

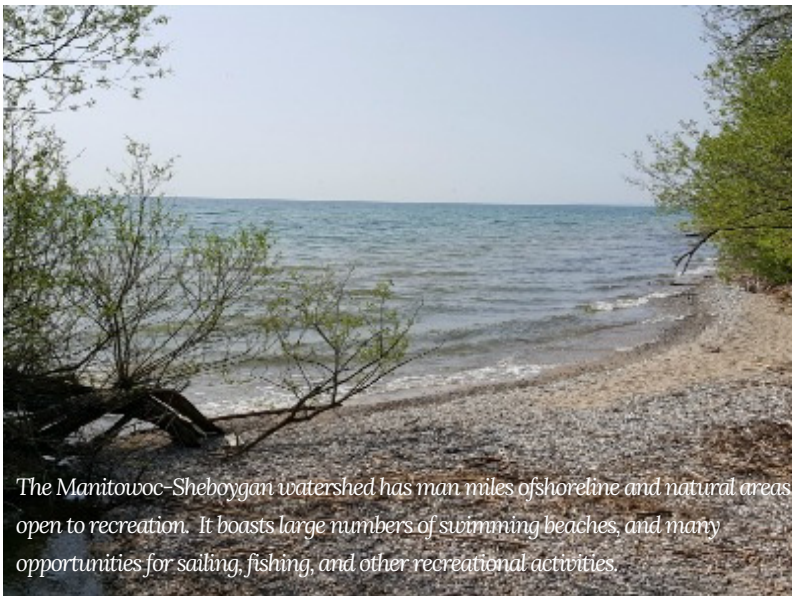
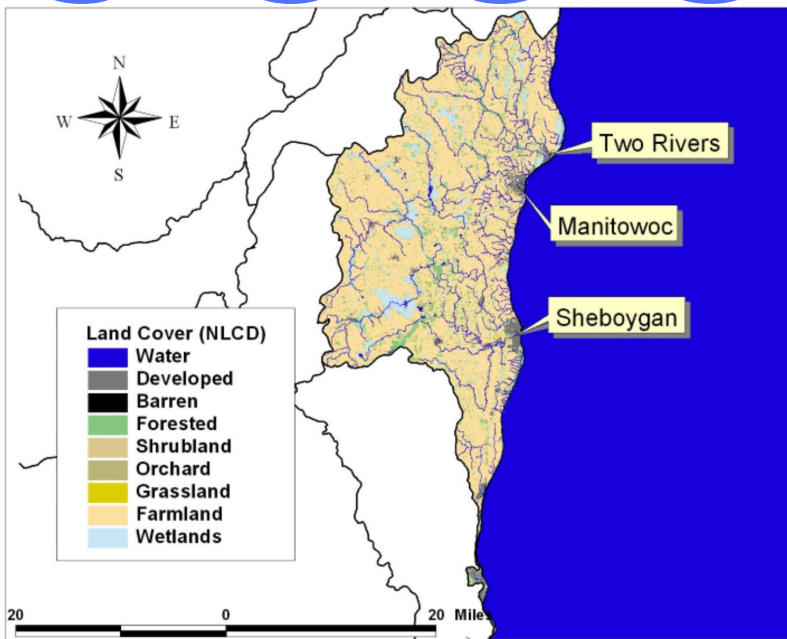
MANITOWOC-SHEBOYGAN WATERSHED

Hydrologic Unit Code 04030101

The Manitowoc-Sheboygan watershed is one of 33 8-digit hydrologic unit code (HUC) watersheds that flow to Lake Michigan. A hydrologic unit code is a sequence of numbers or letters that identify features like a river, river reach, lake, or area like a drainage basin (also called watershed or catchment). The smaller the number, the larger the watershed.

