

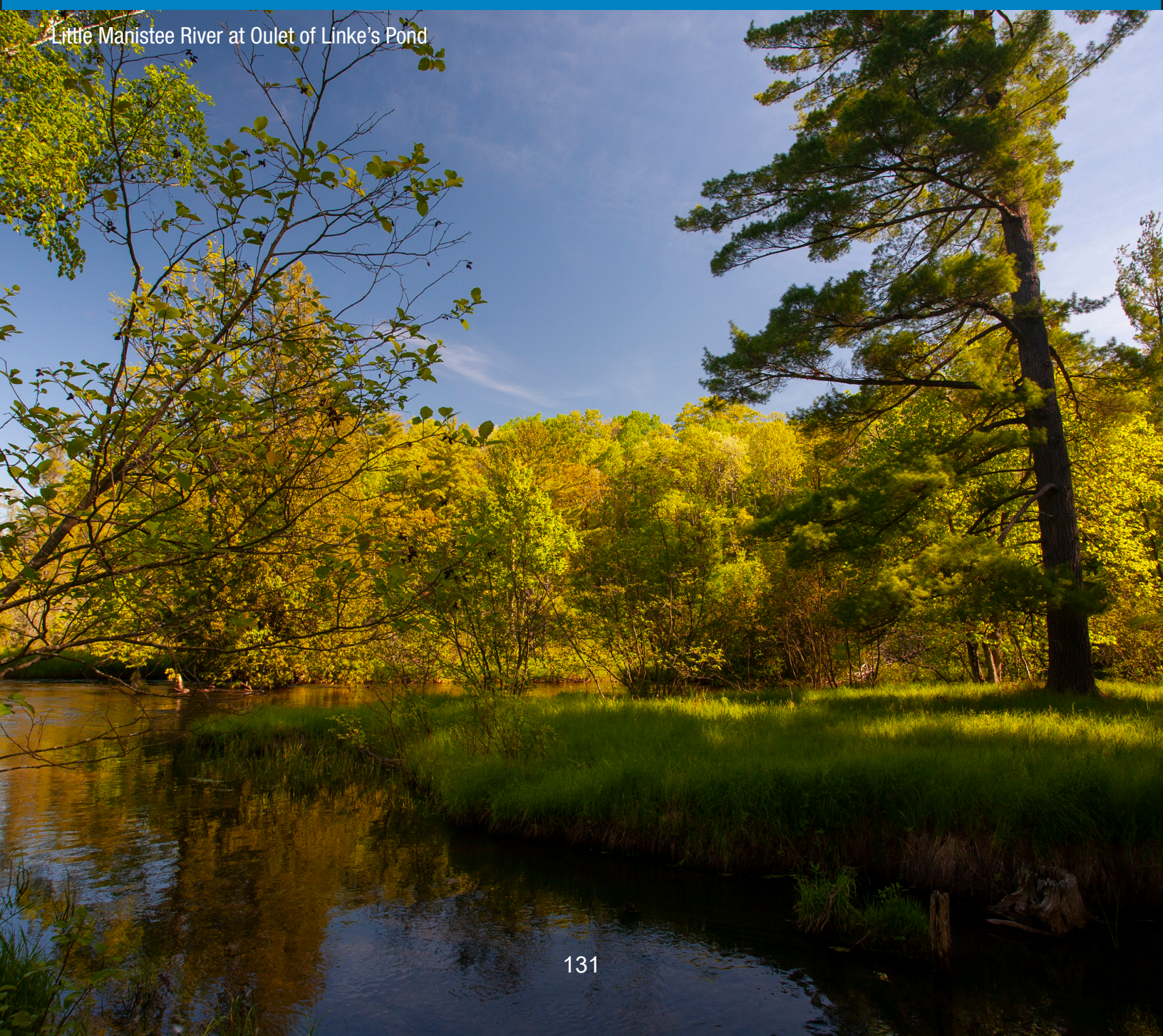
Appendix A — Little Manistee River Watershed Survey

Twenty-four question public opinion survey conducted online using SurveyMonkey in 2018.

Survey Format — pages 132 to 140 (as printed by SurveyMonkey)

Survey Results — pages 141 to 165 (as printed by SurveyMonkey)

Little Manistee River at Outlet of Linke's Pond



Little Manistee River Watershed Survey

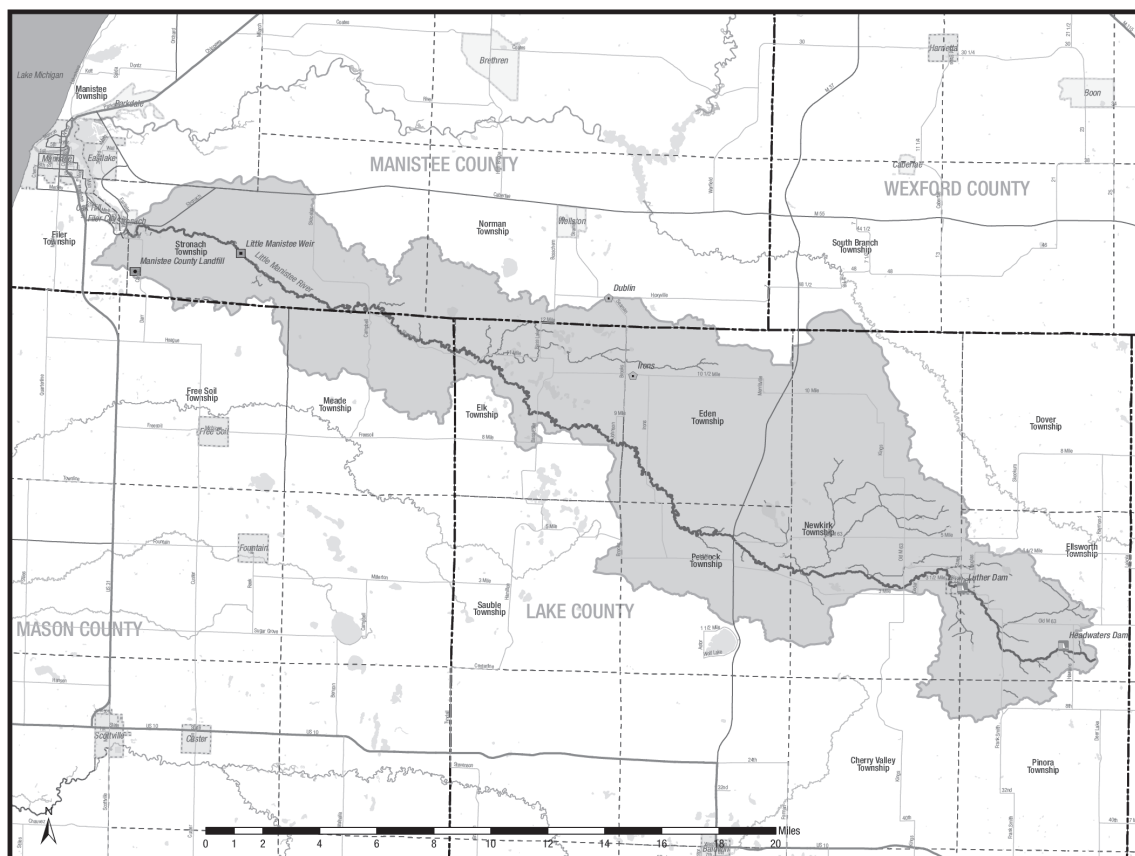
Welcome!

This survey should take only five to 10 minutes to complete and will provide information and community input for the Little Manistee River Watershed Management Plan.

The Little Manistee Watershed Conservation Council is working with the Alliance for Economic Success, Networks Northwest and others to develop this important plan, which will guide long term efforts to protect the quality of local lakes and streams. Public input plays an important role in the process. Your participation will help ensure that the plan meets the needs and desires of those who live in the watershed and those who make use of the local resources.

Thank You for caring about our waters!

Little Manistee Watershed (green shaded area)



Little Manistee River Watershed Survey

Water Quality

Overall, how would you rate the quality of the water in your area?

1. For Canoeing, kayaking or other boating:

- ☐ Poor
- ☐ OK
- ☐ Good
- ☐ Don't Know

2. For eating locally caught fish:

- ☐ Poor
- ☐ OK
- ☐ Good
- ☐ Don't Know

3. For swimming or wading:

- ☐ Poor
- ☐ OK
- ☐ Good
- ☐ Don't Know

4. For picnicking and family activities:

- ☐ Poor
- ☐ OK
- ☐ Good
- ☐ Don't Know

5. For high quality fishing and fish habitat:

- ☐ Poor
- ☐ OK
- ☐ Good
- ☐ Don't Know

6. For scenic beauty:

- ☐ Poor
- ☐ OK
- ☐ Good
- ☐ Don't Know

Little Manistee River Watershed Survey

Watershed Activities

7. Please rank these activities (1st thru 6th) in order of their importance to you



Canoeing / kayaking / other boating



Eating locally caught fish



Swimming



Picnicking and family activities



High quality fishing and fish habitat



Scenic beauty

Little Manistee River Watershed Survey

Sources of Water Pollution

The items below may be sources of water pollution. In your opinion, how much of a problem is each source in your area?

8. Soil erosion and fertilizer runoff from farm fields:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

9. Soil erosion from shorelines and streambanks:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

10. Excessive use of lawn fertilizers and/or pesticides:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

11. Improperly maintained septic systems:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

12. Erosion and stormwater runoff from public roads:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

13. Droppings from geese, ducks and other waterfowl:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

14. Removal of shoreline and streambank vegetation:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

15. Recreational and tourism activities:

- ☐ Not a problem
- ☐ Slight problem
- ☐ Severe problem

16. Other source (please specify):

Little Manistee River Watershed Survey

Pollutants

17. Below is a list of pollutants and conditions that exist in most water bodies, and become a problem in excessive amounts. Please check the boxes for those which you consider to be a problem in your area.

- | | |
|---|--|
| <input type="checkbox"/> Sedimentation (dirt and soil) in the water | <input type="checkbox"/> Invasive aquatic plants and animals |
| <input type="checkbox"/> Phosphorus (contributing to weed growth) | <input type="checkbox"/> Habitat alteration harming local fish |
| <input type="checkbox"/> Bacteria and viruses in the water (such as E.coli) | <input type="checkbox"/> High water temperature |
| <input type="checkbox"/> Trash or debris in the water | <input type="checkbox"/> Pesticides |
| <input type="checkbox"/> Oil and Grease | |
| <input type="checkbox"/> Other (please specify) | |

Little Manistee River Watershed Survey

Courses of Action

Please indicate whether you would be likely to support the following courses of action to address water quality in the Little Manistee River Watershed:

18. Education and voluntary action by property owners

- ☐ Yes
- ☐ No
- ☐ Don't Know

19. Enforcement of rules requiring that all septic systems be inspected at time of property sale

- ☐ Yes
- ☐ No
- ☐ Don't Know

20. Strong local zoning, with requirements that buildings be set back from the river

- ☐ Yes
- ☐ No
- ☐ Don't Know

21. State designation of the Little Manistee as a natural river, with development restrictions

- ☐ Yes
- ☐ No
- ☐ Don't Know

Little Manistee River Watershed Survey

Participant Information

22. Please check all that apply to you

- ☐ Own property in the Little Manistee Watershed
- ☐ Full-time resident of the area in or near the Little Manistee River Watershed
- ☐ Serve as a public official or local government employee (elected or appointed)
- ☐ Visit or use lakes and streams in the Watershed

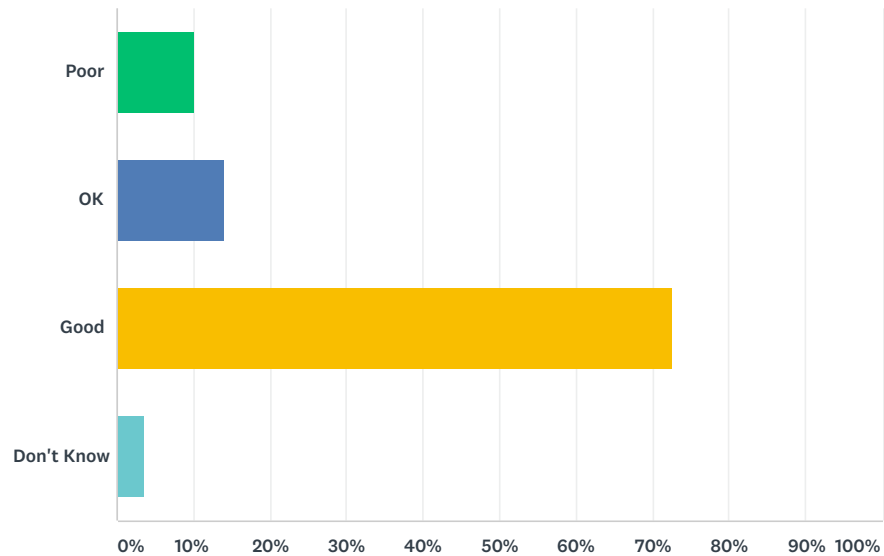
23. Please enter your age

24. Comments & Suggestions

Little Manistee River Watershed Survey

Q1 For Canoeing, kayaking or other boating:

Answered: 201 Skipped: 3

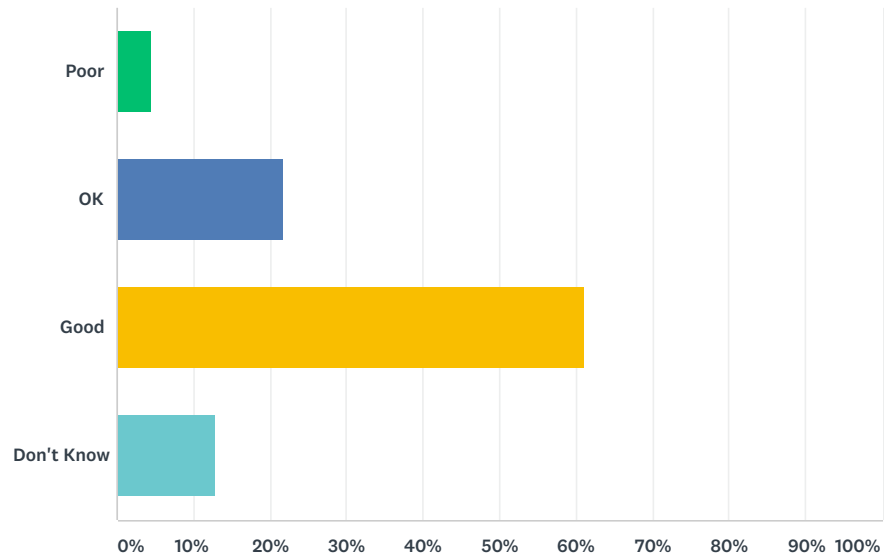


ANSWER CHOICES	RESPONSES	
Poor	9.95%	20
OK	13.93%	28
Good	72.64%	146
Don't Know	3.48%	7
TOTAL		201

Little Manistee River Watershed Survey

Q2 For eating locally caught fish:

Answered: 203 Skipped: 1

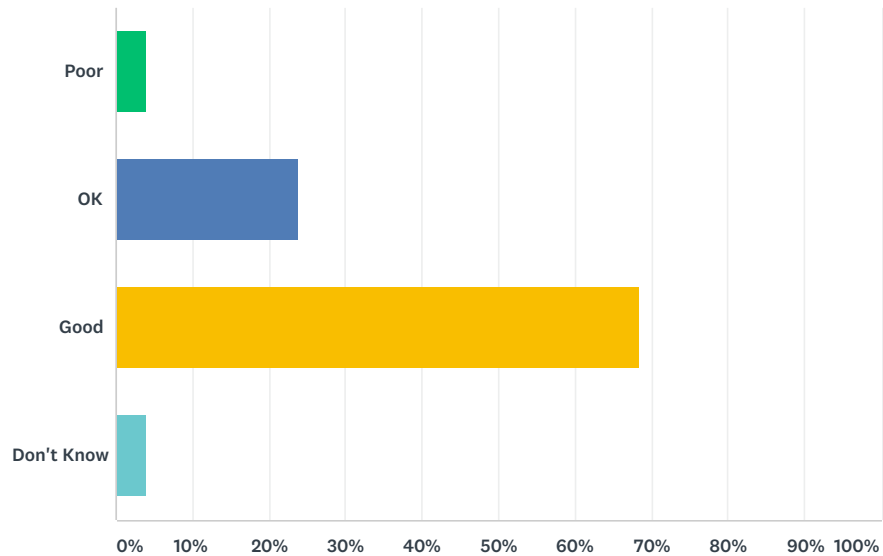


ANSWER CHOICES	RESPONSES	
Poor	4.43%	9
OK	21.67%	44
Good	61.08%	124
Don't Know	12.81%	26
TOTAL		203

Little Manistee River Watershed Survey

Q3 For swimming or wading:

Answered: 202 Skipped: 2

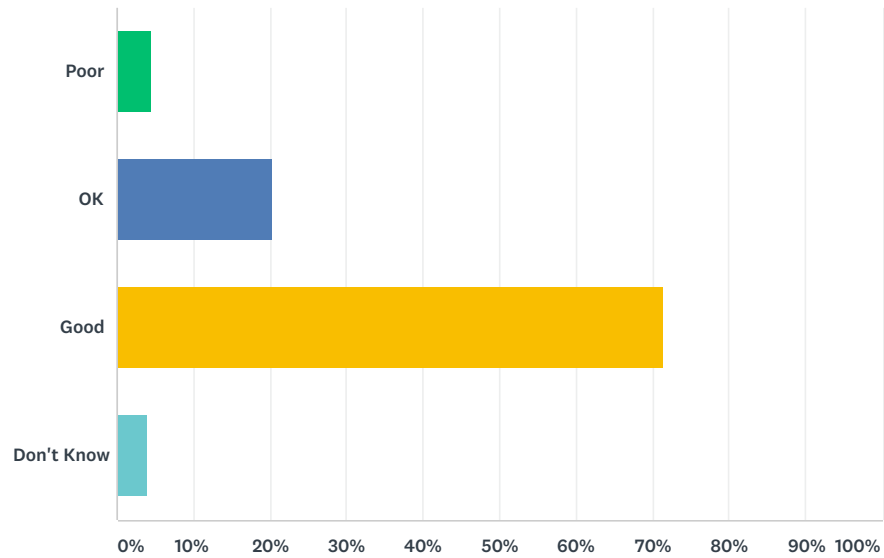


ANSWER CHOICES	RESPONSES	
Poor	3.96%	8
OK	23.76%	48
Good	68.32%	138
Don't Know	3.96%	8
TOTAL		202

Little Manistee River Watershed Survey

Q4 For picnicking and family activities:

Answered: 203 Skipped: 1

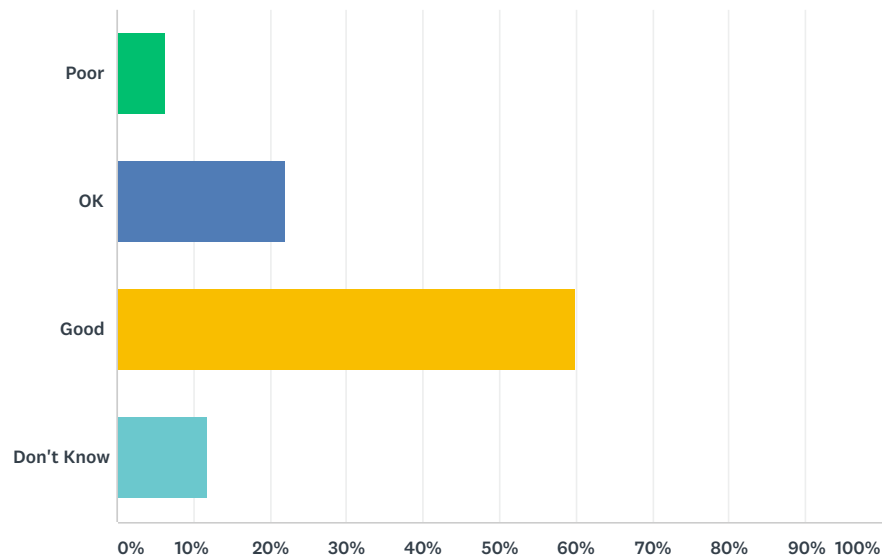


ANSWER CHOICES	RESPONSES	
Poor	4.43%	9
OK	20.20%	41
Good	71.43%	145
Don't Know	3.94%	8
TOTAL		203

Little Manistee River Watershed Survey

Q5 For high quality fishing and fish habitat:

Answered: 204 Skipped: 0

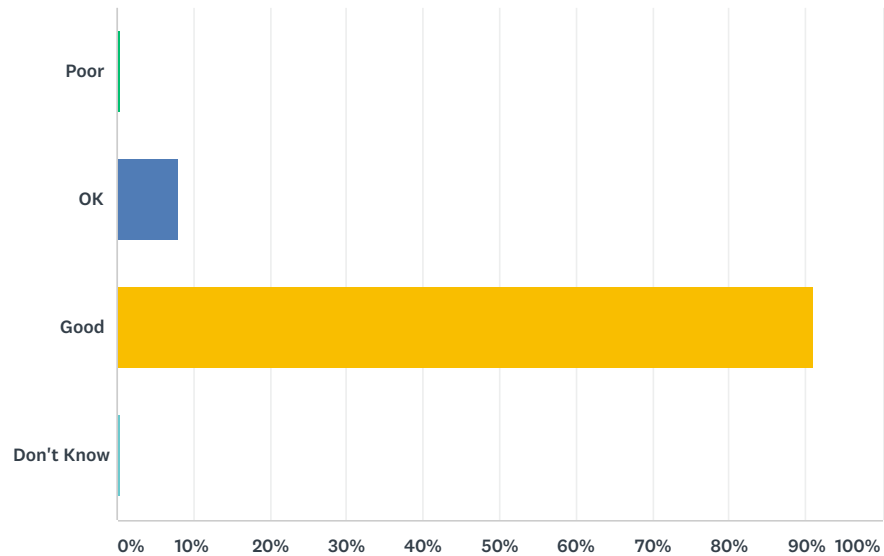


ANSWER CHOICES	RESPONSES	
Poor	6.37%	13
OK	22.06%	45
Good	59.80%	122
Don't Know	11.76%	24
TOTAL		204

