

Casey Lake

Lake Status Report

*Prepared for
Ramsey-Washington Metro Watershed District*

April 2007



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Casey Lake Lake Status Report

Table of Contents

1.0 Introduction.....	1
2.0 Lake Status Summary	5
2.1 Casey Lake.....	5
2.1.1 Lake and Watershed Characteristics	5
2.1.1.1 Description of Casey Lake	5
2.1.1.2 Watershed Characteristics	9
2.1.1.3 Recreational-Uses.....	9
2.1.2 Water Quality Data	12
2.1.2.1 Water Quality Analysis	12
2.1.2.2 P8 Modeling Results	12
2.1.3 Recommendations.....	13
2.1.3.1 Water Quality Goals.....	13
2.1.3.2 Recreational Use Level	13
2.1.3.3 Further Studies	13
3.0 Conclusions.....	14
References.....	15

List of Tables

Table 1-1 Summary of RWMWD Recreational-Use Level (2006 Draft Plan), Preliminary RWMWD Water Quality Goals (2006 Draft Plan), Proposed RWMWD Goals (Result of LSR), and Management Class (2006 Draft Plan) as well as 303(d) Impaired Waters and MDNR Ecological Management Class 4

Table 2-1 P8 Estimated Watershed Runoff and TP Loads to Casey Lake during Wet, Dry, and Average Climatic Conditions 12

Table 3-1 Summary of the Proposed RWMWD Recreational-Use Level, Water Quality Goals, and Management Class 14

List of Figures

Figure 1-1 Location Map 2

Figure 2-1 Casey Lake Approximate Bathymetry 6

Figure 2-2 Casey (a) and its outlet (b) 7

Figure 2-3 Extent of the Critical 100-Year Flood for Casey Lake 8

Figure 2-4 Casey Lake Watershed Land Use 10

Figure 2-5 Casey Lake Watershed Subwatersheds and Drainage 11

List of Appendices

Appendix A Fisheries and Biological Data

1.0 Introduction

One of the primary goals of the Ramsey-Washington Metro Watershed District (District) is to maintain or improve the quality of surface waters to meet or exceed the water quality necessary to support the District's designated beneficial uses. In 1997 the District established beneficial use categories based on desired recreational activities for a waterbody; and revisited again with the 2006 update as part of the development of the *Ramsey-Washington Metro Watershed District Watershed Management Plan* (Plan) (Barr, 1997; Barr, 2006 [draft]). The recreational-use categories are ranked from Level 1 through Level 5, with Level 1 water bodies having the highest number of recreational uses and best water quality.

In order to help achieve desired water quality goals established in Plan, many of the lakes within the District have been studied in Strategic Lake Management Plans (SLMPs). However, for many of the smaller lakes within the District, SLMPs have not yet been completed and District water quality goals have not been re-evaluated. Because of limited lake information and water quality data, the development of a complete SLMP would not be possible for many of these small water bodies. Instead, a Lake Status Report (LSR) will be developed and recommendations will be made to outline future studies for these lakes.

The purpose of this LSR is to summarize and evaluate the available information for Casey Lake which has not been previously studied and to determine appropriate water quality goals based on the current and desired recreational uses, as outlined in the Plan, and through discussion with District staff. The watershed areas tributary to Casey Lake has already been modeled as part of the development of the larger Phalen Chain of Lakes SLMP (Barr, 2004 [Draft]). Figure 1-1 shows the location of Casey Lake.

The Plan (Barr, 2006 [draft]) includes preliminary water quality goals and management classes for each of the District-managed lakes. The water quality goals are defined in terms of total phosphorus (TP), chlorophyll *a* (Chl *a*), and Secchi disc (SD). The goals outlined in the Plan will remain preliminary until an SLMP or other similar study, such as this LSR, is completed and appropriate goals are determined. The preliminary goals are consistent with either the Minnesota Pollution Control Agency's (MPCA) proposed draft criteria for shallow lakes in the North Central Hardwood Forests (CHF) ecoregion (MPCA, 2005), or the goals listed in the 1997 Plan.

