

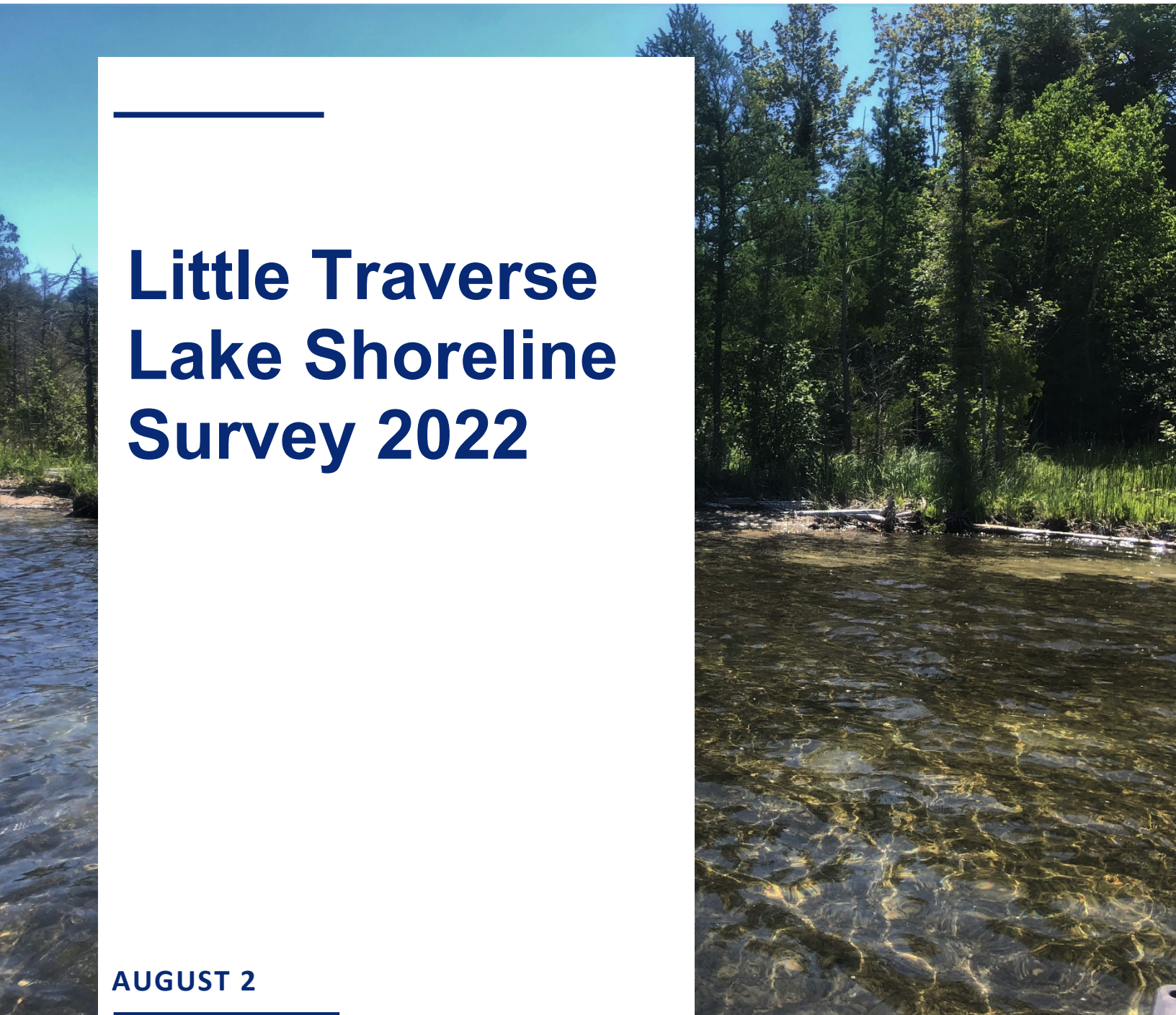
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# Little Traverse Lake Shoreline Survey 2022

**AUGUST 2**

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Little Traverse Lake Property Owners Association  
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# Little Traverse Lake Shoreline Survey

## Summary

A complete shoreline survey of Little Traverse Lake (Leelanau County) was conducted on June 2nd 2022 with the goal of identifying sites with cladophora algae (a bio-indicator species of nutrient inputs) and to collect baseline shoreline conditions to compare with current and future the shoreline surveys. In total 10 sites were found with cladophora with a majority of those found along the developed southern shoreline of the lake. The average algae density rating at the 10 sites with cladophora was 1.1 (light algae growth), with an average growth length of less than 60 mm. Only one of the nine shoreline monitoring sites had cladophora during the survey. These results are similar to the finding during a 2016 survey and combined with the monthly shoreline monitoring suggest that Little Traverse Lake overall has a very healthy shoreline with little nutrient inputs into the lake. However, the density of cladophora sites along the southern shoreline could be an indication that excess nutrients from septic fields and/or poor shoreline management are impacting the lake.

