

Little Manistee Management Survey 2023

Report of Results



"Little Manistee River Scene" by JimFlix,
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Executive Summary

The Little Manistee Management Survey was conducted by the Grand Valley State University (GVSU) Social Science Lab on behalf of the Little Manistee Watershed Conservation Council (LMWCC) to gather input from watershed residents on local water quality and a proposed Michigan Department of Natural Resources (DNR) Natural Rivers Program (NRP) designation for the Little Manistee River.

The LMWCC is a non-profit conservation organization that completes a variety of restoration projects in the Little Manistee River watershed to preserve the natural character of the river and assist landowners with resolving management challenges. The LMWCC coordinates a volunteer network of river stewards who assist with restoration projects and water quality monitoring.

The Social Science Lab is an applied research center at GVSU that helps people solve problems. The lab assists community organizations engaged in stewardship efforts with making targeted, strategic investments that consider community members' values, concerns, and behaviors. We aim to incorporate the wealth of local knowledge into the plans and priorities that drive our partners' work.

The Little Manistee Management Survey was mailed to 1,503 property owners and stakeholders in the Little Manistee River watershed. The research team attempted to contact all property owners along the Little Manistee River and its major tributaries, sending surveys to 714 riparian property owners. These would be the landowners directly affected by the proposed NRP designation. Additionally, a random sample of 661 property owners in the Little Manistee River watershed were mailed surveys to provide input on the average viewpoint of landowners in the broader area. Surveys were also mailed to 135 stakeholders with special interests in the Little Manistee River due to their membership in the LMWCC or other area tax-paying organizations who requested to participate.

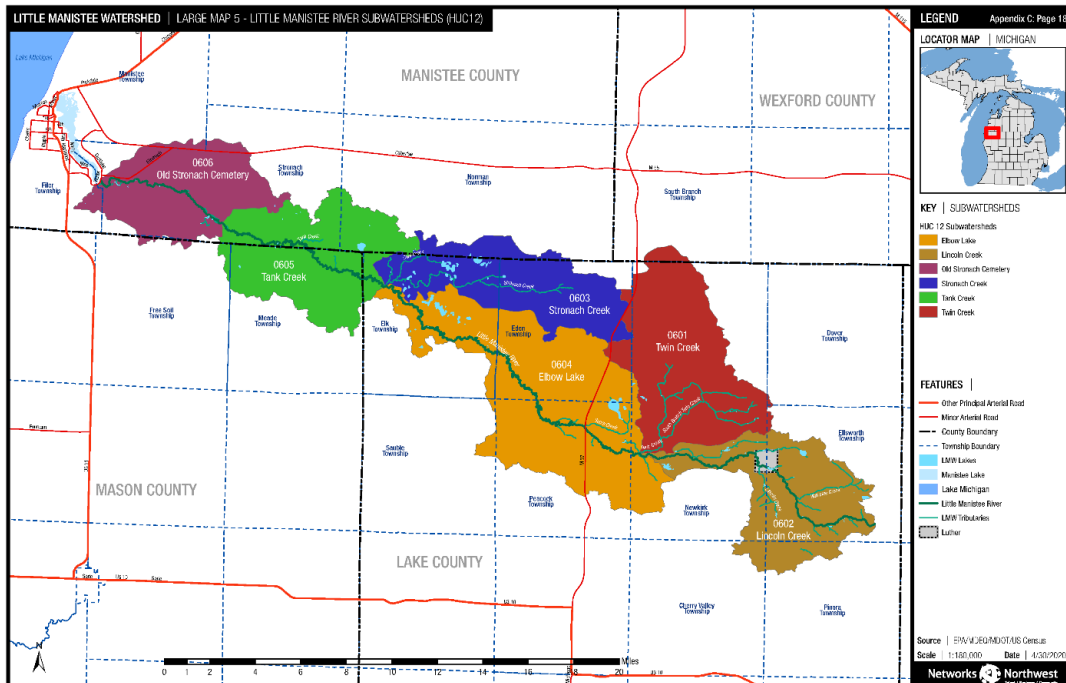
We received completed questionnaires from 304 riparian property owners, 160 watershed property owners, and 67 other stakeholders, for a total of 531 survey respondents. The overall survey completion rate was 37%, although, as discussed below (see "Survey Methods") the survey participation rates varied by respondent groups, with riparian owners and members of interest groups participating at higher rates than watershed property owners.

We learned that Little Manistee property owners are enthusiastic about enjoying the solitude, beauty, and sport provided by their treasured river. Many place a high priority on conservation of the river's natural resources, even while holding complex views regarding the role that the DNR should play in management of the Little Manistee. We heard that many were uncertain about what exactly an NRP designation would mean for their property and future development plans, and others were concerned about maintaining the flexibility they need to manage their property.

In the report that follows, we begin by reviewing background information on the watershed and the community survey. Next, we review what respondents told us about living in the watershed and their conservation priorities. We go on to review the level of support and opposition to the proposed NRP designation, focusing on the characteristics and viewpoints of respondents that help explain their opinions. After reviewing respondents' reported use of water quality best management practices on properties in the watershed, we conclude with recommendations for future outreach and communications concerning conservation in the Little Manistee watershed.

Background and Methods

The Little Manistee River watershed serves as the drainage basin for 145,280 acres of land in Lake, Manistee, Mason, and Wexford Counties. The river flows northwest for approximately 67 miles, originating in eastern Lake County and emptying into Manistee Lake, a drowned river mouth lake directly connected to Lake Michigan (LMWCC, 2022) ¹.



The “Little River” is valued for its abundant trout and steelhead fish, spectacular scenery, and exciting canoeing. Steelhead eggs from the Little Manistee are harvested by the DNR to stock rivers across the state (Bullen, N.d.)². The watershed is sparsely populated, with small villages dotting a landscape of forest and farmland until the river reaches Manistee Lake and the City of Manistee. The western end of the river wanders through the Huron-Manistee National Forest, where numerous federally owned tracts of land offer recreational opportunities that attract seasonal residents and vacation homeowners from around Michigan and the U.S. (USFS, N.d.)³.

Compared to many of its southern counterparts, the Little Manistee River has been spared the intrusions of logging and industrial development. These characteristics contribute to its value as a scenic recreational river and motivate concerned citizens to protect its natural qualities. The LMWCC was established in 1996 to organize conservation efforts for the river. The original group consisted of riparian property owners, private individuals, and representatives from government agencies. Since

¹ Little Manistee Watershed Conservation Council. 2022. History. Accessed 11-17-23, (<http://www.lmwcc.org/aboutus/history/>).

² Bullen, W. H. N.d. The trout streams of Michigan: The Little Manistee River. Michigan Department of Natural Resources, Institute for Fisheries Research Archive. Accessed 11-17-23, (<https://quod.lib.umich.edu/f/fishery/4986997.0074.002?rgn=main;view=fulltext>).

³ U.S. Forest Service. N.d. Little Manistee River, national scenic study river. USDA Huron-Manistee National Forests. Accessed 11-17-23, (<https://www.fs.usda.gov/recarea/hmnf/recarea/?recid=18672>)

its inception, the LMWCC has focused on restoration, protection, and preservation of the watershed through public education and remediation projects (LMWCC, 2022). These activities have included conducting annual water quality and macroinvertebrate monitoring, completing several restoration projects, coordinating a River Steward volunteer program, and creating a watershed management plan to guide conservation activities through 2030.

During the construction of their watershed management plan, the LMWCC identified development pressures as one of several threats facing the Little River over the next ten years. In the interests of ensuring that new building construction for residential homes and businesses occur in a manner that does not cause damage to the river, the LMWCC looked to the Michigan Natural Rivers Program (NRP) as a potential policy model. The NRP creates a state-administered zoning framework for designated rivers that is designed by and managed in collaboration with a committee of residents. On Michigan's 16 designated Natural Rivers, "nearly all construction, land change/earth moving, and placement of structures is regulated within 400-feet of any designated stream segment," and landowners must consult with DNR staff for permits concerning regulated activities (DNR, 2023)⁴.

Because the program has direct implications for how private property owners may manage and make changes to their land, the LMWCC was asked to evaluate public support for a NRP designation for the Little Manistee River prior to the DNR undertaking any preliminary site studies necessary to pursue a designation. The Little Manistee Management Survey therefore combined two primary information gathering purposes. The first was to assess public opinion concerning a NRP designation for the Little Manistee River. Additionally, the questionnaire included items from the social indicators planning and evaluation system (SIPES), which is used to evaluate knowledge, attitudes, and property management actions related to water quality (Genskow and Prokopy, 2011)⁵. This information will be used to focus educational programming and outreach activities outlined in the ten-year watershed plan for the Little River.

Survey Methods

The survey sampling frame was drawn from tax parcel records obtained from Lake, Mason, and Manistee Counties. To avoid double-counting individuals, the original parcel lists were cleaned to remove duplicate property owner names and mailing addresses, resulting in approximately 3,280 unique property owners in the Little Manistee watershed (hereafter "watershed owners") and 714 unique owners of properties along the Little Manistee River and its major tributaries (hereafter "riparian owners")⁶. All 714 riparian owners were invited to participate in the survey. A random sample of 661 watershed owners was also drawn for inclusion in the study. Finally, 128 individuals with special interests in the Little Manistee (hereafter "interest groups") – including members of the

⁴ Department of Natural Resources. 2023. Natural Rivers. Accessed 11-23-23, (<https://www.michigan.gov/dnr/managing-resources/fisheries/natural-rivers>).

