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Date: June 19, 2023

To: Lunenburg Conservation Commission

Shirley Conservation Commission

From: Dominic Meringolo, Senior Environmental Engineer/Project Manager

Re: Lake Shirley – Survey and Treatment Plan

Dear Commissioners,

Based on a survey conducted by our Biologist on June 13th, we are recommending treatment to approximately 34.5-acres of Lake Shirley to manage nuisance weed growth. Thinleaf pondweed (*Potamogeton spp*.) was the most common plant observed in this year's survey. Other target species include non-native curlyleaf pondweed (*Potamogeton crispus*). Other common native species observed this year include bladderwort (*Utricularia sp.*), macroalgae (*Nitella sp. & Chara sp*.) and clasping leaf pondweed (*Potamogeton perfoliatus*). Tapegrass (*Vallinsneria*), which has been a common target in past treatments, was not very prominent this year in most areas and does not require management.

Per the Lake Management Plan, areas of the lake that exhibit either density or biomass factors of 3 or greater (>50%) are candidates for management. Additionally, any growth of non-native species, in this case curlyleaf pondweed (*Potamogeton crispus*) can also be treated. Some candidate areas were not designated for treatment due to their proximity to undeveloped shorelines and/or the presence of non-nuisance species (ex. Stonewort/Chara, waterlilies).

Based on recommendation from Water Restoration Consulting the following areas will be checked again prior to treatment for the presence of coontail (*Ceratophyllum demersum*) and Robbins Pondweed (*Potamogeton robbinsii*), both of which are plants that we would like to see expand in the lake. If specimens of either species are observed, that area would not be treated.

Areas in the vicinity of points 1-7; Areas in the vicinity of points 21-22; Areas in the vicinity of points 30-31.

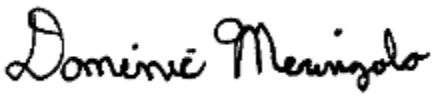
As was approved last year, we ask the Commission to allow us to make field changes on the day of treatment if we observe any additional areas of non-native curlyleaf pondweed or topped-out, problematic vegetation in other areas of the lake not depicted on the map.

No additional areas are proposed for flumioxazin (a/k/a Clipper) herbicide treatment this year. In the proposed treatment areas, Tribune (diquat) herbicide will be used for treatment at a rate of 1.0-1.5 gallons per acre and a copper-based product, either Nautique or copper sulfate, will be used as needed in areas dominated by tapegrass, however this should be quite limited this year.

Treatment is tentatively scheduled for July 11th.

A map of the recommended treatment areas is attached as well as the June 13th survey data table. On the map of the proposed treatment areas, the data points that meet management criteria are included. The LSIC & SOLitude Lake Management will be attending upcoming meetings of the Conservation Commissions to discuss this plan and answer any questions.

