SUMMARY OF THE

Martin & Typo Lakes Impaired Waters Report

TOO MUCH PHOSHORUS = TOO MUCH ALGAE

Martin and Typo Lakes suffer from an excess of the nutrient phosphorus. Phosphorus fuels algae blooms that hamper swimming, fishing, boating, and can also cause other problems. The phosphorus concentration in Martin Lake is about 2 times the state water quality standard; Typo Lake is 5 times higher than that standard.

STUDY OF THE LAKES

In 2001 through 2003 the lakes and their tributaries were intensely monitored for water chemistry and flow. The results led to several offshoot studies to better understand where the phosphorus was coming from, lake ecology, and how different management strategies might work. This information was integrated into computer models which shed further light onto aspects of the lakes that can't be studied directly. The computer models were used to run "what if" management scenarios. All together, these results are presented in the Impaired Waters Report. The report also includes lake management recommendations. The management recommendations are focused on shifting the lakes from their turbid, algae-dominated state to a clearer water condition with a stronger plant community.

Martin Lake algae blown to shore in August

WHAT'S A TMDL?

This study and report are a TMDL. TMDL stands for Total Maximum Daily Load. A TMDL is a type of water quality study, sometimes called an impaired waters study, that determines where pollutants are coming from, how much they need to be reduced in order to meet water quality standards, and how those improvements can be accomplished. Federal law requires a TMDL on all impaired water bodies, and the report has binding implications. An approved TMDL paves the way to lake improvement.

YOUR INPUT IS NEEDED

The report is not finalized — input is needed to ensure it is the best possible plan for these lakes. Submit comments or suggestions by September 12, 2005 to Jamie Schurbon, Water Resource Specialist at the Anoka Conservation District.
16015 Central Ave NE #103 Ham Lake, MN 55304
or email at jamie.schurbon@anokaswcd.org

ANOKA CONSERVATION DISTRICT
www.AnokaSWCD.org

SEE THE FULL REPORT AT: WWW.ANOKASWCD.ORG

TYPO LAKE PHOSPHORUS SOURCES

The largest sources of phosphorus to Typo Lake include:

1. Data Creek — Data Creek is the largest source. Although the majority (60-70%) of Data Creek's water comes from the tributary Ditch 13, the smaller tributary Ditch 20 is of greater concern, where phosphorus concentrations are 2.5 times higher than elsewhere. Ditch 20 flows through broad peatlands. These peatlands release phosphorus to the ditch under continuously wet conditions, but are especially problematic during drying and rewetting sequences common at this location. These releases occur because of chemical and biological changes under these conditions.

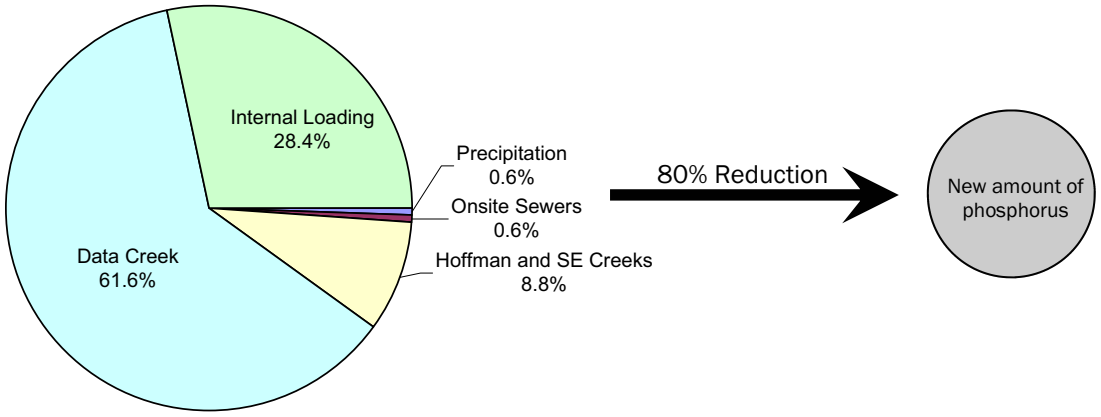
2. Internal Loading— Internal loading occurs when phosphorus comes from within the lake system itself. In Typo Lake numerous factors contribute to internal loading, including an abundance of rough fish, thorough mixing by the wind, lack of vegetation, and high pH.

Other minor sources include Hoffman Creek (north inlet) and the southeast inlet.

TYPO LAKE GOAL

The goal for Typo Lake is an 80% reduction in phosphorus to a summertime average of 90 parts per million. Under this condition algae blooms will still occur, but on a much reduced frequency and intensity. This goal is the same as the water quality standard for similar lakes in southern Minnesota.

Figure 1. Typo Lake phosphorus budget and magnitude of reductions needed to achieve the goal.



MARTIN LAKE PHOSPHORUS SOURCES

The largest sources of phosphorus to Martin Lake include:

1. Data Creek/Typo Creek — Not surprisingly, the largest source of phosphorus to Martin Lake is the troubled waters upstream: Data Creek, Typo Lake, and Typo Creek which links the lakes.

