*Chapter 7:*

Maps and tables for chapter 7: Images from survey results, when available

*Information and Education*

Watershed protection can be sustained over the long term only with the informed support of local stakeholders – including property owners, residents, businesses, government agencies, boaters and anglers.

Watershed Management Plans approved by the Michigan Department of Environmental Quality and the United States Environmental Protection Agency must include an Information/Education (IE) element. This section of the plan will be implemented to inform stakeholders about the specific goals and objectives of the WMP, and engage the public in the long-term process of watershed protection.

The Goals and Objectives for the Little Manistee Watershed Management Plan are presented in Chapter 1 of this document. The IE component is addressed in the first goal, which is reproduced below:

***Goal 1: Develop an educational component to inform and engage the public in long-term water-quality protection efforts and the potential impacts of land use and development.***

*a. Develop a public education program to help create understanding of the short and long term threats to the river environment, including the potential impacts of land use and development.*

*b. Utilize print, broadcast, person-to-person and electronic communication to disseminate a clear, concise message about the public’s role in protecting water quality in the Little Manistee River Watershed.*

*c. Work through conservation districts and the Little Manistee Watershed Conservation Council to coordinate and promote educational efforts of non-profits and government agencies.*

*d. Support sustainable funding for conservation districts and invasive species control agencies.*

*e. Support and promote boater, angler and paddlecraft safety and stewardship practices.*

*f. Engage local residents, landowners and government representatives in discussion of potential water-quality benefits of local zoning or natural river designation.*

The high water quality in the Little Manistee Watershed is largely a result of the region’s forested land cover and extremely low percentage of impervious surfaces (See Chapter 3). The Steering Committee recognized that unplanned development and changes in land use could negatively affect the watershed’s lakes and streams. Because of that, the committee chose to include land use education (objective 1a) and discussion of zoning (objective 1f) among the primary objectives of the WMP.

In addition to general watershed education, the IE component of this WMP focuses on three main categories:

1) The impact of land use practices and regulations on water quality – including ground water

2) Limiting the introduction and spread of invasive species.

3) Management of onsite wastewater systems (septic tanks and drain fields).

These elements were developed during the public planning process, and presented along with a draft of the full WMP document in two informational meetings in 2018.

A social indicators survey was widely distributed to watershed stakeholders to assist in development of the educational component. Full survey results are presented in Appendix A. It is recommended that similar surveys be administered in the future to monitor the effectiveness of the program.

1) Understanding the impact of land use practices on water quality

The watershed has remained lightly populated since the end of the initial timber-harvesting era in the early 20th century. Forests have grown back over the past hundred years, and many – though not all – of the scars from that earlier era have healed. In recent decades, most development in the watershed has been of recreational amenities or dispersed homes, cabins and campsites.

However, the Little Manistee Watershed lies only about 50 miles from Michigan’s fastest growing area – the Grand Rapids Metropolitan Area – which is home to more than a million residents. Grand Rapids Metro residents have traditionally made use of the recreational assets in the Little Manistee and adjacent watersheds including the Pine, Big Manistee and Pere Marquette, so there is a significant likelihood that the area will eventually see an increased level of development pressure.

The IE proposal in the WMP does not aim to discourage or deter investment or development in the area, but to promote best management practices with a goal of minimizing any adverse effects.

The overall goal is to help local communities understand the issues of non-point source (NPS) pollution, and to acquire the tools to preserve natural resources and water quality should that growth occur. Those tools could include such strategies as river setbacks for buildings, control of storm runoff, limitations of impervious surfaces, management of vegetation cutting in stream corridors, updating of stream-crossing infrastructure and/or other “low impact development” techniques. Ultimately, local governments will have the lead role in deciding whether to pursue this goal through local zoning, promotion of Natural River status, or other means.

There is a long-standing local perception that the rural population is opposed to adoption of local zoning. However, the social indicators survey distributed during development of this WMP found support for some level of zoning, as did a 2006 survey conducted by Newkirk Township. (Insert zoning-question graphic)

Beyond the question of zoning, an important consideration for land use education in the watershed is that permeable soils and interconnected aquifers make the region’s groundwater particularly susceptible to contamination that may leach from materials on the surface.

