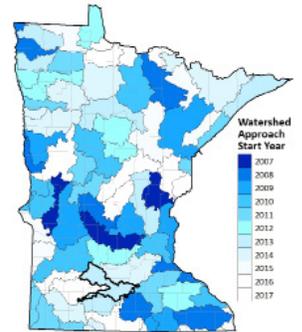


Minnesota River- Mankato Watershed



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 10-year cycle:

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. Implementing restoration and protection projects.

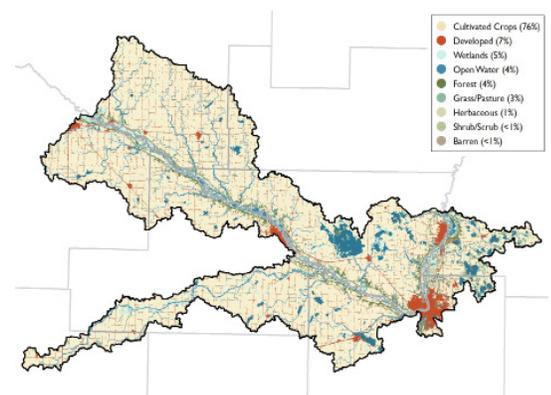
The Minnesota Pollution Control Agency (MPCA) leads the technical work, coordinates and supports strategy development with local partners. The main purpose of the WRAPS report is to summarize all the technical information so that local partners like Soil and Water Conservation Districts can use it for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



Watershed characteristics

The Minnesota River-Mankato watershed drains approximately 826,000 acres among nine counties through 1,564 miles of streams into the Minnesota River. Current land use is similar to other regions in southern and western Minnesota dominated by warm-season, annual, cultivated row crops. Topography through the upland portions of the watershed is relatively flat and well drained through an extensive network of constructed ditches and subsurface tile. Hydrologic Unit Code: 07020007.

The watershed is unique being composed of 21 independent, named tributaries as well as many unnamed tributaries and ravines that flow directly into the Minnesota River. Named tributaries vary in size; the largest is the Little Cottonwood River (167 square miles), and the smallest Three Mile Creek (12 square miles).



The tributaries typically have their headwaters near the boundaries of the watershed and flow toward the mainstem Minnesota River. The wetland complex of Swan Lake, the watershed's largest, lies on the north side of the river. Listed west to east, significant tributaries include: Wabasha Creek, Birch Coulee, Little Cottonwood River, Morgan Creek, Eight Mile, Minneopa Creek, Cherry Creek, and Shanaska Creek.

Lakes are more prevalent in the eastern portion, including: Washington, Crystal, Loon, Scotch, Wita, Ballantyne, and Henry. The majority of the streams are considered warmwater. Springs are present leading to cold water streams including Seven Mile Creek, Spring Creek (Hindeman Cr.), and County Ditch 10 (Johns Cr.).

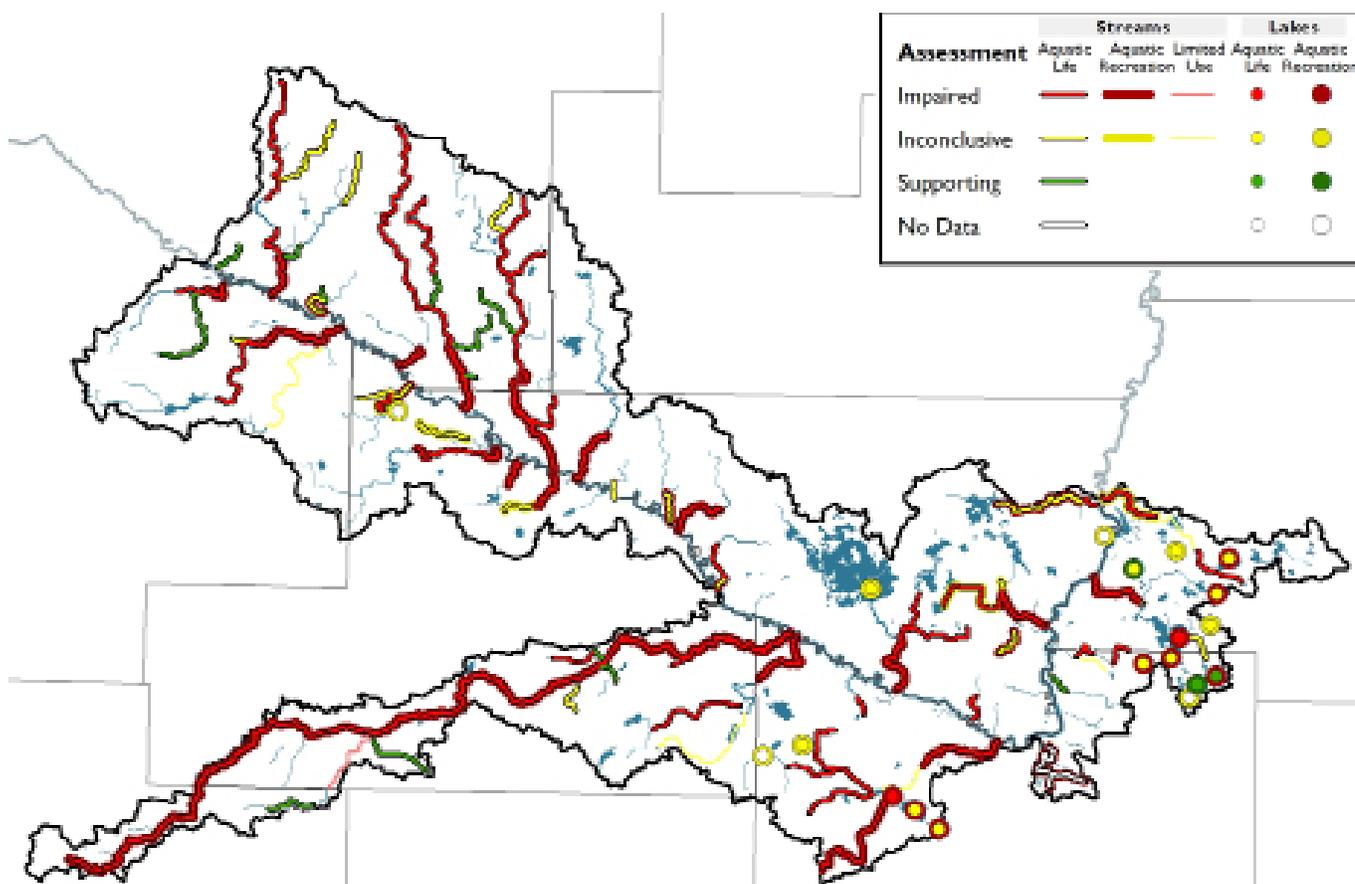
Assessments: Are waters meeting standards?