Little Manistee River Watershed Survey

Q6 For scenic beauty:

Answered: 201 Skipped: 3

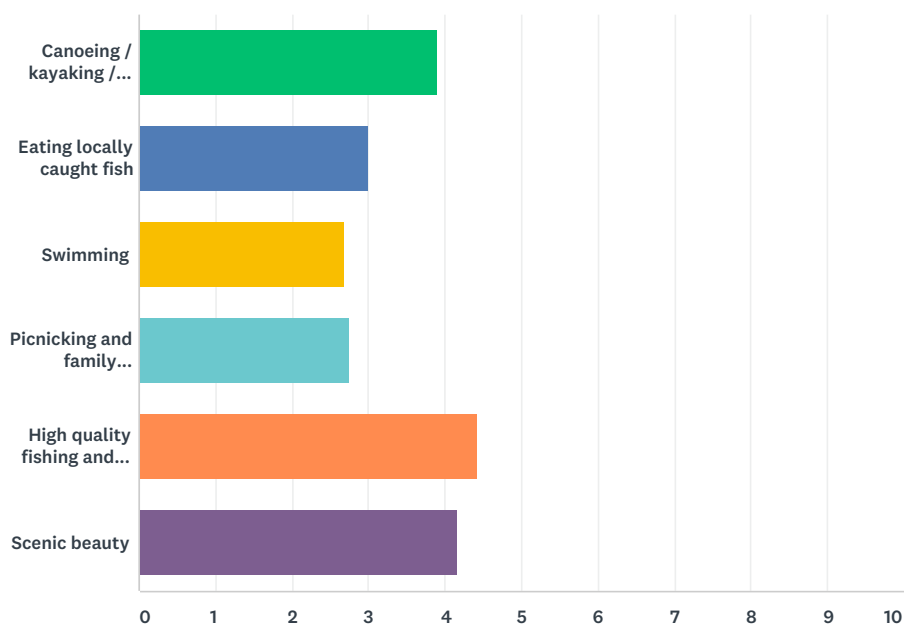


ANSWER CHOICES	RESPONSES	
Poor	0.50%	1
OK	7.96%	16
Good	91.04%	183
Don't Know	0.50%	1
TOTAL		201

Little Manistee River Watershed Survey

Q7 Please rank these activities (1st thru 6th) in order of their importance to you

Answered: 197 Skipped: 7

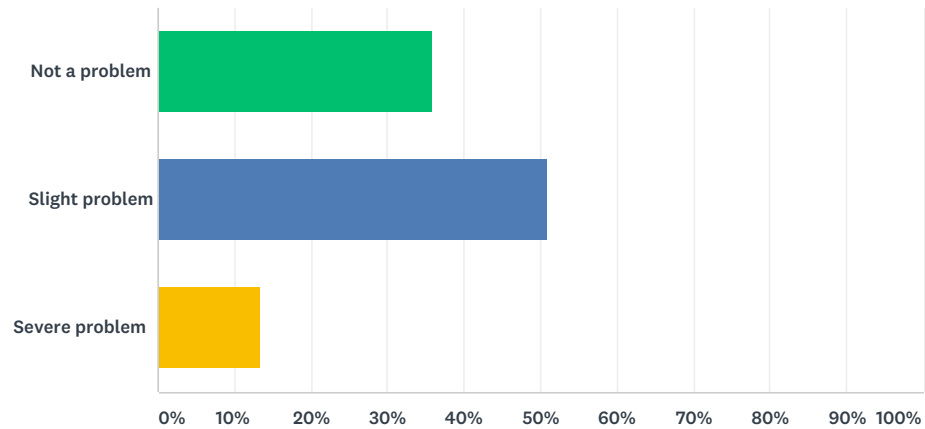


	1	2	3	4	5	6	TOTAL	SCORE
Canoeing / kayaking / other boating	20.86% 39	15.51% 29	25.67% 48	18.72% 35	9.09% 17	10.16% 19	187	3.90
Eating locally caught fish	6.70% 12	18.99% 34	15.08% 27	15.64% 28	13.97% 25	29.61% 53	179	3.00
Swimming	4.84% 9	9.68% 18	13.44% 25	18.28% 34	27.96% 52	25.81% 48	186	2.68
Picnicking and family activities	1.60% 3	6.95% 13	19.25% 36	25.67% 48	29.41% 55	17.11% 32	187	2.74
High quality fishing and fish habitat	42.78% 80	16.58% 31	9.63% 18	10.70% 20	11.23% 21	9.09% 17	187	4.42
Scenic beauty	23.59% 46	31.28% 61	14.87% 29	10.77% 21	8.21% 16	11.28% 22	195	4.17

Little Manistee River Watershed Survey

Q8 Soil erosion and fertilizer runoff from farm fields:

Answered: 193 Skipped: 11

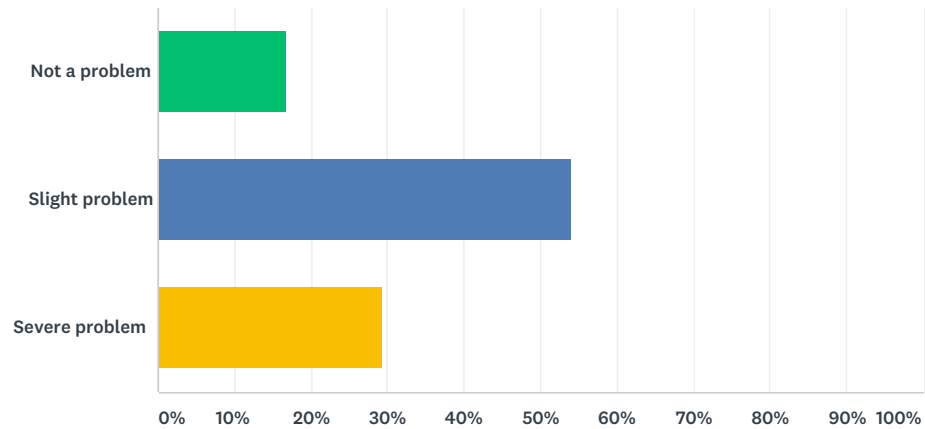


ANSWER CHOICES	RESPONSES	
Not a problem	35.75%	69
Slight problem	50.78%	98
Severe problem	13.47%	26
TOTAL		193

Little Manistee River Watershed Survey

Q9 Soil erosion from shorelines and streambanks:

Answered: 191 Skipped: 13

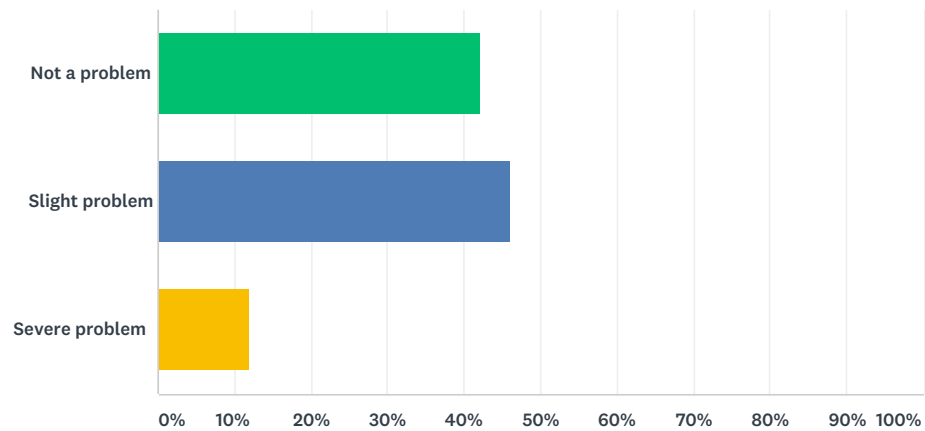


ANSWER CHOICES	RESPONSES	
Not a problem	16.75%	32
Slight problem	53.93%	103
Severe problem	29.32%	56
TOTAL		191

Little Manistee River Watershed Survey

Q10 Excessive use of lawn fertilizers and/or pesticides:

Answered: 193 Skipped: 11

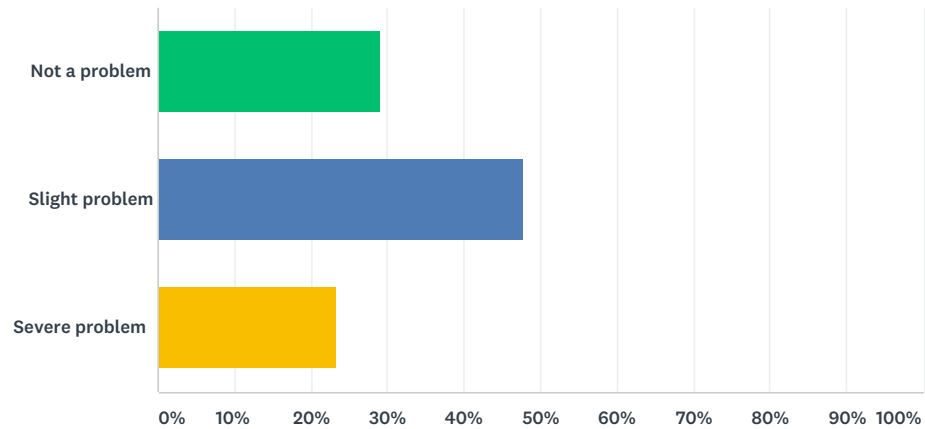


ANSWER CHOICES	RESPONSES	
Not a problem	41.97%	81
Slight problem	46.11%	89
Severe problem	11.92%	23
TOTAL		193

Little Manistee River Watershed Survey

Q11 Improperly maintained septic systems:

Answered: 193 Skipped: 11

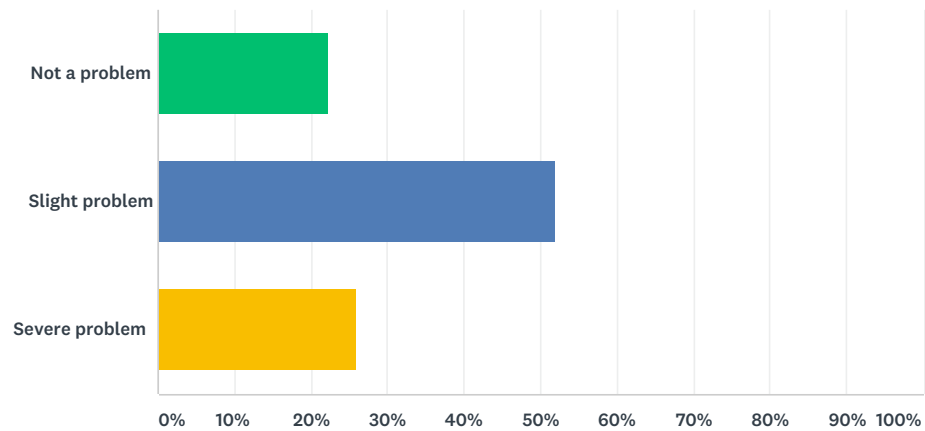


ANSWER CHOICES	RESPONSES	
Not a problem	29.02%	56
Slight problem	47.67%	92
Severe problem	23.32%	45
TOTAL		193

Little Manistee River Watershed Survey

Q12 Erosion and stormwater runoff from public roads:

Answered: 193 Skipped: 11

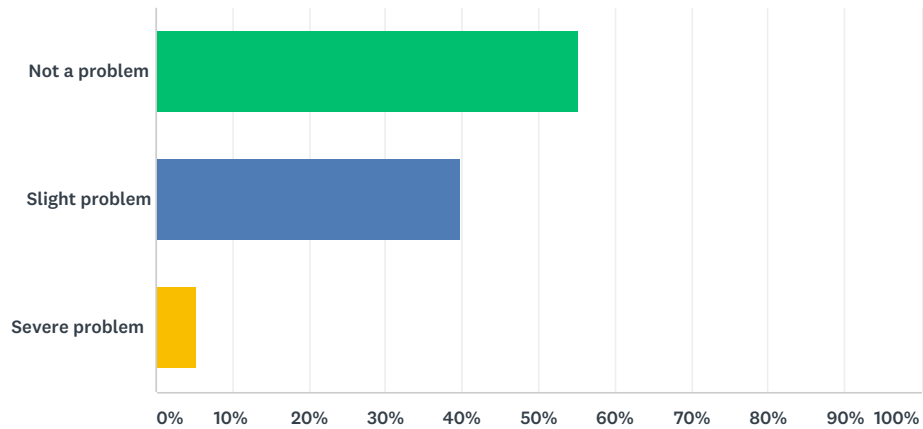


ANSWER CHOICES	RESPONSES	
Not a problem	22.28%	43
Slight problem	51.81%	100
Severe problem	25.91%	50
TOTAL		193

Little Manistee River Watershed Survey

Q13 Droppings from geese, ducks and other waterfowl:

Answered: 194 Skipped: 10

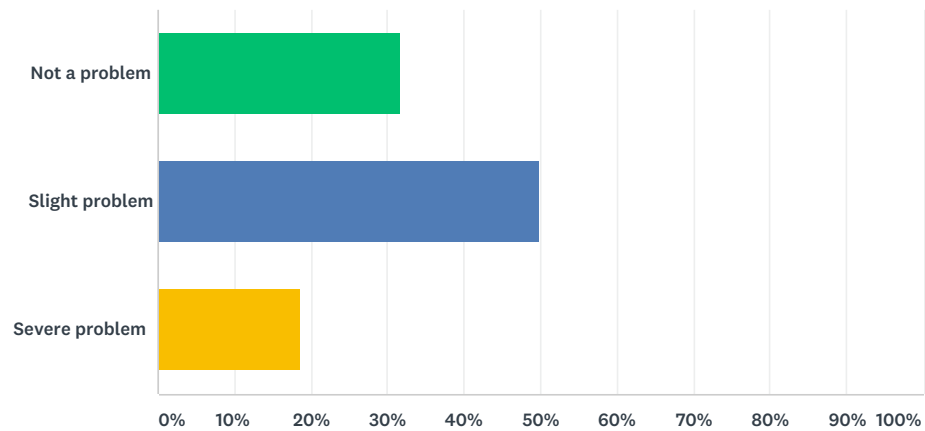


ANSWER CHOICES	RESPONSES	
Not a problem	55.15%	107
Slight problem	39.69%	77
Severe problem	5.15%	10
TOTAL		194

Little Manistee River Watershed Survey

Q14 Removal of shoreline and streambank vegetation:

Answered: 193 Skipped: 11

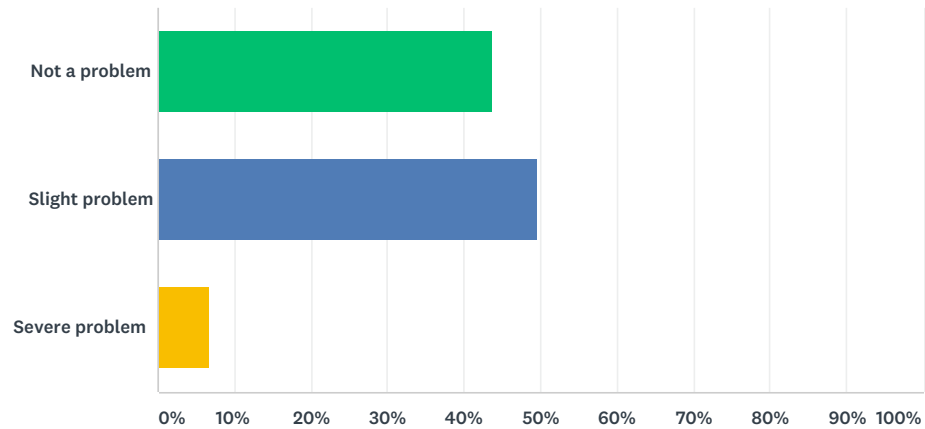


ANSWER CHOICES	RESPONSES	
Not a problem	31.61%	61
Slight problem	49.74%	96
Severe problem	18.65%	36
TOTAL		193

Little Manistee River Watershed Survey

Q15 Recreational and tourism activities:

Answered: 194 Skipped: 10



ANSWER CHOICES	RESPONSES	
Not a problem	43.81%	85
Slight problem	49.48%	96
Severe problem	6.70%	13
TOTAL		194

Little Manistee River Watershed Survey

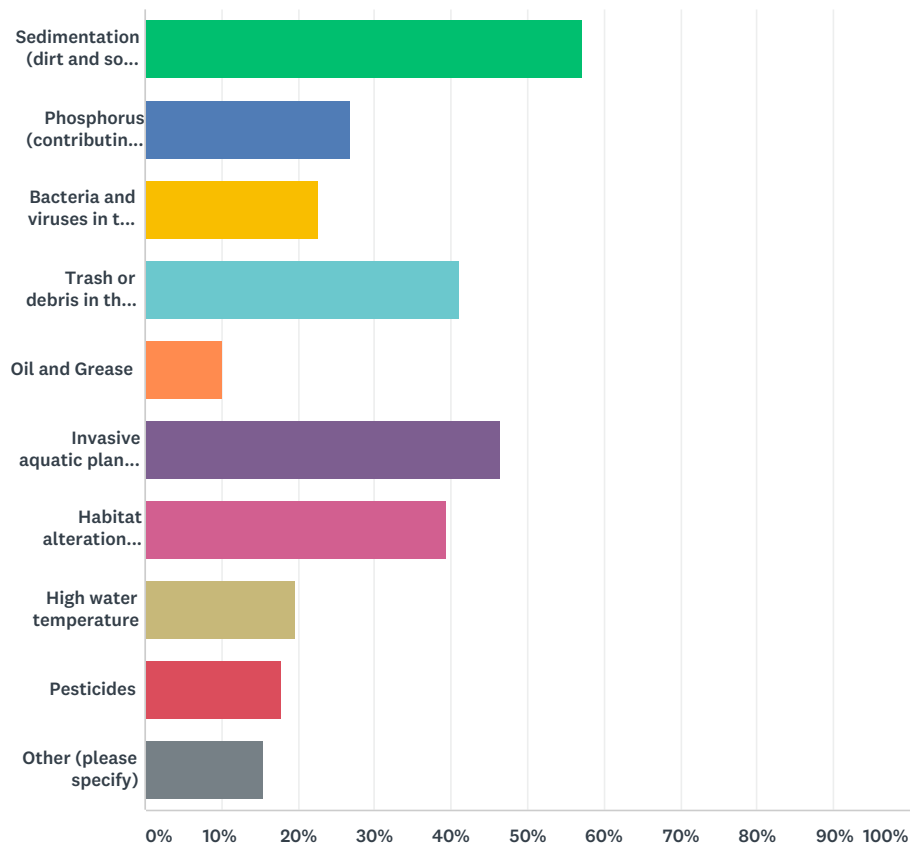
Q16 Other source (please specify):

Answered: 33 Skipped: 171

Little Manistee River Watershed Survey

Q17 Below is a list of pollutants and conditions that exist in most water bodies, and become a problem in excessive amounts. Please check the boxes for those which you consider to be a problem in your area.

