

LAKE EDUCATION AND PLANNING SERVICES, LLC

LOWER TURTLE LAKE BARRON COUNTY

2022 MANAGEMENT SUMMARY REPORT
WBIC: 2079700

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LOWER TURTLE LAKE MANAGEMENT DISTRICT

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INTRODUCTION

This report discusses lake management activities completed by the Lower Turtle Lake Management District (LTLMD) and Lake Education and Planning Services (LEAPS) throughout 2022. The following actions were completed by LEAPS in order to assist the LTLMD in aquatic plant management and lake stewardship education.

- CLP management planning and implementation
- CLP bed mapping survey
- Participating in board and district meetings
- Managing Clean Boats, Clean Waters (CBCW) monitoring at the public boat launch
- Water quality monitoring

Of special note for the 2022 season is the fact that the water level in Lower Turtle Lake which was already low going into the winter of 2021-22, remained very low throughout 2022. In addition, weather conditions through the late winter and spring of 2021 was outstanding for the support of CLP growth. This was not the case with the late winter and spring of 2022. Where the spring of 2021 supported large amount of CLP in Lower Turtle Lake, the spring of 2022 did not.

2022 LEAPS AND LTLMD SERVICES AGREEMENT

An Agreement for Professional Services was signed between LEAPS and the LTLMD covering the time period from March 1, 2022 to December 31, 2022. It was agreed that LEAPS would provide consulting services for the LTLMD related to 2022 CLP management planning, CLP survey work, and general project support, including meeting attendance. This agreement has since ended, and all actions have been completed.

2022 CLP MANAGEMENT AND SURVEY

After discussions with the LTLMD in March, LEAPS constructed a treatment plan for CLP in Lower Turtle Lake in early April 2022 based on bed mapping results from June 2021 (Figure 1). This preliminary CLP treatment plan included the use of Aquathol K, an endothall-based aquatic herbicide, on four treatment areas totaling 9.23 acres (Figure 2). A chemical application permit was submitted to the WDNR on April 11, 2022, and was approved on May 12, 2022. This treatment plan was formally approved by the LTLMD during their April 23, 2022 board meeting.

LEAPS completed a pre-treatment CLP readiness survey on May 19, 2022 to determine if modifications to the original treatment plan needed to be made. Pre-treatment mapping results did not show CLP levels comparable to the 2021 bed mapping so the 2022 treatment proposal was modified to about half of the preliminary (Figure 3). Four areas totaling 4.88 acres were kept in the modified treatment plan to be chemically treated with Aquathol K at 1.5ppm/acre-foot (Table 1).



Figure 1: June 2021 CLP bed mapping results (15 beds totaling 13.35 acres)

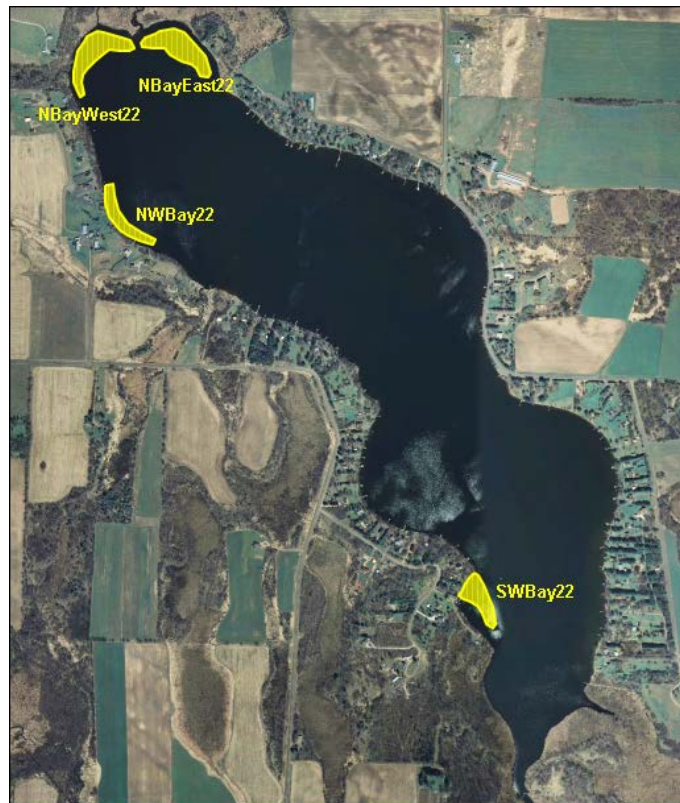


Figure 2: 2022 Preliminary CLP chemical treatment proposal (4 areas totaling 9.23 acres)



