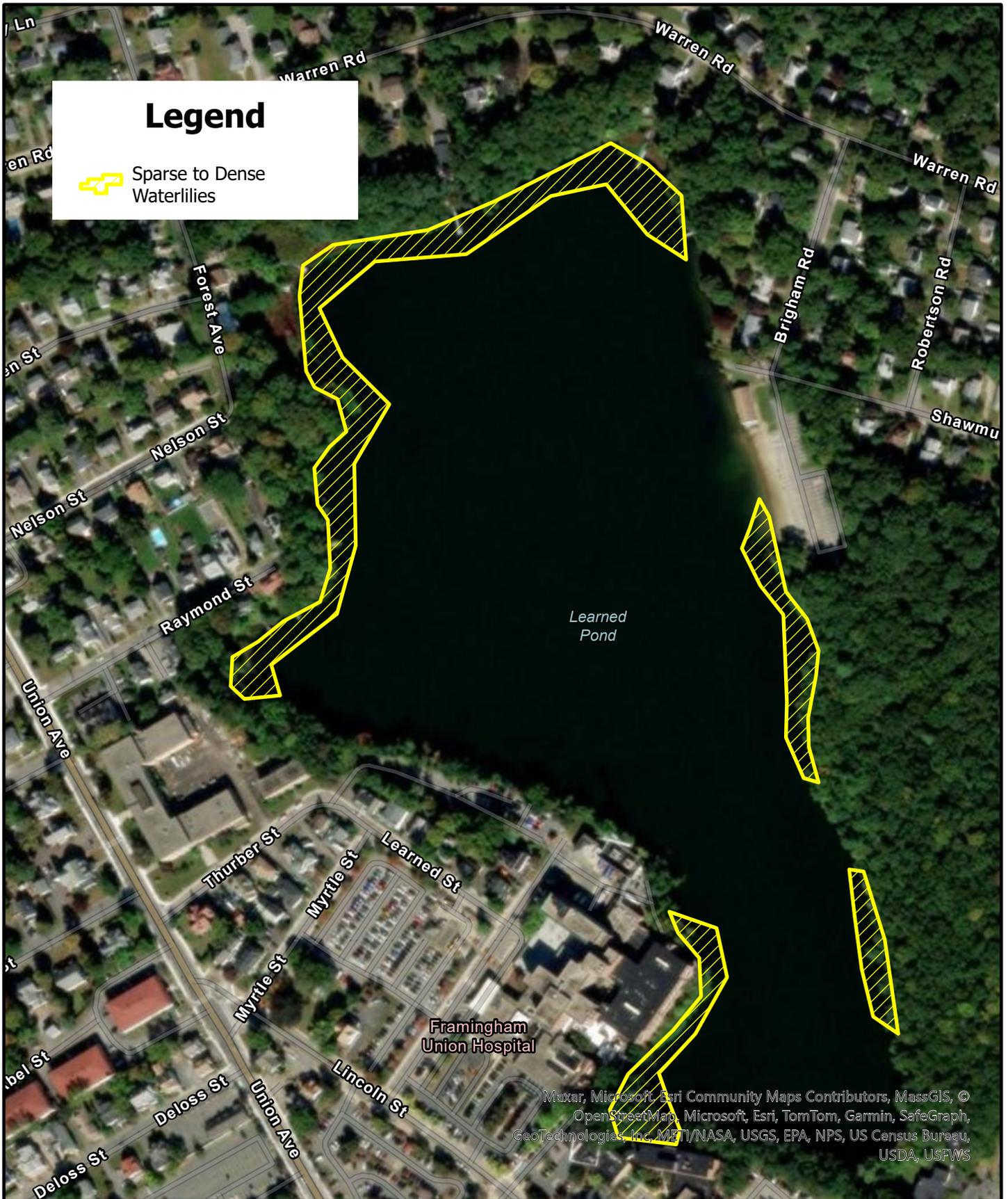
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Gleason Pond
 Vegetation Assemblage
 Framingham, MA

Survey Date
 Map Date
 9/18/2024





Legend

 Sparse to Dense Waterlilies



Learned Pond
 Waterlily Distribution
 Framingham, MA

Survey Date _____
 Map Date 9/18/2024



Legend

● Sparse Variable Milfoil



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USDA, USFWS



Mohawk Pond
Invasive Species Distribution
Framingham, MA

Survey Date

Map Date
9/18/2024



Legend



Dense Filamentous Algae



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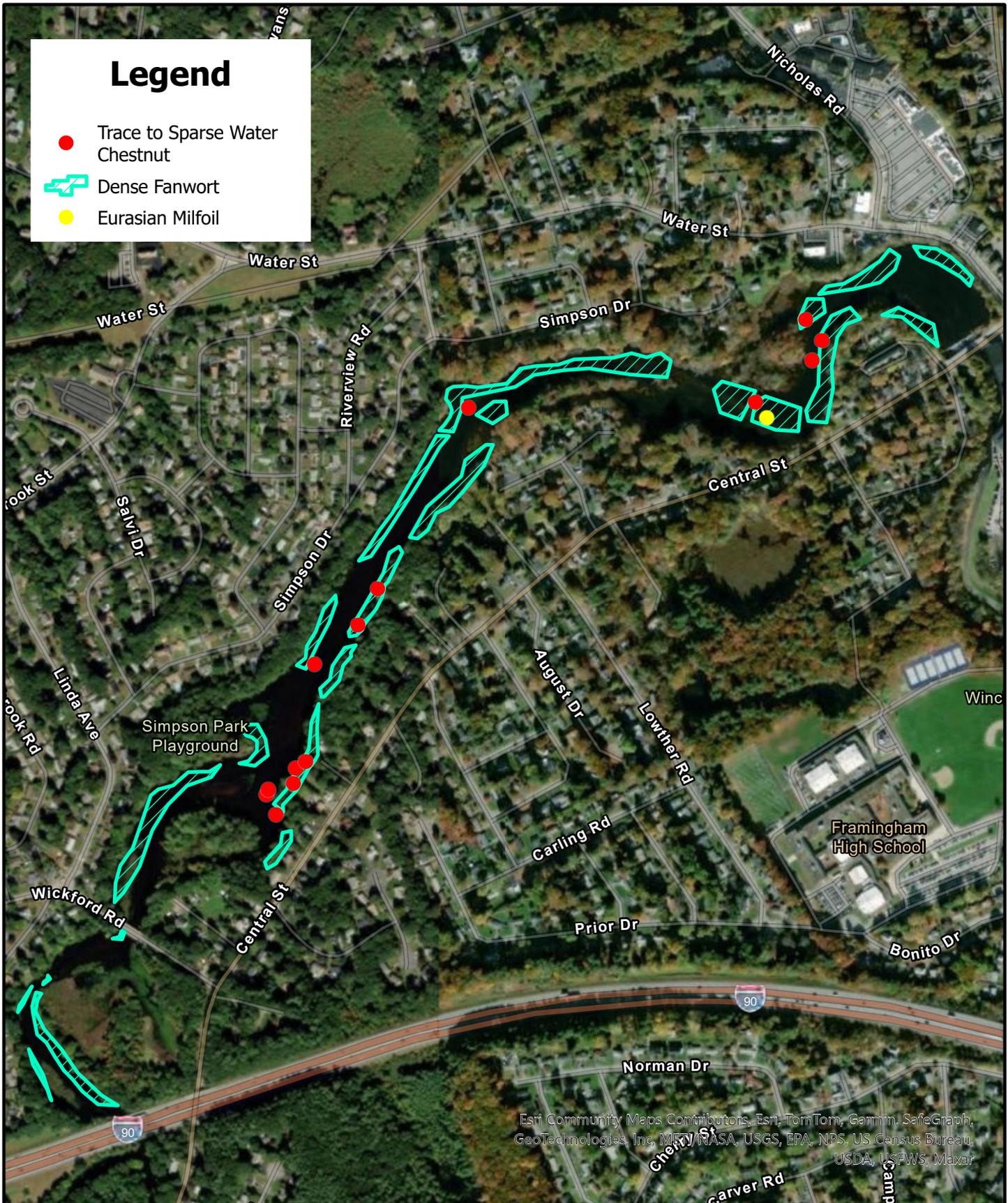


Norton Pond
Algae Distribution
Framingham, MA

Survey Date

Map Date
9/18/2024





Esri Community Maps Contributors, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, MET/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar