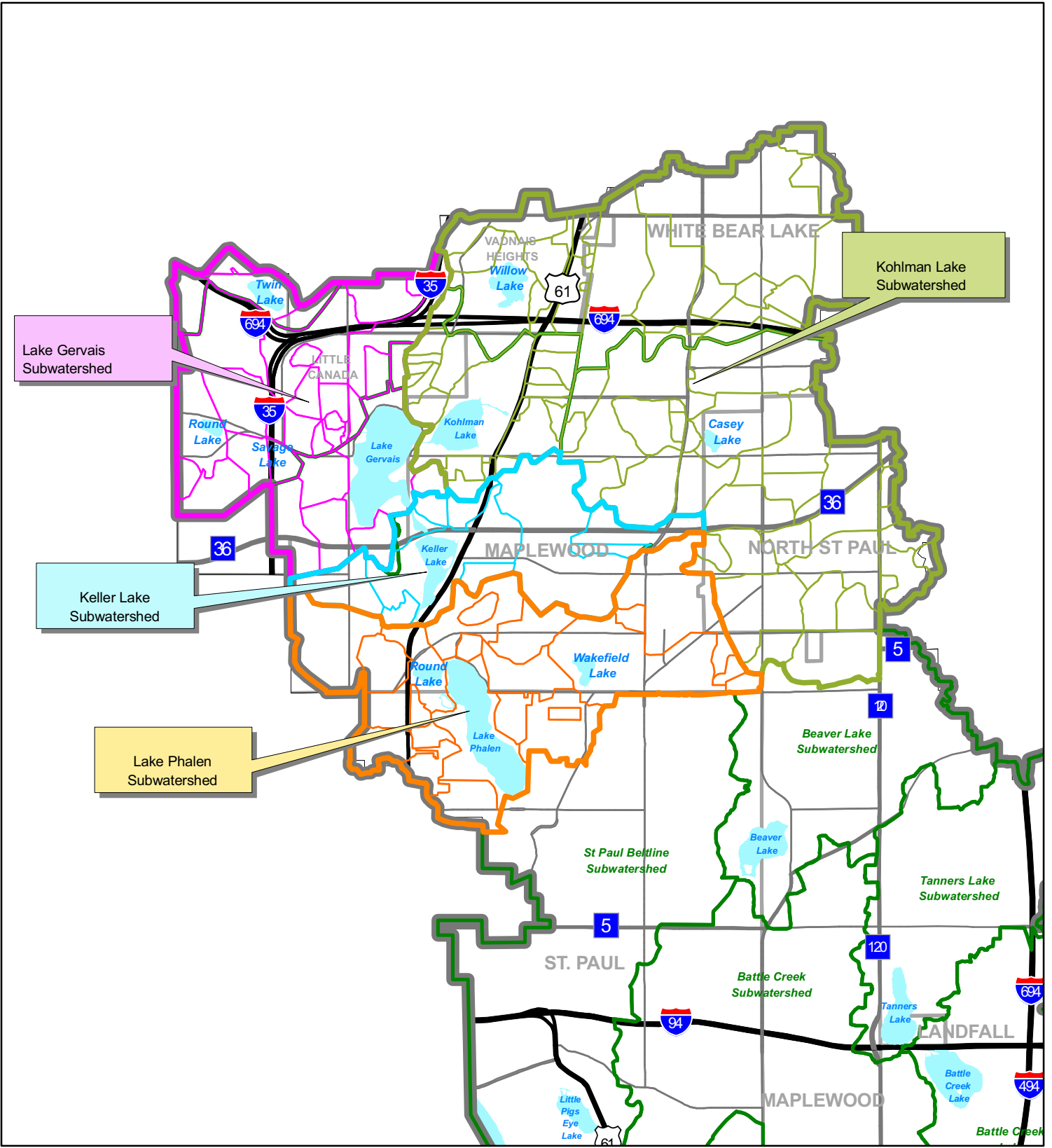


Figure 1-1

Location Map

For lakes, the District management classes are identified as either “Improvement” or “Prevent further degradation.” An “Improvement” class is warranted if the public perceives a need for water quality improvement and there are feasible management options that will accomplish water quality improvement. A “Prevent further degradation” class is assigned when current water quality meets the goals set for the lake. A “Prevent further degradation” class does not, however, imply inaction. Rather, development requirements, fisheries, shoreline, and macrophyte management; as well as additional water quality improvement projects; are pursued for the lake as opportunities and budgets allow.

For wetlands, the District has developed management Classes A, B, and C, based on a recent inventory and assessment of wetlands within the District. The wetland classification is based on the estimated quality of the wetland, with management Class A being the highest quality wetlands. Water bodies classified as “Water Quality Pond” are constructed treatment ponds only.

