

# Little Manistee River

## 2022 Report

*Mason-Lake Conservation District*

*Little Manistee Watershed Conservation Council*



Prepared by Abbey Hull



## INTRODUCTION

Mason-Lake Conservation District, with help from the Little Manistee Watershed Conservation Council (LMWCC), hired intern Abbey Hull again to help with the 2022 monitoring season of the Little Manistee River. She compiled past data and collected chemical, physical and biological data for 2021.

This year the Little Manistee Rivers Quality Assurance Protection Plan (QAPP) was accepted by Michigan's Clean Water Corps (MiCorps). MiCorps is a network of volunteer programs run by the Department of Environment, Great Lakes and Energy (EGLE). Through these programs, lake and river associations around the state receive training to collect and share water quality data. Every association with a QAPP in place with MiCorps receives the same training and protocols to ensure comparable data. MiCorps will also store habitat assessment and macroinvertebrate survey data on their site. This data can be accessed by the public and by other lake and river associations.

In July, Hull went to ten sites on the Little Manistee River to collect chemical and physical data. Information on dissolved oxygen, temperature, *e. Coli*, and phosphorus were gathered. The samples were all tested by Trace Labs. Results were then compiled and compared to previous years at the same sites. Due to high levels of *e. Coli* in 2021 extra samples were taken throughout the season.

Habitat assessments were performed in late July with help from Chelsea Cooper and Alicia Symanski from the Manistee Conservation District. Habitat assessments were completed on three sites; Indian Bridge (LM04), Old Grade Campground (LM05), and Queens Highway (LM06). Site LM04-LM05 are the same sites where macroinvertebrate sampling is done every spring and fall. Habitat assessment help determines if erosion, pollution, or other degradation is occurring in the stream.

Macroinvertebrate surveys were completed in May and October. Macroinvertebrates are creatures that are large enough to see (macro) without a backbone (invertebrate), such as snails, insects, crayfish, etc. Chemical data is great for a snapshot of water quality at a specific date and time but doesn't give a full picture. As macroinvertebrates are living in the stream year-round,

they can give a better big picture of stream health. Macroinvertebrates have varying levels of tolerance to pollution in streams. The more sensitive macroinvertebrates we find in our sample, the healthier the stream.

All of these parameters help create a clear picture of stream health. This large watershed spans four counties in Northwest Michigan. Keeping the river clean and healthy, also helps keep the Great Lakes healthy. Over the past several years, data has been collected and has helped create a baseline for the health of the Little Manistee River.

## CHEMICAL AND PHYSICAL DATA RESULTS

Ten sites were selected along the Little Manistee from Luther Dam down to Stronach. Trace Labs analyzed *e. Coli* and phosphorus samples. A YSI probe was used to measure temperature, and dissolved oxygen. As long as the water quality is within the recommended standards, chemistry only needs to be tested once a year in July. Due to high *e. Coli* levels near Luther Dam, samples were taken in June, and July and will be taken again in mid-August.

Temperature and dissolved oxygen were in normal ranges. Fish need a minimum of 5mg/L of dissolved oxygen to survive in the river. The Little Manistee is generally in the 8-10 mg/L range, which is acceptable.

Phosphorus is tested as it is the limiting factor for plant growth and is one of the top pollutants in waterways in Michigan. According to the USEPA, the recommended limit for phosphorus is a maximum of 0.05 mg/L for lotic systems. Lotic systems are waterways that flow such as streams and rivers whereas lentic systems are still waterways like lakes. Since 2013 the phosphorus levels have dropped. The site near Stronach Road was the only site this year above the recommended amount, at 0.10 mg/L.

*E. Coli* is a type of enteric bacteria- a bacteria commonly found in animal digestive tracts. Large amounts of *e. Coli* in rivers or lakes can cause huge problems. *e. Coli* can cause humans to become very ill by drinking or touching the water. Animals like geese and cows, as well as faulty septic systems, can cause *e. Coli* levels to rise. *e. Coli* levels for partial contact, cannot be over 1000 CFU/100ml. For full-body contact (fully submerged activities like swimming) the levels cannot be over 300 CFU/100ml. There has not been a severely large spike since 2017 which was determined

to be the result of a cow farm upstream.