2. South Martin Lake Inlet—Water coming from Island Lake is of exceptional quality, but is the second largest phosphorus source to Martin Lake because it delivers a large volume of water to the lake. Water quality improvements would be difficult because it is already so low in phosphorus.

3. Mikkelson Creek—This small ditch flows primarily through wetlands. Most of its phosphorus is from natural sources, and not larger than expected to occur naturally.

4. Septic Systems—Failing or non-compliant on-site sewers in lakeshore neighborhoods contribute a relatively smaller percent of the phosphorus, but are nonetheless significant.

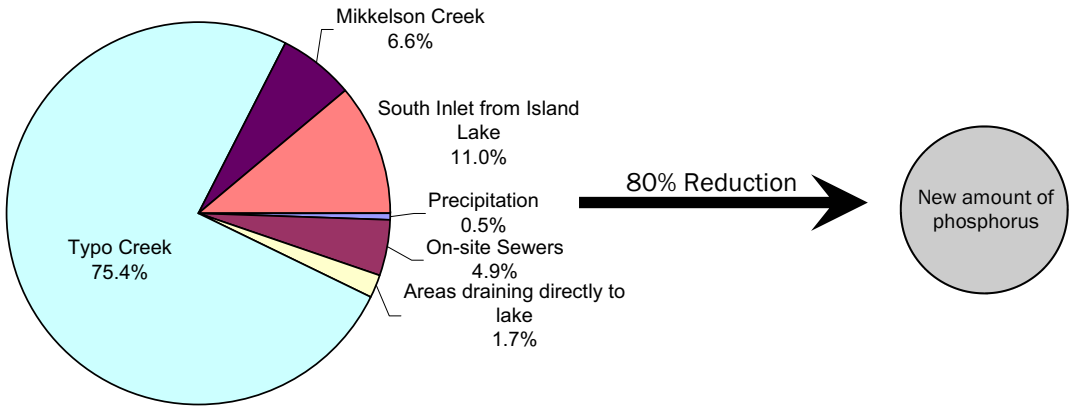
5. Internal Loading—This factor was difficult to estimate in Martin Lake, but is likely significant due to moderate wind mixing and rough fish.

6. Runoff from nearby neighborhoods—Includes storm water and yard runoff like fertilizers.

MARTIN LAKE GOALS

The goal for Martin Lake is an 80% phosphorus reduction to a summertime average of 40 parts per million. This goal is the same as the water quality standard for similar lakes in this region. For comparison, this is about the same condition as Linwood Lake. Though improving Typo Lake will considerably help reaching this goal for Martin Lake, that alone will not suffice. Work needs to be done in both lakes' watersheds.

Figure 2. Martin Lake phosphorus budget and magnitude of reductions needed to achieve the goal.



LAKE CLEAN-UP STRATEGIES

Strategies that could be used to reduce phosphorus loading include:

A. Data Creek Water Control Structure— A water control structure installed on Data Creek at Typo Creek Drive could be used to maintain a regime of more continuously saturated conditions in upstream wetlands, thus reducing phosphorus release occurring during drying and rewetting of ditched wetland soils and providing some settling of suspended solids. An engineering study is needed to determine the feasibility of this option. Offshoot projects could include constructing the control structure to also serve as a carp barrier or temporarily diverting water around Typo Lake to temporarily draw it down and encourage plant growth.

B. Plug County Ditch 20 Lateral Ditches—Plugging these short tributary ditches would reduce the ditched wetland area contributing phosphorus to the waterways.

