REPORT FOR:
Town Wellesley
Natural Resources Commission
Wellesley, Massachusetts

Wights Pond Current Conditions Assessment June 2025

Prepared by:
Aquatic Restoration Consulting, LLC
18 Sunset Drive
Ashburnham, MA 01430

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Introduction

Aquatic Restoration Consulting, LLC (ARC) completed a limited current conditions assessment of Wights Pond in Wellesley, Massachusetts, in June 2025. The purpose of this work was to document physical, chemical, and biological conditions as the Town of Wellesley, through the Natural Resources Commission, assumes ownership of the pond and its associated dam. The scope of work included inlet, in-lake, and outlet water quality sampling; a reconnaissance-level macrophyte assessment; sediment thickness evaluation and phosphorus fractionation analyses; and targeted observations of fish, wildlife, and benthic macroinvertebrates.

Because this effort was designed as a stand-alone snapshot rather than a multi-year monitoring program, sampling was limited to a single mid-season date under dry-weather flow conditions. The resulting data provide a baseline description of Wights Pond that can be compared with future observations and considered alongside other town waterbody assessments, specifically the work completed by Water Resource Services, Inc. (WRS) in 2017. This report does not specifically develop or evaluate management alternatives; rather, it summarizes existing conditions to inform future stewardship of the pond and dam. The general location of Wights Pond within the Town of Wellesley is shown in Figure 1.

Approach and Methods

Field work followed methods that ARC routinely applies in lake and pond assessments across Massachusetts, allowing Wights Pond to be interpreted in a broader context. A handheld Garmin Global Positioning System (GPS) unit was used to locate and record key points on the pond. The location of the samples and observation locations are shown in Figure 2. GPS points beginning at Point 1726 reflect the sequential codes assigned by the GPS unit during fieldwork for all plant, depth, and sediment measurements. These numbers are operational labels that ARC applied throughout the study.

The investigation was conducted during dry weather conditions. Surface water samples were collected at the inlet (WP-In) in the northwest corner of the pond, the central in-lake station (WP-1), and the outlet at the southern dam (WP-Out). Flow was observed at both the inlet and outlet during each sampling event and was visually estimated at approximately 0.5 cubic feet per second (cfs), consistent with low, stable conditions. Grab samples were analyzed for total phosphorus (TP), dissolved phosphorus (DP), nitrate plus nitrite nitrogen (NO_2+NO_3), total Kjeldahl nitrogen (TKN), total suspended solids (TSS), and alkalinity at all three stations, while Chlorophyll-*a* was measured at WP-1. In-situ measurements of temperature, dissolved oxygen (DO), pH, specific conductivity, and turbidity were obtained at each station using a Hydrolab multiparameter sonde, and Secchi disk transparency (SDT) was recorded at WP-1. Collectively, these data provide a basis for evaluating inflow, in-lake, and outflow water quality under representative low-flow conditions.