Luther Dam's levels have been high for multiple years. In July the site was at 200 CFU/100ml. The site near Syers creek was at 250 CFU/100ml. The rest of the sites were at acceptable ranges. In 2020, no sites were above 300 CFU/100ml. Although these sites are within the limit, they may not be within the 30-day standard with a maximum of 130 CFU/100ml. Further testing will be done in mid-August. The MLCD is working on notifying the Village of Luther as the site runs through a park. Depending on the results, further testing may need to be done, including testing whether the *e. Coli* is coming from animal or human sources.

## HABITAT ASSESSMENT RESULTS

Habitat assessments are conducted to look for areas of degradation in streams. Michigan's Clean Water Corps (MiCorps) created by EGLE has a volunteer stream monitoring program (VSMP) that gives protocols for stream assessments. By going to the stream and making observations about plant life, substrate, and stream banks, knowledge about stream health can be gained. It is also important to keep an eye out for erosion. These assessments can also give a baseline of the stream and can be used in the future to look for trends or if degradation is suspected.

These assessments are done by measuring 300 ft of the stream. At 0, 150, and 300 feet, transects are put into place. Within each transect, the depth is measured, and the substrate is determined across the stream every couple of feet. While doing these transects notes are recorded about the river vegetation, riverside or riparian vegetation, and land use of the riparian areas. The riverbanks are assessed for erosion as well during the habitat assessments.

The sites chosen on the Little Manistee are Indian Bridge, Queens Highway, and Old Grade Campground. All of these areas had a good vegetative buffer next to the stream. Overall, the banks were stable with some minimal spots of erosion. It is recommended to do stream habitat assessments every 3-5 years in order to keep an eye on the stream and gain a baseline. The surveys completed in 2022 will be available on MiCorps. As the QAPP was not in place last year, the 2021 habitat surveys will not be available through MiCorps but will be kept by MLCD in order to determine trends.

Overall, the sites scored well with few areas of concern. The bank at Old Grade Campground is quite sandy and has been eroding into the river. There is a large fallen tree across the river and likely used to hold the bank in place. It may be beneficial to work with the campground on a bank stabilization project. The site at Indian Bridge had minimal to no erosion. Although it is visited frequently for recreation, there were no major signs of erosion.

The site at Queens Highway has many undercut banks. However, as it is extremely vegetated the banks seem stable. There is new construction occurring within the 300 feet sampled for macroinvertebrates and scores during habitat assessments. Trees and shrubs were clear-cut within a foot of the river. There is potential for significant erosion to occur at this site

## MACROINVERTEBRATE ASSESSMENT RESULTS

One of the best ways to determine stream health is through macroinvertebrate surveys. Macroinvertebrates have different tolerances of pollution and the species found in the stream can indicate if pollution is present. MiCorps has protocols for these surveys, and the stream is given a Water Quality Rating (WQR). The WQR is between 0-10 and higher scores indicate pollution may be present. Every spring and fall, our volunteers and stream leaders sample at the same sites. Over the past several years the LMWCC has gone out to three sites on the Little Manistee River (Indian Bridge, Queens Highway, and Old Grade Campground) to assess the macroinvertebrates.

Hull and volunteers sampled sites in May and October. All of the sites currently have a WQR within the excellent or very good rating. These scores represent the likelihood of pollution being present in the water. Although there was a substantial amount of rain in the Fall that resulted in high water levels, surveying was still possible. All of the sites scored well and were in the “excellent” or “very good” categories.

Site LM05, Old Grade Campground, has shown a slow, but steady increase in WQR. Although it is still in the “very good” range, it should be watched. The increase could be the result of difficulty while sampling, or human impact, such as the high e. Coli levels upstream of this site. Macroinvertebrate sampling should be continued every fall and spring, with a close watch on-site LM05.

## CONCLUSION

Overall, the Little Manistee is a very healthy river. The majority of chemical and physical data are in acceptable ranges. The main concern is *E. Coli* levels and the occasional phosphorus spike. Habitat surveys showed there are some areas with heavy erosion and potential future sites of erosion. Habitat assessments are recommended to be completed every five years. However, if there is concern they may be completed sooner. The macroinvertebrate surveys continue to show healthy stream quality and are an easy way to get the community involved with river health.

