

Little Traverse Lake 2023 Lake Biologist AIS Final Report

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Task Description #1

EWM Surveillance

FWS Biologists will identify via drone surveillance and then either snorkel or SCUBA dive on all major aquatic gardens discovered in 2023. All aquatic plants will be identified and generally quantified, with special attention directed towards discovering EWM and any other aquatic invasive species (AIS).

On July 15, all major aquatic gardens were surveyed via the rake toss method. Four rake tosses were completed at each site (in the four cardinal directions) and the number of times we found each species is reported. The most common plants found were common stonewort (a macroalgae), water celery, and northern watermilfoil (native). At each aquatic garden, we also surveyed using full SCUBA gear. Each garden was documented using an underwater GoPro video camera. Underwater video footage was archived on the external hard drive included with this report.

A map is provided [here](#) that shows surveyed aquatic gardens. Each placemark (labeled 1-12) can be clicked on to open and show GPS coordinates for that site along with a list of plants found. The plants listed are those commonly found in our watershed. The plant species found at each particular site are numbered 1-4, with 4 being highly abundant and 1 being sparse (no number means that plant was not found at that site). With this map, you can get a visual snapshot of each site and where the most diverse sites are on the lake. The information is also shown in Table 1.

An aerial drone survey of the entire littoral zone was conducted. Dan Mays (GTB Biologist) informed us in June that, due to tribal policy, no drone work could be included in our "early detection" work (SCUBA and eDNA) for which they are providing partial funding. Since the aquatic gardens have not changed in the past 2 years, we felt confident that conducting the drone survey of the littoral zone *after* our SCUBA/GoPro analysis would still provide valuable and archivable data for the association and not jeopardize funds coming from GTB. All aerial drone footage was also placed on the Little Traverse Lake external hard drive.

Site	Lat	Long	Chara	Whorled/ Northern Milfoil	Slender Naiad	Variable Pondweed	Pondweed	Arum-leaved Arrowhead	Sago Pondweed	Water Celery	Slender Nitella	Bird's nest stonewort
1	44.92351	-85.86134	4		1				4	4	3	
2	44.91884	-85.85091	4						2	4	1	
3	44.91827	-85.84878	4								1	
4	44.91816	-85.84902	1	1					1			
5	44.91802	-85.84678	1						1	1		
6	44.91892	-85.84209	2	2					2		1	4
7	44.92201	-85.83105		3	2						1	
8	44.91887	-85.83252	4	1		2		1	1	1		
9	44.92171	-85.83254	2	4							1	
10	44.92894	-85.82708	4		1		1	2	2			
11	44.92841	-85.82851	4					1	1	1		
12	44.92424	-85.85348	4	4								

Table 1: Plant identification at each aquatic garden on LTL

Task Description #2

Purple Loosestrife/Yellow Flag Iris/Phragmites Surveillance

The entire shoreline will be assessed and the presence of all emergent AIS species (particularly Purple Loosestrife, Yellow Flag Iris, Phragmites) will be identified and documented. Two surveys will be completed in May when Yellow Flag Iris is in bloom and 2 more surveys completed later in August when Purple Loosestrife is in bloom. This work will be in concert with all AIS eradication work LTLA volunteers or others are involved in.

Yellow Flag Iris (YFI) surveys were completed on June 10 and June 15. 23 sites were located where YFI was found. Locations were sent to Jeff Shutz (head of AIS committee) by June 19 so that immediate action could be taken, if so desired. It is our recommendation to reach out to homeowners where YFI is found to ask for their removal of the plant via digging. Flowers can be deadheaded if digging cannot be completed in a timely manner. YFI spreads via seeds dropped in the lake and via vegetative reproduction of roots. Deadheading will mitigate the spread of YFI via seeds, but plants could still grow via roots if not dug.

Here is the [map](#) and [data sheet](#) of YFI results. Please note: data sheet has links to pictures of properties with YFI on them. These are meant to help committee members identify residences. Please distribute with care.

Purple Loosestrife (PL) surveys were completed on August 7 and 15. 21 sites were found where PL is growing around the lake, with the most growth in the west corner. This is logical due to the flow of water from east to west in the lake. PL can spread via seeds or roots, although it puts out many more seeds in a year than YFI does. Notes were taken where there were only one or two sprigs growing and our recommendation is to prioritize those small sections immediately so that they don't become a bigger problem. One site has a very large population (number 13) and it is recommended that beetles and/or chemicals are applied to this population if homeowners give permission.

Site 21 is a location where we observed phragmites. It was immediately reported to Jeff Shutz so that action could be taken. This is the first time we have seen phragmites directly on the shoreline of LTL, thus it is recommended that there is increased awareness for this species, to decrease the chance of spreading.

[Map](#) and [data sheet](#) of PL and phragmites results. Please note: data sheet has links to pictures of properties with PL and phragmites on them. These are meant to help committee members identify residences. Please distribute with care.

Task Description #3

Microscopic Algal Community Survey

Four (4) plankton tows will be conducted, 3 horizontal surface pulls and one vertical deep water pull. Common microscopic phytoplankton and zooplankton will be identified and documented to genus

along with their relative abundance. Results will be compared to 2020-22 field work results to monitor and document changes.

Four plankton tows were collected on July 12, identically to previous years. Phytoplankton and zooplankton diversity compared similarly to previous years, although slightly fewer species were found. We are consistently seeing several phytoplankton types including *Aphanocapsa sp.*, *Merismopedia sp.*, *Microcystis sp.*, *Ceratium sp.* and *Peridinium sp.* These genera are all common to the watershed and found on Lime Lake as well. The blue green algae *Microcystis sp.* was found at low, not alarming levels. After four years of sampling, we are starting to see trends with which phytoplankton are most common in the lake and which are more sporadically seen. This information may be useful for the future, if trends ever begin to change, to signify diversity changes on the lake. Results can be seen in Table 2 below.