⁵ Genskow, K., and Prokopy, L. (eds.) 2011. The social indicators planning and evaluation system for nonpoint source management: A handbook for watershed projects. 3rd Edition. Great Lakes Regional Water Program. (104 pages).

⁶ After receiving numerous inquiries from riparian property owners erroneously excluded from the first survey mailing, the riparian property list was further verified against the online parcel maps maintained by each county. The final count of riparian owners (n=714) reflects the product of this manual verification of records, in which 68 individuals who are no longer riparian property owners were removed from the list and 109 individuals who are current riparian property owners were added.

LMWCC, tax-paying LLC owners not named in parcel records, and members of the Indian Club (a fishing and hunting club) – were also invited to participate in the study.

In total, 1,503 households were mailed requests to complete the survey from July – September 2023. The survey was distributed following the tailored design protocol (Dillman et al., 2014)⁷, which consisted of four waves of mailing: 1) a pre-notice letter, 2) a questionnaire packet, 3) a reminder postcard, and 4) a replacement questionnaire.

We received 531 completed questionnaires and 35 blank questionnaires (indicating that the recipient declined to participate in the study). After removing 61 addresses that were returned by the U.S. Postal Service as undeliverable, the overall survey response rate was 39%, with a 37% completion rate⁸. We received no response from 876 households after four contact attempts (a 61% nonresponse rate). However, the response, completion, and nonresponse rates varied by respondent subgroup (see **Table 1**), with the completion rate for riparian owners and interest groups being considerably higher than for watershed owners. The high nonresponse rate among watershed owners may reflect a lack of understanding concerning the relevance or applicability of the survey to their property. In total, 304 riparian owners completed the survey, 160 watershed owners completed the survey, and 67 members of interest groups completed the survey.

Table 1. Survey Participation Rates

| | All Respondents | | Riparian Owners | | Watershed Owners | | Interest Groups | |
|------------------|-----------------|----|-----------------|----|------------------|----|-----------------|----|
| | N | % | n | % | n | % | n | % |
| Surveys Sent | 1,503 | -- | 714 | 48 | 661 | 44 | 128 | 8 |
| Not Deliverable | 61 | 4 | 23 | 3 | 36 | 5 | 2 | 1 |
| Completion Rate | 531 | 37 | 304 | 44 | 160 | 26 | 67 | 53 |
| Refusal Rate | 35 | 2 | 14 | 2 | 13 | 2 | 8 | 6 |
| Response Rate | 566 | 39 | 318 | 46 | 173 | 28 | 75 | 60 |
| Nonresponse Rate | 876 | 61 | 373 | 54 | 452 | 72 | 51 | 40 |

Survey Participants

The characteristics of survey respondents compared to U.S. Census Bureau American Community Survey (2016-2020) estimates for the watershed appear in **Table 2**. Census Bureau population estimates are an imperfect comparison given that they represent the characteristics of full-time residents, whereas our survey data represent both full-time *and* seasonal residents with vacation homes or camping properties in the watershed. However, they are the only population estimates for this geographic area available.

⁷ Dillman, D.A., Smyth, J.D., and Christian, L.M. 2014. *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Hoboken, NJ: Wiley.

⁸ Response rate = (completed surveys + declined surveys) / (total surveys - undelivered surveys)

Completion rate = completed surveys / (total surveys - undelivered surveys)

Nonresponse rate = no response / (total surveys - undelivered surveys)

Our survey respondents were, on average, older and more highly educated than the Census Bureau estimates for the general population of full-time watershed residents. Survey respondents were also more likely to be male. Those aged 65 years and older are represented in our survey data at nearly twice the rate they are estimated to exist in the general population of full-time watershed residents. Likewise, nearly half of survey respondents have a bachelor’s or graduate degree while only 13% of watershed residents are estimated to have this level of education. Additionally, whereas two-thirds of survey respondents are men, the Census Bureau estimates that 54% of full-time residents in the Little Manistee watershed are men. Some of this discrepancy reflects the fact that each house received only one Little Manistee Management Survey, unlike the Census which requests information on everyone in the household.

Table 2. Demographic Characteristics of Respondents

| | N | % Respondents | % ACS Estimates |
|----------------------------------|----------|----------------------|------------------------|
| Gender | | | |
| Male | 364 | 68.5 | 54.0 |
| Female | 124 | 23.3 | 46.0 |
| Declined to answer | 22 | 4.1 | -- |
| Race | | | |
| White alone | 473 | 89.1 | 94.3 |
| Amer. Indian, Asian, or Latino | 7 | 1.3 | 5.7 |
| Declined to answer | 51 | 9.6 | -- |
| Age | | | |
| 18-64 years old | 206 | 38.8 | 58.7 |
| 65 years and older | 271 | 51.0 | 28.7 |
| Declined to answer | 54 | 10.2 | -- |
| Education Level | | | |
| High school / GED or less | 85 | 16.4 | 55.8 |
| Some college | 160 | 30.9 | 31.5 |
| Four-year college degree or more | 253 | 49.0 | 13.0 |
| Declined to answer | 19 | 3.6 | -- |
| Household Income | | | |
| Less than \$50,000 | 87 | 17.2 | 54.2 |
| \$50,000 or more | 295 | 58.2 | 45.5 |
| Declined to answer | 125 | 24.7 | -- |

However, some of the discrepancies between survey respondents compared to Census Bureau estimates are understandable when we consider the characteristics of second homeowners in the watershed. In our data, 27% (n=143) of respondents are full-time residents who live at their home in the watershed for 9-12 months of the year. Among these full-time residents, 35% have a bachelor’s or graduate degree and 36% earn incomes less than \$50,000 per year. In contrast, 57% of part-time residents have a bachelor’s or graduate degree and 18% earn incomes less than \$50,000 per year. In other words, the part-time residents included in our data have, on average, higher education levels and earning power than do full-time, local watershed residents - characteristics that facilitate their ownership of a second home in the Little Manistee watershed. In the absence of comparable

population estimates for *property owners*, then, there are limitations to our ability to assess how accurately survey respondents reflect the demographic characteristics of watershed residents.

Approximately one-quarter of respondents have owned their property in the Little Manistee watershed for less than ten years. A second quarter have been landowners for 10-24 years, while another quarter have owned their property for 25-39 years. The quarter of survey participants with the most longevity in the watershed ranges from 40 years to multiple generations. Half of survey participants have properties that are under six acres in size, while another half own properties ranging from 6-700 acres. However, there are few large landowners in our dataset, with only 10% of respondents reporting that they own properties over 60 acres. Most property owners reported owning rural residences or cabins (73%, n=385). Another 16% of respondents (n=85) own vacant properties that they use for hunting and camping or harvesting trees. Five percent live in town (n=28), and 1% (n=6) own farms. Thirty-three respondents had “other” types of properties, which they described as “seasonal” or “hunting clubs.”

Table 3 reports the number of survey responses from each township. Because only small outreaches of the watershed boundaries stretch into Filer, Free Soil, Pinora, and Sauble Townships, few property owners from these townships were included in our original sampling frame. As a result, we received fewer than five responses from each of these townships. Additionally, the layer of data used to derive the property owner information contained a defect for properties within the Little Manistee boundary of Norman Township. The research team was unable to resolve this problem prior to the deadline for preparing the first survey mailing. Therefore, the results presented herein are not representative of Norman Township residents, with whom further research and/or direct outreach should be conducted.

Table 3. Survey Respondents by Township

| | Survey Responses (n) |
|------------------------|----------------------|
| Lake County | |
| Eden Twp. | 58 |
| Elk Twp. | 186 |
| Ellsworth Twp. | 32 |
| Newkirk Twp. | 42 |
| Peacock Twp. | 102 |
| Pinora Twp. | 2 |
| Sauble Twp. | 1 |
| Manistee County | |
| Filer Twp. | 3 |
| Norman Twp. | 3 |
| Stronach Twp. | 50 |
| Mason County | |
| Free Soil Twp. | 3 |
| Meade Twp. | 37 |

In the report that follows, we are unable to present results at the township level for townships with five or fewer respondents. Any conclusions drawn about viewpoints, preferences, or behaviors for townships from which we received so few responses would be highly imprecise.

Living in Little Manistee Watershed

To gain an understanding of Little Manistee property owners’ interests in the river, we asked several questions about recreational activities, conservation priorities, and concerns about water quality.

Respondents were presented with a list of six recreational activities (see **Figure 1**) and asked to select which was most important to them. Because some respondents selected more than one activity, percentages sum to greater than 100. Fishing and hunting were most frequently ranked as respondents’ favorite activity, followed by enjoying scenic beauty. To a lesser extent, boating

(including canoeing and kayaking) and viewing birds and wildlife were also important, whereas swimming and family activities were somewhat less important activities for survey respondents.