Answered: 168 Skipped: 36



ANSWER CHOICES	RESPONSES	
Sedimentation (dirt and soil) in the water	57.14%	96
Phosphorus (contributing to weed growth)	26.79%	45
Bacteria and viruses in the water (such as E.coli)	22.62%	38
Trash or debris in the water	41.07%	69
Oil and Grease	10.12%	17
Invasive aquatic plants and animals	46.43%	78
Habitat alteration harming local fish	39.29%	66
High water temperature	19.64%	33
Pesticides	17.86%	30
Other (please specify)	15.48%	26

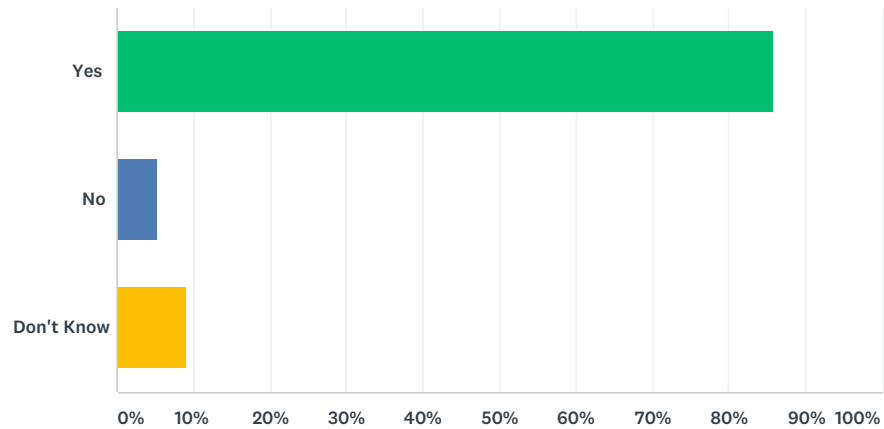
Little Manistee River Watershed Survey

Total Respondents: 168

Little Manistee River Watershed Survey

Q18 Education and voluntary action by property owners

Answered: 190 Skipped: 14

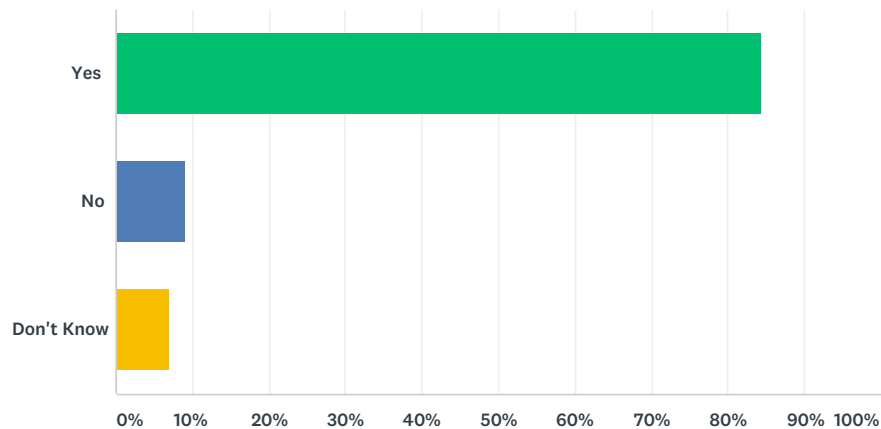


ANSWER CHOICES	RESPONSES	
Yes	85.79%	163
No	5.26%	10
Don't Know	8.95%	17
TOTAL		190

Little Manistee River Watershed Survey

Q19 Enforcement of rules requiring that all septic systems be inspected at time of property sale

Answered: 190 Skipped: 14

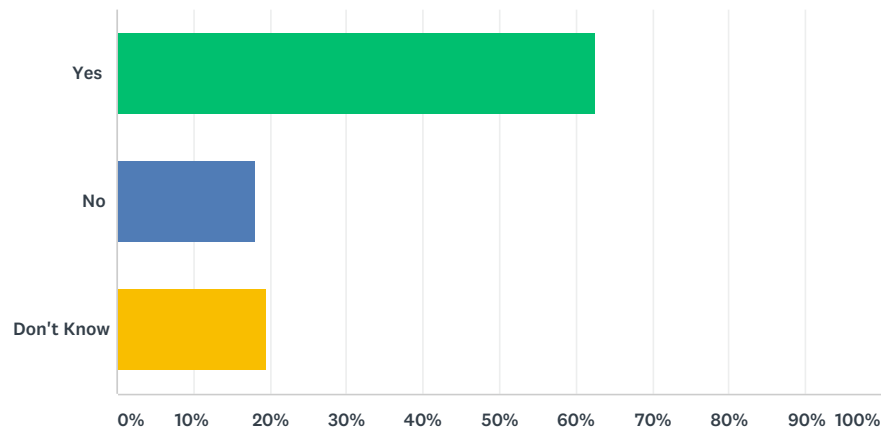


ANSWER CHOICES	RESPONSES	
Yes	84.21%	160
No	8.95%	17
Don't Know	6.84%	13
TOTAL		190

Little Manistee River Watershed Survey

Q20 Strong local zoning, with requirements that buildings be set back from the river

Answered: 190 Skipped: 14

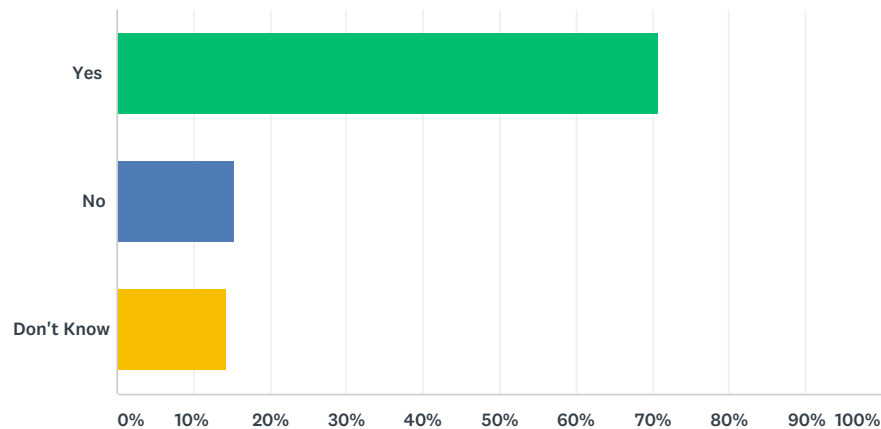


ANSWER CHOICES	RESPONSES	
Yes	62.63%	119
No	17.89%	34
Don't Know	19.47%	37
TOTAL		190

Little Manistee River Watershed Survey

Q21 State designation of the Little Manistee as a natural river, with development restrictions

Answered: 191 Skipped: 13

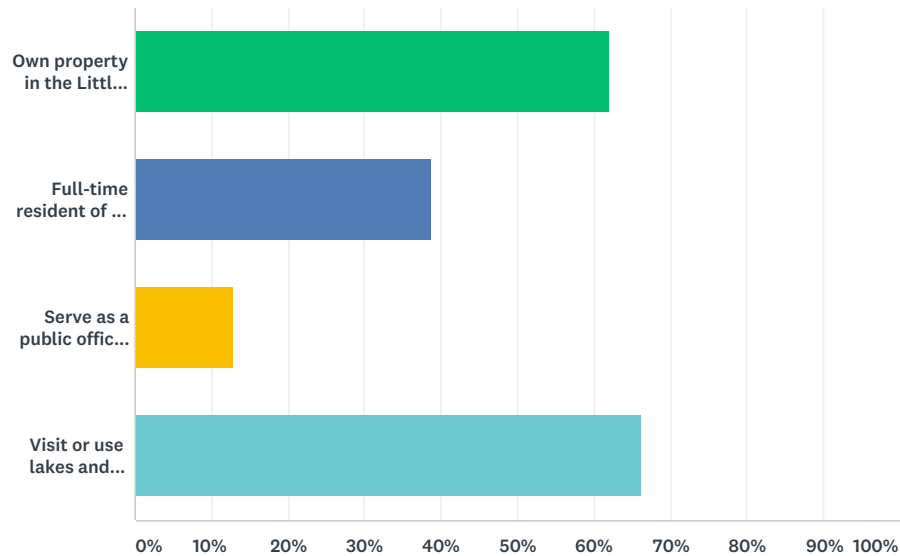


ANSWER CHOICES	RESPONSES	
Yes	70.68%	135
No	15.18%	29
Don't Know	14.14%	27
TOTAL		191

Little Manistee River Watershed Survey

Q22 Please check all that apply to you

Answered: 189 Skipped: 15



ANSWER CHOICES	RESPONSES	
Own property in the Little Manistee Watershed	61.90%	117
Full-time resident of the area in or near the Little Manistee River Watershed	38.62%	73
Serve as a public official or local government employee (elected or appointed)	12.70%	24
Visit or use lakes and streams in the Watershed	66.14%	125
Total Respondents: 189		

Little Manistee River Watershed Survey

Q23 Please enter your age

Answered: 185 Skipped: 19

Little Manistee River Watershed Survey

Q24 Comments & Suggestions

Answered: 55 Skipped: 149

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Appendix B — Summary of Outreach

As Curated By Armas Soorus, Little Manistee Watershed Conservation Council, March 2020

Linke's Pond



SUMMARY OF OUTREACH

The following summary, derived from meeting minutes and contact with participants, provides a record of outreach efforts taken during the development phases of the Little Manistee Watershed Management Plan, from 2014 through 2020

– Armas Soorus, Little Manistee Watershed Conservation Council, March 2020

Efforts to include all stakeholders in the watershed plan creation process and the ongoing implementation of the plan include outreach to LMWCC members, individuals, riparian owners, local watershed organizations, commercial interests, Indian tribes, governmental units and departments at the village, city, township, county, state and federal levels and all other interested parties.

The Little Manistee Watershed Conservation Council (LMWCC) is the lead organization in bringing together the interested parties to create and implement the plan and is committed to the ongoing implementation of the plan after approval. The Alliance for Economic Success (AES) has provided critical guidance in plan creation, especially in the early stages. The AES helped by providing a draft partnership agreement and a pamphlet explaining what a watershed management plan is and why we need a watershed management plan for the Little Manistee River.

The LMWCC Board identified and prioritized the need for a watershed management plan in a series of board meetings in late 2014. The LMWCC initially reached out to Michigan DEQ and DNR (now EGLE), Trout Unlimited, the National Forest Service, the Alliance for Economic Success, conservation districts and the Little River Band of Ottawa Indians to help us understand how to create and implement a watershed management plan. Our partners at Spicer Group in Manistee also provided valuable input to the plan as we were proceeding through the process.

June 2015 - The first meeting of what would become the Little Manistee River Watershed Steering Committee was held. This Steering Committee forms the central core of our outreach program as well as bringing expertise from interested stakeholders in the watershed. Throughout the course of the creation of the plan there has been input from a broad range of interests throughout the watershed at the Steering Committee meetings. All Steering Committee meetings are open to the public and we listen to everyone that wants to speak and use their ideas as input to the plan.

At this first meeting the Steering Committee:

- Approved the Partnership Agreement, including the Watershed Description within the Partnership Agreement.
- Established the Plan Criteria as both Michigan DEQ and US EPA Nine Elements pending agreement by the LMWCC Board.
- Initiated RFP process to identify a consultant to develop and write the plan.
- Suggested the Creation of Funds at the Manistee County Community Foundation for Plan Creation and Implementation.
- Identified LMWCC as the lead organization.

SUMMARY OF OUTREACH

Present at this meeting were representatives of: LMWCC (2), LRBOI (1), Manistee County Planning Dept. (1), AES (1), Michigan DEQ (1), MCCF (1), USDA Farm Service Agency (FSA), Wexford, Osceola, Missaukee Counties (1) and, Trout Unlimited (1).

In July of 2015 the LMWCC Board presented the idea to their membership at their annual meeting and asked for signatures on the Partnership Agreement. The idea was well received by membership and the board felt it was meeting the wishes of the membership by continuing the development of the plan.

The LMWC then began the public outreach process by attending township and county commissioner meetings in the watershed. The LMWCC made presentations at each, explaining who they are, why they wanted a watershed management plan for the Little Manistee River and asked the individuals and organizations to sign the partnership agreement and participate in the creation and implementation of the plan. With the exception of one township and one county commission they received signed partnership agreements and contacts for email distribution so they could stay apprised of the plan status and take part in the creation and implementation. The LMWC then reached out to additional townships and counties, city and village governments, lake associations, conservation districts, land conservancies and individuals through presentations and personal contacts. The AES created a flyer that explained what a watershed management plan is and why one should be created that was distributed.

During the development of the plan the Little Manistee River Watershed Steering Committee has evolved into the broad-based group listed in detail in the introduction to the WMP.

At the August 1, 2015 meeting the LMWCC Board:

- LMWCC agrees to develop the Watershed Management Plan to both Michigan DEQ and US EPA Nine Elements Criteria.
- LMWCC authorizes creation of 3 funds at the Manistee County Community Foundation – “Plan Fund” to develop the Watershed Management Plan, the “Implementation Fund” to implement and maintain the watershed management plan and an “LMWCC Fund” to contain funds donated to the LMWCC to help ensure its long-term viability.

The Funds created at the Manistee County Community Foundation were intended to help bring in funds from individuals and organizations that were not familiar with the LMWCC and would feel more confident the funds they donated would be appropriately used with the oversight of a community foundation.

October 2015 - The second meeting of the Little Manistee River Watershed Steering Committee was held to:

- Confirm our shared vision of the high-level Scope and Objectives for the Watershed Management Plan (EPA and DEQ Criteria)
- AES began preparing a news release plan

SUMMARY OF OUTREACH

At this point in time 10 counties and townships had signed the partnership agreement and 5 were pending final signature. Attendance at this meeting included representatives from: LMWCC (3), LRBOI (1), Manistee County Planning Dept. (1), AES (1), MCCF (1), TU (1), Public Sector Consultants (1), NFS (1), Lake County Commissioner (1), Michigan DEQ (1), private citizens (2).

In December 2015 the third meeting of the Little Manistee River Watershed Steering Committee was held and:

- Public Sector Consultants formally selected as Consultant by consensus vote of Steering Committee. Tim Ervin and AES to assist in writing contingency contract.
- The group agreed to use the “Little Manistee River Watershed Steering Committee” as our identity.
- Agreed to identify a subgroup of 5 to 7 members to act as a “Fund Advisory Committee” with this group and the LMWCC per the Manistee County Community Foundation documents to administer the 2 funds at the MCCF.
- Elected a President and a Secretary.
- Elected initial members of the Fund Advisory Committee

Work on the consultant contract continued thru March of 2016 when it was approved by the LMWCC board. The Funding Committee was also approved by the LMWCC board at the March 2016 meeting. The funding committee consists of 2 LMWCC board members and 5 other non-LMWCC board members from the community. As of this date it consists of the 2 LMWCC board members, a county commissioner, a fishing guide and two local businessmen. Attendance at this meeting consisted of representatives from: LMWCC (3), AES (1), MDEQ (1), Lake County Commissioner(1), Private Citizen (1), Grand Traverse Regional Land Conservancy (1), Manistee Area Conservation District (1), Cool Lake Association (3), Sable River Watershed (1).

In December of 2015 the AES made a news release that the Little Manistee River Watershed Steering Committee had been formed and was working to create a watershed management plan for the Little Manistee River. The new release was circulated in all the local newspapers.

Fund raising for the plan creation began in earnest during May of 2016 and continued through June 2017. The AES and LMWCC worked to solicit contributions from businesses, foundations, individuals, community foundations and others for the plan creation. By June of 2017 it was clear that sufficient funds for Public Sector Consultants were not going to be raised so the AES reached out to Networks Northwest as a lower cost alternative.

June, 2017 – The Little Manistee River Watershed Steering Committee agreed we would work with the LMWCC and Networks Northwest to negotiate a contract for creation of the plan. The contract was formally approved by the LMWCC at their July 7, 2017 meeting. Attendance at this meeting included representatives from: Elk Township (1), Lake County Commission (1), Spicer Group (1), Manistee Conservation District (1), MDEQ (1), Sable River Watershed (2), Manistee County Planning Dept. (1), NFS (1), LMWCC (4) and Networks Northwest (1).

SUMMARY OF OUTREACH

August 2017 - The Little Manistee River Watershed Steering Committee meeting served as the kick-off for the Networks Northwest team and they brought templates of forms and maps as well as prototype plans and goals for the team to review. This meeting was attended by representatives of the LMWCC (5), NNW (2), MDEQ (1), Manistee Conservation District (1), Manistee Planning Dept. (1), Grand Traverse Area Land Conservancy (1), The Spicer Group (1), Lake County Commissioner (1), Trout Unlimited (1), MCCF (2), Elk Township (1) and NFS (1).

September 2017 - The Little Manistee River Watershed Steering Committee met to review final negotiations on the contract between Networks Northwest, The Alliance for Economic Success (acting as fiduciary for LMWCC) and the LMWCC. Networks Northwest had already begun work and brought documents on Designated Uses, Goals and Objectives, Critical Areas, Maps and a Survey Outline which were discussed at length. Attendance at this meeting included: LMWCC (3), NNW (1), The Spicer Group (1), LRBOI (1), Manistee County Community Foundation (1), Manistee County Planning Dept. (1), NFS (1), MDEQ (1), and USGS(1), LRBOI (1), TU (1).

January of 2018 - The Little Manistee River Watershed Steering Committee met to review and discuss Implementation Tasks, Goals and Objectives, Maps, Data gathered, Acceptable Safe Uses, Preservation of the Rustic Character, Economic Opportunities and the importance of Education in our plan. Also noted was the importance to the local community of the lifestyle in the watershed and how they want to protect it. At this point in time Networks Northwest had the Public Survey on line and ready for use. The LMWCC committed to notifying the public of the survey and encouraging them to take the survey through newspaper announcements, bulletins and email. Attendance at this meeting included representatives from LMWCC (3), NNW (1), NFS (1), Elk Township (1), Sable River Watershed (1), TU (1) LRBOI (1), MSUE (1) and AES (1).

March 2018 - The Little Manistee River Watershed Steering Committee met to review and discuss Stronach Creek road crossing issues, the Seyers Lake dam failure, the Luther Dam, Zoning and Master Plans. The group recognized the primacy of the Village of Luther to determine the future of the dam and agreed to a position of monitoring the condition of the dam and helping to remove it if the village can no longer afford to maintain it. Significant portions of the plan were posted to the LMWCC.org web site in draft form for review and comment. Attendance at this meeting included representatives of AES (1), Manistee Co. PC (1), LMWCC (3), Portage Lake Watershed Forever (1), Norman Township (1), NFS (1), NNW (1) and Cool Lake POA (1).

April 2018 - The Little Manistee River Watershed Steering Committee met to review and discuss the dates for the public meetings and how to publicize them, Data gathered by NNW, Implementation Tasks, Milestones, the Luther Dam , the Education Plan, Invasive Species and Septic Systems. Public Meeting dates were set as May 24, 2018 - Luther Lions Club, 6 - 8 pm and June 7, 2018 - Manistee ISD, 6 - 8 pm. Attendance at this meeting included representatives from: LMWCC (2), NFS (1), LCEDA (2), AES (1), Portage Lake Watershed Forever (1), Manistee County Planning (1), MDEQ (1), MDNR Fisheries (1), Private Citizen (1), Cool Lake POA (1), LRBOI (1), USFS (1).

May 2018 - The Little Manistee River Watershed Steering Committee held a meeting in the Village of Luther at the North end of the watershed to gather more public input on the plan. The meeting had been publicized in the local newspapers, television news, via an email distribution that included all parties that had provided

SUMMARY OF OUTREACH

contact information to the steering committee including many for local township and village governmental representatives as well as bulletins in the local Libraries and businesses. Conservation Districts within the watershed also posted meeting notices on their web sites. In addition, the LMWCC created a listing of all property owners addresses within the watershed based on county records. Due to funding limitations it mailed a meeting notice to half (2149) of the addresses. The addresses were selected by listing the owner's names in alphabetical order, numbering them sequentially and sorting out the odd numbered addresses for mailing.

Attendance at the meeting consisted of 30 people. Attendance included representatives of: Elk Township (1), LMWC (4), Ellsworth Twp. (2), OLCD (1) and 21 Private citizens. Attending as resources to answer questions were Rob Carson (Manistee County Planning Director), Chelsea Cooper (Water Quality Technician, Manistee Conservation District) and Chris Riley (Fish and Wildlife Biologist at U.S. Forest Service). There was an extensive public comment session at the end of the meeting.

The presentation to the public included who the LMWCC, Little Manistee River Watershed Steering Committee and Networks Northwest are and the purpose and content of a watershed management plan. It also explained the purpose of the plan and meeting were not to drive zoning or the removal of the Luther dam, both of which were clear concerns of the local residents. It was explained the meeting was focused on getting public input on Critical Areas, Locally Desired Uses, Implementation, the Informational/Educational Component and Zoning Ordinance Issues as well as other thoughts they had related to the plan. Mark Tonello of the Michigan DNR made a presentation on the Little Manistee River Fishery and Cold Water Ecology. Christina Curell from the Michigan State University Extension made a presentation on Groundwater, Agriculture and Best Management Practices. Vicki Sawicki of the North Country Cooperative Invasive Species Management Area made a presentation on the Invasive Species Program. Ed Hoogterp and Scot Gest Presented an overview of the current draft of the plan and Ed then led a session for public Comments and Questions.

June 2018 - The Little Manistee River Watershed Steering Committee held a meeting in the City of Manistee at the southern end of the watershed to gather more public input on the plan. This meeting had been advertised in conjunction with the May Meeting in Luther and had the same agenda and similar presentations. This meeting was much smaller with 14 people attending. Because of the much smaller size the meeting was much less formal and structured and had an open discussion as the presentations were made with a short comments and questions period after the presentations. Attendance at the meeting included: Sable River Watershed (1), Private Citizens (5), MDNR (1), MACD (1), Portage Lake Forever (1), NNW, (1), LMWCC (1) and Manistee Planning Dept (1).

November 2018 - The Little Manistee River Watershed Steering Committee met to review the results of the Luther and Manistee meetings and the current draft of the watershed management plan. An annual summit to review status of the plan was added to the Task List as well as seeking a paid watershed technician to implement the plan. The group recognized that groundwater, septic systems and monitoring stations needed to be emphasized as items in the plan and related information needs added to the plan. Road crossings were added as a critical area due to their impact. Ed Hoogterp expected a version to be at MDNR for an informal review In

SUMMARY OF OUTREACH

several weeks. Attendance at this meeting included representatives from Sable River Watershed (1), LCEDA (1), LMWCC (3), Portage Lake Watershed Forever (1), Hamlin Lake Association (2), USGS (1), NMU (1), MACD (3), USFS (1), LRBOI (1) and Norman Twp. (1).

