

# Little Manistee River 2021 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 to help with the 2021 monitoring season of the Little Manistee River. She compiled past data and collected chemical, physical and biological data for 2021.

In August, Abbey Hull and Conservation Technician Jerry Kass went to ten sites on the Little Manistee River to collect chemical and physical data. They collected information on dissolved oxygen, temperature, *E. Coli*, as well as some other parameters. The samples were tested by the environmental lab at the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and Trace Labs. The results were then compiled and compared to previous years at the same sites.

Habitat assessments were performed in late September. Abbey Hull helped the Manistee Conservation District with multiple habitat assessments in the Manistee River watershed in August and September. Three sites were chosen for habitat assessments on the Little Manistee River. They are the same sites where the macroinvertebrate study is done every spring and fall; Indian Bridge, Old Grade Campground, and Queens Highway. These assessments help determine if erosion, pollution, or other degradation is occurring in the stream.

On October 2nd, macroinvertebrate sampling was done. 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 current stream health but doesn't give a full picture. As macroinvertebrates are living in the stream year-round, they can give a better picture of the health of the stream. 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 of the health of the Little Manistee River.

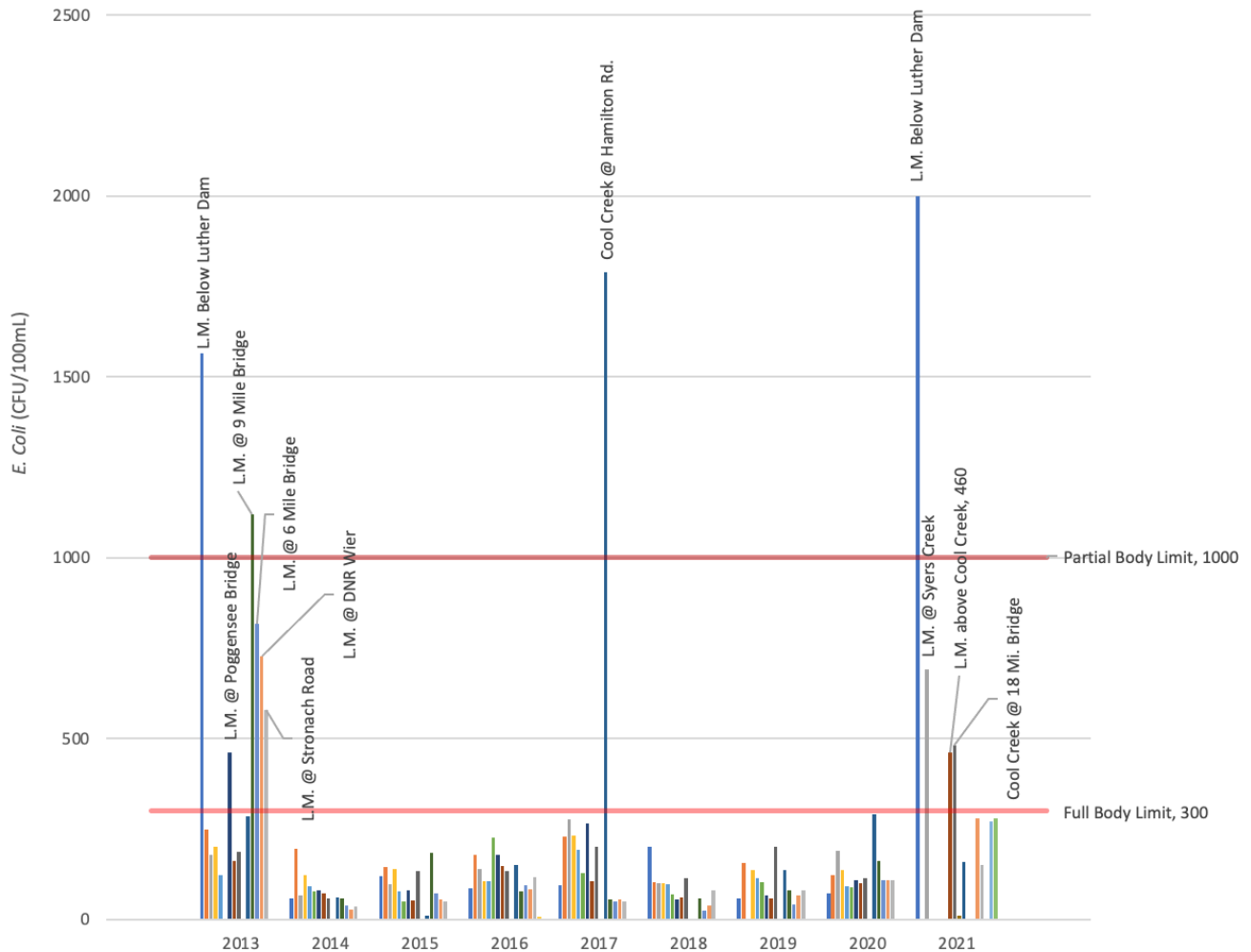