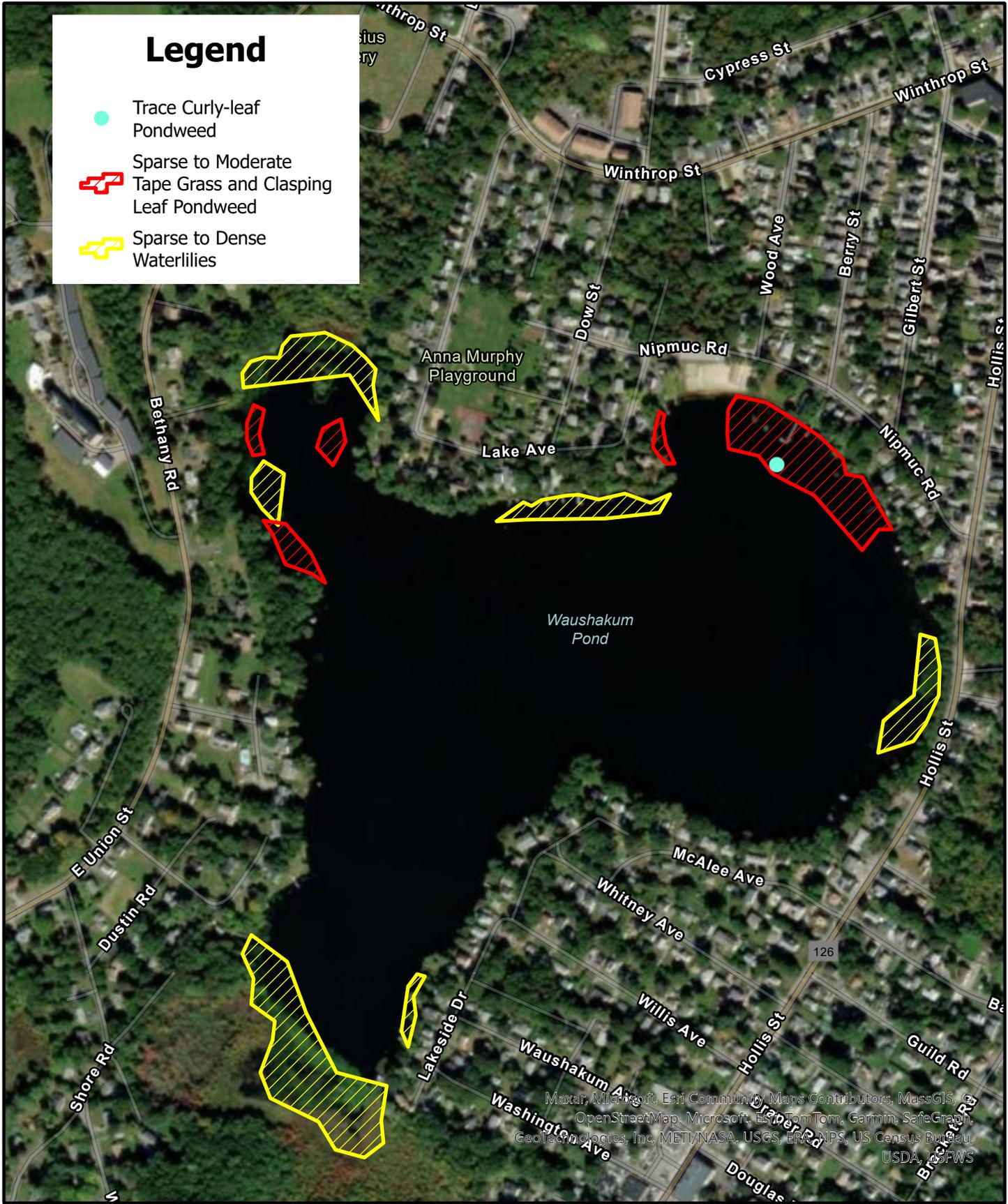
Sudbury River
 Invasive Aquatic Vegetation
 Framingham, MA

Survey Date
Map Date
10/21/2024



Legend

- Trace Curly-leaf Pondweed
- Sparse to Moderate Tape Grass and Clasping Leaf Pondweed
- Sparse to Dense Waterlilies



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Waushakum Pond
Aquatic Vegetation Distribution
Framingham, MA

Survey Date
Map Date
9/18/2024



● Water Quality Results



16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC13212

Customer Contact Information

Company Name: Water and Wetland	Contact Person: Joe Onorato
Address: 134 Ferry St., South Grafton, MA 01560	E-mail Address: joe@waterandwetland.com
	Phone: 888-493-8526

Waterbody Information

Waterbody:	Framingham Ponds - MA
Waterbody size:	151.00
Depth Average:	6.00

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM52719-1	Big	Turbidity (NTU)	EPA 180.1	3.2	
		Conductivity (µS/cm)	EPA 120.1	1338.1	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
		Chlorophyll a (µg/L)	EPA 445	<10	
		Total Phosphorus (µg/L)	EPA 365.3	12.6	
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	40.3	
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	80.1	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.11	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.11	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.29	
		E. coli (CFU/100mL)	EPA 9223B	<1	
		Total Coliforms (CFU/100mL)	EPA 9223B	648.8	
		Total Nitrogen (mg/L)	calculated	0.4	
pH	EPA 150.1	9.7			
CTM52720-1	Little	Turbidity (NTU)	EPA 180.1	3.4	
		Conductivity (µS/cm)	EPA 120.1	1316.2	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
		Chlorophyll a (µg/L)	EPA 445	<10	
		Total Phosphorus (µg/L)	EPA 365.3	33.5	
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	43.5	
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	80.1	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.09	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.09	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.68	
		E. coli (CFU/100mL)	EPA 9223B	4.1	
		Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6	
		Total Nitrogen (mg/L)	calculated	0.77	
pH	EPA 150.1	8.8			

CTM52721-1	Waushakum	Turbidity (NTU)	EPA 180.1	2.9
		Conductivity (µS/cm)	EPA 120.1	496.5
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5
		Chlorophyll a (µg/L)	EPA 445	11.5
		Total Phosphorus (µg/L)	EPA 365.3	49.9
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	26.2
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	43.0
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.18
		Nitrite (mg/L)	Campbell et al 2004	<0.02
		Nitrate (mg/L)	calculated	0.18
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.55
		E. coli (CFU/100mL)	EPA 9223B	3.1
		Total Coliforms (CFU/100mL)	EPA 9223B	248.1
		Total Nitrogen (mg/L)	calculated	0.73
		pH	EPA 150.1	9.1
CTM52722-1	Learned	Turbidity (NTU)	EPA 180.1	2.5
		Conductivity (µS/cm)	EPA 120.1	609.7
		Free Reactive Phosphorus (µg/L)	EPA 365.3	5.1
		Chlorophyll a (µg/L)	EPA 445	<10
		Total Phosphorus (µg/L)	EPA 365.3	14.3
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	<10
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	17.6
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.18
		Nitrite (mg/L)	Campbell et al 2004	<0.02
		Nitrate (mg/L)	calculated	0.18
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.3
		E. coli (CFU/100mL)	EPA 9223B	3.0
		Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6
		Total Nitrogen (mg/L)	calculated	0.48
		pH	EPA 150.1	7
CTM52723-1	Gleason	Turbidity (NTU)	EPA 180.1	3
		Conductivity (µS/cm)	EPA 120.1	987.2
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5
		Chlorophyll a (µg/L)	EPA 445	20.3
		Total Phosphorus (µg/L)	EPA 365.3	41.3
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	26.7
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	33.0
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.12
		Nitrite (mg/L)	Campbell et al 2004	<0.02
		Nitrate (mg/L)	calculated	0.12
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.58
		E. coli (CFU/100mL)	EPA 9223B	1.0
		Total Coliforms (CFU/100mL)	EPA 9223B	1553.1
		Total Nitrogen (mg/L)	calculated	0.7
		pH	EPA 150.1	7
CTM52724-1	Norton	Turbidity (NTU)	EPA 180.1	3.7
		Conductivity (µS/cm)	EPA 120.1	364.2
		Free Reactive Phosphorus (µg/L)	EPA 365.3	6.0
		Chlorophyll a (µg/L)	EPA 445	22.3
		Total Phosphorus (µg/L)	EPA 365.3	73.6
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	37
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	40.1
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.42
		Nitrite (mg/L)	Campbell et al 2004	<0.02
		Nitrate (mg/L)	calculated	0.42
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	1.08
		E. coli (CFU/100mL)	EPA 9223B	17.1
		Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6
		Total Nitrogen (mg/L)	calculated	1.5
		pH	EPA 150.1	7.1
CTM52725-1	Sudbury	Turbidity (NTU)	EPA 180.1	3.5
		Conductivity (µS/cm)	EPA 120.1	470.1
		Free Reactive Phosphorus (µg/L)	EPA 365.3	5.2

