

May 31 2022

John Westerling, Director
Department of Public Works
PO Box 209
Hopkinton, MA 01748

RE: Summary of May 2022 Lake Maspenock Aquatic Vegetation Surveys

Dear Director Westerling,

This letter provides a summary of the results and data from the Lake Maspenock aquatic vegetation survey conducted on May 20, 2022. This information documents the status of the aquatic vegetation community in Lake Maspenock (the “Lake”) in late spring 2022. These data and analyses are part of the on-going monitoring conducted by members of the Lake Maspenock Citizens Input Group (the “CIG”) and assisted by volunteers which provide information central to effective lake management activities.

The aquatic vegetation surveys visit up pre-determined sampling stations twice a year (late spring and late summer) to monitor seasonal lake vegetation growth. Table 1 provides a list of the standard sampling locations with their approximate GPS locations¹. Locations of the monitoring stations in the Lake are shown on the map in Appendix A.

At each vegetation monitoring station, samplers followed protocol used for previous surveys (see Appendix B), with observations of total water depth, Secchi disk transparency (SDT) depth, weed species present, areal coverage via visual observations with an AquaScope viewer, and relative species density via replicate tosses of a “weed rake.” At some deeper stations, it was not possible to accurately estimate areal coverage on the bottom due to water column turbidity obscuring the bottom. Raw data and field notes were recorded on standardized forms and are provided in Appendix C (see attachment).

The May 2022 vegetation survey visited 11 sampling locations. Results of the survey are provided in Table 1 with summary station conditions color-coded according to the density key at the bottom of the table. During sampling, the volunteers indicated that the lake level was down 6-9” from full elevation, which seems consistent with the coloration of shoreline rocks. Water clarity was generally very good with Secchi disk transparency (SDT) depth measurements to the bottom in most locations. The SDT reading at two deep stations ranged from 8.2 to 9.7 ft.

Table 1 shows that seven species of aquatic vegetation were identified in the survey (see Table 1 for scientific names). All seven species have been previously detected in the Lake. The two most common

¹ For May 2022, we used a Google app as an approximate measure of GPS location. To guide us, we relied on the waypoints collected on a previous survey together with the best professional judgment of the survey crew.

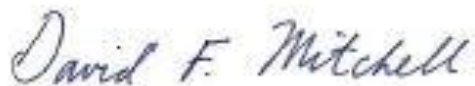
species were: variable milfoil (located in 8 of 11 survey locations) and largeleaf pondweed (6 of 11 locations). Detected at lesser frequencies (three stations) were European naiad, fanwort, and waterweed. Detected at lowest frequencies (one or two locations) were bladderwort and tapegrass. As indicated in Table 1, with the exception of NB/CL and NB/C, most stations had trace to sparse amounts of invasive species. Two stations (NSI and SB/Dam) had no plants recorded either by direct observation (AquaScope) or by grappling with the lake rake.

The overall impression for spring 2022 is that the growth of invasive aquatic weeds was generally light at this time. However, both variable milfoil and largeleaf pond were well-established at two North Basin (NB/CL and NB/C) in terms of coverage and density and this could lead to problematic conditions at those stations later in the year. As expected with the mid-May survey date, most locations did not have pronounced growth into the water column. However, as the season progresses, both the density and biomass of plants are expected to increase and may become more noticeable as leaf tops and reproductive structures reach the surface. For example, tapegrass generally develops later in the season and is more visible when fruiting stems (corkscrew appearance) are in the water column. Compared to previous years, there was a diminished presence of European naiad which is somewhat surprising given its ubiquity in the bottom cover of North Basin over recent years. Filamentous green algal mats were observed at NB/WB. Waterweed (*Elodea*) was observed in the North Basin for the first time.

Results were compared to the June 10, 2021 survey which was conducted about three weeks later but still had good water clarity (as indicated by SDT depths). Both surveys show the low development of weeds typical of early growing season at most stations. Largeleaf pondweed and variable milfoil were the leading dominants in both 2021 and 2022. Additional insights into growth patterns and the overall seasonal peak growth will be available when the late summer (August-September) survey is conducted.





Please review this letter and accompanying data and documents and let me know if you have any questions or need further clarification.

Sincerely,

A handwritten signature in cursive script that reads "David F. Mitchell". The ink is dark and the signature is written in a fluid, connected style.