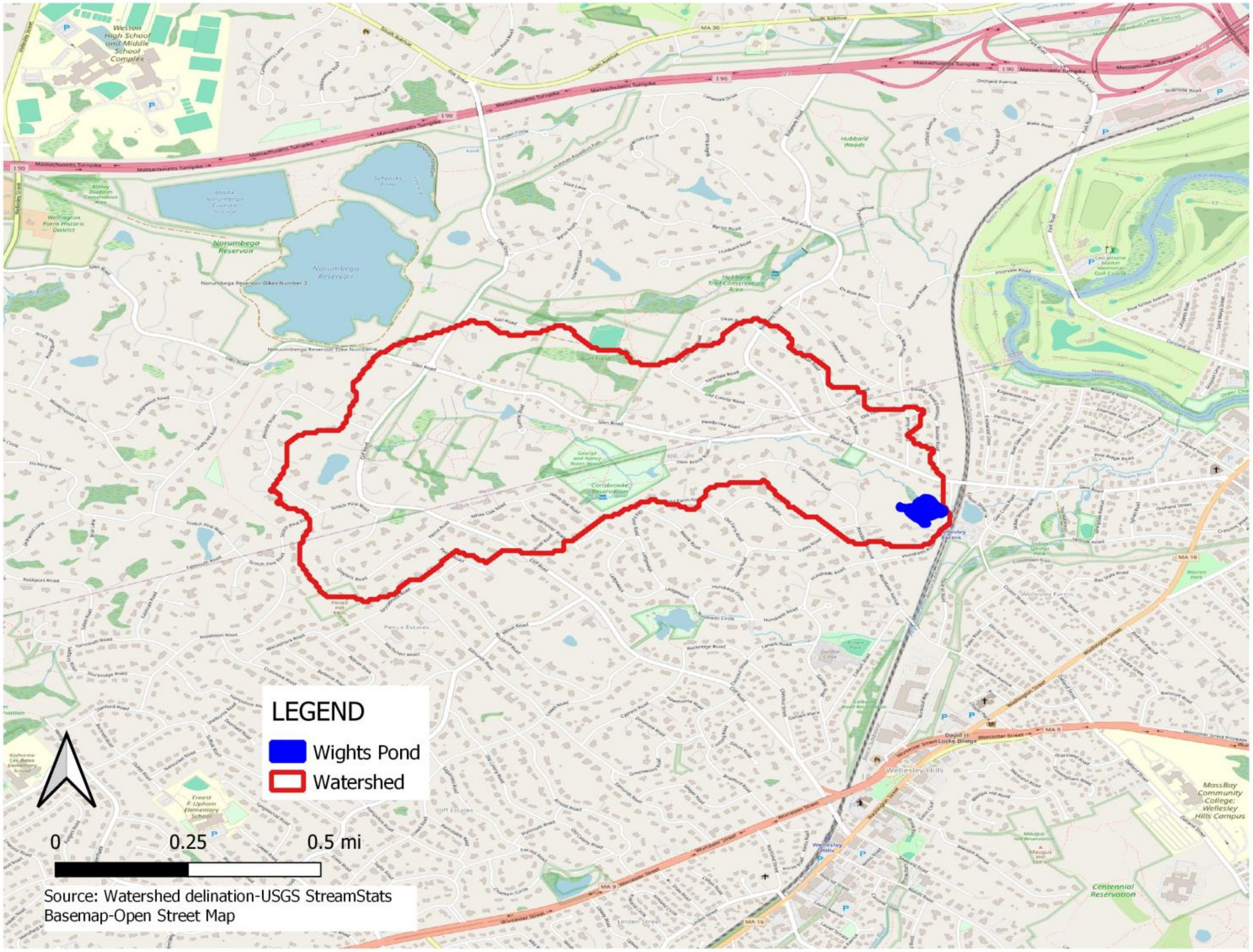

Figure 1 - Wights Pond Location

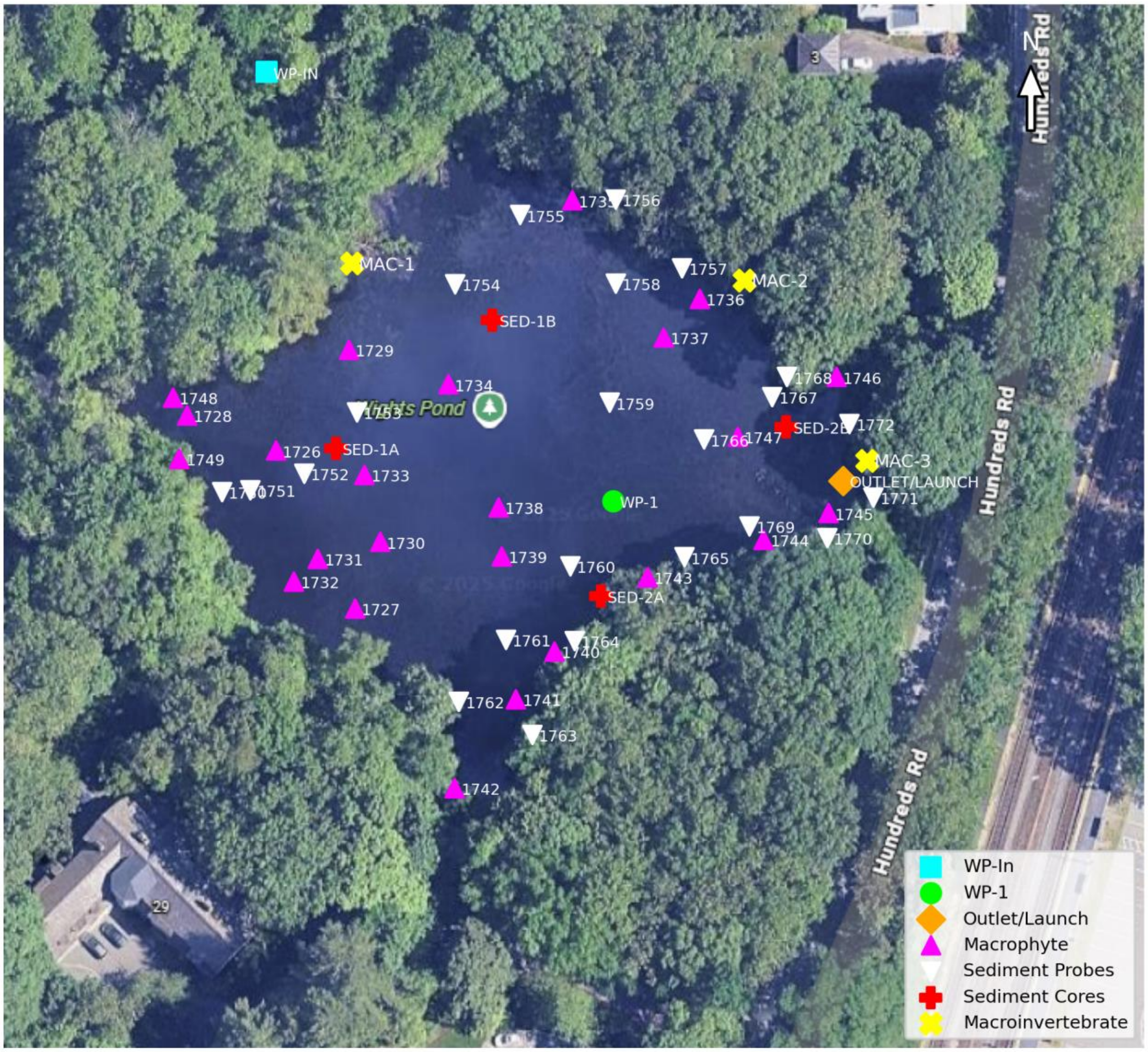

Figure 2 - Sample Locations

Sediment conditions were characterized by using a grid of probe measurements and two composite cores. At each of the probe waypoints (1748–1771), ARC personnel measured water depth, the thickness of unconsolidated material overlying a firm substrate, and the qualitative character of the sediment (e.g., muck over hard bottom, muck over gravel, or tight muck) using a graduated metal rod and pushed into the sediment until refusal. In addition, four sediment core locations (Figure 2) were established in the depositional mid-pond area to assess sediments for phosphorus content. Cores SED-1A and SED-1B were composited into sample SED-1-COMP, and cores SED-2A and SED-2B into sample SED-2-COMP for laboratory phosphorus fractionation.

The macrophyte community was assessed qualitatively by visiting GPS-referenced macrophyte points and surveying intervening shoreline and littoral areas. At each location, ARC personnel recorded dominant species, nuisance patches, and the presence of non-native or invasive plants, with particular attention to water chestnut (*Trapa natans*), a non-native invasive species. When observed, ARC hand-harvested the individual water chestnut plants for disposal off-site.

ARC collected benthic macroinvertebrates using timed dip-net sweeps of surface sediments at three locations in Wights Pond. Samples were preserved and delivered to Dr. Kenneth Wagner of WRS for taxonomic identification and enumeration. Phytoplankton and zooplankton samples were also collected at the time of macroinvertebrate sampling; those results are discussed below.

Physical Characteristics and Watershed Setting

Wights Pond is a small, shallow impoundment (maximum depth observed 3.8 feet) located in the northern portion of Wellesley, immediately upstream of Farms Station Pond. The pond lies adjacent to Hundreds Road and the Massachusetts Bay Transportation Authority (MBTA) commuter rail corridor and is surrounded primarily by residential neighborhoods with pockets of wooded open space. The pond covers approximately 1.5 acres at normal water levels and has a simple basin morphology characterized by gently sloping margins surrounding a central depositional zone.

Watershed Characteristics

Wights Pond receives drainage from the northern half of Farm Station Pond watershed and functions as a detention and settling basin for stormwater, sediment, and nutrients. WRS noted that Wights Pond provides a degree of natural purifying detention for downstream waters by reducing the amount of particulate material transported to Farms Station Pond. The contributing watershed is large (350 acres) in comparison to the pond size (~2.0 acres)[1]. The watershed-to-pond size ratio is 207:1. The ratio of watershed area to lake surface area is often a predictor of lake water quality. Lakes with small watershed-to-lake area ratios generally maintain lower external nutrient and sediment loading, clearer water, and more stable ecological conditions. In contrast, as the watershed-to-lake area ratio increases, the risk of water-quality impairment due to elevated nutrient loading, sediment inputs, and increased runoff. Lakes and ponds with watershed-to-lake ratios approaching or exceeding roughly 10:1 should be regarded as increasingly sensitive to watershed-driven degradation and may require more specific nutrient management and land-use controls.

In addition to water quality risk due to the size of the watershed, the watershed is highly developed and consists primarily of single-family residential neighborhoods, along with stretches of transportation infrastructure creating a large area of impervious surfaces (Figure 3). These land uses generate stormwater runoff that rapidly enters the pond during wet-weather events. Under dry-weather conditions, inflow is limited to slow base-flow discharges from storm drains, shallow groundwater seepage, and small trickles that persist along the inlet channel. The U.S. Environmental Protection Agency (EPA) includes watershed percent impervious cover as a formal

[1] Pond and watershed area differ depending on the source. Pond surface acres range from 1.3 (Open Street Map) to 2.1 acres (MassGIS Landuse data layer). Watershed delineation in WRS 2017 varies from that produced with StreamStats but are comparable with a relative percent difference of 15%.

"stressor exposure" metric, because increased imperviousness is strongly linked to elevated pollutant loads, altered hydrology (higher runoff, flashier flows), and degraded habitat. The United States Geological Survey (USGS) StreamStats program estimates that over 65% of the watershed is developed land and 10% of the watershed is impervious surface based on the National Land Cover Database – 2011. Overall, the watershed's developed character and impervious surfaces create hydrologic conditions that influence the pond's water quality and sedimentation patterns, particularly during rainfall.