	Chlorophyll a (µg/L)	EPA 445	<10
	Total Phosphorus (µg/L)	EPA 365.3	35.3
	Alkalinity (mg/L as CaCO ₃)	EPA 310.2	23.7
	Total Hardness (mg/L as CaCO ₃)	EPA 130.2	38.5
	Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.36
	Nitrite (mg/L)	Campbell et al 2004	<0.02
	Nitrate (mg/L)	calculated	0.36
	Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.55
	E. coli (CFU/100mL)	EPA 9223B	68.3
	Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6
	Total Nitrogen (mg/L)	calculated	0.91
	pH	EPA 150.1	7.1
CTM52726-1 Mohawk	Turbidity (NTU)	EPA 180.1	4
	Conductivity (µS/cm)	EPA 120.1	312.8
	Free Reactive Phosphorus (µg/L)	EPA 365.3	<5
	Chlorophyll a (µg/L)	EPA 445	13.1
	Total Phosphorus (µg/L)	EPA 365.3	35.5
	Alkalinity (mg/L as CaCO ₃)	EPA 310.2	26
	Total Hardness (mg/L as CaCO ₃)	EPA 130.2	41.8
	Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.52
	Nitrite (mg/L)	Campbell et al 2004	<0.02
	Nitrate (mg/L)	calculated	0.52
	Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.62
	E. coli (CFU/100mL)	EPA 9223B	178.2
	Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6
	Total Nitrogen (mg/L)	calculated	1.14
	pH	EPA 150.1	6.9

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COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Laboratory Information

Date / Time Received: 05/30/24 12:00 PM

Date Results Sent: Tuesday, June 4, 2024

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This entire report was reviewed and approved for release.



Reviewed By: Laboratory Supervisor

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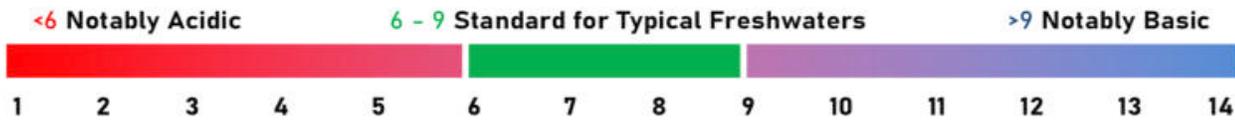
SePRO Lab

Water Diagnostics for Lakes & Ponds

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Total Phosphorus (TP): is the measure of all phosphorus in a sample as measured by persulfate strong digestion and includes: inorganic, oxidizable organic and polyphosphates. This includes what is readily available, potential to become available and stable forms. *<12 μ g/L oligotrophic; 12-24 μ g/L mesotrophic; 25-96 μ g/L eutrophic; > 96 μ g/L hypereutrophic*

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< 10 NTU drinking water standards and typical trout waters; 10-50 NTU moderate; > 50 NTU potential impact to aquatic life.



16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC14949

Customer Contact Information

Company Name: Water and Wetland	Contact Person: Joe Onorato
Address: 134 Ferry St., South Grafton, MA 01560	E-mail Address: joe@waterandwetland.com
	Phone: 888-493-8526

Waterbody Information

Waterbody:	Framingham Ponds - MA
Waterbody size:	151.00
Depth Average:	6.00

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM57476-1	Gleason	Turbidity (NTU)	EPA 180.1	3.4	09/09/2024
		Conductivity (µS/cm)	EPA 120.1	877.5	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	6.8	
		Chlorophyll a (µg/L)	EPA 445	10.1	
		Total Phosphorus (µg/L)	EPA 365.3	30.2	
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	38.1	
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	37.2	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.08	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.08	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.39	
		E. coli (CFU/100mL)	EPA 9223B	18.5	
		Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6	
		Total Nitrogen (mg/L)	calculated	0.47	
		pH	EPA 150.1	6.9	
CTM57477-1	Learned	Turbidity (NTU)	EPA 180.1	7.2	09/09/2024
		Conductivity (µS/cm)	EPA 120.1	491.0	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
		Chlorophyll a (µg/L)	EPA 445	56.8	
		Total Phosphorus (µg/L)	EPA 365.3	31.7	
		Alkalinity (mg/L as CaCO ₃)	EPA 310.2	12.5	
		Total Hardness (mg/L as CaCO ₃)	EPA 130.2	18.0	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.07	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.07	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.82	
		E. coli (CFU/100mL)	EPA 9223B	206.4	
		Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6	
		Total Nitrogen (mg/L)	calculated	0.89	
		pH	EPA 150.1	7	

CTM57478-1 Little Farm	Turbidity (NTU)	EPA 180.1	3	09/09/2024
	Conductivity (µS/cm)	EPA 120.1	1068.7	
	Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
	Chlorophyll a (µg/L)	EPA 445	<10	
	Total Phosphorus (µg/L)	EPA 365.3	24.3	
	Alkalinity (mg/L as CaCO ₃)	EPA 310.2	64.5	
	Total Hardness (mg/L as CaCO ₃)	EPA 130.2	91.4	
	Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.08	
	Nitrite (mg/L)	Campbell et al 2004	<0.02	
	Nitrate (mg/L)	calculated	0.08	
	Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.36	
	E. coli (CFU/100mL)	EPA 9223B	4.1	
	Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6	
	Total Nitrogen (mg/L)	calculated	0.44	
	pH	EPA 150.1	7.3	
	CTM57479-1 Mohawk	Turbidity (NTU)	EPA 180.1	
Conductivity (µS/cm)		EPA 120.1	246.4	
Free Reactive Phosphorus (µg/L)		EPA 365.3	5.3	
Chlorophyll a (µg/L)		EPA 445	105.3	
Total Phosphorus (µg/L)		EPA 365.3	70.1	
Alkalinity (mg/L as CaCO ₃)		EPA 310.2	24.2	
Total Hardness (mg/L as CaCO ₃)		EPA 130.2	35.6	
Total Nitrate (mg/L) and Nitrite (mg/L)		Campbell et al 2004	0.06	
Nitrite (mg/L)		Campbell et al 2004	<0.02	
Nitrate (mg/L)		calculated	0.06	
Total Kjeldahl Nitrogen (mg/L)		EPA 351.2	1.08	
E. coli (CFU/100mL)		EPA 9223B	7.4	
Total Coliforms (CFU/100mL)		EPA 9223B	>2419.6	
Total Nitrogen (mg/L)		calculated	1.14	
pH		EPA 150.1	7.6	

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Laboratory Information

Date / Time Received: 09/10/24 12:00 PM

Date Results Sent: Friday, September 13, 2024

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This entire report was reviewed and approved for release.



Reviewed By: Laboratory Supervisor

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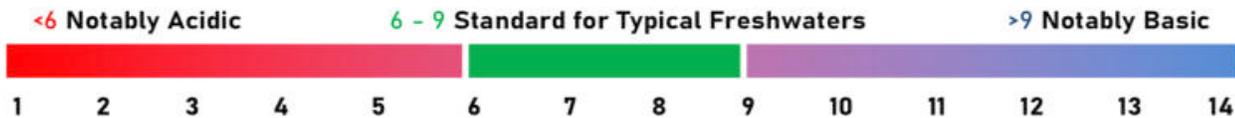
SePRO Lab

Water Diagnostics for Lakes & Ponds

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16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC14981

Customer Contact Information

Company Name: Water and Wetland	Contact Person: Joe Onorato
Address: 134 Ferry St., South Grafton, MA 01560	E-mail Address: joe@waterandwetland.com
	Phone: 888-493-8526

