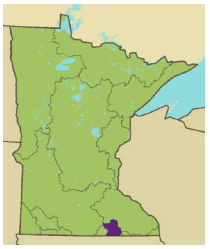
Cedar River Watershed

Watershed Restoration and Protection Strategies (WRAPS) Report Summary



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:

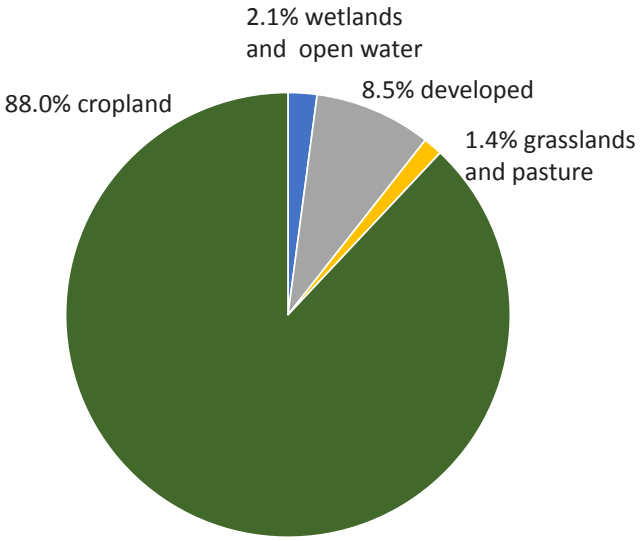
1. Monitoring water bodies and collecting data over two years on water chemistry and biology.
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters.
3. Developing strategies to restore and protect the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

The Minnesota Pollution Control Agency (MPCA) leads the technical work and coordinates and supports strategy development with local and regional 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 and cities can use it for planning and implement the best strategies in prioritized locations.

Watershed characteristics

- Size in Minnesota: 709 square miles
- Counties in Minnesota: Dodge, Freeborn, Mower and Steele
- Ecoregion: Western Cornbelt Plains
- Municipalities in Minnesota: The largest city is Austin, population of nearly 25,000, with several small towns in the watershed, including Adams, Blooming Prairie, Brownsdale, Geneva, Hayfield, Hollandale, Lyle and Rose Creek
- Most of the land is used for agriculture (chart at right)
- Tributary to the Iowa River, which flows into the Mississippi River; headwaters is in Minnesota while majority of watershed is in Iowa

Land use in the Cedar watershed in Minnesota



The Cedar River watershed in southeastern Minnesota is part of a larger river basin that covers 7,485 square miles, mostly in Iowa. The river runs south 54 miles from its headwaters in Dodge County, through the City of Austin, to the Minnesota-Iowa border. The MPCA study focused only on the Minnesota portion of the watershed.

The majority of the watershed in Minnesota is prime agricultural land. Since European settlement in the late 1800s, people have implemented extensive drainage systems to facilitate transportation and crop production, including draining wetlands, installing ditch and tiling systems, and straightening streams. The result is that more water drains from the land and at higher flows. These increased flows lead to erosion and higher sediment levels in streams.

