

Summary

Identifying conditions stressing fish and macroinvertebrates

Le Sueur River Watershed



Why is it important?

The Le Sueur River Watershed in south-central Minnesota is home to several small cities and numerous species of wildlife and fish. The watershed's wealth of lakes and streams is a valuable resource for aquatic recreation such as fishing and paddling. The water's health is essential to human quality of life and to sustaining aquatic life.

The watershed covers 710,832 acres within the Minnesota River Basin. Water quality is important to local citizens as well those downstream. Several studies have shown that the Le Sueur is a major contributor of sediment – soil particles and other matter – to the Minnesota River and eventually the Mississippi.

Concerned about flooding, collapsing streambanks and bluffs, and murky water, local citizens are working with state agencies and Minnesota State University-Mankato to form a watershed group to heal this suffering river system.

Healing the river system requires an understanding of its water quality problems. Biological monitoring looks at fish and macroinvertebrate (bug) communities to assess the health of water. Quite simply, a healthy water system will sustain a variety of life. Biological monitoring often detects problems that other methods may miss or underestimate. By examining a stream's biological health, scientists and local partners can determine the impact of human changes on aquatic resources.

Key issues

The Le Sueur River and its tributaries are showing signs of stress, as far as fish and macroinvertebrate populations, due to several interrelated factors. (Macroinvertebrates are creatures without backbones, such as insects, crayfish, snails and small clams, and are commonly called bugs.) Major stressors in this watershed include these interrelated factors:

- Changes to the watershed's hydrology.
- Lack of habitat.
- High nutrient levels. Nutrients can lead to algal blooms that can harm aquatic life such as fish and recreation such as swimming.
- High turbidity levels. Turbidity is a measurement of how cloudy or muddy water is, with clear water the goal to support aquatic life and recreation.

These stresses result from the significant changes over the past 150 years. Since European settlement in the 1860s the watershed has undergone major land changes, including the plowing of its native prairies, harvesting of its hardwood forests, draining of its wetlands and modifications to its natural stream courses. Agriculture accounts for the majority of land use activities within the watershed. Farmland is highly tilled for drainage purposes. Climate change is worsening the impact of these changes.

The Minnesota Pollution Control Agency (MPCA) and several partners identified the stressors in the watershed following an intensive water monitoring and assessment effort, which is part of the state's watershed approach to restoring and protecting Minnesota waters. This approach is a holistic way of gauging the health of streams and lakes, and developing strategies to restore or protect their water quality.

Highlights of report

- Impairments – violations of state water quality standards – are common throughout the watershed.
- Based on monitoring the amounts and types of fish and bugs found in streams, 16 stream sections do not meet the standards for supporting aquatic life.
- Changes in hydrology and lack of habitat were stressors in the following streams analyzed: Little Le Sueur River, Iosco Creek, Le Sueur River, Little Cobb River, Cobb River, Rice Creek, Maple River, and County Ditches 15, 12, 19 and 6. Elevated levels of nitrates and/or phosphorus were stressors in all the above streams except for the Little Le Sueur River, County Ditch 19 and Maple River.

To improve water quality in the Le Sueur watershed, the MPCA recommends:

- Additional studies to further identify sources of pollutants.
- Significant reductions in nitrates from drain tile along with reductions in phosphorus.
- Implementing best management practices to hold water longer after rain and snowmelt in order to keep a base flow to sustain aquatic life and to reduce the amount of water – carrying nutrients and sediments – flowing downstream.
- Maintaining connections between streams and floodplains, and taking other steps to stabilize streambanks where there are no such connections.
- Improve habitat by stabilizing streambanks, establishing beneficial vegetation and buffers along streams and lakes, and implementing best management practices to reduce sediment levels.
- Overall, the watershed needs vast improvements in water and sediment retention to improve water quality.

About this study

Watershed Approach

Phase 1: Monitor and assess health of waters

Phase 2: Identify conditions stressing biological life

Phase 3: Determine maximum pollutant loads

Phase 4: Determine Watershed Restoration and Protection Strategies

Start process over every 10 years

This stressor identification follows an intensive water monitoring effort in the Le Sueur River Watershed dating back to 2008. In partnership with the Minnesota State University-Mankato Water Resources Center, the MPCA examined several parameters in several streams. In addition to water chemistry sampling, nearly 100 stream stations were sampled for biology. The MPCA and several partners familiar with the watershed examined the data to identify stressors to healthy water conditions. The next step in the process will be to develop strategies to restore water quality in impaired streams and protect those meeting state standards.



Full report

To view the full report, go to www.pca.state.mn.us/clypdc0 or search for “Le Sueur watershed” on the MPCA website at www.pca.state.mn.us.

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