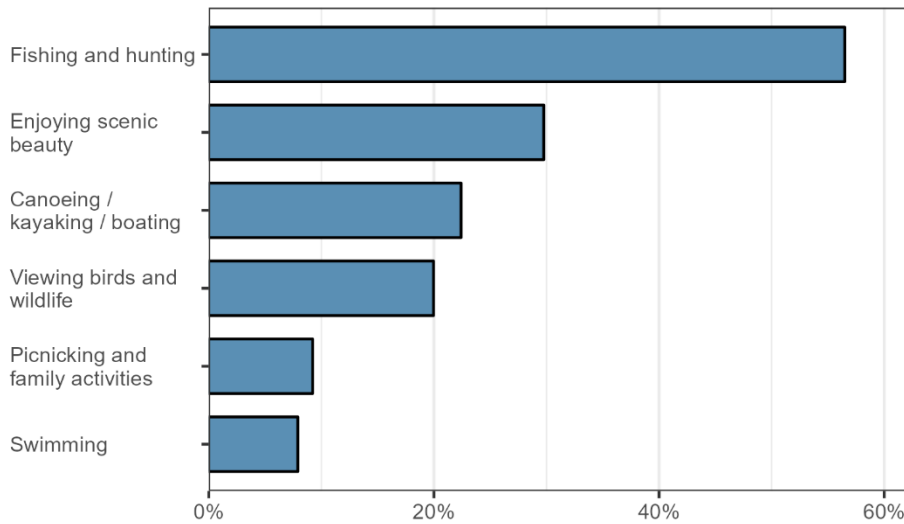


Figure 1. Percent of Respondents Ranking Each Activity the "Most Important"

Survey respondents noted several things they believe would improve fishing and kayaking on the Little Manistee River, including managing habitat conditions, and limiting boating activities. For example, respondents wrote:

“Allow wild runs of steelhead and browns. Limit canoeing.”

“I prefer the way the LMWCC did on/in stream projects to stop erosion and build fish habitat.”

“I would like to see [a catch] limit of 2 or 3 fish/day. And size must be 12”+.”

“For the last two years, there has been an overabundance of salmon running up the river. I kayak the river quite often. I am seeing schools of salmon as early as July. In September, the dead carcasses are laying around all over.”

“I feel that in our area, the growing depth of sediment is having an effect on trout habitat.”

“Much of the structure that was put in the river by the CCC to support the trout habitat has washed away over the years or been damaged by canoes. Are there plans to ever rebuild these structures? Fishing on the river seems to be mostly small trout (rainbows) with large fish hard to find. Fishing was much better 20 years ago.”

“Trout habitat has dropped a lot in the Little Manistee the last few years, especially in Lake County area.”

“We need wild runs of steelhead, not penned fish released later.”

“Appreciate that canoes, kayaks & tubing are only devices allowed. I am told that rentals of above devices are limited which is appreciated.”

“There are no motors or boats allowed on the Little Manistee River. Please never ever let that be changed! Only canoes, kayaks, and inner tubes.”

“Keep motorized vehicles out of the streams and small rivers like the L.M.!”

“I am concerned about the canoe/tubing companies coming through the rivers and cutting outgrowth on the banks and through log jams (or remove them completely).”

“We would like to see the Little Manistee River in Peacock Township opened, cleaned up for kayaking, tubing, etc. There is too much debris, fallen trees, overgrowth, to make it even close to passable.”

“There should be a restriction on the size of the boats allowed on LMR. Currently, it is allowable for anyone to cut trees in the river to get their [fishing and pontoon] boats through.”

“Fisherman are launching at the DNR access. They remove river brush and cut logs. They anchor at deep holes and snag fish for 3-4-5 hours until all the fish are gone from that hole.”

“Gentlemen fishermen are awesome, but snagging boat poachers are overriding us. They are organized, and foul hook for hours. It is like a business.”

We also asked respondents how much they thought that four conservation actions should be prioritized in the Little Manistee watershed: providing fish and wildlife habitat, reducing erosion and stormwater runoff, adapting to climate change, and educating the public about water quality. Conservation priorities were measured using a 3-point Likert scale ranging from not a priority (1) to high priority (3).

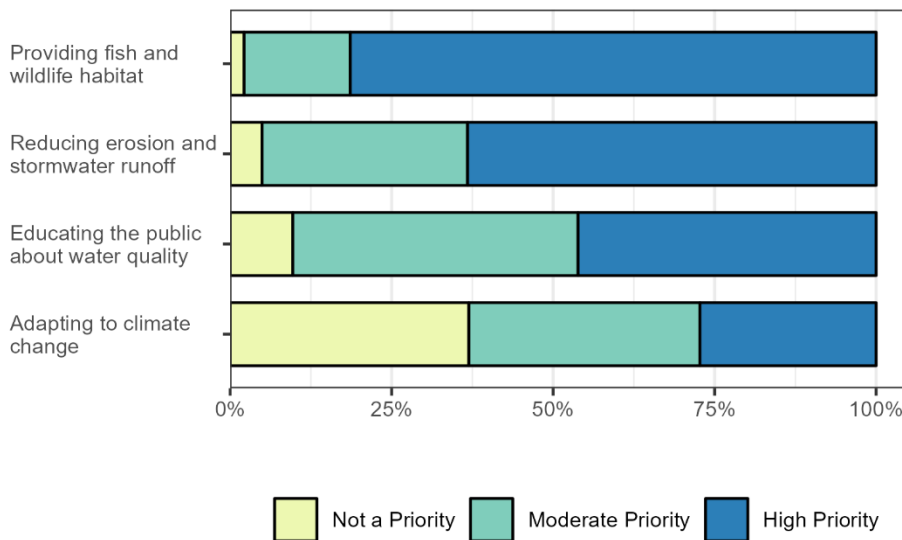


Figure 2. Opinions about Conservation Priorities

Reflecting the high value placed on fishing and hunting, 81% of respondents believed that a high priority should be given to fish and wildlife habitat (**Figure 2**). Sixty-three percent thought implementing erosion control measures should be a high priority, and 46% prioritized public education. In contrast, only 27% of respondents thought that adapting to climate change was a high

priority for conservation efforts. Other studies have likewise found that climate change is a poor framework for communicating about conservation action in rural communities (Olson Hazboun et al., 2019)⁹, suggesting greater success with communications emphasizing conservation benefits to fish and wildlife.

We used a measure of perceptions about water pollution from the social indicators planning and evaluation system (SIPES) (Genskow and Prokopy, 2011). We asked survey respondents to evaluate how severely they believed six water pollutants are impacting the Little Manistee watershed (Table 4). For each item, respondents ranked severity on a 4-point scale, from “not at all a problem” (1) to “severe problem” (4). Respondents could also answer that they “don’t know” about a pollutant.

Table 4. Respondent Evaluations of Water Pollutants

| | n | Min-Max | Mean (SD) | % “Severe” | % “Don’t Know” |
|---|-----|---------|-----------|------------|----------------|
| Invasive aquatic plants and animals | 514 | 1-4 | 2.7 (1.0) | 19 | 23 |
| Sediment in the water | 512 | 1-4 | 2.6 (1.0) | 16 | 4 |
| Nutrients from fertilizer in the water | 512 | 1-4 | 2.5 (1.0) | 16 | 21 |
| <i>E. coli</i> or fecal matter in the water | 514 | 1-4 | 2.4 (1.1) | 14 | 25 |
| Trash or debris in the water | 514 | 1-4 | 2.4 (1.0) | 15 | 7 |
| Algae in the water | 512 | 1-4 | 2.1 (1.0) | 7 | 19 |

Little Manistee property owners evaluated all pollutants as slight (2) - to- moderate (3) problems on average. While no pollutant stood out as particularly alarming to respondents, invasive aquatic plants and animals were seen as somewhat more severely impacting the watershed compared to other pollutants, while algal blooms were evaluated as somewhat less problematic. Knowledge was lowest regarding the extent of the problem posed by *E. coli* contamination, invasive species, and nutrient loading, with over 20% of respondents unable to evaluate severity of these pollutants.

In open comments left at the end of the survey, respondents noted several other concerns about conditions they worry may be impacting water quality and water levels in the watershed:

“Currently we are having BIG problems with beaver blocking the culverts that goes under Hamilton Road.”

“Dead ash trees are our largest concern. Manmade structures i.e., old dams, old bridges that are obsolete and abandoned need to be cleared out.”

“I have seen the mayfly hatch dwindle to zero. They used to cover the screens, but I have not seen one for years. I blame the sand from Luther dam.”

“Trash pumps, an agricultural tool, could be utilized to install numerous small sand traps in the upper stretches of the Little Manistee and some tributaries. Sand, not silt or sediments, is the greatest ecological problem.”

⁹ Olson Hazboun, S., Briscoe, M., Givens, J., and Krannich, R. 2019. Keep quiet on climate: Assessing public response to seven renewable energy frames in the Western United States. *Energy Research & Social Science*, 57: 101243, <https://doi.org/10.1016/j.erss.2019.101243>.

“Little Manistee needs to get back to water flow that we had 25 years ago. Water flow is controlled so flooding downstream is at bare minimum due to housing built too close.”

“Water flow of Little Manistee needs to be increased to help get rid of silt and sand that filled gravel beds when dam went out.”

“Extensive stream work was done on the L.M. in the 1950s. Most of it has silted over from poorly managed upstream development and poorly constructed road crossing (bridge).”

“Keep Luther Dam as is. Dredge for sediment [every] 5 years.”

“The town of Luther will fight a city sewer to the end. MI DNR must force it. It’s a problem.”

“I have issues on how the road commissions protects the river. 12 Mile Road on Cool Creek. The road runs parallel to the river at several locations, grading puts debris in the water.”

“Little Syers Lake is now dropped to a level never seen! So much so no water flows in the creek. A different style culvert should have been used.”

“I have 13 acres on Syers Lake. Since I purchased it, the lake is drying up. Why?”

“I continue to be very concerned about how the area’s wetland is maintained. The reduction in our water level has had a significant effect on our property. The fishing is spotty; swimming is often not possible; and it has on occasion been so low that our well won’t produce water.”

