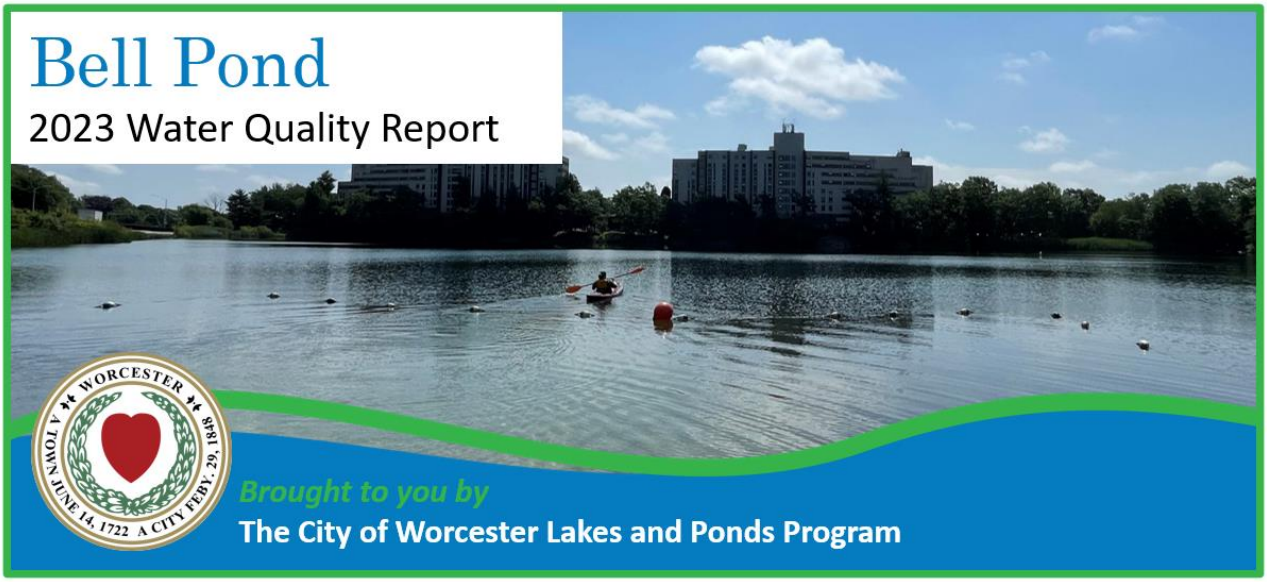
Bell Pond

2023 Water Quality Report



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The City of Worcester Lakes and Ponds Program

Summary

The following report is presented by the City of Worcester Department of Sustainability and Resilience (DSR), Lakes and Ponds Program (L&P). It details the program's water quality monitoring results, management activities and outreach efforts at Bell Pond in 2023. The "State of the Lake" will be rated "Excellent", "Good", "Fair", or "Poor" based on the results' implications on water quality and recreational value. This report will also outline projects and opportunities the City of Worcester's Lakes and Ponds Program (L&P) intends to implement at Indian Lake in 2024.

Though Bell Pond is close to Worcester's urban center, it exhibits few water quality challenges. Often exhibiting high water clarity, low nutrient levels, and very low risk of closure due to cyanobacteria and fecal bacteria, Bell Pond supports a healthy ecosystem and a wide variety of recreational opportunities. ***In 2023, Bell Pond received a score of "Excellent"***. Continue reading to learn more about this rating and L&P's water quality monitoring results.

Background

Bell Pond is an 11-acre pond located in the Bell Hill neighborhood of Worcester (see *Figure 1*). Once known as "Bladder Pond", Bell Pond served as a fire suppression and drinking water source for the City of Worcester in the late 1800's. These days, Bell Pond provides ample public access for recreation and continues to have high quality water. The Pond is bordered on the North by Belmont Street, a highly trafficked road to Shrewsbury. To the East is the Seabury Heights retirement housing complex, and to the West there are wooded parklands with footpaths and a fishing platform. There is a small, City-maintained beach on the west side that is well-used in the summer months. Bell Pond is one of the most accessible waterbodies in the city, with pedestrian access around much of the shoreline. Despite its small size, Bell Pond's deepest point is approximately 17 feet, located in the middle of the waterbody. Water to the pond

is primarily supplied by underground springs. The pond's main outlet is a catch basin located near the Seabury Heights driveway. There is also a secondary, less defined outlet to the south of the pond in the vicinity of the fishing platform. The pond is stocked in the spring and fall with Rainbow Trout and is a popular local fishing destination.

The following report details the results of a collection of water quality monitoring programs in 2022, as well as the exciting projects and opportunities the City of Worcester's Lakes and Ponds Program intends to implement in 2023.