Figure 3: 2022 Modified CLP chemical treatment proposal

Table 1: 2022 Modified CLP treatment details

Lower Turtle Lake 2022 Modified-Final CLP Treatment - 5/19/2022 (LEAPS)							
Name	CLP Density	Substrate	Acres	Mean Depth (feet)	Acre-feet	Target a.i. (liquid) (ppm a.e.)	Aquathol (liquid) Application (gallon)
North Bay West	mod	Muck	1.94	3.0	5.82	1.50	5.82
North Bay East	mod	Muck	1.37	3.0	4.11	1.50	4.11
NW Bay	mod	Muck	.74	4.0	2.96	1.50	2.96
SWBay	mod	Muck	.83	4.0	3.32	1.50	3.32
TOTAL			4.88		16.21		16.21
*Treated at 1.5 ppm a.i. (Aquathol K-liquid)							
				Estimated Herbicide Cost			
Aquathol K (liquid)				Herbicide (\$135/gal)	\$2,188.35		
Rate (ppm)	gal/ac-ft			Applicator Fee	\$200.00		
1.5	1.00			WDNR Permit Cost	\$270.00		
2	1.33			Total Cost	\$2,658.35		
2.25	1.50						
2.5	1.67						
3	2.00						
*Water Temperature on May 19, 2022 was 63 F (8-9am)							

Shoreline property owners adjacent to the treatment areas were notified in April/May of the upcoming treatment, and a notice was submitted to the local newspaper as well. On May 24, 2022, 4 areas totaling 4.88 acres were treated by Northern Aquatic Services (NAS – Dale Dressel) using 16.21 gallons of liquid Aquathol K at 1.5 ppm. The application took 3 hours. Water temperature was 64F, air temp was 62F, and the wind was out of the SE at 2-3 mph.

Following the treatment, LEAPS performed a CLP bed mapping survey on June 8, 2022 and found 15 beds totaling 20.61 acres (Figure 4). But if the Outlet area (15.4 acres) is taken out, the amount drops to 5.21 acres. The outlet area has never been chemically treated. The CLP there does not immediately and negatively impact the lake and the dense vegetation may help to maintain early season water levels in the lake. Furthermore, the bed of CLP on the north end of the lake near the outlet, which was chemically treated in 2022, still had a lot of CLP (3.52 acres), but it was not very dense with a rake fullness rating mostly in the 1 out of 3, with 3 being the most dense. The amount of CLP found in this area does not likely warrant chemical treatment again in 2023, so the total acreage of CLP drops to 1.69 acres in 2022.

None of the remaining areas mapped in 2022 are big enough to chemically treat in 2023. Moreover, each of these areas was loaded with small fishes, mostly crappie, proving that they provide important early season fish habitat.

2022 CLP management was for the most part successful. The amount of CLP that returned in the northeast bay near the inlet was somewhat disappointing though. Water levels were low at the time of chemical treatment. As a result Aquathol K was applied only at 1.5 ppm/acre-foot in 2022. This was a full point less than what was done in 2021 (2.5 ppm) and may have contributed to the less than complete results. Future chemical application will again go up to at least 2.0 ppm/acre-foot.



Figure 4: June 2022 CLP bed mapping results (15 beds totaled 20.61 acres)

2022 LTLMD MEETINGS

LEAPS attended two different LTLMD board meetings in 2022. The first was the On April 23th, 2022. The second was on October 8, 2022. LEAPS personnel presented the ongoing CLP management plan and answered questions from the constituents pertaining to management. It was highlighted that the process included obtaining a WDNR chemical application permit, completing a CLP pretreatment survey, modifying the treatment proposal if needed, hiring a contractor to treat the CLP areas, and performing a CLP posttreatment survey – all of which have been completed.

2022 LTLMD CBCW

LEAPS again provided contracted watercraft inspections for Lower Turtle Lake on the east landing. This included hiring personnel, scheduling, data entry into the WDNR SWIMS database, and an end of season summary. Two individuals were hired by LEAPS from the Turtle Lake and Almena area to provide CBCW inspection. Caidon Scheps was hired as the main inspector. Kolton Bader also provided some CBCW inspection. Additional time was put in by Jim Czajkowski and Lana Blumer. A total of 210 hours of inspection were put in at the landing, unfortunately, Caidon Scheps lost seven data entry sheets from July 15 to August 5th totaling 31 hours. As a result, only 179 hours were recorded in the WDNR SWIMS Database.

During that time, 152 boats were inspected; and 296 people were contacted. Inspection began on May 7, 2022 and the last date of inspection was August 27, 2022. Inspection time was fairly well distributed over the four month inspection time frame (Table 2). Of the 152 boats inspected, Table 3 shows where they were prior to coming to Lower Turtle, and which lakes they came from that had an invasive species. Several lakes had EWM and even zebra mussels.

