

Des Moines River Basin Watersheds



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. (2014, 2015)
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters. (2016-2018)
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). (2019-2020)
4. Coordinating with local One Watershed-One Plan efforts for implementation of restoration and protection projects. (2020-beyond)

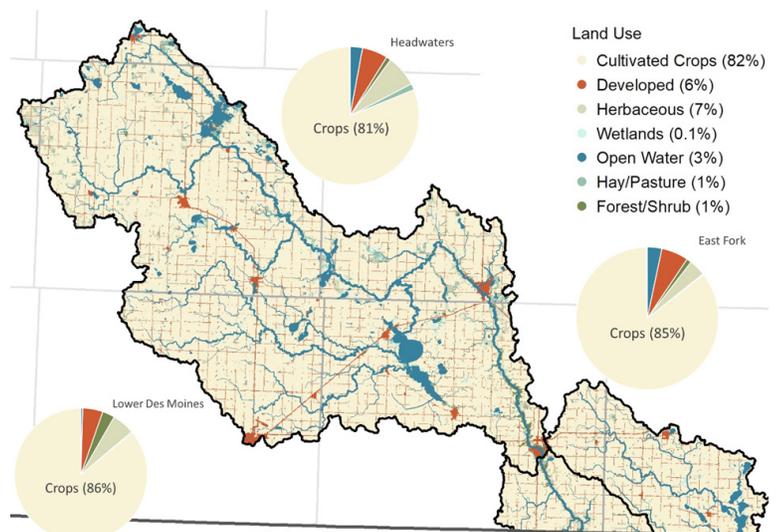
The Minnesota Pollution Control Agency (MPCA) leads the technical work and coordinates and supports strategy development with local partners. The main purpose of the WRAPS report is to summarize all the technical information so that local partners such as Soil and Water Conservation Districts can use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



Watershed characteristics

The Minnesota portion of the Des Moines River Basin is 983,719 acres (1,537 square miles) encompassing parts of Cottonwood, Jackson, Lyon, Martin, Murray, Nobles, and Pipestone counties. Major municipalities in the basin include Slayton, Windom, Jackson and Worthington.

The three HUC-8 watersheds (Des Moines Headwaters, 07100001; Lower Des Moines, 07100002; and East Fork Des Moines, 07100003) are located in Northern Glaciated Plains (northwest part of the basin), while the remaining area is located in the Western Corn Belt Plains. The major land use is cultivated crops.



Watershed characteristics (cont'd)

The Des Moines River Basin is a major tributary to the Mississippi River in Iowa. Minor tributaries in the watersheds are Beaver Creek, Lime Creek and Heron Lake Outlet.

A large portion of the watershed (298,799 acres) drains to a system of wetlands and lakes known as the Heron Lake complex. This complex includes North and South Heron Lake, Jack Creek, Okabena Creek and Heron Lake Outlet.

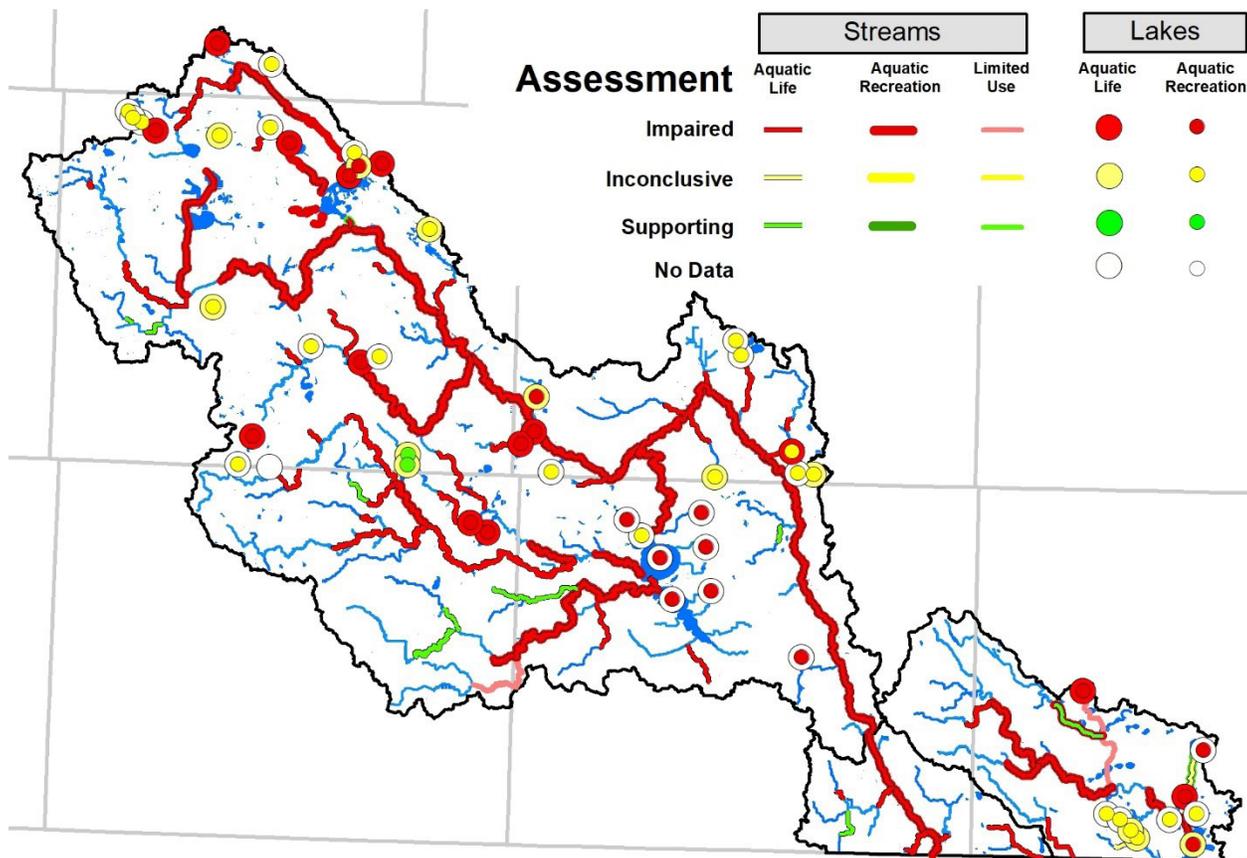
Many other lakes are of importance in the basin and include Shetek, Talcot, First and Second Fulda, East and West Graham, Okamanpedan, Bright and Clayton.

