WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

November 24, 2025

Hop Brook Protection Association
PO Box 707
Sudbury, MA 01776
Sent via email: jeff@hopbrook.org

Re: Hop Brook Ponds (Stearns Millpond, Carding Millpond, and Grist Millpond), Sudbury, MA (DEP#301-1283) – 2025 Year End Report

Dear Hop Brook Protection Association Members:

It is our pleasure to present a year-end summary report to The Hop Brook Protection Association regarding the 2025 aquatic management program at the Hop Brook Ponds. The Hop Brook waterbodies include Stearns Millpond, Carding Millpond, and Grist Millpond, all located in Sudbury, MA.

Historically, Hop Brook Protection Association has battled invasive species water chestnut *(Trapa natans)* within all three waterbodies: Stearns Millpond, Carding Millpond, and Grist Millpond. The goal of the 2025 program was to manage the invasive water chestnut 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, permitting, surveys, treatments, and reporting.

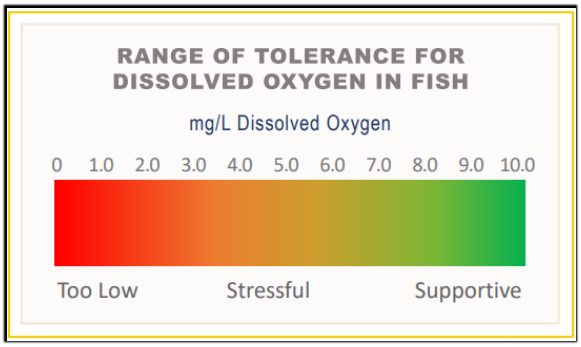

Figure 1: Dissolved oxygen table

During each visit to the ponds, 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 (Figure 2). Dissolved oxygen is the amount of oxygen in water that is available to aquatic organisms. DO is necessary to support fish spawning, growth, and activity. Tolerance varies by species, please see the figure provided for a general range of fish tolerance (Source: epa.gov). Dissolved oxygen can be affected by many outside factors, such as: temperature, time of day, and pollution. Dissolved oxygen levels are typically lowest early in the morning. Healthy water should generally have concentrations of about 6.5-8+ mg/L (Figure 1). Water clarity was also assessed using a Secchi disk, as applicable (Figure 2). 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


Figure 2: Equipment and meters utilized during each site visit

Secchi depth, is a measurement of the transparency of the water. All readings are included in the tables throughout this report.

Water quality samples were collected at specific visits from the contracted locations of the site. The samples were properly preserved, and shipped on-ice via FedEx Overnight, or transported directly to the most appropriate lab. The lab then analyzed the samples for the contracted/required parameters. Results are provided at the end of this report. Any concerning results were immediately brought to the attention of the Client previously.

All permitting, treatments, and survey tasks were completed without issue and at the proper times. The tables throughout the report provide the specific dates of each task. Below the table, each visit/task performed is described in additional detail.

Stearns Millpond

Stearns Millpond (Figure 3) is the northernmost waterbody of the three Hop Brook Ponds and is approximately 16.8 acres. This pond is primarily surrounded by woodlands with developed properties scattered on both the northern and southern shorelines. The inlet (which is Hop Brook) to Stearns Millpond is found along the southwestern point. Water flows from west to east within the waterbody, with the outlet noted at the northeastern point (adjacent to the public parking lot). This outlet is a constructed dam that flows back into Hop Brook. The pond is fairly shallow, with an average depth of roughly 2.5-3 feet. Access to this waterbody is gained from the public parking lot off of Dutton Road.

Figure 3: Stearns Millpond - Sudbury, MA

Summary Of 2025 Management Activities

Date	Task/Description
June 10, 2025	A pre-management survey was performed to document baseline conditions of the pond, note the current vegetation species/densities present, and to guide future 2025 management; Water samples were collected
July 15, 2025	An interim survey was conducted to confirm treatment areas; The initial water chestnut treatment was completed
August 6, 2025	A post-management survey was completed to evaluate the effectiveness of the previous treatment and the overall 2025 aquatic management program, and to guide recommendations for 2026; The follow-up water chestnut treatment was completed

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Figure 4: Image depicts one of the several trace density patches of water chestnut observed during the June survey visit.

June 10, 2025 – Pre-Treatment Survey / Sampling Event

On 6/10/25, Senior Aquatic Biologist, Colin Gosselin, made a visit to the Stearns Millpond. 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
Water Chestnut*	*Trapa natans*
Curly-Leaf Pondweed*	*Potamogeton crispus*
Common Waterweed/Elodea	*Elodea canadensis*
Duckweed	*Lemna*
Coontail	*Ceratophyllum demersum*

A visit was conducted at Stearns Millpond, which consisted of vegetation surveys and the collection of basic water quality data. Stearns Millpond contained small patches of trace density water chestnut. Trace to sparse densities of invasive curly-leaf pondweed (*Potamogeton crispus)* were also noted along the littoral zone. Additionally, scattered patches of coontail (*Ceratopyllum demersum)* and duckweed (*Lemna)* were observed around the edges. The delay in plant growth within the millponds can be attributed to complications involving the later-than-average frost timings towards the conclusion of winter. Based on the prevailing invasive assemblages noted during each survey, an initial treatment for water chestnut would be conducted within the waterbody in early July.

Temperature & Dissolved Oxygen		
Pond	Surface Temp (°C)	Surface DO (mg/L)
Stearns Millpond	19.4	8.55

Water Quality Parameters
Algae ID - Classification - Biomass, Alkalinity, Chlorophyll A, Conductivity, Hardness, Nitrates and Nitrites, Nitrogen - Total (Kjeldahl), pH, Phosphorus - Free Reactive (water), Phosphorus - Total (Water), Turbidity

Figure 5: Image depicting the pre-treatment surface conditions of Stearns Millpond during the July treatment visit.

July 15, 2025 – Interim Survey / Treatment

On 7/15/25, Senior Aquatic Biologist, Colin Gosselin, made a visit to Stearns Millpond. 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
Common Waterweed/Elodea	*Elodea canadensis*
Duckweed	*Lemna*
Water Chestnut*	*Trapa natans*

This site visit to Stearns Millpond consisted primarily of a foliar herbicide treatment for the millpond's characteristic invasive water chestnut. A survey and the collection of basic water quality data were also performed. The pond was topped out with moderate to dense waterweed (*Elodea canadensis)* and duckweed, with only a few open water areas being present. Trace densities of a few individual water-chestnut plants were observed throughout the pond. Overall, the water chestnut within Stearns Millpond is at a significantly healthier level, with a large reduction in density from last year. The foliar treatment went without issue and excellent coverage was achieved via airboat. Due to the state of water chestnut assemblage, a switch to removal via hand-pulling may be in order for next year pending the circumstances regarding the species.

As noted, a treatment was conducted for the control of water chestnut. The liquid herbicide, Clearcast (imazamox), was applied using the most appropriate boat, equipped with a calibrated pump, which is used to target the water chestnut plants via foliar application methodology. This method allows for even and precise coverage. Weather was also closely monitored prior to treatment to ensure a treatment date without rain or high winds.

Prior to the treatment, 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.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
29.3	9.54

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Figure 6: Image depicting one of the several water chestnut plants that were hand-pulled during the August treatment visit to Stearns Millpond.

August 6, 2025 – Post-Treatment Survey / Follow-up Treatment

On 8/6/25, Senior Aquatic Biologist, Colin Gosselin, and Field Assistant, Nick Cameron, made a visit to Stearns Millpond. 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
Filamentous Algae	
Water Chestnut*	*Trapa natans*
Duckweed	*Lemna*
Common Waterweed	*Elodea canadensis*
Watermeal	*Wolffia*

This site visit to Stearns Millpond consisted of the collection of basic water quality data, completing a survey, and conducting a foliar herbicide treatment. Dissolved oxygen readings continued to maintain healthy levels. Nuisance density pondweeds such as elodea were observed throughout the pond. Additionally, sparse density patches of filamentous algae were scattered throughout the waterbody, often accompanying any topped-out sections of pondweeds. The treatment was conducted to target and curb the presence of any prevailing invasive water chestnut, which was observed in scattered densities around the pond. Very isolated water chestnut populations were hand-pulled and properly disposed of. Overall, the treatment went without issue and excellent coverage was achieved via airboat.

A treatment was conducted for the control of water chestnut. The liquid herbicide, Clearcast (imazamox), was applied using the most appropriate boat, equipped with a calibrated pump, which is used to target the water chestnut plants via foliar application methodology. This method allows for even and precise coverage. Weather was also closely monitored prior to treatment to ensure a treatment date without rain or high winds.

