



# Grand Marais Creek Watershed

## Why is it important?

The Grand Marais Creek Watershed is located in northwest Minnesota. The watershed drains nearly 300,000 surface area acres of land, and is for the most part very low gradient with a poorly defined floodplain. The area is dominated by agricultural use as annual flooding brings nutrients and topsoil to the area making it desirable soil for cropland production. As a result, the majority of the area has been converted from tall-grass prairie to cropland over the last century. Approximately 92% of the watershed is used for crop production.

Developed land occupies approximately 5% of the watershed, with most of this being various small rural towns such as Oslo and Fisher. Open water accounts for roughly 1.3%, wetlands 1.1%, and forest/shrub land 1%. The combination of minimal forest/shrub land and a huge amount of exposed soil required for row crop production has created the perfect conditions for massive soil loss to occur through erosion mechanisms of both surface water and wind.

Major reaches within this watershed include Grand Marais Creek, Judicial Ditch 1, County Ditch 2, and County Ditch 75. Grand Marais Creek originates just east of the Red Lake River approximately 1.5 miles northwest of the town of Fisher.

## Key issues

The watershed is dominated by agriculture, with nearly 92% of the land use in crop production. Approximately 72% of streams have been altered from their original course in an effort to increase drainage rates to better suit the current land use practices of the area. These alterations have resulted in heavy sedimentation and lowered levels of oxygen in many streams, reducing the abundance and diversity in both fish and aquatic insect (macroinvertebrate) communities.

Widespread changes in land use practices will need to occur to bring about significant improvement in most indicators. Increased public understanding and interest in these conditions is also needed since the vast majority of land in the watershed is privately owned and improvements will require a change in agricultural practices that are largely voluntary.

## Highlights of report

Approximately 72% of the streams in the watershed have been altered from their original course, leading to the loss of coarse substrates and increased sedimentation. This results in the loss of abundance and diversity in both fish and aquatic insects (larval stages of dragonflies, mayflies and other insects).

- At the stations where fish surveys were able to be conducted, sample populations were dominated by species such as fathead minnow and brook stickleback. This is likely a result of poor habitat conditions. Because of sedimentation, there is minimal coarse substrate (for spawning) available.
- The highly altered condition of the watershed through vast ditch and tile networks plausibly has an effect on dissolved oxygen throughout the reaches.
- Though the watershed is largely impaired, there were a few sensitive aquatic insects collected such as mayflies. There are likely additional communities that would repopulate if suitable habitat conditions were re-established; for example, a recently completed project that re-established meanders in Grand Marais Creek for a distance of about six miles. Coarse substrates, woody debris, re-meandering, depth variability, and more permanent flows will be vital for recolonization in these systems.

- Of the seven stations where fish surveys were conducted, six were used to assess aquatic life for fish and none scored above designated thresholds, indicating non-support for these communities.
- Farmers are strongly encouraged to increase buffer zones and use crop rotation practices as this should minimize erosion and decrease nutrient contamination.
- The surface geology of the Red River Valley is such that conditions for groundwater recharge are ideal in only a few areas around topographic highs and in the presence of surface sand and gravel deposits. Preservation of these areas is critical to maintaining sufficient groundwater availability for consumptive use.

## About this report

### Watershed approach

Phase 1: Monitor and assess health of waters

Phase 2: Identify conditions stressing biological life

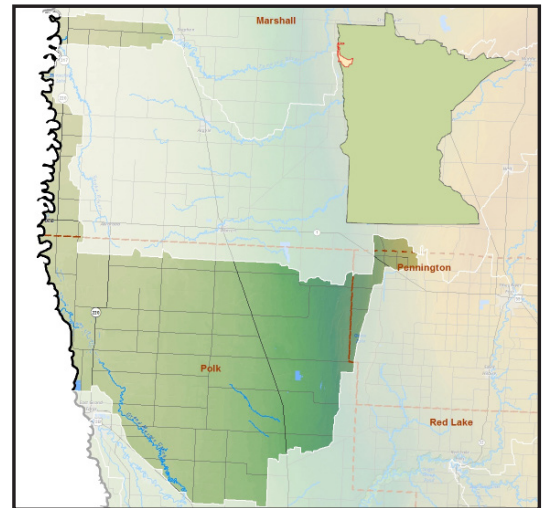
Phase 3: Determine maximum pollutant loads

Phase 4: Determine Watershed Restoration and Protection Strategies

Start process over every 10 years

Minnesota has adopted a watershed approach to address the state's 80 major watersheds. This approach incorporates water quality assessment, watershed analysis, civic engagement, planning, implementation, and measuring results into a 10-year cycle that addresses both restoration and protection. During the 10-year cycle, intensive monitoring for Grand Marais Creek started in 2012.

Waters not meeting state standards are still listed as impaired and Total Maximum Daily Load studies are performed as they have been, but in addition the watershed approach includes a more cost-effective and comprehensive assessment of the watershed's overall health. A key aspect of this effort is using watershed-scale models and other tools to help state agencies, local governments and other watershed stakeholders determine how to best proceed with restoring and protecting lakes and streams. The Grand Marais Creek Watershed Monitoring and Assessment Report summarizes past assessment/diagnostic work and outlines ways to prioritize actions and implement strategies. This is phase one of a four phase process outlined at left.



## Full report

To view the full report, visit the Grand Marais Creek Watershed page on our website. Search the web for "MPCA Grand Marais Creek."

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