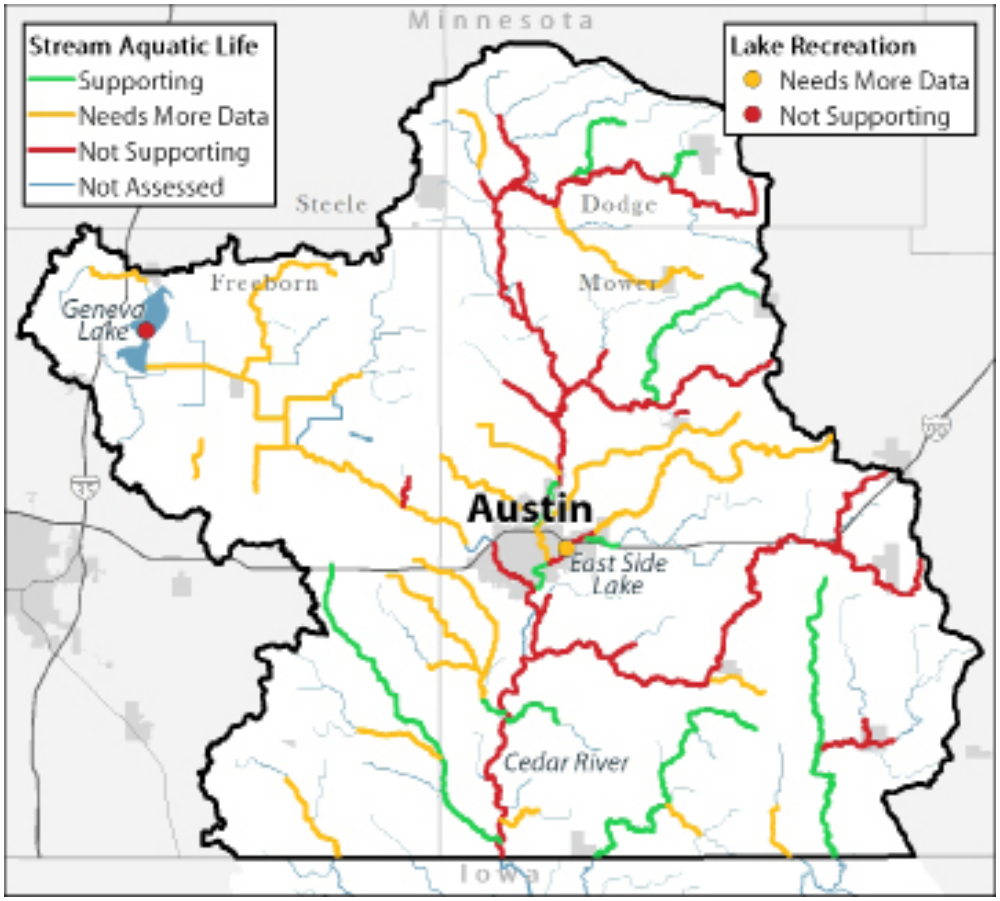
Federal, state and local partners, along with landowners, are implementing more practices to improve water quality in the Cedar River watershed. These efforts include conservation practices in agricultural areas, as well as improvements in urban stormwater management. Recent analysis shows that implementation efforts are reducing the amount of sediment entering the stream channels.

The Cedar River system provides recreation for residents and visitors, with paddling opportunities, hiking along Dobbins Creek at the Hormel Nature Center, and fishing throughout the watershed. A 25-mile water trail for boating runs from Lansing, through Austin, to the Iowa border.

Assessments: Are waters meet ng standards?

During the first phase of the watershed approach – intensive watershed monitoring – the MPCA collected data about biology such as fish populations, chemistry such as pollutant levels, and flow to determine if lakes and streams were meeting water quality standards designed to ensure that waters are fishable and swimmable. Waters are “impaired” if they fail to meet standards. While impairment indicates that lakes and streams are not meeting water quality standards, it does not mean that they are always unfit for recreation, like swimming. Restoration and protection goals in the Cedar River watershed are set according to both local (within the watershed) and downstream considerations. The map below shows the assessment results for streams and lakes in the Cedar River Watershed.

- **Supporting:** Stream conditions support the water quality standards for aquatic life (fish and bugs) and aquatic recreation (swimming and boating). These streams need protective strategies to maintain their conditions.
- **Needs more data:** The MPCA and partners lack enough data to determine if the waters meet standards. The agency will try to gather these data in its second round of monitoring, scheduled for 2019.
- **Not supporting:** At times, streams and lakes fail to fully support the standards. These waters need restoration strategies.
- **Not assessed:** Because the streams have been so altered from their natural condition, the MPCA decided to not assess them for water quality standards designed for streams.



Conditions stressing water quality

Excessive levels of sediment, bacteria and nutrients are the major issues that need to be addressed in the Cedar River watershed, according to the monitoring, assessment and stressor identification work. High levels of these pollutants can hurt aquatic life and recreation:

- Excessive sediment can cloud the water which reduces light penetration for beneficial plants and may favor undesirable algae species.
- Excessive sediment can also interfere with proper gill functioning of fish, smother macroinvertebrates (bugs), and harm their habitat.
- Bacteria levels in streams can indicate sewage or manure in the water, and may create conditions where water is unsafe for swimming.
- High phosphorus levels can cause excessive algae growth leading to high pH and low dissolved oxygen. High pH and low dissolved oxygen can be harmful to aquatic life.
- The stress on fish and macroinvertebrates leads to less diversity of species.
- Algae blooms can also degrade aesthetics and recreational use of lakes and streams.