Prior to the treatment, 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.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
27.6	7.93

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Carding Millpond

Carding Millpond (Figure 8) is found between Grist Millpond and Stearns Millpond. This waterbody is south of Stearns Millpond, and northeast of Grist Millpond. Carding Millpond is approximately 42.8 acres, including two islands within the middle of the pond. The northern island is roughly 0.85 acres while the southern island (the larger island) is about 2.4 acres. Access to Carding Millpond was gained from a boat launch on the northern shoreline. The road to the boat launch is found off Dutton Road, which runs along the western shoreline. The pond is surrounded by sparse woodlands with a handful of developed properties/fields mixed noted on each shoreline. Two inlets are noted within the pond, one in each southern basin. The primary inlet is found within the southwestern basin. The outlet within the pond is along the northern shoreline, which flows into Hop Brook.

Figure 7: Carding Millpond - Sudbury, MA

Summary Of 2025 Management Activities

Date	Task/Description
June 10, 2025	A pre-management survey was performed to document baseline conditions of the pond, note the current vegetation species/densities present, and to guide future 2025 management; Water samples were collected
July 23, 2025	An interim survey was completed to confirm treatment areas; The initial water chestnut treatment was performed
August 6, 2025	A post-management survey was completed to evaluate the effectiveness of the previous treatment and the overall 2025 aquatic management program, and to guide recommendations for 2026; The follow-up water chestnut treatment was completed

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Figure 8: Image depicting the growth of young water chestnut plants that were observed during the June survey visit to Carding Millpond.

June 10, 2025 – Pre-Treatment Survey / Sampling Event

On 6/10/25, Senior Aquatic Biologist, Colin Gosselin, made a visit to the Hop Brook Ponds. 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
Water Chestnut*	*Trapa natans*
Common Waterweed/Elodea	*Elodea canadensis*
Duckweed	*Lemna*
Coontail	*Ceratophyllum demersum*

A site visit was conducted at Carding Millpond which consisted of a vegetation survey and the collection of basic water quality data. Carding Millpond's vegetation assemblage comprised of trace density water chestnut plants within the shallow coves and by the dam. In addition, a few small water chestnut plants were observed below the surface but no major mats had surfaced yet. Trace to sparse densities of invasive curly-leaf pondweed were also noted along a majority of the littoral zone. Water flow was heavy at the time of survey. The delay in plant growth within the millponds can be attributed to complications involving the later-than-average frost timings towards the conclusion of winter. Based on the prevailing invasive assemblages noted during each survey, an initial treatment for water chestnut would be conducted within the waterbody in early July.

Temperature & Dissolved Oxygen		
POND	Surface Temp (°C)	Surface DO (mg/L)
Carding Millpond	19.7	9.71

Water Quality Parameters
Algae ID - Classification - Biomass, Alkalinity, Chlorophyll A, Conductivity, Hardness, Nitrates and Nitrites, Nitrogen - Total (Kjeldahl), pH, Phosphorus - Free Reactive (water), Phosphorus - Total (Water), Turbidity

Figure 9: Image depicting the pre-treatment surface conditions of Carding Millpond during the July treatment visit.

July 23, 2025 – Interim Survey / Treatment

On 7/23/25, Senior Aquatic Biologist, Colin Gosselin, made a visit to Carding Millpond. 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
Water Chestnut*	*Trapa natans*

The site visit consisted of completing a survey, collecting basic water quality data, and completing the initial treatment. This treatment was delayed compared to the other two waterbodies as the road to the entrance of the pond was being paved, and access to the boat launch was not granted. There was a very little increase of water chestnut observed from pretreatment survey as the plants were very scattered around the pond. The majority of the population was observed around the outlet area near the dam. No large patches were observed throughout the pond. Large patches of duckweed were observed near the inlet areas. The water quality seemed much better than last year. The treatment went well, and excellent coverage was achieved.

A treatment was conducted for the control of invasive water chestnut. Clearcast (imazamox), was paired with a non-ionic surfactant. The mixture was applied to live water chestnut via foliar application using low-volume calibrated spray equipment. This methodology allows for even coverage and distribution to the target water chestnut, while limiting any non-target impacts. Weather was also closely monitored prior to treatment to ensure a treatment date without rain or high winds.

Prior to the treatment, 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.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
30.1	8.77

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August 6, 2025 – Post-Treatment Survey / Follow-up Treatment

On 8/6/25, Senior Aquatic Biologist, Colin Gosselin, and Field Assistant, Nick Cameron, made a visit to Carding Millpond. 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.

Figure 10: Image depicting the pre-treatment surface conditions within Carding Millpond during the August treatment visit.

Species Identified	
Common Name	Latin Name
Water Chestnut*	*Trapa natans*
Duckweed	*Lemna*
Filamentous Algae	
Snailseed Pondweed	*Potamogeton bicupulatus*
Common Waterweed/Elodea	*Elodea canadensis*
Thin-leaf Pondweed	*Potamogeton pusillus*
Watermeal	*Wolffia*
Coontail	*Ceratophyllum demersum*
Common Waterweed	*Elodea canadensis*

This site visit to Carding Millpond consisted of the collection of basic water quality data, performing a survey, and conducting a foliar herbicide treatment. Dissolved oxygen readings continued to maintain healthy levels. Elodea and other pondweeds, such as snail-seed pondweed (*Potamogeton bicupulatus)*, thin-leaf pondweed (*Potamogeton pusillus)*, and coontail were observed in high densities throughout the entire pond, with many sections of the pond also being covered with watermeal (*Wolffia)*. Sparse to moderate density filamentous algae patches were also observed at various locations. The treatment was conducted to target and curb the presence of invasive water chestnut, which was found in scattered patches throughout the pond. Overall, the treatment went without issue and excellent coverage was achieved via airboat.

A follow-up treatment was conducted for the control of water chestnut. The liquid herbicide, Clearcast (imazamox), was applied using the most appropriate boat, equipped with a calibrated pump, which is used to target the water chestnut plants via foliar application methodology. This method allows for even and precise coverage. Weather was also closely monitored prior to treatment to ensure a treatment date without rain or high winds.

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.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
28.1	7.34

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Grist Millpond

Figure 11: Grist Millpond - Sudbury, MA

Grist Millpond (pictured in Figure 13) is found north of Route 20 (Boston Post Road) and south of Wayside Inn Road. This waterbody is approximately 12.9 acres and is surrounded by woodlands and wetlands, with a small number of developed properties along the northern shoreline. The Wayside Inn Grist Mill is located downstream of the pond. Access to the pond was gained from the northeastern point of the waterbody, adjacent to the outlet. Water flows from the west (inlet at the western point) to east within Grist Millpond. The outlet to the pond is a small culvert that is noted underneath a walking path. There are walking paths observed around portions of the perimeter of this waterbody. Grist Millpond is a well-known historical site in addition to a popular location for outdoor recreational activities such as hiking, fishing, walking dogs, and bird watching. There is public parking off Wayside Inn Road for both the Grist Millpond area as well as the Wayside Inn Grist Mill area.

Summary Of 2025 Management Activities

Date	Task/Description
June 10, 2025	A pre-management survey was performed to document baseline conditions of the pond, note the current vegetation species/densities present, and to guide future 2025 management; Water samples were collected
July 15, 2025	An interim survey was completed to confirm treatment areas; The initial water chestnut treatment was performed
August 6, 2025	A post-management survey was completed to evaluate the effectiveness of the previous treatment and the overall 2025 aquatic management program, and to guide recommendations for 2026; The follow-up water chestnut treatment was completed

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Figure 12: Image depicting the pre-treatment surface conditions of Grist Millpond during the June survey visit.

June 10, 2025 – Pre-Treatment Survey / Sampling Event

On 6/10/25, Senior Aquatic Biologist, Colin Gosselin, made a visit to Grist Millpond. 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
Water Chestnut*	*Trapa natans*
Curly-Leaf Pondweed*	*Potamogeton crispus*
Common Waterweed/Elodea	*Elodea canadensis*
Duckweed	*Lemna*
Coontail	*Ceratophyllum demersum*

A visit was conducted at Grist Millpond which consisted of a vegetation survey and the collection of basic water quality data. Grist Millpond contained scattered patches of trace density water chestnut plants near the outlet. The inlet area was clear of any water chestnut plants at the time of survey. However, trace to sparse density invasive curly-leaf pondweed was observed from the outlet to slightly past the millpond's first bottleneck. A few small clumps of waterweed and duckweed were also observed in trace densities near the dam area. The delay in plant growth within the millponds can be attributed to complications involving the later-than-average frost timings towards the conclusion of winter. Based on the prevailing invasive assemblages noted during each survey, an initial treatment for water chestnut would be conducted within the waterbody in early July.

Temperature & Dissolved Oxygen		
POND	Surface Temp (°C)	Surface DO (mg/L)
Grist Millpond	19.2	8.70

Water Quality Parameters
Algae ID - Classification - Biomass, Alkalinity, Chlorophyll A, Conductivity, Hardness, Nitrates and Nitrites, Nitrogen - Total (Kjeldahl), pH, Phosphorus - Free Reactive (water), Phosphorus - Total (Water), Turbidity

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Figure 13: Image depicting the surface conditions of Grist Millpond during the July treatment visit. Trace densities of water chestnut can be seen intermixed with patches of filamentous algae and duckweed.

