

Cannon River Watershed

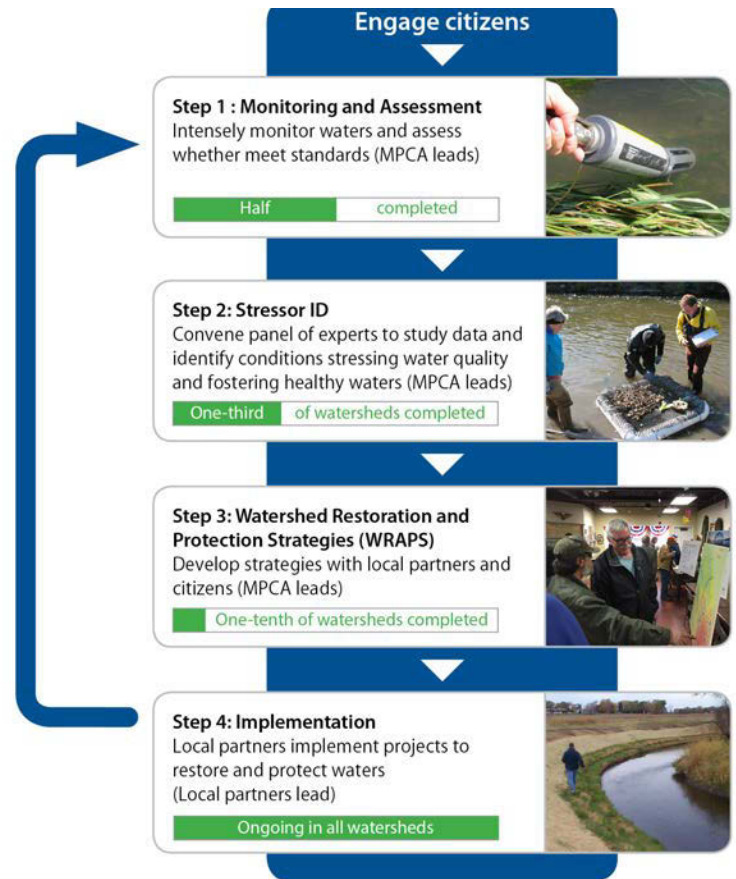
Developing Watershed Restoration and Protection Strategies (WRAPS)



Minnesota has adopted a watershed approach to gauge the health of lakes and streams in the state's 81 major watersheds. This approach looks at a drainage area as a whole instead of focusing on lakes and stream sections one at a time.

This watershed approach incorporates the following into a 10-year cycle:

1. Monitoring water bodies and collecting data on water chemistry and biology. This monitoring started in the Cannon River Watershed in 2011.
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters. This assessment started in the Cannon in 2013-'14.
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). This will occur in the Cannon in 2015.
4. Implementing restoration and protection projects in the watershed.



The 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 like Soil and Water Conservation Districts can use it for planning and implement the best strategies in prioritized locations.

