

Winnebago River Watershed

Watershed approach

Minnesota has adopted a watershed approach to address the state's 80 major watersheds. This approach looks at the drainage area as a whole instead of focusing on lakes and stream sections one at a time, thus increasing effectiveness and efficiency. This watershed approach incorporates the following activities into a cycle repeated on a regular basis:

1. Monitoring water bodies and collecting data over two years on water chemistry and biology.
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters.
3. Developing strategies to restore and protect the watershed's water bodies, and report them in a document called Watershed Restoration and Protection Strategies (WRAPS).
4. Coordinating with local One Watershed-One Plan efforts for implementation of restoration and protection projects.

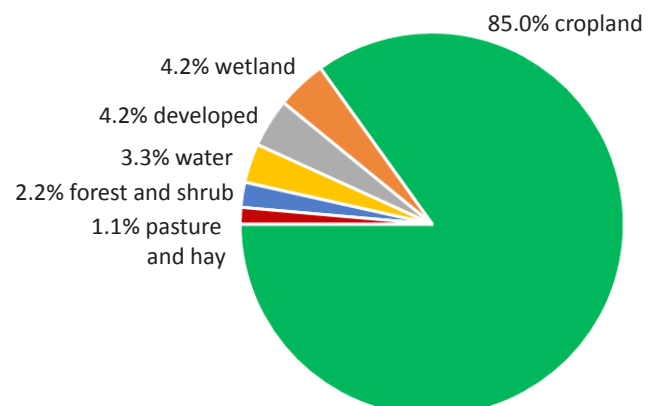
The Minnesota Pollution Control Agency (MPCA) leads the technical work and coordinates and supports strategy development with local partners. The main purpose of the WRAPS report is to summarize all the technical information so that local partners can use it for planning and implement the best strategies in prioritized locations.



Watershed characteristics

- Size: 688 square miles, with 71 square miles (10%) in Minnesota
- Counties: Freeborn (99% of Minnesota portion) and Faribault (1% of Minnesota portion)
- Ecoregion: Western Corn Belt Plains
- Municipalities: Conger and Emmons
- Most of the land is cropland
- Tributary to the Cedar River
- The 8-digit hydrologic unit code (HUC): 07080203

Land use in the Winnebago Watershed

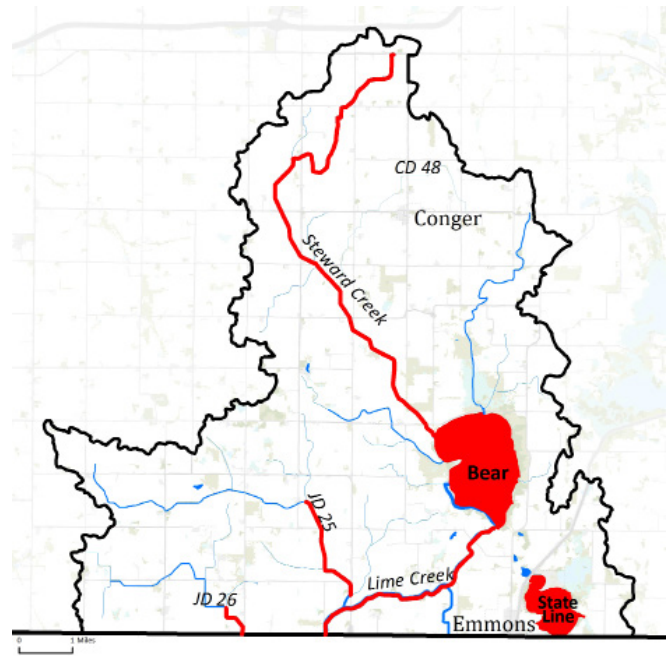


Assessments: Are waters meeting standards?

During the first phase of the watershed approach – intensive watershed monitoring – the MPCA collected data in 2015-16 about biology such as fish populations, chemistry such as pollutant levels, and flow to determine if streams were meeting water quality standards designed to ensure that waters are fishable and swimmable. Waters are “impaired” if they fail to meet standards. Impaired waters require a study called a Total Maximum Daily Load (TMDL), the maximum amount of a pollutant that a water body can accept and still meet standards. The map at right shows impairments, in red, in the Winnebago watershed.