February 2019 - The Little Manistee River Watershed Steering Committee met to conduct the first Watershed Summit. The Michigan DEQ has been closely monitoring the progress and content of the watershed management plan drafts and recommended that the Steering Committee assume the plan will be approved and move forward with the implementation tasks identified in the plan. The purpose of this meeting was to be the first step in implementing the watershed management plan. It was the first annual summit to review progress and understand the status of the tasks identified in the plan and to identify and plan specific tasks for the coming year. Armas Soorus updated the group on the status of the plan: That it had not been submitted for informal review but was proceeding to be completed and in the final stages. The group then proceeded to identify Task Description, Status, Target Date and a Leader for all tasks listed under the following categories in the task list:

- Shoreline/Streambank Issues
- Storm Water and Runoff
- Planning, Zoning and Land Use
- Road Stream Issues
- Habitat for Fish and Wildlife
- Wastewater and Septic Systems

Attendance at this meeting included representatives from: AES (1), LMWCC (5), Indian Club (1), MACD (1), Ellsworth Twp. (1), Norman Twp. (1), MDNR (1), Private Citizens (2) and the Michigan District 100 State Representative.

April 2019 – The Steering Committee submitted the draft watershed management plan to MDEQ for an informal review of contents before submitting it for official approval.

August 2019 - The Little Manistee River Watershed Steering Committee held a second summit to continue to identify Task Description, Status, Target Date and a Leader for all tasks listed under the following categories in the task list:

- Hydrology, Groundwater and Wetlands
- Water Quality Monitoring
- Information and Education

Attendance at this meeting included LMWCC (2), Osceola-Lake Conservation District (1), The Indian Club(1) and Newkirk Township (1).

March 2020 - The Little Manistee River Watershed Steering Committee held a Third summit to continue to identify Task Description, Status, Target Date and a Leader for all tasks listed under the following categories in the task list:

- Land Protection and Management

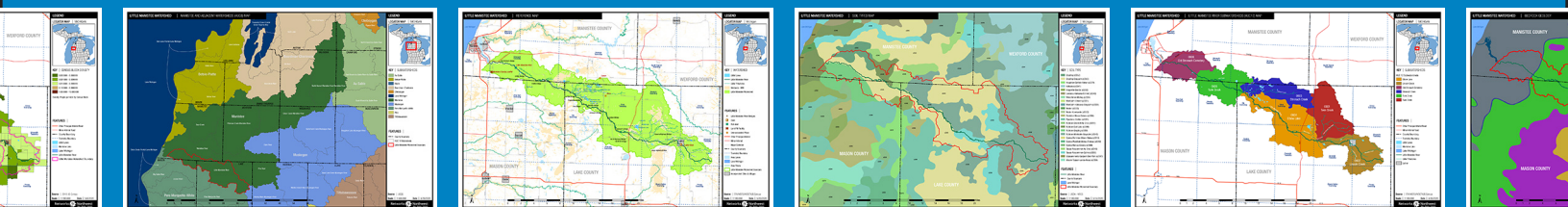
SUMMARY OF OUTREACH

- Recreation, Safety, Navigation and Human Health
- Invasive Species
- Identify Priority Items for 2020
- Further Investigate the public interest in the Michigan Natural Rivers Program for the Little Manistee River
- Install Monitoring Stations Designed by Trout Unlimited
- Identify additional resources for implementing the plan

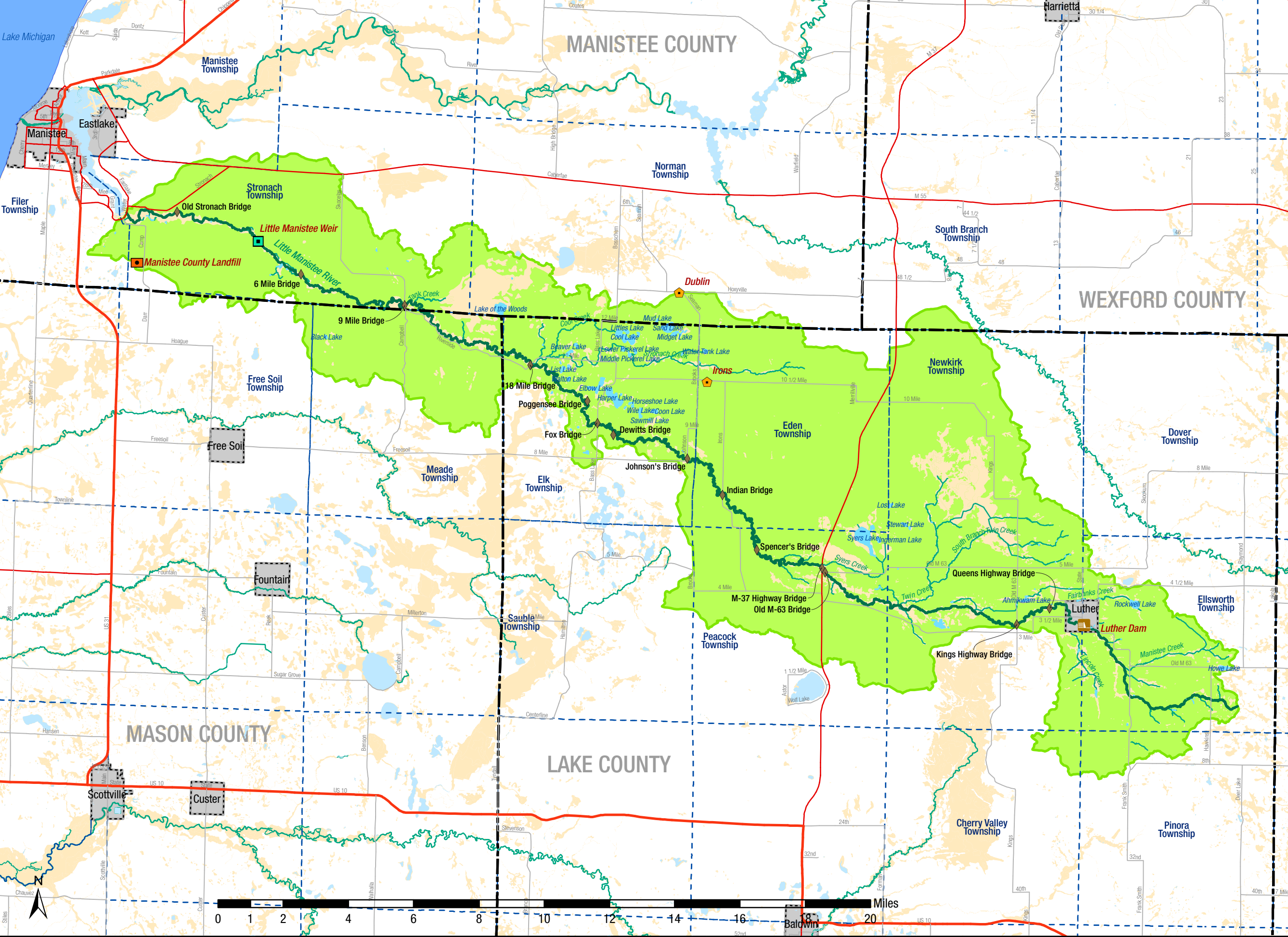
The Funding Committee voted to purchase a Trout Unlimited Mayfly monitoring station for \$1,500 to monitor conductivity, depth and temperature at one point on the Little Manistee.

Attendance at this meeting included representatives from MACD (2), Portage Lake Watershed Forever (2), Goucker Fly Fishing (1), LMWCC (6), Spicer Group (1), Lake County Economic Development Assoc. (1), Osceola-Lake Conservation District (2), LRBOI (1).

Appendix C — Large Maps



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- KEY | WATERSHED**
- LMW Lakes
 - Little Manistee River
 - LMW Tributaries
 - Wetlands - NWI
 - Little Manistee Watershed

- FEATURES |**
- Little Manistee River Bridges
 - Dam
 - Fish Weir
 - Land Fill Facility
 - Unincorporated Place
 - Other Principal Arterial
 - Minor Arterial
 - Major Collector
 - County Boundary
 - Township Boundary
 - Area Lakes
 - Lake Michigan
 - Area Rivers
 - Little Manistee Watershed Boundary
 - Incorporated Cities & Villages

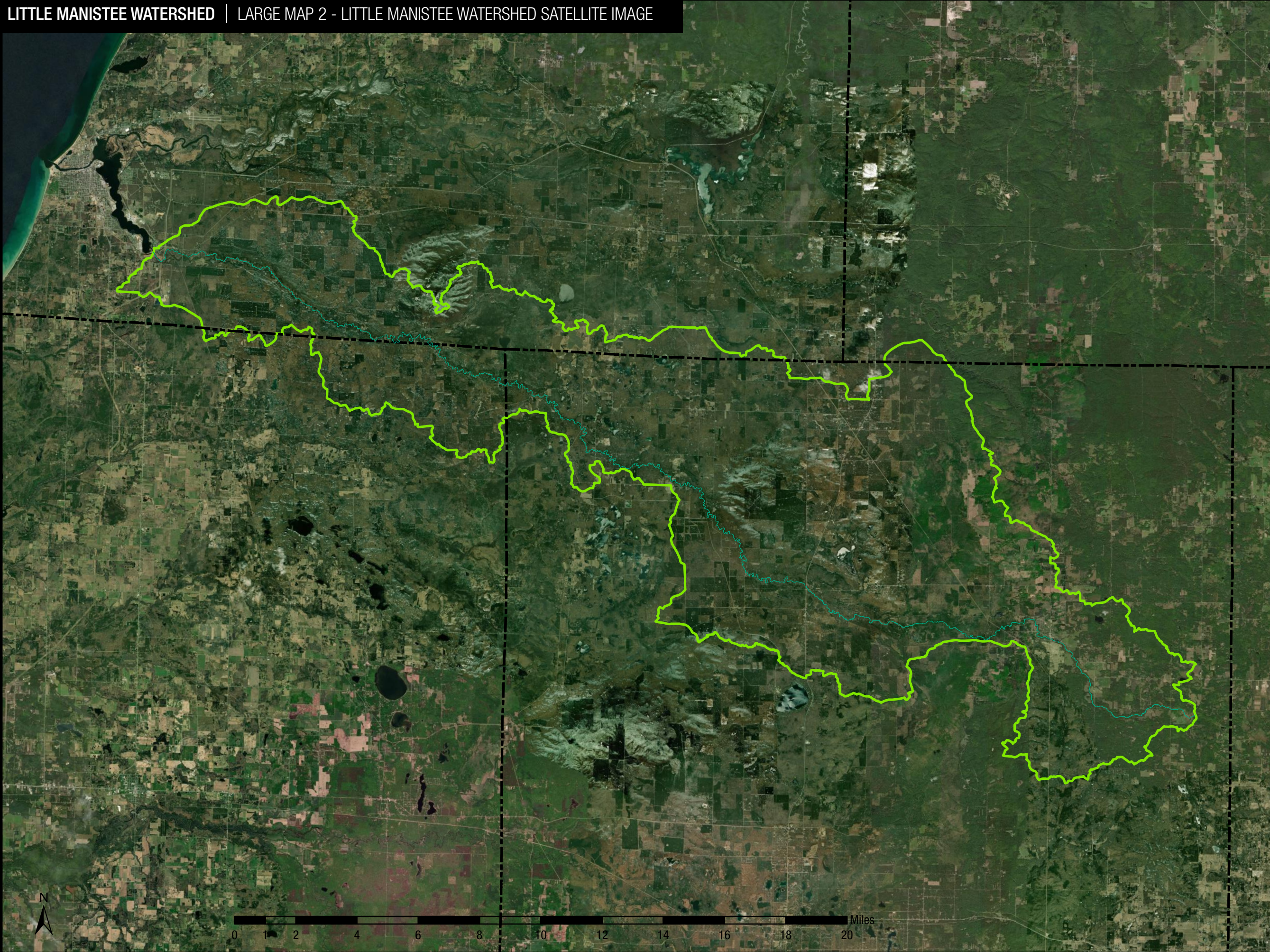


KEY | Imagery Description

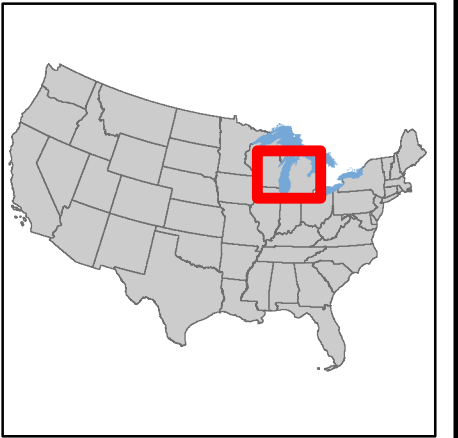
World Imagery provides one meter or better satellite and aerial imagery in many parts of the world and lower resolution satellite imagery worldwide. The map includes 15m TerraColor imagery at small and mid-scales (591M down to 72k) and 2.5m SPOT Imagery (288k to 72k) for the world, and USGS 15m Landsat imagery for Antarctica. The map features 0.3m resolution imagery in the continental United States and 0.6m resolution imagery in parts of Western Europe from Digital Globe. Recent 1m USDA NAIP imagery is available in select states of the US. In other parts of the world, 1 meter resolution imagery is available from GeoEye IKONOS, AeroGRID, and IGN Spain. Additionally, imagery at different resolutions has been contributed by

- FEATURES |**
- Little Manistee River
 - - County Boundary
 - ▭ Little Manistee Watershed Boundary

Source | ESRI
Scale | 1:188,415 Date | 4/30/2020



LOCATOR MAP | Michigan



KEY | LEVEL IV ECOREGIONS

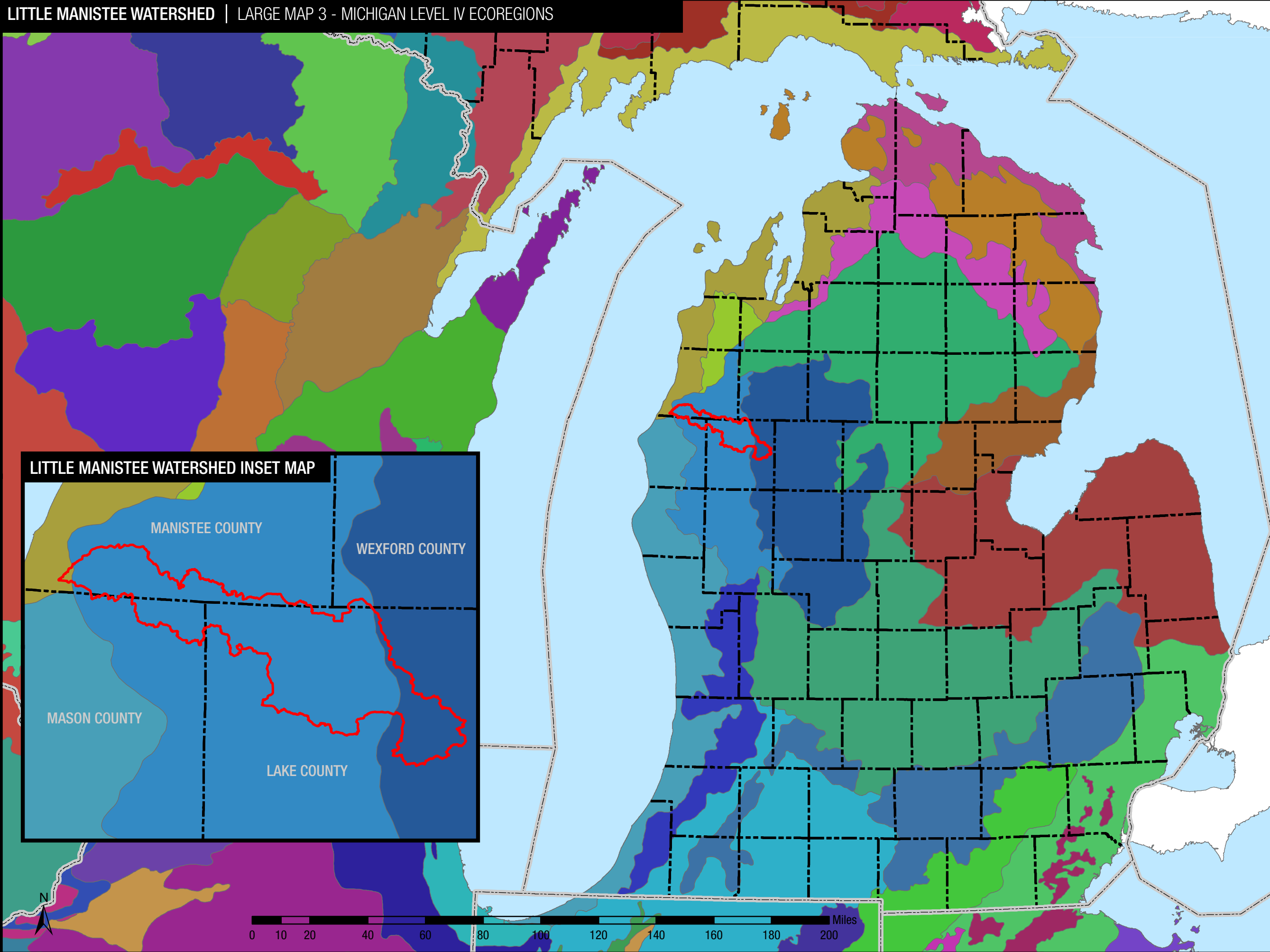
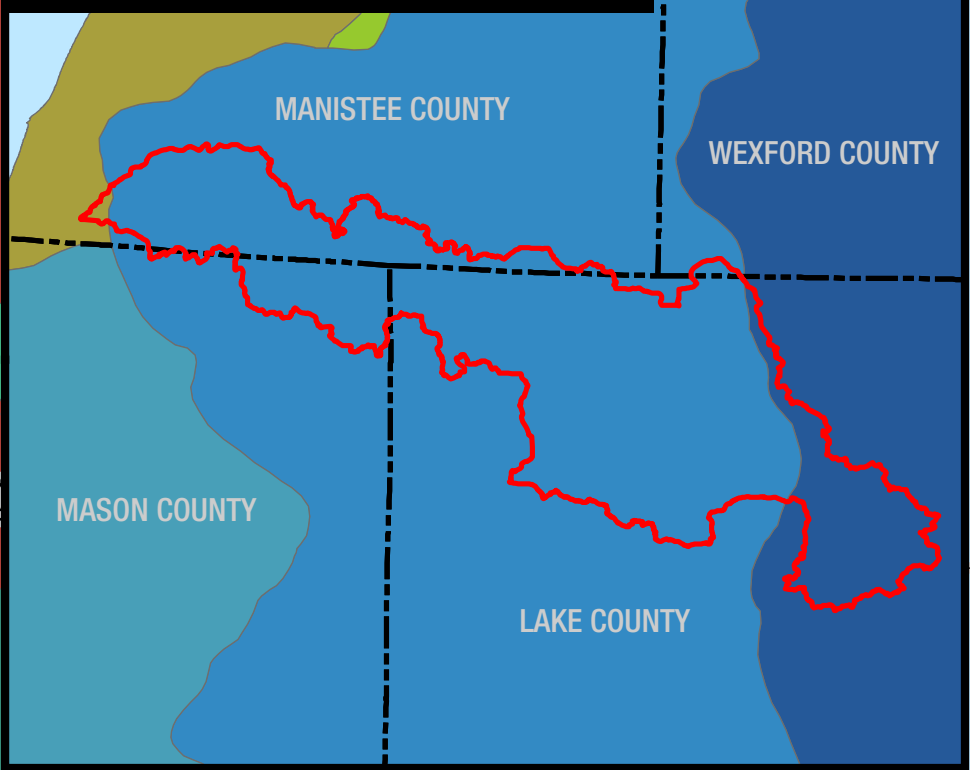
- Cadillac Hummocky Moraines
- Door Peninsula
- Lake Michigan Lacustrine Clay Plain
- Lake Michigan Moraines
- Lansing Loamy Plain
- Manistee-Leelanau Shore
- Michigan Lake Plain
- Mio Plateau
- Newaygo Barrens
- Platte River Outwash
- Saginaw Lake Plain
- Tawas Lake Plain
- Vanderbilt Moraines