## Chemical and Physical Data Results

In 2021, chemical and physical data were analyzed in the Little Manistee River. Ten sites were selected along the Little Manistee from Luther Dam down to Stronach. Trace Labs analyzed *E. Coli* Data. The EGLE labs analyzed chloride, nitrogen, and phosphorus. Abbey Hull and Jerry Kass used probes and pH strips to test for pH, conductivity, temperature, and dissolved oxygen. Chemistry data has been tested every year in the summer, it is recommended to sample every spring and fall, or continue with testing once a year in late summer if twice a year is not achievable.

Temperature, conductivity, and pH were all in normal ranges. The dissolved oxygen was a bit lower than in past years but overall was in the normal range. Fish need a minimum of 5mg/L of dissolved oxygen to survive in the river. The Little Manistee is generally in the 7-9 mg/L range, which is acceptable. All of the chloride, nitrogen, and phosphorus were in acceptable ranges.

*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; this can happen by drinking or touching the water. Animals like geese and cows can cause *E. Coli* levels to rise as well as faulty septic systems. *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. At the Luther Dam site levels were at 2000 CFU/ 100ml. Two sites on Cool Creek and one site near Syers creek were all between 450-700 CFU/100ml. The rest of the sites were at acceptable ranges. In 2020, no sites were above 300 CFU/100ml. More testing needs to be done, especially near Luther Dam. Testing for human versus animal *E. Coli* also needs to be done.

### Little Manistee *E. Coli* Results 2013-2021



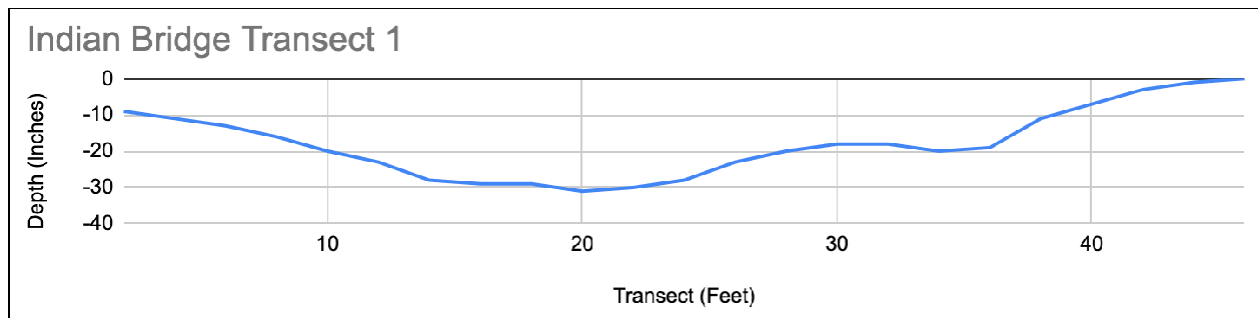
The largest spike in 2021 was in the river at Luther Dam, about 20 feet from where it leaves Mill Pond. It needs to be monitored in the future, and further testing needs to be done to determine if the bacteria is coming from humans or other animals. This will help determine if further regulation needs to be done on nearby agriculture or septic systems.