The Michigan Natural Rivers Program

The LMWCC sought to understand the level of support within the watershed for the Little Manistee River to receive a Michigan Natural Rivers designation. The Natural Rivers Program (NRP) is administered by the Michigan DNR. The program establishes a local citizens committee to develop standards for protection of the land within 400 feet of the riverbank and important tributaries. Survey respondents were presented with a summary of the program and its intention and were directed to explore more detailed information about the NRP on the DNR website. Respondents then indicated whether they support, oppose, or are unsure about enrolling the Little River in the Michigan NRP.

Of the 514 respondents who answered the question at the time of surveying, 44% (n=224) supported an NRP designation for the Little Manistee River, 26% (n=135) were opposed, and 30% (n=155) were unsure about the proposal.

We explored the characteristics of respondents who supported, opposed, and were unsure about the NRP proposal, including the type of respondent (riparian owner, watershed owner, or interest group member), the county and township in which the respondent’s property was located, whether they are full-time or part-time residents, how long they have owned their Little Manistee property, the size of their Little Manistee property, and individual demographic characteristics (education, income, and age).

The margin of error (MOE) tells us how much we would expect a value in the actual population of Little Manistee property owners to differ from the estimates captured in our survey data¹⁰. Based on our estimates of the number of unique property owners in the watershed, derived from tax parcel data, the MOE for responses reported for *all survey respondents* can be expected to fall within +/- 3.6% of the actual population value (at the 90% confidence interval). The MOE for responses reported for *subsets of survey respondents* varies depending on the number of respondents in the subgroup compared to their population size but can generally be expected to be substantially larger than the MOE for all respondents.

Preference for NRP by Respondent Type

Figure 3 displays preferences for the NRP by the type of respondent. Riparian owners were 2.8 times more likely to oppose the NRP (30%, n=90 opposed) than were watershed owners (11%, n=29 opposed). Respondents from interest groups were the least supportive of the proposal, (45%, n=29 opposed), and they were notably less unsure about their position on the proposal¹¹. **Table 5** provides an elaborated description of these results.

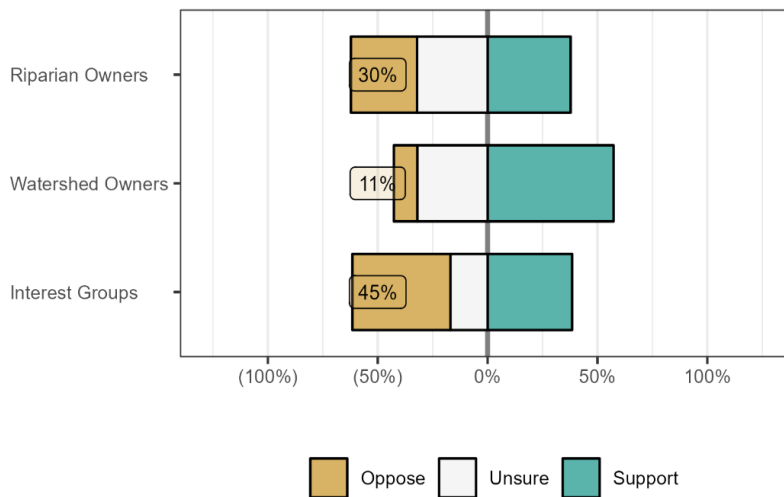


Figure 3. Preference for NRP by Respondent Type

¹⁰ The MOE is calculated by taking the square root of the proportion of the sample with a particular characteristic (\hat{p}) multiplied by the proportion of the sample that does not have that characteristic ($1 - \hat{p}$) divided by the sample size (n ; or group sample size for owner type, county, and township MOE). The result is multiplied by the critical value (z) corresponding to the desired confidence interval (1.645 for a 90% confidence interval). To provide a more conservative estimate of the population variability, a proportion of 50% ($\hat{p} = 0.5$) was used.

¹¹ There were 123 respondents who self-reported being LMWCC members, some of whom were included in the interest group category and some of whom owned riparian or watershed properties and thus were included in those groups. Among the 123 self-reported LMWCC members, 47% (n=58) supported the proposal, 30% (n=37) were opposed, and 23% (n=28) were unsure.

Table 5. Respondents' NRP Preference by Respondent Type

| | Support % (n) | Unsure % (n) | Oppose % (n) | MOE % |
|------------------|-------------------------|------------------------|------------------------|-----------------|
| All Respondents | 43.5 (224) | 30.2 (155) | 26.3 (135) | 3.6 |
| Riparian Owners | 37.8 (113) | 32.1 (96) | 30.1 (90) | 4.7 |
| Watershed Owners | 57.3 (86) | 32.0 (48) | 10.7 (16) | 6.7 |
| Interest Groups | 37.9 (25) | 16.7 (11) | 43.9 (29) | 10.2 |

Preference for NRP by County and Township

The NRP designation can be applied to portions of the river rather than its entirety, and we therefore knew that it would be important to examine NRP preferences at the county and township levels. However, the watershed is unevenly distributed across political jurisdictions, with the bulk of parcels in the watershed in Lake County and much smaller portions of the watershed touching Manistee and Mason Counties. Further, while reported responses corresponding to *all survey respondents* can be expected to fall within +/- 3.6% of the actual population value (at the 90% confidence interval), the margin of error for responses reported for *individual counties and townships* is notably higher. This reflects the smaller number of responses (*n*) in the dataset for these subsets of respondents. **Table 6** presents NRP preference by respondent township and county. Townships from which we received five or fewer responses (Pinora, Sauble, Filer, Norman, and Free Soil) are not included.

Table 6. Respondents' NRP Preference by Township

| | Support % (n) | Unsure % (n) | Oppose % (n) | MOE % |
|-----------------|-------------------------|------------------------|------------------------|-----------------|
| All Respondents | 43.5 (224) | 30.2 (155) | 26.3 (135) | 3.6 |
| Lake County | 47.3 (191) | 30.0 (121) | 22.8 (92) | 4.1 |
| Eden Twp. | 51.7 (30) | 20.7 (12) | 27.6 (16) | 10.8 |
| Elk Twp. | 46.7 (85) | 31.3 (57) | 22.0 (40) | 6.0 |
| Ellsworth Twp. | 59.0 (19) | 31.0 (10) | 9.0 (3) | 14.5 |
| Newkirk Twp. | 36.6 (15) | 31.7 (13) | 31.7 (13) | 12.7 |
| Peacock Twp. | 42.0 (42) | 30.0 (30) | 28.0 (28) | 8.1 |
| Manistee County | 18.5 (10) | 29.6 (16) | 50.0 (27) | 11.0 |
| Stronach Twp. | 17.4 (8) | 23.9 (11) | 58.7 (27) | 11.6 |
| Mason County | 37.8 (14) | 32.4 (12) | 29.7 (11) | 13.0 |
| Meade Twp. | 38.2 (13) | 32.4 (11) | 29.4 (10) | 13.5 |

Support was highest among Lake County respondents (47% support, n=191) and lowest among Manistee County respondents (18% support, n=10), while Mason County respondents were more evenly split between support (38%, n=14), opposition (30%, n=11), and uncertainty (32%, n=12).

Support for the NRP was highest in Ellsworth (59% support, n=19), Eden (52% support, n=30), and Elk Townships (47% support, n=85), and lowest in Stronach Township (17% support, n=8). Responses from Newkirk, Meade, and Peacock Townships were more evenly distributed across response categories, with more even proportions of respondents being supportive, opposed, or uncertain about the proposal.

Stronach Township stood out as the only township in which a clear majority of respondents were opposed to the NRP (59% opposed, n=27), suggesting greater resistance to an NRP designation in the lower reaches of the Little Manistee River compared to the headwaters. Comments left by Stronach Township respondents provided context regarding their opposition to the NRP proposal. Several Stronach respondents noted that existing zoning regulations provided sufficient protection for the river and opposed state preemption of local zoning authority, writing:

“Federal- and state-owned properties are the majority on the river and watershed and are among the least maintained! We do not appreciate the State of Michigan trying to usurp legitimate local zoning and private property authority.”

“I have been fishing, canoeing on the river forever and have not been seeing problems in Stronach. I would like to keep the river the way it is and not add additional setbacks as Stronach already has zoning in place.”

“Over 71% of Stronach river frontage is already owned by the DNR or the township. There’s a small percentage of property owners and [the proposal] will supersede the zoning of Stronach with the river designation. The real issue is Lake County!”

“We are already required to have 20 acres per one residence for building. We also already have a 100-foot restriction for building by the river.”

Others expressed mistrust for the DNR’s management of the program, with several citing dissatisfaction with the DNR’s management of the Little Manistee River Weir in Stronach Township as evidence:

“One of the most destructive non-natural structures in the Little Manistee watershed is the DNR fish weir. The managing of when the gates are closed for natural fish migration needs to be looked at if the river is to be designated a ‘Natural River.’”

“If you want a natural river then remove the weir. It affects fish migration and water flow. I know it is necessary but let more go upstream.”

“I have fished the Little Manistee since I was eight years old. It has gone through many changes over the years. Most notably the weir on the lower half. Since its installment fishing has steadily declined. The lower half is a shadow of itself.”

“The DNR has shown that they cannot manage without undue red-tape and restrictions. There are projects now that need to be done for improvement of our river that DNR refuses to allow. Bank improvements are constantly denied which would improve the river quality. Adding more rules and regulations would only make things worse!”