Waterbody Information

Waterbody:	Framingham Ponds - MA
Waterbody size:	151.00
Depth Average:	6.00

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM57498-1	Sudbury River	Turbidity (NTU)	EPA 180.1	3.1	09/10/2024
		Conductivity (µS/cm)	EPA 120.1	417.4	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
		Chlorophyll a (µg/L)	EPA 445	<10	
		Total Phosphorus (µg/L)	EPA 365.3	18.3	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	29.1	
		Total Hardness (mg/L as CaCO3)	EPA 130.2	44.1	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.1	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.1	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.59	
		E. coli (CFU/100mL)	EPA 9223B	31.8	
		Total Coliforms (CFU/100mL)	EPA 9223B	1413.6	
		Total Nitrogen (mg/L)	calculated	0.69	
pH	EPA 150.1	6.7			
CTM57499-1	Big Farm Pond	Turbidity (NTU)	EPA 180.1	2.8	09/10/2024
		Conductivity (µS/cm)	EPA 120.1	1167.9	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
		Chlorophyll a (µg/L)	EPA 445	<10	
		Total Phosphorus (µg/L)	EPA 365.3	12.5	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	49.5	
		Total Hardness (mg/L as CaCO3)	EPA 130.2	90.5	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.08	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.08	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.67	
		E. coli (CFU/100mL)	EPA 9223B	8.6	
		Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6	
		Total Nitrogen (mg/L)	calculated	0.75	
pH	EPA 150.1	7.2			

CTM57500-1 Norton Pond	Turbidity (NTU)	EPA 180.1	2.9	09/10/2024
	Conductivity (µS/cm)	EPA 120.1	242.3	
	Free Reactive Phosphorus (µg/L)	EPA 365.3	<5	
	Chlorophyll a (µg/L)	EPA 445	<10	
	Total Phosphorus (µg/L)	EPA 365.3	25.7	
	Alkalinity (mg/L as CaCO3)	EPA 310.2	32.4	
	Total Hardness (mg/L as CaCO3)	EPA 130.2	32.5	
	Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	<0.02	
	Nitrite (mg/L)	Campbell et al 2004	<0.02	
	Nitrate (mg/L)	calculated	<0.02	
	Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	1.08	
	E. coli (CFU/100mL)	EPA 9223B	19.5	
	Total Coliforms (CFU/100mL)	EPA 9223B	>2419.6	
	Total Nitrogen (mg/L)	calculated	1.08	
	pH	EPA 150.1	8.4	

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Laboratory Information

Date / Time Received: 09/11/24 12:00 PM

Date Results Sent: Monday, September 16, 2024

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Reviewed By: Laboratory Supervisor

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SePRO Lab

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Total N is all nitrogen in the sample (organic N+ and Ammonia) determined by the sum of the measurements for Total Kjeldahl Nitrogen (TKN) and ionic forms.

Nitrites and Nitrates are the sum of total oxidized nitrogen, often readily free for algae uptake.

< 1 mg/L typical freshwater; 1-10 mg/L potentially harmful; >10 mg/L possible toxicity, above many regulated guidelines

Chlorophyll a: primary light-harvesting pigment found in algae and a measure of the algal productivity and water quality in a system.

0-2.6 μ g/L oligotrophic; 2.7-20 μ g/L mesotrophic; 21-56 μ g/L eutrophic; > 56 μ g/L hypereutrophic

Turbidity: Measurement of water clarity. Suspended particulates (algae, clay, silt, dead organic matter) are the common constituents impacting turbidity.

< 10 NTU drinking water standards and typical trout waters; 10-50 NTU moderate; > 50 NTU potential impact to aquatic life.




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SePRO Lab

Water Diagnostics for Lakes & Ponds



SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 feet

Average depth: 15 acres

Date Algae Sample Received: 9/11/2024

SeSCRIPT Analysis Performed: Algae ID and Water Quality Baseline Plus

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
			★★
<i>Planktolyngbya</i> sp.	Cyanophyta-Blue-green algae	Filamentous, planktonic, potential toxin producer	73,200
<i>Aphanizomenon</i> sp.	Cyanophyta-Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	9,400

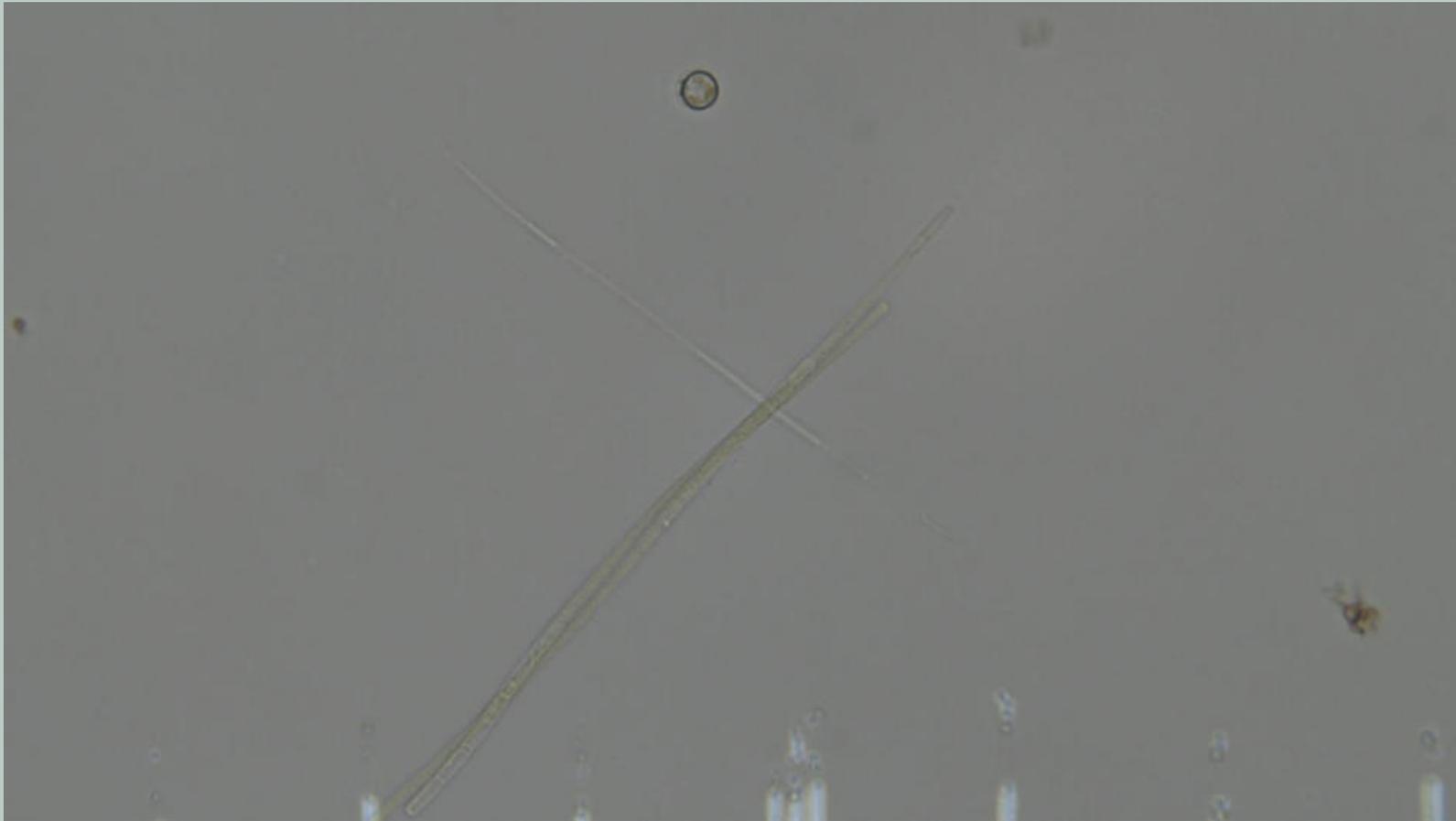
Other algae observed at densities less than 40 cells/mL: *Cyclotella* (Bacillariophyta); *Aphanocapsa*, *Dolichospermum*, *Microcystis* (Cyanophyta); *Staurastrum* (Streptophyta); *Trachelomonas* (Euglenophyta)

Some particulate matter observed

SeScript Alert Index	Threat Level	Cyanobacteria Levels (cells/mL)
★	Low	Less than 20,000
★★	Moderate	20,000 to 100,000
★★★	High	More than 100,000
★★★★	Extreme	More than 100,000 with scum/mats

Algae ID Pictures

Waushakum Pond





Water Quality Results

Waushakum Pond

Analysis	Measurements	Description
pH (SU)	7.0	Neutral
Conductivity ($\mu\text{S}/\text{cm}$)	401.1	Typical for freshwaters
Alkalinity (mg/L as CaCO_3)	34.9	Low buffered
Hardness (mg/L as CaCO_3)	18.8	Soft
Turbidity (NTU)	3.0	Low



Nutrient Results

Waushakum Pond

Analysis	Measurements	Description
Total Phosphorus ($\mu\text{g/L}$)	17.8	Moderate amount: Mesotrophic
Free Reactive Phosphorus ($\mu\text{g/L}$)	< 5	Low
Total Kjeldahl Nitrogen (mg/L)	0.55	Low
Nitrates & Nitrites (mg/L)	0.07	Low
Total Nitrogen (mg/L)	0.62	Low
Chlorophyll a ($\mu\text{g/L}$)	< 10	Low
<i>E. coli</i> (CFU/100mL)	5.2	Low
Total Coliforms (CFU/100mL)	325.5	High

SeSCRIPT Discussion



Healthy



Polluted

The algae and water sample collected from **Waushakum Pond** was received on 9/11/2024. Based on results from the water quality and algae analyses, proposed treatment recommendations for control of the problematic algae and nutrient management in **Waushakum Pond** were determined (see below).