Please see the table at the end of the report for all *E. Coli* results.

## 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 the stream assessments. By going to the stream and making observations about plant life, substrate and the stream banks, knowledge about the 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. During these transects, 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 minimal erosion was found. Other erosion surveys have been done along the river and there are significant amounts of erosion in some areas. Below is one of the graphs that shows a transect of the Little Manistee River. This would be a cross-section of the river, with the left and right being the banks.

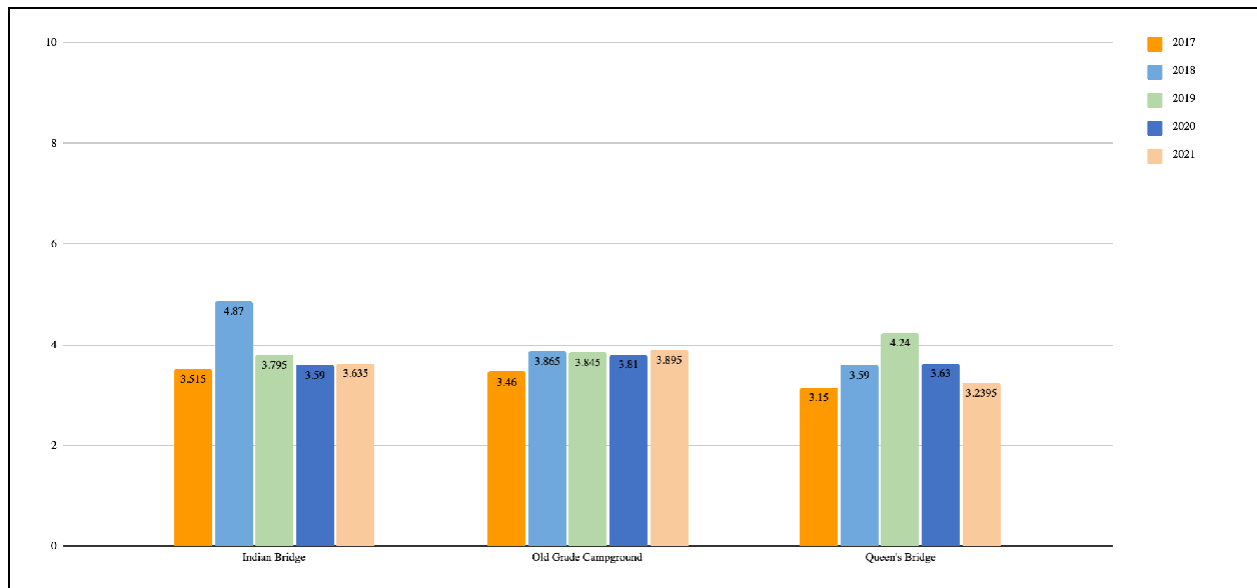


The sites chosen on the Little Manistee were at Indian Bridge, Queens Highway, and Old Grade Campground. All of these areas had a good vegetative buffer next to the stream. Overall, the banks were stable with some minimal spots of erosion. It is recommended to do stream habitat assessments every 1-5 years in order to keep an eye on the stream. A survey will need to be done in 2022 to be submitted to MiCorps, this can be done in the spring or fall.

## 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. Every fall and spring a team goes to the same site on a stream to survey. 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.

In 2020, MiCorps updated its standards for the stream ratings. In the past it was on a scale of 0-50 (under 19 being very poor, over 48 being excellent) and now is scored from 1-10 (1 being excellent, 10 being very poor). Over the summer, Abbey Hull went through the past samples at these three sites to update their ratings. Between all of the sites, they average a 3.7 out of 10 (1 being an excellent rating, 10 being a very poor rating). In October a team went out to the three sites and between all the sites they averaged a 3.8. The graph below shows the scores for all three sites between 2017 and 2021. Although there are some shifts overall, they have been steady and healthy.