Additional classifications of the water bodies based on water quality include the Impaired Waters List under Section 303(d) of the *Federal Clean Water Act (CWA)*. Those water bodies that do not meet the water quality standards established under the CWA are included on this list and future development of total maximum daily loads (TMDL) is required. The Minnesota Department of Natural Resources (MDNR) has developed another ecological management classification system for Minnesota lakes (Schupp, 1992) that is based on parameters such as lake size, depth, chemical fertility, and growing season length.

Table 1-1 summarizes the goals and classifications of Casey Lake. Note that for District-managed wetlands there are no water quality goals established. Additionally, note that the 2006 Preliminary RWMWD Water Quality Goals are those listed in the Plan (Barr, 2006 [draft]). The 2006 Proposed RWMWD Water Quality Goals are the result of this LSR and evaluation of the information available for the Lake.

Table 1-1 Summary of RWMWD Recreational-Use Level (2006 Draft Plan), Preliminary RWMWD Water Quality Goals (2006 Draft Plan), Proposed RWMWD Goals (Result of LSR), and Management Class (2006 Draft Plan) as well as 303(d) Impaired Waters and MDNR Ecological Management Class

Water Body	RWMWD Use Level	2006 Preliminary RWMWD Water Quality Goal	2006 Proposed RWMWD Water Quality Goal	RWMWD Management Class	303(d) Impaired Waters Pollutant	MDNR Ecological Class
Casey Lake	N/A	N/A	N/A	Wetland Management Class B	N/A	N/A