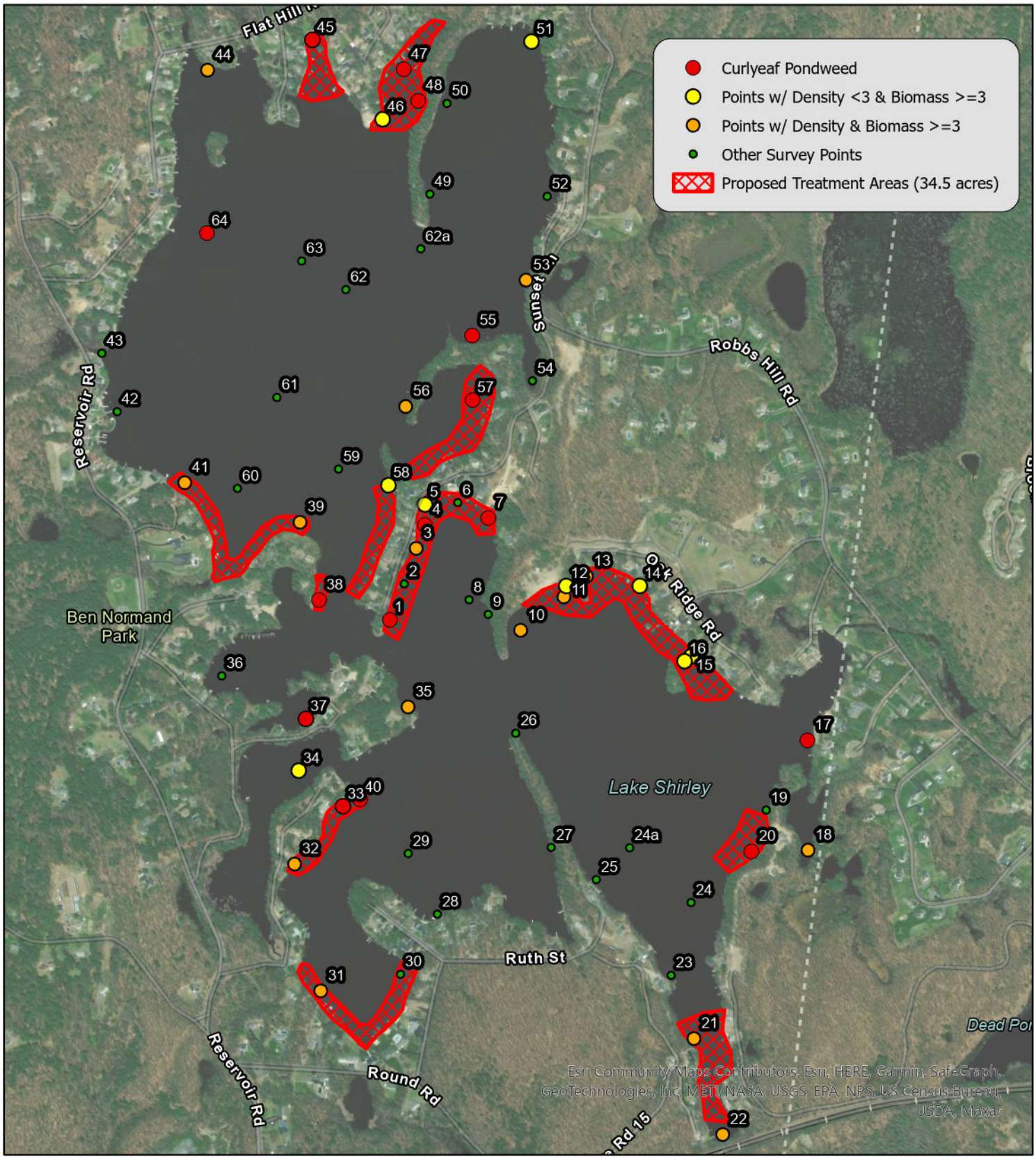
Regards,
SOLitude Lake Management



Dominic Meringolo
Senior Environmental Engineer/Project Manager

Figure 1 - 2023 Proposed Treatment Areas

SOLITUDE LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com



Lake Shirley
Lunenburg, MA

Lake Shirley

0 870 1,740 Feet

1:10,924

N

Map Date: 6/16/2023
Prepared by: DMM
Office: SHREWSBURY, MA

X= Present D = Dominant

Plant Species	# stations present	# stations dominant	% stations present	% stations dominant	Monitoring Locations																																						
Scientific Name					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	24a	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Cabomba caroliniana	29	10	44%	15%		D	D	X	D	D	X	X	X	X	X	X	D	X	X			X	D					X		D	X		D		D				X		D		X	
Elodea canadensis	0	0	0%	0%																																									
Vallisneria americana	11	1	17%	2%	D						X		X				X																					X						X
Eleocharis sp.	1	0	2%	0%																																								
Utricularia Sp.	12	0	18%	0%		X		X			X	X		X				X				X																X						X
Chara sp.	0	0	0%	0%																																								
Nitella sp.	11	2	17%	3%		X				X																	X									X								
Macro	10	2	15%	3%							D	D	X													X		X												X	X	X		X	
Potamogeton bicupulatus	0	0	0%	0%																																								
Najas flexilis	5	2	8%	3%																								D								X		D	X					
Potamogeton gramineus	1	1	2%	2%																																								
Various	0	0	0%	0%																																								
Najas gracillima	4	1	6%	2%															X																										
Potamogeton crispus	15	3	23%	5%	X			X			X										X			X						X								X				X	X	
Potamogeton amplifolius	2	1	3%	2%																				D	X													X						
Potamogeton epihydrus	1	0	2%	0%																																								
Potamogeton perfoliatus	11	5	17%	8%			X								X			D	X	D	X										X							D					
Potamogeton foliosus	0	0	0%	0%																																								
Ceratophyllum demersum	0	0	0%	0%																																								
Potamogeton zosteriformis	0	0	0%	0%																																								
Nuphar variegata	1	0	2%	0%																																								
Nymphaea odorata	0	0	0%	0%																																								
Fontinalis sp.	0	0	0%	0%																																								
Zosterella dubia	3	1	5%	2%				X													X	D																						