The MPCA and partners assessed 12 sections of streams and two lakes in the Winnebago River watershed for meeting standards:

- Four stream sections have phosphorus and bacteria levels too high at times to meet standards. These impairments are addressed in the Winnebago River Watershed TMDL study.
- Eight stream sections need more information for assessment.
- The two lakes - Bear and State Line - have nutrient and algae levels too high at times to meet standards for recreation. The MPCA will address these impairments through the Winnebago TMDL study.
- No stream sections meet the standards for aquatic life, and these impairments are addressed in the WRAPS report. These impairments included low dissolved oxygen levels, as well as fish and bug populations lower in numbers and species variety than expected for similar waters.



Stressors and pollutants: What factors are affecting fishing and swimming?

Based on intensive water monitoring and stressor identification work, the following factors are affecting fishing and swimming conditions in the Winnebago River Watershed:

- Altered hydrology: Artificial drainage, such as channelized ditches and field tiling, is driving many of the problems in the watershed.
- Bacteria: *E. coli* and/or fecal coliform bacteria can indicate sewage or manure in water and also make the water unsafe for swimming.
- Biology (fish and/or bugs): There are fewer fish and bugs, and fewer species of them, than expected for these type of streams.
- Nutrients: Excess phosphorus in streams is fueling suspended algae growth and thick mats of aquatic plants, creating difficult living conditions for fish and bugs. Excess phosphorus in the two lakes is also fueling algae, reducing water clarity.
- Aquatic habitat conditions: The lack of riffle and pool structures, as well as stream bottoms smothered by silt and sand, create limited places for fish and bugs to live in streams in the Winnebago watershed.
- Nitrates: Excess nitrate and nitrogen levels are a stressor to fish and bugs in Steward Creek, the headwater to Bear Lake. Nitrates are also a concern for people downstream because nitrates can make water unsafe to drink. Steward Creek outlets to Lime Creek/Winnebago River, a tributary to the Cedar River in Iowa that is impaired by nitrates and is the drinking water source for the city of Cedar Rapids, Iowa.



One way to measure clarity of water is to use a Secchi disk on a rope marked with centimeters, dropping the disk into the water until it can no longer be seen. Secchi readings in Bear and State Line lakes show low water clarity due to excessive algae and plant growth.

Restoration and protection strategies

Most of the land in the Winnebago River Watershed is used for agriculture. Because farming is the dominant land use, this is where most of the work needs to be done for water quality restoration. General strategies that will help improve water quality include:

- Reducing nutrient and sediment levels by reducing field surface runoff, improving nutrient management, and implementing sediment trap practices.
- Holding back more water through wetland restoration and soil health practices.
- Supporting the Minnesota Department of Natural Resources' shallow lake management strategies for Bear and State Line lakes.
- Addressing failing septic systems, improving animal manure management, and ensuring animal feedlot compliance.



Water monitoring shows high levels of phosphorus that cause algae throughout waters in the Minnesota portion of the Winnebago River Watershed.

Key conclusions of first cycle

- Many water bodies throughout the Minnesota portion of the Winnebago Watershed have levels of nutrients too high to meet water quality standards.
- High nutrient levels, low dissolved oxygen levels, degraded habitat and altered hydrology are hurting fish and bug populations.
- Nitrates are negatively impacting bugs in the headwater stream Steward Creek.

Next steps

The Winnebago River Watershed approach began in 2015 with the WRAPS report published in spring 2020. The restoration and protection strategies listed in the WRAPS report will be the basis for developing local implementation plans, through the Shell Rock River/Winnebago One Watershed One Plan, to restore and protect water resources. The report lays out goals, milestones and responsible entities to address protection and restoration priorities in the watershed. The targets are intended to provide guidance and “measuring sticks” to assess the watershed’s health and success of actions taken. The MPCA and local partners began conducting the second round of intensive water monitoring in this watershed in 2019 and plan to finish it in 2020.

Full report

To view the full report, go to <https://www.pca.state.mn.us/water/watersheds/winnebago-river> or search for “Winnebago” on the MPCA website at www.pca.state.mn.us.

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