For the purpose of this report, the health rating reflects water quality concentrations detected at the time of collection and should only be used as a guide for treatment purposes. Follow product label instructions. Check with the appropriate local and state agencies for product restrictions and permit regulations prior to use.

SeSCRIPT Diagnostic Guidance

Waushakum Pond

To restore *Waushakum Pond* to a more balanced natural state, it is recommended to manage the nuisance algae and the nutrient pollution (or prevent pollution levels to rise to unhealthy levels).

STEP 1: ALGAE MANAGEMENT

In order to control the targeted algae at this site, apply:

SeClear algaecide and water quality enhancer at a rate range of 1.3-2.6 gallons/acre-foot (0.2-0.4 mg Cu/L).

Contact your SePRO Aquatic Specialist for further guidance on final application rate selection, technique and frequency based on project objectives, site conditions, algae location and density at treatment time.

STEP 2: PHOSPHORUS MANAGEMENT

Analysis of the water quality parameters in this pond revealed this system is mesotrophic. Based on these site-specific water parameters, consider implementing one of the following EutroSORB phosphorus removal solutions to restore water quality in your water body.

- a. **Recovery Solution:** Improve or prevent further nutrient pollution by applying EutroSORB WC on an annual basis. The recommended starting dose is 10 PDUs per acre. Integrate with SePRO algaecide applications as needed to control algae and achieve desired water quality objectives.
- b. **Reset Solution:** Reset the ecological clock and restore water quality in your pond by implementing a Reset application strategy customized by water body. EutroSORB G permanently binds phosphorus pollution both in the water and at a source, the sediments.

Always read and follow product labels and applicable permits. Contact your SePRO Technical Specialist for assistance on developing a custom prescription based on site conditions and water quality management objectives



Water Quality Analysis Explanation

These water quality parameters are essential to document the condition of a water body and design custom treatment prescriptions to achieve desired management objectives.

pH: Measure of how acidic or basic the water is (pH 7 is considered neutral).



Hardness: Measure of the concentration of divalent cations, primarily consisting of calcium and magnesium in typical freshwaters. *0-60 mg/L as CaCO₃ soft; 61-120 moderately hard; 121-180 hard; > 181 very hard*

Alkalinity- Measure of the buffering capacity of water, primarily consisting of carbonate, bicarbonate and hydroxide in typical freshwaters. Waters with lower levels are more susceptible to pH shifts. *50 mg/L as CaCO₃ low buffered; 51-100 moderately buffered; 101-200 buffered; > 200 high buffered.*

Conductivity- Measure of the waters ability to transfer an electrical current, increases with more dissolved ions. *50 uS/cm relatively low concentration may not provide sufficient dissolved ions for ecosystem health; 50-1500 typical freshwaters; > 1500 may be stressful to some freshwater organisms, though not uncommon in many areas.*

Phosphorus: Essential nutrient often correlating to growth of algae in freshwaters.

Total Phosphorus (TP) is the measure of all phosphorus in a sample as measured by persulfate strong digestion and includes: inorganic, oxidizable organic and polyphosphates. This includes what is readily available, potential to become available and stable forms. *12 µg/L oligotrophic; 12-24 µg/L mesotrophic; 25-96 µg/L eutrophic; > 96 µg/L hypereutrophic*

Free Reactive Phosphorus (FRP) is the measure of inorganic dissolved reactive phosphorus. (PO₄⁻³, HPO₄⁻², etc.). This form is readily available in the water column for algae growth.

Nitrogen: Essential nutrient that can enhance growth of algae.

Total N is all nitrogen in the sample (organic N⁺ and Ammonia) determined by the sum of the measurements for Total Kjeldahl Nitrogen (TKN) and ionic forms.

Nitrites and Nitrates are the sum of total oxidized nitrogen, often readily free for algae uptake. *1 mg/L typical freshwater; 1-10 potentially harmful; >10 possible toxicity, above many regulated guidelines*

Chlorophyll a: primary light-harvesting pigment found in algae and a measure of the algal productivity and water quality in a system. *0-2.6µg/L oligotrophic; 2.7-20 µg/L mesotrophic; 21-56 µg/L eutrophic; > 56 µg/L hypereutrophic*

Turbidity- Measurement of water clarity. Suspended particulates (algae, clay, silt, dead organic matter) are the common constituents impacting turbidity. *<10 NTU drinking water standards and typical trout waters; 10-50 NTU moderate; > 50 NTU potential impact to aquatic life.*




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Water Diagnostics for Lakes & Ponds

SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 acres

Average depth: 15 feet

Date Algae Sample Received: 6/12/2024

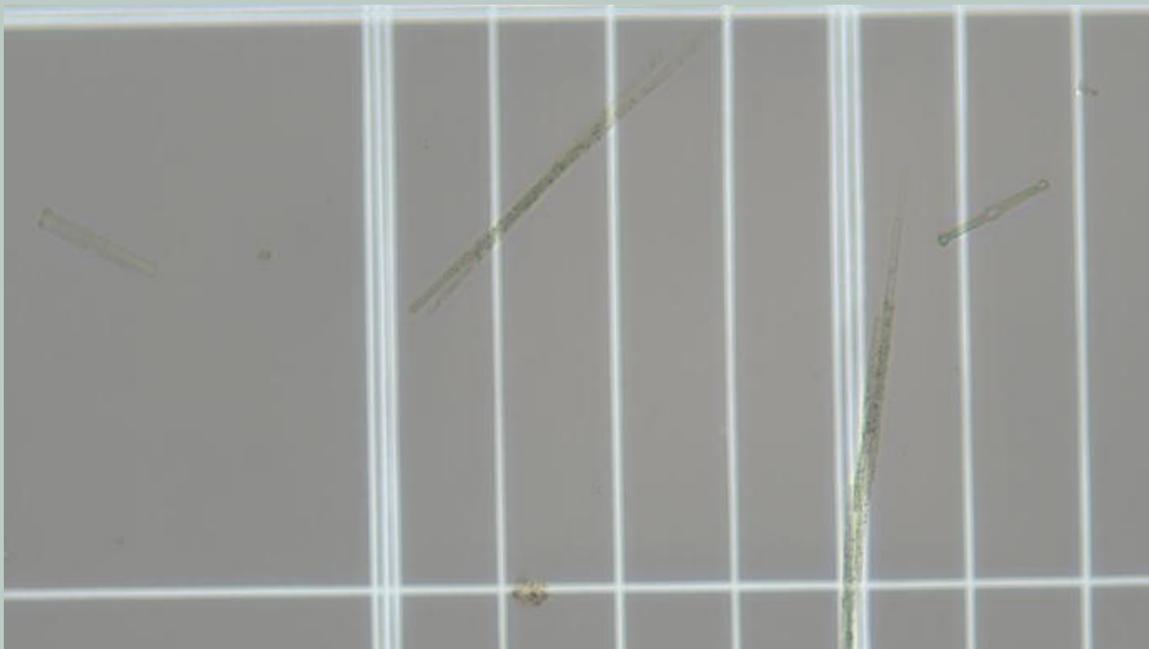
SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	14,800
<i>Tabellaria</i> sp.	Bacillariophyta- Diatoms	Colonial, planktonic	1,600

Other algae observed at densities less than 40 cells/mL: *Asterionella* (Bacillariophyta); *Gloeocystis* (Chlorophyta); *Cuspidothrix*, *Dolichospermum* (Cyanophyta)






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Water Diagnostics for Lakes & Ponds

SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 acres

Average depth: 20 feet

Date Algae Sample Received: 6/18/2024

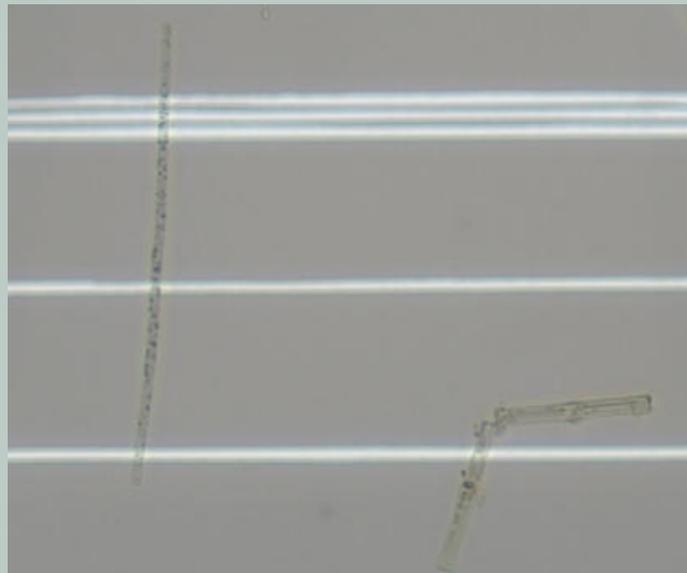
SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	7,600
<i>Tabellaria</i> sp.	Bacillariophyta- Diatoms	Colonial, planktonic	1,200

Other algae observed at densities less than 40 cells/mL: *Asterionella*, *Eunotia* (Bacillariophyta); *Gloeocystis* (Chlorophyta); *Aphanocapsa*, *Dolichospermum* (Cyanophyta); *Closterium* (Streptophyta); *Gymnodinium* (Dinophyta)






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SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Project Name: Waushakum Pond

Address: 134 Ferry St. South Grafton, MA. 01560

Surface Area: 80 acres

Contact Person: Joe Onorato

Average depth: 15 feet

Phone: (888)-493-8526

Date Algae Sample Received: 7/16/2024

Email: joe ; info@waterandwetland.com

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
★★★★			
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	112,100
<i>Dolichospermum</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	24,500

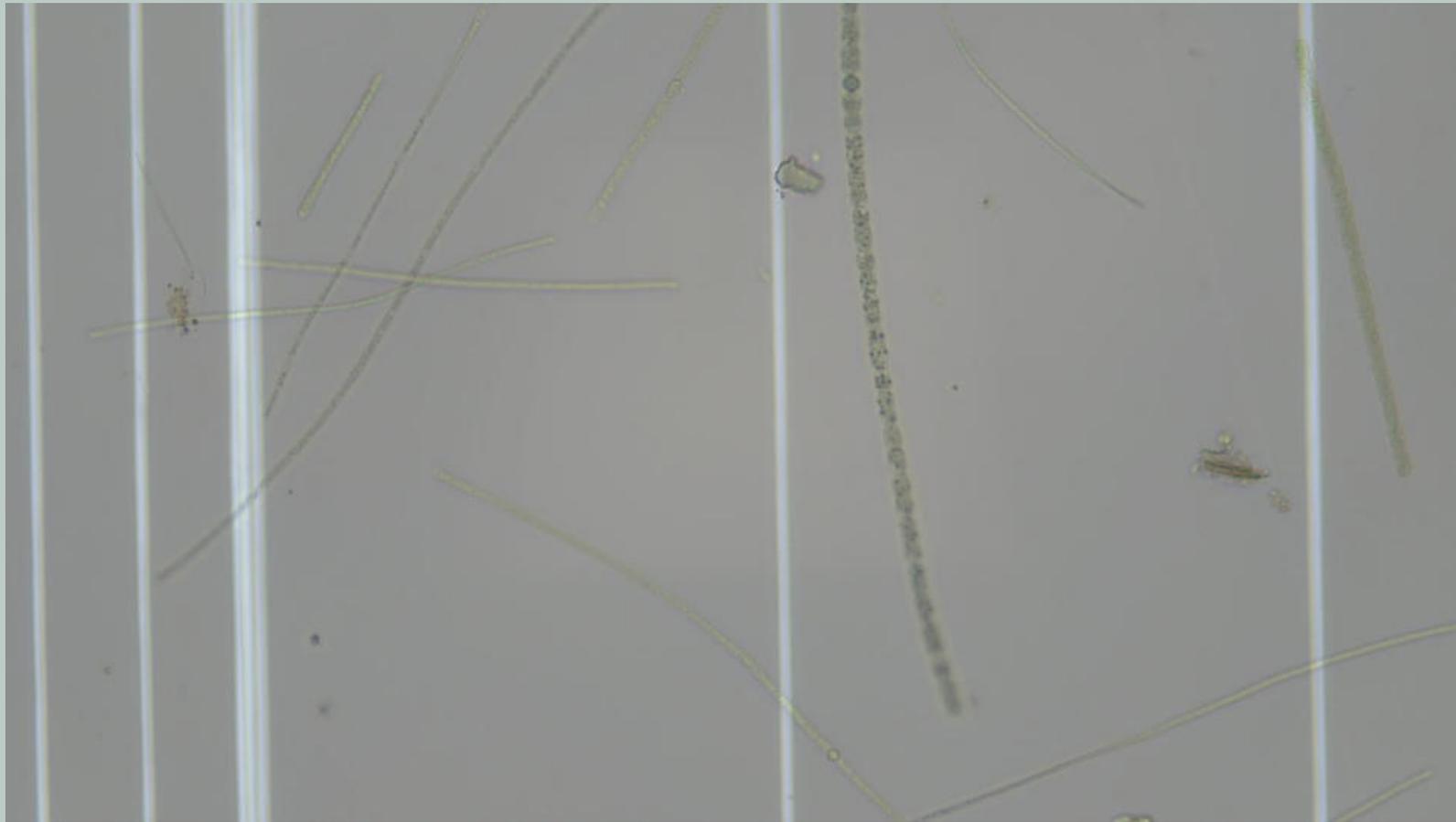
Other algae observed at densities less than 40 cells/mL: *Desmodesmus*, *Gloeocystis*, *Tetraedron* (Chlorophyta); *Microcystis*, *Woronichinia* (Cyanophyta); *Cosmarium* (Streptophyta); *Trachelomonas* (Euglenophyta)

Some particulate matter observed

SeScript Alert Index	Threat Level	Cyanobacteria Levels (cells/mL)
★	Low	Less than 20,000
★ ★	Moderate	20,000 to 100,000
★ ★ ★	High	More than 100,000
★ ★ ★ ★	Extreme	More than 100,000 with scum/mats

Algae ID Pictures

Waushakum Pond






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Water Diagnostics for Lakes & Ponds



SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Project Name: Waushakum Pond

Address: 134 Ferry St. South Grafton, MA. 01560

Surface Area: 80 acres

Contact Person: Joe Onorato

Average depth: 15 feet

Phone: (888)-493-8526

Date Algae Sample Received: 7/23/2024

Email: joe ; info@waterandwetland.com

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
★★★★			
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	99,900
<i>Dolichospermum</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	26,800