“I have been a property owner for over 45 years. However, I wish the DNR would use its resources to focus on other issues... Allowing more fish to pass over the weir so property owners above 9 Mile bridge can see more fish. We have kept records since the ‘70s. Maybe not take all of the eggs from the fish and allow more salmon to come upriver. Recent contact with DNR personnel indicate an anti-sportsman attitude.”

Preference for NRP by Residency

We compared preference for the NRP proposal among full-time (n=138) and part-time or seasonal residents (n=377). Survey respondents were asked to report the number of months each year they spend at their Little Manistee property, and respondents reporting 9-12 months of the year were considered “full-time” residents¹². A larger proportion of full-time residents opposed the NRP proposal (36% opposed, n=50) compared to part-time and seasonal residents (23% opposed, n=85) (**Figure 4**). We also examined NRP preferences by the average number of years that respondents reported owning their Little Manistee property but did not find statistically significant differences in support based on the duration of property ownership.

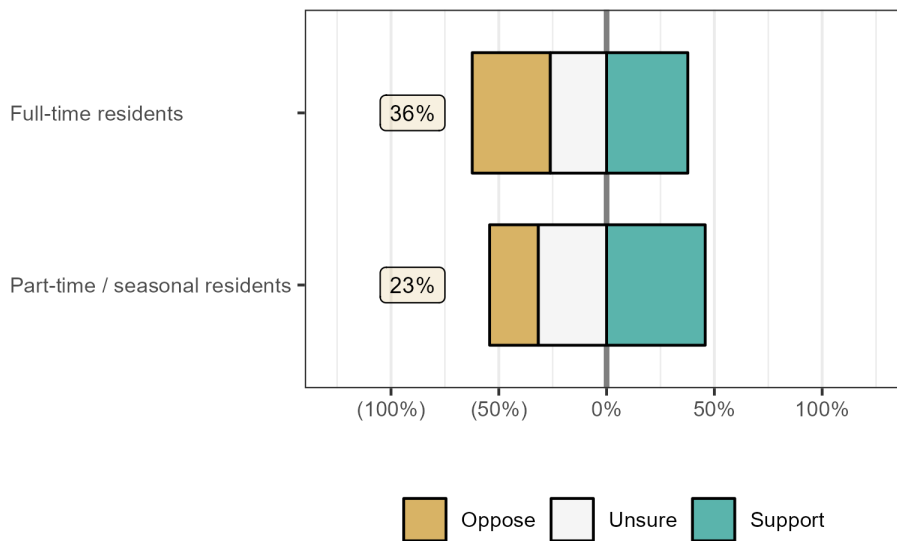


Figure 4. NRP Preference by Residency

Preference for NRP by Demographic Characteristics of Respondents

To understand more about factors contributing to individual preferences regarding the NRP, we used logistic regression analysis, which allows us to mathematically model the strength of the relationship between each variable and an outcome (i.e., support for NRP) when several other variables are simultaneously held at unchanging, or controlled, rates. Variables in the model include demographic characteristics (i.e., age, education level, and household income), characteristics of the property (i.e., size in acres, county of property), the type of respondent (riparian owner, watershed owner, or interest group member), and their status as a full-time or part-time resident. Results are displayed in **Table 7**¹³. An odds ratio (OR) represents the percentage of the increase or decrease in odds that a respondent is likely to support the NRP proposal, all other factors held constant. Values that reach a threshold of statistical significance ($p < 0.10$), signify that the corresponding factor meaningfully impacts the odds that a respondent supports the NRP and are denoted in bold.

¹² Using the 9-month threshold includes residents who winter in warmer locations in the full-time category.

¹³ For ease of interpretation, Table 7 presents a simplified version of the model. The elaborated model, including confidence intervals and standardized coefficients, is available upon request.

Table 7. Logistic Regression Results, Factors Predicting Support for NRP

| Predictor | OR | p |
|-------------------------|-------|------------------|
| Constant | 0.079 | |
| Age | 1.021 | 0.040 |
| Size | 0.921 | 0.196 |
| Household Income | | |
| \$50,000 to \$99,999 | 1.222 | 0.547 |
| \$100,000 to \$149,999 | 1.128 | 0.758 |
| \$150,000 to \$199,999 | 1.092 | 0.844 |
| \$200,000 or more | 0.376 | 0.026 |
| Prefer not to answer | 0.903 | 0.766 |
| County | | |
| Mason | 1.988 | 0.207 |
| Lake | 2.992 | 0.007 |
| Education Level | | |
| Some college | 1.939 | 0.059 |
| 2-year college degree | 2.011 | 0.086 |
| 4-year college degree | 2.024 | 0.040 |
| Graduate degree | 4.154 | <0.001 |
| Prefer not to answer | 5.907 | 0.142 |
| Respondent Type | | |
| Riparian Owners | 0.427 | <0.001 |
| Interest Group | 0.325 | 0.009 |
| Residency | | |
| Part-time / seasonal | 1.242 | 0.384 |

Compared to respondents from Manistee County (the reference group), respondents from Lake County were 3.0 times more likely to support the NRP when all other factors were held at fixed values. Mason County respondents were no more or less likely to support the NRP than were Manistee County respondents. Additionally, for every one-year increase in a respondent’s age, the likelihood of supporting the NRP increased slightly, by 2.1%.

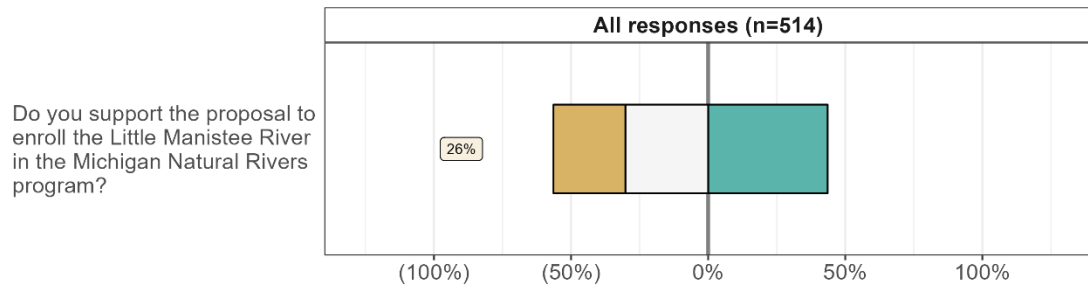
In contrast, respondents with higher reported household incomes had significantly lower odds of supporting the NRP. Respondents with a household income of \$200,000 or more were 2.7 times less likely to support the NRP compared to those making less than \$50,000 (reference group). Respondents with a high school degree or less (reference group) also had lower odds of supporting the NRP than respondents with any other level of education. Finally, respondents that own riparian properties were 2.3 times less likely to support the NRP compared to watershed property owners, while interest group members were 3.1 times less likely than watershed owners to support the NRP.

Property size and full-time or part-time residency were not statistically significant predictors of NRP support when all other factors were accounted for in the model.

Understanding NRP Support, Opposition, and Uncertainty

To learn more about the viewpoints underlying respondents' preferences, respondents were asked whether they agreed, disagreed, or were unsure about a series of explanatory statements about the NRP. The list of statements appears in **Figure 5b**, where responses are presented by the respondents' general preference for the NRP proposal (**Figure 5a**). These responses help us understand why respondents supported, opposed, or were uncertain about an NRP designation for the Little River.

(a)



(b)