## Conclusion

Overall, the Little Manistee is a very healthy river. The majority of chemical and physical data looks good. The habitat and macroinvertebrate surveys resulted in good scores. Although evidence from the habitat surveys do not show severe erosion, continual monitoring is advised. The largest issue is the presence of *E. Coli* in the stream. Some of the sites have double the standard for partial contact and nearly six times more than full-body contact; it should be monitored closely. Action should be taken by the LMWCC or with the local Conservation Districts in the future to determine the source of the issue and mitigate the *E. Coli* levels in the river.

## Little Manistee Water Quality Report- August 30, 2021

LMWCC Site #	Collection Location	<i>E. coli</i> Col/100 mL	Nitrate/ Nitrite mg/L	CL mg/L	DO mg/L	Cond. uS/cm	pH	Phos. (T) mg/L	Air Temp ° F	Water Temp ° F	Time EST
	Detection Limits >	0	0.20	4.00	1.00			0.01			
1	L.M. Below Luther Dam	2000	0.92	ND		230.0	7.0	0.14	68	68	9:10
6	L.M.@ N Rivers Ldg M63	690	0.75	4.2		220.0	7.0	0.033	70	67	9:36
12	L.M. above Cool Creek	460	1.2		8.3	210.0	7.0	0.074	71	67	11:00
13	Cool Creek @ 18 Mi. Bridge	480	0.86	ND	8.9	200.0	7.0	0.055	71	68	11:10
16	Cool Creek @ Cool Lake	9		ND	9.2	300.0	7.0	0.016	71	76	10:17
18	Cool Creek @ Hamilton Rd.	160	0.21	ND	7.5	290.0	7.0	0.018	71	68	10:30
21	L.M. @ DNR Wier	280	0.81	ND	10.1	230.0	7.0	0.057	74	67	11:45
22	L.M. @ Stronach Road	150	0.57	ND	10.6	240.0	7.0	0.033	74	67	11:50
24	Stronach Creek @ 11.5 Mile Rd	270	0.5	ND	7.3	260.0	7.0	0.016	71	73	10:07
25	Stronach Creek @ Beaver Lake	280			7.0	240.0	7.0		71	69	10:45

Results from Trace Labs and EGLE Environmental Laboratory

NP= Not performed

ND= Not Detected



### Little Manistee *E. Coli* Results 2013-2021

E. Coli										
	Detection Limits >	0	0	0	0	0	0	0	0	0
LMWCC										
Site #	Collection Location	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	L.M. Below Luther Dam	1565	59	119	86	93	201	57	73	2000
2	L.M. Above Fairbanks Creek	248	196	144	179	228	103	155	121	
6	L.M. @ N Rivers Ldg M63 (syer creek, Hurleys)	178	65	96	138	276	99		190	690
8	L.M. @ Spencer Bridge	201	122	140	104	231	99	135	135	
9	L.M. @ Johnson Bridge	121	91	77	105	194	96	115	91	
10	L.M. @ Dewitts Bridge		78	49	225	128	68	101	88	
11	L.M. @ Poggensee Bridge	461	81	81	179	264	56	65	108	
12	L.M. above Cool Creek	161	73	52	147	105	59	59	101	460
13	Cool Creek @ 18 Mi. Bridge	186	59	133	133	201	113	201	113	480
16	Cool Creek @ Cool Lake				3	1	1	1	2	9
18	Cool Creek @ Hamilton Rd.	285	60	11	150	1789		137	290	160
19	L.M. @ 9 Mile Bridge	1120	57	184	77	56	58	81	162	
20	L.M. @ 6 Mile Bridge	816	38	72	93	50	24	41	108	
21	L.M. @ DNR Wier	727	28	55	82	54	37	66	107	280
22	L.M. @ Stronach Road	579	34	49	118	49	79	80	108	150
23	Cool Lake @ Ctr. West Lobe				6	1	1	1	1	
24	Stronach Creek @ 11.5 Mile Rd									270
25	Stronach Creek @ Beaver Lake									280

Partial Body Contact Limit

Full Body Contact Limit