

Prior Lake Aquatic Plant Evaluation on August 4, 2016

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Findings

Six areas were surveyed on August 4, 2016. At each area, a boat path zig-zagged around the nearshore area and in the middle of the area as well and sampling occurred in front of lakeshore residences and in front of natural shoreline stretches.

Each of the 6 areas had unique aquatic plant conditions which are summarized in Table 1. A map of locations of aquatic plant survey areas is shown in Figure 1. The plant densities within the survey areas are shown in Figure 2 and plant densities and sample depths for individual samples are found in the Appendix.

The dominant plants in all 6 areas were native plants. When Eurasian watermilfoil (EWM) was present, the density was variable. EWM was observed matting at the surface in shallow water depths in Areas 1 and 5. In general heavy milfoil growth was found in patches rather than continuous beds.

Area 1, Watersedge Cove: heaviest plant growth was on the south side of the cove and was a mixture of native plants and EWM. The north side had fewer navigational hindrances. Buoys delineated a navigational channel.

Area 2, Shady Beach Cove: had remarkable floating duckweed and watermeal coverage. This was largely a function of the shallow water depths of 2 to 4 feet. Algae were present, but sparse.

Area 3, Upper Prior Access Bay: had patchy aquatic plant growth. The heaviest growth was from coontail and was found on the north side of the bay.

Areas 4, 5, and 6: These areas had a variety of plant growth and are summarized in Table 1.

Table 1. Aquatic plant conditions within 6 areas. Density scale is 1 to 4, with 1 and 2 = light, 3 = moderate, and 4 = heavy growth.

Area	Acres of the Area	Number of Sites Sampled	Depths (ft)	Eurasian Watermilfoil Density	Native Plant Density	Notes
1. Watersedge Cove	14.5	29	4-10	0-4	1-4	Open channel delineated by orange and green buoys. Navigational problems can occur outside of the buoys in nearshore areas.
2. Shady Beach Cove	1.7	7	2-8	1-2	2-4	Duckweed and watermeal had nearly 100% surface coverage. Perfect growing conditions for duckweed. Coontail was dominant submerged plant.
3. Upper Prior Access Bay	25.4	23	4-7	0-1	0-4	Dominant plant is coontail, but elodea is heavy in some areas.
4. Mud Bay	49.6	5	5	1-3	0-1	Patchy growth, potential navigational problem in some areas close to shore.
5. Lakefront Bay	10.7	3	6-7	1-4	2	No navigational problems in mid bay. Heavy growth of EWM in nearshore area.
6. Candy Cove	13.5	8	6-32	0-3	2-4	Navigation is mostly clear. Cabbage grows to surface in patches in some nearshore areas.

Aquatic Plant Management Ideas

1. As lake water clarity improves, due in part to zebra mussel growth, aquatic plant growth will increase in distribution and abundance.
2. Most of the heavy plant growth is within 150 feet of shore. This is the riparian zone and is typically managed by the riparian owner.
3. Up to 2,500 square feet of submerged vegetation can be removed by the riparian owner using physical methods. Any herbicide use requires a MnDNR permit.
4. MnDNR permits for treating EWM should be directed to Keegan Lund at the MnDNR.
5. MnDNR permits for treating native plants should be directed to Shane McBride, APM Specialist, at the MnDNR.
6. Aquatic plants get most of their nutrient requirements from lake sediments. It is always a good idea for lake residents to reduce phosphorus and nitrogen runoff from their property into the lake. In the long term, this could reduce excessive aquatic plant growth.
7. In Area 1 (Watersedge) buoys marked a navigational channel and was a good management approach. In the future, riparian owners could create pathways from their docks to the open channel using herbicides or a mechanical harvester.
8. In Area 2 (Shady Beach Cove) duckweed and watermeal are the dominant plants. The herbicide, Clipper, has been found to be an effective control and needs to be applied 2 to 3 times per summer by a licensed applicator. Floating filamentous algae was present, but sparse.
9. Area 3 (Upper Prior Access Bay) has some heavy growth of aquatic plants which are dominated by the native coontail. Early season application of Aquathol or a summer herbicide application would control the nearshore heavy growth. Because the public access is nearby, mechanical harvesting would also be an option.