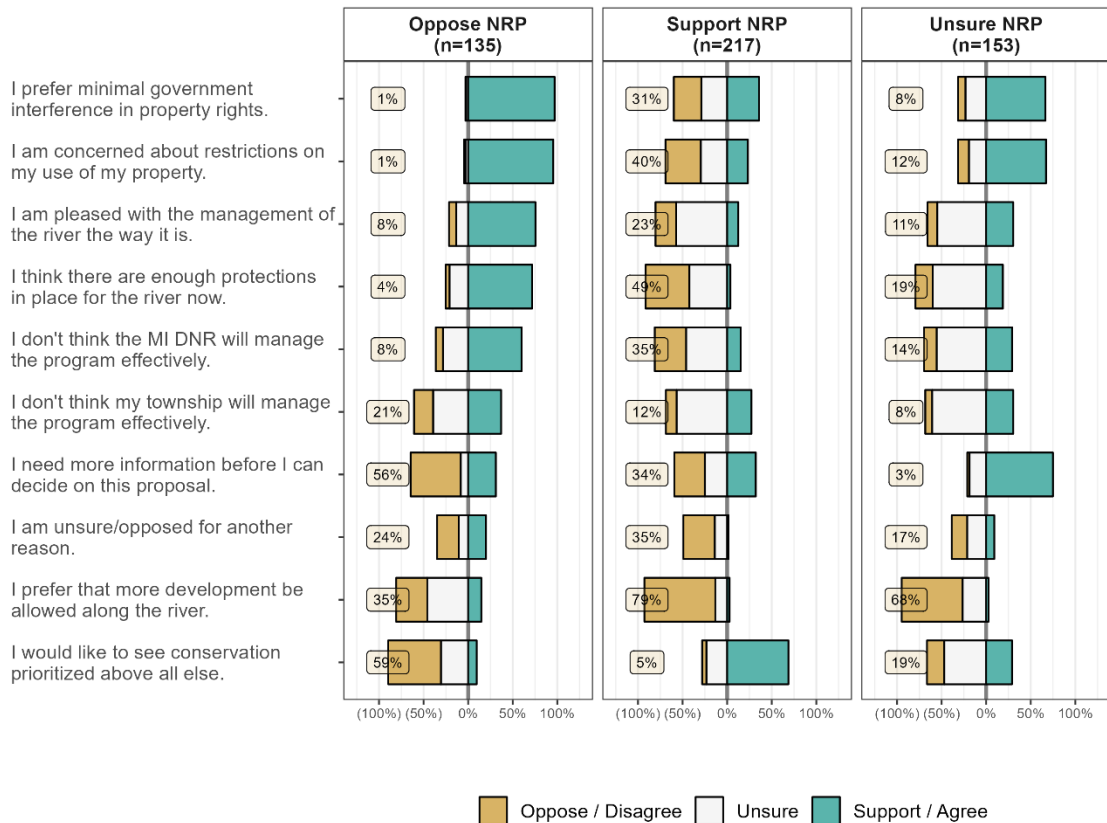


Figure 5. Viewpoints on the NRP by NRP Preference

Among respondents who are opposed to an NRP designation for the Little Manistee River (**Figure 5b**, left facet), concern about government interference in private property rights and potential restrictions on the use of one's property are key factors underlying opposition to the proposal, with over 95% of respondents opposed to the NRP agreeing that these sentiments explain their position. Approximately 75% of those who are opposed to the NRP believe that the management practices and protective standards currently in place are satisfactory, and 60% do not believe that the DNR will manage the NRP effectively. In their written comments about the proposal, NRP opponents elaborated on these points, noting that they trust riverfront owners to effectively protect the river:

"Conservation is a good thing but should not be forced. I believe the majority of people want to do the right thing and will do so when they understand how their actions have impact...we have to consider that there are likely people who own vacant land which may be a small parcel where all parts of the property would be within 400 ft of what's considered riverbank."

"We feel strongly about preserving the river and its habitat. I fear the 'natural river' designation, while it sounds nice, will be much too restrictive."

"Have respect for the landowner. The river should be shared by animals, fish, and humans equally. Create incentives to reward proper conservation efforts by individuals."

"Compared to other Natural Rivers in the state, the Little Manistee is by far the smallest river which would be over-grown with tags and bushes. This would provide obstructions to canoeing and make fishing very difficult."

"I do not feel the landowners along the river have been informed of the extent to which they give local/state government the authority to control their use of their property."

"I don't want some group or organization coming in and trying to railroad the landowners into some program that restricts our rights as property owners to enjoy our river."

"I hesitate because we do some canoeing/kayaking in the river - would this prevent us from clearing downed trees that are across the river? I also think restricting what is built along the river within 400 ft is ludicrous."

"Hurts the value and options of how I manage my property."

"I purchased my land for a home site. I would like to be close enough to enjoy the sight of the river."

"With the proposed setback from the river my property would be useless!"

"I feel adding the restrictions of the Natural River designation will ultimately lower our property value and reduce our overall happiness/comfort level that we enjoy now."

"I chop vegetation 20 ft to river's edge so I can enjoy the site of the river and watch canoers and kayaks come down the river. I do not appreciate over-governing of my river home."

"I support protection and management of the river. I also support individual property rights... We want to protect the river and its habitat, but the proposed restrictions are too restrictive and interfere with property rights."

“The Natural Rivers Program should not be forced on landowners.”

“What will property owners gain? What will property owners lose? Do we need 100 pages of regulations? There are 300 rivers in Michigan, why the Little Manistee River? There is no threat of over development. Most is owned by our government.”

“We maintain our property and treat the river and watershed for our benefit and the eventual benefit of generations to come. If there are people abusing the environment, I'm sure there are laws already in place to go after them. We do not need additional laws or regulations.”

“I do not support this proposal because I believe that the biggest issue is with Lake County and the townships that the LMR run through. The fact that they do not currently have any building ordinances allows for too much development very close to the river.”

“I believe Lake County / Peacock Township have adequate regulations to protect the river.”

“The NRP is a terrible idea. The river is in great shape and there are adequate measures in place to maintain and enhance its condition... NRP will also inhibit our ability to manage our property to promote better wildlife habitat and maintain the banks of the stream.”

“Focus on and deal with people along the river who are blatantly engaging in activities that have a negative impact on the river.”

“The offenders of poor river management should be approached. Monitor the users (drop-in kayakers and fishers) for waste, etc.”

“Property owners manage this river frontage very well. They know what is best for the river and conservation of the river is best left to the riverfront owners.”

“We value our Little River and take care of it. We do not need a governing agency telling us how one needs to do it.”

“I reject the notion that I can't be trusted to 'do what is right' on my own property. I want my private property to remain private. I do not want to give anyone the right to access my property at will nor to dictate how I can run it.”

“The federal government already owns the majority of the river. The residents take much better care of it than the feds. The state will only make it worse.”

“Reasonable zoning codes are preferred. We do not trust remote government officials dictating use of our property, which homeowners have the motivation to maintain for ongoing property values.”

“The DNR does some good and necessary things. They do however push the public on too many things. Their authority needs to be reined in.”

“MI DNR has zero credibility in my opinion. I will actively oppose their increased oversight.”

“My concern is predominantly giving the federal and/or state government the legal right to inspect my property for compliance concerns without my prior permissions.”

“As Reagan put it, ‘The most terrifying words in the English language are: I’m from the government and I’m here to help.’”

“The vast majority of property owners are already interested in conservation and the health of the river. We oppose this state’s (Michigan) attempt to take away legitimate local government authority.”

“We all love and respect the river so why does the government have to have any say?”

“Our property is natural, is clean and well managed. Putting DNR in charge would only delay and possibly damage our stretch of the river.”

“We have seen no significant manmade deterioration of the river in the 45 years we have owned our property. In fact, we’ve heard of one report that states the river quality is actually improving... Our recommendations: 1. Identify the real problems with scientific historical evidence (what is the problem?) 2. Educate riverfront owners on how to ‘fix’ the problem. 3. Measure to see if the ‘problem areas’ improve. 4. If they don’t improve, work with local zoning to address the problem. 5. Keep the river governance out of Lansing.”

Among respondents who support an NRP designation for the Little Manistee River (**Figure 5b**, middle facet), the prioritization of environmental conservation “above all else” stands out as a clear explanatory factor, with 70% of NRP supporters agreeing that this statement aligns with their viewpoint on the proposal. Nearly half of those who support the NRP disagree that there are currently enough protections in place for the river. While NRP supporters are less concerned about restrictions on the use of their properties than are NRP detractors, NRP supporters are evenly split regarding the topic of government interference with private property rights. Many supporters commented on the fine balance to strike between protection and privacy, citing valued attributes of the Little River that merit preserving:

“Voting in favor of additional governmental restrictions goes against my normal routine. However, I do strongly believe that in order to protect such a valuable resource as the L.M., protective measures must be implemented.”

“I believe [the NRP] is a fair balance of property owners’ rights with a set of rules that governs how the community protects a shared resource.”

“Nobody likes government interference, but some restrictions are necessary.”

“I prefer minimal government interference with property rights, but I do not want the river abused, polluted, destroyed, or changed from its natural path. Some people, if not supervised, will damage the river.”

“I am in favor of conservation being a priority but am not sure about saying it is the only priority. Some balance needs to be found.”

“We can’t have the wild west as it relates to management of properties along the river system. However, I am concerned about the setbacks and how much control this local board will have to make these decisions.”

“Most people like their space, but a well-organized effort can certainly extend and improve the natural beauty of the natural resources we have been blessed with!”

“People should not be allowed to pollute the river just because they own frontage.”

“I believe NR designation is critical to controlling the currently unchecked development and damage to the watershed. I appreciate your help with this.”

“This last year I have noticed more development on Riverside Drive. People clearing forest to build. I wish there were more efforts to support sustainable development.”

“Unfortunately, I have seen development that wouldn't have been allowed if it had Natural River protection. Residences and cabins have been built too close to the river, built over fill in the floodplain, built in filled over and cut down swamps, trees and brush cut down to allow the landowner an unrestricted view, lawns established down to the river's edge and woody debris removed from the river.”

“Local zoning efforts are failing to protect shorelines and riparian properties by allowing development that destroys natural habitat of wildlife and vegetative species and wetlands at the whim of the landowner.”

“From what I have learned about the Natural Rivers Program, I am in support of it. Even if that means I must alter my property. Conservation of the River takes priority.”

“In favor. I have too many landowners upstream who do not care about the river. Mowing to water edge, removing trees, running ATVs in stream, etc.”

“I was on a float trip this spring and noticed a property owner nearby clean cut several acres downstream from the weir, I presume to get a better view. It looked absolutely terrible and will no doubt impact the river!”

“This proposal is highly needed! More and more people are turning their riverfront into suburban lots. Docks are an eyesore and don't belong in a river our size.”

“I like what protections have done for the Pine River which is nearby.”

“Has been very effective on rivers where it is in place, but DNR needs to be more forceful in enforcement of regulations.”

“I think if we leave the river alone and not allow too much development the river will stay healthy.”

“I would support a proposal that aligns with my desire to retain a natural, healthy environment.”

“I think it will help preserve the river in its natural state.”

“I believe that without protection similar to the Natural Rivers Program the Little Manistee River will, over time, degrade significantly in respect to the aesthetic beauty and quality of the fishery.”

“Area needs to be protected for enjoyment of generations to come.”

“The property we own in the watershed is a vacation property for us, we spend time there to enjoy the natural beauty of Michigan. We are very interested in protecting that natural beauty.”