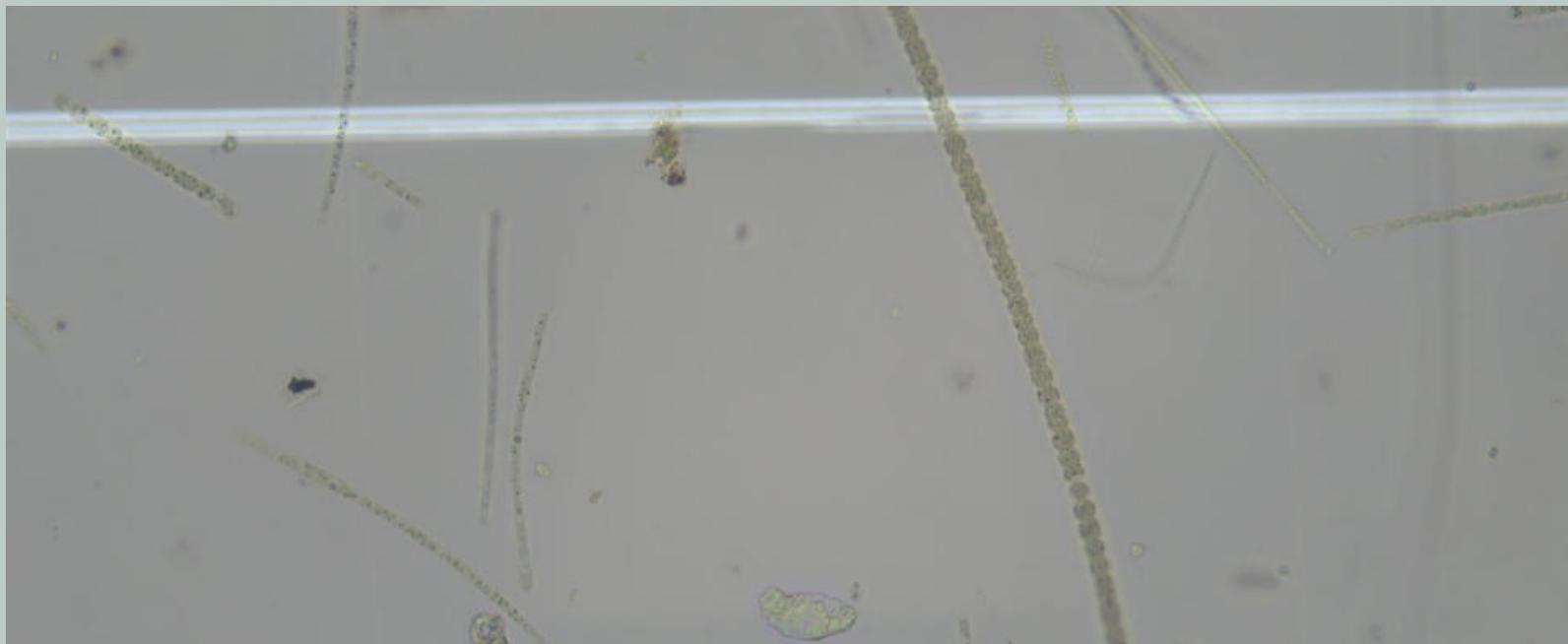
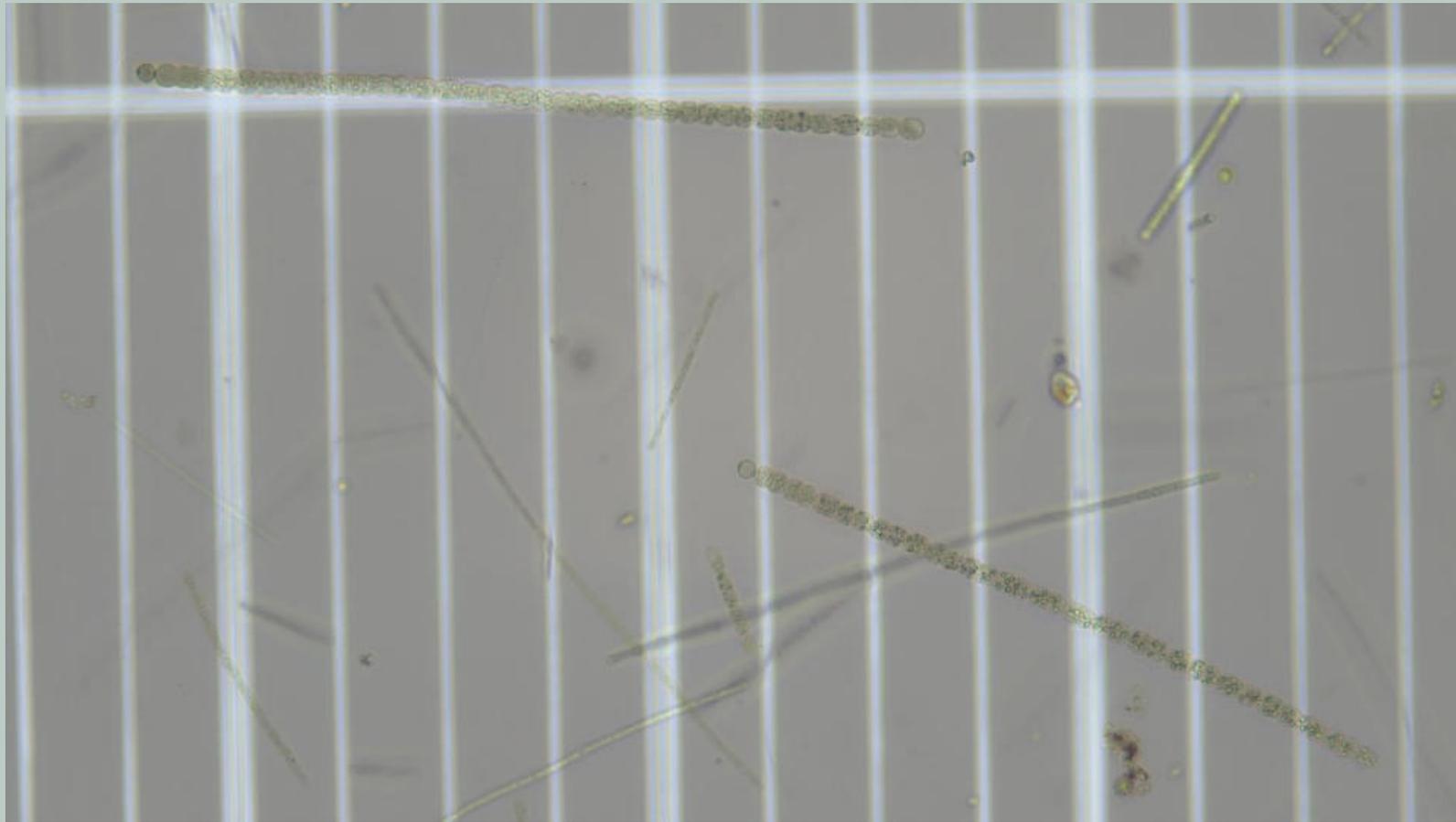
Other algae observed at densities less than 40 cells/mL: *Aulacoseira* (Bacillariophyta); *Oocystis* (Chlorophyta); *Microcystis*, *Planktolyngbya*, *Pseudanabaena* (Cyanophyta); *Closterium* (Streptophyta); *Cryptomonas* (Cryptophyta)

Some particulate matter observed

SeScript Alert Index	Threat Level	Cyanobacteria Levels (cells/mL)
★	Low	Less than 20,000
★ ★	Moderate	20,000 to 100,000
★ ★ ★	High	More than 100,000
★ ★ ★ ★	Extreme	More than 100,000 with scum/mats

Algae ID Pictures

Wauhakum Pond






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Water Diagnostics for Lakes & Ponds

SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 acres

Average depth: 15 feet

Date Algae Sample Received: 7/31/2024

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
			★★
<i>Lyngbya</i> sp.	Cyanophyta- Blue-green algae	Filamentous, mat-forming, potential toxin and taste/odor producer	42,300

