

Lake Status

Overall Strategy: Focused Watershed Management (2010-2013)

Water Quality Rating: A: Secchi – 16.4 ft; TP (2007) – 15 µg/L

Impairment: *Aquatic consumption* due to mercury in fish tissue.

Water Quality Trend: Secchi – Declining; TP – No Trend

Shoreland Classification: Recreational Development

Subwatershed Land Cover: 25% developed, 26% forests and woodlands, 1% grassland/shrubland/sparse vegetation, 25% lakes and open water wetlands, 22% planted or cultivated, 1% wetlands.

Resource Goals

Short Term Goals – Year 2015

- Maintain a mean summer phosphorus concentration at or below 15 µg/L ± 4%.
- Achieve a mean summer secchi disk no less than 23 ft.
- Maintain sustainable Daphnia populations to control algal abundance.
- Encourage the lake association and continue the cooperative relationship with County Parks Department.
- Revise goals based on the focused watershed management efforts.

Long Range Goals - Year 2020

- Maintain a mean summer phosphorus concentration at or below 15 µg/L ± 4%.
- Achieve a mean summer secchi disk no less than 23 ft.
- Maintain sustainable Daphnia populations to control algal abundance.
- Revise goals based on the focused watershed management efforts.
- Conduct watershed management in consideration of the area’s statewide importance to the Blanding’s turtle.

DNR Fisheries Lake Management Plan (1995)

- Long Range Goal: Maintain a two story management program supporting a fishery of 100 mhr/a.
- (continued on next page)



BASIC FACTS

DNR ID	82004600
Section	23
Township	31
Range	20
Lake Area	203 acres
Subwatershed Area	806 acres
Outlet Elevation	869.0
Low Water Level	865.36 (‘78)
High Water Level	870.70 (‘51)
Ordinary High Water	8.2
100-Yr. Flood Elev	N/A
Greatest Depth	68 ft.

Control Structures: Weir

Fish Species:

Rainbow Trout, Black Bullhead, Black Crappie, Bluegill, Green Sunfish, Hybrid Sunfish, Largemouth Bass, Northern Pike, Pumpkinseed Sunfish, Yellow Bullhead, Yellow Perch (2003)

Aquatic Nuisance Species:

None

CMSCWD References:

WCD Water Monitoring Report (08)
 Maintaining Zooplk for WQ: Square Lk.
 Clean Water Partnership Project (‘02)
 DNR Lake Water Level Report
 DNR Lake Information Report
 MN Statewide Mercury TMDL (‘07)

Implementation

Operational Priorities

- Focused Watershed Management 2010-2013
- In-Lake Groundwater Monitoring
- Groundwater Monitoring Network
- In-Lake Water Quality Monitoring
- In-Lake Biomonitoring
- Work with landowners to place remaining undeveloped shoreline into conservation easements.
- Partner with the Lake Association on lake management.

Education

- Focused Watershed Education Program 2010-2014
- Informational Kiosk at the Washington County Square Lake Park.
- Distribute Septic Management Materials to homeowners in the watershed.
- Distribute home lawn care information.
- Develop and distribute information to encourage riparian landowners to protect and/or restore aquatic vegetation.
- Distribute DNR Rules to riparian landowners.
- Distribute current shoreland zoning regulations.
- Distribute boating regulations to boat launches.
- Work with private campground/marina (Golden Acres) to distribute educational materials and provide exotics inspections concurrent with efforts at public (Square Lake Washington County Park) boat launch.

Regulatory

Activities impacting Square Lake will be regulated by the watershed district through its *Rules of the District*. Regulatory efforts will be coordinated with May Township, the City of Hugo, Washington County, and MNDNR, where applicable.

DNR Fisheries Lake Management Plan (1995), Continued

- Operational Plan:
 - Stock 3,000 yearling rainbow trout in spring.
 - Stock 2,000 yearling rainbow trout in fall.
- Mid Range Objective: Maintain a two story fishery with bluegill proportional stock density of 40 and rainbow trout that will support 100 man-hours/acre.
- Potential Plan:
 - Increase fall stocking of yearling rainbow trout by 1,000.
 - Stock culled rainbow trout brood stock as available.
 - Annual stocking of 1,000 yearling brown trout.
 - Stock culled brown trout brood stock as available.
 - Conduct a creel or recreational use survey.
 - Install a fishing pier.

Overall Assessment: Square Lake

Square Lake is an excellent example of a local and state supported effort to protect a pristine lake resource. Square Lake, considered one of the clearest of 950 metropolitan (Minneapolis/St. Paul) lakes, is ranked in the top 1% for water clarity in the North Central Hardwood Forest Ecoregion of Minnesota. Square Lake has a watershed to lake ratio of only 2.5:1, which contributes to the lake's excellent water quality. Data collected indicated that the hydrologic inflow consisted of approximately 70% groundwater, 25% precipitation, and only 5% surface runoff. As suggested in the DNR Fisheries Lake Management Plan summary above, the MN DNR have stocked Square Lake with rainbow trout regularly since 1980. Square Lake is listed on the EPA's 303(d) list of impaired waters due to the mercury content in fish. In 2007 the MPCA completed a statewide Total Maximum Daily Load (TMDL) study and implementation plan to address the state's mercury impairments.

A Phase 1 Clean Water Partnership grant from the MPCA allowed for a Diagnostic Feasibility Study and Implementation Plan for Square Lake that was completed in 2002. The goal of the study is to maintain water quality, biological integrity, and sustainable surface water use of Square Lake. The project included characterizing the nutrient and hydrologic budgets, data collection (e.g., secchi disk, phosphorus and chlorophyll *a*), education plan development and planning for protection of a sustainable natural system. Square Lake Clean Water Partnership study results indicate that in order to protect the lake, the following must occur: keep nutrient and pesticide inputs very low, manage fisheries consistent with Square Lake CWP recommendations, monitor biological components, manage septic input, educate adjacent homeowners, develop an aquatic plant management plan and maintain no net increase in phosphorus. In-lake phosphorus concentrations are significantly better than the MPCA lake standard of (40µg/L).

Despite Square Lake's excellent water quality and historic preservation efforts, the lake has a declining water quality trend. In an effort to preserve the pristine lake, Square Lake will undergo focused watershed mgmt. during the years 2010-2014.

Projects

Current:

- Septic Pumping Program (WCD & Met Council)
- Focused Watershed Management 2010-2013:
 - Clean Water Partnership (CWP) - Implementation Plan Refinement, activities include:
 - In-Lake, Watershed + Groundwater Assessments
 - Stakeholder Input
 - Goal Setting
 - Identification and Prioritization of Implementation Options
 - Diagnostic Study Report Update
 - Implementation Plan Update
 - CWP Implementation Projects
 - Focused Watershed Water Quality Monitoring
 - Focused Watershed BMP Program
 - Permitting Program

Future/Potential:

- Septic System Upgrades
- Soil Testing Program
- Wilder Road Stabilization
- Gully Erosion Control Project
- Maywood Stormwater Pond Retrofit/Enhancement
- Wilder Wetland Rehabilitation
- Evaluate Predation of Daphnia
- Aquatic Plant Survey
- Aquatic Plant Management Plan
- Boat inspections for Eurasian water-milfoil and zebra mussels.
- Develop regulations regarding alterations of ice/beach ridges.
- Develop stormwater runoff regulations to provide no net increase in phosphorus.
- Conduct a study to determine appropriate peak and off-peak surface water use.
- Develop an access policy consistent with surface water use study.

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



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