July 15, 2025 – Interim Survey / Treatment

On 7/15/25, Senior Aquatic Biologist, Colin Gosselin, made a visit to Grist Millpond. 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
Water Chestnut*	*Trapa natans*
Common Waterweed/Elodea	*Elodea canadensis*
Duckweed	*Lemna*

This site visit to Grist Millpond primarily consisted of a foliar herbicide application for the purpose of treating the millpond's characteristic invasive water chestnut growth. A survey and the collection of basic water quality data were also performed. Although the water clarity was poor due to excess tannin deposits, it was visibly better than last year. The water chestnut has reduced by 90+% from the start of the program. The water chestnut maintained very sparse densities throughout the pond, with the densest area being observed near the outlet. No large patches of water chestnut were observed, as most of the patches were comprised of clumps with 2-4 plants. The foliar treatment went without issue and excellent coverage was achieved via airboat.

A treatment was conducted for the control of water chestnut. The liquid herbicide, Clearcast (imazamox), was applied using the most appropriate boat, equipped with a calibrated pump, which is used to target the water chestnut plants via foliar application methodology. This method allows for even and precise coverage. Weather was also closely monitored prior to treatment to ensure a treatment date without rain or high winds.

Prior to the treatment, 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.

Temperature & Dissolved Oxygen	
Surface Temp (°C)	Surface DO (mg/L)
28.8	8.94

Figure 14: Image depicting the surface conditions of Grist Millpond during the August treatment event.

August 6, 2025 – Post-Treatment Survey / Follow-up Treatment

On 8/6/25, Senior Aquatic Biologist, Colin Gosselin, and Field Assistant, Nick Cameron, made a visit to Grist Millpond. 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
Water Chestnut*	*Trapa natans*
Filamentous Algae	
Benthic Algae	
Cattails	*Typha*
Common Waterweed	*Elodea canadensis*

This site visit to Grist Millpond consisted of the collection of basic water quality data, completing a survey, and performing a foliar herbicide treatment. Elodea and other nuisance density pondweeds were observed the entire pond. These densities were often accompanied by filamentous algae mats on the surface. The treatment was conducted to target and curb the presence of any prevailing invasive water chestnut within the waterbody, which was scattered in sparse densities around the pond. Overall, the treatment went without issue and excellent coverage was achieved via airboat.

A follow-up treatment was conducted for the control of water chestnut. The liquid herbicide, Clearcast (imazamox), was applied using the most appropriate boat, equipped with a calibrated pump, which is used to target the water chestnut plants via foliar application methodology. This method allows for even and precise coverage. Weather was also closely monitored prior to treatment to ensure a treatment date without rain or high winds.

Prior to the treatment, the shoreline was posted with neon pink signs noting the treatment, 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)
26.8	6.72

Water Quality

As required by the special orders (within the order of conditions), during the June 10th and September 8th survey events, water samples were collected to analyze specific water quality within Grist Millpond, Stearns Millpond, and Carding Millpond. Samples were collected from the middle of the ponds, preserved, and immediately taken/shipped to a State certified laboratory, where they were analyzed for the specific

contracted parameters. The samples were analyzed for turbidity, true color, apparent color, total alkalinity, pH, ammonia nitrogen, nitrate nitrogen, total kjeldahl nitrogen, total phosphorus, soluble phosphorus, and E. coli. All samples collected were "surface grabs." Dissolved oxygen and temperature were measured using a calibrated meter during each site visit.

Water quality in ponds and lakes 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.

Water Quality Parameter	Results					
	06/10/2025			09/08/2025		
	Grist Millpond	Stearns Millpond	Carding Millpond	Grist Millpond	Stearns Millpond	Carding Millpond
Turbidity (NTU)	2.9	3.6	3.4	3.2	3.5	3.2
True Color (A.P.C.U)	152	159	114	39	44	9
Apparent Color (A.P.C.U)	201	190	129	64	62	20
Total Alkalinity (mg $CaCO_3$/L)	59.2	46.7	59.9	67.5	43.6	54.1
pH (SU)	7.5	7.3	7.5	7.5	7	8.5
Ammonia Nitrogen (µg/L)	103.3	321.9	317.1	123.7	40.2	30.2
Nitrite, Nitrate (mg/L)	5.11	1.07	2.24	1.52	0.03	0.03
Total Kjeldahl Nitrogen (mg/L)	1.01	0.95	1.19	0.77	<0.1	<0.1
Total Phosphorus (µg/L)	51.4	79.7	73.4	89.3	83.8	81.2
Free Reactive Phosphorus (µg/L)	7.7	26.0	9.7	28.8	26.4	22.2
E. Coli (CFU/100ml)	152.3	36.8	3.0	66.3	260.3	35.0
Conductivity (uS/cm)	-	-	-	705.6	540.6	705.7
Total Hardness (mg $CaCO_3$/L)	-	-	-	85.6	56.6	63.3
Chlorophyll A (ug/L)	-	-	-	13.9	<10	<10

Water Quality Parameter Table

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.
<10 NTU drinking water standards; 10-50 NTU is considered moderate; >50 NTU potentially impactful to aquatic life. All turbidity readings within the three ponds during both samplings were in a desirable range.

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True Color: The color of the water sample after filtering all suspended material. This measurement represents the color of the filtered water due to dissolved components.
Apparent Color: the color of the entire water sample, which consists of color caused by both dissolved and suspended particles/components. This value can be highly variable based on weather conditions. Typically, values may increase in the case of storm events and may decrease in the event of drought. *0-25 is clear, 25-40 is light tea-color, 40-80 is tea color, >80 is dark tea color. All ponds appeared as a dark tea color during the June sampling. Apparent Color dropped significantly during the September sampling, with Grist Millpond and Stearns Millpond consisting of a tea color and Carding Millpond becoming clear.*
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. *>20 mg/L is considered healthy; ~50 mg/L illustrates the water is resistant to change. All samplings were near or slightly above 50 mg/L, illustrating that the ponds are less susceptible to pH shifts.*
pH: the measure of how acidic or basic the water is. *<6 notably acidic; 6-9 standard for freshwaters (7 is neutral); >9 notably basic. pH during all samplings was within a standard range for freshwaters and near neutral in all samplings.*
Nitrogen, Ammonia: Ammonia and organic nitrogen can enter water through sewage effluent and runoff from land where manure has been applied or stored. Ammonia in water is non-toxic to humans, but it is toxic to aquatic life. Unlike other forms of nitrogen, which can indirectly harm aquatic ecosystems by increasing nutrient levels and promoting algae growth in the process known as eutrophication, ammonia has direct toxic effects on aquatic ecosystems. High levels of ammonia in lakes and streams can promote the growth of algae, which in turn can choke out the growth of other aquatic plants. Bacteria can also convert ammonia in water to nitrate in a process known as nitrification. Nitrification is a beneficial process if it takes place in the soil — plants can use the produced nitrates as food. However, nitrification tends to lower the dissolved oxygen levels in water, making it harder for fish and other aquatic life to breathe. *Ammonia nitrogen was well below 500 µg/L threshold for all samplings.*
Nitrogen, Nitrate: Nitrate nitrogen is important to the growth of algae. Nitrate is the oxidized nitrogen and is often readily free for algae uptake. *<1 mg/L typical for freshwater; 1-10 mg/L is potentially harmful; >10 mg/L possibly toxic. Generally, <0.30 mg/L is ideal, and a maximum of 10 mg/L is the EPA standard for drinking water. Nitrate results fell within the standard range that is typical of freshwater*
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. *Generally, concentrations below 1.0 mg/L are considered desirable. Readings for Grist and Carding Millpond were slightly above the desired range during the June sampling. The September sampling event yielded desirable levels for all ponds.*
Total Phosphorus: Total phosphorous is a nutrient that is essential for plants and algae to grow. Typically, a value of 30 parts per billion, or 30 µg/L, is sufficient enough to stimulate excessive plant and algae growth. This sample measures all forms of phosphorus in the water column. *<12 µg/L is considered nutrient deficient or oligotrophic; 12-24 µg/L is considered a moderate amount of nutrients, or mesotrophic; 25-96 µg/L is nutrient rich, or eutrophic; >96 µg/L is considered excessive nutrients, or hypereutrophic.*