Figure 1 – *Bell Pond is an 11-acre pond located in the Bell Hill neighborhood of Worcester that sports a bathing beach, wooded park land and a popular sport fishery.*

Prior to the Lakes and Ponds Program (L&P), Bell Pond's water quality had not been monitored by the City of Worcester or any other entity. The pond is not listed as impaired on the Massachusetts Section 303(d) List by the Department of Environmental Protection (MassDEP), and since monitoring began in 2017, results have indicated that Bell Pond has few water quality challenges. There was only one beach closure at Bell Pond due to a fecal bacteria exceedance since L&P began monitoring and collecting data in 2017. In past years there have been no cyanobacteria criteria exceedances, water clarity has been high, and no contaminants of concern have been identified. Anecdotal accounts of litter have continued to be a potential threat to wildlife and recreation. Recently, invasive species have become a bigger concern. In 2020, the invasive mollusk, *Corbicula fluminea,* was identified in the pond. While not considered a threat to recreation, its threat to local ecology remains unknown. In 2022, the invasive plant *Phragmites australis* was documented along parts of the shoreline for the first time, although the extent of the infestation remains manageable. Over the past five years, L&P has consistently rated water quality at Bell Pond as "Excellent".

Management Summary

Since 2017, L&P has conducted lake management activities to mitigate invasive aquatic plants, nutrient and sediment loading, cyanobacteria, and fecal bacteria that have threatened waterbodies throughout the City of Worcester. As Bell Pond has not been observed to have any of these challenges, no management in these areas has been necessary. Based on 2022 findings, the L&P is developing a plan to eradicate the invasive *Phragmites australis*. The Lakes and Ponds Program continues to evaluate potential threats posed by the invasive mollusk, *Corbicula fluminea*, as well as litter, and investigate management methods to mitigate these threats.

Sampling Analysis and Overview

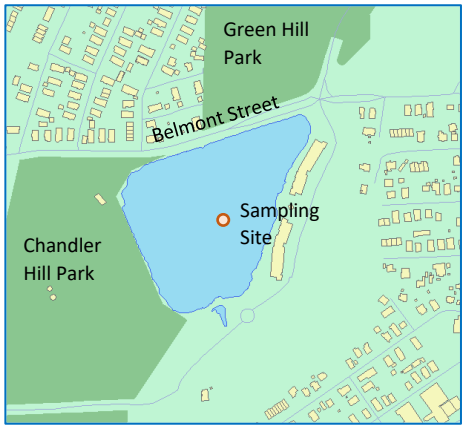

Figure 2 – *Bell Pond location and sampling site.*

Bell Pond was visited semimonthly from May through October and sampled at the deepest point, located approximately in the center of the pond (see *Figure 2*). As no aboveground tributary exists, no tributary sample was taken. Probe measurements and water samples were collected 1 foot below the surface of the water ("surface"), and two feet from the bottom of the lake ("bottom"). During every sampling event L&P evaluated Secchi transparency, dissolved oxygen (DO), pH, total phosphorus (TP), and total dissolved phosphorus (TDP). Samples were also collected for total suspended solids (TSS), ammonia (NH_3), and nitrate (NO_3) monthly. In past years, L&P collected samples for *Escherichia coli* (*E. coli*) from the lake surface. As in-lake *E. coli* results never indicated concern, L&P ceased collecting them in 2023, although beach testing by Inspectional Services continued. In 2022, L&P collected samples to be analyzed for industrial contaminants and emerging contaminants of concern on two occasions. Altogether, the L&P visited Bell Pond 12 times in 2023. Even though Worcester experienced its second highest precipitation total on record in 2023, there were less than 0.25 inches of rainfall in the 24 hours prior to data collection for 10 of these events. However, on 29-Jun there were 0.91 inches of rain in the 24 hours prior to sampling, on 14-Sep there were 0.59 inches. These days are categorized as "wet weather" sampling events and denoted with the symbol in this report. Volunteers from the Worcester Cyanobacteria Monitoring Collaborative (WCMC) collected samples from the city beach area for phycocyanin and relative cyanobacteria density analysis to assess bloom risk. Samples were taken twice monthly between late April and October, on 29-Apr, 15-May, 27-May, 12-Jun, 24-Jun, 10-Jul, 22-Jul, 7-Aug, 19-Aug, 16-Sep, 2-Oct, and 30-Oct. Additionally, the Worcester Department of Inspectional Services tested the beach area for *E. coli* as an indicator for harmful bacteria on a weekly basis during the summer months.

Raw data are displayed and explained in this report. No statistical analysis has been performed. Subsequent ratings of "Excellent", "Good", "Fair", and "Poor" for reported values are based on the MassDEP SMART Monitoring Watershed Report Card Criteria.

Monitoring Parameters and 2023 Results

Quality Assurance/Quality Control

The Lakes and Ponds Program uses Quality Assurance/Quality Control (QAQC) checks to ensure that our data are representative of local conditions and meet precision and accuracy standards. QAQC check results identify data that need to be flagged and/or censored before they are shared and can highlight issues that affect data quality. When data fail to meet acceptable criteria for these checks, they are either flagged as being slightly less robust or censored entirely. Flagged data points are marked with a red flag

and censored data are not included in this report. For more information on L&P's data quality, please contact greenworcester@worcesterma.gov.