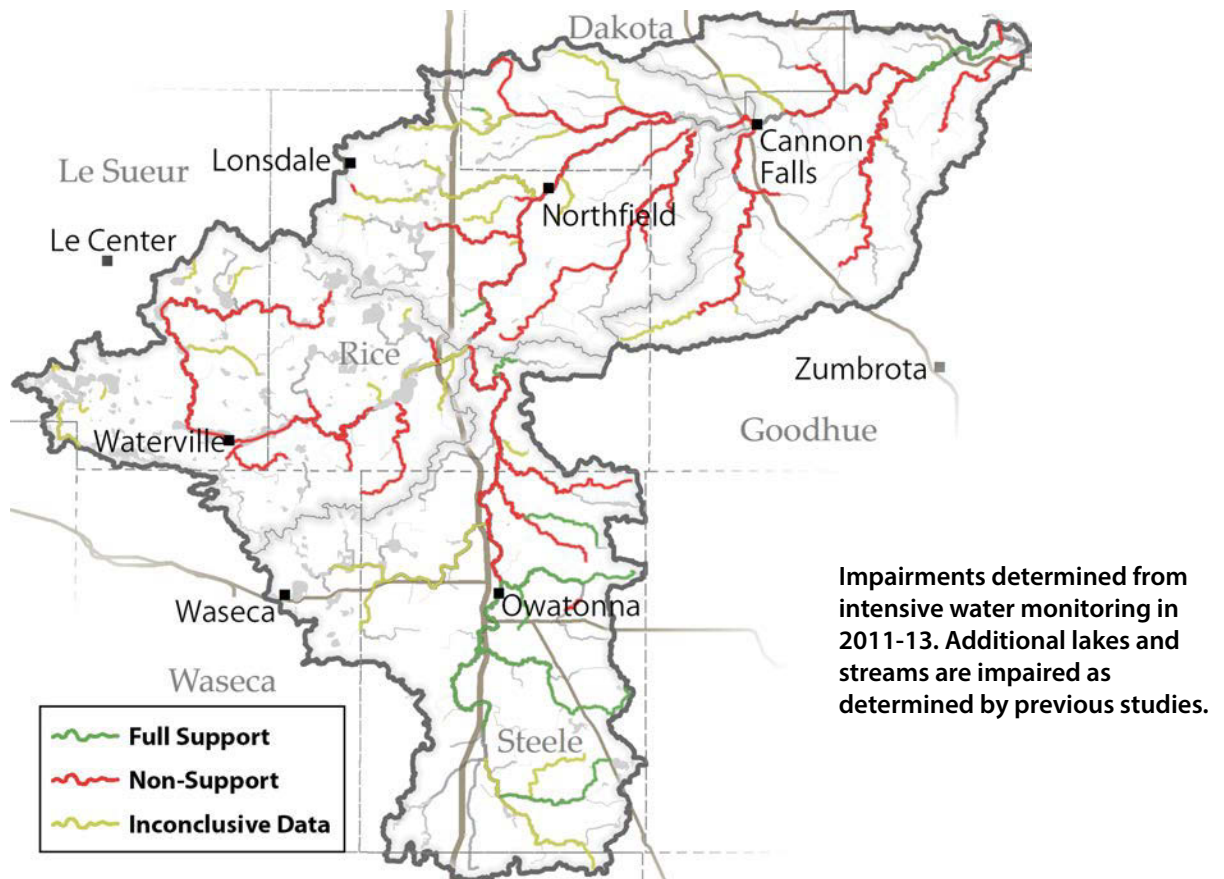
Watershed characteristics

- Size: 1,460 square miles or 946,440 acres.
- Counties: Steele, Rice, Goodhue, Le Sueur, Dakota and Waseca.
- Major cities: Waseca, Owatonna, Faribault, Northfield and Red Wing.
- After merging with the Straight River at Faribault, the Cannon River flows through Byllesby Reservoir and empties into the Mississippi north of Red Wing.
- For planning, the watershed is divided into four geographic "lobes": the Upper Cannon is dominated by lakes; the Straight River is highly agricultural; the Middle Cannon is the transition between the Upper and Straight; and the Lower Cannon has trout streams and more forested land.
- The 8-digit hydrologic unit code or HUC for the Cannon is 07040002.



Paddling and other recreation are popular in the Cannon River Watershed. (photo by Jeff Jarvis)

Streams meeting and failing standards in Cannon River Watershed



Goals for improving water quality in the Cannon watershed and downstream

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

- Five of 45 lakes studied fully meet the standards for fishable and swimmable: Beaver, Dudley, Fish, Kelly, and Roemhildts.
- 36 of the 45 lakes fail to meet the standards all the time because of high nutrient levels that cause algal blooms.
- Four of the 45 lakes lack enough information for assessment and will be studied further.
- In the future, chloride – toxic to fish and other aquatic life – may be a water quality problem in some lakes.
- 11 of 70 stream sections studied fully meet the standards for fishable and swimmable.
- 59 of the 70 stream sections fail to meet standards because of high soil and sediment levels; elevated mercury and PCBs levels in fish; low levels of dissolved oxygen needed to sustain fish and other aquatic life; bacteria levels that indicate sewage or manure; and/or fewer fish and macroinvertebrates (bugs) expected for numbers and species.
- Four coldwater trout streams also fail to meet standards because of nitrate levels.

Restoration and protection goals in the Cannon River watershed are set according to both local (within the watershed) and downstream considerations.

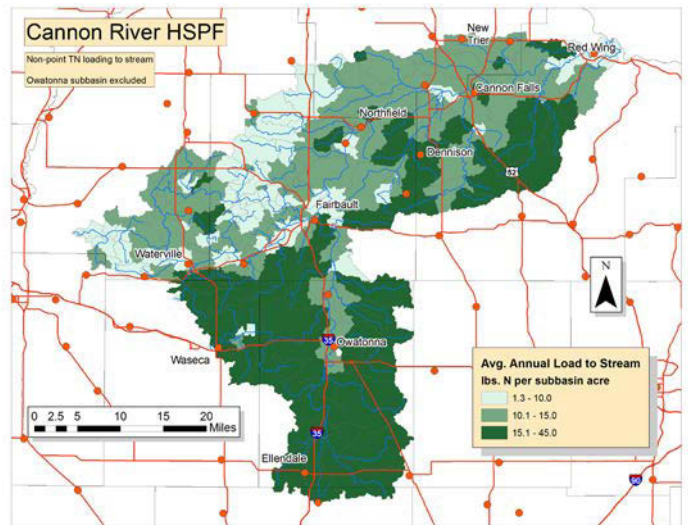
For nutrients in the Cannon River, Minnesota's Nutrient Reduction Strategy provides stakeholder-supported numeric targets: 12% reduction in phosphorus levels and 20% in nitrogen levels from current conditions by 2025. Studies for the Mississippi River and Lake Pepin incorporate reductions of 50% for both sediment and phosphorous levels in the Cannon River.