All three of the millponds are within the nutrient rich, or eutrophic, range.
Free Reactive Phosphorus: Soluble phosphorous is the measure of filterable soluble and inorganic phosphorus. This form of phosphorus is directly taken up by plant cells. *Soluble phosphorus was below the concerning threshold in all three ponds.*
E. Coli: E. Coli is a potentially harmful fecal coliform bacteria that can be harmful to humans and pose a health threat. *>235 colonies/100 ml is potentially harmful. All results were well below this threshold, except for Stearns Millpond during the September sampling, which is slightly above the potentially harmful threshold at 260.3 CFU/100mL.*
Hardness: Measure of the concentration of divalent cations, primarily consisting of calcium and magnesium in typical freshwater. *0-60 mg/L as CaCO3 soft; 61-120 mg/L as CaCO3 moderately hard; 121-180 mg/L as CaCO3 hard; >181 mg/L as CaCO3 very hard. In the September sampling, Stearns Millpond is characterized as soft, with both Carding and Grist Millpond being characterized as moderately hard; which is common for New England waterbodies.*
Conductivity: Measure of the waters ability to transfer and electrical current, increased with more dissolved ions. *<50 uS/cm relatively low concentrations may not provide sufficient dissolved ions for ecosystem health; 50-1500 uS/cm typical freshwaters; >1500 uS/cm may be stressful to some freshwater organism, though not uncommon in many areas. All millponds displayed conductivity levels that were typical of freshwaters during the September sampling event.*
Chlorophyll a: primary light-harvesting pigment found in algae and a measure of the algal productivity and water quality in a system. *0-2.6ug/L oligotrophic; 2.7-20 ug/L mesotrophic; 21-56 ug/L eutrophic; >56ug/L hypereutrophic. All millponds displayed chlorophyll a levels consistent with a mesotrophic characterization.*

Algae Sampling

During the two sampling events, an algae sample from each pond was collected, and transported to the lab, where they were identified for algae species and enumeration. This parameter is not required within the Order of Conditions, but we feel it has value. We did not charge an extra cost to test for this. The samples were properly preserved and shipped to SePro Labs in North Carolina where they were analyzed for algae ID and enumeration. We have attached the results to this report and have summarized below.

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. Neither sampling event resulted in concerning cyanobacteria levels. It's important to note that prior to the sampling, during the summer months, visual signs of an algae bloom were documented. Despite this, both sample events found low algae cell counts in all three waterbodies.

WATER & WETLAND

LAKE, POND & WETLAND MANAGEMENT

Early Season Sampling

Algae ID Results

Hop Brooks Ponds

Identification	Classification	Description	Density/Biomass (cells/mL)
Carding Millpond			
Woronichinia sp.	Cyanophyta-Blue-green algae	Colonial, planktonic, potential toxin producer	< 40
Lyngbya sp.	Cyanophyta-Blue-green algae	Filamentous, mat-forming, potential toxin and taste/odor producer	< 40

Other algae observed at densities less than 40 cells/mL: *Desmodesmus* (Chlorophyta); *Cryptomonas* (Cryptophyta)

Some particulate matter observed

Identification	Classification	Description	Density/Biomass (cells/mL)
Grist Millpond			
Cyclotella sp.	Bacillariophyta-Diatoms	Single-celled, planktonic	< 40
Desmodesmus sp.	Chlorophyta-Green algae	Colonial, planktonic	< 40
Amphora sp.	Bacillariophyta-Diatoms	Single-celled, planktonic	< 40

Some particulate matter observed

Algae ID Results

Hop Brooks Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
Stearns Millpond			
Pediastrum sp.	Chlorophyta-Green algae	Colonial, planktonic	< 40
Snowella sp.	Cyanophyta-Blue-green algae	Colonial, planktonic, potential toxin producer	< 40

Other algae observed at densities less than 40 cells/mL: *Eunotia* (Bacillariophyta); *Desmodesmus* (Chlorophyta); *Cryptomonas* (Cryptophyta)

Some particulate matter observed

WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Late Season Sampling

Algae ID Results

Hopbrook Ponds

Identification	Classification	Description	Density/Biomass (cells/mL)
Carding Millpond			
Staurodesmus sp.	Streptophyta- Desmids	Single-celled, planktonic	440

Other algae observed at densities less than 40 cells/mL: *Pediastrum, Scenedesmus* (Chlorophyta); *Lyngbya* (Cyanophyta); *Cosmarium* (Streptophyta)

Much particulate matter observed

Identification	Classification	Description	Density/Biomass (cells/mL)
Grist Millpond			
Cryptomonas sp.	Cryptophyta- Cryptomonads	Single-celled, flagellated, planktonic	< 40
Cyclotella sp.	Bacillariophyta- Diatoms	Single-celled, planktonic	< 40

Identification	Classification	Description	Density/Biomass (cells/mL)
Stearns Millpond			
Cryptomonas sp.	Cryptophyta- Cryptomonads	Single-celled, flagellated, planktonic	100

Summary / 2026 Recommendations

Stearns Millpond

The 2025 management program at Stearns Millpond was highly successful in maintaining control of water chestnut and improving overall pond conditions. Two applications of Clearcast (imazamox) were performed, and follow-up hand-pulling effectively eliminated remaining individual plants. By late season, open-water habitat was restored throughout much of the pond, and native vegetation such as tape grass and pondweeds were present at healthy densities. Dissolved oxygen readings remained favorable, and water clarity was consistently good.

For 2026, we recommend maintaining the same proactive management program focused on early detection and rapid response. A spring survey should be conducted to document any water chestnut regrowth, followed by two sequential herbicide applications in June and July. Given that the seedbank remains viable for more than a decade, continued annual control is essential to prevent re-establishment. Routine water quality sampling should also continue to monitor phosphorus levels and dissolved oxygen trends, as nutrient enrichment may promote future nuisance vegetation growth.

Carding Millpond

The 2025 management program at Carding Millpond achieved excellent control of water chestnut through timely herbicide treatments and follow-up hand-pulling. However, following the reduction of water chestnut, dense coverage of duckweed and watermeal developed across portions of the pond. While native, these species can reduce oxygen exchange and shade out submersed vegetation. Curly-leaf pondweed was again documented at trace levels but did not reach nuisance density.

For 2026, we recommend continued management of water chestnut with imazamox treatments in early summer, paired with hand-pulling of isolated plants. Given the persistence of duckweed and watermeal, we also recommend monitoring these species closely and implementing a contact herbicide treatment if surface coverage exceeds 60 percent of the pond. Should curly-leaf pondweed continue to spread in future years, a systemic whole-pond Sonar (fluridone) treatment should be considered to provide multi-year control and promote greater open-water habitat. Water quality monitoring should continue to assess nutrient conditions and to help determine whether internal loading may be contributing to dense vegetative growth.

Grist Millpond

The 2025 management program at Grist Millpond effectively reduced water chestnut populations through two sequential herbicide treatments and follow-up hand-pulling. Excellent control was achieved prior to seed drop, and all work was completed in accordance with the Order of Conditions. Similar to Carding Millpond, dense mats of duckweed and watermeal developed later in the season, particularly along the southern and western coves. Curly-leaf pondweed was also present in moderate densities.

For 2026, continued annual management of water chestnut is recommended using imazamox treatments early in the season, with supplemental hand-pulling as needed. We also recommend that consideration be given to a systemic Sonar (fluridone) treatment to target the reduction of overall vegetative density in the pond. This approach would provide multi-year control of the invasive pondweed and help maintain open-water conditions. Continued water quality monitoring—including dissolved oxygen, phosphorus, and clarity—will also be critical for evaluating nutrient enrichment and guiding future management.

Overall, great progress was made in 2025 across Stearns Millpond, Carding Millpond, and Grist Millpond as conditions continued to improve under the Hop Brook Ponds management program. Water chestnut densities have been dramatically reduced, and habitat quality has improved throughout the system as a result of timely herbicide applications, hand-pulling, and consistent monitoring. Water & Wetland is proud to continue supporting the Hop Brook Protection Association and the Town of Sudbury in the stewardship

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LAKE, POND & WETLAND MANAGEMENT

of these important resources. We hope that you were impressed not only with the results of the 2025 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 continuing our partnership with the Hop Brook Protection Association and the Sudbury Conservation Commission in 2026 and for many years to come.