Fecal Bacteria

Recreational contact with water contaminated by certain fecal bacteria may cause illness. *Escherichia coli*, or *E. coli* are a type of bacteria found in the digestive tract of warm-blooded animals including geese, pets, and humans. While most strains are harmless, some can make you very sick. These bacteria enter the water in many ways, including direct contact with animal waste, runoff from the shoreline and impervious surfaces like paved roadways during rainstorms, leaking septic tanks, and illicit sewer connections that empty sewage to the stormwater system. The Commonwealth of Massachusetts has strict regulations for bathing beaches, and Worcester Inspectional Services collects samples for *E. coli* weekly at public beaches, including Bell Pond, during the swimming season to ensure that the water is safe for direct contact, closing beaches if the results are above the recreational threshold of 235 CFU/100 mL. In past seasons L&P has collected samples for *E. coli* at the surface of certain in-lake sites to assess *E. coli* conditions in open water. As in-lake *E. coli* results never indicated concern, L&P ceased collecting them in 2023.

2023 BEACH E.COLI	
DATE	RESULT
26-Jun	<4
3-Jul	40
10-Jul	136
17-Jul	76
24-Jul	<4
31-Jul	48
7-Aug	12
14-Aug	48
21-Aug	<4

Excellent	*Good*
Fair	*Poor*

Red Text = Beach Closure

***Table 1** – There were no beach closures at Bell Pond in 2023. Results from beach and open water* E. coli *testing fell in the ranges considered "Excellent" and "Good" all season.*

Fecal Bacteria at Bell Pond. There were no beach closures at Bell Pond in 2023 (see *Table 1*). Results of beach *E. coli* testing by Worcester Inspectional Services ranged between undetected and 136 CFU/ 100mL, falling within ranges considered "Excellent" and "Good" by DEP. As there were no beach closures due to fecal bacteria in 2023, *E. coli* at Bell Pond continued to be considered "Excellent".

Water Clarity

Water clarity is a measure of the transparency of water. Algae, microscopic organisms, eroded particles, and re-suspended bottom sediments are factors that interfere with light penetration and reduce water transparency. Clear water allows sunlight to penetrate the depths of a waterbody, supporting growth of aquatic plants, which provide food, shelter, and oxygen to aquatic organisms. Clear water is also pleasant to the eye and safer for recreational contact. Turbid water, or water filled with particles, absorbs more heat from sunlight. This reduces the water's capacity to hold oxygen, creating favorable conditions for algal and cyanobacteria blooms, which further reduce clarity. Water clarity can be measured with a Secchi disk or by quantifying Total Suspended Solids (TSS). A Secchi disk is a weighted black and white disk on a distance-calibrated line that is lowered into the water until it is no longer visible. Secchi readings are collected on each lake visit by L&P. TSS is a measure of the dry weight of suspended particles in a given amount of water. TSS samples are taken on a monthly basis and submitted to a lab for analysis.

Water Clarity at Bell Pond. Historically, water clarity at Bell Pond has been very high in comparison to the Program's other lakes, often the highest in the City. In 2022, this trend continued with all but two clarity readings falling between 11 and 17 feet. However, this year, two low Secchi depth readings were recorded in July and August. On 27-Jul and 10-Aug, Secchi depth was 6.5 and 6.25 feet respectively, the lowest two readings observed in Bell Pond by the Lakes and Ponds Program. The remaining readings were back in the ranges considered "Good" and "Excellent". Regardless, Secchi readings were within the expected range for most of the season and low readings occurred when expected during the warmest part of the season. Although Bell Pond Still Exhibits the highest clarity of the lakes monitored by L&P, it is rated "Good" in 2023.

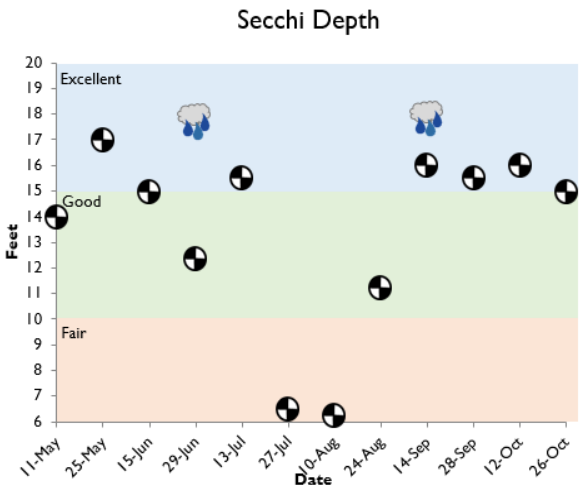

Figure 3 *- Secchi depth was categorized as "Excellent" and "Good" except for two dates in July and August when it decreased to the "Fair" category.*