“I love our beautiful rivers and I would like everything done that is possible to preserve them.”

“I am surprised that the Little Manistee watershed was not designated in the National River Program years ago. The river and tributaries are gems that cannot be replicated.”

“The Little Manistee is a hard-working river who helps populate other rivers with the weir. This river is a treasure and should be selected for the best sorts of conservation efforts.”

“The Little Manistee River system is a blue-ribbon trout habitat and should be protected.”

“Just keep the river clean + fish + wildlife so people can go fishing.”

“My happy memory of the Little Manistee day is our campfire and then my dad's shouts as he caught and fought and landed a 17 lb. steelhead. I write with prayers for your work. I hope you are able to get a Natural Rivers Program designation.”

“We love the river and the opportunity it gives us to be amongst the birds and wildlife and natural habitat. We enjoy making memories with our family.”

“The Manistee watershed is a natural beauty that needs to be preserved for generations to come. It is an important feature of the area for many reasons and must be protected from attempts to change or destroy its natural beauty.”

“Preserve, protect, enjoy. Leave it for my grandchildren. An asset that can never be replaced. We must protect the river for the short time we enjoy it so it can be there forever.”

Respondents who are unsure about the NRP proposal are in some respects the most interesting group of respondents (**Figure 5b**, right facet). Unlike those who are definitively opposed or supportive, respondents who are unsure are not firmly committed to a position and therefore represent a persuadable population. A full 75% of those unsure about the NRP agreed that they need more information. Considering that two-thirds of those unsure about the NRP share NRP detractors' concerns about government interference in private property rights and restrictions on the use of their property, information that specifically addresses how the NRP regulations affect land management would likely be the most appreciated. Those who were unsure about the NRP were also highly uncertain about the appropriateness of existing management actions and protective measures, and they were also uncertain about whether the DNR or their township could effectively administer the program. Many expressed uncertainty about what the NRP would mean for future plans, writing:

“I am hoping to build a small wood fired sauna within 50 ft of the river. I'm hoping any restrictions will not affect my hope/plans.”

“I support conservation and stream management. I'm concerned about who gets to decide if I need a deck or a dock or any alteration.”

“I support conservation, but I don't want my taxes raised. Also, I want the right to enjoy a cleared-out section or dock on my riverbank.”

“Concerned about restoration plans to our cottage which is approx. 40 feet from the water.”

“I am concerned that these will just be more roadblocks to cutting and effectively managing the forests for proper wildlife habitat.”

“I want to be able to build a dock on the land I own on the river.”

“My house is less than 100’ from the river. I love the river! Need to see it and enjoy it.”

“Not sure what stipulations government would put on private properties.”

“I don’t want to lose rights and decision-making ability and I don’t want new laws costing me more money to maintain my property. If decisions are made that limit rights and require specific concessions from landowners, monies should be available to assist.”

“I would be for natural rivers but don't like idea of DNR control.”

“I work in the construction industry, so I understand and agree with setbacks and building restrictions. I support conservation of our natural resources but would like to see a more cooperative effort.”

“As far as any more rules and regulations being placed on individuals, I think there are times it could be necessary. But enforcement of building codes on any waterfront properties should be done by the township or county.”

“Building codes should be handled through township boards and if they are not following DNR rules already in place then fine or penalize them, not the current residents of the river.”

“The problem is that the citizen committee will end up being packed with individuals that think that they are much smarter and better equipped to control other people’s lives.”

“I do not want some committee continually increasing rules and regulations on river management... In 50 years, the Little Manistee River has done alright! Let’s not try to fix something that is not broken!”

“I am concerned that a non-elected bureaucratic committee will be established, who answers to no one, and will become the governing authority of the watershed.”

While there are clearly different views regarding the merits of the NRP, it is worth noting *a point of common ground* across respondents. Whether they supported, opposed, or were unsure about the NRP, few respondents agreed with the statement, “I prefer that more development be allowed along the river.” Little Manistee property owners may disagree about the preferred regulatory approach for the Little River, but there is widespread interest in maintaining its rustic character.

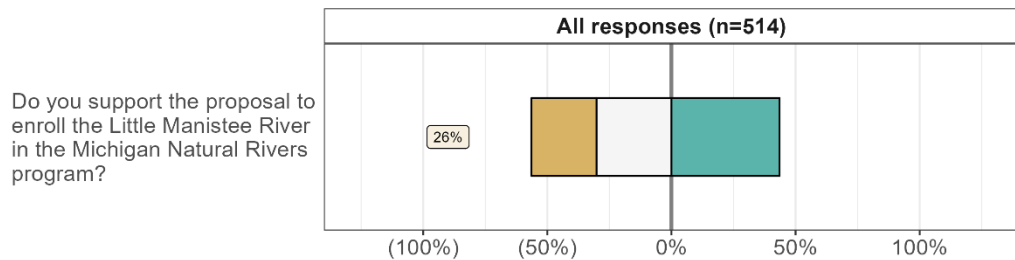
Alternatives to the NRP

The survey also presented respondents with a list of four alternative regulatory standards and asked if they found these options more agreeable than an NRP designation (see list in **Figure 6**). For each item, respondents could select that they support, oppose, or were unsure about the proposed alternative. These questions were intended to be completed only by respondents who were unsure about or opposed to the NRP, but many respondents who supported the NRP also completed these

questions. **Figure 6b** therefore presents opinions on the NRP alternatives by the respondents' preference for the original NRP proposal (**Figure 6a**).

It is apparent that respondents who generally supported the NRP were also in favor of each of the proposed NRP alternatives. Likewise, most respondents who opposed the NRP were also opposed to the alternative regulatory proposals, except for tax incentives for landowners who voluntarily install setbacks or vegetative buffers on their property. Among those who were unsure about the NRP, there was a great deal of support for each of the proposed alternatives. This indicates that there is widespread interest in implementing *some type* of regulatory protections for the Little River, even if the NRP is not landowners' clear preference.

(a)



(b)

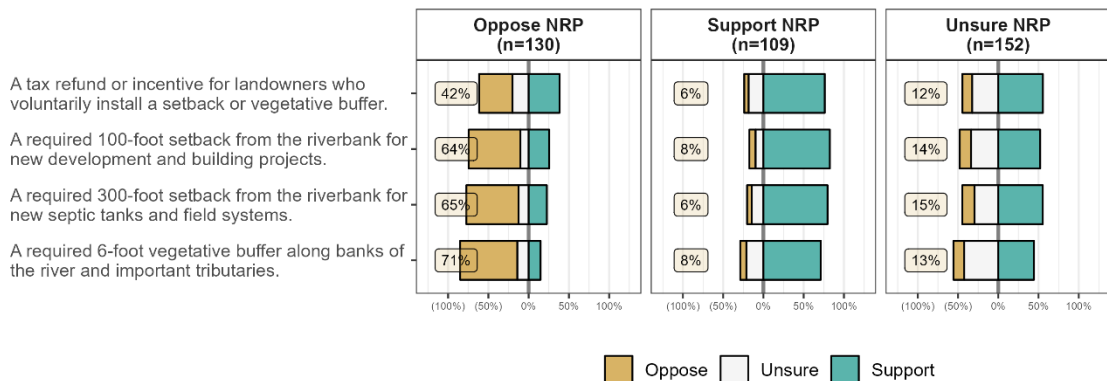


Figure 6. Opinions about NRP Alternatives by NRP Preference

Property Management Practices

The Little Manistee Management Survey also asked property owners about property management practices identified as priority outreach areas in the LMWCC's 2020 Watershed Management Plan for the Little Manistee River. Routine inspection and maintenance of on-site sanitation systems is important for preventing leaks and failures that can contaminate groundwater, and streambank management practices can have important consequences for erosion and habitat management. Therefore, we asked survey respondents a series of questions about septic system maintenance and streambank management in the Little Manistee watershed.

Half of survey respondents (n=267) reported having a septic system on their property of known age, 14% (n=72) did not have a septic system, and 21% (n=114) did not know the age of their system. Of those who reported not having any on-site sanitation system on their property, 61% (n=44) reported owning a vacant lot, and 24% (n=17) reported owning a rural residence or hunting cabin. Only two respondents (3%) indicated that they did not have a septic system because their property was in-town and connected to a municipal sewer service. The average age of septic systems reported by respondents was 24 years, with the range of system ages being large – from brand new systems to 80-year-old systems. However, only 6% of systems were reported to be 50 years old or older.

