

# Sand Hill River Watershed



## Why is it important?

The Sand Hill River flows 101 miles from its source in Sand Hill Lake east of Bagley to the Red River near Climax. The watershed includes portions in North Dakota. The Minnesota portion of the watershed covers 395,000 acres out of the total of 708,500 acres. Most of the watershed lies within the Lake Agassiz Plain Level III Ecoregion which is dominated by glacial sediments and landforms consisting of thick layers of silt and clay on a very flat landscape. This makes the landscape ideal for farming but also prone to severe flooding.

Most of the watershed is privately owned (98%) and farmed (84%). The topography can be broken into three regions: the glacial lake bed deposits in the west, the beach ridge area in the center, and the glacial moraine region in the east. The lake plane is comprised of flat deposits of clay and silt. East of the lake bed is the beach ridge area, the old shorelines of ancient Lake Agassiz. The glacial moraine region in the east has small lakes, wetlands, and a rolling terrain.

Most original wetlands have been drained. Crops include corn, soybeans, sugar beets, and small grains. Activities such as big and small game hunting, upland bird hunting, waterfowl hunting, and fishing are popular in the watershed.

Cities and towns in the watershed include: Clinton, Donnelly, Elbow Lake, Graceville, Herman, Morris, Norcross, Wendell, and Wheaton.

## Key issues

Many stream segments failed to meet standards for aquatic life (fish and aquatic insects) and aquatic recreation use (swimming); however, fish and aquatic insect communities (the larval stage of dragonflies, mayflies, etc.) were generally good in the lower reaches of the Sand Hill. Excessive bacteria resulted in all of the swimming impairments.

Dams and other barriers have limited the passage of certain fish and contribute to aquatic life impairments in the Upper Sand Hill River Subwatershed; however, many of these barriers have since been replaced with riffle structures. Kittleson Creek is the only stream segment in the watershed that fully supports aquatic life and swimming. The sections of Kittleson Creek that were assessed are relatively undisturbed areas, likely contributing to the good in-stream habitat conditions and healthy biological community.

## Highlights of report

- Habitat conditions vary greatly across the watershed with better habitat along portions of the Upper Sand Hill River where the river retains its natural channel. In contrast, with the exception of Kittleson Creek, many tributary streams have generally poor habitat and show signs of severe degradation. Due to the flashy nature of these streams, much of the aquatic insect habitat becomes either flushed out during peak flows or becomes less available during dry periods. In addition, excess sedimentation has filled in pools and rocky stream bottoms needed by sensitive fish and aquatic insect species.
- Elevated bacteria levels were found on all four reaches of the Sand Hill River, which can indicate conditions are unsafe for swimming and fishing.

## Highlights (cont.)

- Sources of bacteria that have the potential to cause waterborne illnesses in streams include outdated or underperforming septic systems and animal waste (e.g., livestock, pets, wildlife). Excess sedimentation has contributed to much of the watershed being impaired by turbidity, including most of the main stem of the Sand Hill River. Rivers and streams in the watershed have been heavily modified to promote agricultural drainage and stream channelization, which likely contributes to aquatic life impairments. Heavily modified drainage can increase scouring of stream banks as heavy flows during spring runoff and summer rain events enlarge stream channels, exacerbating bank erosion.
- Steps to help bring turbidity and bacteria values back into compliance with state standards include identifying areas contributing to the impairments, improving areas along streams, and adjusting land uses around the river and its tributaries.
- Lake water quality varies widely within the headwater subwatersheds, indicating a variety of factors are in play. Overall, four of the 11 lakes assessed did not support swimming. Impairments are due to excess nutrients which can cause unsightly and sometimes toxic algal blooms. In addition, wind mixing in shallow lakes can re-suspend sediment in the water, reintroducing phosphorus attached to soil particles in the water column. Protecting lakes that currently meet standards is necessary to prevent them from becoming impaired.

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## About this study

### Watershed approach

Phase 1: Monitor and assess health of waters

Phase 2: Identify conditions stressing biological life

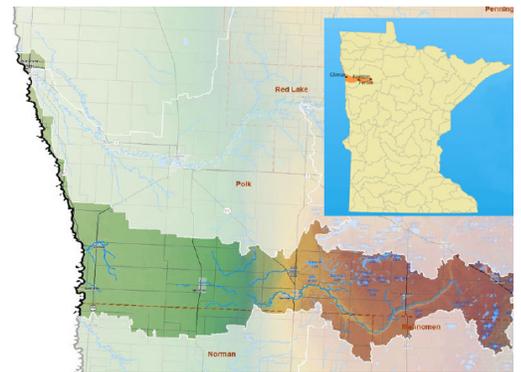
Phase 3: Determine maximum pollutant loads

Phase 4: Determine Watershed Restoration and Protection Strategies

Start process over every 10 years

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. The first cycle for the Sand Hill River Watershed began in 2011 with intensive monitoring.

Waters not meeting state standards are still listed as impaired and Total Maximum Daily Load studies are performed as they have been in the past, 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 to develop and utilize 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 Sand Hill River Watershed Monitoring and Assessment Report summarizes past assessment and diagnostic work and outlines ways to prioritize actions and implement strategies. This is phase one of a four phase process outlined at left.



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## Full report

To view the full report, visit the Sand Hill River Watershed page on our website. Search the web for "MPCA Sand Hill Watershed."

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## Contact person

Cary Hernandez  
Minnesota Pollution Control Agency  
[cary.hernandez@state.mn.us](mailto:cary.hernandez@state.mn.us)  
218-846-8124