## APPENDIX A: 2022 CHEMISTRY RESULTS

### Little Manistee Water Quality Report- July 26, 2022

LMWCC Site #	Collection Location	Total Coliform Colonies / 100 mL	<i>E. coli</i> Col/100 mL	Dissolved Oxygen mg/L	Phosphorus (T) mg/L	Air Temp. ° F	Water Temp. ° C	Time E.S.T.
1	L.M. Below Luther Dam	1000.0	200	9.1	0.05	67	17	8:15
6	L.M.@ N Rivers Ldg M63	1200.0	250	10.5	0.05	67	15	8:30
11	L.M. @ Poggensee Bridge	160.0	40	8.0	0.05	70	16	9:00
13	Cool Creek @ 18 Mi. Bridge	120.0	80	8.5	0.05	70	17	9:45
16	Cool Creek @ Cool Lake	140.0	2	9.4	0.05	70	23	9:15
18	Cool Creek @ Hamilton Rd.	110.0	40	9.2	0.05	70	21	9:30
19	L.M. @ 9 Mile Bridge	110.0	57	10.0	0.05	73	18	10:00
21	L.M. @ DNR Wier	1400.0	150	10.7	0.05	76	17	10:45
22	L.M. @ Stronach Road	150.0	98	10.5	0.14	76	17	11:00

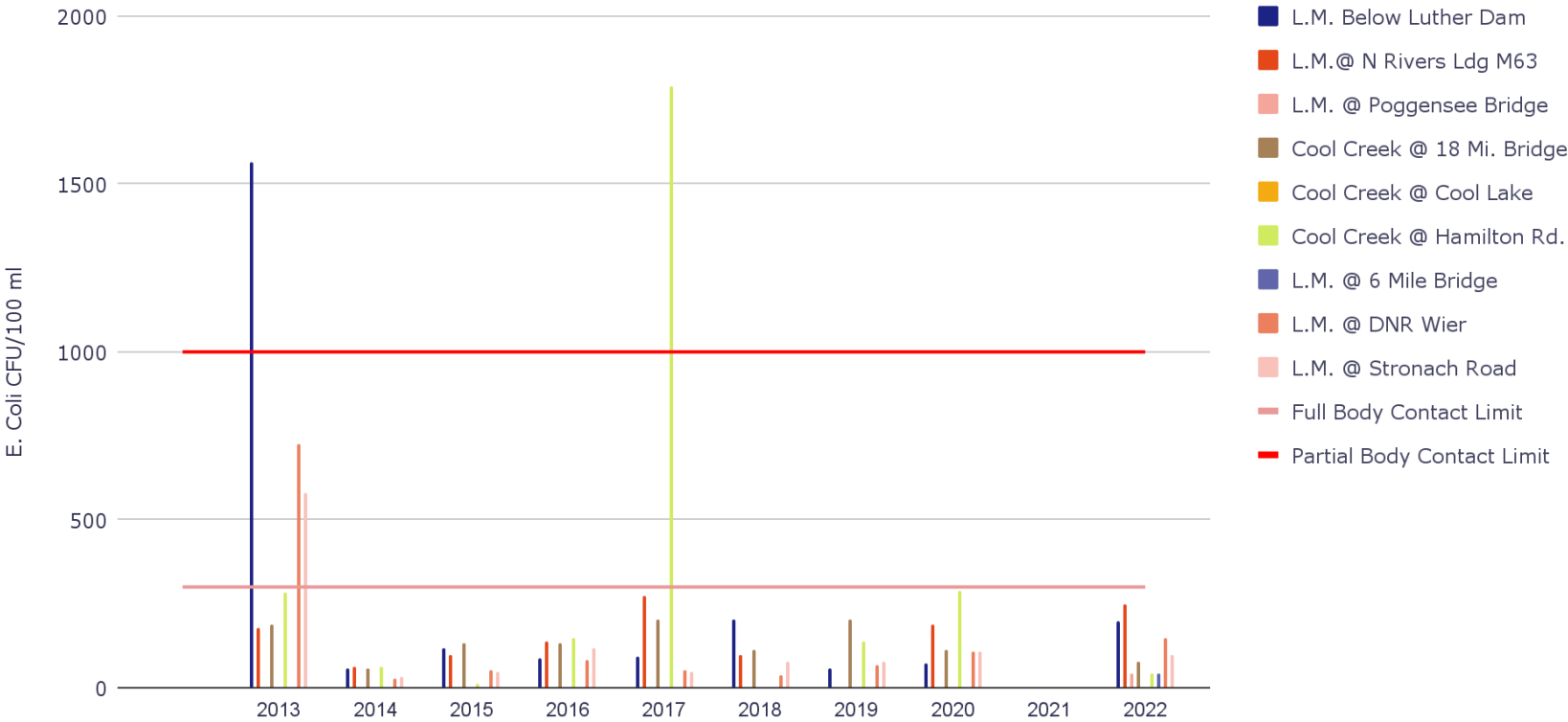
Please refer to the [lmwcc.org](http://lmwcc.org) website for a brief explanation of water quality surveys test results, or refer to other references on water quality standards.