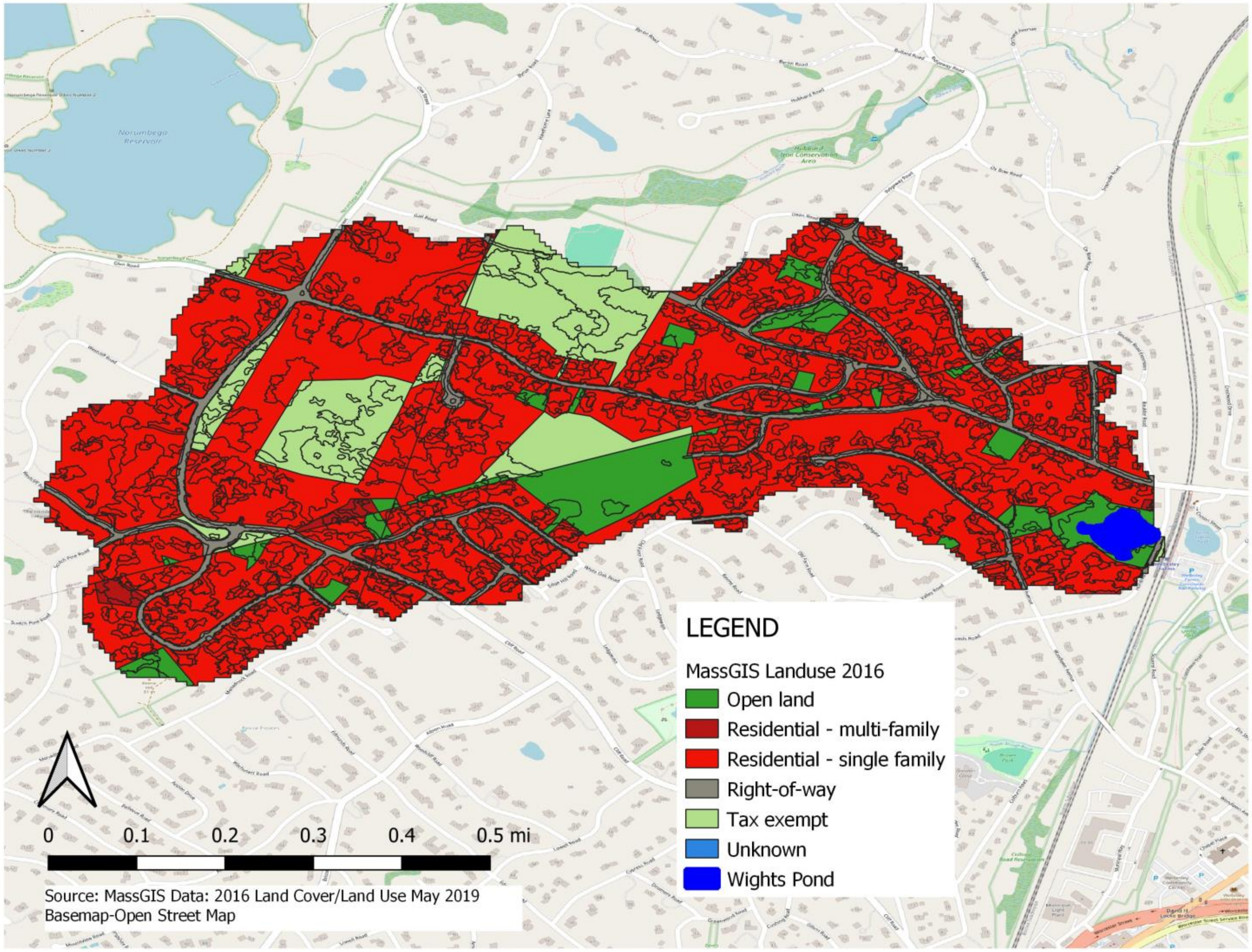

Figure 3 - Wights Pond Watershed

Hydrology and Bathymetry

Stormwater enters Wights Pond through a network of small storm drain outfalls and overland flow paths that direct run-off from residential streets, driveways, rooftops, and other impervious surfaces. Many of these conveyances discharge to the northwest inlet, which serves as the primary stormwater entry point. During rainfall, these systems transport sediment, organic debris, roadway materials, and particulate-bound phosphorus into the pond, contributing to water quality fluctuations and sediment accumulation.

Dry-weather inflow is minimal and typically consists of slow, continuous trickle flow from storm drain lines that hold groundwater, along with minor seepage along the shoreline. The contrast between storm-driven flow and dry-weather conditions produces rapid shifts in turbidity and nutrient concentrations during and shortly after rainfall.

Flow duration estimates, provided via the United States Geological Survey (USGS) StreamStats program, estimate the 50% flow-duration (Q50) of 0.6 cubic feet per second. The 50% flow duration represents the specific discharge (flow rate) of a river or stream that was equaled or exceeded 50% of the time over a given historical period and represents the median daily flow. Because streamflow distributions are typically skewed toward episodic high-flow events, the Q50 flow is generally lower than the long-term average annual discharge and should not be interpreted as an estimate of mean flow conditions.

Outflow occurs through a controlled structure at the southeastern corner of the pond. Because the pond is small and shallow, its residence time is short, particularly during storm events when runoff volumes may exceed the pond's capacity to store incoming water. Under these conditions, water may pass rapidly through the system, producing short-term increases in turbidity and nutrient concentrations. Direct precipitation contributes a modest portion of the lake's hydrologic input, while evaporation, especially during summer, offsets a portion of this volume. Groundwater interactions appear limited to small contributions along the shoreline, with no evidence of large, discrete inflow or discharge zones.

Using a rough inflow estimate based on standard water yield per area of watershed, the pond receives approximately 830,000 cubic meters (cu m) per year[2]. Using this, together with the pond volume (approx. 5000 cu m), the pond flushes over 150 times per year, or retains water for <3 days. As mentioned before, this varies greatly depending on precipitation patterns. Water is retained longer during dry periods and is flushed quickly during wet periods. The hydrologic budget of Wights Pond is dominated by rapid stormwater inflows, which limits the ability to quantify specific water balance components reliably.

Despite the short residence time, the pond retains a substantial portion of stormwater-derived particulates due to its function as a settling basin. Fine sediments and organic material settle within the central basin, contributing to the thick organic deposits documented during sediment

[2] Inflow for Farms Station reported by WRS in 2017 was 906,954 cu m/yr. Wights Pond watershed is 98% of Farms Station, so the inflow difference between calculation is within acceptable variability (<7% relative difference) for the purposes of this limited investigation.

probing. This sediment retention influences long-term water quality conditions and supports the internal loading processes described later in this report.