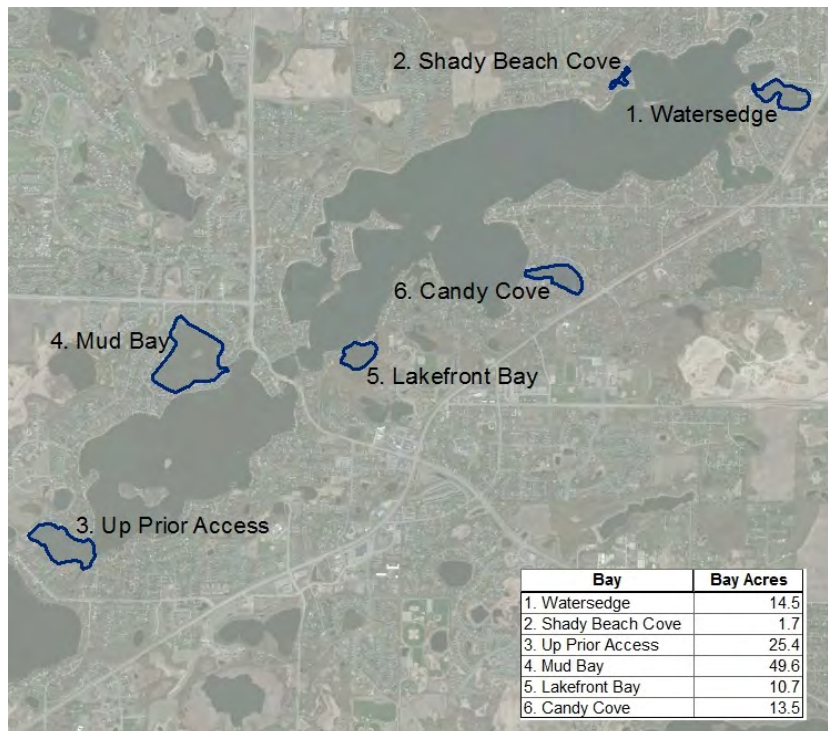
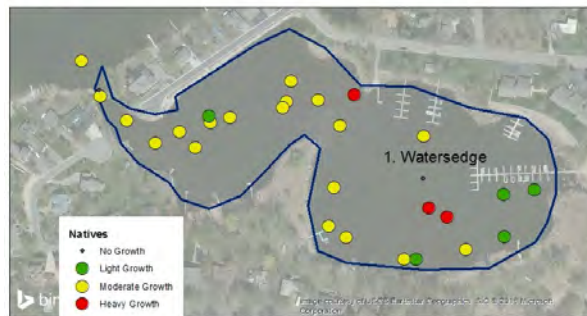
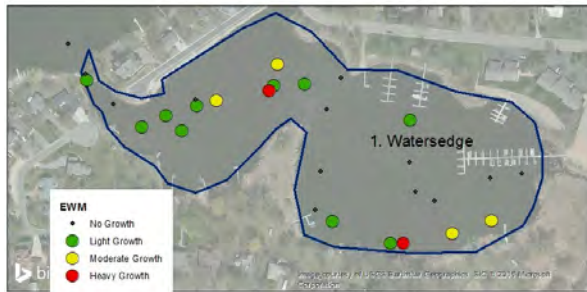


Figure 1. Locations of 6 aquatic plant survey areas, surveyed on August 4, 2016.

Watersedge Bay EWM and Natives
August 4, 2016



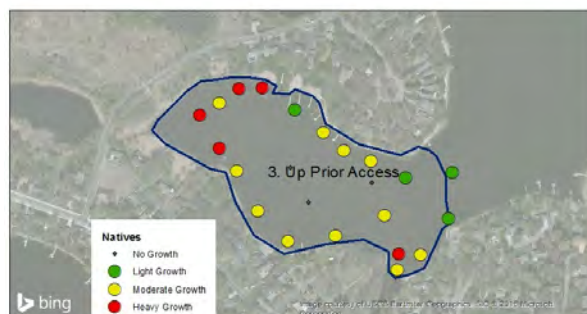
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UTM NAD 1983
Blue Water Science

Shady Beach Cove Duckweed and Watermeal
August 4, 2016



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UTM NAD 1983
Blue Water Science

Upper Prior Access EWM and Natives
August 4, 2016



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UTM NAD 1983
Blue Water Science

Figure 2. Aquatic plant densities for 3 surveyed areas showing densities for EWM and native plants at the individual survey points. Native plants were typically more abundant than EWM. In Area 2, duckweed had nearly 100% coverage. The cove is about 2 to 4 feet deep which are perfect growing conditions for duckweed.

Mud Bay EWM and Natives
August 4, 2016



Lakefront Bay EWM and Natives
August 4, 2016



Candy Cove EWM and Natives
August 4, 2016

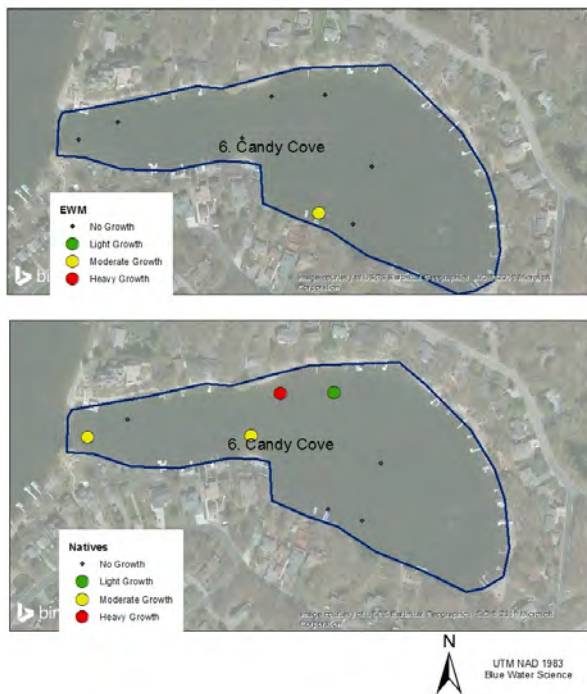


Figure 2 - concluded. Native plants were the most common in Areas 4 and 6. The Lakefront Bay Area (5) had patchy EWM which was also common in the nearshore area along the natural shoreline.