2.0 Lake Status Summary

2.1 Casey Lake

2.1.1 Lake and Watershed Characteristics

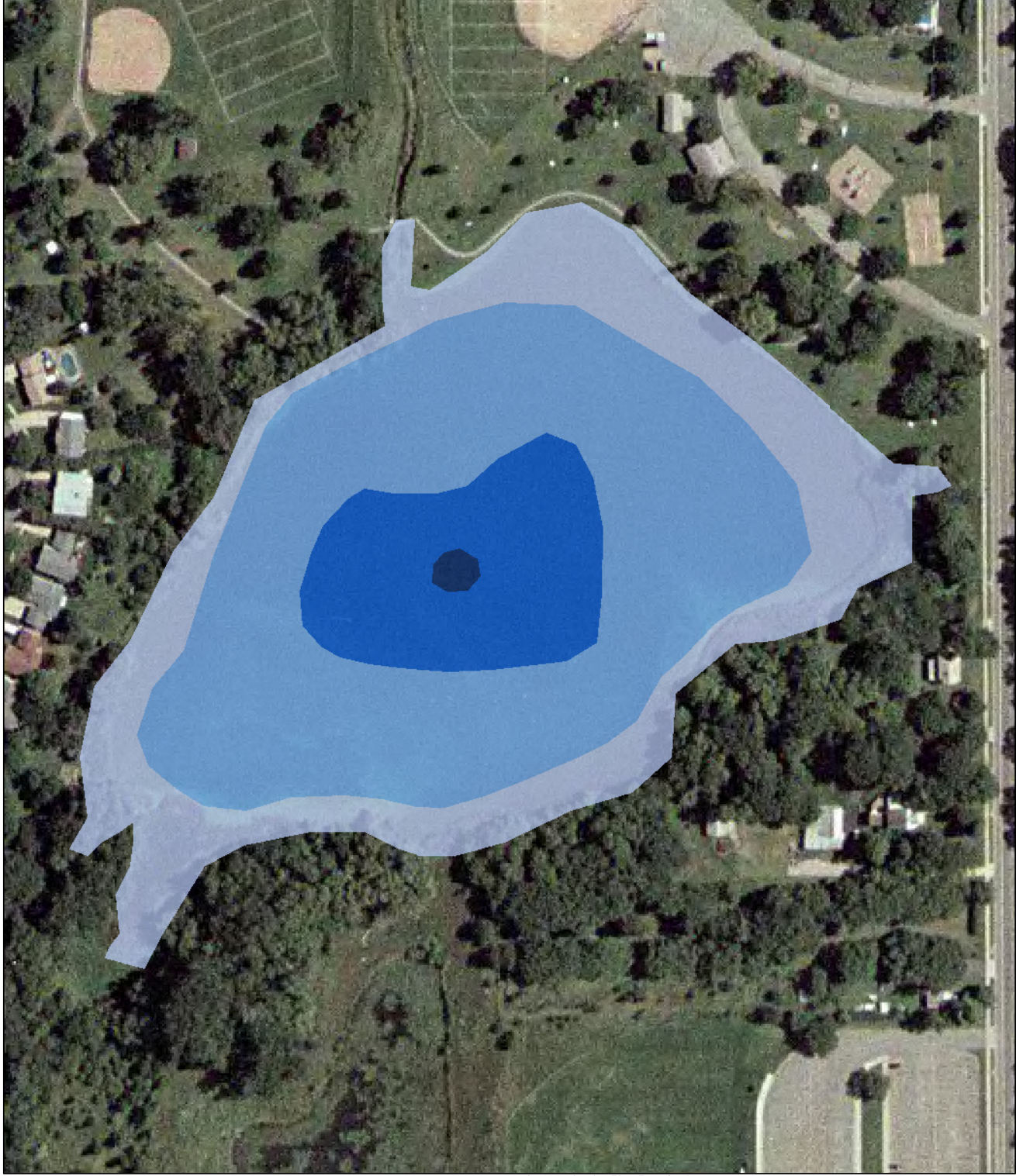
2.1.1.1 Description of Casey Lake

Casey Lake is located just east of White Bear Avenue (Township 20, Range 22, Section 2) in Casey Lake City Park in North St. Paul. Although called a lake, Casey Lake is actually a 12-acre wetland, as it is not classified as lacustrine under the Cowardin system (Cowardin, 1979) used by the District to categorize water bodies as lakes or wetlands. For this reason, it is considered a district-managed water body rather than a district-managed lake. It is also classified as Protected Public Water in the MDNR Public Waters Inventory (62-5P).

The maximum depth of Casey Lake is 3.5 feet. Approximate bathymetric contours have been created using lake depth survey data gathered by the District in 2002 and can be seen in Figure 2-1. There are no historic lake level data available for Casey Lake.

The primary outlet of Casey Lake is located on the west side of the lake and discharges to a tributary that drains to Kohlman Creek. It is surrounded by emergent vegetation, predominantly cattails. The outlet structure is a beehive over a riser with a 12-inch outlet pipe. The riser extends 2 feet above the top of the outlet pipe. The beehive outlet structure, as shown in Figure 2-2, can accumulate dead plant material and debris. The normal water level (NWL) used for modeling was 925.3 feet MSL and the critical 100-year flood elevation for Casey Lake was determined to be 928.1 feet MSL, as part of the development of the District *Watershed Management Plan* (Barr, 1997; Barr, 2006 [draft]).

Figure 2-3 shows the extent of the 100-year critical flood.



Legend

Depth

0 - 1.6 ft
1.6 - 3 ft
3 - 3.5 ft
3.5+ ft



Figure 2-1
Casey Lake
Approximate Bathymetry
Lake Status Report
Ramsey-Washington Metro Watershed District