Temperature

Water temperature is important to understanding both the biology and chemistry of aquatic ecosystems. Because many organisms prefer to live in a narrow temperature range, understanding temperature across the area and depth of a water body is essential. Temperature is also a determining factor in the speed of chemical reactions and the ability of water to hold oxygen. As temperature increases, water can hold less dissolved oxygen. Temperature dynamics in lakes can also determine the level of mixing experienced throughout the water body, affecting the distribution of oxygen, nutrients, and organic matter throughout the lake. Temperature was measured using a thermometer on a handheld probe. To get a more complete picture of how temperature changes through the water column, depth profiles were performed, in which readings were taken at the surface and at 1 ft increments through the water column.

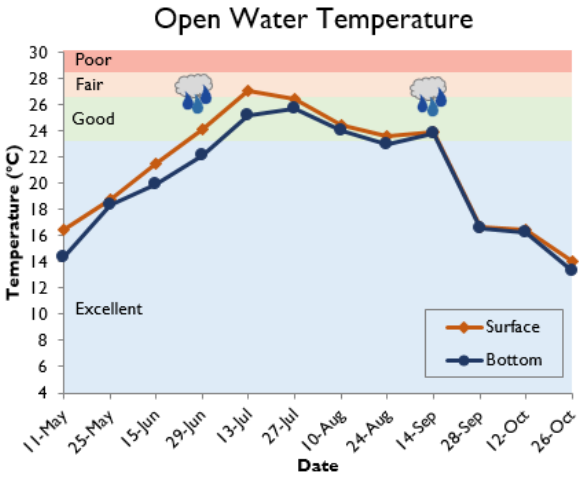

Figure 4*- Surface and bottom temperatures were in the "Excellent" and "Good" categories for most of the season. Surface temperature was in the "Fair" category on one instance in July.*

Temperature at Bell Pond. Temperature readings in Bell Pond continued to show trends similar to past years, with surface and bottom temperature below 23.8°C, or in the range considered "Excellent" in spring, early summer and fall. Surface and bottom temperatures rose throughout the summer and peaked at 27.1° C on 13-Jul.

Temperature was consistent throughout the water column all season, with a maximum difference between surface and bottom of only 2.1°C (see *Appendix*). This suggests that mixing through the water

column is not impeded by thermal stratification. In 2023, temperature at Bell Pond continued to be rated overall as “Excellent”.

Dissolved Oxygen

Oxygen dissolved in water is essential to aquatic life, just as it is to life on land. Dissolved Oxygen (DO) is a highly variable parameter that is controlled by many factors, including temperature, pressure, aeration, diffusion, rate of photosynthesis, rate of respiration and more. When water temperature rises, water can hold less dissolved oxygen, potentially causing stress to aquatic organisms. Thermal stratification, which is layering in the water column based on temperature, can also create a barrier to waterbody mixing, creating areas with depleted DO (hypoxia) in some deeper portions of waterbodies. Increased algal growth followed by excessive decomposition of organic material can also lead to low oxygen conditions, potentially causing fish kills. DO was measured using a galvanic DO sensor on a handheld probe at the water’s surface, and two feet from the bottom at the in-lake locations. To get a more complete picture of how DO changes through the water column, depth profiles were performed, in which readings were taken at 1 ft increments through the water column.

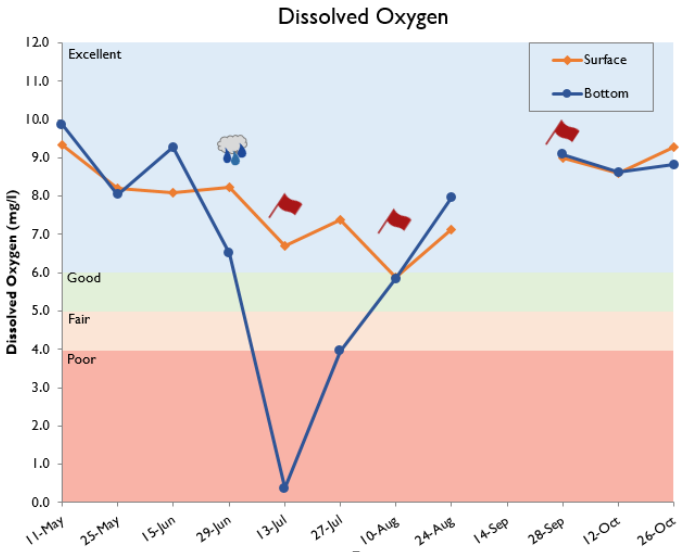

***Figure 5** - Surface dissolved oxygen was considered excellent for all but one instance in August. Bottom dissolved was in the "excellent" category for all but three dates in July and August.*

Dissolved Oxygen at Bell Pond. At Bell Pond surface readings showed dissolved oxygen ranging between 5.87 mg/L and 9.33 mg/L. On the bottom DO fluctuated more widely. Most notably, DO dropped below 4 mg/L, into the range considered “Poor” on 27-Jul and 10-Aug, the days with the lowest Secchi clarity.