## Introduction

Cladophora is a branched, filamentous green algal species that is commonly associated with calcareous freshwater lakes in Northern Michigan. The presence and abundance of cladophora is controlled by specific environmental requirements for temperature, substrate, nutrients, and other factors. Cladophora is found most commonly in the wave splash zone and shallow shoreline areas of lakes and streams and grows best on stable substrates such as rocks and logs or artificial substrates such as concrete or wood seawalls. Cladophora prefers water temperatures in a range of 50 to 70 degrees Fahrenheit, which means that the optimal time for growth and detection in Northern Michigan lakes is from mid-May to early July, and September to October. The rapid growth potential of and sensitivity to available phosphorus along with its visible colonization on lake shoreline substrate make it an ideal algae bio-indicator species for nutrient inputs around a lake.

Little Traverse Lake is an oligotrophic lake located in Leelanau County Michigan. Although water quality on the lake has remains pristine, potential increased shoreline development, high water levels, leakage from aging septic systems and invasive species threaten the water quality of the lake. In 2016 a cladophora survey of the shoreline was conducted and 12 cladophora sites were identified. Nine shoreline sites were selected for regular surveys to track trends in algae growth on the lake. Although cladophora has been found in each year from 2019 – 2022, cladophora growth mostly remains at low levels with no obvious trends.

Cladophora is a common

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## Methods

The Little Traverse Lake Shoreline was surveyed by canoe on June 2<sup>nd</sup> 2022. Sample sites were chosen primarily where cladophora algae was visibly present. However, to collect baseline data for future surveys control sites were randomly selected every few hundred yards even if cladophora wasn't present. At each site the water temperature and Specific Conductivity was measured, GPS coordinates were taken and a photograph was taken of the shoreline conditions. Additionally, if cladophora was present a density rating from 0 (clear/no algae) to 5 (heavy algae growth) was recorded (see Canale final LTL report 12/21 for more details.) Cladophora was measured for length in millimeters and the distance along the shoreline in linear feet. Data was entered into an Excel Spreadsheet and results were mapped using Google Maps online.

## Results

A total of 10 cladophora sites were found during the complete shoreline survey covering approximately 223 linear feet of shoreline (figure 1, Table 1.) Algae density rating at the cladophora sites averaged 1.1 (light algae growth) with a maximum rating of 2. The average cladophora length was 59 mm with a maximum length of 135 mm. Seven cladophora sites were on the south shore of the lake mostly along the developed shoreline near M-22. Cladophora was also found at the outlet of a Creek on the Leelanau Conservancy Swanson preserve property and at two sites along the north shore. Only one (site 6 Kammerer) of the 9 monthly monitoring sites had cladophora during the shoreline survey.



Figure 1. Little Traverse Lake Cladophora survey results from 06/2/2022. Green dots with white stars represent sites with Cladophora. Small orange dots represent sites that were monitored but did not have cladophora. Sites are numbered in the order they were surveyed.

Table 1. Little Traverse Lake shoreline survey data collected at 10 sites with cladophora present on 6/2/22.

Site	Tem p (F)	Specific Conduc tivity	Cladophora growth (mm)	Algae density Rating	Shoreline distance (feet)	GPS	Comments
7	67.2	380.6	135	2	20	44.921547, -85.859161	Wetland area
11	67.7	377.5	65	1.5	55	44.916436, -85.846778	Cabins nearest to M-22
12	67.6	374.6	30	0.5	5	44.916389, -85.846375	Red House near the lake
13	67.6	372.5	30	0.5	10	44.916344, -85.844125	Rock Shoreline
15	68.1	375.6	30	0.5	50	44.916869, -85.842339	Clad along rock shoreline
17	67.7	372.7	90	2	10	44.917031, -85.841278	Rocks btw house
18	68.3	368.9	40	1.5	40	44.917600, -85.838889	Kammerer/Tosch
26	69.8	391.3	50	1	20	44.925892, -85.824347	LC North Stream Outlet
36	72	375.7	70	1	5	44.926389, -85.845589	Lawn to lake
40	72.9	376.7	50	0.5	8	44.925203, -85.851303	W of Sutfin shoreline erosion

## Conclusions

Overall algae growth around Little Traverse Lake was minimal. Only 10 sites had cladophora present which was down from the 2016 study. Algae density at monitored sites was low and length was short even though the water temperatures were optimal for cladophora.