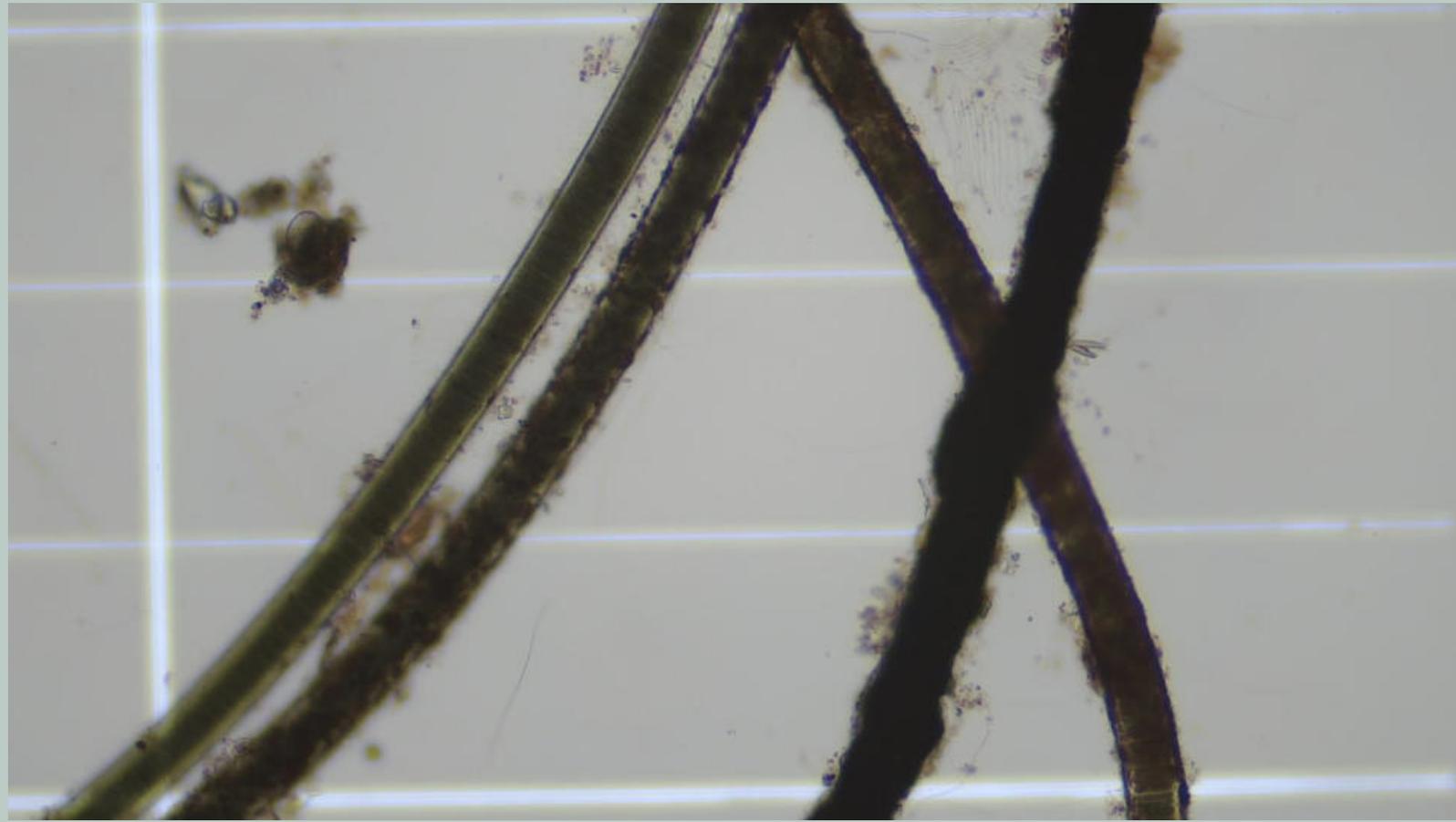
Other algae observed at densities less than 40 cells/mL: *Aphanizomenon*, *Dolichospermum*, *Heteroleibleinia*, *Microcystis*, *Planktolyngbya* (Cyanophyta)

Some bacteria and particulate matter observed

SeScript Alert Index	Threat Level	Cyanobacteria Levels (cells/mL)
★	Low	Less than 20,000
★ ★	Moderate	20,000 to 100,000
★ ★ ★	High	More than 100,000
★ ★ ★ ★	Extreme	More than 100,000 with scum/mats

Algae ID Pictures

Wauhakum Pond






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Water Diagnostics for Lakes & Ponds

SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 acres

Average depth: 15 feet

Date Algae Sample Received: 08/15/2024

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
★ ★ ★			
<i>Planktolyngbya</i> sp.	Cyanophyta- Blue-green algae	Filamentous, planktonic, potential toxin producer	251,000
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-forming, planktonic, potential toxin and taste/odor producer	22,400

Other algae observed at densities less than 40 cells/mL: *Scenedesmus* (Chlorophyta); *Microcystis* (Cyanophyta); *Gymnodinium* (Dinophyta); *Trachelomonas* (Euglenophyta)

SeScript Alert Index	Threat Level	Cyanobacteria Levels (cells/mL)
★	Low	Less than 20,000
★ ★	Moderate	20,000 to 100,000
★ ★ ★	High	More than 100,000
★ ★ ★ ★	Extreme	More than 100,000 with scum/mats

Algae ID Pictures

Waushakum Pond






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Water Diagnostics for Lakes & Ponds

SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 acres

Average depth: 15 feet

Date Algae Sample Received: 08/27/2024

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

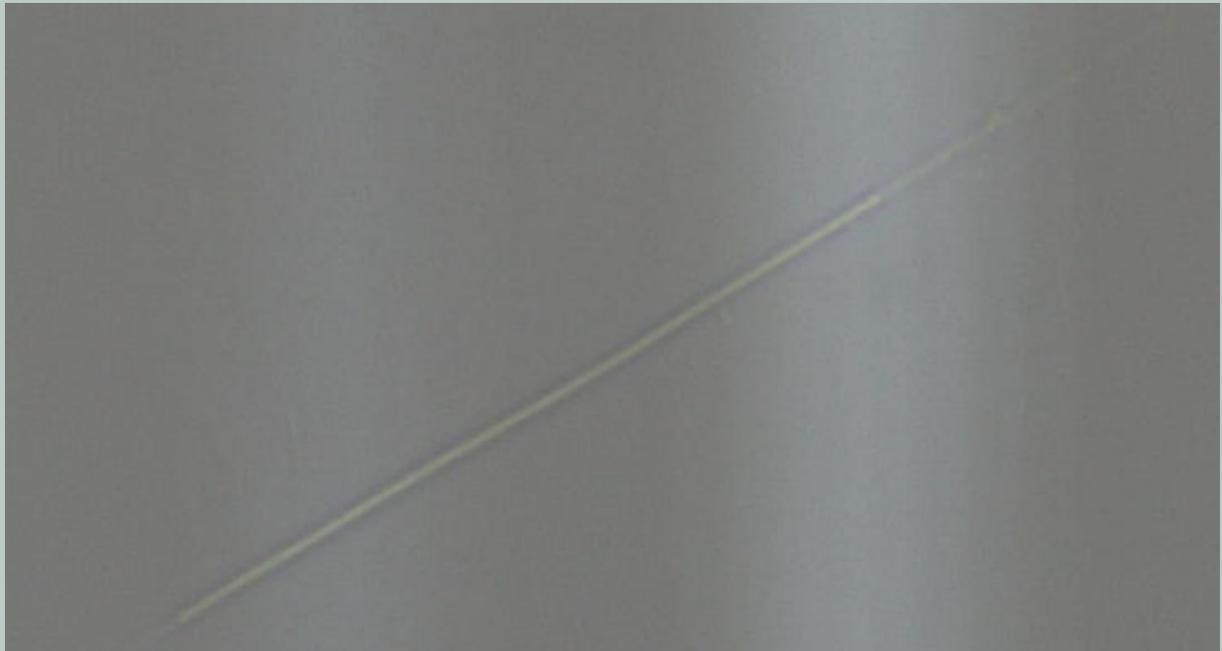
Identification	Classification	Description	Density/Biomass (cells/mL)
			★★★
<i>Planktolyngbya</i> sp.	Cyanophyta- Blue-green algae	Filamentous, planktonic, potential toxin producer	184,900

Other algae observed at densities less than 40 cells/mL: *Oocystis*, *Selenastrum* (Chlorophyta); *Aphanizomenon*, *Raphidiopsis* (Cyanophyta); *Trachelomonas* (Euglenophyta)

SeScript Alert Index	Threat Level	Cyanobacteria Levels (cells/mL)
★	Low	Less than 20,000
★★	Moderate	20,000 to 100,000
★★★	High	More than 100,000
★★★★	Extreme	More than 100,000 with scum/mats

Algae ID Pictures

Waushakum Pond






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SePRO Lab

Water Diagnostics for Lakes & Ponds



SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 feet

Average depth: 15 acres

Date Algae Sample Received: 10/01/2024

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	3,800
<i>Dolichospermum</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	1,200

Other algae observed at densities less than 40 cells/mL: *Fragilaria* (Bacillariophyta); *Dinobryon* (Chrysophyceae); *Cryptomonas* (Cryptophyta); *Planktolyngbya*, *Woronichinia* (Cyanophyta); *Gymnodinium* (Dinophyta); *Euglena*, *Trachelomonas* (Euglenophyta)






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SePRO Lab

Water Diagnostics for Lakes & Ponds



SeSCRIPT Analysis Report: Waushakum Pond

Company: Water and Wetland

Address: 134 Ferry St. South Grafton, MA. 01560

Contact Person: Joe Onorato

Phone: (888)-493-8526

Email: joe ; info@waterandwetland.com

Project Name: Waushakum Pond

Surface Area: 80 feet

Average depth: 15 acres

Date Algae Sample Received: 10/11/2024

SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Waushakum Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
<i>Aphanizomenon</i> sp.	Cyanophyta- Blue-green algae	Filamentous, scum-former, planktonic, potential toxin and taste/odor producer	9,700

Other algae observed at densities less than 40 cells/mL: *Asterionella* (Bacillariophyta); *Cryptomonas* (Cryptophyta); *Dolichospermum*, *Planktothrix* (Cyanophyta)

Some particulate matter observed