Type	Classification	Tow Date									
		Vertical 7/30/20	Tows 7/30/20	Tow 7/14/21	Tows 7/28/21	Vertical 7/28/21	Vertical 8/1/22	Tows 8/1/22	Tows 7/12/23	Vertical 7/12/23	
Aphanocapsa sp.	Algae - Blue Green			4	4	2	3	4			
Merismopedia sp	Algae - Blue Green	2	3	2	1	2	3	2		3	
Microcystis aeruginosa	Algae - Blue Green	4	3	4	3	2	3	4		4	
Asterionella sp	Algae - Diatom	3									
Cyclotella sp	Algae - Diatom			1	1						
Cymbella sp	Algae - Diatom	1						2			
Fragularia sp.	Algae- Diatom	2	3	4			1				
Gyrosigma sp.	Algae- Diatom						1				
Navicula sp	Algae - Diatom	1	1		1		1		1	1	
Odontidium sp	Algae - Diatom								1		
Pinnularia sp	Algae - Diatom				1				1		
Pleurosigma sp	Algae - Diatom	1									
Synedra nana	Algae - Diatom	3	2				2	1			
Synedra capitata	Algae - Diatom	2									
Synedra sp	Algae- Diatom								2	1	
Tabellaria sp	Algae - Diatom	1						1			
Ceratium hirundinella	Algae - Dinoflagulate	3	4	2	2	1	3	3	4	2	
Peridinium sp	Algae - Dinoflagulate	5	5	2	5	2	4	5	3	3	
Chlorococcus sp	Algae - Green		3		1	1		1			
Chroococcus sp	Algae - Green	3	2		3						
Cosmarium sp.	Algae - Green		1								
Euglena	algae- Green			1							
Mougeotia sp	Algae - Green		1	1							
Pediastrum simplex	Algae - Green	2	3	1	2	1	1	2	2	1	
Scenedesmus sp	Algae- Green	2		1	1	1	1	1	1		
Spirogyra sp	Algae - Green		1	1							
Zygnema sp	Algae - Green			1							
Chryso-sphaerella sp	Algae - Yellow Green			1		1					
Dinobryon cylindricum	Algae - Yellow Green	2	3			1	1	2		1	
Bosmina coregoni	Arthropod - Cladoceran								1		
Ceriodaphnia sp	Arthropod - Crustacean	1	2								
Cyclops vernalis	Arthropod - Crustacean	1	3		1		1			1	
Kertella sp.	Arthropod - Crustacean						1	2	2	2	
Polyantra sp.	Arthropod - Crustacean							1	2	2	
Diffugia sp	Protozoan- ameba				2	1	2	2			

Table 2: Relative amounts of phytoplankton and zooplankton on LTL from 2020-2023.

Task Description #4

Miscellaneous consulting

FWS biologists will be available throughout the year for consulting on biological issues found on LTL or within the Good Harbor Bay Watershed.

Biologists consulted with several riparians and LTL committee members about suspect algae and plant growth in LTL. Kelsey also consulted with an LTL homeowner on their property regarding what was growing and how to best maintain natural habitat. We continue to work closely with LTLA board members to answer questions and give recommendations on all water-related issues. It continues to be a pleasure to work in collaboration with the Little

Traverse Lake Association, Lime Lake Association, the Grand Traverse Band of Ottawa and Chippewa Indians, and the National Park Service to protect and preserve the water quality within the Good Harbor Bay Watershed.

Task Description #5

Discovery Boat III Cruises

FWS conducted the maiden voyage of Discovery Boat III (thanks to Captain Jeff Schutz!) in 2021, followed by two more cruises in 2022. This endeavor, inspired by and modeled after the Discovery Boat cruises conducted by the Glen Lake Association, provides a unique opportunity for riparians to learn, firsthand, about Little Traverse Lake and the projects the LTLA is involved in. Dates and times determined by LTLA in coordination with FWS.

Kelsey, along with Sam Ogle, led three Discovery Boat III tours this summer with Captain Jeff Schutz. Two were held on July 21 and one was held on Aug 11. The tours were focused on water quality education specifically to LTL, while highlighting work that LTLA is doing to help preserve the lake. Tours seemed very well received and had a conversational atmosphere in which many great questions were asked and discussed. These tours took great steps to provide lake members with education about how best to be stewards of LTL. Thanks again to Jeff Schutz for his time, expertise, and boat on these tours.

General 2023 Recommendations

1. As you may know, Eurasian Water Milfoil (EWM) has been found on Little Glen Lake. This only strengthens our need to continue monitoring efforts for early detection. It is our recommendation that we continue monitoring via rake toss and scuba diving on aquatic gardens, along with continuing the eDNA project (separate report to follow).
2. It appears that Yellow-flag Iris may still be on the increase on LTL so we recommend a task force be formed to begin eradication of all plants (with landowner permission, of course) in the spring of 2023. We would love to discuss your efforts with YFI, as our surveys are unnecessary if work is not being done based on the data collected during these surveys.
3. There seems to be interest, through conversations with riparians, to have 'Greenbelt Consultations' for LTLA members. This is something that we offer on Lime Lake, paid for by the lake association so it is free of charge to members, and has been very beneficial for the education of our members. Essentially, members can request a consult and the lake biologist (or other knowledgeable person) sets up a time to meet at their property to discuss lake friendly shoreline practices. This idea originated from Rob Karner, lake biologist on Glen Lake. You have some very knowledgeable and qualified board members who could help with these consults; thus, this may be something that you decide to offer for your association members.