The south shore of Little Traverse Lake was the only hotspot for cladophora and some further investigation should be done to find the cause of the algal growth. That area has a higher density of older cabins and residents and also has a high percentage of harden shoreline structures compared to other areas of the lake.

The cladophora site at the east end (site 26 of the lake was at the mouth of a creek which is a typical source for nutrient input. The creek drains a cedar swamp near a cattle farm which could be an additional source of nutrients into the lake.

The two sites along the north shore seemed to be very site specific with very small patches of cladophora found. Site 36 had a manicured lawn up to the lake and site 40 had some shoreline erosion that the property owners were trying to mitigate.

Of the nine shoreline survey sites only Kammerer had cladophora during this survey. However, cladophora was found in 2022 at Stein, Donatelli, and Sutfin, with Stein and Kammerer being the most commonly occurring sites for cladophora (Figure 2).

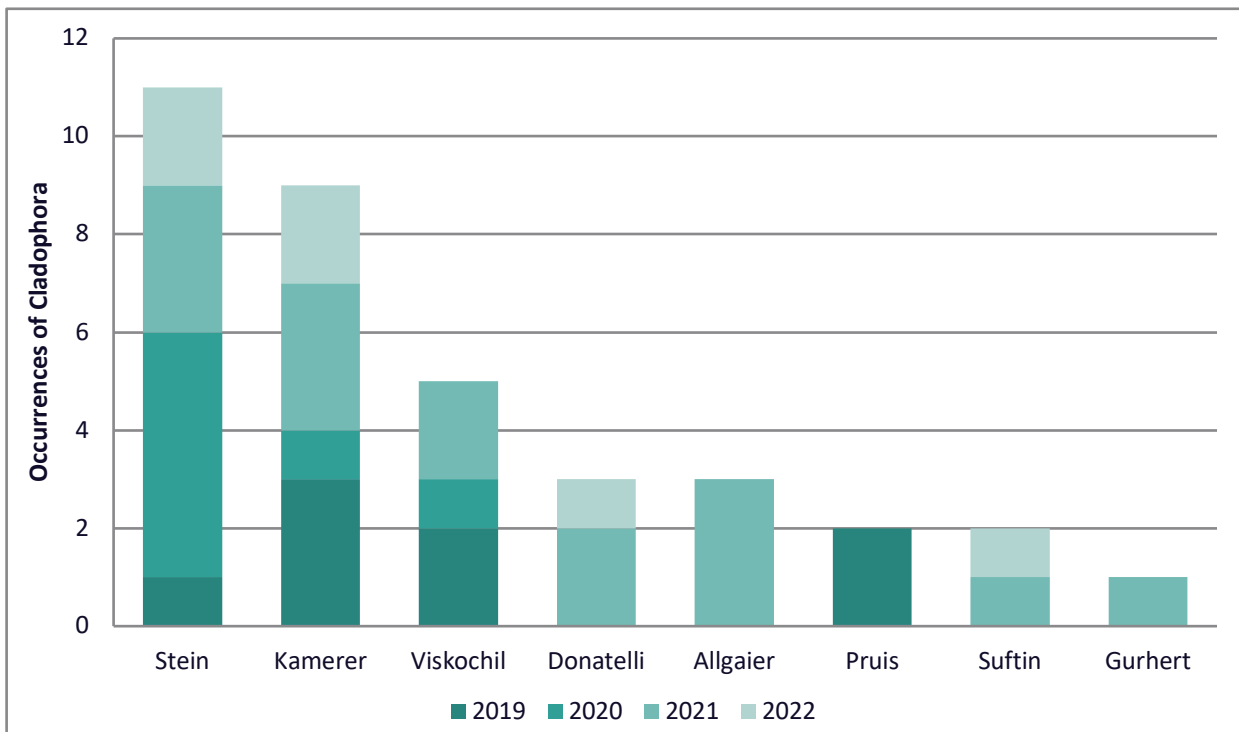


Figure 2. The occurrences of cladophora by site from 2019 – 2022 during monthly summer survey. Number of surveys conducted per year: 2019 – 6, 2020 – 11, 2021 – 6, 2022 – 4.

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**Pictures of Cladophora sites**



**Picture 1. Site 7, 44.921547, -85.859161**



**Site 11, 44.916436, -85.846778**



Site 13, 44.916389, -85.846375



Site 15, 44.916869, -85.842339



**Site 17, 44.917031, -85.841278**



**Site 18 – Kammerer 44.917600, -85.838889**





**Site 26, 44.925892, -85.824347**



**Site 26, 44.926389, -85.845589**



Site 40, 44.925203, -85.851303