Many of monitored stream reaches and lakes have impaired aquatic recreation (swimming) and/or aquatic life (fish and macroinvertebrates). Fourteen assessed stream reaches fully support aquatic life, and no assessed stream reaches support aquatic recreation due to elevated levels of bacteria at times. Three assessed lakes support aquatic recreation, and two assessed lakes support aquatic life. A Total Maximum Daily Load (TMDL) study covers 8 eutrophication (phosphorus), 34 *Escherichia coli* (*E. coli*) bacteria, 6 total suspended solids, and 3 nitrate impairments within the watershed. A TMDL is the total amount of a pollutant that a water body can accept and still meet water quality standards.

Conditions stressing water quality

Non-point sources (urban and rural stormwater runoff) are the dominant source of pollutants/stressors. Surface runoff is not the only pathway that transports pollutants/stressors to water bodies. Subsurface tile drainage systems, which are typically designed to drain water from fields within a couple days of a precipitation event, also have the potential to carry and deliver pollutants and stressors to surface waters. Tile drainage has been identified as a primary cause of stream flow changes in heavily tiled landscapes.

Pollutants or conditions contributing to degraded water quality include: altered hydrology, excess nitrogen, sediment/total suspended solids, phosphorus, low dissolved oxygen, habitat, connectivity, temperature, and bacteria.



Restoration and protection strategies

Since the Minnesota River-Mankato Watershed land use and pollutant sources are generally dominated by agriculture, reducing pollutant/stressor contributions from agricultural sources is a high priority.

Wide-scale stabilization of eroding streambanks and ravines is cost-prohibitive. Instead, first addressing altered hydrology (e.g. excessive, concentrated flows) within the landscape can help decrease wide-scale stream and ravine erosion problems.

Most of the changes that must occur to improve and protect water resources are voluntary; therefore, communities and individuals ultimately hold the power to restore and protect waters in the Middle Minnesota River Watershed. Strategies and practices include: managing nutrients, reducing erosion, increasing vegetation, installing or restoring water storage basins, and improving soil health. Considerable work has been done in 7-Mile Creek, Spring Creek, and Crystal Lake.

Civic engagement major focus

Civic engagement and public participation has been a major focus. The MPCA worked with counties and Soil and Water Conservation Districts, consultants and other state agencies on eight projects to promote civic engagement and collaboration. These efforts identified opportunities and constraints for water quality improvements:

1. Strategic placement of Best Management Practices including stormwater management, shoreland management, soil health, nutrient management, wetland restoration and enhancement.
2. Continue education efforts on water quality concerns and practices in urban and rural areas.
3. Protection of the few unimpaired lakes in the watershed.
4. Revising stormwater management policies.
5. New commitment of landowners on nutrient management, tillage management, and cover crops. Much interest in trying denitrifying bioreactors and phosphorus removal tank systems.
6. Conservation success stories, demonstration sites, and field days highlighting the effectiveness of conservation practices in improving water resources.

Identified constraints to addressing water quality issues include: financial resources, lack of local leadership, programs too complex and not flexible, target smaller areas such as subwatersheds to build social networks and promote civic engagement in water quality, and face-to-face conversations needed to make significant progress in the watershed.

Key conclusions of first cycle

After intensive water monitoring and assessing whether lakes and streams meet water quality standards, the MPCA and local partners have determined the following goals:

- 25 % reduction in peak and annual river flow
- 60 % reduction in nitrogen loads
- 50 % reduction in phosphorus loads
- 50 % sediment reduction in restoration areas
- 60 % bacteria reduction
- 25 % increase in habitat score

A long-term commitment is needed to restore and protect the waters of the Minnesota River-Mankato Watershed. Implementing strategies will take 20, 30 years or more with 10-year interim milestones to measure and motivate progress.

This long-term effort will help detect any trends in pollutant levels, and measuring the impact of changes on the landscape to water quality. In addition, the MPCA and partners will conduct intensive watershed monitoring in the watershed every 10 years, providing another measurement of whether strategies implemented are working to restore and protect waters .

Full report

To view the full report, go to www.pca.state.mn.us/water/watersheds/minnesota-river-mankato, or search for “Minnesota River-Mankato Watershed” on the MPCA website.

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