Sincerely,

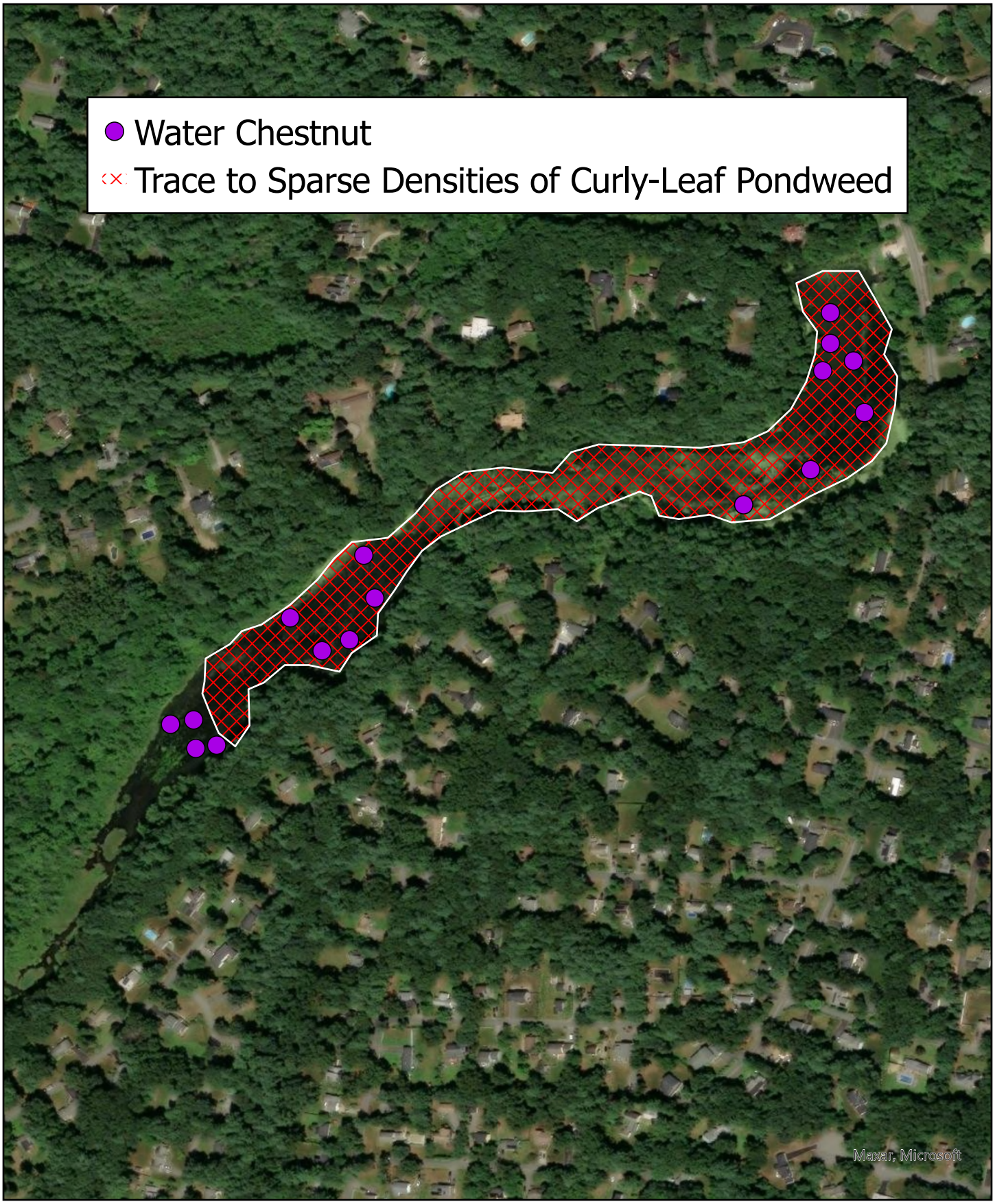
James Lacasse
Branch Manager
Senior Environmental Scientist
c: 774-276-6098
o: 888-4WETLAN(D)
james@waterandwetland.com
www.waterandwetland.com

Attachments Include

- **Pre-Treatment Invasive Species Maps**
- ***Post-Treatment Invasive/Nuisance Species Maps**
- **Lab WQ Results**

***It is important to note that a dot on the map (specifically for water chestnut) typically signifies a single plant or a very small number of plants. Many of which appeared dead/dying.**

CC: Sudbury Conservation Commission

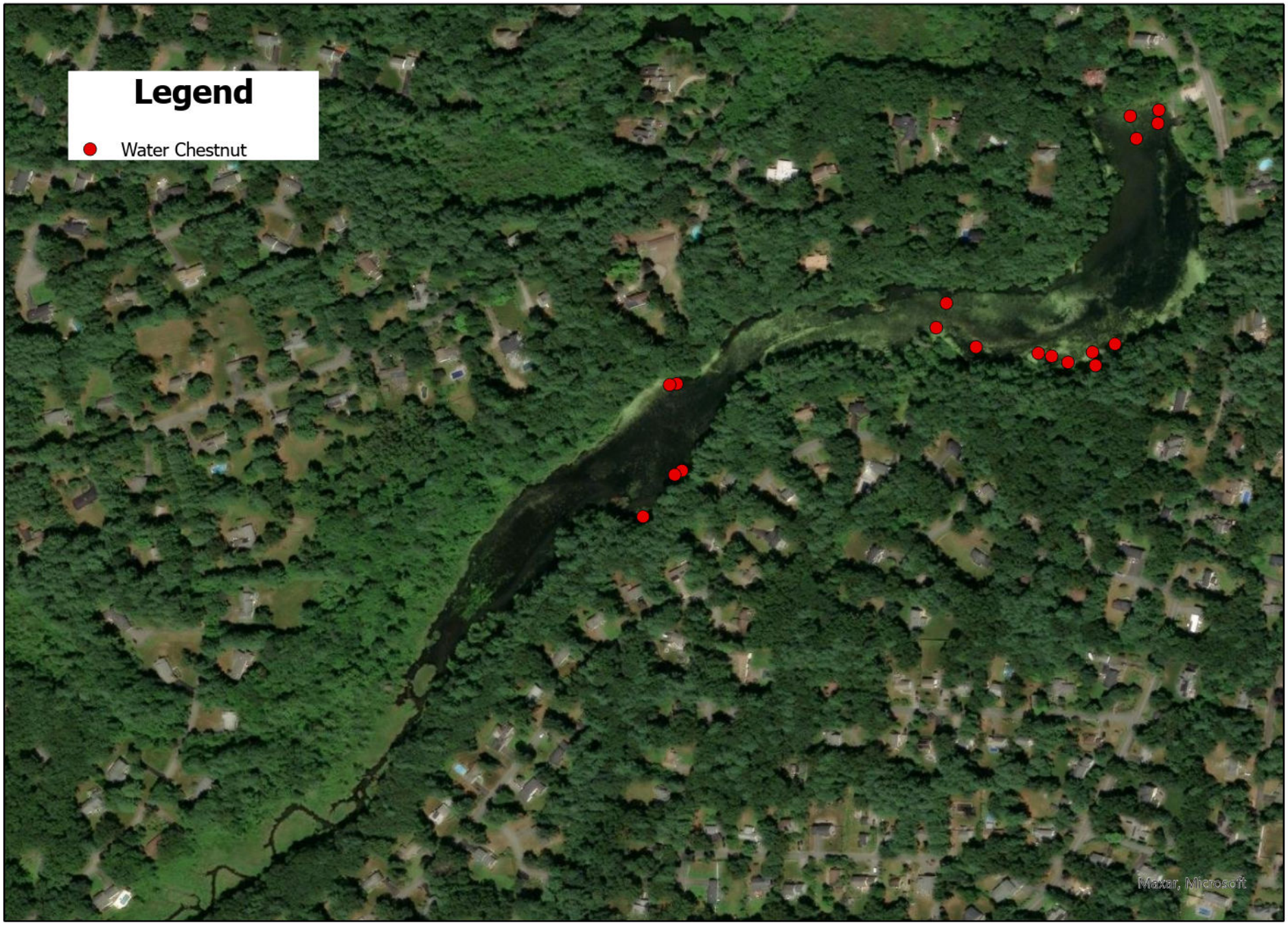


WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Stearns Mill
Invasive Plant Assemblage
Sudbury, MA