Water depths during the June 2025 survey ranged from roughly one to 3.8 feet, with the deepest areas confined to the mid-pond basin. Thick deposits of soft organic sediment occupy much of the basin, particularly toward the center and western arm of the pond. These physical features strongly influence water quality and biological conditions by limiting water clarity, reducing habitat complexity, and supporting internal nutrient recycling. A bathymetric map of Wights Pond, based on GPS-referenced depth measurements collected during the June 2025 survey, is presented in Figure 4. The bathymetric surface is derived from discrete depth measurement points collected throughout the pond. Because the interpolation fills the spaces between these points, it can occasionally create small, isolated depressions that appear deeper than the surrounding bottom. These “holes” are artifacts of point spacing rather than true features, and the actual bottom is almost certainly smoother and more continuous. Manually correcting these minor anomalies would require disproportionate effort and would not affect overall depth patterns or future management conclusions.

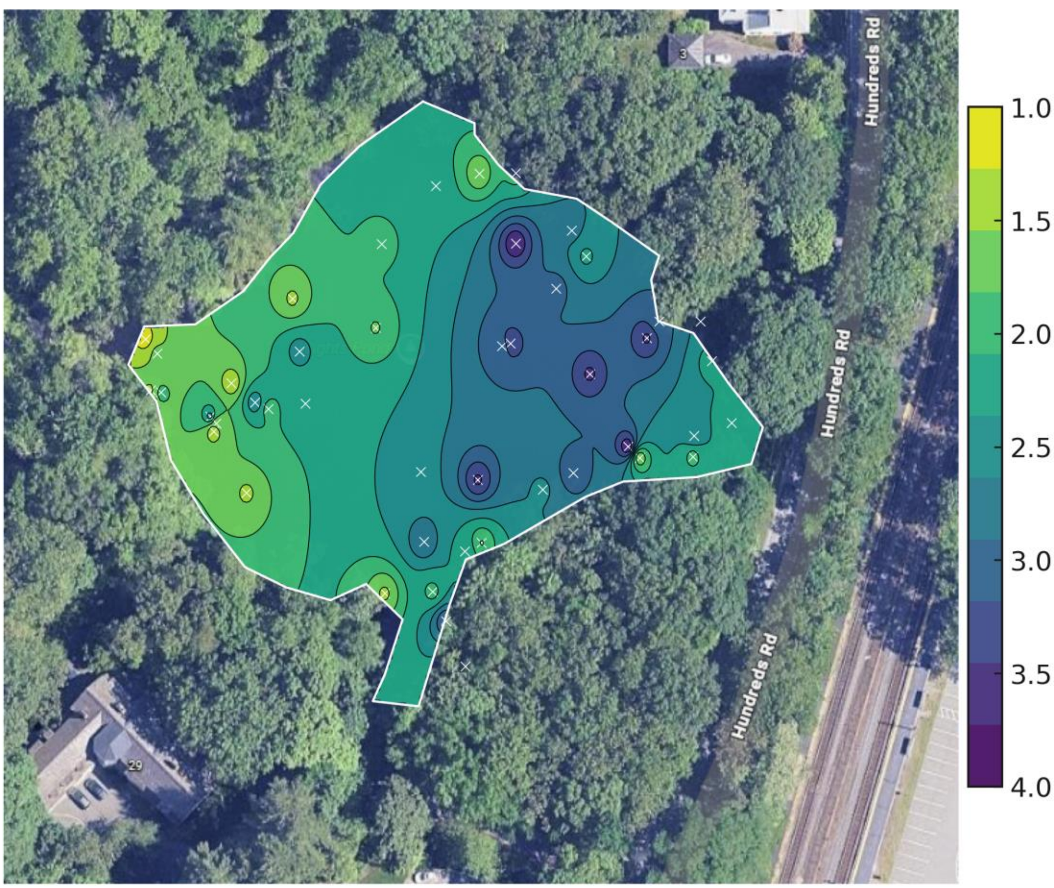

Figure 4 - Wights Pond Bathymetry

Bathymetric contours generated from June 2025 depth measurements collected at macrophyte and sediment-probe waypoints. Depths are shown in feet, with shallower areas indicated by lighter colors and deeper mid-basin areas by darker colors.

Water Quality Assessment

Wights Pond receives inflow from a highly developed watershed that includes transportation corridors, institutional facilities, and residential neighborhoods. Stormwater run-off from these areas delivers sediment, organic material, and nutrients to the inlet at the northeastern corner of the pond. Because the June 2025 sampling was conducted under dry-weather flow conditions, the results primarily reflect base-flow conditions and internal cycling rather than storm-driven loading. The following field measurements and laboratory analyses provide a snapshot of mid-season water quality conditions.

Field measurements collected at WP-1 showed warm, well-oxygenated, and weakly stratified conditions, consistent with a shallow impoundment. Surface temperature at WP-1 was 22.0°C, decreasing slightly to 21.1°C at 3 feet. Dissolved oxygen (DO) remained high throughout the profile (13.9–14.1 mg/L), . pH at WP-1 was moderately alkaline (8.53–8.55) influenced by mid-day sampling and elevated surface photosynthesis. Specific conductivity was ~526 µS/cm, reflecting the influence of urban watershed inputs. Turbidity at the surface was 7.3 NTU, increasing to 12.9 NTU near the bottom, likely due to resuspension of fine organic sediments.

At the inlet (WP-In), cooler and less oxygenated water (14.2°C; 9.31 mg/L DO) entered the pond, accompanied by a slightly lower pH (7.04) and slightly higher conductivity (543 µS/cm). Turbidity was low (0.1 NTU), reflecting stable base-flow conditions. Outlet conditions (WP-Out) were similar to in-lake values, with 23.4°C, 13.8 mg/L DO, pH 8.69, and 529 µS/cm conductivity, indicating that the pond was not significantly altering water chemistry under these dry-weather conditions. In situ water quality data are presented in Table 1.

Table 1 - In Situ Water Quality Data

	WP-1					WP-In					WP-Out				
	6/21/2025					6/21/2025					6/12/2025				
Depth (ft)	Temp (°C)	DO (mg/L)	pH (SU)	Spec. Cond (µs/cm)	Turbidity (NTU)	Temp (°C)	DO (mg/L)	pH (SU)	Spec. Cond (µs/cm)	Turbidity (NTU)	Temp (°C)	DO (mg/L)	pH (SU)	Spec. Cond (µs/cm)	Turbidity (NTU)
0.0	22.02	14.05	8.55	526.7	7.3	14.20	9.31	7.04	542.8	0.1	23.40	13.82	8.69	529.6	3.4
3.0	21.09	13.90	8.53	526.5	12.9										

Secchi disk transparency ranged from 2.1 to 3.0 feet, characteristic of shallow, nutrient-enriched systems with suspended algae and intermittent sediment resuspension. Filamentous green algae were patchily distributed along the shoreline, and the water column exhibited a light brown, silty appearance. These patterns indicate that turbidity was influenced by both phytoplankton and fine organic sediments.

Surface Chlorophyll-*a* concentrations measured at WP-1 were reported to be 24 µg/L, consistent with moderate algal biomass. Because the pond is shallow and prone to mixing, short-term fluctuations in algae concentration are expected, especially in response to sunlight, wind, or internal nutrient release.

Total phosphorus concentrations at WP-In, WP-1, and WP-Out were similar, indicating that Wights Pond was neither strongly retaining nor exporting phosphorus under low-flow conditions. Concentrations of nitrate + nitrite and total Kjeldahl nitrogen also showed minimal spatial variability. Together, the nutrient, chlorophyll-*a*, and in situ measurements depict Wights Pond as a shallow, nutrient-enriched urban pond influenced by both watershed inputs and internal recycling (more resuspension driven). While the June 2025 dry-weather results provide a useful baseline, additional seasonal sampling, particularly during storm events and late-summer low-oxygen periods, would help clarify the magnitude and variability of nutrient exchange and its implications for algal growth and water clarity. Water quality data are summarized in Table 2.