The water column was uniformly oxygenated during all but one sampling session (see Appendix). July 13 was the only day on which hypoxic conditions were observed, with DO below the avoidance limit for fish in the bottom 4 ft of the water column.

pH

pH is the concentration of hydrogen ions (H+) in a solution. The more H+ ions that are present, the more acidic the solution. On a scale of 0-14 units, 7 is a neutral pH. As pH increases from 7, the solution is more basic, and as pH decreases from 7, it becomes more acidic. In aquatic ecosystems, pH affects most chemical and biological processes including species distribution, growth rate, reproductive success, and nutrient dynamics in lakes. A high pH can promote chemical reactions that release phosphorus from lake sediments. Healthy lakes in our area have a pH between 6.5 and 8.5. pH was measured using an ion-selective electrode (ISE) pH sensor on a handheld monitoring probe. Readings are taken at the water's surface and two feet from the bottom.

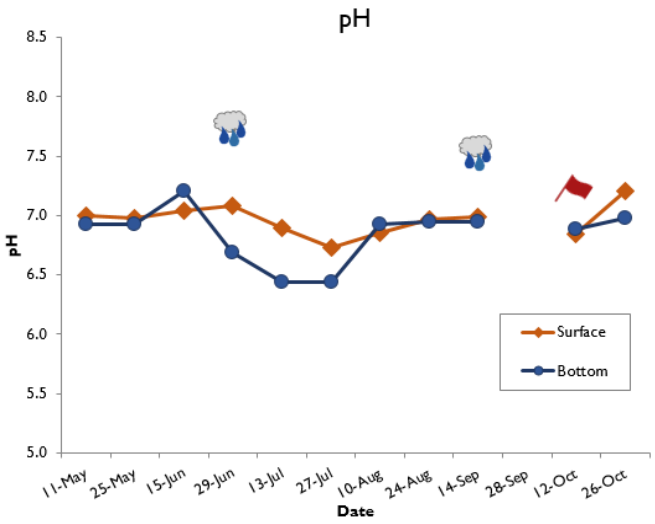

Figure 6 *- pH fluctuated between 6.73 -7.21 (surface) and 6.44-7.21 (bottom).*

pH at Bell Pond. pH readings taken on the surface and bottom of Bell Pond were in the expected range based on past seasons' results. In 2023, pH ranged between 6.73 on the surface and 6.44 and 7.21 on the bottom. In 2022, results indicated higher than expected pH, but this trend did not continue into 2023.

Nutrients

Nutrients, primarily nitrogen (N) and phosphorus (P), are food sources for aquatic plants and algae. Although plants and algae are the basis of aquatic food chains and are necessary for a healthy lake ecosystem, an overabundance of nutrients can lead to issues such as harmful algal blooms and excessive plant growth. Common nutrient inputs to urban lakes and ponds include fertilizers, pet and goose waste, illicit sewer connections to the stormwater system, and runoff that flows over land into the stormwater system. Additionally, under the right conditions, P can be released from the sediments at the bottom of the lake, becoming more available for uptake by organisms. To examine the nutrients present in program lakes, L&P collects samples for several compounds and submits them to an external lab for

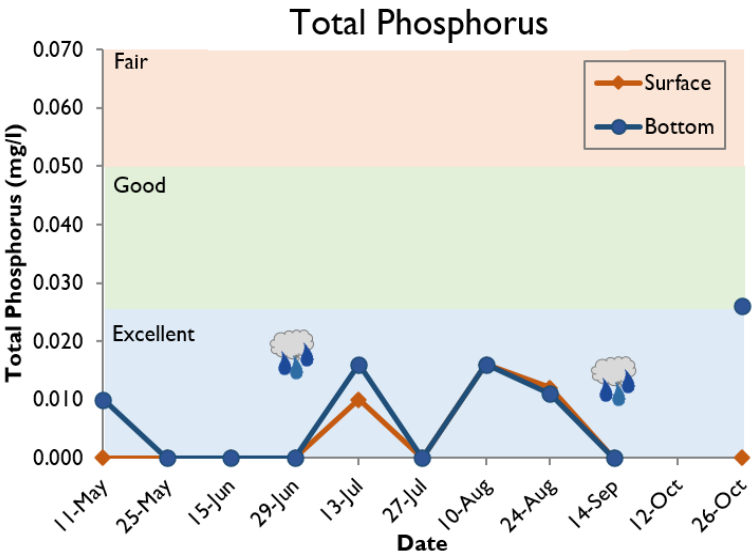

Figure 7 *- Total phosphorus remained in the "Excellent" category throughout the 2023 season at the surface. At the bottom, all but one result were considered "Excellent".*

analysis. To measure N, samples are collected for Nitrate (NO_3) and Ammonia (NH_3) at all sites monthly. To measure P, samples are collected for total phosphorus (TP) twice a month at all sites, and total dissolved phosphorus (TDP) twice a month at all bottom sites. TDP is analyzed to understand how much P is dissolved in the water and available for use by aquatic organisms.