Survey Date
6/10/2025
Map Date
6/12/2025

N

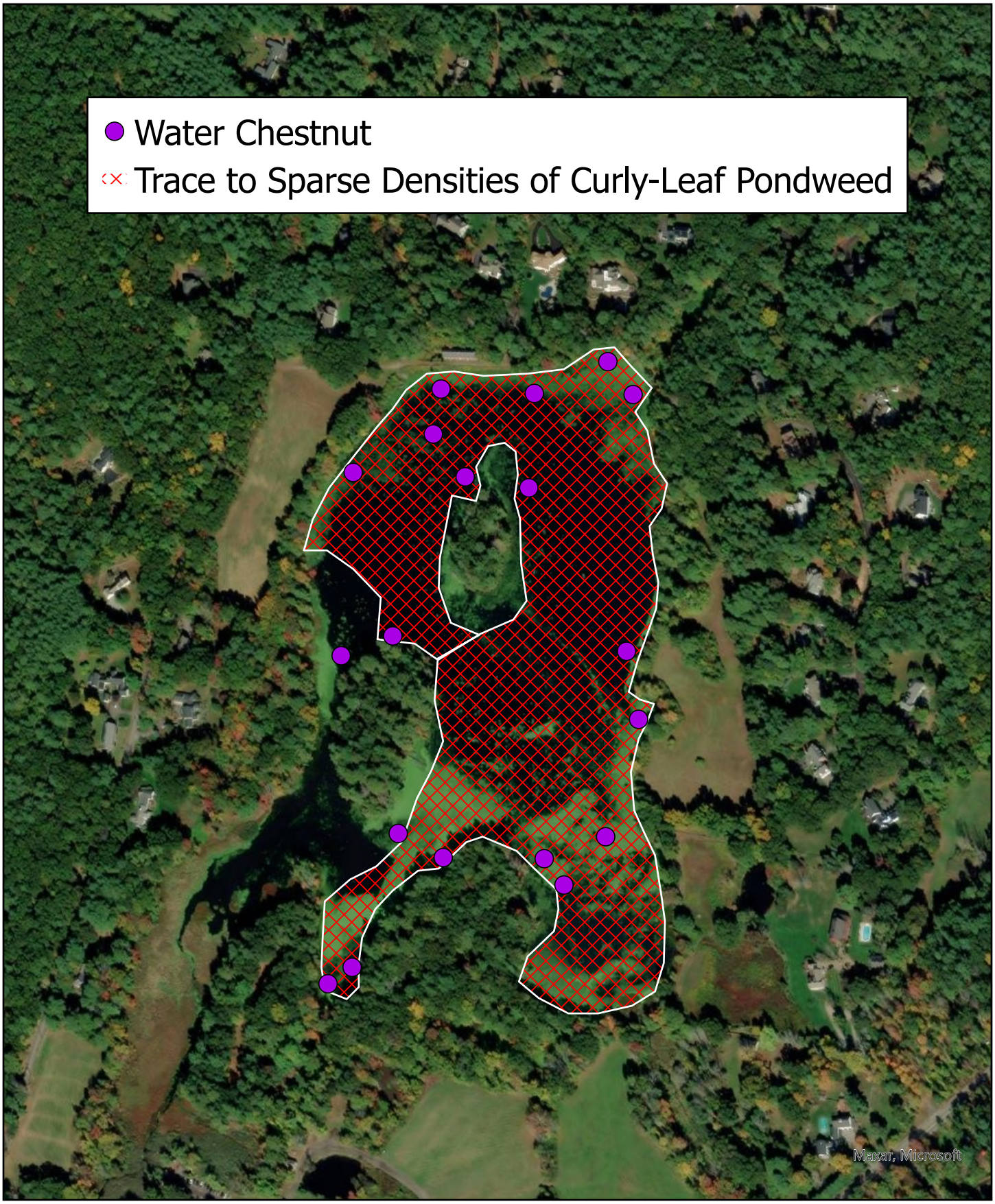


WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Stearns Millpond
Invasive Species Map
Sudbury, MA

Survey Date
9/8/2025
Map Date
9/11/2025

N

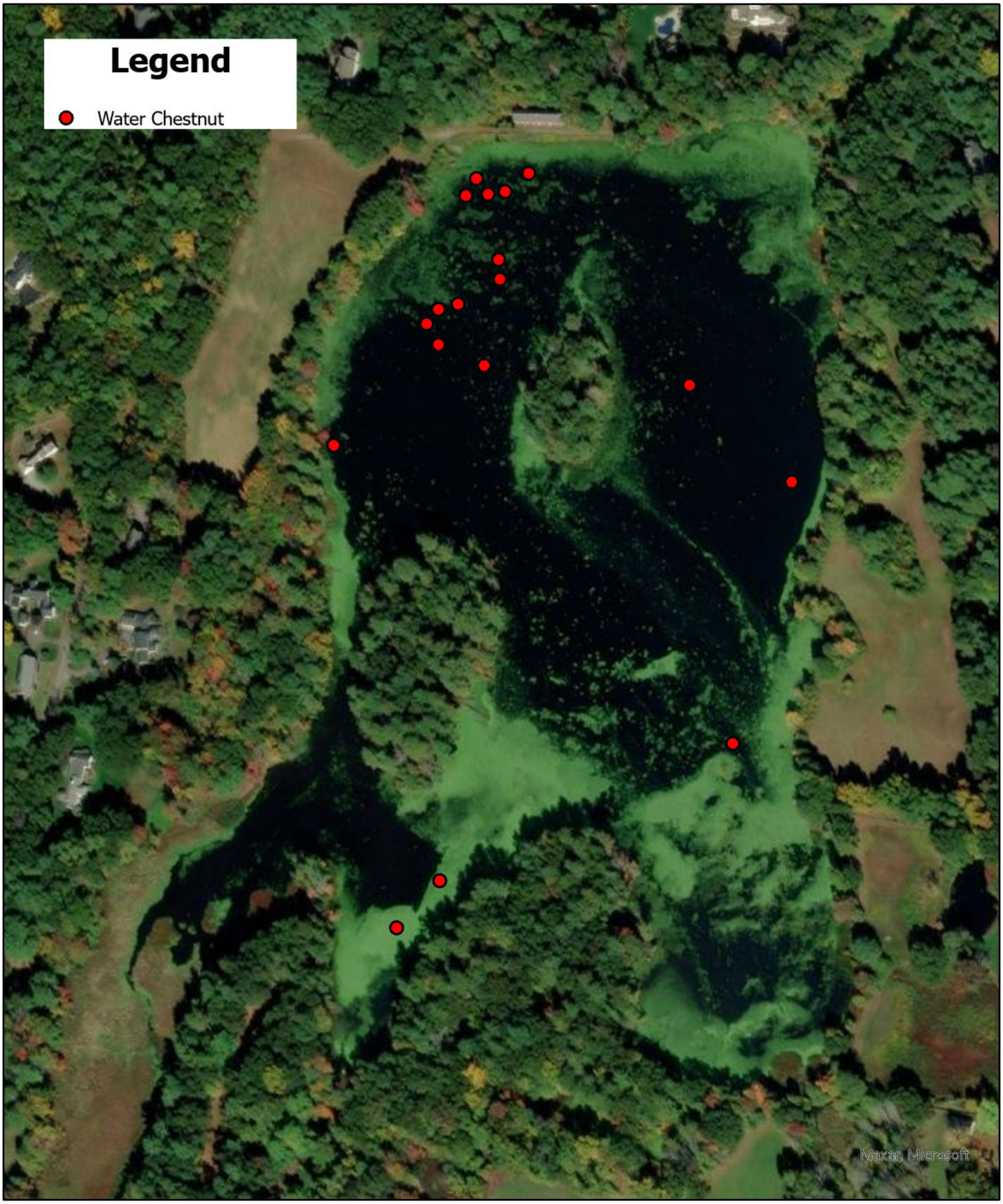


WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Carding Mill Pond
Invasive Plant Assemblage
Sudbury, MA

Survey Date
6/10/2025
Map Date
6/12/2025

N

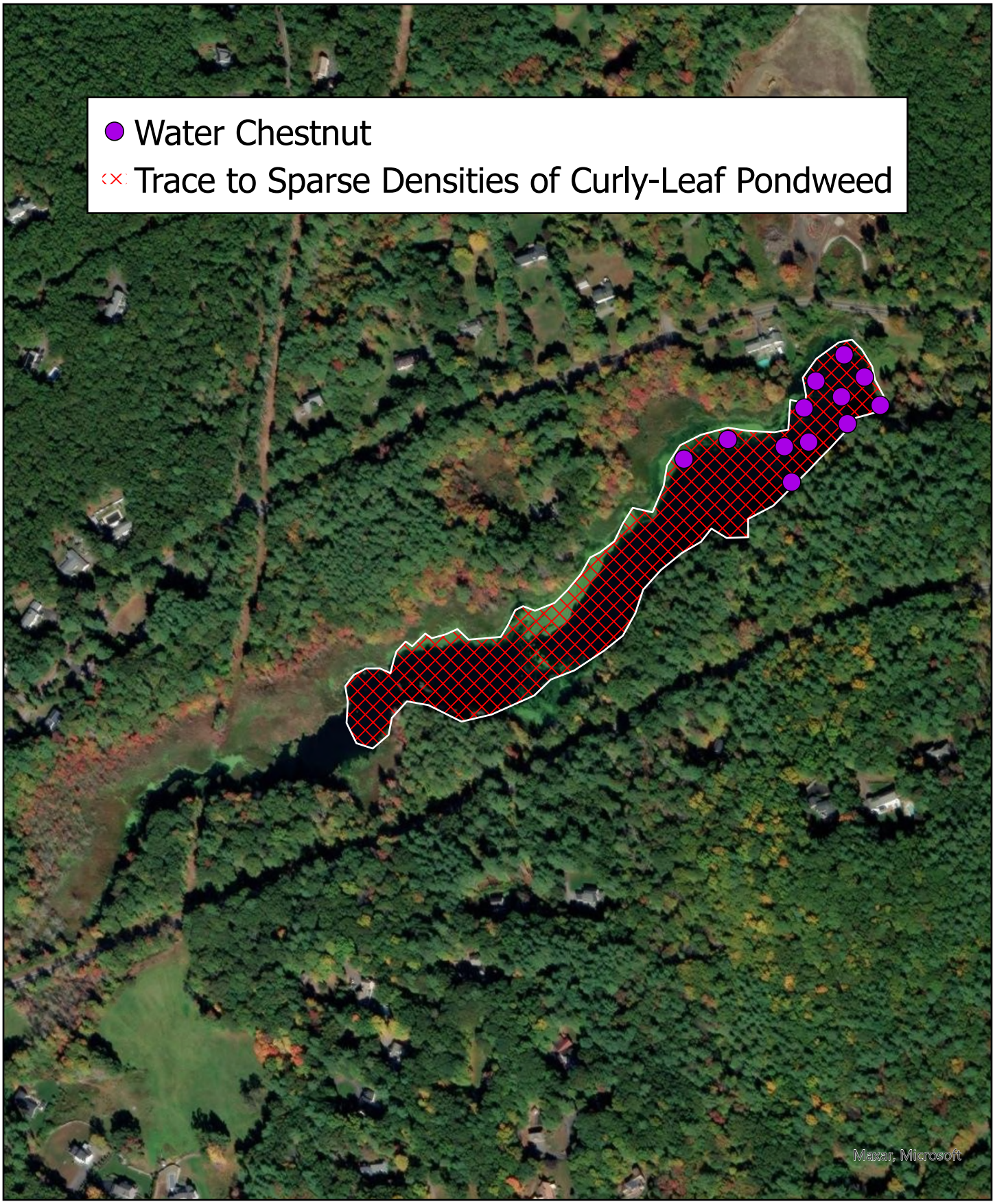


WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Carding Millpond
Invasive Species Map
Sudbury, MA