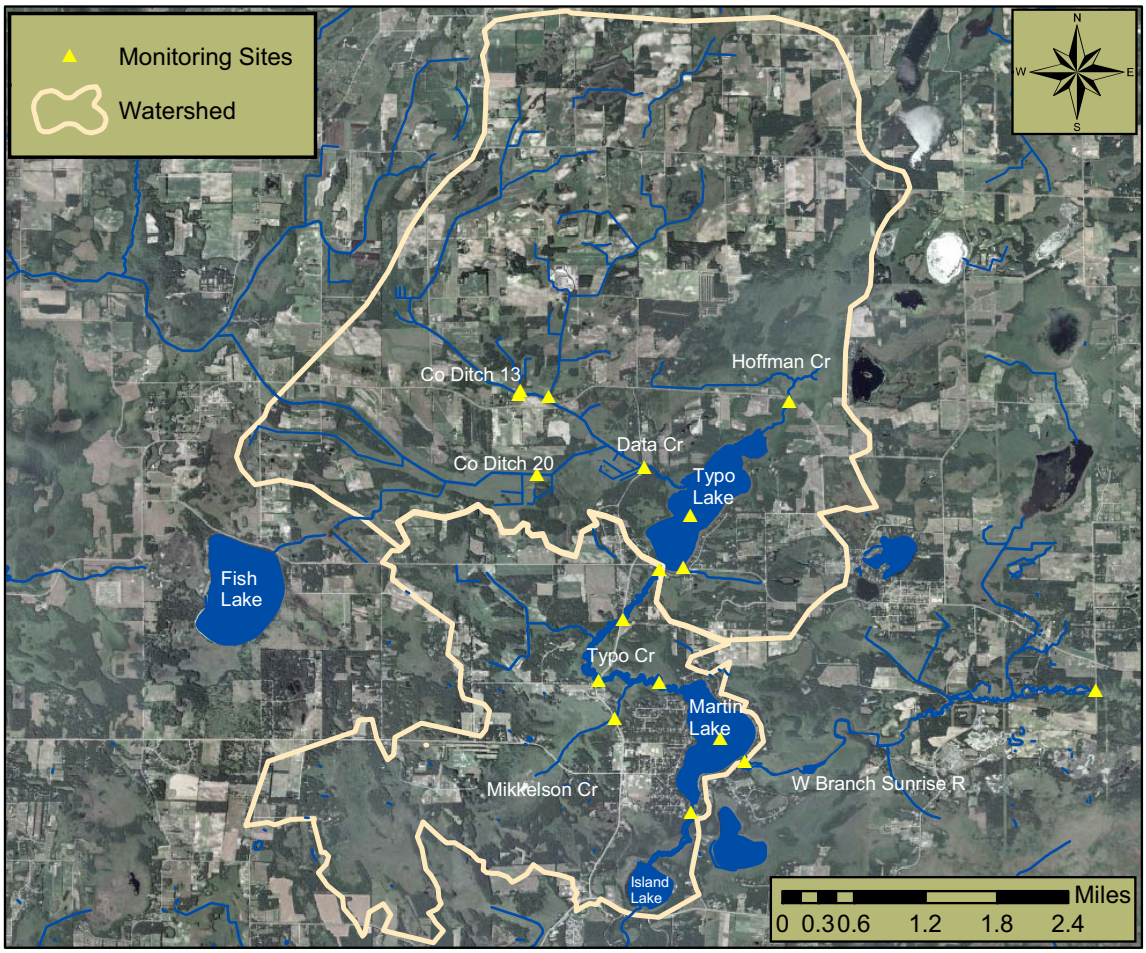
C. Rough Fish Control—Numerous rough fish control attempts have been made in the past. New attempts, if made, need to be more intense. Options include commercial harvests, installing fish barriers to minimize breeding in adjacent wetlands, and continued predatory fish stocking.

D. Martin Lake Septic Systems Improvement— This can be accomplished through low interest loans, education, securing group pumping discounts, pumping reminders, compliance inspections, and/or infrastructure improvements (community systems).

E. Martin Lake Rain Gardens—These small, attractive systems could be installed on some lakeshore properties to capture stormwater before it reaches the lake.

F. Development Best Management Practices (BMPs) - Strict adherence to runoff and erosion control measures is needed for construction or grading work within the watersheds.

G. Establish Aquatic Vegetation—Cost share programs exist to encourage landowners to plant native vegetation on their shoreline, but more participation is needed. Likewise, landowners need to be selective with control of existing aquatic vegetation. In-lake vegetation helps by consuming nutrients otherwise used by algae, providing habitat for zooplankton that eat algae, minimizing mixing of bottom sediments, and by facilitating other processes. Aquatic plant establishment efforts will be most successful after some water clarity improvement has been made.



WHEN DO WE START CLEANING UP THE LAKES?

There are things residents, lake associations, and local governments can start doing right away (strategies D-G, among others). For larger projects that probably need outside funding help, the timeline is less certain. The MN legislature and diverse political forces statewide have recognized the need for cleaning up impaired lakes, but legislation has languished with legislators unable to decide *how* to fund it. Hopefully the MN legislature will pass some form of the Clean Water Legacy Act soon, and clean up work can be accelerated statewide. In the meantime, we will continue work locally and compete for existing grants.

HOW QUICKLY WILL WE SEE IMPROVEMENTS?

The timeline for lake cleanup will be measured in years, not months. Many interrelated factors that sustain each other are causing poor water quality. For example, rough fish, lack of plants, and high phosphorus each create a situation that is favorable for the others. Breaking the interrelated causes of poor water quality will take multiple efforts simultaneously. It's a challenging situation, but good progress can be made if pursued by the community and local leaders.

PROJECT PARTNERS

- Anoka Conservation District (conducted project)
- Anoka County Ag Preserves Program
- Martin Lakers Association
- Minnesota Pollution Control Agency
- Sunrise River Watershed Mgmt Organization

MORE INFORMATION

Jamie Schurbon
Water Resource Specialist
Anoka Conservation District
763-434-2030 ext. 12
jamie.schurbon@anokaswcd.org

SEE THE FULL REPORT AT: WWW.ANOKASWCD.ORG

Draft Date: 7/28/05