Potamogeton confervoides	1	0	2%	0%																																				X				
Potamogeton pusillus	0	0	0%	0%																																								
Potamogeton sp. (thin)	44	30	67%	45%		X	X	D	X	X	X	X	D	D	D	D	X	X	D	X	D				D	D	D				D				D	D		X	D		D	D	D
Potamogeton robbinsii	0	0	0%	0%																																							
Species Richness					2	4	3	5	2	3	6	4	4	3	3	2	3	4	4	2	4	3	1	2	2	2	2	3	0	2	3	0	1	0	1	3	1	4	5	3	2	2	4	3
Plant density Index					1	2	3	3	2	3	3	4	1	3	3	1	4	2	2	1	3	4	1	3	4	3	3	2	0	1	3	0	1	0	2	3	3	2	2	3	2	2	3	3
Plant biomass index					2	2	3	3	3	2	3	2	1	4	4	4	4	3	3	3	3	4	2	3	4	3	2	2	0	2	2	0	2	0	2	4	3	3	4	4	2	3	4	3

Key to Density and Biomass Indices		
Value	Density (% cover)	Biomass
0	Absent: 0%	No growth
1	Sparse: 1-25%	Scattered plant growth; or primarily at lake bottom
2	Moderate: 26-50%	Less abundant growth; or in less than half of water column
3	Dense: 51-75%	Substantial growth through majority of water column
4	Very Dense: 76-100%	Abundant growth throughout water column to surface

X= Present

Plant Species	# stations present	# stations dominant	% stations present	% stations dominant	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	62a	63	64	65	66	
Scientific Name																																	
Cabomba caroliniana	29	10	44%	15%					X	X	X									X	X												
Elodea canadensis	0	0	0%	0%																													
Vallisneria americana	11	1	17%	2%			X	X	X						X	X																	D
Eleocharis sp.	1	0	2%	0%							X																						
Utricularia Sp.	12	0	18%	0%				X												X	X												
Chara sp.	0	0	0%	0%																													
Nitella sp.	11	2	17%	3%			X	X	X					D								X	X						D				
Macro	10	2	15%	3%		X																											
Potamogeton bicupulatus	0	0	0%	0%																													
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Potamogeton crispus	15	3	23%	5%						D		D	X							X		X								D			
Potamogeton amplifolius	2	1	3%	2%																													
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Nymphaea odorata	0	0	0%	0%																													
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Potamogeton robbinsii	0	0	0%	0%																													
Species Richness					1	3	3	4	4	3	3	2	3	2	1	2	2	1	0	6	3	3	3	0	2	1	1	0	1	1	0	1	2.397058824
Plant density Index					2	3	3	2	3	2	2	3	3	3	1	2	1	3	0	3	3	1	2	0	1	2	2	0	1	1	0	2	2.088235294
Plant biomass index					2	4	1	2	4	3	3	4	3	2	1	3	2	3	0	4	3	2	3	0	2	2	1	0	1	2	0	1	2.426470588