Table 2 – Water Quality Data

Parameter	6/21/2025		
	WP-1	WP-In	WP-Out
TP	0.074	0.041	0.066
DP	0.051	0.037	0.033
TKN	0.77	0.33	0.43
NO2+NO3	0.795	2.11	0.784
TSS	8	<5	6
Alkalinity	54	44	60

Taken together, the water clarity, nutrient, and chlorophyll indicators suggest that Wights Pond functions as a nutrient-enriched, shallow urban pond with conditions shaped by both watershed inputs and internal recycling.

Sediment Evaluation

ARC evaluated sediment conditions in Wights Pond using a combination of probe measurements and laboratory analysis of composite core samples. A total of 25 GPS-referenced probe stations (1748–1772) were distributed throughout the central basin and along key depositional areas. At each probe location, ARC personnel measured water depth, the thickness of unconsolidated organic material overlying a firmer substrate, and the qualitative nature of the sediment (e.g., soft muck, medium-density muck, tight muck, muck over hardpan, or muck over gravel). These measurements provide an assessment of the spatial distribution of organic sediment accumulation within the pond.

Water depths at the time of the June 2025 survey ranged from approximately 1.1 to 3.7 feet, while unconsolidated sediment thickness ranged from roughly 2.4 to more than 9 feet. The deepest deposits (7–9+ ft) were observed within the mid-pond basin, particularly near stations 1760, 1759, and 1766, where the probing rod reached the limit of its graduated scale before contacting firm bottom. These results confirm the presence of a well-defined depositional zone consistent with basin morphology and limited hydrologic flushing. In contrast, shallower deposits (2.4–4 ft) were more typical near the eastern shoreline, the northern outlet reach, and in nearshore areas where coarser substrate or gravel lenses were encountered.

The qualitative texture classifications support the conclusion that Wights Pond functions as an effective sediment trap. Most stations exhibited muck over hard bottom, indicating an accumulation of fine organic material overlying compact substrate. Stations in the interior basin frequently registered tight muck, reflecting older, more compressed material. Several transition zones exhibited thin muck over gravel or mixed substrates, suggesting lower depositional potential and greater exposure to wind-driven circulation or localized scouring. Spatial patterns in unconsolidated sediment accumulation across the basin are shown in Figure 4. Similar to the bathymetric contours, pockets of deeper sediments are artifacts of point spacing rather than true features, and the actual sediment thickness is almost certainly smoother and more continuous in the center. These variations would not considerably change the sediment volume estimates for management purposes.

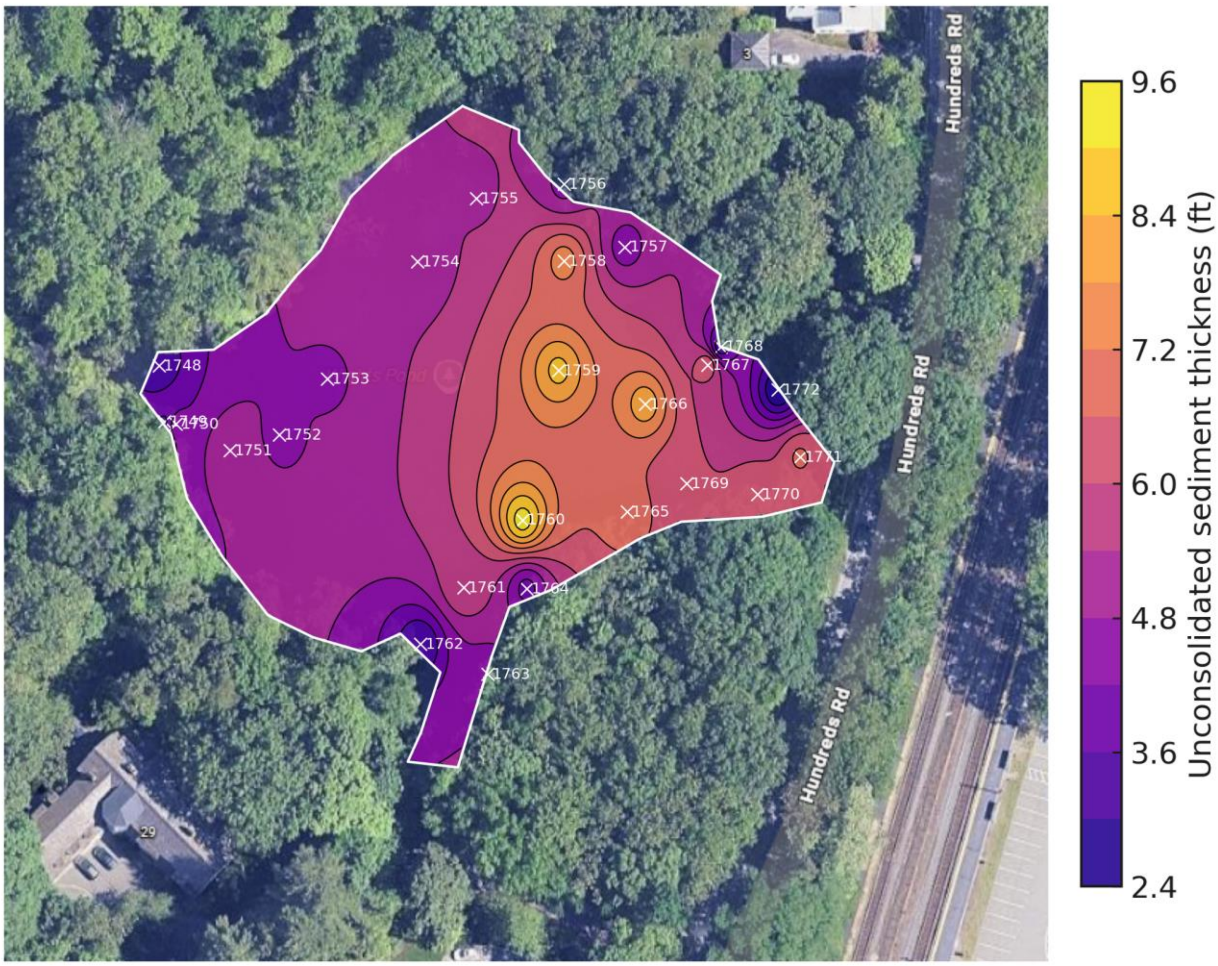

Figure 5 - Sediment Thickness in Wights Pond

To supplement the probe grid, two pairs of sediment cores were collected from the pond's deeper central portion. Cores SED-1A and SED-1B were composited into sample SED-1-COMP, and cores SED-2A and SED-2B into SED-2-COMP, targeting depositional zones where fine material and phosphorus are most likely to accumulate. The composite samples were sectioned, catalogued, and submitted under chain-of-custody for laboratory analysis of total phosphorus and operationally-defined phosphorus fractions.