Assessments: Are waters meeting standards?

Many monitored stream reaches and lakes are impaired for aquatic recreation (swimming) and/or aquatic life (fish and macroinvertebrates). Nine assessed stream reaches fully support aquatic life, and two assessed stream reaches support aquatic recreation. Two assessed lakes support aquatic recreation, and no assessed lakes support aquatic life. A total maximum daily load (TMDL) study covers two stream and 23 lake eutrophication (phosphorus), 10 *Escherichia coli* (*E. coli*) and 15 fecal coliform bacteria, 17 total suspended solids, one pH and one chloride impairments within the basin. A TMDL is the total amount of a pollutant that a water body can accept and still meet water quality standards. These are covered in three TMDL reports, one approved in 2008 and two completed along with the WRAPS report.

Which waters are not meeting standards?

Sixty-seven stream reaches and 24 lakes were determined to be impaired. Each can be impaired for both aquatic life (fish and macroinvertebrates) and aquatic recreation (swimming), and could require multiple TMDL studies.



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.

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

Restoration and protection strategies

Because the Des Moines River Basin land use and pollutant sources are generally dominated by agriculture, reducing pollutant/stressor contributions from agricultural sources is a high priority.

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 Des Moines River Basin. Some identified strategies and practices include:

- Plant cover crops to increase soil health and reduce runoff
- Decrease the use of tillage by utilizing conservation tillage, no-till, strip till or ridge till to improve soil health and reduce runoff
- Decrease fertilizer use by reducing application rates, targeting the application, and using appropriate nutrient management to reduce nutrient runoff
- Diversify crops to improve soil health and reduce runoff
- Apply manure to cropland using improved application practices to reduce runoff

Some of these practices have been implemented throughout the watershed already. Examples of these include cover crops, conservation tillage and some Conservation Reserve Enhancement Program wetland restorations.

Civic engagement major focus

Civic engagement and public participation have been a major focus. The MPCA worked with watershed districts, SWCDs, counties, consultants and other state agencies to promote civic engagement and collaboration. These efforts identified opportunities and constraints for water quality improvements. Opportunities include:

- Interest in slowing the flow of water
- Need for new storage areas and maintenance of existing storage areas
- Restoration efforts targeting key areas
- Interest in more baseline water quality information
- A need for more training events and education of implementation activities
- 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: existing programs are too restrictive, inadequate incentive programs, lack of research results being distributed, a loss of production acres and not enough controlled drainage.

Key conclusions of first cycle

After intensive water monitoring and assessing whether lakes and streams meet water quality standards, it was determined that a few waters in the Des Moines River Basin are in good condition and need protection, but many are impaired and need restoration.

The MPCA and local partners have determined the following goals:

- 45% increase in habitat score

Key conclusions of first cycle (cont'd)

- 45% reduction of phosphorus lake and stream loads
- 30% reduction of sediment loads
- 30% reduction of nitrogen loads
- 20% reduction in peak and annual stream flow
- 50% reduction of bacteria loads

First Fulda Lake is now meeting water quality standards that it failed to meet previously. Second Fulda Lake is still meeting water quality standards. Improvements in this lake system are due to successful restoration efforts completed by many landowners and government agencies (state and local). This effort demonstrates that cooperation is paramount to achieve water quality goals. This lake system will require protective actions.

Priority areas were developed with the use of the WRAPS data as well as local knowledge and input. Some priority areas include protection of supporting waters, such as First and Second Fulda Lakes, and those that are barely impaired, such as Fox, Shetek, and Bright Lakes. Several stream reaches need protection because they are meeting their beneficial use standards. However, of the stream reaches that are impaired, none are considered to be barely impaired. Other locally driven priority areas include drinking/ground water and popular recreational waters.

A long-term commitment is needed to restore and protect the waters of the Des Moines River Basin. 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 measure 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

View the full report on the MPCA website by going to www.pca.state.mn.us and search for "Des Moines River".

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