Nutrients at Bell Pond. In 2023 Total Phosphorous results were similar to past years, ranging from below the reporting limit to 0.017 mg/L on the surface and the reporting limit to 0.024 mg/L on the bottom. All results recorded were in the range considered "Excellent". The same was true for total dissolved phosphorus All but one result was below the reporting limit, and the one detected result was at the reporting limit of 0.010 mg/L. As in years past, results suggest that phosphorus concentrations at Bell Pond are low and do not pose a significant water quality risk.

At the surface and bottom, NO_3 was not detected in all but one instance on 28-Sep. All detected results were in the range considered "Excellent". At the surface and bottom, NH_3 was not detected in all but one instance on 26-Oct. Nitrogen results in Bell Pond remain low and were overall considered "Excellent" in 2023.

Cyanobacteria

Cyanobacteria are naturally occurring microorganisms in lakes and ponds. Using sunlight and nutrients such as N and P, cyanobacteria use photosynthesis to gain energy similarly to plants. While normal at low densities in healthy ecosystems, under the right conditions some species of cyanobacteria can reproduce quickly and cause potentially harmful blooms. In addition to being unsightly and smelly, cyanobacteria blooms can produce toxins that are harmful to humans and pets. Blooms also have the potential to create anoxic conditions that can cause fish kills.

To understand the abundance of cyanobacteria and make decisions regarding lake management and safe access, L&P utilizes the data collected by the Worcester Cyanobacteria Monitoring Collaborative (WCMC) to measure cyanobacteria indicators and estimate toxin exposure risk. The WCMC is a group of community science volunteers that collect water quality samples twice monthly between May and October at 24 waterbodies in and around Worcester, including Bell Pond. Parameters examined include phycocyanin and the relative abundance of cyanobacteria taxa. Similar to chlorophyll, the pigment phycocyanin is used by cyanobacteria to harness the sun's energy, converting carbon dioxide to sugars for growth and reproduction. Phycocyanin is unique to cyanobacteria and can be used as an indicator of cyanobacteria's relative abundance in a waterbody. Cyanobacteria taxa and their comparative abundance helps determine what toxins may be present. The WCMC is also able to determine relative density of cyanobacteria genera in samples using a high-powered microscope. Using both phycocyanin and comparative cyanobacteria density the WCMC can begin to assign bloom risk at each participating waterbody. For more information on the WCMC and their results, visit WorcesterMA.gov/WCMC.

Cyanobacteria at Bell Pond. Over the course of the 2023 season, phycocyanin was only detected in one result from fluorometry analysis conducted by the WCMC (see *Figure 8*), and cyanobacteria density was either rated “none” or “low”. Only one genus of cyanobacteria was observed, *Microcystis sp.* The combination of cyanobacteria data collected by the WCMC and high clarity and low nutrient results indicates that Bell Pond is not at significant risk for harmful cyanobacteria blooms. In 2023, Bell Pond continued to be considered low risk for a cyanobacteria bloom and was rated "Excellent".

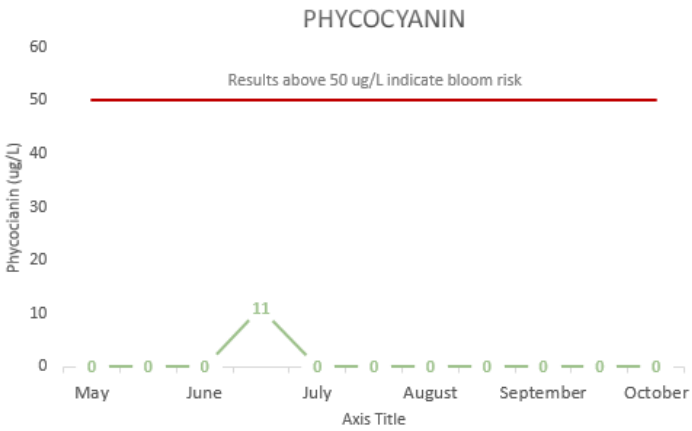

Figure 8 – *Phycocyanin was only detected in one result from fluorometry analysis conducted by the WCMC at Bell Pond, indicating that cyanobacteria were not prevalent here in 2023.*

Invasive Aquatic Plants and Animals

An invasive plant or animal is an organism that is not native to the region and outcompetes local flora and fauna. The absence of natural constraints, like predators or environmental limitations, allows invasive plants and animals to reproduce at a rapid rate. When invasive aquatic plants and animals become too numerous or dominant, they can overtake all available space, disrupting local ecosystems and making recreation more difficult. Invasive organisms can arrive at new locations by hitching a ride on boats, pets, or boots. Some are released with good intentions as a beautiful addition to a landscape or sport fishing opportunity. Professional surveys and visual inspections from Lakes and Ponds Program staff are used to make management decisions regarding invasive species.

