

Summary

Watershed Monitoring and Assessment Report

Bois de Sioux River Watershed



Why is it important?

The Bois de Sioux River Watershed lies within the headwaters region of the Red River Basin and encompasses an area of 718,685 acres. It includes areas in west-central Minnesota, southeastern North Dakota, and northeastern South Dakota.

Land within the watershed is used predominately for agricultural row crop production. Extensive hydrologic alterations such as stream channelization and ditching have been made throughout the watershed to promote soil drainage. Flooding is frequent. Major rivers include the Bois de Sioux River and Rabbit River. Numerous small unnamed creeks and ditches occur throughout the watershed. There are 325 lakes greater than 10 acres in surface area. Major lakes include Lake Traverse, Upper Lightning, and Mud Lake.

In 2010 the MPCA began intensive surface water monitoring in the watershed and in 2012 waters were assessed for aquatic life, aquatic recreation, and aquatic consumption use support. Every stream segment assessed failed to meet aquatic life use standards. Only one segment fully supported aquatic recreation use. Most aquatic life impairments were for low dissolved oxygen and/or excess turbidity. All aquatic recreation impairments were caused by excessive bacteria levels. Some aquatic life impairments were due to poor fish and macro invertebrate communities. All lakes had high nutrient levels and low transparency.

Key issues

Streams in the Bois de Sioux River Watershed are in overall poor condition. Because of their geographic and geologic setting on the landscape they are highly susceptible to the disturbances that are prevalent throughout the watershed. As a consequence, stream habitat, water chemistry and the biology have all been compromised. Where sufficient data exists, assessments for aquatic life, recreation, and fish consumption indicate non-support of these uses.

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 will be 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

- There are 86 species of fish documented in the Red River Basin. Crews found 31 of these species in the Bois de Sioux Watershed, with the most diverse communities found on the mainstem of the Bois de Sioux. The most abundant species in the watershed is the fathead minnow. They are tolerant of low dissolved oxygen and can survive in pools during dry periods. They are also one of the first species to move into disturbed habitat from ditching and dredging activities. Other commonly sampled species in the watershed included black bullhead, creek chub, common carp, white sucker, and orange spotted sunfish.
- The watershed contains several aquatic macro invertebrate species. The vast majority of macro invertebrates found are very tolerant of environmental stress

(i.e. lack of habitat, elevated nutrients, low dissolved oxygen). Very few sensitive aquatic macro invertebrate species were found. Those that were found were few in number. They included mayflies, stoneflies, and caddisflies.

- Excessive turbidity and low dissolved oxygen were the two most prevalent types of aquatic life impairments. Both may be influenced by a multitude of factors including the surrounding land use, stream morphology and nutrient inputs.
- Excess nutrients such as nitrogen and phosphorus can increase algae in streams, resulting in low dissolved oxygen, larger fluctuations in DO and increased turbidity.
- In addition to high nutrient levels, high levels of bacteria found in some streams can increase biological oxygen demand further reducing dissolved oxygen.
- Nutrient sources within the watershed include fertilizer, wastewater treatment facilities, septic systems, and nutrient recycling from stream bed sediment.
- Nutrients move from fields to streams from runoff. Phosphorous levels at all stations on the Rabbit River and one station on the Bois de Sioux exceeded 350 parts per million. Levels above 150 are considered poor.
- The combination of flat topography and fertile soils has resulted in widespread cultivation which in turn has resulted in stream sedimentation problems, mainly during spring flood events.

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 81 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.

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. This report summarizes past assessment and diagnostic work and outlines ways to prioritize actions and implement strategies.



Full report

To view the full report visit the Bois de Sioux River Watershed page on our website.

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