



The watershed is known for important environmental resources that are enjoyed by large numbers of tourists and summer visitors



Over half of the watershed is farmland, with large areas of forests and wetlands. The area is known for recreational activities, particularly by summer visitors. Land use data source: NOAA

## DOOR-KEWAUNEE WATERSHED

#### Hydrologic Unit Code 04030102

The Door-Kewaunee watershed is one of 33 8-digit hydrologic unit codes watersheds that flow to Lake Michigan. A hydrologic unit code is a sequence of numbers or letters that identify a hydrological feature 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**

- The Door-Kewaunee Watershed is approximately 767 square miles in size with 65% of the watershed area is engaged in agriculture.
- Summer homes and tourism make up a bulk of the economy in the area, yielding a multitude of recreational activities including hiking, birding, camping, rafting, canoeing, hunting, fishing, and boating on Lake Michigan and Green Bay.
- The area was sculpted by glaciers and is dominated by the Niagara limestone formation, which underlies most of the basin, but projects above ground prominently as the Niagara Escarpment, visible throughout much of Door County.
- Some watershed groups working basin issues include:
  - League of Women Voters of Wisconsin http://www.lwvwi.org/
  - Lakeshore Basin Website basineducation.uwex.edu/lakeshore
  - Lakeshore Natural Resource Partnership www.lnrp.org
  - Lakeshore Basin DNR Team http://dnr.wi.gov/topic/watersheds/basins/lakeshore/
  - Healthy Water Door County http://www.healthywaterdoorcounty.org/
  - Midwest Environmental Advocates http:midwestadvocates.org/
  - Kewaunee CARES-Citizens Advocating Responsible Environmental Stewardship

LEAGUE OF WOMEN VOTERS<sup>®</sup> Lake Michigan Region AND WISCONSIN www.lwvlmr.org/ https://my.lwv.org/wisconsin

# **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.
- Waste from farm animals and pets increases eColi and other pathogens in streams, lakes and beaches.
- Shallow aquifers that feed groundwater drinking water supplies and provide base streamflow are at risk to agricultural runoff from large dairy farms and fertilizer runoff.
- Beach closures resulting from higher eColi 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.
- Several waterways are on the 303d impaired waters list, meaning they have higher levels of contaminants requiring special remediation. Contaminants found include PCBs and PCBs in fish tissue. More information is found at http://dnr.wi.gov/topic/watersheds/basins/lakeshore/.

## **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, swimable, 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 stormwater management using stream buffers, wetland restoration, and naturalized detention areas practices to prevent flooding, polluted runoff and to aid groundwater 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.
- Engage the North Central Region Water Network. The Water Network is a 12state collaboration designed to enhance connectivity across regional and state water projects, develop and carry out integrated outreach and education efforts, and coordinate projects with measurable short and long-term environmental and social impacts.

#### BEACH IMPROVEMENT PROJECT

Water quality practices have been installed at this beach to reduce and treat storm water runoff for improved water quality and overall beach health The project reseived financial support through a sub-grant from the Door County Soil & Water Conservation Department under provisions of the the Great Lakes Restoration initiative administered by the United State Evinomental Protection Agency: Great Lakes National Program Office:



