



Schmidt, Pomerleau and Bass Lakes

TMDL Study: Excess nutrients (Phosphorus)

In 2002, the Minnesota Pollution Control Agency (MPCA) listed Schmidt, Pomerleau and Bass Lakes as impaired for aquatic recreation under Section 303(d) of the Clean Water Act. The main cause for this impairment is excessive nutrients in the lakes. Excess phosphorus in the lakes from stormwater runoff is causing extensive summertime algal blooms that decrease water clarity and limit recreational activities.

Schmidt, Pomerleau and Bass Lakes

Almost the entire drainage area of Schmidt, Pomerleau and Bass Lakes is located within the City of Plymouth in the northwest suburban Twin Cities area, with a fraction located in the City of Maple Grove. The Pomerleau Lake and Schmidt Lake subwatersheds drain through the Bass Lake subwatershed to Bass Lake. Bass Lake outlets through Bass Creek to Shingle Creek, which outlets into the Mississippi River.

There are about seven storm sewer outfalls discharging into Bass Lake as well as Bass Creek and eight storm sewer outfalls to Schmidt Lake.

TMDL Background

Based on the federal Clean Water Act, waters that do not meet water quality standards are impaired. States are required to develop a clean-up plan called a Total Maximum Daily Load (TMDL) for each impairment affecting a water body. A TMDL must identify all sources of a



Schmidt Lake

pollutant and determine the amount each source must reduce its contribution to meet applicable water quality standards.

Lake Impairments

The goal of this TMDL is to quantify the pollutant reductions needed for Schmidt, Pomerleau and Bass Lakes to meet state water quality standards.

Schmidt and Bass Lakes are shallow lakes, while Pomerleau Lake is a deep lake.

Bass Lake is approximately 175 acres with an average depth of 10.1 feet and 82% of the lake is littoral (less than 15 feet in depth). Pomerleau Lake is approximately 30 acres with an average depth of 10.9 feet and 66% littoral area. Schmidt Lake is approximately 37 acres with an average depth of 5.5 feet and 92% littoral area.

The numeric targets for shallow lakes in the North Central Hardwood Forest (NCHF) Ecoregion are summer averages of ≤ 60 micrograms per liter ($\mu\text{g/L}$) total

phosphorus, ≤ 20 $\mu\text{g/L}$ chlorophyll-a, and ≥ 1.0 meter of Secchi depth. The numeric targets for deep lakes in the NCHF Ecoregion are summer averages of ≤ 40 $\mu\text{g/L}$ total phosphorus, ≤ 14 $\mu\text{g/L}$ chlorophyll-a, and ≥ 1.4 meters of Secchi depth.

Historic summer average total phosphorus (TP) concentrations in Schmidt, Pomerleau, and Bass Lakes range from 40 $\mu\text{g/L}$ to 90 $\mu\text{g/L}$ with the highest concentrations occurring in Pomerleau Lake and the lowest occurring in Schmidt Lake.

Pollution sources

Stormwater from urban runoff is one of the major phosphorus sources to Schmidt, Pomerleau, and Bass Lakes. Impervious surfaces in the watershed improve the efficiency of water moving to streams and lakes resulting in increased transport of phosphorus into local water bodies. Phosphorus in stormwater is a result of transporting organic material such as leaves and grass clippings, fertilizers, and sediments to a water body. The internal loading of phosphorus in the lakes is another source caused by a combination of curly-leaf pondweed dieback and the sediment release of nutrients.

Reductions

In order to consistently meet water quality standards, the TMDL Study requires a phosphorus load reduction of 67 percent for Pomerleau Lake, 9 percent for Schmidt Lake, and 33 percent for Bass Lake.

Implementation strategies

Best Management Practices (BMPs) that reduce nonpoint sources of phosphorus in the watershed and in-lake phosphorus will improve water quality in these lakes.

Examples of BMPs are:

- Retrofit stormwater detention ponds and other infiltration BMPs, particularly during street reconstruction projects
- Increase infiltration and filtration in the watershed through the use of rain gardens, native plantings, and reforestation
- Protect high-value wetlands to prevent phosphorus export

- Educate property owners about proper fertilizer use and low-impact lawn care practices
- Manage in-lake phosphorus levels through plant and fisheries manipulation

For more information about water bodies in the Shingle Creek Watershed, go to www.shinglecreek.org.

For more Information

Wenck Associates, Inc. prepared the Schmidt, Pomerleau, and Bass Lakes Nutrient TMDL Report for the Shingle Creek Watershed Management Commission and Minnesota Pollution Control Agency. For more information about the Schmidt, Pomerleau, and Bass Lakes Nutrient TMDL Report, visit www.pca.state.mn.us/water/tmdl/project-schmidtpomerleaubass-nutrients.html or contact:

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For general TMDL information, browse www.pca.state.mn.us/water/tmdl/. For more information about the waterbodies in the Shingle Creek Watershed, visit www.shinglecreek.org.