Local goals for waterbodies include specific phosphorus reductions for the individual lakes of the upper Cannon and the Bylesby Reservoir, habitat improvement for various streams, and nitrate reductions in drinking water wells and trout streams. These goals "nest" well in that attainment of local goals will generally result in attainment of the next goal downstream.

Information and tools to support targeting work

The MPCA, local partners and citizens will use various tools and data to shape the strategies and geographic priorities for restoration and protection in the Cannon River Watershed, including the following.

- **Intensive Watershed Monitoring:** The comprehensive nature of this monitoring allows for basic identification of waters that are likely targets for restoration or protection. For details, see the monitoring report on the MPCA website (go to www.pca.state.mn.us and search for "Cannon watershed").
- **Stressor Identification:** A team of experts examines impairments to fish and bug populations to identify conditions stressing or fostering healthy aquatic life, paving the way for restoration and protection strategies.
- **Watershed modeling:** Water quality and quantity data are paired with mapping information such as land use and the best available scientific literature to create a computer tool called a model. The Cannon watershed has custom-built models for stakeholders to use to estimate the changes in water quality from different changes on the landscape.
- **Nitrogen and phosphorus Best Management Practice (BMP) spreadsheets:** These tools allow for examination of BMP combinations and the resulting reductions in nutrient levels.
- **Terrain analysis:** Rice County contracted with Houston Engineering to execute Geographic Information System work in the upper Cannon that identifies priority locations for sediment and phosphorus reduction work. Some local partners have done similar work at other scales.
- **Zonation:** By combining technical information and stakeholder input, agencies and landowners can develop strategies into specific plans for restoring and protecting waters.
- **Total Maximum Daily Loads (TMDLs):** This is the total amount of a pollutant that a water body can accept and still meet water quality standards. The MPCA uses TMDLs when calculating permit limits for storm- and wastewater discharges, such as a sewage treatment plant discharging to a river.
- Many other reports, data and documents will be useful in developing strategies for the Cannon watershed. Much of this information is available on the Cannon River Watershed Partnership website at <http://crwp.net> (click on "library" tab).



This is an example of a data layer from the Cannon watershed, showing the amount of nitrogen entering streams. Local stakeholders and agencies can use these data layers to set priorities for reducing pollutants.

Timeline and context

There is a long history of technical and planning work in the Cannon watershed. The WRAPS represents a gathering and distillation of all this work and an infusion of some new and useful information and engagement components. The goals remain the same: restore and protect waters. The strength of the WRAPS is in the time and money dedicated to identifying priorities and developing the best strategies.

In 2015 the MPCA and Cannon River Watershed Partnership will hold a series of meetings to gather input from stakeholders on geographic priorities and strategies to restore and protect waters:

- June 9: Kickoff meeting for strategy development
- July 13-17: Meetings held at different locations in watershed
- Sept. 28-Oct. 2: Meetings held at different locations in watershed
- Dec. 7-14: Meetings held at different locations in watershed
- Feb. 8-12: Final meeting for strategy development

Local partners will then use the WRAPS report to plan and secure funding for implementation projects.

Conditions stressing water quality

Excessive levels of nutrients in the Cannon's water resources are the major issue that needs to be addressed, according to monitoring, assessment and stressor identification work done in the watershed. High levels of phosphorus and nitrogen cause a cycle that hurts aquatic life and recreation:

- Algae grows, leading to high pH and low dissolved oxygen levels in the water as the algae decay.
- The high pH and low oxygen make it hard for fish and other aquatic life to survive.
- The stress on fish and bugs leads to less diversity of species.
- Algal blooms also degrade aesthetics and recreational use of lakes and streams.
- High nutrient levels may also impact drinking water in karst areas where the bedrock is porous, meaning pollutants can easily reach groundwater used for drinking. Nitrate levels are present in some trout streams and private wells in the Cannon watershed.

Other concerns include:

- Sediment levels – soil and other particles that cloud the water – that can fill holes and riffles in streambeds used by fish for habitat.
- Bacteria levels in streams indicate sewage or manure in the water, and may make the water unsafe for swimming.

Expectations and measuring success

A long-term commitment is needed to restore and protect the waters of the Cannon. Implementing strategies will take 20, 30 years or more with 10-year interim milestones to measure and motivate progress. The WRAPS will include identification of milestones and discussion of expectations regarding water quality changes.

The MPCA and partners have a statewide network that monitors pollutant levels in major rivers, including the Cannon. This long-term effort will help detect any trends in pollutant levels, measuring the impact of changes on the landscape to water quality.

Also, the MPCA and partners will conduct intensive watershed monitoring in the Cannon watershed every 10 years, providing another measurement of whether strategies implemented are working to restore and protect waters.



Cannon watershed residents have taken several steps to improve their lakes and streams. (CRWP photo)

Contacts and resources

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



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