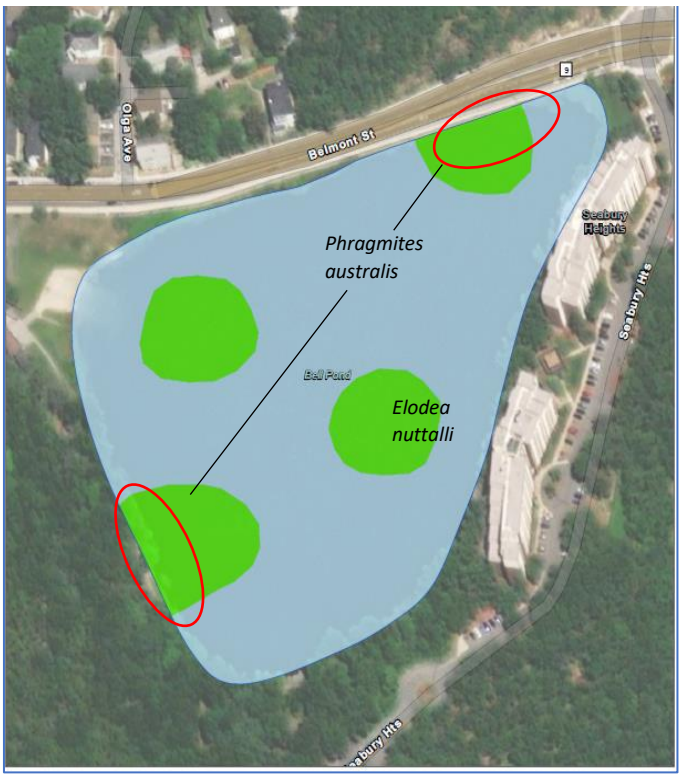

Figure 9 – *Plant mapping contracted by L&P in 2022 indicated the presence of the invasive plant Phragmites australis along parts of the shoreline for the first time (circled in red), and the native plant Elodea nuttalli (shaded green).*

Invasive Aquatic Plants and Animals at Bell Pond. Past plant surveys and monitoring have indicated that invasive aquatic plants have not previously been a challenge at Bell Pond. However, in 2022, plant mapping contracted by L&P indicated the presence the invasive plant *Phragmites australis* along parts of the shoreline for the first time (see *Figure 9*). At this time, the extent of the infestation remains manageable. Additionally, in 2020 the Lakes and Ponds

Program found evidence of the invasive mollusk, *Corbicula fluminea.* Although it is not known how long it has been residing in Bell Pond, it does not appear to be impeding lake health or recreation at this point. Moving forward, the Lakes and Ponds Program will continue to monitor changes in the population of this and other mollusks in Bell Pond.

Industrial Contaminants

As a post-industrial urban center, legacy pollutants and emerging contaminants of concern from industrial processes may be present in Worcester's recreational waters. These contaminants may cause negative health and environmental effects. Every three years, L&P tests for a range of these compounds on both a wet and dry weather event in our lakes. Because most industrial contaminants are legacy pollutants, contamination levels are not expected to change much year to year. In 2022, L&P tested for 74 volatile organic compounds (VOCs), 72 semi volatile organic compounds (SVOCs), 9 polychlorinated biphenyls (PCBs), petroleum hydrocarbons (TPH), 23 perfluoroalkyl substances (PFAS), 21 pesticides, 10 herbicides, and 22 heavy metals. Please see the 2022 Bell Pond Lake Report for results from the most recent contaminant testing. To see a full list of contaminants tested for, contact greenworcester@worcesterma.gov.

State of the Lake

For the seventh year running, the Lakes and Ponds Program has rated Bell Pond's overall water quality as "Excellent". Since monitoring began in 2017, there was only one beach closure for a fecal bacteria exceedance, and no lake closures due to cyanobacteria. With few exceptions, results for temperature, DO, *E. coli*, TP, NH_3, NO_3 and TSS are considered "Excellent". Despite occasional lower clarity readings, Bell Pond remains the clearest waterbody monitored by L&P. In 2022, the invasive plant *Phragmites australis* was documented along parts of the shoreline for the first time, however, the extent of the infestation remains manageable. While an invasive mollusk is present, it does not appear to be impacting recreation. Bell Pond is an excellent resource for Worcester residents and the Lakes and Ponds Program looks forward to continuing to support its recreational and environmental value.