Overall, the streams studied had poor fish and macroinvertebrate populations. Lack of habitat, elevated nitrogen and phosphorus levels, low dissolved oxygen, and changes in stream flows are all common stressors to aquatic life.

This study looked at two lakes in the watershed:

- Geneva Lake in Freeborn County is the only naturally occurring lake left in the watershed. The Minnesota Dept of Natural Resources manages the lake for wildlife. The lake has nutrient levels too high and water clarity too low to meet the recreation standard. The study determined that phosphorus needs to decrease by about 13% for the lake to meet standards.
- East Side Lake has fish with mercury levels high enough to restrict their consumption. See the Minnesota Dept. of Natural Resources website for more information: www.dnr.state.mn.us/lakefind/index.html.

Restoration and protection strategies

While strategies will differ across the watershed according to land and water characteristics, several common strategies would help improve water quality throughout the Cedar watershed, including:

- Improve soil health through better management of nutrients in fertilizer and manure; reduced tillage; and growing cover crops. Better soil health would help reduce erosion and runoff from fields.
- Control water within fields through controlled drainage practices and alternatives to drainage such as water storage areas.
- Control water below fields by restoring wetlands; installing water and sediment basins; and managing channels and culverts.
- Improve habitat by restoring streams to natural meanders, planting and maintaining buffers, and designing ditches to account for water quality.
- Managing stormwater in urban areas.
- Upgrading rural septic systems.

Because most of the land in this watershed is used for agriculture, that is where most of the strategies need to be implemented.

Key conclusions of first cycle

Many waters in the Cedar watershed are impaired and need restoration.

Sediment and phosphorus levels continue to be high in many streams and lakes.

Nitrogen is a growing concern. Monitoring shows a significant increase in nitrogen levels in both the long-term and short-term. The Cedar River in Minnesota has some of the highest nitrogen concentrations in the state. Nitrogen levels are a priority concern because of the potential impact to drinking water sources. Leaching of nitrogen fertilizer is the main source of nitrogen in waters in this watershed, and thus fertilizer management is a key strategy to reducing levels of this pollutant.

More living cover on the land is a strategy that offers multiple benefits, including reducing pollutants that reach waters, reducing runoff and providing wildlife habitat.

There is no one practice or change that will solve the Cedar River's water quality problems. It will take a combination of practices sustained over time and throughout the watershed. For example, a project in the Roberts Creek subwatershed showed conservation tillage can reduce sediment loading by about 5%. When combined with other practices and controlled drainage, sediment loading decreased by up to 30%.

People have changed nearly 77% of the streams and much of the land to accommodate farming and urban development. Many streams have been changed to the point that the MPCA could not assess them according to water quality standards designed for streams. Since European settlement of the area, about 95% of the watershed's wetlands have been drained. Wetlands play an important role in retaining and filtering water.

Reductions in phosphorus will be needed from both direct sources, such as wastewater treatment plants, and from indirect sources, such as farm fields, to reduce algae growth in lakes and streams.

Next steps and measuring results

The MPCA and partners will conduct intensive watershed monitoring in the Cedar watershed every 10 years, using the data for planning as well as providing another measurement of whether implemented strategies are working to restore and protect waters. A handful of ongoing monitoring sites will provide a more continuous record of stream water quality.

Full report

For the full report, go to www.pca.state.mn.us and search for "Cedar River."

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- Mower SWCD: 507-434-2603 or www.mowerswcd.org
- Freeborn SWCD: 507-373-5607 or http://www.freebornswcd.org
- Dodge SWCD: 507-374-6364 or http://dodgeswcd.org

MINNESOTA POLLUTION CONTROL AGENCY

The Clean Water, Land and Legacy Amendment is funding a large part of the MPCA's watershed approach.

CLEAN WATER LAND & LEGACY AMENDMENT