Results from Trace Lab

APPENDIX B: E. Coli Results

Little Manistee E. Coli Results

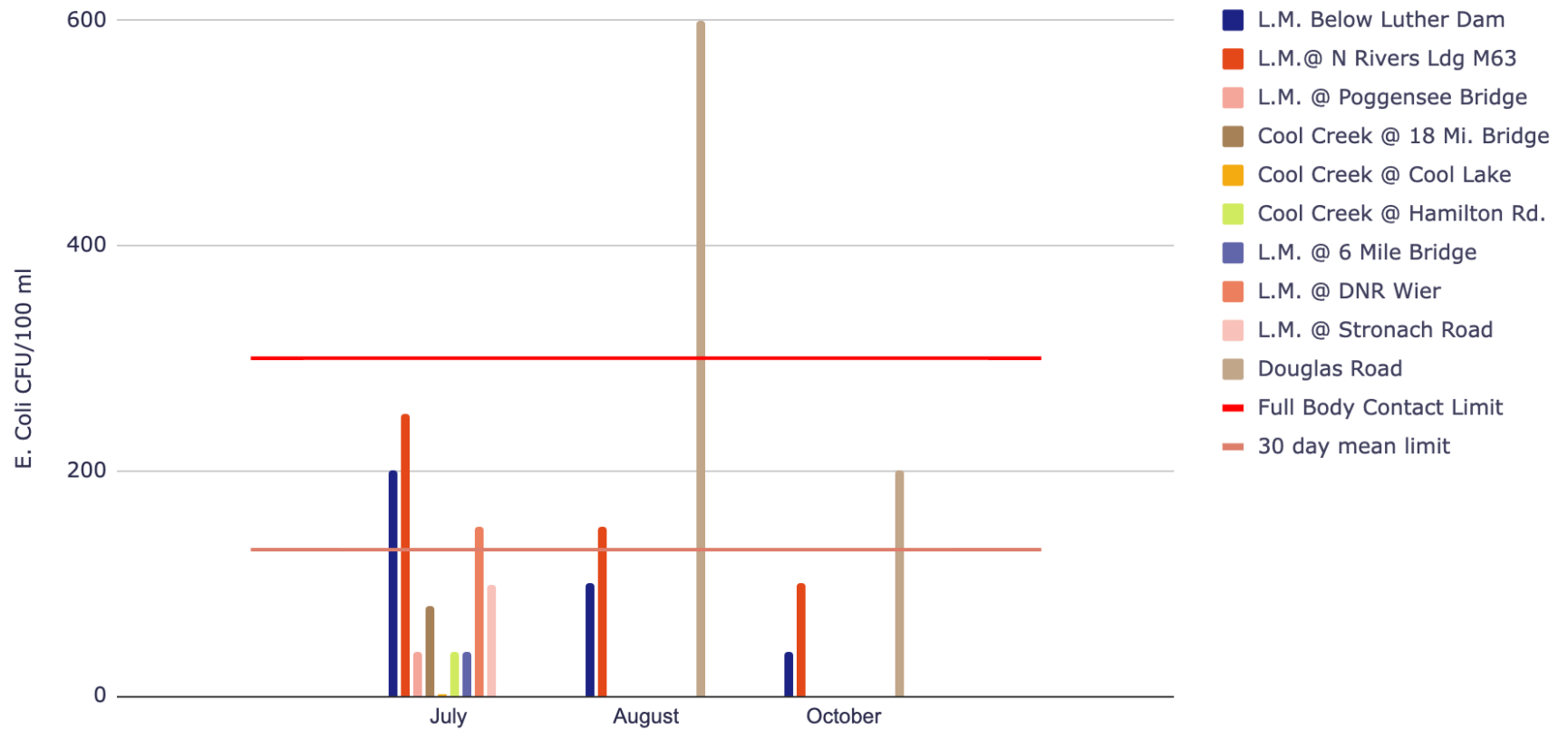
2013-2022





## Little Manistee E. Coli Results

2022

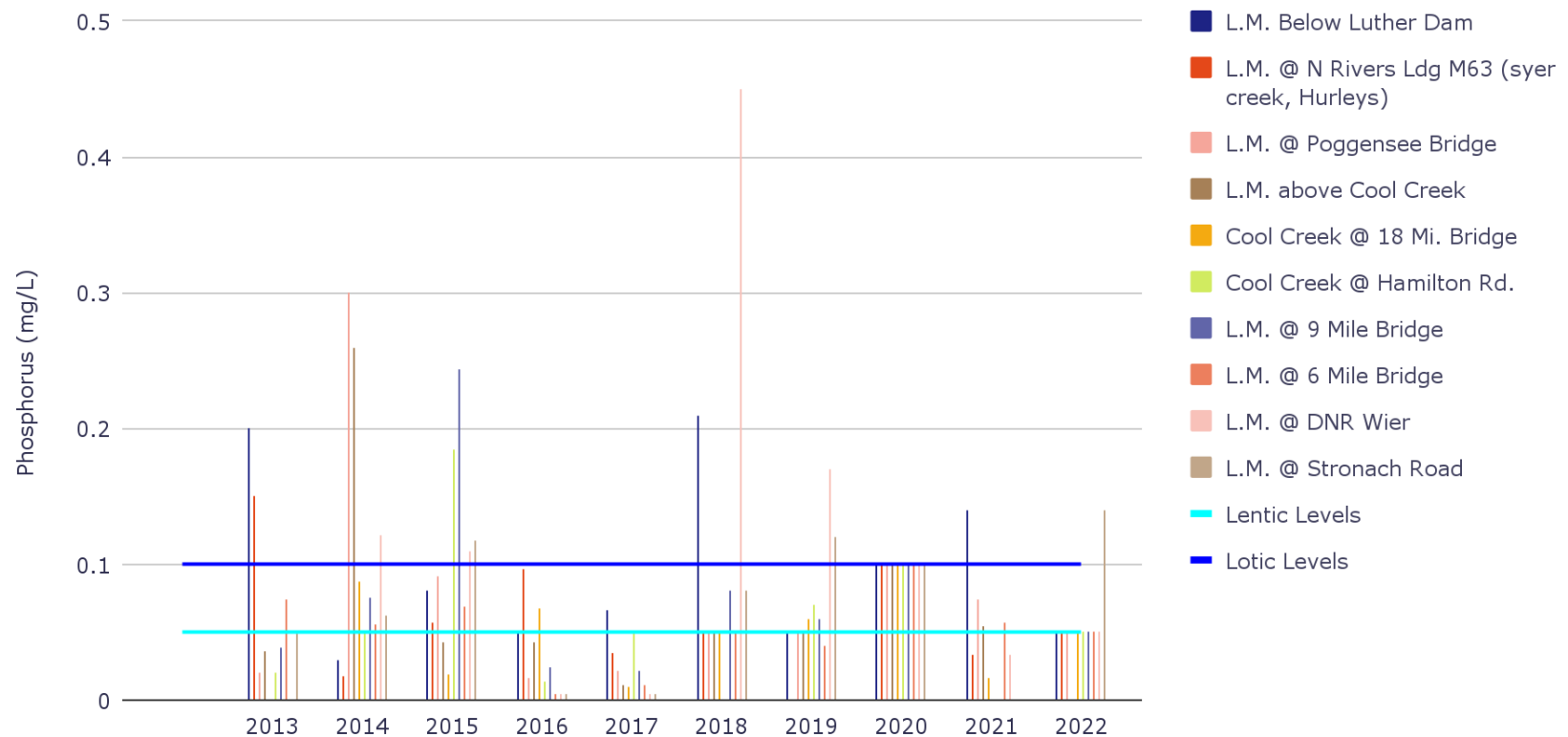


## APPENDIX C: PHOSPHORUS RESULTS

To control eutrophication, the USEPA has established a recommended limit of 0.05 mg/L for total phosphates in streams that enter lakes (Lentic Levels) and 0.1 mg/L for total phosphorus in flowing waters (Lotic Levels).