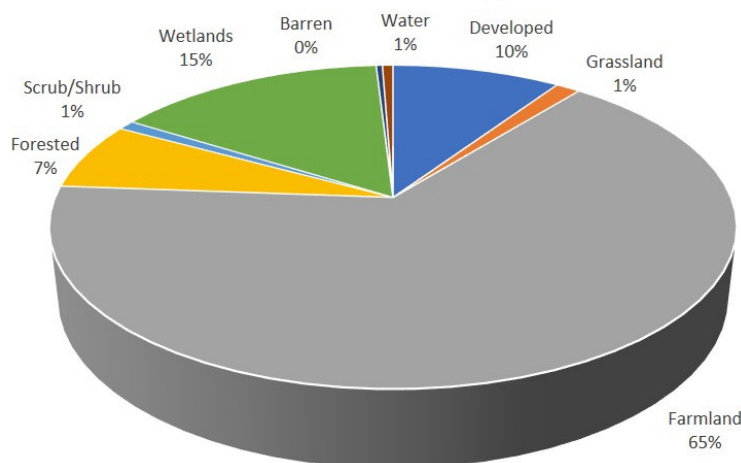
OVERVIEW

- Totalling 1,652 square miles, the Watershed includes the Branch River, the North and South Branches of the Manitowoc River, the Lower Manitowoc River, Sevenmile and Silver Creeks in the Manitowoc subwatershed and the Sauk and Sucker Creeks, the Black River, the Sheboygan River, the Onion River, the Mullet River, and the Pigeon River in the Sheboygan River subwatershed.
- Water quality has been impaired as a result of runoff from specific and diffuse sources carrying contaminated sediments that degrade habitats.
- Grasslands and barrens are promoted through prescribed burns and mowing.
- Recreational highlights include wildlife watching, hiking, fishing, birding, bicycling, golf, horseback riding, snowmobiling, skiing, camping, and water sports.
- Some watershed groups working on basin issues:
 - League of Women Voters of Wisconsin <http://www.lwvwi.org/>
 - Sheboygan River Basin Partnership – www.sheboyganrivers.org
 - Friends of the Manitowoc River <http://lnrp.org/friends-of-the-manitowoc-river-watershed/>
 - Lakeshore Basin Website – basineducation.uwex.edu/lakeshore
 - Lakeshore Natural Resource Partnership – www.lnrp.org
 - Sheboygan River Basin DNR Team – www.dnr.state.wi.us/org/gmu/sheboygan
 - Friends of Kohler Andrea State Park
 - Friends of the Sheboygan Marsh
 - E H May Environmental Park Association



The Manitowoc-Sheboygan watershed has many miles of shoreline and natural areas open to recreation. It boasts large numbers of swimming beaches, and many opportunities for sailing, fishing, and other recreational activities.

Land Cover: Manitowoc-Sheboygan Watershed



Over half of the 1652 square miles of the watershed is farmland. The watershed has seen significant urban and suburban development at the expense of agriculture. Land use data source: NOAA

KEY CHALLENGES

- Agricultural practices can be associated with fertilizer/pesticides runoff, excessive sedimentation of streams resulting in low levels of dissolved oxygen that contributes to algal growth and can cause dead zones.
- Development in urban areas and farmland expansions drained historic wetlands, destroyed habitat, straightened streams, which reduced stormwater holding opportunities for water infiltration that impacts groundwater levels.
- Sheboygan River priorities include remediation of contaminated sediments, nonpoint source pollution control, brownfield and waterfront restoration, and habitat protection and restoration
- Waste from farm animals and pets increases E. Coli and other pathogens in streams, lakes and beaches.
- Beach closures resulting from higher E. Coli levels have been an ongoing problem, but have seen reductions in numbers as sources are addressed.
- Increased severe storms cause stream bank and bluff erosion sending sediment downstream impacting water quality and aquatic life.
- Increases in invasive/non-native plant species pushes out native species which support native wildlife and pollinators.
- Road salt in street runoff increases chloride pollution on nearby habitat and receiving streams and lakes impacting aquatic life.
- Loss of natural areas and habitats impact wildlife populations that rely on natural land and water migration corridors and recreational open space.
- Pumping from deep confined aquifers lowered groundwater levels, resulting in higher radium and other contaminant concentrations.
- Several waterways are on the 303d impaired waters list, meaning they have higher levels of contaminants requiring special remediation. Contaminants found include E. Coli, metals, sediments, and total suspended solids.



Runoff from farms and developed areas can lead to algal growth in streams and Lake Michigan



Stream buffers prevent fertilizers and other pollutants from entering waterways

NEEDED ACTIONS

This list implies separate items, but they interact in the watershed. Many items represent a legacy of industrial and agricultural activities prior to the 1972 Clean Water Act framework to meet the goal of fishable, swimmable, and drinkable water.

- Support use of technology and weather awareness for better targeting application levels of nutrients and pesticides to prevent loss of applied products into runoff for farms, golf courses and other large areas,
- Improve habitat and water quality by constructing stream buffers, restoring wetlands and other practices on streams for both farms and developed areas.
- Review Wisconsin Department of Natural Resources streams status reports to target areas where action is needed (see <http://dnr.wi.gov/topic/rivers/>)
- Identify areas where sediments are entering and how they are moving as a result of streambank erosion to prevent and repair erosion.
- Factor changing climate and intensive storms into storm water management using stream buffers, wetland restoration and naturalized detention areas practices to prevent flooding, polluted runoff and to aid ground water recharge and possible recreational open space opportunities.
- Collaborate to gather or support research on the movement of sediments and beach sand due to changing storm intensity.
- Maintain and leverage the momentum of the Clean Water Act's framework of State Water Quality Standards and Section #319 Watershed Planning.
- Maintain and leverage the momentum of the recent watershed projects of the federal Great Lakes Restoration Initiative.



The Pitcher's Thistle is an important plant species found in the watershed.



The Ice Age Trail follows roughly the terminal moraine from the last ice age.