David F. Mitchell, Ph.D., CLM

Code	Station General Description	Latitude	Longitude	Total Depth (ft)	SDT Depth (ft)	Aquatic Species Observed										Aquatic Vegetation Density
						BW	EN	FW	LLP	Nit	RLP	TG	VMf	WW	Relative Density	
NB/EC	North Basin: East Cove / West Main St.	N 42° 12' 25"	W 71° 33' 18"	5.1	5.1(TB)	-	X	-	-	-	-	-	X	-	EN; VMf - trace.	
NB/CL	North Basin: West Main St. Cartop Launch	N 42° 12' 17"	W 71° 33' 31"	6.3	6.3 (TB)	-	-	-	X	-	-	-	X	X	VMf - moderate; LLP - sparse; WW - trace.	
NB/C	North Basin: central location	N 42° 12' 10"	W 71° 33' 27"	6.5	6.5 (TB)	-	-	-	X	-	-	X	X	X	LLP and VMf- sparse to moderate; EN and WW - trace.	
NB/WB	North Basin: West Bank	N 42° 12' 05"	W 71° 33' 36"	5.0	5.0 (TB)	-	-	-	X	-	-	-	X	-	LLP and VMf- trace; filamentous algae - sparse	
NB/NWI	North Basin; north of Woody Island	N 42° 12' 00"	W 71° 33' 23"	5.0	5.0 (TB)	-	X	X	-	-	-	X	-	-	EN, FW, TG - trace	
NB/BWI	North Basin; below Woody Island	N 42° 11' 57"	W 71° 33' 17"	7.5	7.5 (TB)	-	X	X	X	-	-	-	X	-	EN - trace to sparse; FW, LLP, and VMf - trace	
NSI	North of Sandy Island	N 42° 11' 52"	W 71° 33' 16"	2.1	2.1 (TB)	-	-	-	-	-	-	-	-	-	Leaf and muck; no plants	
SB/SB	South Basin; South Bank, Sandy Island	N 42° 11' 48"	W 71° 33' 19"	9.7	8.2	X	-	X	X	-	-	-	X	-	FW and LLP sparse to trace; BW and VMf - trace	
SB/EC.s	South Basin; East Cove, south of rock pile	N 42° 11' 11"	W 71° 33' 17"	7.0	7.0 (TB)	X	-	-	X	-	-	-	X	X	LLP - trace to sparse; BW, VMf, and WW - trace	
SB/WC	South Basin; West Cove	N 42° 11' 08"	W 71° 33' 19"	13.8	9.0	-	-	-	-	-	-	-	X	-	VMf - sparse	
SB/Dam	South Basin; north of dam	N 42° 10' 57"	W 71° 33' 16"	4.9	4.9 (TB)	-	-	-	-	-	-	-	-	-	Stone and gravel; no plants	

Code	Common Name	Scientific Name	Indigenous?	Invasive?	Color Code for Relative Coverage
BW	Bladderwort spp.	<i>Utricularia spp.</i>	Yes	No	 = Little to no invasive species and/or trace to sparse cover
EN	European naiad	<i>Najas spp.</i>	No	Yes	
FW	Fanwort	<i>Cabomba carolinia</i>	No	Yes	 = Invasives present at low-moderate levels; moderate cover
LLP	Largeleaf Pondweed	<i>Potamogeton amplifolius</i>	Yes	Opportunistic	
Nit	Nitella (macroalgae)	<i>Nitella spp.</i>	Yes	No	 = Invasives co-dominant; moderate-heavy; some impacts
RLP	Ribbonleaf Pondweed	<i>Potamogeton epiphydrus</i>	Yes	No	
TG	Tape grass	<i>Valisnaria americana</i>	Yes	Opportunistic	 = Invasives dominant, severe recreational impacts
VMf	Variable milfoil	<i>Myriophyllum heterophyllum</i>	No	Yes	
WW	Waterweed	<i>Elodea canadensis</i>	Yes	No	

APPENDIX A

Locations of Lake Maspenock Aquatic Vegetation Survey Stations

APPENDIX B

General Lake Maspenock Aquatic Vegetation Survey Sampling Protocol

1. Motor to sampling station on map using GPS and depth as guide. Note that sampling stations have been recoded, using Station Code sheet for correct abbreviations. This will be entered on the Monitoring form (one each per station).
2. On station, anchor boat and make final GPS coordinate and get total depth, enter station code on Monitoring Form as well as date and sampling crew.
3. If total depth > 10 ft, take a Secchi disk reading on “shady side” using aqua-viewer. The Secchi disk transparency depth is the average of the depth at which you lose sight of the disk and the depth at which you reacquire it.
4. Using aqua-viewer do two 1-minute assessment of bottom coverage; one from each side of boat. Estimate overall coverage, dominant weed species, and their individual coverage
5. Conduct first 35 ft first weed rake toss (make sure there is plenty of clearance and **make sure that someone is holding on the other end !**)
6. On the monitoring form, record overall density (see guide) and density of the dominant species retrieved.
7. Conduct replicate weed rake toss (in another direction from boat) and record observations. If the values are the same of a species (circle) the first data. Otherwise, fill in form.
8. If new plant species are found, place in Ziploc bags with water and place in cooler for later identification.
9. Add any additional relevant observations on station location on monitoring form.
10. Motor to next station and continue survey.

APPENDIX C

Lake Maspenock Aquatic Vegetation Survey May 2022 – Raw Data Sheets