Ongoing Projects and Plan for 2024

Water Quality Monitoring

In 2024, the Lakes and Ponds Program will continue to monitor Bell Pond to ensure that it maintains high water quality. L&P will closely water clarity, given that L&P recorded its lowest clarity results for Bell Pond in 2023. L&P will also develop a plan to monitor for the invasive plant *Phragmites australis* to guide potential management efforts. The WCMC will continue to monitor Bell Pond for cyanobacteria. In addition to collecting phycocyanin and cyanobacteria density data, the WCMC will continue to develop its methods of evaluating toxin exposure risk, with the hopes of creating a cost effective and accurate way to determine toxin exposure risk.

Community Science and Water Storage. Since 2019, Bell Pond has been part of a worldwide scientific study on freshwater storage called "Lake Observations by Citizen Scientists & Satellites" which was spearheaded by the University of North Carolina and funded through NASA. The study relies on community scientists, or ordinary people, to collect lake level observations from a gauge located in the shallow water near Belmont Street. Simultaneously, satellites are collecting data on changes to the area of the lake from above. Using both data points, the study can track changes in the volume of water in the lake over time.

As time has passed since the installation of the gauge, the frequency of observations has decreased. To increase engagement, L&P hopes to publish more promotional materials on the study, including an episode of the video series, the "Blue Space Minute". L&P will also begin a gauge maintenance plan, so it is more visible from the road, and add signage on the adjacent railing to call attention to the project. To get involved and see the data in real time, visit *www.locss.org*.

Lake Management

Goose Fencing. In 2021, the Lakes and Ponds Program implemented a Goose Fencing Pilot Project that aimed to reduce the number of beach closures by humanely keeping geese away from the beach (see *Figure 12).* Geese usually enter the beach from the water and are not good at getting over low fences. They are uncomfortable when there are barriers between the beach and the water because the water is their escape route from land predators. After lifeguards erected a small fence between the shore and water during the evening hours, L&P found the use of the beach by the geese was significantly reduced, and beach closures also seemed to be reduced. L&P will continue to deploy goose fencing in 2024 at Bell Pond, working with beach lifeguards to erect the fencing during the swimming season with the hopes that it will improve visitor experience at the pond.

Figure 12 – *Goose fencing at Coes Reservoir was successful in deterring geese from the beach area.*

Invasive Aquatic Plants. Following the identification of the invasive plant *Phragmites australis* around the perimeter of Bell Pond, L&P will begin the processing of permitting required for the application of herbicides to control the spread of the plant. If successful, L&P will contract the application of herbicide to curtail the spread of the plant in the fall of 2024.

Education and Outreach

Angler Outreach. In 2023, the Lakes and Ponds Program partnered with MassWildlife to host a "Catch and Cook" event at Bell Pond. MassWildlife provided equipment and instruction to teach residents how to fish and how to clean and prepare fish to eat. This event was very well received and L&P hopes to partner again in 2024. L&P will also help build pride around Bell Pond through producing educational and communication materials.

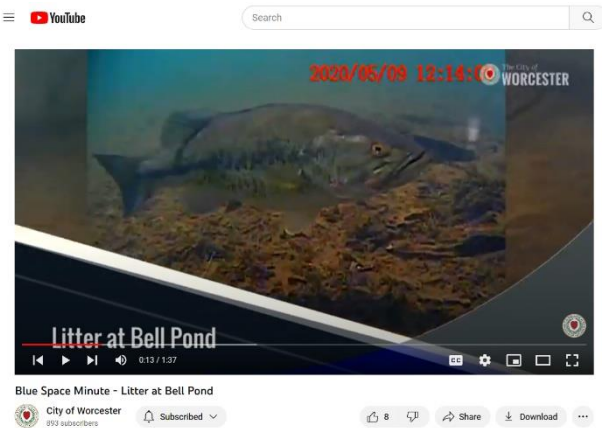

Figure 13 – *The "Blue Space Minute" debuted an episode on Litter in 2022 on the City of Worcester YouTube Channel.*

Text Message Alert System. In 2023, the Lakes and Ponds Program launched a text message alert system and residents can sign up to receive up to date information on lake access to guide upcoming visits. Text messages will alert residents to when a beach is closed for fecal bacteria exceedances, or if a boat ramp is closed because a lake is receiving an invasive aquatic plant treatment. Especially since many lake goers use public transportation to access waterbodies, L&P aims to provide a resource that can help to guide plans before people begin travel. The Lakes and Ponds Program will continue to work with DCR, Inspectional Services, and the Parks Department to establish a flow of information to keep the system up to date.

Litter. Inappropriately disposed waste is harmful to the ecological, aesthetic, and recreational value of lakes and ponds. In 2024, DSR will begin work on a Zero Waste Master Plan that will provide a comprehensive strategy for understanding and mitigating the impact of waste in our community. Lakes and Ponds Program will collaborate with DSR staff on ways to reduce impact of waste and litter in our lakes and ponds.

To learn more about Lakes and Ponds Program offerings, please see WorcesterMA.gov/bluespace.

Appendix: Depth Profiles