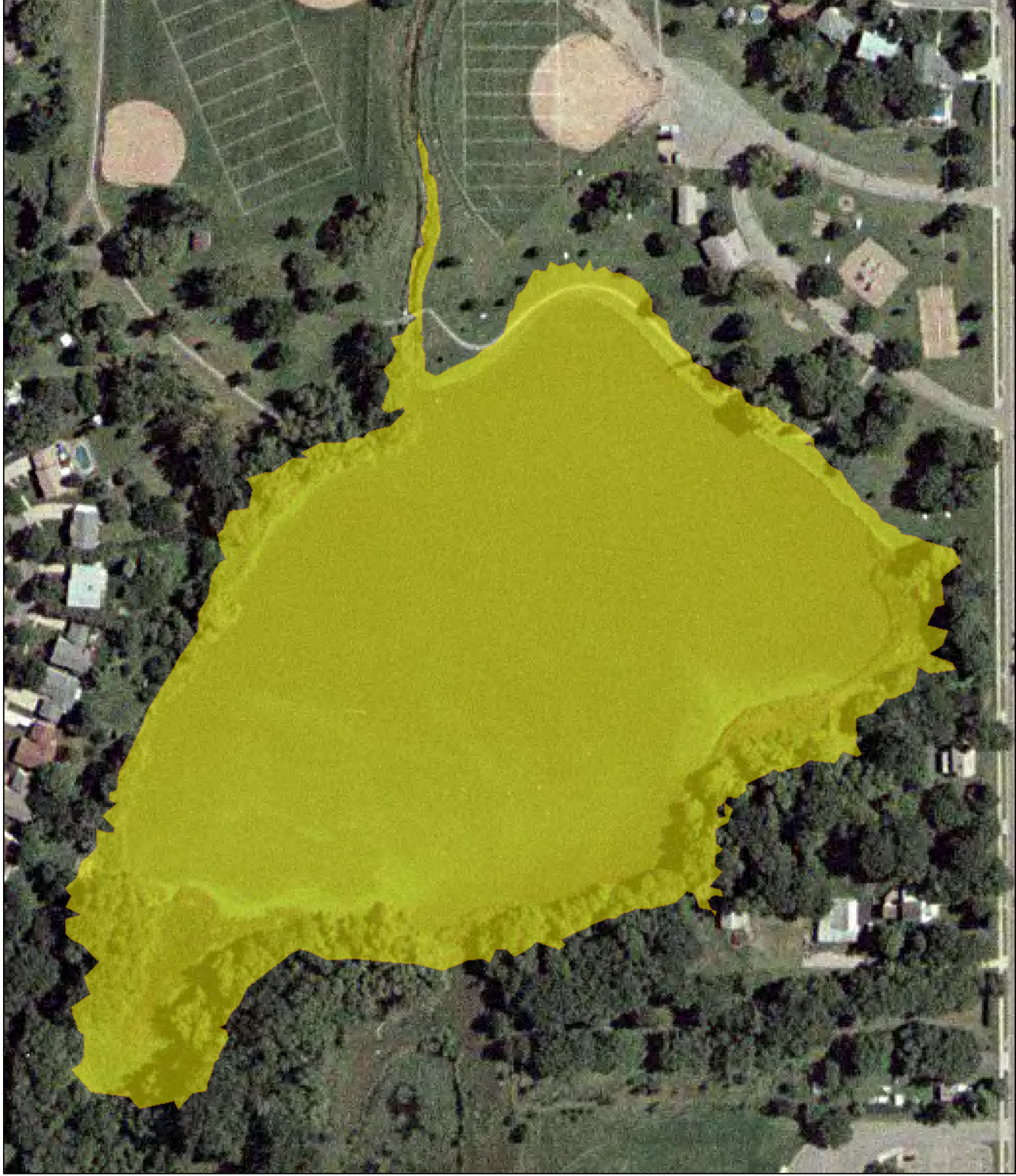


(a)




(b)

Figure 2-2
Casey Lake (a) and its outlet (b)
(Photos taken 5/11/2006)



