

**Lake Status**

**Overall Strategy:** Impaired Watershed Management

**Water Quality Rating:** D (2007)

Secchi (2007) – 2.9 ft; TP – N/A

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

**Water Quality Trend:** Secchi (2007) – N/A (shallow); TP – N/A

**Shoreland Classification:** Natural Environment

**Subwatershed Land Cover:** 3% developed, 30% forests and woodlands, 4% grassland/shrubland/sparse vegetation, 12% lakes and open water wetlands, 34% planted or cultivated, 16% wetlands.

**Resource Goals**

**Short Term Goals – Year 2015**

- Achieve a five-year mean summer phosphorus concentration at or below 125 µg/L ± 4%.
- Maintain a mean summer secchi depth no less than 1.5 ft.
- Maintain District’s existing good relationship with Landowner and Land Manager for possible teaming on lake management and education opportunities. Work with county Parks when the watershed is incorporated into the Big Marine Regional Park.

**Long Range Goals - Year 2020**

- Achieve a five-year mean summer phosphorus concentration at or below 100 µg/L ± 4%.
- Maintain a mean summer secchi depth no less than 1.5 ft.
- Conduct watershed management in consideration of the area’s statewide importance to the Blanding’s turtle.

**DNR Fisheries Lake Management Plan:** None



**BASIC FACTS**

<b>DNR ID</b>	82002600
<b>Section</b>	8
<b>Township</b>	31
<b>Range</b>	20
<b>Lake Area</b>	62 acres
<b>Subwatershed Area</b>	1088 acres
<b>Outlet Elevation</b>	N/A
<b>Low Water Level</b>	940.05 ('06)
<b>High Water Level</b>	941.44 ('03)
<b>Ordinary High Water</b>	N/A
<b>100-Yr. Flood Elev</b>	943.0 (FEMA)
<b>Greatest Depth</b>	7 ft

**Control Structures:**  
None

**Fish Species:**  
Bullhead, Green Sunfish

**Aquatic Nuisance Species:**  
None

**CMSCWD References:**  
WCD Water Monitoring Report ('07)  
Mud-Turtle Lake Study ('96)  
DNR Lake Water Level Report

## Implementation

### Operational Priorities

- Impaired Watershed Management per TMDL Study Recommendations
- Provide Input to the Big Marine Regional Park Planning Process

### Education

Impaired Watershed Education Program per TMDL Study Recommendations

### Regulatory

Activities impacting Mud 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
- Permitting Program

### Future/Potential:

- TMDL Implementation Plan Projects.

\* See *2010 Watershed Management Plan* Section V, *Lake Management Plans* for additional information on District lake management activities.

## Overall Assessment: Mud Lake

Mud Lake is a shallow lake completely surrounded by a large, private livestock grazing operation. The grazing operation uses rotational grazing to manage pasture lands. There is no public access to the lake. In the past the lake has been subjected to considerable nutrient-laden runoff and erosion due to historic logging and farming practices. The lake likely has a high internal loading rate for phosphorus. When the District last monitored for in-lake phosphorus concentrations in 2001 concentrations were significantly worse than the MPCA shallow lake standard of (60µg/L). In 2007 the lake did not meet the MPCA shallow lake standard of 1 m for secchi depth transparency.

Water levels in Mud Lake are maintained by the Turtle Lake control weir. This weir was installed by the District as part of the District's 1985 Outlet project for the purpose of maintaining waterlevels in the upstream lakes and wetlands. The project also included a series of dikes around Mud Lake also for maintenance of water levels.

Based on an Aerial Lakeshore Analysis study (1998), the most common influence on the lake was runoff from non-point source pollution from adjacent fields caused by the lack of a maintained vegetative buffer between fields and the lake. The recommendations from that study are to investigate and correct all point and non-point sources of pollution to the lake and to keep the forested areas intact.

Based on measured lake characteristics and landuse in the lake's minor subwatershed, water quality modeling indicated that a significant amount of phosphorus needs to be removed to improve the water quality of the lake. Without extensive restoration efforts, this lake will remain hypereutrophic and continue to have poor water quality. The 2010 goal of achieving a mean summer secchi depth no less than 1.5 feet has been met. Mud Lake is undergoing impaired watershed management.