Survey Date
9/8/2025
Map Date
9/11/2025

N

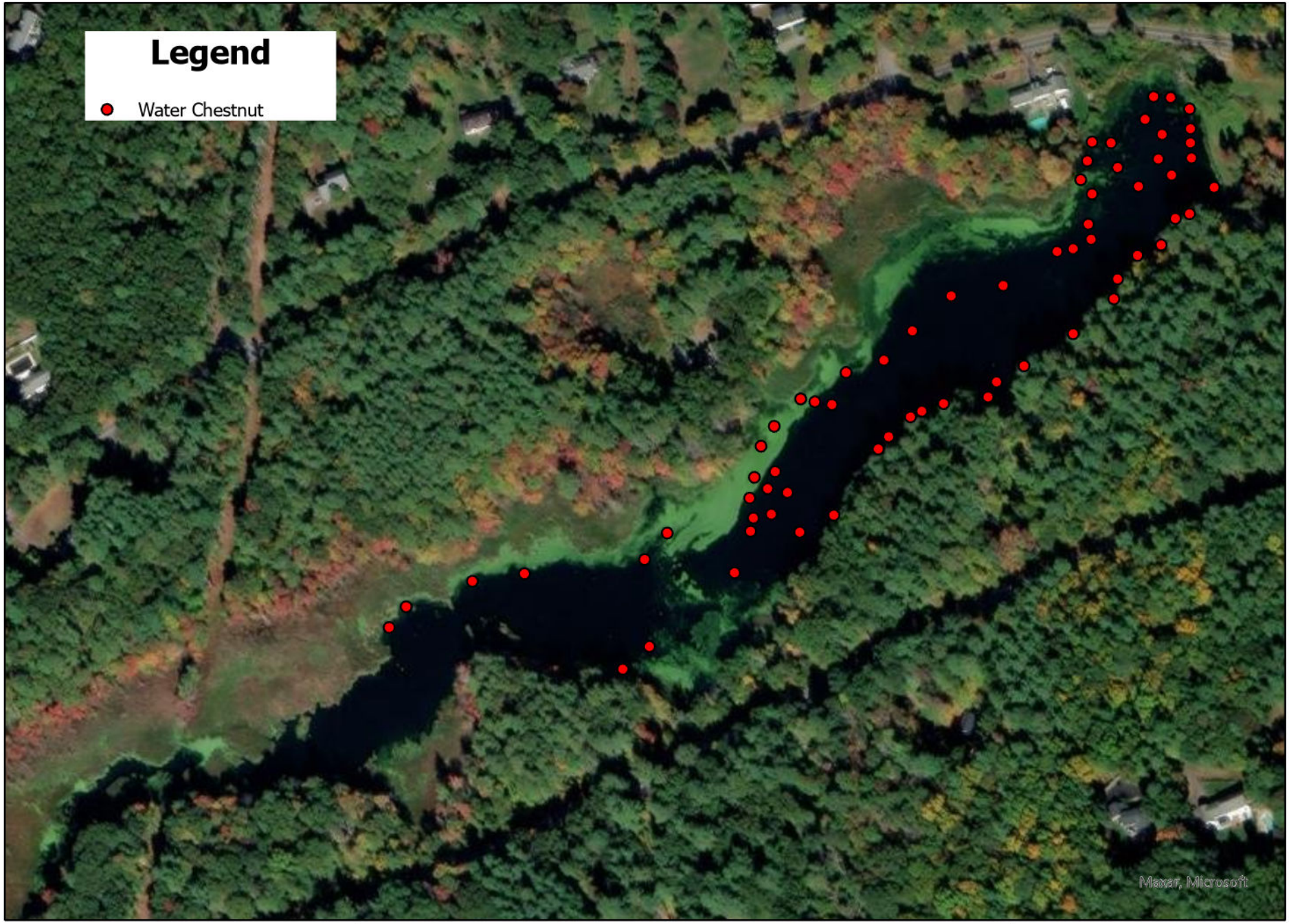


WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Grist Mill Pond
Invasive Plant Assemblage
Sudbury, MA

Survey Date
6/10/2025
Map Date
6/12/2025

N



WATER & WETLAND
LAKE, POND & WETLAND MANAGEMENT

Grist Millpond
Invasive Species Map
Sudbury, MA

Survey Date
9/8/2025
Map Date
9/11/2025

N

SePRO Lab
Water Diagnostics for Lakes & Ponds
SeSCRIPT*
16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC17509

Customer Contact Information

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

Waterbody Information

Waterbody:	Hop Brook Ponds - MA
Waterbody size:	
Depth Average:	

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM63973-1	Carding Mill Pond	Turbidity (NTU)	EPA 180.1	3.4	06/10/2025
		Free Reactive Phosphorus (µg/L)	EPA 365.3	9.7	
		Total Phosphorus (µg/L)	EPA 365.3	73.4	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	59.9	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	2.24	
		Nitrite (mg/L)	Campbell et al 2004	0.08	
		Nitrate (mg/L)	calculated	2.16	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	1.19	
		E. coli (CFU/100mL)	EPA 9223B	3.0	
		Total Coliforms (CFU/100mL)	EPA 9223B	1732.9	
		Total Nitrogen (mg/L)	calculated	3.43	
		pH	EPA 150.1	7.5	
		Ammonia (µg/L)	SESC 12	317.1	
		True Color (CU)	EPA 2120C	114	
		Apparent Color (CU)	EPA 2120B	129	
CTM63974-1	Grist Millpond	Turbidity (NTU)	EPA 180.1	2.9	06/10/2025
		Free Reactive Phosphorus (µg/L)	EPA 365.3	7.7	
		Total Phosphorus (µg/L)	EPA 365.3	51.4	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	59.2	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	5.11	
		Nitrite (mg/L)	Campbell et al 2004	0.07	
		Nitrate (mg/L)	calculated	5.04	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	1.01	
		E. coli (CFU/100mL)	EPA 9223B	152.3	
		Total Coliforms (CFU/100mL)	EPA 9223B	344.8	
		Total Nitrogen (mg/L)	calculated	6.12	
		pH	EPA 150.1	7.5	
		Ammonia (µg/L)	SESC 12	103.3	
		True Color (CU)	EPA 2120C	152	
		Apparent Color (CU)	EPA 2120B	201	

CTM63975-1	Stearns Millpond	Turbidity (NTU)	EPA 180.1	3.6	06/10/2025
		Free Reactive Phosphorus (µg/L)	EPA 365.3	26.0	
		Total Phosphorus (µg/L)	EPA 365.3	79.7	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	46.7	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	1.07	
		Nitrite (mg/L)	Campbell et al 2004	0.05	
		Nitrate (mg/L)	calculated	1.02	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.95	
		E. coli (CFU/100mL)	EPA 9223B	36.8	
		Total Coliforms (CFU/100mL)	EPA 9223B	1413.6	
		Total Nitrogen (mg/L)	calculated	2.02	
		pH	EPA 150.1	7.3	
		Ammonia (µg/L)	SESC 12	321.9	
		True Color (CU)	EPA 2120C	159	
		Apparent Color (CU)	EPA 2120B	190	

ANALYSIS STATEMENTS:
SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.
PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.
QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.
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: 06/11/25 12:00 PM
Date Results Sent: Thursday, June 19, 2025

This entire report was reviewed and approved for release.

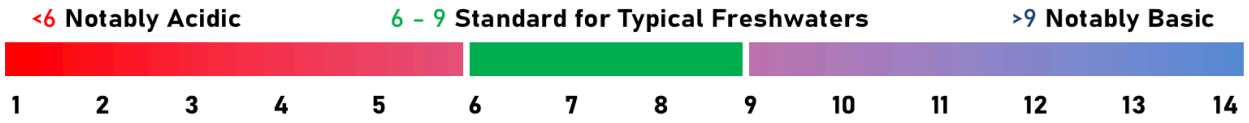
Reviewed By: Laboratory Manager

SePRO Lab
Water Diagnostics for Lakes & Ponds

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 the desired management objective.