Legend

 Flood Elevation = 928.2 ft MSL

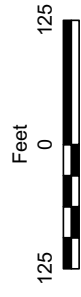


Figure 2-3

Casey Lake
Critical Flood Elevation

Lake Status Report
Ramsey-Washington Metro Watershed District

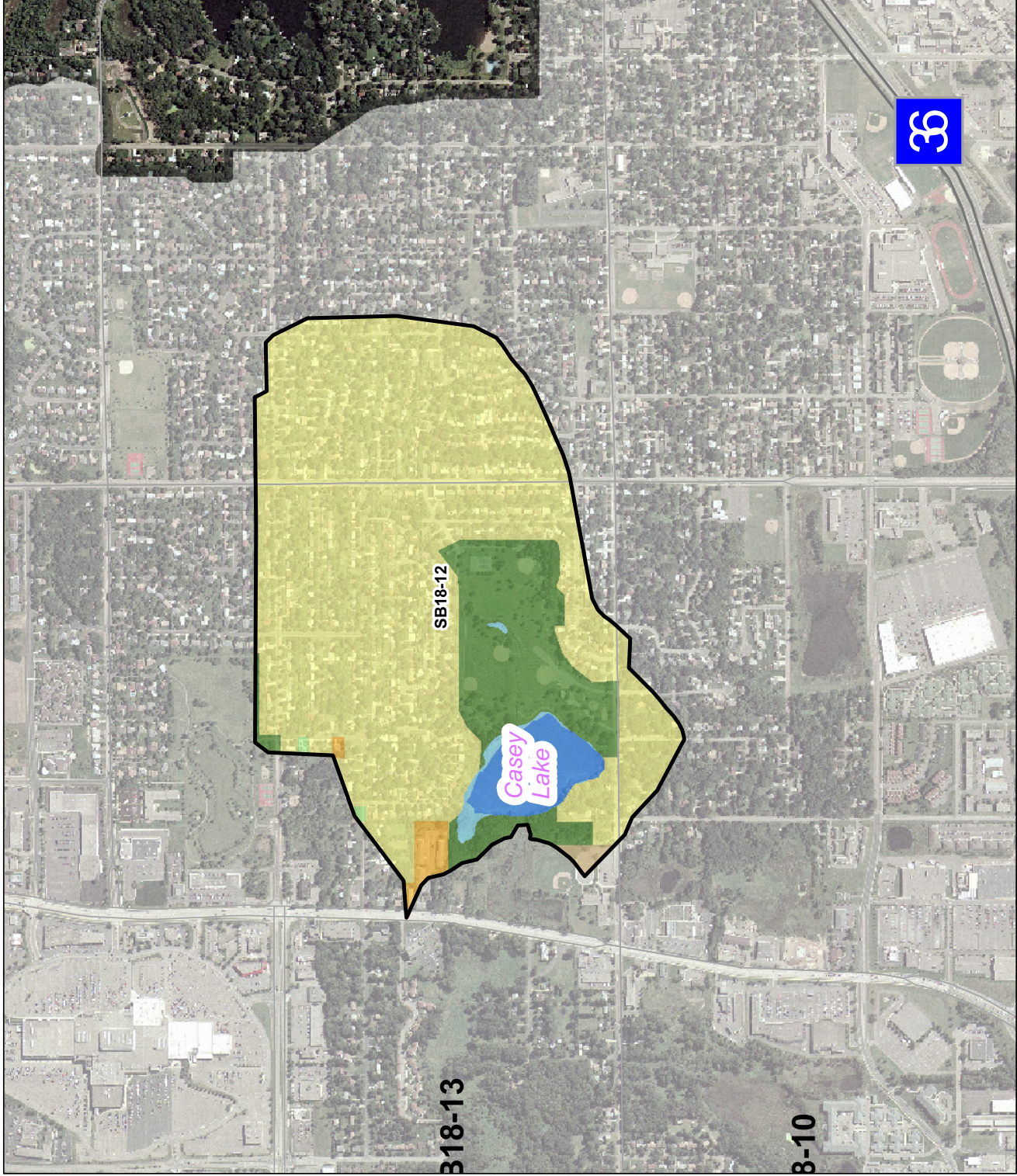
2.1.1.2 Watershed Characteristics

The Casey Lake watershed (including the lake surface area) covers a 240-acre area north of Highway 36 and east of White Bear Avenue) and is part of the larger Kohlman Lake watershed. The land use in the Casey Lake watershed is predominantly low-density residential (76.0%). The breakdown of the remaining land uses in the watershed is as follows: Agricultural (0.2%), High-density residential (1.5%), Institutional (0.5%), Natural/park/open (15.9%), Open water (4.9%), and Wetland (1.0%). Casey Lake, itself, has been classified as a combination of open water and wetland land uses. A map of land use within the Casey Lake watershed can be seen in Figure 2-4.

Drainage from the watershed generally flows to the west/southwest into Casey Lake via the storm sewer system. There are several inlets to Casey Lake coming from the north, east, and south. The drainage area and flow patterns for Casey Lake are shown in Figure 2-5.

2.1.1.3 Recreational-Uses

Because it is actually a wetland, the District has not assigned a recreational-use level to the Casey Lake and does not cite any recreational-uses in the Plan. There is no designated access to Casey Lake, although carry-in access is possible from the parking lot. Local ordinance prohibits the use of motors on Casey Lake. District staff has confirmed that they have not observed anyone boating or canoeing on Casey Lake. However, the adjacent park has picnic tables, a grill, and a shelter available for use as well as benches and a walking path overlooking the lake. Additionally, ducks were observed to be nesting around Casey Lake in the spring of 2006 suggesting that Casey Lake is used by waterfowl and other wildlife.