FEATURES |

- Little Manistee Watershed Boundary
- State Boundary
- County Boundary

Source | EPA
Scale | 1:2,000,000 Date | 4/29/2020

LITTLE MANISTEE WATERSHED INSET MAP



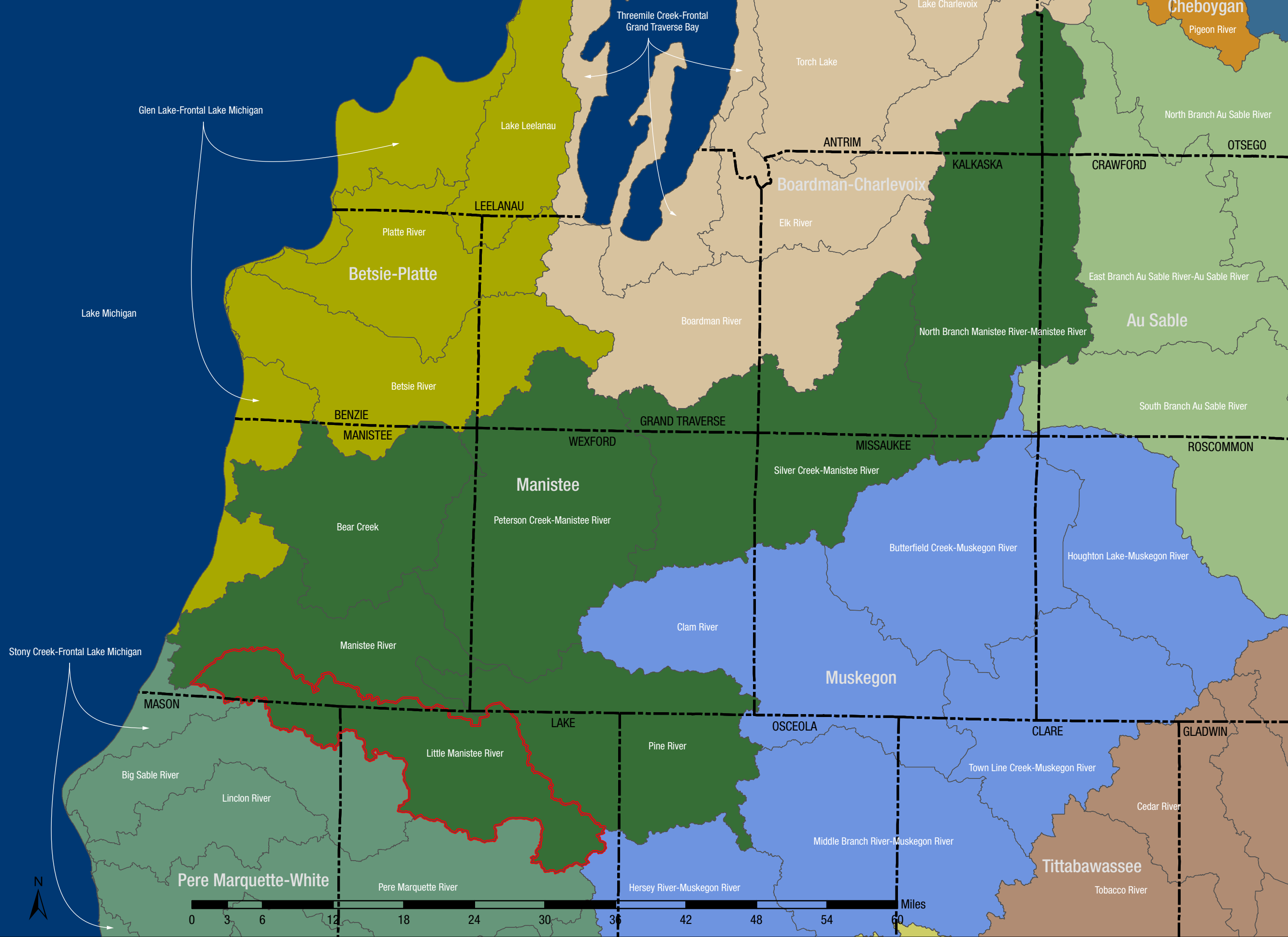


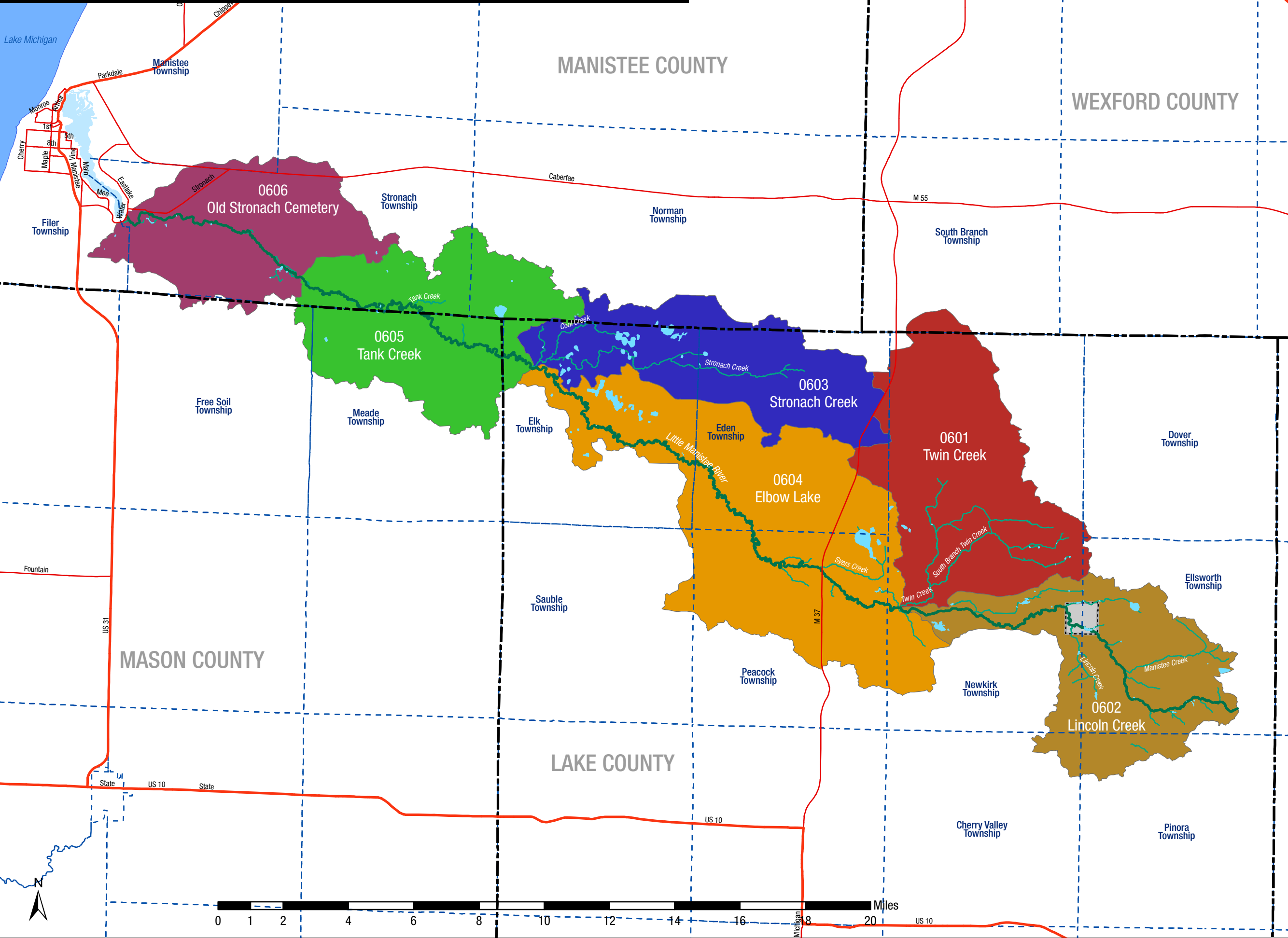
KEY | SUBWATERSHEDS

- Au Sable
- Betsie-Platte
- Black
- Boardman-Charlevoix
- Cheboygan
- Lake Michigan
- Manistee
- Muskegon
- Pere Marquette-White
- Pine
- Tittabawassee

FEATURES |

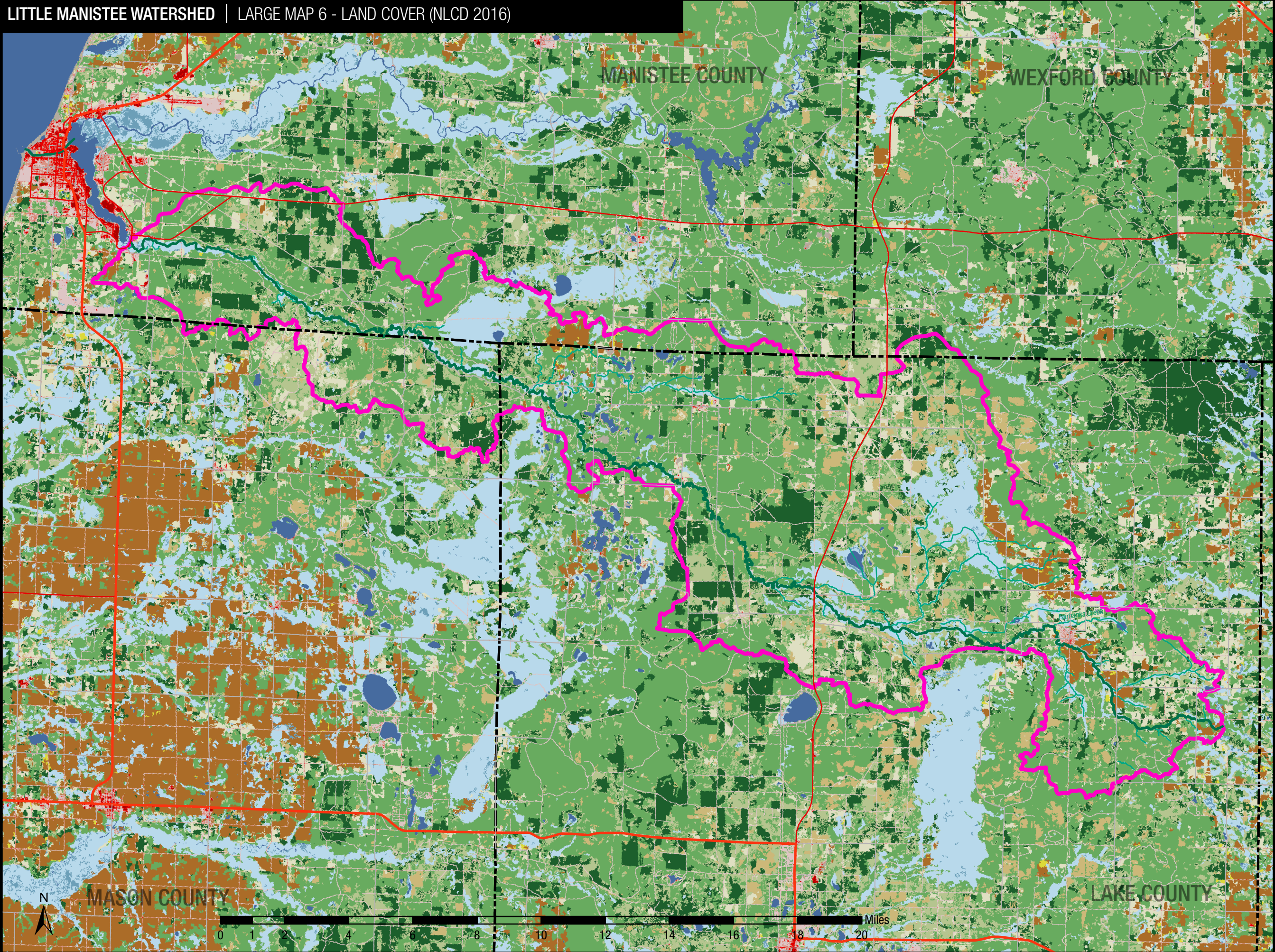
- County Boundary
- HUC 10 Watersheds
- Little Manistee Watershed Boundary





- KEY | SUBWATERSHEDS**
- HUC 12 Subwatersheds
- Elbow Lake
 - Lincoln Creek
 - Old Stronach Cemetery
 - Stronach Creek
 - Tank Creek
 - Twin Creek

- FEATURES |**
- Other Principal Arterial Road
 - Minor Arterial Road
 - County Boundary
 - Township Boundary
 - LMW Lakes
 - Manistee Lake
 - Lake Michigan
 - Little Manistee River
 - LMW Tributaries
 - Luther

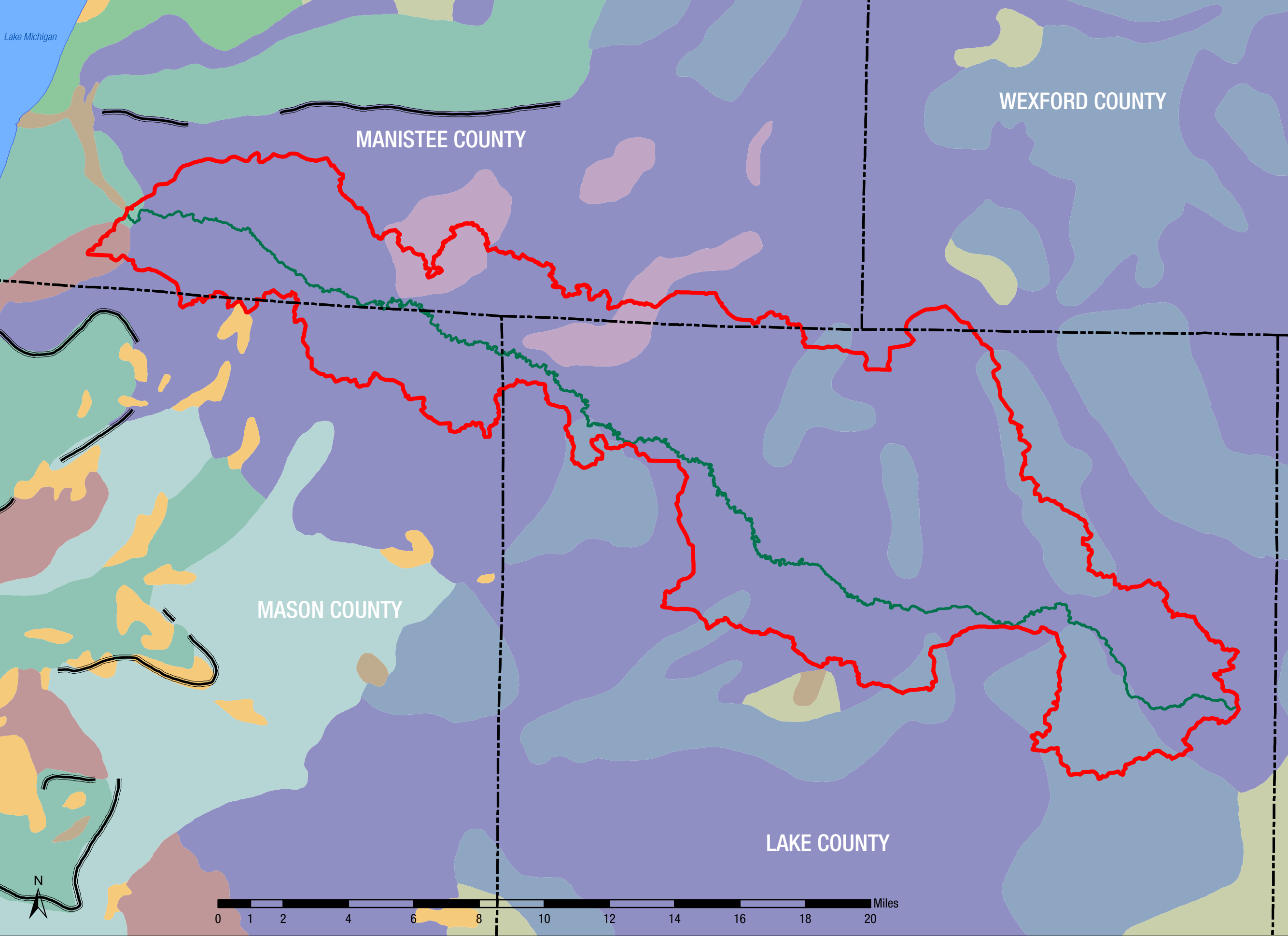


- KEY | LAND COVER CLASS
- Barren Land
 - Cultivated Crops
 - Deciduous Forest
 - Developed, High Intensity
 - Developed, Low Intensity
 - Developed, Medium Intensity
 - Developed, Open Space
 - Emergent Herbaceous Wetlands
 - Evergreen Forest
 - Hay/Pasture
 - Herbaceous
 - Mixed Forest
 - Open Water
 - Perennial Snow/Ice
 - Shrub/Scrub
 - Unclassified
 - Woody Wetlands

Anderson Level II Classification System

- FEATURES |
- Other Principal Arterial
 - Minor Arterial
 - Major Collector
 - County Boundary
 - Little Manistee River
 - LMW Tributaries
 - Little Manistee Watershed Boundary

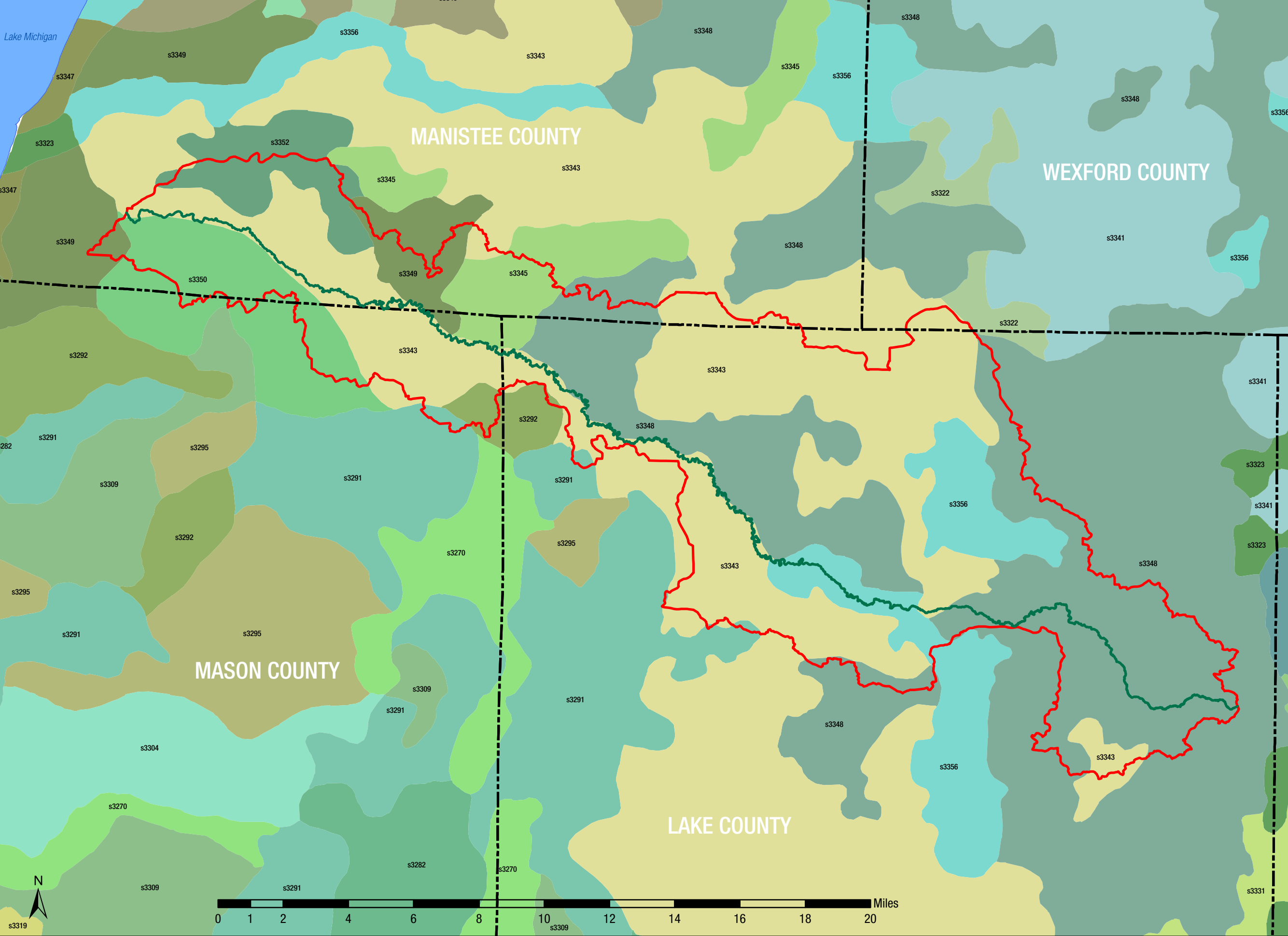
Source | MRLC
Scale | 1:180,000 Date | 4/29/2020



- KEY | QUATERNARY TYPE**
- Coarse-textured glacial till
 - Dune sand
 - End moraines of coarse-textured till
 - End moraines of fine-textured till
 - End moraines of medium-textured till
 - Fine-textured glacial till
 - Glacial outwash sand and gravel and postglacial alluvium
 - Ice-contact outwash sand and gravel
 - Lacustrine sand and gravel
 - Water

- FEATURES |**
- Quaternary Feature: Shoreline
 - County Boundary
 - Little Manistee Watershed Boundary
 - Little Manistee River
 - Lake Michigan