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 mg/L as CaCO3 moderately hard; 121-180 mg/L as CaCO3 hard; > 181 mg/L as CaCO3 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 mg/L as CaCO3 moderately buffered; 101-200 mg/L as CaCO3 buffered; > 200 mg/L as CaCO3 high buffered

Conductivity: Measure of the waters ability to transfer an electrical current, increases with more dissolved ions.
< 50 µS/cm relatively low concentration may not provide sufficient dissolved ions for ecosystem health; 50-1500 µS/cm typical freshwaters; > 1500 µS/cm 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 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.
0-2.6µg/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.

SePRO Lab
Water Diagnostics for Lakes & Ponds
SeSCRIPT*
16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC19432

Customer Contact Information

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

Waterbody Information

Waterbody:	Hop Brook Ponds - MA
Waterbody size:	
Depth Average:	

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM68197-1	Carding Millpond	Turbidity (NTU)	EPA 180.1	3.2	09/08/2025
		Conductivity (µS/cm)	EPA 120.1	705.7	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	22.2	
		Chlorophyll a (µg/L)	EPA 445	<10	
		Total Phosphorus (µg/L)	EPA 365.3	81.2	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	54.1	
		Total Hardness (mg/L as CaCO3)	EPA 130.2	63.3	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.03	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.03	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	<0.1	
		E. coli (CFU/100mL)	EPA 9223B	35.0	
		Total Coliforms (CFU/100mL)	EPA 9223B	574.8	
		Total Nitrogen (mg/L)	calculated	0.03	
		pH	EPA 150.1	8.5	
		Ammonia (µg/L)	SESC 12	30.2	
		True Color (CU)	EPA 2120C	9	
		Apparent Color (CU)	EPA 2120B	20	
CTM68198-1	Stearns Millpond	Turbidity (NTU)	EPA 180.1	3.5	09/08/2025
		Conductivity (µS/cm)	EPA 120.1	540.6	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	26.4	
		Chlorophyll a (µg/L)	EPA 445	<10	
		Total Phosphorus (µg/L)	EPA 365.3	83.8	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	43.6	
		Total Hardness (mg/L as CaCO3)	EPA 130.2	56.6	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	0.03	
		Nitrite (mg/L)	Campbell et al 2004	<0.02	
		Nitrate (mg/L)	calculated	0.03	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	<0.1	
		E. coli (CFU/100mL)	EPA 9223B	260.3	
		Total Coliforms (CFU/100mL)	EPA 9223B	913.9	

		Total Nitrogen (mg/L)	calculated	0.03	
		pH	EPA 150.1	7	
		Ammonia (µg/L)	SESC 12	40.2	
		True Color (CU)	EPA 2120C	44	
		Apparent Color (CU)	EPA 2120B	62	
CTM68199-1	Grist Millpond	Turbidity (NTU)	EPA 180.1	3.2	09/08/2025
		Conductivity (µS/cm)	EPA 120.1	705.6	
		Free Reactive Phosphorus (µg/L)	EPA 365.3	28.8	
		Chlorophyll a (µg/L)	EPA 445	13.9	
		Total Phosphorus (µg/L)	EPA 365.3	89.3	
		Alkalinity (mg/L as CaCO3)	EPA 310.2	67.5	
		Total Hardness (mg/L as CaCO3)	EPA 130.2	85.6	
		Total Nitrate (mg/L) and Nitrite (mg/L)	Campbell et al 2004	1.52	
		Nitrite (mg/L)	Campbell et al 2004	0.1	
		Nitrate (mg/L)	calculated	1.42	
		Total Kjeldahl Nitrogen (mg/L)	EPA 351.2	0.77	
		E. coli (CFU/100mL)	EPA 9223B	66.3	
		Total Coliforms (CFU/100mL)	EPA 9223B	913.9	
		Total Nitrogen (mg/L)	calculated	2.29	
		pH	EPA 150.1	7.5	
		Ammonia (µg/L)	SESC 12	123.7	
		True Color (CU)	EPA 2120C	39	
		Apparent Color (CU)	EPA 2120B	64	

ANALYSIS STATEMENTS:
SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.
PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.
QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.
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: 09/09/25 12:00 PM
Date Results Sent: Friday, September 12, 2025

Disclaimer: The results listed within this Laboratory Report relate only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its client. This report shall not be reproduced, except in full, without written permission from SRTC Laboratory. The Chain of Custody is included and is an essential component of this report.

This entire report was reviewed and approved for release.

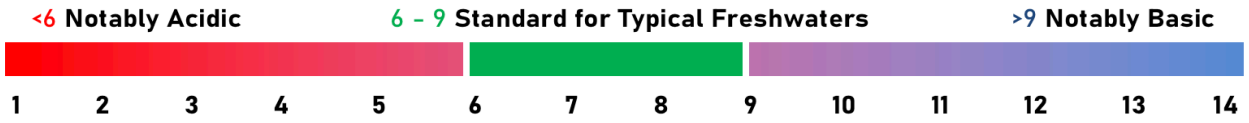
Reviewed By: Laboratory Manager

SePRO Lab
Water Diagnostics for Lakes & Ponds

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 the desired management objective.

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 mg/L as CaCO3 moderately hard; 121-180 mg/L as CaCO3 hard; > 181 mg/L as CaCO3 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 mg/L as CaCO3 moderately buffered; 101-200 mg/L as CaCO3 buffered; > 200 mg/L as CaCO3 high buffered

Conductivity: Measure of the waters ability to transfer an electrical current, increases with more dissolved ions.
< 50 µS/cm relatively low concentration may not provide sufficient dissolved ions for ecosystem health; 50-1500 µS/cm typical freshwaters; > 1500 µS/cm 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 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.
0-2.6µg/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: Hop Brooks Ponds

Company: Water and Wetland
Address: 134 Ferry St. South Grafton, MA. 01560
Contact Person: James Lacasse
Phone: (774)-276-6098
Email: james@waterandwetland.com

Project Name: Hop Brooks Ponds
Surface Area: NA
Average depth: NA
Date Algae Sample Received: 6/11/2024
SeSCRIPT Analysis Performed: Algae ID

Algae ID Results

Hop Brooks Ponds

Identification	Classification	Description	Density/Biomass (cells/mL)
Carding Millpond			
Woronichinia sp.	Cyanophyta-Blue-green algae	Colonial, planktonic, potential toxin producer	< 40
Lyngbya sp.	Cyanophyta-Blue-green algae	Filamentous, mat-forming, potential toxin and taste/odor producer	< 40

Other algae observed at densities less than 40 cells/mL: *Desmodesmus* (Chlorophyta); *Cryptomonas* (Cryptophyta)

Some particulate matter observed

Identification	Classification	Description	Density/Biomass (cells/mL)
Grist Millpond			
Cyclotella sp.	Bacillariophyta-Diatoms	Single-celled, planktonic	< 40
Desmodesmus sp.	Chlorophyta-Green algae	Colonial, planktonic	< 40
Amphora sp.	Bacillariophyta-Diatoms	Single-celled, planktonic	< 40

Some particulate matter observed

Algae ID Results

Hop Brooks Pond

Identification	Classification	Description	Density/Biomass (cells/mL)
Stearns Millpond			
Pediastrum sp.	Chlorophyta-Green algae	Colonial, planktonic	< 40
Snowella sp.	Cyanophyta-Blue-green algae	Colonial, planktonic, potential toxin producer	< 40

Other algae observed at densities less than 40 cells/mL: *Eunotia* (Bacillariophyta); *Desmodesmus* (Chlorophyta); *Cryptomonas* (Cryptophyta)

Some particulate matter observed


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SeSCRIPT Analysis Report: Hopbrook Ponds

Company: Water and Wetland
Address: 134 Ferry St. South Grafton, MA. 01560
Contact Person: James Lacasse
Phone: (774)-276-6098
Email: james@waterandwetland.com

Project Name: Hopbrook Ponds
Surface Area: NA
Average depth: NA
Date Algae Sample Received: 10/22/2025
SeSCRIPT Analysis Performed: Algae ID
eCOC: 20041

Algae ID Results

Hopbrook Ponds

Identification	Classification	Description	Density/Biomass (cells/mL)
Carding Millpond			
Staurodesmus sp.	Streptophyta- Desmids	Single-celled, planktonic	440

Other algae observed at densities less than 40 cells/mL: *Pediastrum, Scenedesmus* (Chlorophyta); *Lyngbya* (Cyanophyta); *Cosmarium* (Streptophyta)

Much particulate matter observed

Identification	Classification	Description	Density/Biomass (cells/mL)
Grist Millpond			
Cryptomonas sp.	Cryptophyta- Cryptomonads	Single-celled, flagellated, planktonic	< 40
Cyclotella sp.	Bacillariophyta- Diatoms	Single-celled, planktonic	< 40

Algae ID Results

Hopbrook Ponds

Identification	Classification	Description	Density/Biomass (cells/mL)
Stearns Millpond			
Cryptomonas sp.	Cryptophyta-Cryptomonads	Single-celled, flagellated, planktonic	100