Table 8. Use of Best Management Practices in the Watershed

| On-site Sanitation (Septic) Systems | | | | | |
|--|----------|------------------------------|-------------------------------|---------------------------------|--------------------------|
| General Servicing | N | Every 3-5 Years % (n) | Every 6-10 Years % (n) | More than 10 Years % (n) | Never % (n) |
| Pumping the tank | 367 | 47.1 (173) | 24.0 (88) | 16.9 (62) | 12.0 (44) |
| System inspection | 363 | 33.3 (121) | 18.5 (67) | 11.3 (41) | 36.9 (134) |
| Additional Maintenance | N | Currently Use It | Know How, Not Using | Somewhat Familiar | Never Heard of It |
| Check cover for closure | 368 | 52.7 (194) | 8.4 (31) | 18.2 (67) | 20.7 (76) |
| Check drain field for wetness | 369 | 49.3 (182) | 7.6 (28) | 23.6 (87) | 19.5 (72) |
| Check drain field for roots | 368 | 32.6 (120) | 8.2 (30) | 28.3 (104) | 31.0 (114) |
| Check effluent filter for clogs | 363 | 28.1 (102) | 7.4 (27) | 21.8 (79) | 42.7 (155) |
| Limitations to BMP Use | N | Not At All | A Little | Some | A Lot |
| I need more information | 345 | 58.0 (200) | 9.9 (34) | 18.8 (65) | 13.3 (46) |
| The cost | 362 | 58.0 (210) | 18.0 (65) | 16.9 (61) | 7.2 (26) |
| I didn't realize it's important | 350 | 59.1 (207) | 18.3 (64) | 14.9 (52) | 7.7 (27) |
| The time required | 362 | 69.3 (251) | 16.6 (60) | 12.2 (44) | 1.9 (7) |
| Streambanks/Shorelines | | | | | |
| General Maintenance | N | Currently Use It | Know How, Not Using | Somewhat Familiar | Never Heard of It |
| Protect banks w/ vegetation | 374 | 68.7 (257) | 5.9 (22) | 19.8 (74) | 5.6 (21) |
| Improve habitat for wildlife | 370 | 61.9 (229) | 6.8 (25) | 25.4 (94) | 5.9 (22) |
| Maintain 6+ ft buffer | 368 | 54.3 (200) | 10.9 (40) | 22.6 (83) | 12.2 (45) |
| Improve adjacent land | 355 | 51.0 (181) | 9.3 (33) | 26.8 (95) | 13.0 (46) |
| Limitations to BMP Use | N | Not At All | A Little | Some | A Lot |
| Lack of equipment | 347 | 46.7 (162) | 15.9 (55) | 19.9 (69) | 17.6 (61) |
| I need more information | 327 | 48.0 (157) | 11.3 (37) | 21.7 (71) | 19.0 (62) |
| The time required | 346 | 48.3 (167) | 17.9 (62) | 21.4 (74) | 12.4 (43) |
| The cost | 346 | 51.2 (177) | 19.1 (66) | 16.2 (56) | 13.6 (47) |

Regarding maintenance of their septic systems (**Table 8**), most respondents with systems reported having the tank pumped at regular intervals, consistent with industry recommendations (every 3-5 years). Inspections occur less frequently, with one-third of respondents reporting that they had never had their system inspected. Respondents were most familiar with inspecting the tank cover for proper close and checking the drain field for wet spots indicating leakage. They were somewhat less familiar with the importance of checking the drain field for possible root encroachment, and 43% had

never heard of checking the effluent filter for clogs¹⁴. When asked about factors that limit their ability to properly maintain their septic systems, over 50% of respondents indicated that lacking the time, money, awareness, or information were not at all a problem for them. Of these barriers, lacking information was slightly more of a problem, with 32% of respondents reporting that not having the information they needed to take care of their system caused “some” or “a lot” of trouble for them.

Several respondents expressed concern about implications of the NRP proposal for septic systems. There were acknowledgements that regulatory oversight might be necessary to counter negligent management, and several noted a preference for state or local legislation:

“My concern is that some of the existing lots are very small. Septic systems must include holding tanks as an option to full septic systems.”

“We have a cabin on 1.3 acres with a creek on 2 sides. 100 ft build and 300 ft septic restrictions (esp.) would be extreme.”

“Public water/sewer options must be available before restrictions on septic systems.”

“Very concerned about houses across our street - river runs behind houses across the street not having septic tanks or drain fields. If no septic or drain field, should be made mandatory for homeowners - no grandfather act. They have no right to pollute the river.”

“We need point of sale septic inspections.”

“The recent discussion in legislature to inspect septic systems along the river every 3 years would go a long way to preserving and correcting septic problems.”

“I’m sure there are many systems that don't meet current standards. If there was a required 300' setback for septic, ours doesn't comply. We only have 275' to back of property. That is unrealistic for many.”

“Lansing already has legislation pending on statewide septic system laws. With many of the homes used as vacation homes, we would think septic systems would not be a significant issue. We could be wrong. Regardless, we think septic issues could be addressed through local township zoning. This should be the first place to start...if there are severe problems.”

Concerning streambank maintenance, most respondents with water features on their property reported having river frontage (57%, n=287), a creek (20%, n=1-2), a wetland, (16%, n=83), a lake (13%, n=65), or some combination of these four types of water features. Use of best management practices (BMPs) for streambanks and shorelines was high among survey respondents. Two-thirds reported protecting the bank or shoreline with vegetation, 62% have made improvements to shoreline habitat, and just over half reported maintaining a 6-foot vegetative buffer and improving the land adjacent to the stream. As with septic maintenance practices, approximately half of survey respondents indicated that lacking time, money, equipment, or information were not at all a problem preventing their use of streambank/shoreline BMPs, although lack of equipment and information were slightly bigger barriers than were having adequate time or money.

¹⁴ Effluent filters are not present on all systems and may not be included in older septic systems.

Conclusions and Recommendations

Our survey of property owners in the Little Manistee River watershed identified several key topics and constituencies that those promoting watershed conservation might consider. First, there is a unifying interest in fishing and hunting among Little River property owners, and explaining how conservation efforts stand to benefit these activities will be a fruitful way to build connections.

Concerning threats to local water quality, knowledge was lowest regarding the extent of the problem posed by *E. coli* contamination, invasive species, and nutrient loading, with over 20% of respondents unable to evaluate the severity of these problems in the watershed. Outreach and education efforts should therefore focus on communicating about these three types of pollutants, their sources, and their consequences in the watershed, with emphasis on impacts to habitats supporting fish and wildlife as well as animal and human health.

Further outreach is particularly needed with young families, who were underrepresented in our survey data, and with property owners in Norman Township. A data error in the tax parcel records prevented us from obtaining a representative number of responses from Norman Township, and we are therefore limited in drawing conclusions about their preferences regarding a Natural Rivers designation for the Little Manistee River. Direct outreach with Norman Township residents is needed to learn their preferences on the NRP proposal.

Elsewhere in the watershed, survey respondents reported a high degree of familiarity with recommended best management practices for on-site sanitation (septic) systems and maintaining streambanks and shorelines. Many properties in the watershed are used seasonally and for vacationing, with no permanent structures or water and sanitation infrastructure. Ensuring that seasonal campers have adequate, properly maintained facilities to discharge wastewater and that restrooms are available at popular recreation sites would be important future investments for reducing the risk of *E. coli* and other fecal contaminants in waterways. Most survey respondents with waterways on their property reported understanding the benefits of maintaining vegetation along their streambank or shoreline, although sedimentation remained a primary concern for survey respondents, along with invasive species management and nutrient loading. This suggests that native plant sales and invasive species strike teams will continue to be valuable investments for county conservation districts and their partners.

Survey respondents left several additional suggestions for outreach and communication, writing:

“Suggest utilizing television, P.B.S. documentary to tell this river’s story from logging era to present. Talk to the old timers!”

“Education is key. The public outreach should anticipate the counter argument and address it up front. It's really about preserving a unique natural resource for the benefit of everyone today and those in the future.”

“I believe that there needs to be education on the consequences of the lack of protections for the river – including negative changes that have occurred in unprotected rivers and positive changes in protected rivers.”

“I would like more information on what is currently in place for river protections and then what the proposal would offer for additional management.”

“I would like to know more about cleaning up at the river’s edge with fallen trees and down trees! How can I get involved for my area?”

“I think the property owners should have more information on septic systems and more information on keeping 4-8 feet of streambank vegetation on their properties. There is a total lack of knowledge by the majority of property owners on these issues. And they should have information describing the importance of leaving trees/logs in the river.”

“I love the river. Would like to learn more about helping it and be able to use it more. Need help cleaning it out (trees).”

“My property sits on a bend in the river and is wearing down the bank. I understand the river changes as time goes on. But I would like help and direction on how to fix it.”

Our survey results indicated that property owners value the scenic beauty of their watershed properties and we found evidence that landowners prefer that *something* be done to preserve the qualities of the Little River that make it a cherished wilderness retreat. However, we did not find clear support indicating that the NRP is the preferred policy option among Little River property owners.

Approximately one out of three Little Manistee property owners were unsure about the NRP proposal (30%, n=155), and 75% of these landowners indicated that they had not been adequately informed about the specifications of the program and how it would affect their property. We overwhelmingly heard that landowners were concerned about their ability to flexibly manage their property free from state interference. Those wishing to promote the NRP therefore have an opportunity to build support among this substantial constituency of “unsure” landowners using a focused communication strategy that specifies which land use requirements and restrictions would be implemented within the 400-foot management district under the DNR’s jurisdiction.

Stronach Township survey respondents were by far the least enthusiastic about the NRP. Many Stronach respondents wrote that they believed the existing zoning regulations in Manistee County provided adequate protection of the river, and they cited dissatisfaction with the DNR’s management of the Little Manistee River Weir in Stronach Township as further evidence of their distaste for the NRP. Those wishing to promote the NRP would be best served by developing a proposal that excludes the Stronach reaches of the river, and perhaps the whole of Manistee County.

A larger proportion of survey respondents supported the NRP proposal (44%, n=224) compared to survey respondents who opposed it (26%, n=135), but there is overall less support than there is opposition and uncertainty about the proposal (56%, n=290 opposed or unsure). We also found that support was higher among part-time or seasonal residents and those who own properties in the wider watershed than among full-time residents and owners of riparian properties. This suggests that those promoting the NRP have more work to do in building support among property owners who are the most direct stakeholders to the NRP proposal - riparian owners and full-time residents.