Legend

Land Use

- Natural/Park/Open
- Developed Parkland
- Golf Course
- Agricultural
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Institutional
- Institutional - High Imperviousness
- Airport
- Highway
- Commercial
- Industrial/Office
- Other
- Open Water
- Wetland
- Casey Lake Watershed
- RWMWD Boundary

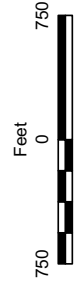
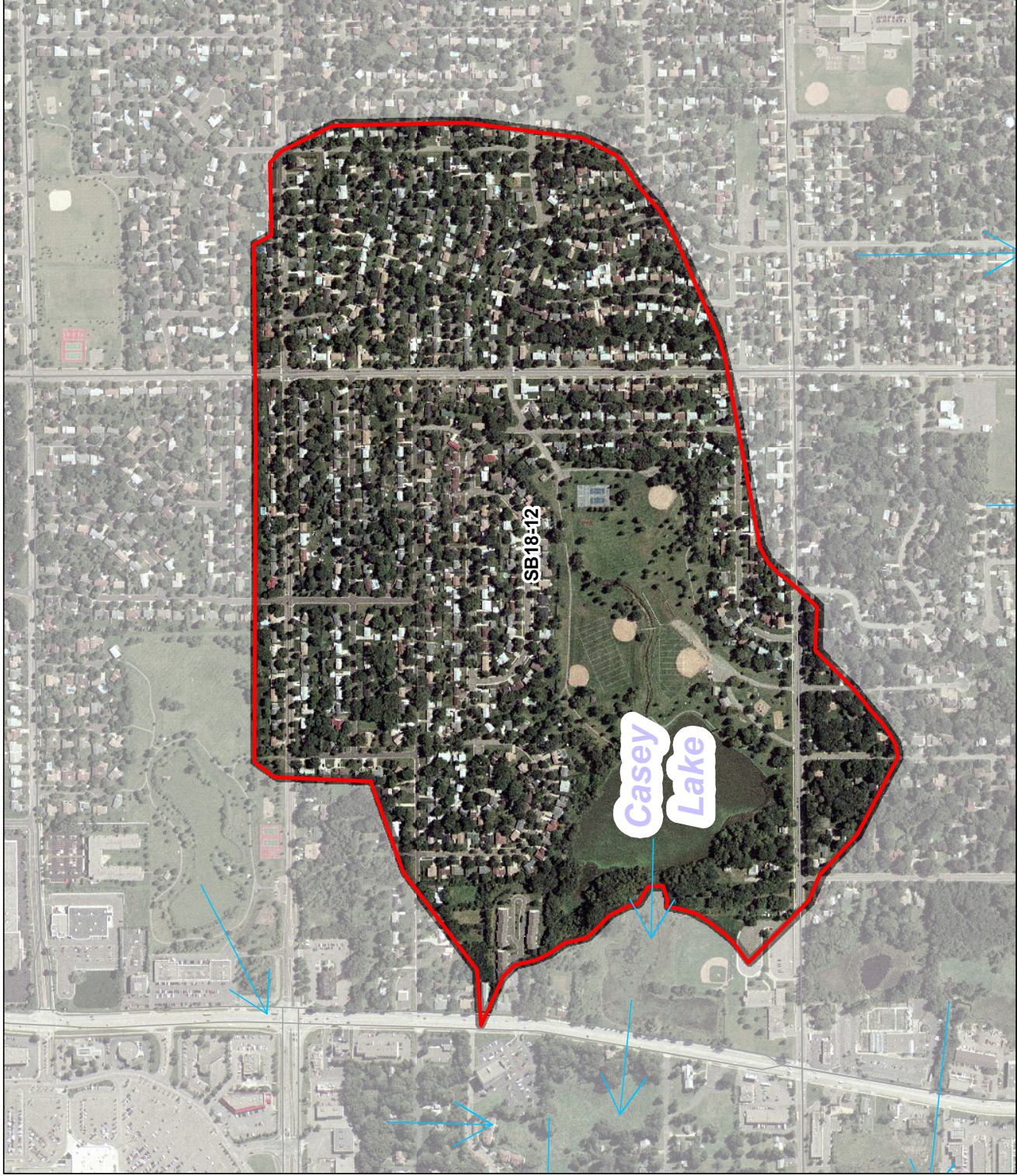


Figure 2-4

Casey Lake Watershed
Land Use

Lake Status Report
Ramsey-Washington Metro Watershed District



Legend

-  Casey Lake Watershed
-  Flow Direction
-  RWMWD Boundary



Figure 2-5

Casey Lake Watershed
Subwatersheds & Drainage

Lake Status Report
Ramsey-Washington Metro Watershed District

2.1.2 Water Quality Data

2.1.2.1 Water Quality Analysis

There has been no water quality monitoring conducted for Casey Lake other than a brief water quality evaluation completed during the latest MDNR fishery survey in 2001. On the date of the survey, the water quality was considered poor with a Secchi disc depth of only 0.5 feet (0.15 meters).