Pictures of Aquatic Plant Conditions at Six Survey Areas



1. Watersedge: Heavy plant growth is found in nearshore areas on the south shore and is composed of a combination of EWM and native plants. Buoys have been installed to mark a navigational channel. In addition, channels could be created from the docks out to open water as well. The marina docks did not have navigational hindrances at the time of this survey.



2. Shady Beach Cove: Duckweed and watermeal are abundant in shallow water at depths of 2 to 4 feet. The green plants floating on the surface are duckweed and watermeal. Algae was minor in this area. Duckweed and watermeal are native plants and under the correct conditions can cover the water surface. This cove has the correct conditions. Submerged plants are dominated by coontail. When water depths reach 6 feet or more, duckweed is absent (picture in lower right).



3. Upper Prior Lake Access Bay: The most abundant plant growth was found along the north shoreline and in the west end of the bay. The dominant plant was coontail although EWM was present.



4. Mud Bay: EWM is present, but patchy. This shallow bay is mostly navigable.

5. Lakefront Bay: EWM is common to abundant and the nearshore areas support beds of EWM. In the middle of the bay EWM is patchy.



6. Candy Cove: Aquatic plant growth is mostly light to moderate. The significant dropoff about 50 feet offshore limits nuisance growth to a narrow vegetative band.

APPENDIX

Area	Waypoint	Depth (ft)	EWM	Natives	Floating plants	Clasping-leaf	Coontail	Elodea	NWM	Water celery	Water stargrass	Notes
1	1	10		3								
	2	6	1							3		
	3	4	1			1				3		
	4	6	1	3								
	5	5	1	3								in the channel
	6	4	1	3		1					3	
	7	3		3						1	1	
	8	6		3				1		1	1	
	9	6		3								In front of dock, patchy: plants 1 ft below surface
	10	6	2	3			2					
	11	5	2	3								
	12	5	4						1			by dock
	13	4	3	3					1			
	14	4	3	2								by dock - EWM matted
	15	3		2								by Marina - no problem
	16	5		1								by Marina - no problem
	17	7		4								coontail floating - patchy at the surface
	18	8		4								coontail - patchy
	19	10										No plants
	20	7	1	3								4 ft below surface
	21	3		4						4		inside green buoy
	22	6	1	3								in channel - no problem
	23	3	3	3								Coontail, water celery, stargrass
	24	4	4	3								outside navigational channel marked with orange buoys - matted
	25	7	3	3								outside navigational channel - matted
	26	7		2								in channel - plants 5 ft from surface
	27	6	2	3								
	28	4		3								celery + others - 5 ft from surface
	29											End of Area 1
2	30	6	1	3								Area 2; coontail and water celery
	31	5			4							Duckweed and watermeal
	32	2	2	3	4							Duckweed (30%) and watermeal (70%)
	33	2		3	4							Duckweed and watermeal; FA 1
	34	2	1	3	4							Duckweed and watermeal
	35	5			4							Duckweed and watermeal
	36	8	2	3								2 ft from surface
	37	13		3								No problem
6	38	6		3								3 ft below surface
	39	14	3									EWM matted; 0-20 ft from shore, no problem
	40	20										
	41	32										No plants
	42	14		2								No problem
	43	8		4								Cabbage, 0-30 ft surface
	44	10										Cabbage
	45	7	4	2								Beach; EWM at the surface - dying back
5	46	7	1	2								Beach; open water
	47	6	4	2								Beach; EWM matted from here to shore
4	48	5	3	1								Clear
	49	5		3								Patchy, natural shore
	50	5		2								Patchy, natural shore
	51	5		1								Patchy, natural shore
3	52	5		1								Houses, no problem, patchy
	53	7		1								Area 3
	54	6		2								
	55	6	1	3								No problem, 4 ft from surface
	56	5		3								Coontail, elodea
	57	5		3			3	1				
	58	5		2								
	59	4		4								
	60	4		4			4					FA - 1; natural shoreline
	61	6	1	3								Coontail
	62	4		4	4							White lilies
	63	4		4			4	4				
	64	5		3								No problem
	65	5		3								Coontail and elodea, no problem
	66	4		3			3					No problem
	67	4		3			3					No problem
	68	2		4			4					FA on top, need to maintain a channel in this narrow, use herbicides
	69	2		3			2					
	70	4		3			1	3				
	71	5		3				3				Middle of bay, no problem
	72	6										Middle of bay, no problem
	73	7										Middle of bay, no problem
	74	7	1									Middle of bay, no problem
	75	6		2								Landing
Average			2.0	2.8	4.0	1.0	2.9	2.4	1.0	2.4	1.7	
Occurrence (75 sites)			28	61	6	2	9	5	2	5	3	