Table 2: 2022 monthly CBCW hours

Month	Monitoring (hrs)
May	28
June	52
July	60
August	39

Table 3: 2022 lakes visited and with AIS

Upper Turtle Lake	Barron	
Rice Lake	Barron	HEWM
Beaver Dam Lake	Barron	EWM
Grindstone Lake	Sawyer	
Long Lake	Washburn	
Lake Magnor	Polk	
Chetek Lake	Barron	
Big Round Lake	Polk	
St. Croix/Mississippi River		ZM
Deer Lake	Polk	ZM
Horseshoe Lake	Barron/Polk	HEWM
Spider Lake	Washburn	
Half Moon Lake	Polk	
Bear Lake	Barron/Washburn	
Shell Lake	Washburn	
Lower Vermillion Lake	Barron	EWM
<u>Wapogasset Lake</u>	Polk	
<u>Poskin Lake</u>	Barron	
<u>Prairie Farm Millpond</u>	Barron	

2022 CITIZEN LAKE MONITORING WATER QUALITY

Lower Turtle Lake - Middle-Deep Hole was sampled 4 different days during the 2022 season. Parameters sampled included:

- water clarity
- temperature
- dissolved oxygen
- total phosphorus
- chlorophyll

The average summer (July-Aug) secchi disk reading for Lower Turtle Lake - Middle-Deep Hole was 2.5 feet. Typically the summer (July-Aug) water was reported as murky and green. This suggests that the secchi depth may be mostly impacted by algae. Algal blooms are generally considered to decrease the aesthetic appeal of a lake because people prefer clearer water to swim in and look at. Algae are always present in a balanced lake ecosystem. They are the photosynthetic basis of the food web. Algae are eaten by zooplankton, which are in turn eaten by fish.

Chemistry data was collected on Lower Turtle Lake - Middle-Deep Hole. The average summer chlorophyll (the green pigment in algae) was 60.9 µg/l. The summer total phosphorus average was 64 µg/l. Lakes that have more than 20 µg/l and impoundments that have more than 30 µg/l of total phosphorus may experience noticeable algae blooms.

The overall Trophic State Index (based on chlorophyll) for Lower Turtle Lake - Middle-Deep Hole was 66. The TSI suggests that Lower Turtle Lake was eutrophic (Figure 5). This TSI usually suggests blue-green algae become dominant and algal scums are possible, extensive plant overgrowth problems are also possible. Eutrophic lakes are characterized by decreased water clarity, oxygen-depleted bottom waters, excessive plant growth, and a warm-water fishery. These conditions accurately describe Lower Turtle Lake in 2022.

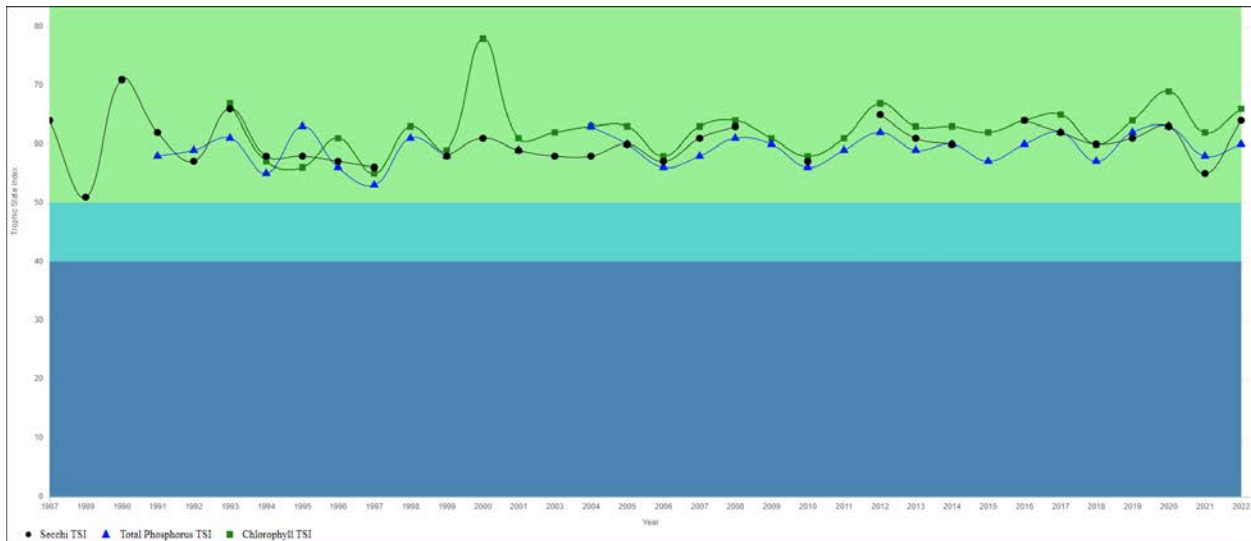


Figure 5: 1987-2022 Lower Turtle Lake summer (July and August) TSI status

2023 CLP PRELIMINARY MANAGEMENT PLANNING

Based on the results of the posttreatment bed mapping survey, chemical control may not be warranted in 2023. A proposal will probably be drawn up for the northeast end of the lake, but not likely any other location.