Under well-oxygenated conditions, most fractions of phosphorus remain largely bound within the sediment and do not readily enter the water column. However, when bottom waters become oxygen-depleted, iron-bound phosphorus (Fe-P) can be released into porewater and subsequently diffuse upward into the overlying water. Although Wights Pond is shallow and does not exhibit strong, persistent thermal stratification, short-lived periods of oxygen depletion can develop under calm, warm conditions or during periods of elevated biological oxygen demand. These episodic low-oxygen intervals are sufficient to mobilize phosphorus from the upper sediment layer and sustain elevated water-column concentrations during the summer growing season.

Both composite samples contained elevated total phosphorus concentrations, approximately 1,200–1,900 milligrams per kilogram (mg/kg) (dry weight). Total P is the sum of all fractions minus Biogenic P, which is part of the organic P fraction. Biogenic P which is mostly organic material (including algae, bacteria, detritus, etc.) that has not completely decayed into a stable form. The contribution of biogenic P is not well understood, but one study suggested that between 8 and 30% of biogenic P can become soluble (NALMS 2019). The iron-bound phosphorus (Fe-P) is readily released during anoxic conditions. While biogenic P can be released, it tends to occur slower than Fe-P release and only a portion of organic P is released.

A substantial portion of the phosphorus was associated with aluminum and calcium, indicating that this pool of phosphorus is stable under most conditions and unlikely to become mobile under low-oxygen conditions. However, even though the proportion of Fe-P is low (16-19% of the total P), the overall concentration is high and could represent a substantial release if water at the sediment-water interface goes anoxic. Even periodic anoxia could result in substantial release and influence the overlying waters. Sediment resuspension also contributes to the internal load.

The Fe-P can be sequestered and inactivated through the addition of aluminum, typically alum (aluminum sulfate). These treatments can also periodically improve water clarity since the compound will strip the water column of suspended sediments. Additional investigations are needed to determine the feasibility of alum treatments if internal loading is targeted in future management options. The sediment phosphorus data and probe-based thickness measurements indicate that Wights Pond possesses a substantial reservoir of nutrient-rich, organic material capable of supporting internal phosphorus loading through resuspension and diffusion. The deepest deposits occur in the central basin, where organic sediment thickness exceeds 7 to 9 feet and where fine material has accumulated over decades of reduced flushing and limited basin circulation. These depositional characteristics, combined with the high total phosphorus concentrations measured in the composite core samples, reflect a long history of external nutrient inputs and subsequent retention within the sediment column. Any long-term management strategy focused on reducing phosphorus concentrations and improving water clarity should evaluate the role of sediment inactivation alongside watershed-based nutrient controls to limit the recycling of phosphorus from bottom sediments into the water column.

Table 3 - Sediment Fractionation Data

SAMPLE ID	% SOLIDS	% WATER	TOTAL-P (mg/kg)	LOOSELY BOUND P (mg/kg)	FE BOUND P (mg/kg)	AL BOUND P (mg/kg)	BIOGENIC P (mg/kg)	CA BOUND P (mg/kg)	ORGANIC P (mg/kg)
SED-1-COMP	20.6%	79.4%	1236	<2.00	193	435	56.9	519	89.2
SED-2-COMP	15.3%	84.7%	1889	<2.00	359	848	158	355	328

Lake Nutrient Budget

Wights Pond's nutrient budget reflects the combined influence of watershed inputs, limited hydrologic flushing, and internal loading from organic-rich sediments. Although stormwater runoff delivers phosphorus during rain events, the June 2025 sampling occurred under dry-weather, base-flow conditions and therefore provides a snapshot of background nutrient dynamics rather than storm-driven pulses.

External phosphorus inputs originate from stormwater runoff, groundwater flow, direct precipitation, wildlife, and localized shoreline sources. During wet-weather periods, these sources can deliver sediment-bound and dissolved phosphorus to the inlet, creating short-term concentration increases. Because Wights Pond has a short hydrologic residence time, a portion of this externally supplied phosphorus is transported relatively quickly to the outlet.

However, internal loading plays an equally important, and during warm months, often more influential role in sustaining elevated phosphorus concentrations. The pond's sediments contain thick deposits of organic material that store large quantities of phosphorus accumulated over decades. Under low-oxygen conditions at the sediment–water interface, iron-bound phosphorus becomes mobile and diffuses upward into the water column. Wind-driven resuspension can further enhance phosphorus exchange by disturbing the soft surface sediments and mixing porewater with the overlying water.

Phosphorus ultimately leaves the pond through outflow, sediment burial, and biological uptake. Still, the balance between inputs and internal recycling tends to favor elevated summer concentrations in shallow, nutrient-enriched systems such as Wights Pond. Understanding this interplay between watershed loading and sediment release is essential when evaluating long-term management strategies, especially those aimed at improving water clarity or reducing algal growth. Additional water quality data would be needed to further understand seasonal changes in the phosphorus concentrations throughout the pond.

This nutrient budget framework provides the context for the water quality conditions observed during the June 2025 assessment.

Based on the loading analysis reported by WRS (2017), Farms Station Pond receives approximately 23 kilograms of phosphorus per year from its 417-acre watershed. Because Wights Pond drains about 350 acres, or roughly 84 percent of that watershed, a simple area-scaled expectation would place the Wights Pond watershed load on the order of approximately 19 kg/yr if unit-area loading were uniform. The screening-level load estimate developed in this assessment for Wights Pond (~12 kg/yr, derived from a single dry-weather base-flow sampling event) is lower than that area-scaled value but of the same order of magnitude, which is reasonable given that the ARC estimate is based on one dry-weather snapshot and does not capture storm-driven pulses. In contrast, the WRS value reflects an annualized load for the full Farms Station watershed. Overall, the two estimates are broadly consistent and support the conclusion that Wights Pond receives a substantial share of the nutrient load ultimately delivered to Farms Station Pond while functioning as an upstream settling basin.

Aquatic Macrophyte Assessment

The aquatic plant community in Wights Pond was relatively sparse during the June 2025 survey, with low to moderate overall cover and biovolume. The limited macrophyte growth is consistent with the pond's shallow depth, soft organic sediments, and reduced water clarity, all of which can constrain rooted plant abundance. Filamentous green algae were present in scattered shoreline patches and in shallow coves, reflecting localized nutrient availability and the influence of fine sediment resuspension. Benthic algal presence was minimal and restricted to patchy filamentous mats along the shoreline, with no substantive benthic growth observed.

Vascular macrophytes included scattered curly-leaf pondweed (Potamogeton crispus), small clusters of common duckweed (Lemna minor), and low-density beds of other native pondweeds and floating-leaf species. No large or contiguous nuisance beds were observed, and rooted plant cover generally remained low across most of the littoral zone. This pattern is typical of small impoundments with organic sediments, moderate nutrient enrichment, and limited water transparency.

A targeted survey for the invasive water chestnut (Trapa natans) was conducted along the southern shoreline and near the outlet structure. A total of 29 individual plants were hand-harvested and removed for upland disposal. Most plants occurred near macrophyte observation points 1741 and 1745, with no evidence of a large, continuous bed or extensive seed bank. The low-density occurrence of water chestnut suggests that early detection and removal efforts have been effective to date. Continued monitoring, ideally on an annual basis during early to mid-summer, will be important to prevent the establishment of larger nuisance populations.