Coarse, sandy soils, especially in the absence of deep-rooted vegetation, have only limited ability to filter materials that dissolve in rain or snowmelt and percolate into the ground. Thus, pesticides and fertilizers applied to lawns or field crops are at risk of leaching all the way to the water table if not carefully applied at rates that can be taken up by the vegetation. The same risk holds true for used motor oil or other petroleum products that may be improperly disposed of on the ground.

A 1995 report by the Manistee County Planning Department found that most soils on the area fall into “very rapid” or “rapid” permeability categories. That finding means the region has “a high potential for contamination from activities involving hazardous materials which take place on the surface…”

The WMP proposes that the land use education program include materials to inform property owners of Best Management Practices for groundwater protection.

The Little Manistee Watershed Conservation Council will work with Networks Northwest, the Manistee County Planning Department and others to develop and disseminate information.

Land use is likely to be the single largest factor in determining future water quality in the Little Manistee Watershed. For that reason the WMP’s implementation tasks (Category L in Chapter 5) include a grant-supported project to engage with township governments and the public for discussion and consideration of zoning and other potential forms of land use regulation.

2) Limiting the introduction and spread of invasive species

Aquatic nuisance species of concern in this region include zebra and quagga mussels, Eurasian milfoil, round gobies, sea lampreys, New Zealand mud snails**,** *Didymosphenia germinata* (“rock snot”) and potentially many others. Terrestrial plants of concern include garlic mustard, Phragmites, narrow leaf cattails Japanese knotweed and more.

Surveys here and in adjacent watersheds identify invasives as a major water-quality concern. But many residents and visitors may be unable to identify the problem species and may be unaware of best practices to limit their spread.

The emerald ash borer likely reached the area in campfire wood transported from previously infested regions; zebra mussels and Eurasian milfoil have been inadvertently introduced to some lakes by recreational watercraft; *Didymosphenia* may adhere to the boots of fishermen’s waders; and hikers may accidentally spread garlic mustard seeds along forest trails.

The WMP recognizes that recreational activities – by both residents and visitors – are vital to the region’s economic and cultural well-being. Therefore, it is important that this element of the plan focus on encouraging responsible recreation in ways that minimize the spread of invasives.

The Northwest Michigan Invasive Species Network operates an informative website with photographs and information about invasive plants that occur in the region. Additional ISN resources available to the public include print materials and the opportunity for group presentations and plant identification by network staff.

The Clean Boats, Clean Waters program, sponsored by Michigan Sea Grant, provides informational materials and instructional forums to educate boaters on ways to detect and remove weeds and other invaders before launching into new waters. Generally, the advice is that any vessel which has not been out of water and dry for 10 days should be cleaned before launching in a new waterway. If a dedicated boat-wash facility is not available, kayaks and canoes can easily be washed at home, or at commercial car washes.

The Benzie Conservation District, through an MDNR grant, operates a mobile boat-washing system that is available for educational events in Manistee County and may eventually be available throughout the watershed.

To help control the spread of invasives on fishing gear, the WMP proposes installation of information kiosks and wader cleaning stations at popular river entry sites.

3) Management of onsite wastewater systems (septic tanks and drain fields)

As detailed in Chapter 3 of this WMP, most residential properties in the watershed are served by individual on-site wastewater systems – primarily by septic tanks and drain fields.

These systems, when properly sited and maintained, can efficiently break down bacteria and nutrients in household waste, while protecting the environment. However, some property owners unfortunately take an “out of sight, out of mind” attitude toward these systems, and may ignore preventative maintenance.

Without proper attention, the systems may become clogged or overloaded. When that happens, nutrients and/or pathogens may contaminate the soil and ultimately reach groundwater, lakes or streams.

The most important BMP for septic systems (assuming the system is designed and installed properly) is regular pumping, with the waste transported to a facility for proper treatment.

Information is readily available on wastewater BMP’s, but this information has not been communicated effectively to all property owners. To improve this communication, the LMWCC will work with health departments to develop clear and simple information sheets, which can then be included on lake association websites, offered as public service announcements in local media, and mailed to property owners with tax bills and other township communications.

The WMP also supports a regulation to require inspection of septic systems whenever a property is sold. This will be best accomplished through statewide legislation, as Michigan is the only state without a septic system code. Such a provision is included in the governor’s 30 year water strategy for the state, and is under consideration in the Legislature at the time of the completion of the WMP.