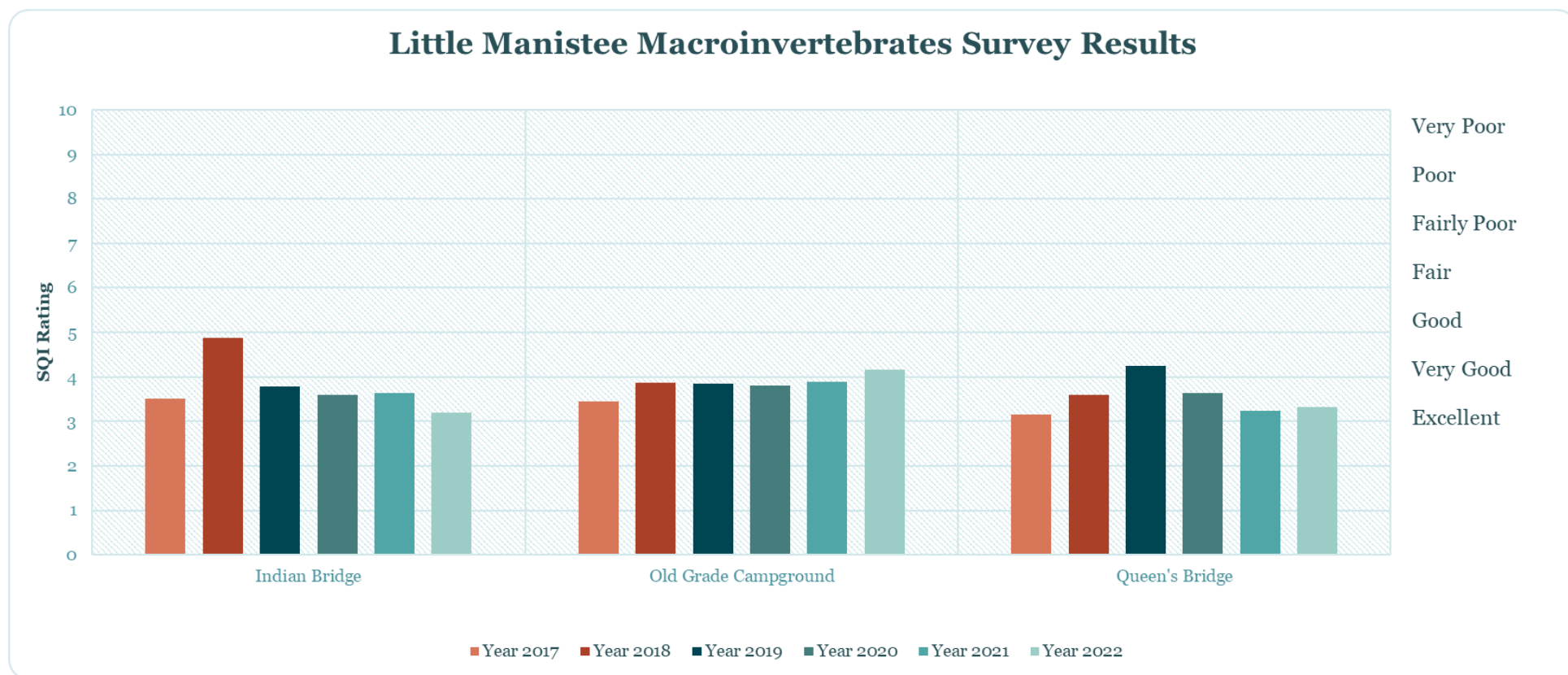
### Little Manistee Phosphorus Results

2013-2022



APPENDIX D: MACROINVERTEBRATE RESULTS

Upper Little Macroinvertebrate Surveys 2017-2022



## Lower Little Macroinvertebrate Surveys 2022

### Spring 2022

LM01 Little Man @ 6 Mile- *Excellent* 3.3

LM02 Cool Creek- *Excellent* 2.6

LM03 Johnson's Bridge- 2.9 *Excellent*

### Fall 2022

LM01 Little Man @ 6 Mile- *Excellent* 3.3

LM02 Cool Creek- *Very Good* 3.7

LM03 Johnson's Bridge- *Excellent* 3.0