SIGNIFICANT NATURAL FEATURES

- The watershed has two primary ecological landscapes which include Southeast Glacial Plains and Northern Lake Michigan Ecological Landscapes that provide habitat for several species.
- State facilities such as the Kettle Moraine State Forest, Kohler-Andrae State Parks, Harrington Beach State Park, various state wildlife areas, and the Ice Age National Scenic Trail provide both satisfying and unique recreational experiences.
- Watershed streams have water quality that supports trout populations and have spring and fall runs of stocked Steelhead and Salmon.
- Other fishing opportunities exist in rivers and harbors for Northern Pike, Smallmouth Bass, and Yellow Perch.
- Wildlife includes White-tailed Deer, Ring-Necked Pheasant, Waterfowl, Geese, Gray and Flying Squirrels, Raccoons, Woodcock, a variety of hawks, songbirds, and shorebirds.
- The National Heritage Inventory has documented 10 endangered, 20 threatened, and 37 special concern plant and animal species, and 24 rare aquatic and terrestrial communities within the Sheboygan River Basin.
- The Nature Conservancy has identified critical habitats of Black Ash – Mixed Hardwood Swamp, Great Lakes Dune Pine Forest, Great Lakes Hemlock – Beech – Hardwood Forest, Great Lakes Beachgrass Dunes, and Great Lakes Beach as well as baymouth/barrier beaches with sand near shore at Point Beach State Park.
- In addition, Pitcher's Thistle and the Piping Plover have been identified as a critical species at Point Beach State Park.
- Ridge and Swale habitats are on Rawley Point and Woodland Dunes Nature Preserve.

DRINKING WATER

- The source of drinking water is either surface water (Lake Michigan) or groundwater (wells).
- More communities are served by groundwater supplies, although more people are served by Lake Michigan surface supply because the larger cities use Lake Michigan water supply.
- Manitowoc, Twin Rivers, and Sheboygan all use Lake Michigan surface water as their public water supplies.
- These utilities report no contaminant levels exceeding U.S. E.P.A. quality standards for regulated contaminants water put into their distribution system.
- Lead is increasingly being seen as a problem in some of the older distribution systems. The majority of water treatment utilities add phosphate to decrease the potential of lead leaching from eroding lead pipes in service lines.
- Contaminants exceeding quality standards are reported most frequently from groundwater utilities and consist of bacteria, lead, copper, and nitrates.
- Radium can be a problem when water is drawn down from deep confined aquifers in certain places and is an indication that water is being over pumped and the source over taxed.
- Wastewater utilities treat wastewater to state water quality standards and discharge treated effluent to streams and the Lake.



Kohler-Andrae State Park



the Piping Plover has been identified as a critical species at Point Beach State Park.



The Nature Conservancy has identified critical habitats at Point Beach State Park.



Lake Michigan supplies most residents with their drinking water, although groundwater is an important source for many smaller communities

SHEBOYGAN RIVER AREA OF CONCERN (AOC)

- The Lower Sheboygan River and Harbor were designated an AOC because of water quality and habitat problems associated with the historical discharge of pollutants into the AOC and the potential adverse effect the pollutants could have on Lake Michigan.
- Of the 14 beneficial uses (BUIs), these are impaired for Sheboygan River
 - Restrictions on fish and wildlife consumption
 - Degradation of fish and wildlife populations
 - Fish tumors or other deformities
 - Bird or animal deformities or reproduction problems
 - Degradation of benthos
 - Degradation of phytoplankton and zooplankton populations
 - Restriction on dredging activities
 - Loss of fish and wildlife habitat

Two BUIs have been removed, restrictions on dredging activities and eutrophication or undesirable algae

- The high levels of nutrients, solids and toxics entering the river had caused a series of problems including nuisance algal blooms, fish consumption advisories and contaminated sediments.
- The Sheboygan River Area of Concern (AOC) encompasses the lower Sheboygan River downstream from the Sheboygan Falls Dam, including the entire harbor and nearshore waters of Lake Michigan.
- Pollutants of concern, both conventional and toxic, have been identified as suspended solids, fecal coliform bacteria, phosphorus, nitrogen, polychlorinated biphenyls (PCBs), Polynuclear Aromatic Hydrocarbons (PAHs) and heavy metals.
- All of the management actions for the Phase I restoration plan have been completed. Phase II management actions are getting underway.
- The area has seen significant restoration and economic development in the AOC.

More information is available at

<http://dnr.wi.gov/topic/greatlakes/sheboygan.html>

TO READ MORE ABOUT IT

General Overviews

Wisconsin DNR Overview:

<http://dnr.wi.gov/topic/watersheds/basins/sheboygan/>

<http://dnr.wi.gov/topic/watersheds/basins/lakeshore/>

Watershed Central wiki:

https://wiki.epa.gov/watershed2/index.php/Manitowoc-Sheboygan_Watershed

Watershed Plans

Sheboygan River

<http://dnr.wi.gov/topic/watersheds/basins/sheboygan/>

Manitowoc River

<http://dnr.wi.gov/topic/watersheds/basins/lakeshore/>

Mullett Watershed Plan

<http://dnr.wi.gov/topic/watersheds/documents/basins/sheboygan/SH05Wtplan.pdf>

Great Lakes Restoration Initiative

Great Lakes Restoration Initiative project information

<http://www.glri.us> and glrimap.glc.org



Sheboygan River AOC remediation



The AOC restored area has seen significant economic development



Manitowoc River



Canoeing on the Sheboygan River