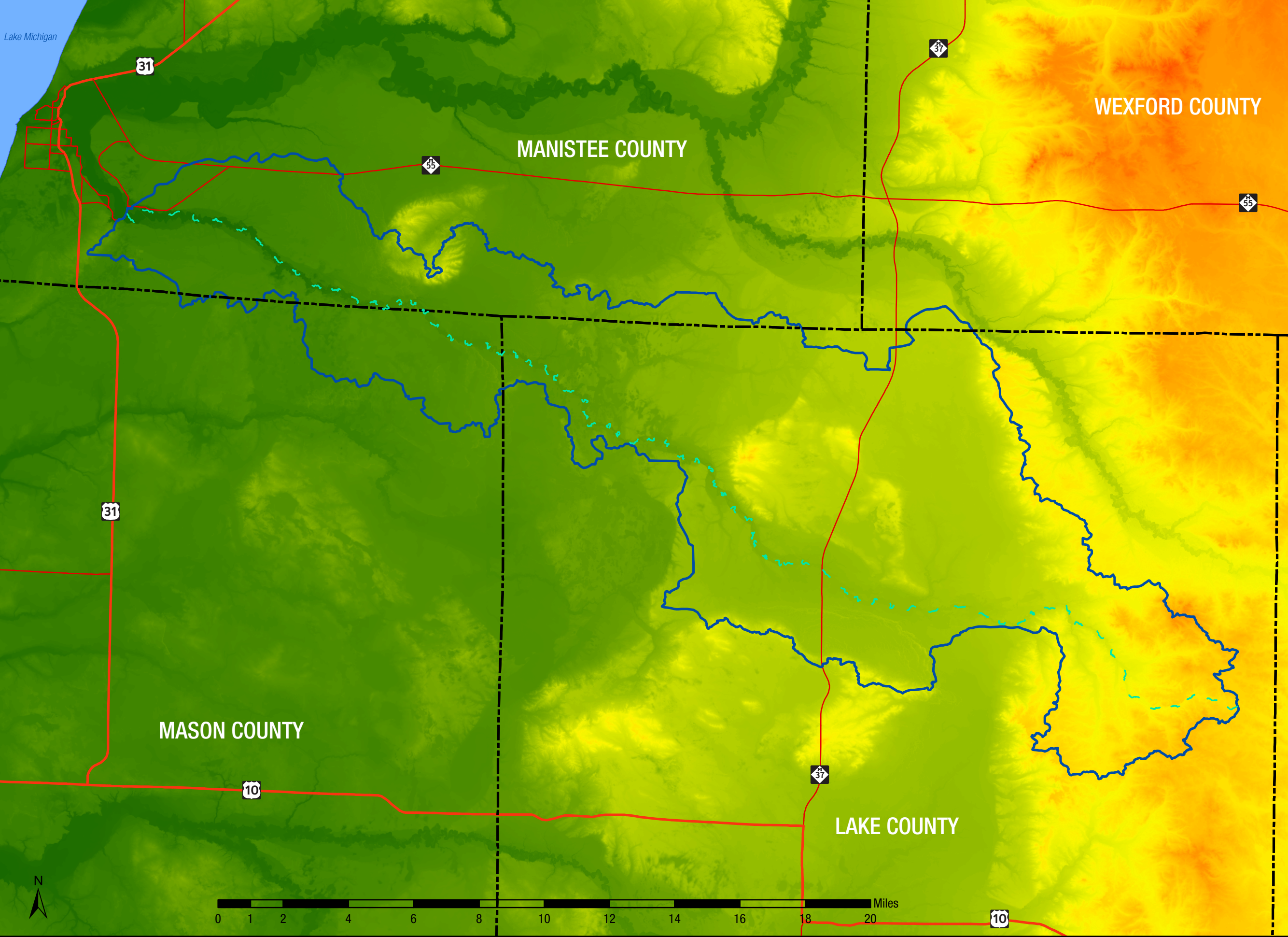
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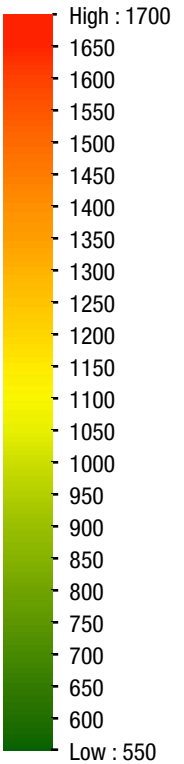
- KEY | SOIL TYPE**
- Grayling (s3352)
 - Grayling-Graycalm (s3343)
 - Houghton-Carlisle-Adrian (s3270)
 - Kalkaska (s3341)
 - Kingsville-Granby (s3292)
 - Leelanau-Kalkaska-Emmet (s3340)
 - Menominee-Markey (s3334)
 - Montcalm-Emmet (s3331)
 - Montcalm-Kalkaska-Graycalm (s3339)
 - Nester (s3323)
 - Nester-Kawkawlin (s3322)
 - Perrinton-Ithaca-Coloma (s3295)
 - Pipestone-Grattan (s3291)
 - Rubicon-Croswell-Au Gres (s3351)
 - Rubicon-East Lake (s3349)
 - Rubicon-Grayling (s3350)
 - Rubicon-Montcalm-Graycalm (s3348)
 - Spinks-Perrinton-Miami-Metea (s3319)
 - Spinks-Plainfield-Metea-Chelsea (s3282)
 - Spinks-Remus-Coloma (s3309)
 - Tawas-Roscommon-Au Gres (s3345)
 - Tawas-Roscommon-Cathro (s3356)
 - Udipsamments-Eastport-Deer Park (s3347)
 - Wixom-Tappan-Londo-Avoca (s3304)

- FEATURES |**
- Little Manistee River
 - County Boundary
 - Lake Michigan
 - Little Manistee Watershed Boundary

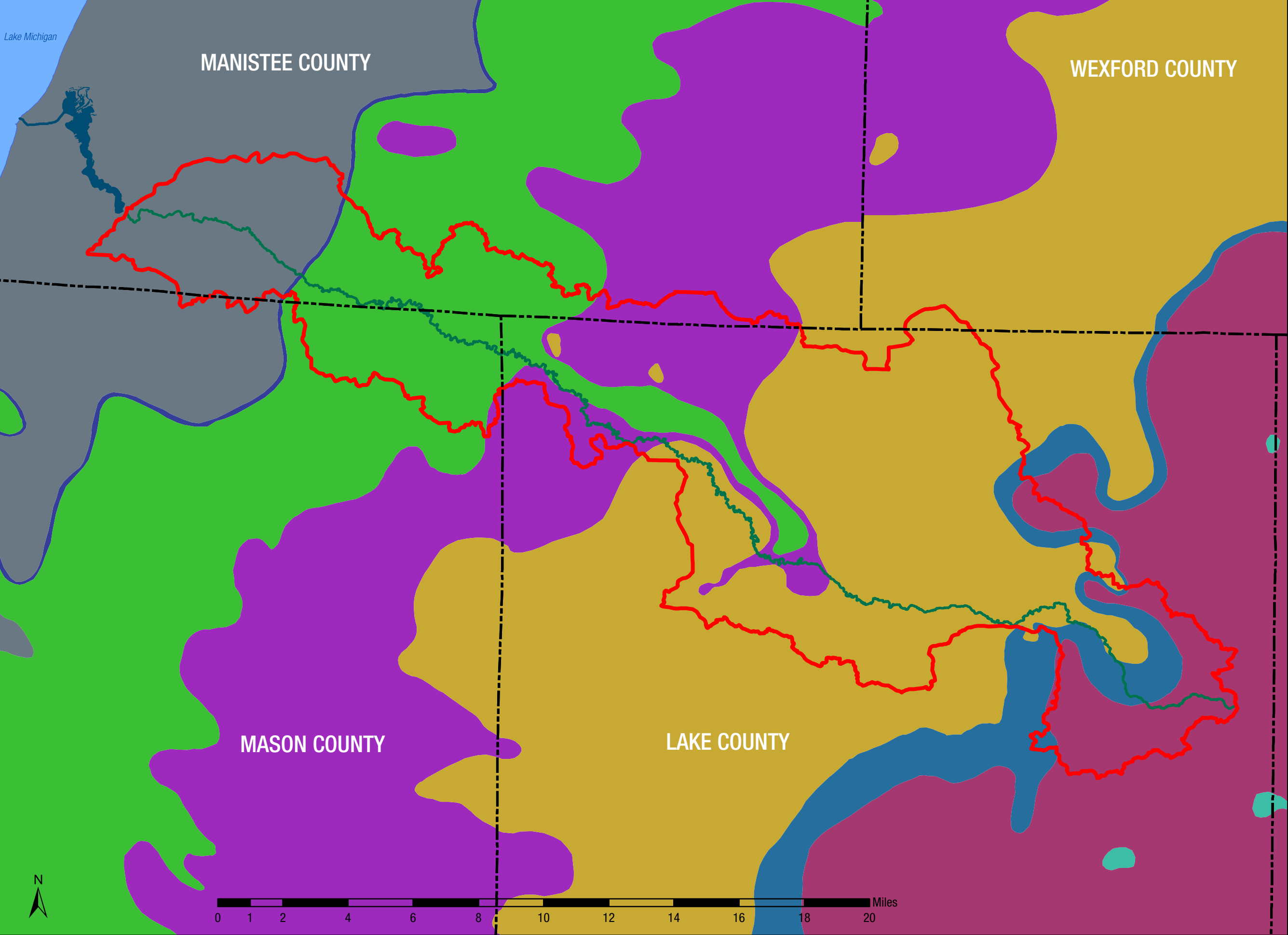
Source | USDA - NRCS
Scale | 1:180,000 Date | 5/14/2020



KEY | ELEVATION (Feet)



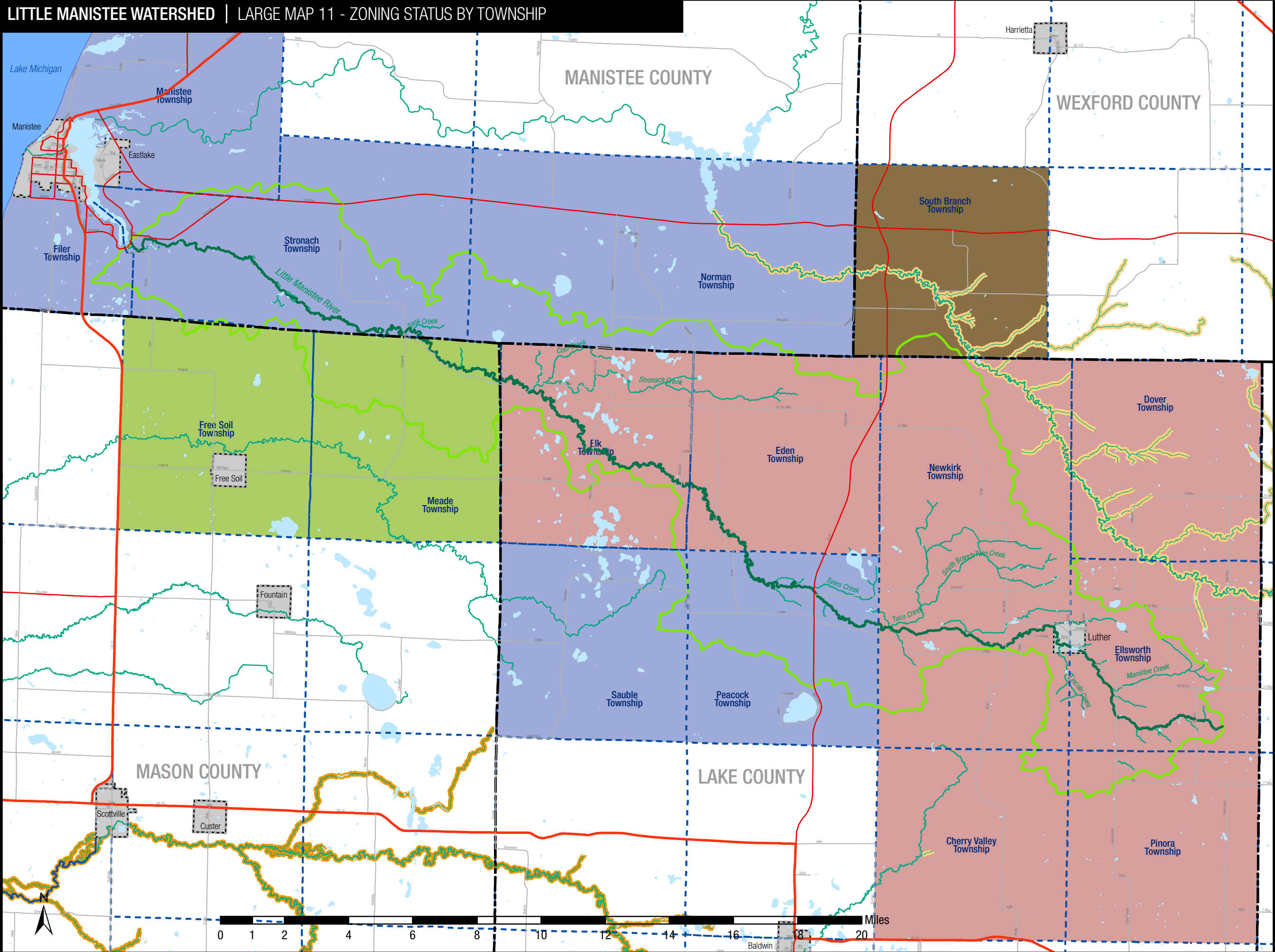
- FEATURES |
- Little Manistee River
 - County Boundary
 - Lake Michigan
 - Little Manistee Watershed Boundary
 - Roads - Other Principal Arterial
 - Roads - Minor Arterial



- KEY | BEDROCK TYPE
- BAYPORT LIMESTONE
 - COLDWATER SHALE
 - ELLSWORTH SHALE
 - MARSHALL FORMATION
 - MICHIGAN FORMATION
 - RED BEDS
 - SAGINAW FORMATION
 - SUNBURY SHALE

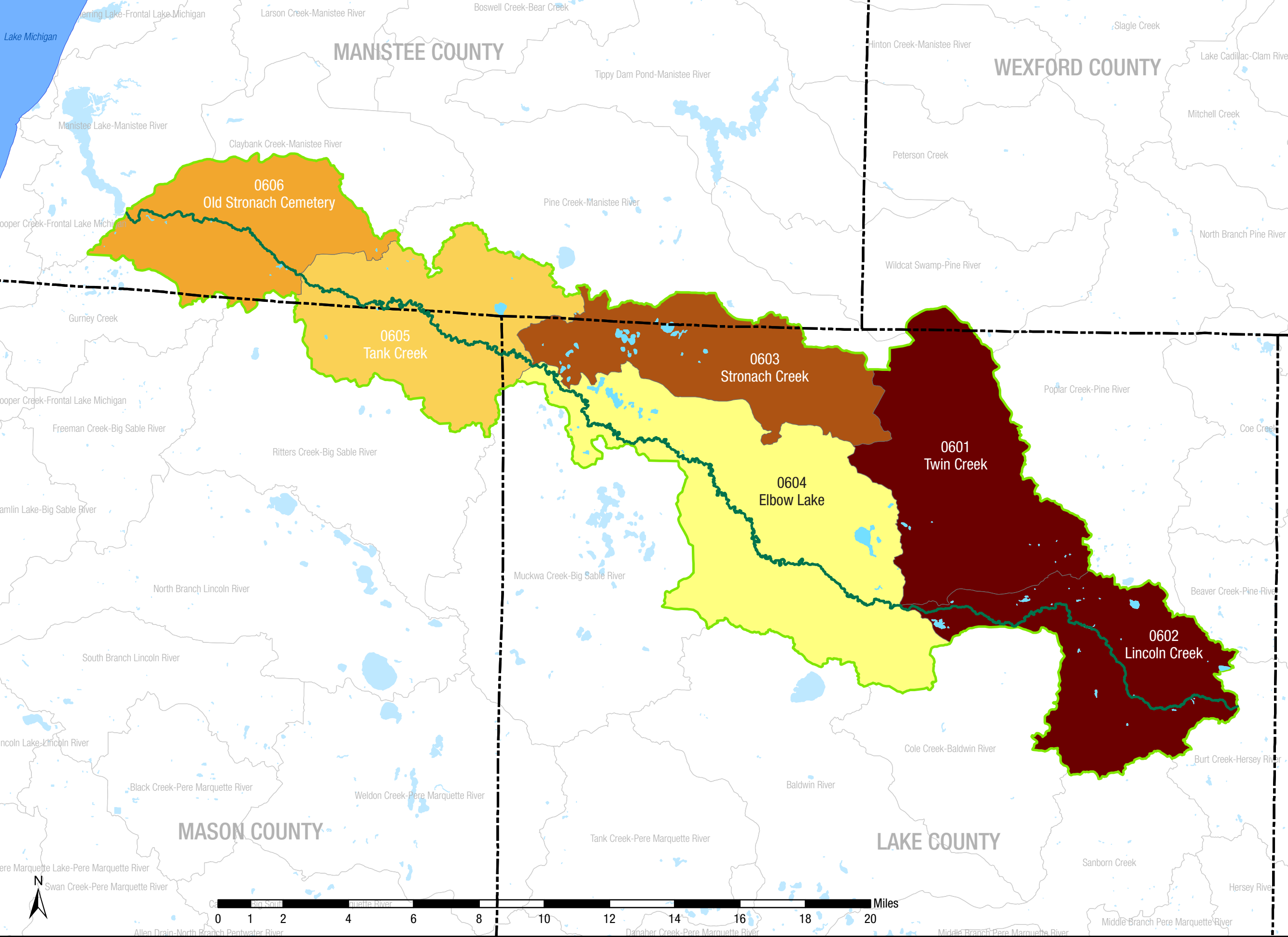
- FEATURES |
- County Boundary
 - Little Manistee Watershed Boundary
 - Little Manistee River
 - Manistee River
 - Manistee Lake
 - Lake Michigan

Source | Michigan GIS Open Data
Scale | 1:180,000 Date | 5/13/2020



- KEY | LAND USE REGULATION**
- Pere Marquette Natural River District
 - Pine River Natural River District
 - Township Zoning
 - County Administered Zoning
 - Joint Planning & Zoning
 - Not Zoned
 - Incorporated Cities & Villages

- FEATURES |**
- Other Principal Arterial
 - Minor Arterial
 - Major Collector
 - County Boundary
 - Township Boundary
 - Inland Lakes
 - Little Manistee River
 - LMW Tributaries
 - Area Rivers
 - Lake Michigan
 - Little Manistee Watershed Boundary



LEGEND

LOCATOR MAP | Michigan



KEY | P RATE (KG/HECT)

- 0.002000
- 0.002001 - 0.003000
- 0.003001 - 0.004000
- 0.004001 - 0.005000
- 0.005001 - 0.012000

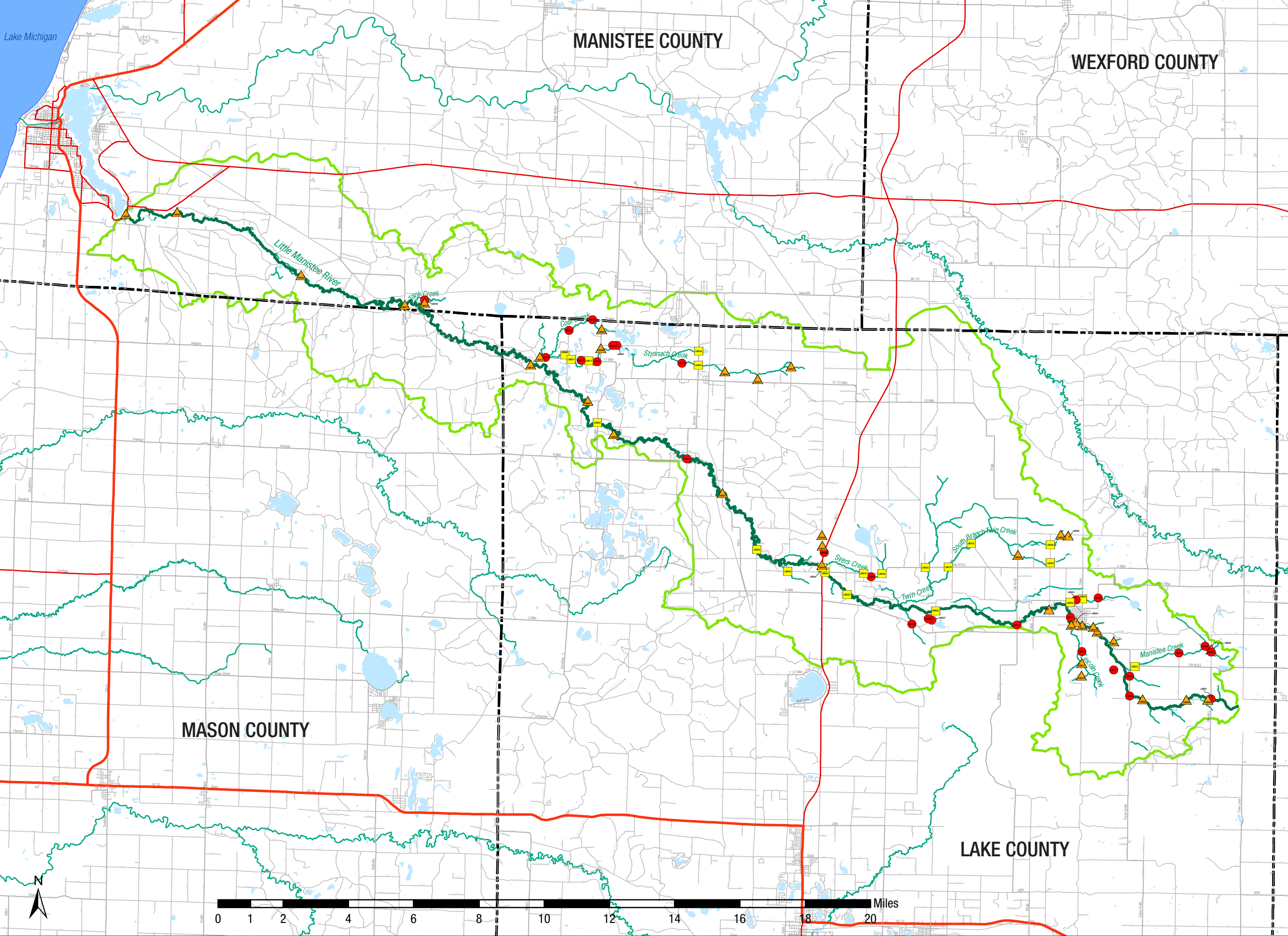
FEATURES |

- Little Manistee River
- County Boundary
- LMW Lakes
- Lake Michigan
- Little Manistee Watershed Boundary