Overall, the macrophyte community reflects a system with moderate nutrient enrichment but limited rooted plant development owing to turbid conditions, soft sediments, and shallow depths. Filamentous algae and isolated invasive plants represent the primary vegetation management concerns at this time, both of which can be effectively addressed through continued monitoring and early-intervention removal. Aquatic macrophyte data for Wights Pond are presented below in **Table 4**.

Table 4 - Aquatic Macrophyte Data

Point	Water	Cover	Bio-volume	FG	Lm	Pcrisp	Tn	Total	Observations
1726	1.3	1	1			S		1	
1727	1.3	1	1	D	M			2	
1728	1.6	1	1	D	M			2	
1729	1.5	4	1	D		S		2	
1730	2.0	4	1	D				1	Small bass
1731	1.6	4	2	D				1	
1732	1.5	3	1	D		S		2	Carp
1733	2.3	2	1	D		S		2	
1734	1.8	4	1	D		S		2	Sunfish, Bass
1735	1.6	2	1	D		S		2	
1736	2.3			D	M	S		3	
1737	3.0	3	1	D				1	
1738	3.0	3	1	D				1	Red Tail Hawk, Green Bull Frog, Carp
1739	2.6	4	1	D				1	
1740	2.3	3	1	D				1	
1741	2.0	1	1	D				1	
1742	1.6	1	1					1	
1743	2.6	0	0					0	
1744	1.6	1	1	D				0	
1745	2.6	1	1	D			S	2	Sunfish, Harvested 29 Tn plants
1746	2.6	1	1		M		S	2	
Frequency of Occurrence				17	4	7	2	21	
Frequency Dominant				17	0	0	0		
% Time Dominated when Present				100%	0%	0%	0%		

FG – filamentous algal mats
Lm - Lemna minor
Tn - Trappa natans
Pcrisp - Potamogeton Crispus

Biological Community

Visual observations during the June 2025 field work documented an active but modest warmwater fish and wildlife community. Multiple largemouth bass, sunfish, and common carp were observed throughout the pond, along with numerous green bullfrogs along the shoreline. A red-tailed hawk was noted hunting in the vicinity of the pond, and a great blue heron was seen foraging in shallow areas. These observations confirm that Wights Pond provides usable habitat for common warmwater fish, amphibians, and piscivorous birds despite its small size and urban setting.

Phytoplankton samples from Wights Pond indicated a diatom-dominated community with lesser contributions from green algae and dinoflagellates. Total phytoplankton density was on the order of 1,300 cells per milliliter, with an estimated biomass of roughly 800 micrograms per liter. Diatoms (Bacillariophyta) accounted for approximately 95 percent of total cell density and about three-quarters of total biomass, reflecting a community strongly weighted toward centric and pennate forms. The most abundant taxa included colonial Fragilaria/related araphid pennate diatoms, Aulacoseira, and associated Fragilaria/Synedra-type taxa, with a smaller contribution from coccoid/colonial green algae (Chlorophyta) and a minor dinoflagellate (Pyrrhophyta) component. A limited number of taxa were flagged as potential taste-and-odor producers, but no cyanobacteria were detected.

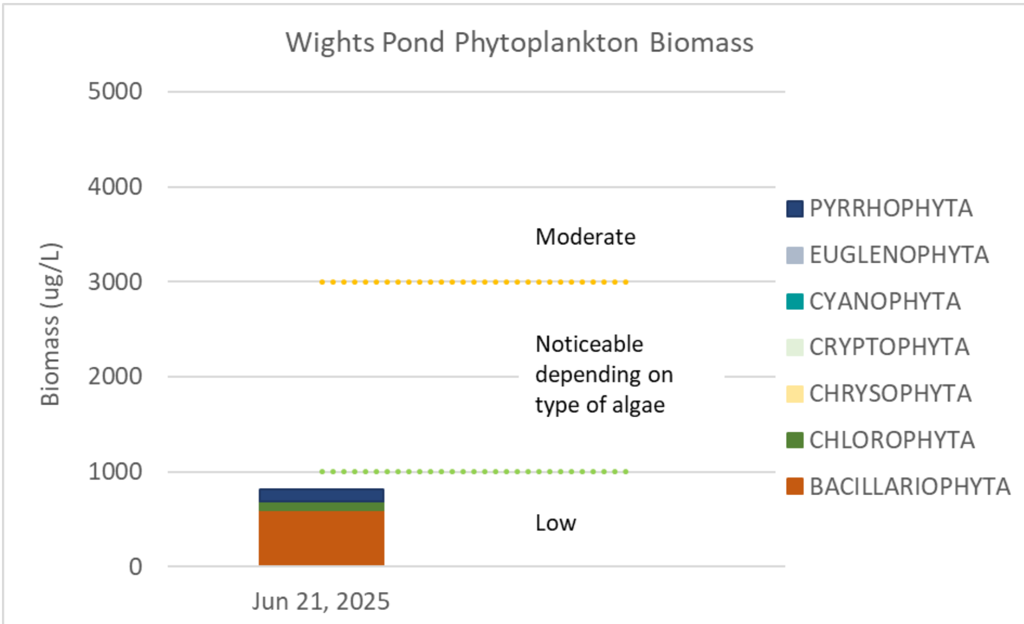

Figure 6 - Wights Pond Phytoplankton Biomass

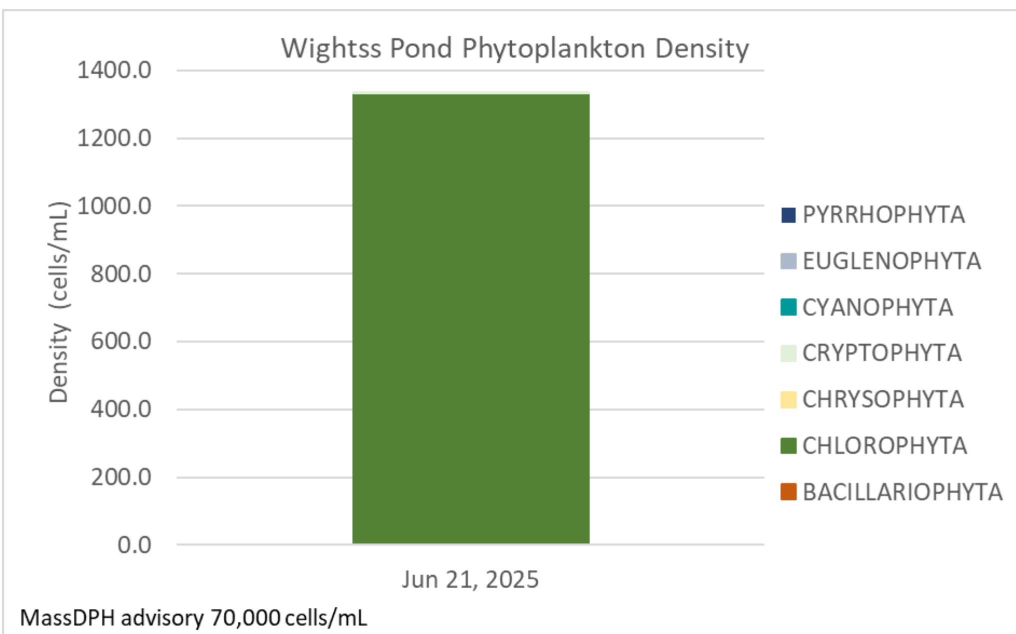

Figure 7 - Wights Pond Phytoplankton Density

The zooplankton community in Wights Pond consisted primarily of copepods and other zooplankton, with smaller contributions from cladocerans and rotifers. Total zooplankton density was approximately 77 individuals per liter, with an estimated biomass of about 300 micrograms per liter. Copepods comprised roughly two-thirds of the total numerical density and about 40 percent of the total biomass, while cladocerans contributed about 20 percent of the density and 6 percent of the biomass. Rotifers accounted for the remaining 10–15% of numerical abundance. Twelve zooplankton taxa were identified.

