

CHISAGO LAKES TOTAL MAXIMUM DAILY LOAD AND RESTORATION & PROTECTION PLAN

The Total Maximum Daily Load Study (TMDL) quantified the amount of phosphorus entering the lakes and the amount that would need to be reduced in order to meet the State water quality standards. These reductions are quantified below. Lake restoration activities can be grouped into two main categories: those practices aimed at reducing external nutrient loads, and those practices aimed at reducing internal loads. The focus of restoration activities will depend on the lake's nutrient balance and opportunities for restoration. However, it is always important to first address sources of external nutrient loads to lakes to prevent the accumulation of phosphorus in the sediments, which contributes to future internal loading, and to ensure long-term stability of in-lake restoration efforts.

Phosphorus Reductions Needed by Lake

Lake	Phosphorus reductions needed [lb/yr]				Primary Reduction Strategy
	Total	Watershed	In-lake	Upstream lakes	
North Center	1,108	595	0	513	Watershed Reductions
South Center	1,260	842	208	210	
Ogren	467	430	37	0	
Pioneer	1,771	21	1,750	0	In-lake Reductions
Emily	362	100	262	0	Reductions from Watershed and In-Lake
Linn	2,395	848	1,547	0	
Little	2,658	1,562	1,096	0	
School	1,593	818	773	0	
Wallmark	3,997	1,052	2,945	0	

Restoration/Protection Activities

Load reduction restoration/protection activities consist of watershed projects, in-lake projects, and point source best management practices, and were identified for each impaired and protection lake. The load reduction /protection activities identified for the implementation plan include:

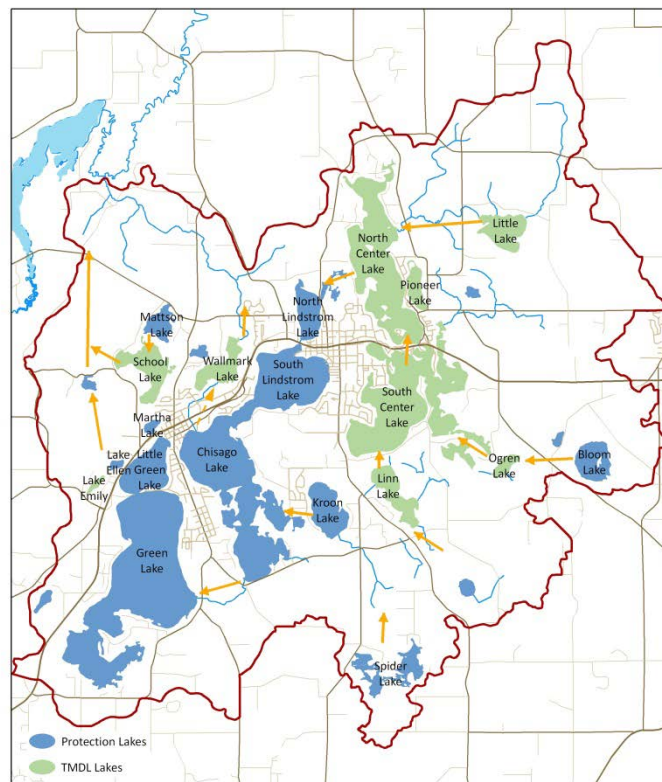
Watershed Practices

- Biofilters
 - Field/shoreline buffers
 - Vegetated swales
- Sedimentation
 - Ponds and pond retrofits
 - Wetland restoration
 - Gully stabilization
- Bioretention and Infiltration
 - Rain gardens
 - Infiltration Best Management Practices (BMPs)
- Agricultural BMPs
 - Conservation tillage
 - Nutrient management planning
 - Prescribed grazing
- Lawn management
- Sand-iron filtration
- Septic system upgrades

In-Lake Practices

- Sediment phosphorus inactivation
- Trophic state alteration
 - Fish kill/ fish stocking
 - Carp management
 - Curly-leaf pondweed management
 - Floating vegetation mat installation
 - Lake drawdown
 - Algaecide application
 - Barley straw installation

Point Source Practices



Chisago Lakes Chain of Lakes Watershed
TMDL and Protection Lakes

Chisago SWCD
Chisago Lakes Chain of
Lakes Watershed TMDL
2012



Partners:

Chisago Soil & Water
Conservation District
Chisago Lakes Lake
Improvement District
Minnesota Pollution
Control Agency
Emmons Olivier
Resources, Inc.

Targeted Water

Bodies:

Chisago Lakes Chain of
Lakes Watershed (All
Lakes)

Approval Date:

TMDL: February 20,
2013
Restoration and
Protection Plan:
February 25, 2013

Can I read it?

The TMDL and
Restoration and
Protection Plan are
available here:
<http://www.pca.state.mn.us/wfhya0a>

