

Lake Status

Overall Strategy: Impaired Watershed Management

Water Quality Rating: B-: Secchi – 8.6 ft.;

TP – 38 µg/L

Impairment: *Aquatic recreation* due to excess nutrients in the lake.

Water Quality Trend: TP & Secchi – No Trend

Shoreland Classification: Natural Environment

Subwatershed Land Cover:

4% developed, 55% forests and woodlanes, 1% grassland/shrubland/sparse vegetation, 24% lakes and open water wetlands, 14% planted or cultivated, 2% wetlands.



Resource Goals

Short Term Goals – Year 2015

- Achieve a water quality rating of at least B.
- Achieve a five-year mean summer phosphorus concentration at or below 35 µg/L ± 4%.
- Achieve a mean summer secchi depth no less than 9 ft.
- Continue working with the private landowner and Wilder Foundation for teaming on lake management and education.
- Revise goals based on the CMSCWD Lake TMDL Study.

Long Range Goals - Year 2020

- Achieve a water quality rating of at least B.
- Achieve a five-year mean summer phosphorus concentration at or below 30 µg/L ± 4%.
- Achieve a mean summer secchi depth no less than 9 ft.
- Conduct watershed management in consideration of the area’s statewide importance to the Blanding’s turtle.

DNR Fisheries Lake Management Plan (1999)

- Long Range Goal: Provide gamefish population to support 75-100 fishing hours per acre.
- Operational Plan:
 - Annual winter fish house counts.
 - Monitor winter oxygen levels.
- Mid Range Objective: Identify and develop a public access for 3-5 car/trailer units.
- Potential Plan:
 - Develop adequate public access.
 - Install a fishing pier.
 - Install a winter aeration system.

BASIC FACTS

DNR ID	82003400
Section	22
Township	31
Range	20
Lake Area	47 acres
Subwatershed Area	201 acres
Outlet Elevation	landlocked
Low Water Level	914.05 ('07)
High Water Level	917.97 ('03)
Ordinary High Water	N/A
100-Yr. Flood Elev	919.5 (FEMA)
Greatest Depth	44 ft.

Control Structures:

Culvert under Norell Ave. connected to West Boot Lake

Fish Species:

Black Bullhead, Black Crappie, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkin Seed Sunfish, Yellow Bullhead (2003)

Aquatic Nuisance Species:

Purple Loosestrife (1999)
Eurasian Water Milfoil
Curlyleaf Pond Weed

CMSCWD References:

WCD Water Monitoring Report ('08)
DNR Lake Water Level Report
DNR Lake Information Report

Implementation

Operational Priorities

Impaired Watershed Management per TMDL Study Recommendations

Education

Impaired Watershed Education Program per TMDL Study Recommendations

Regulatory

Activities impacting East Boot Lake will be regulated by the watershed district through its *Rules of the District*. Regulatory efforts will be coordinated with May Township, Washington County and the Minnesota DNR, where applicable.

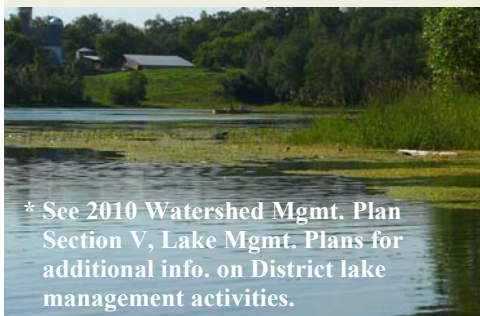
Projects

Current:

- CMSCWD Lake TMDL Study
- Best Management Practices (BMP) Program per TMDL Study Recommendations
- Water Quality Monitoring Program per TMDL Study Recommendations
- Ongoing BMP Monitoring
- Permitting Program

Future/Potential:

- TMDL Implementation Plan Projects
- Roadside Revegetation Project
- Purple Loosestrife Control and Collection
- Water Quality Diagnostic Feasibility Study



* See 2010 Watershed Mgmt. Plan Section V, Lake Mgmt. Plans for additional info. on District lake management activities.

Overall Assessment: East Boot Lake

East Boot Lake has limited existing development adjacent to it since the eastern side of the lake is in the Wilder Forest and the western half is owned by a single landowner who is currently operating a dairy farm. The lake receives some fishing pressure in both winter and summer. In-lake phosphorus concentrations typically exceed the MPCA standard of (40 µg/L) and the lake is therefore listed as impaired.

Based on an Aerial Lakeshore Analysis, the major influence on the lake is non-point source runoff from agricultural fields and dairy operation adjacent to the lake followed by non-point source pollution from County Road #55. The District has been working for the last 10-yr with the landowner, Department of Agriculture and Washington Conservation District to address the feedlot and manure management concerns and restore the quality of the lake. Approximately 50% of the shoreland has Best Management Practices (BMPs) in use (i.e. forested buffer) primarily due to its location in the Wilder Forest.

Based on measured lake characteristics and land use in the lake's minor subwatershed, water quality modeling completed for the 2000 Watershed Management Plan indicated that minimal protection efforts (such as agricultural BMPs, feedlot and manure management) could reduce phosphorus input to the lake and help maintain the lakes good water quality. However, these practices were not implemented and increased phosphorus loadings appear to have contributed to a decrease in the water quality.

In 2001, the Carnelian Marine Watershed District completed a paleolimnological investigation of trophic changes in four lakes in the watershed: Big Carnelian Lake, Big Marine Lake, East Boot Lake, and Loon Lake. The purpose of the investigation was to establish the baseline trophic conditions existing in the lake prior to European settlement in the mid-1800s. The diatom-inferred total phosphorus (TP) values for East Boot Lake indicate that changes in nutrient inputs to the lake coincided with peaks in agricultural activity. Inferred TP increases from greater than 20 µg/L before 1900 to a peak concentration of 42 µg/L around 1930 and drops by the 1950s, coinciding with the regional peak in farming activity around 1930 and improvements in farming practices between 1930 and the 1950s. TP increased somewhat again in the 1970s. The median pre-settlement TP for a larger group of lakes with similar TP reconstructions was 16-32 µg/L. The study determined that East Boot was less eutrophic in the distant past.

East Boot Lake is one of 10 lakes in the CMSCWD on the EPA's 303(d) list of impaired waters impaired for nutrients. Phase I of the Lake Total Maximum Daily Load (TMDL) Study is complete. The target completion date for the East Boot Lake TMDL is 2015. East Boot Lake has not achieved the 2010 goals of a water quality rating of at least 'B' and a five-year mean summer phosphorus concentration at or below 35 µg/L ± 4% based on the 2008 WCD Water Monitoring Report. It has achieved a mean summer secchi depth no less than 2 ft. These goals have been transferred to 2015 goals, and East Boot Lake is undergoing impaired watershed management.