Source | USDA - NRCS

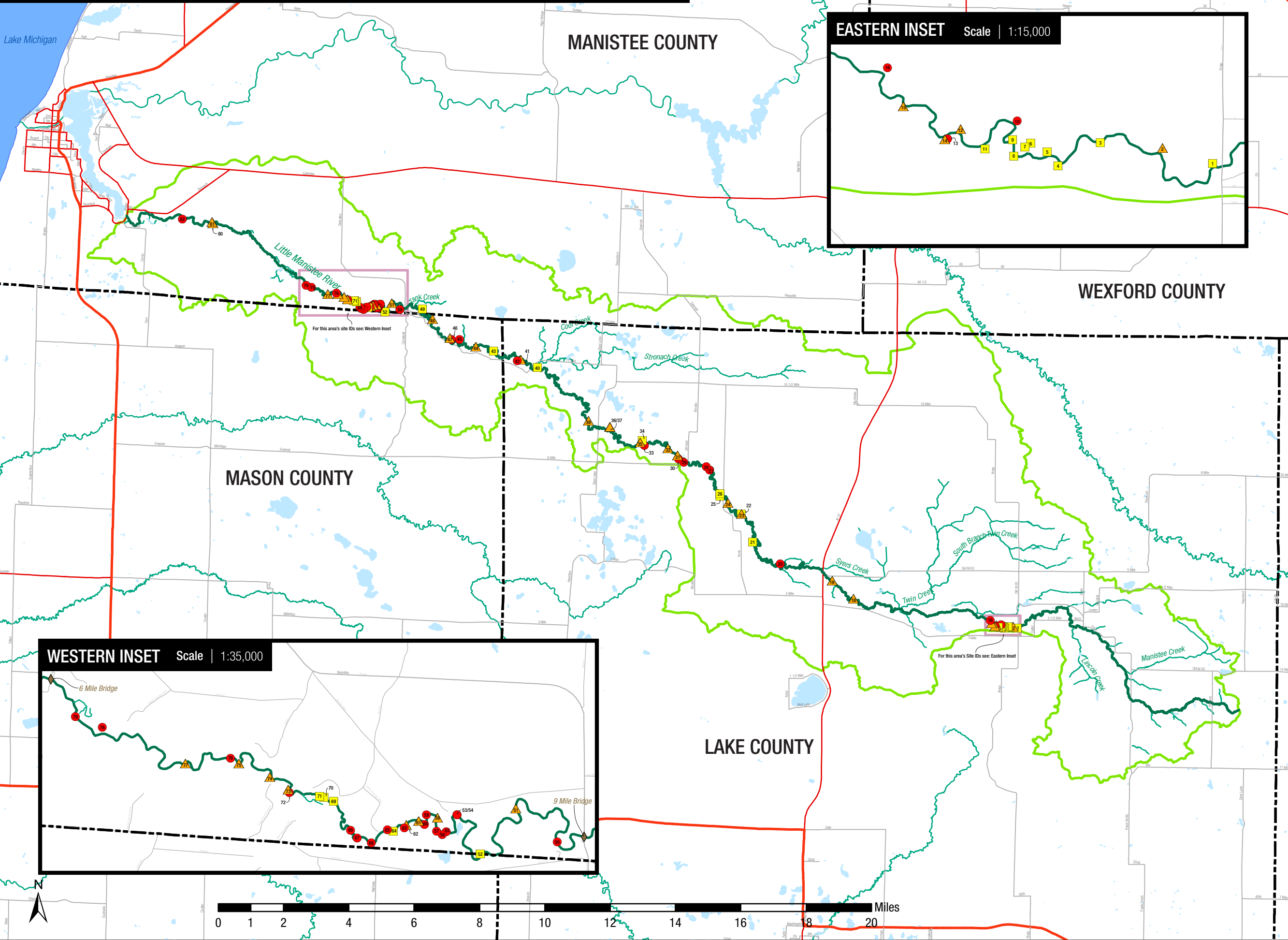
Scale | 1:180,000

Date | 4/30/2020



- KEY | Crossing Severity**
- Minor
 - Moderate
 - Severe

- FEATURES |**
- Little Manistee River
 - Other Principal Arterial
 - Minor Arterial
 - Major Collector
 - Local Roads
 - County Boundary
 - Inland Lakes
 - Area Rivers
 - Lake Michigan
 - Little Manistee Watershed Boundary



KEY | Erosion Severity

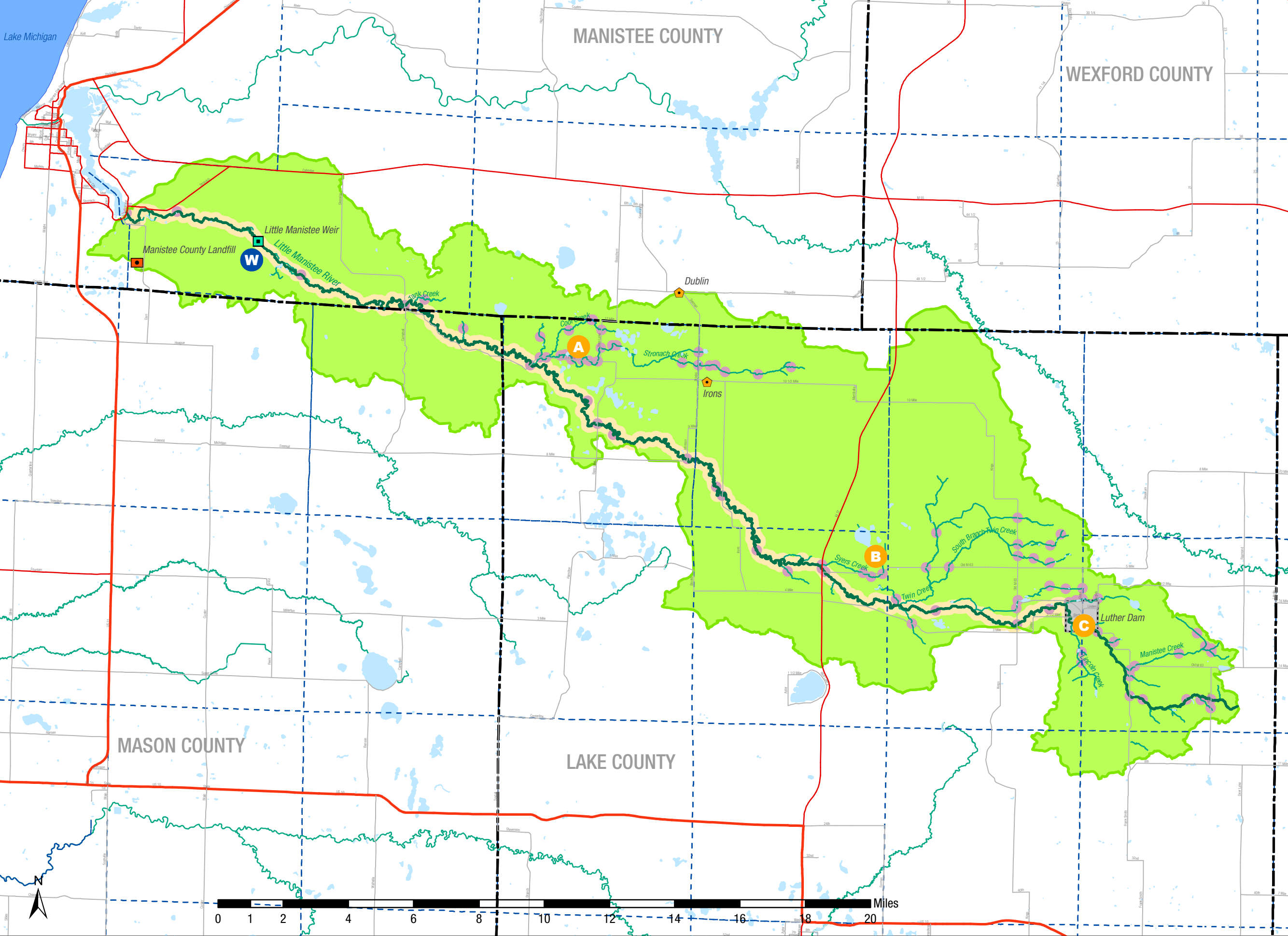
- Minor
- Moderate
- Severe

Site ID 17 not mapped due to incomplete latitude and longitude data for the site.

Streambank erosion site offsets from river channel at inset scale is due to positional errors from a lower river survey point resolution.

FEATURES |

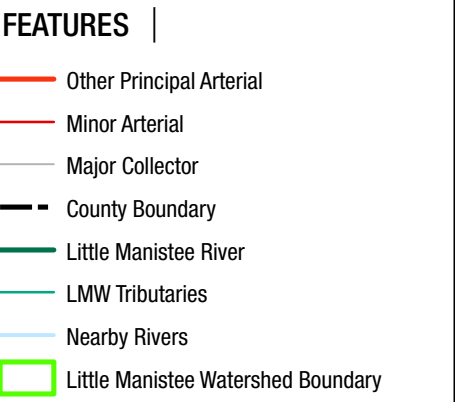
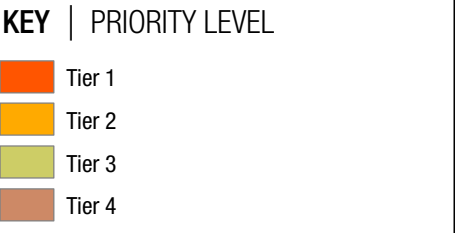
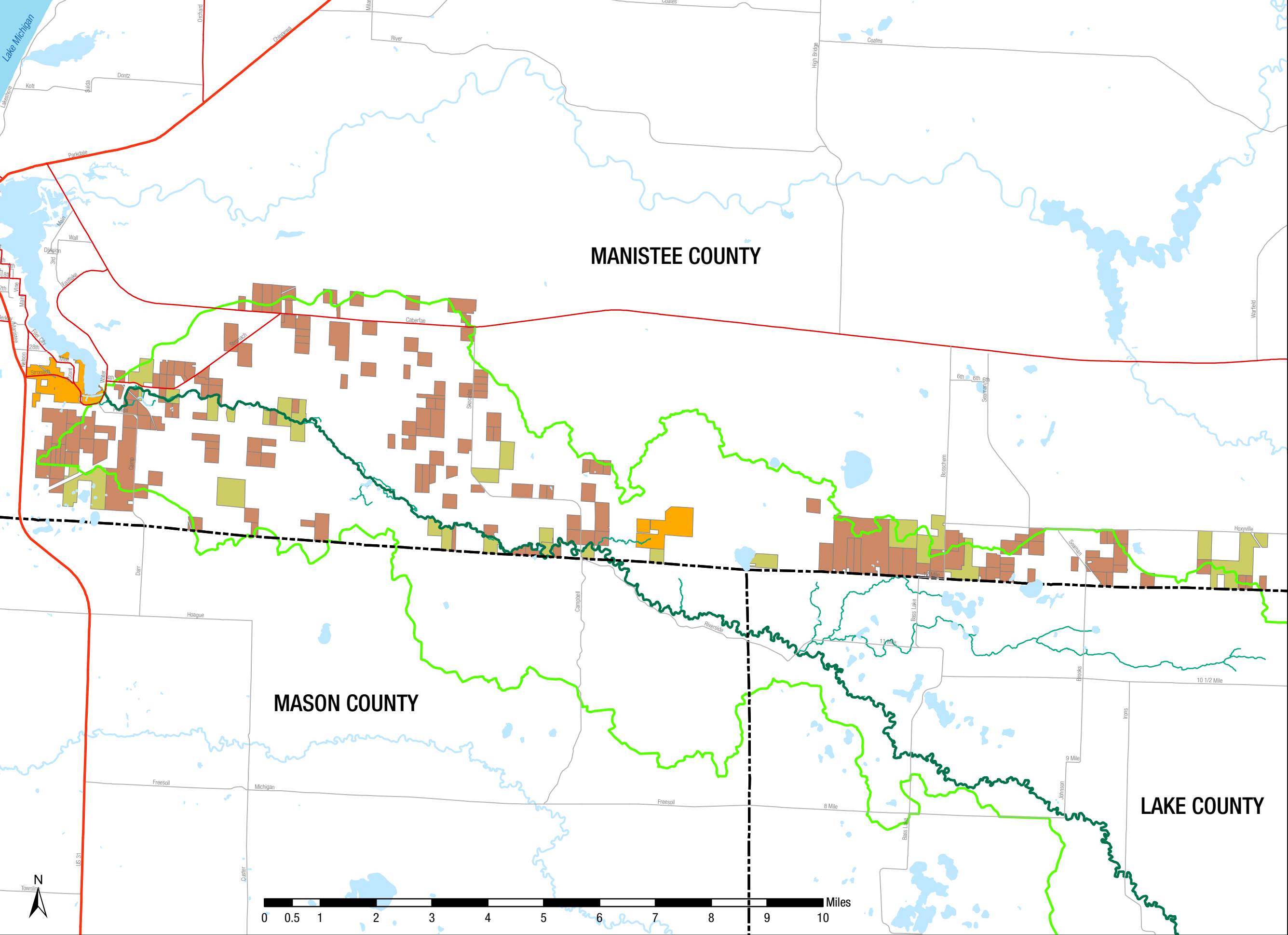
- Little Manistee River
- Other Principal Arterial
- Minor Arterial
- Major Collector
- County Boundary
- Inland Lakes
- Area Rivers
- Lake Michigan
- Little Manistee Watershed Boundary

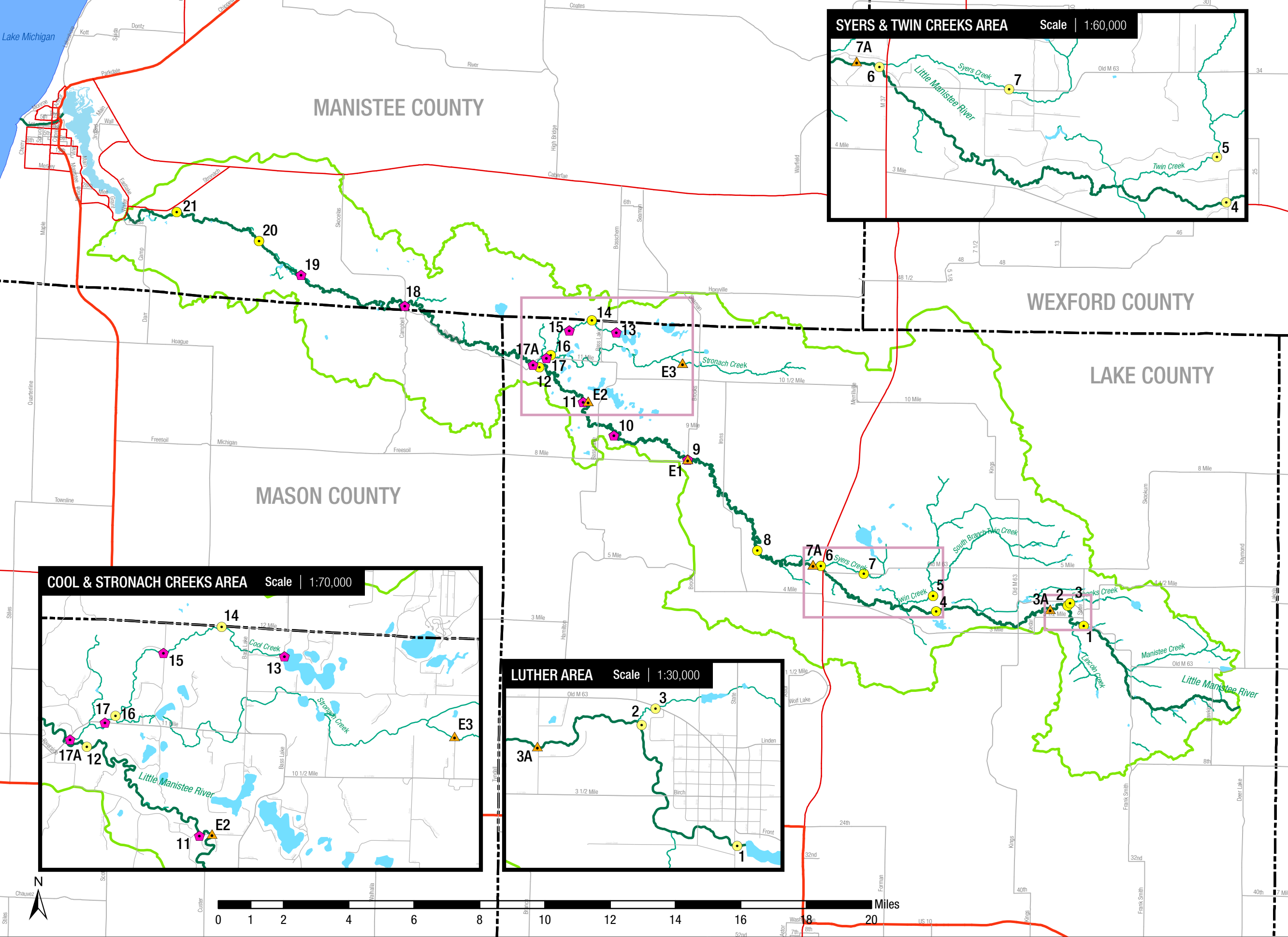


- KEY | CRITICAL/PRIORITY AREAS
- Critical Areas
- A** Cool/Stronach Creeks
 - B** Syers Lake and Creek
 - C** Luther Millpond Dam
 - Road Stream Crossings
 - Little Manistee Streambank Erosion
- Priority Areas
- W** Little Manistee Weir

- FEATURES |
- Fish Weir
 - Land Fill Facility
 - Unincorporated Place
 - Roads-Other Principal Arterial
 - Roads-Minor Arterial
 - Roads-Major Collector
 - County Boundary
 - - - Township Boundary
 - Inland Lakes
 - Lake Michigan
 - Little Manistee River
 - LMW Tributaries
 - Area Rivers
 - Little Manistee Watershed Boundary
 - Luther

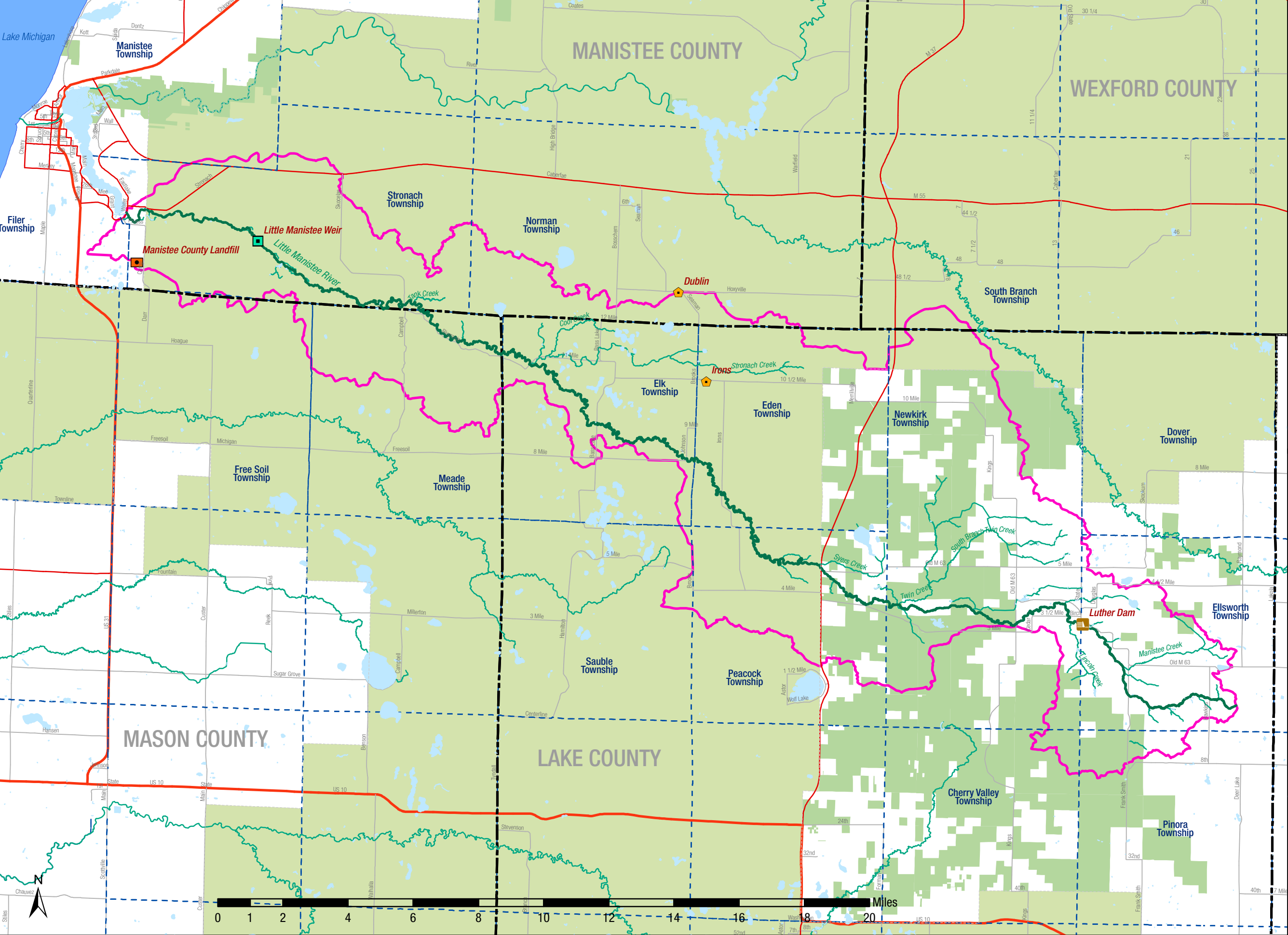
Source | EPA/MDEQ/MDOT/US Census
Scale | 1:180,000 Date | 5/1/2020