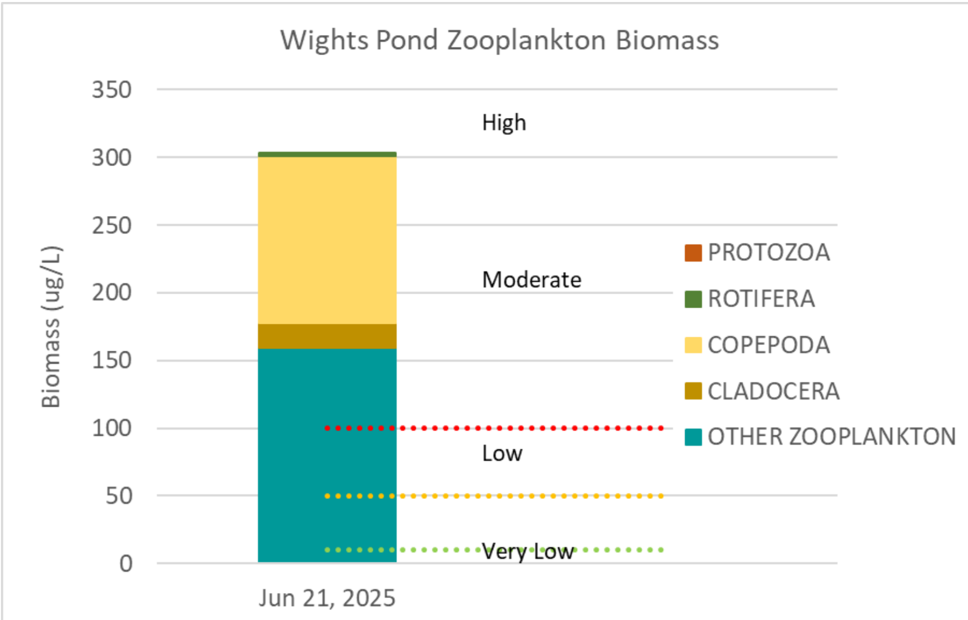

Figure 8 - Wights Pond Zooplankton Biomass

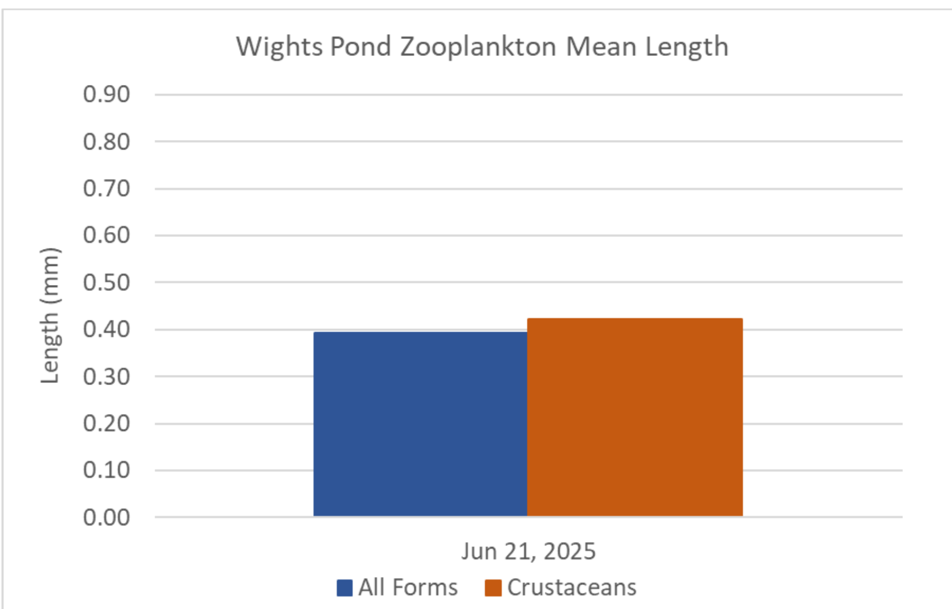

Figure 9 - Wights Pond Zooplankton Mean Length

Benthic Macroinvertebrates

ARC collected three semi-quantitative benthic macroinvertebrate samples from Wights Pond using timed dip-net sweeps. These samples were analyzed by WRS/Dr. Wagner. Overall abundance was low and dominated by midge larvae (Chironomidae), with scattered occurrences of stoneflies, damselflies, and a single caddisfly.

Taken together, the fish and wildlife observations, phytoplankton and zooplankton results, and benthic macroinvertebrate data depict Wights Pond as a small, nutrient-enriched urban impoundment supporting a typical warmwater assemblage.

Table 5 - Benthic Macroinvertebrate Data

Taxon		# per Wights Pond sample		
Scientific name	**Common name**	**MAC-1**	**MAC-2**	**MAC-3**
Amphipoda	Scud		3	
Diptera, Chironomidae	Midge flies	12	9	13
Diptera, Culicidae	Mosquitos			2
Gastropoda	Snails (egg masses)	1	2	
Isopoda	Sow bugs		1	
Oligochaeta	Annelid worms	1	1	1
Plecoptera	Stoneflies		2	
Trichoptera	Caddisflies	1		
Zygoptera	Damselflies		2	
	Total	15	20	16

Because the study was based on a single mid-season sampling event, these results should be interpreted as a baseline description rather than a comprehensive characterization of seasonal variability. Nevertheless, the data provide a useful foundation for future comparisons and for integrating Wights Pond into the broader context of town waterbody management. If the Town elects to pursue more detailed investigations or develop specific management actions in the future, the information presented here will help support that planning process.

A review of the Massachusetts Natural Heritage and Endangered Species Program (NHESP) data layers indicates that Wights Pond is not located within Priority Habitat or Estimated Habitat for Rare Wildlife, and no Certified Vernal Pools occur in or adjacent to the site. The U.S. Fish and Wildlife Service IPaC database similarly identifies no federally listed species or designated critical habitat within the project area.

Field observations during the June 2025 assessment documented only common warmwater fish, amphibians, birds, and macroinvertebrates typical of small urban ponds. The qualitative macrophyte survey identified no rare or state-listed aquatic plants, and Dr. Wagner's review of plankton and macroinvertebrate samples did not detect any taxa of conservation concern.

Based on available state and federal mapping, combined with field observations, no protected species are known or expected to occur in Wights Pond, and the pond does not fall within any mapped rare-species habitat that would require additional permitting or conservation measures at this time.

This assessment was not intended as a formal rare-species survey; conclusions regarding protected species are based on available state and federal mapping and the observations made during the June 2025 site visit.

References

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Study Limitations

Results represent conditions at the time of sampling and provide a snapshot of mid-season conditions. Additional seasonal monitoring would improve characterization of variability and internal loading dynamics.