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





and groundwater

#### 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,
- The Basin includes Northern Lake Michigan Coastal and Southeast Glacial Plains Ecological Landscapes. Low sand dunes and beach ridges along the shoreline support unique plant species,
- Vegetation is maple-basswood-beach forests and wetlands. In the Southeast Glacial Plains area, former savanna and wetlands are predominant, along with kettle lakes and the Kettle Moraine landscape feature. This area's wetlands are highly productive for plants, insects, and invertebrates.
- Maple-basswood is the most common forest type, and the tree species with the greatest volume in the basin is ash followed by soft maple, aspen, basswood and beech,
- Surface waters are a mix of lakes and cold and warm water streams with smallmouth bass, walleye, northern pike, panfish and trout. Great Lakes fisheries provide lake trout, lake whitefish, salmon and yellow perch.
- The basin's groundwater is underlain by Niagara Dolomite, or Karst (fractured limestone), which allows pollutants such as bacteria to move quickly and which makes this resource highly susceptible to contamination.
- Wildlife include white-tailed deer, turkey, ring-necked pheasant, ruffed grouse, waterfowl, geese, beaver, mink, otter, colonial waterbirds, trumpeter swans, eagle, osprey, northern goshawk, shorebirds.
- Grasslands, which support over 105 bird species, are promoted through prescribed burns and mowing.
- The Nature Conservancy identified the Mink River Estuary as a Great Lakes estuary with regionally important natural values as a coastal wetland and forest landscape. It provides habitat for a number of important plants and animals including fish, migratory and breeding birds, and many mammals representative of a northern Wisconsin mixed conifer hardwood forest.
- The Ridges Sanctuary provides more than five miles of winding trails through the most biologically diverse ecosystem in Wisconsin. The preserve, recognized as a National Natural Landmark, consists of 30 narrow, crescentshaped sandy ridges which represent a former beach line of Lake Michigan. Each one took an average of 30 to 50 years to form. These extraordinary forests and wetlands are home to more than 475 plant species, including 25 of the 40 species of orchids native to the state.
- In addition to all of these natural wonders, the historic Baileys Harbor Range Lights, a rare type of lighthouse, are found here and can be viewed from the Sanctuary's hiking trails.



The Niagara Escarpment is found in the Door County Peninsula

### **DRINKING WATER**

- The source of drinking water is either surface water (Lake Michigan) or groundwater (wells).
- Much of the drinking water in the basin is derived from groundwater
- Many utilities report no contaminant levels exceeding U.S. E.P.A. quality standards for regulated contaminants.
- Lead is increasingly being seen as a problem in some of the older systems. The majority of water treatment utilities add phosphate to decrease the potential of lead leaching from eroding lead pipes in service lines to homes and facilities.
- The Niagara Escarpment's, thin soil layer, combined with the vertical and horizontal fracturing common in the bedrock, makes the groundwater vulnerable to contamination.
- Contaminants exceeding quality standards are reported most frequently from groundwater include arsenic, other metals and bacteria.
- Healthy Water Door County invests in initiatives that research water quality issues, educate policymakers and the community, and mitigate the threats to water sources. Among the programs is testing private well water quality.
- Wastewater utilities treat wastewater to water quality standards and discharge treated effluent in streams and the Lake.
- In the 1970s the US Congress passed the Clean Water Act followed by the Safe Drinking Act due to studies that showed problems directly related to both contamination in the source of water and the distribution systems in more urban areas.
- In recent years, growth and changes in the agriculture industry have brought about new issues to deal with. Problems associated with large agricultural operations have affected many water bodies used as sources for drinking water as nutrient-rich runoff water causes the growth of algae in surface water and manure contamination of groundwater. In rural areas that use private, unregulated wells for drinking water, the groundwater sources have been impacted. http://dnr.wi.gov/topic/DrinkingWater/manure.html
- The Wisconsin Department of Agricultural, Trade, and Consumer Protection estimates that roughly one in five private wells in rural areas of Wisconsin have levels of agricultural pollution that makes the water unsafe to drink.
- In fall 2017, the Wisconsin legislature sent a bill to the Governor for signature. The bill proposes to make help households cover the costs of dealing with contaminated wells or failing septic systems by allowing local governments to provide low cost or no-cost loans to replace these wells and systems. It also increases the maximum grant amount under the Well Compensation Grant program to \$12,000. https://docs.legis.wisconsin.gov/2017/proposals/ab226

### **TO READ MORE ABOUT IT**

General Overviews Wisconsin DNR Overview: http://dnr.wi.gov/topic/watersheds/basins/lakeshore/ Watershed Central wiki: https://wiki.epa.gov/watershed2/index.php/Door-Kewaunee Watershed USGS Infectious Disease and the Environment Lab usgs.gov/wiscience Watershed Plans West Twin River http://dnr.wi.gov/water/watershedDetail.aspx? code=TK01&Name=West%20Twin Lakeshore Basin http://dnr.wi.gov/topic/watersheds/documents/basins/lakeshore/ lakeshoremain.pdf Great Lakes Restoration Initiative http://www.glri.us and glrimap.glc.org

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





The watershed has many cherry and apple orchards



The Mink River Estuary is one of the few high quality estuaries remaining in the US