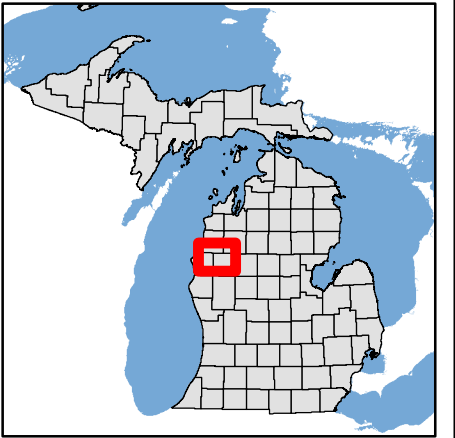


- KEY | MONITORING SITES**
- ▲ Macroinvertebrates
 - Water Quality
 - ◆ Water Quality/Macroinvertebrates

- FEATURES |**
- Other Principal Arterial
 - Minor Arterial
 - Major Collector
 - County Boundary
 - LMW Lakes
 - Little Manistee River
 - LMW Tributaries
 - Lake Michigan
 - Little Manistee Watershed Boundary



LOCATOR MAP | Michigan



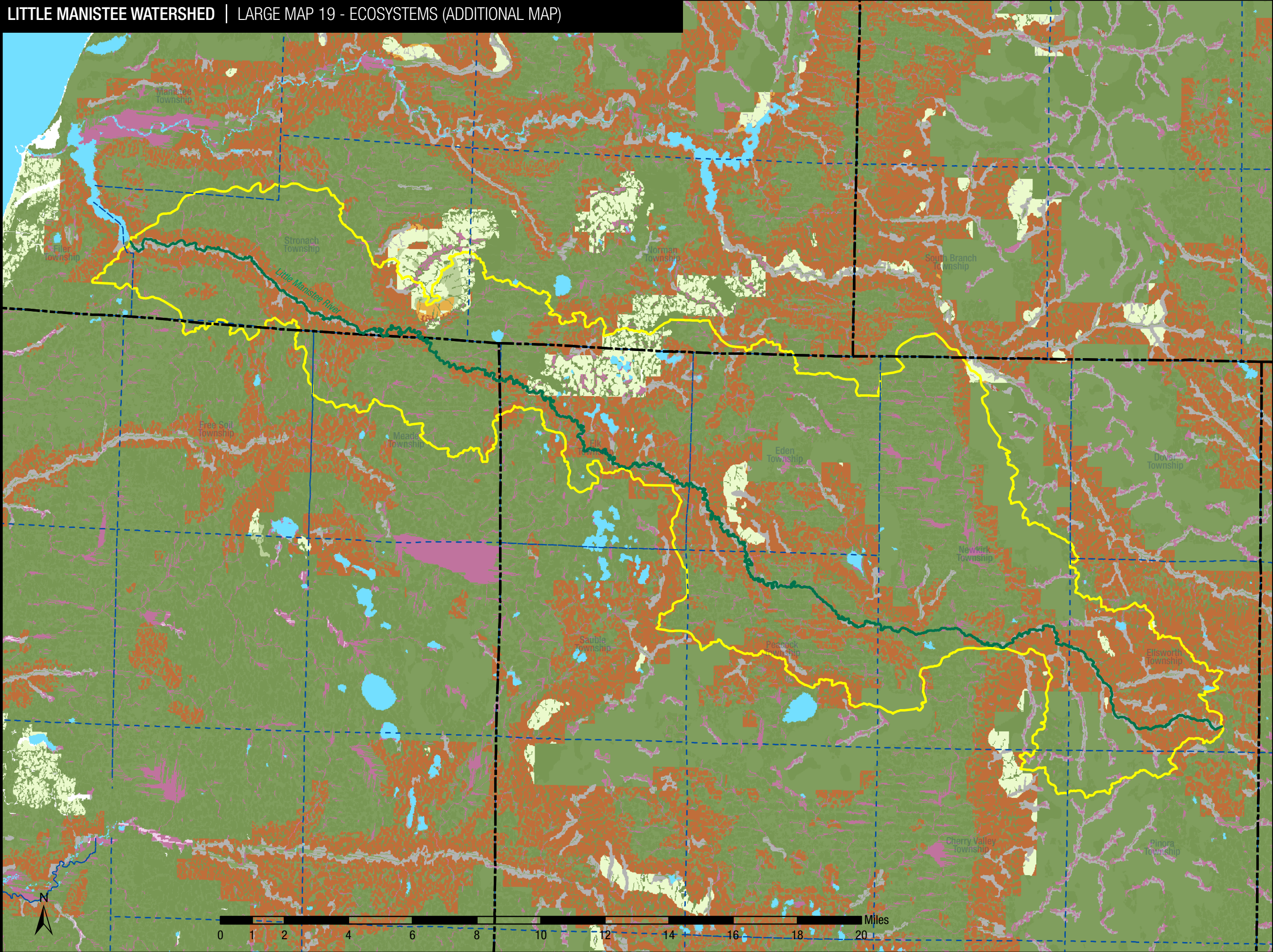
KEY | FOREST AREAS

- State Forest
- National Forest

FEATURES |

- National Forest Boundary
- Inland Lakes
- Little Manistee River
- LMW Tributaries
- Area Rivers
- County Boundary
- Township Boundary
- Roads-Other Principal Arterial
- Roads-Minor Arterial
- Roads-Major Collector
- Lake Michigan
- Little Manistee Watershed Boundary

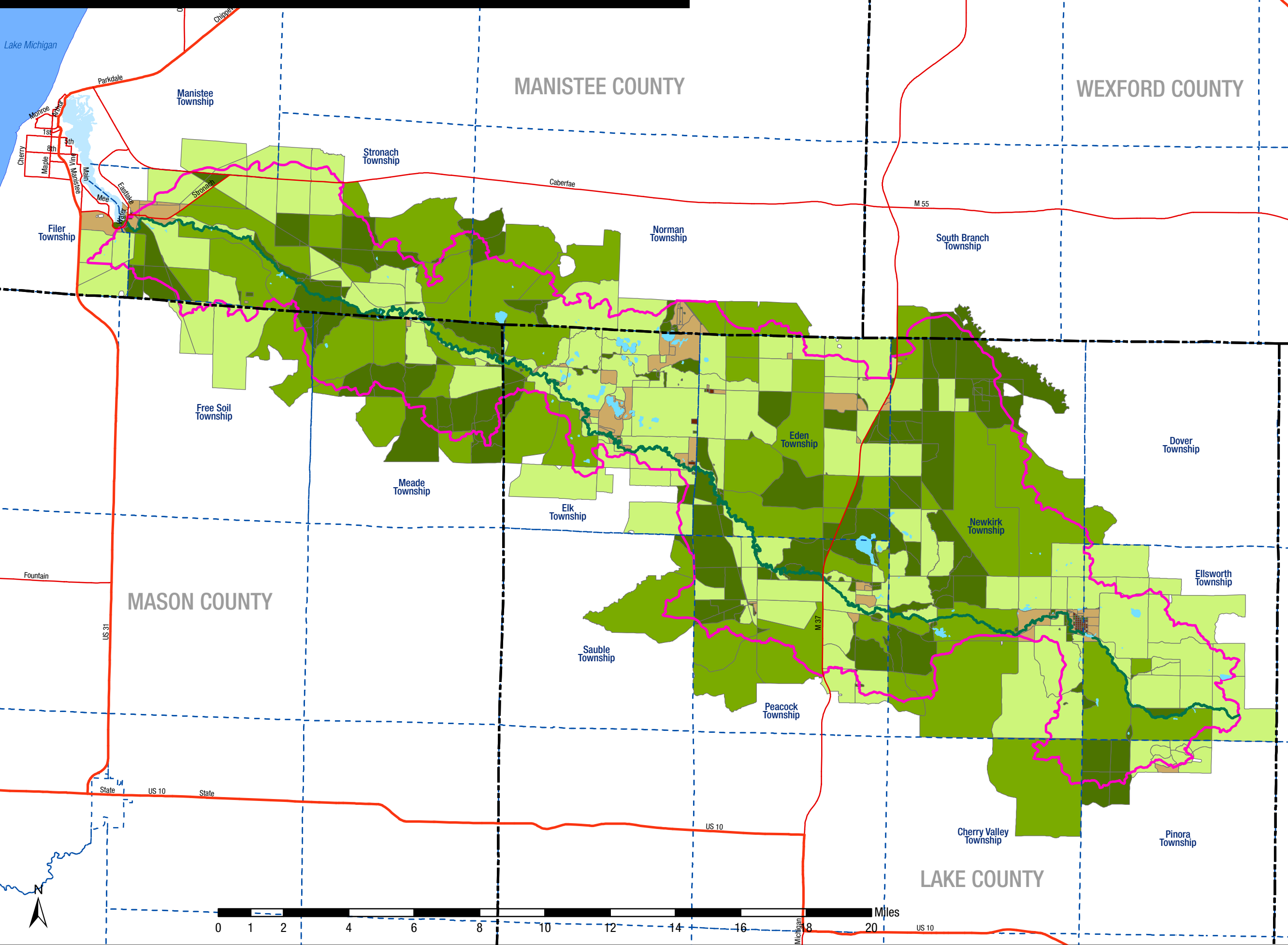
Source | EPA/MDEQ/MDOT/US Census
 Scale | 1:180,000 Date | 5/1/2020



- KEY | ECOLOGICAL LAND UNITS**
- Boreal Jack Pine-Black Spruce Forest
 - Laurentian Acidic Rocky
 - Laurentian-Acadian Northern Pine-(Oak) Forest
 - Laurentian Pine-Oak Barrens
 - Laurentian-Acadian Floodplain Forest
 - Laurentian-Acadian Alkaline Conifer-Hardwood Swamp
 - Northern Appalachian-Acadian Conifer-Hardwood Acidic Swamp
 - Laurentian-Acadian Calcareous Rocky Outcrop
 - Laurentian-Acadian Acidic Cliff and
 - Laurentian-Acadian Northern Hardwoods Forest
 - Laurentian-Acadian Pine-Hemlock-Hardwood Forest
 - Laurentian-Acadian Wet Meadow-Shrub Swamp
 - Water

- FEATURES |**
- Little Manistee River
 - County Boundary
 - Township Boundary
 - Little Manistee Watershed Boundary

Source | GEO/USGS
Scale | 1:180,000 Date | 4/29/2020



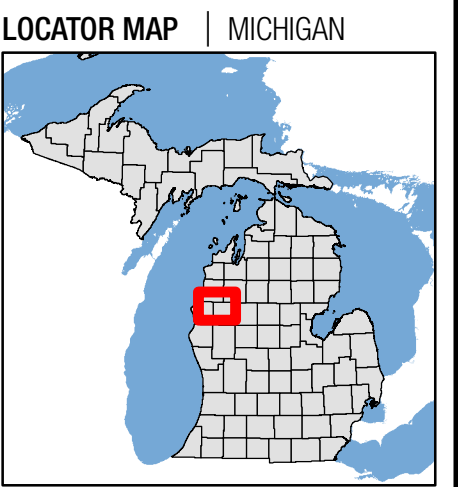
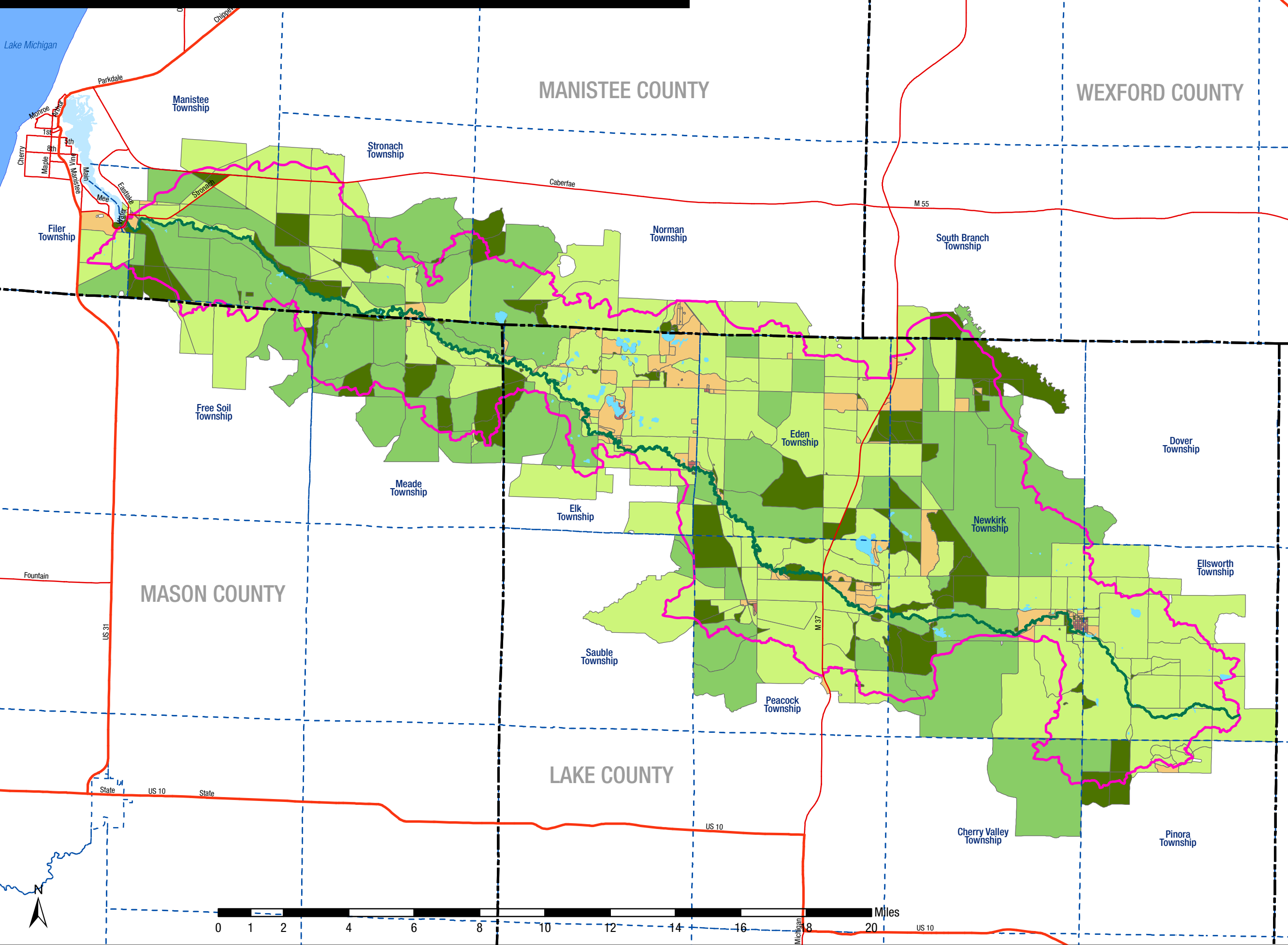
KEY | CENSUS BLOCK DENSITY

0.000000 - 0.000999
0.001000 - 0.009999
0.010000 - 0.099999
0.100000 - 0.999999
1.000000 - 10.000000

Density: People per Acre by Census Block

- FEATURES |**
- Other Principal Arterial Road
 - Minor Arterial Road
 - County Boundary
 - Township Boundary
 - LMW Lakes
 - Manistee Lake
 - Lake Michigan
 - Little Manistee River
 - Little Manistee Watershed Boundary

Source | 2010 US Census
Scale | 1:180,000 Date | 5/6/2020



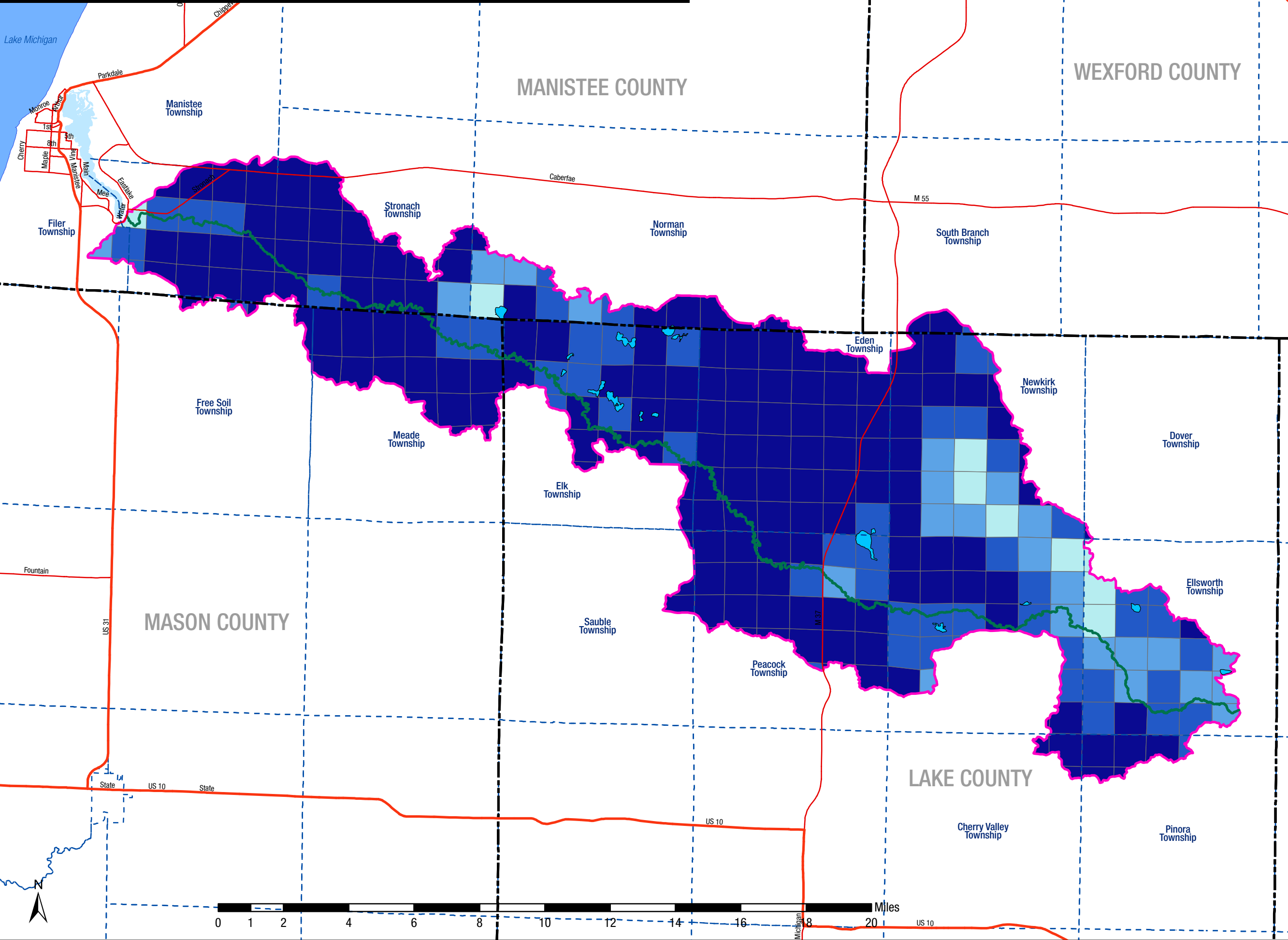
KEY | CENSUS BLOCK DENSITY

0.000000 - 0.000999
0.001000 - 0.009999
0.010000 - 0.099999
0.100000 - 0.999999
1.000000 - 5.000000

Density: Housing Units per Acre by Census Block

- FEATURES |**
- Other Principal Arterial Road
 - Minor Arterial Road
 - County Boundary
 - Township Boundary
 - LMW Lakes
 - Manistee Lake
 - Lake Michigan
 - Little Manistee River
 - Little Manistee Watershed Boundary

Source | 2010 US Census
Scale | 1:180,000 Date | 6/2/2020



KEY | GROUNDWATER RECHARGE

Lightest Blue	9 - 10
Light Blue	11 - 12
Medium Blue	13 - 14
Dark Blue	15 - 16

Color scale indicates Groundwater Recharge rate in inches per year.
(Cell Size: 1 Square Mile)

- FEATURES |**
- Other Principal Arterial Road
 - Minor Arterial Road
 - County Boundary
 - Township Boundary
 - LMW Lakes >10 acres
 - Manistee Lake
 - Lake Michigan
 - Little Manistee River
 - Little Manistee Watershed Boundary

Source | MDEQ, USGS, MSU
Scale | 1:180,000 Date | 6/2/2020