The latest fishery survey indicated that black bullhead was the most abundant species. Other common species were black crappies, common carp, as well as green sunfish. There is no macrophyte, phytoplankton, or zooplankton information available for Casey Lake.

2.1.2.2 P8 Modeling Results

The P8 Model of the Casey Lake watershed was run for wet, dry, and average climatic conditions. Water and total phosphorus loads from the watershed were determined for each climatic period. The results of this modeling are summarized in Table 2-1.

Table 2-1 P8 Estimated Watershed Runoff and TP Loads to Casey Lake during Wet, Dry, and Average Climatic Conditions

Climatic Condition (Water Year)	Parameter		Load
Wet (10/1/01-9/30/02)	Flow	ac-ft	139.29
	TP	lbs	230.91
Average (10/1/00-9/30/01)	Flow	ac-ft	188.61
	TP	lbs	239.97
Dry (10/1/88-9/30/89)	Flow	ac-ft	110.03
	TP	lbs	169.04

It is important to note that climatic condition periods were selected based on depths of precipitation over a 17-month period that included the summer before the water year of interest because it is assumed that the water and TP load to the lake during this period affects the following year's spring TP concentration. During the 12-month period from October through September (the water year), however, the water and phosphorus loads to the lake were slightly higher during the average year than the wet year.

2.1.3 Recommendations

2.1.3.1 Water Quality Goals

As previously mentioned, Casey Lake is not a district-managed lake but rather a wetland. Therefore, no preliminary District lake water quality goals have been established for Casey Lake. In general, the District's approach to managing wetlands is to achieve no net loss of acreage, function and value.

According to the District's wetlands management classification, Casey Lake falls into Management Class B (Barr, 2006 [draft]). Wetlands under this classification are considered high-quality wetlands that should be protected from development and other pressures of increased use, including indirect effects. This classification requires the maintenance of natural buffers (Minimum = 25 feet, Average = 50 feet) to help retain wetland function.

The Minnesota Lake Eutrophication Analysis Procedure (MINLEAP) is a screening tool for estimating lake conditions and for identifying "problem" lakes. In addition, MINLEAP modeling has been done in the past to identify Minnesota Lakes which may be better or worse than they "should be" based on their location, watershed area and lake basin morphometry.

Results from MINLEAP analysis suggest that the expected water quality in a minimally impacted lake, similar to Casey Lake (based on its location within the Central Hardwood Forest ecoregion and with its basic basin and watershed characteristics), would be expected to be within the following ranges for TP, Chl *a*, and SD, respectively: 63 to 107 µg/L, 21 to 66 µg/L, and 0.5 to 1.2 meters. There is currently no available water quality monitoring data against which these MINLEAP ranges can be compared.

2.1.3.2 Recreational Use Level

Use of Casey Lake for canoeing appears to be very limited. However, because there are facilities in the adjacent park, as well as walking paths and observed wildlife, the recreational uses of Casey Lake should include picnicking, aesthetic, and wildlife viewing.

2.1.3.3 Further Studies

If the District identifies water quality in Casey Lake as a high priority, the first recommendation would be to collect additional lake information, including concurrent water quality, macrophyte, and lake level data, as there is currently no data available for Casey Lake related to these parameters.

3.0 Conclusions

In summary, for Casey Lake, there is little information available with regards to water quality and macrophytes. Additionally, this resource is managed as a District wetland. Because of limited information, updated District water quality management goals cannot be established.

Table 3-1 below summarizes the proposed District recreational-use levels, water quality goals, and management classes based on evaluation of the data available for each lake.

Table 3-1 Summary of the Proposed RWMWD Recreational-Use Level, Water Quality Goals, and Management Class

Water Body	RWMWD Use Level	2006 RWMWD Water Quality Goal	RWMWD Management Class
Casey Lake	N/A	N/A	Wetland Management Class B

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Appendix A

Fisheries and Biological Data

Name: Casey

Nearest Town: WHITE BEAR LAKE
 Primary County: Ramsey

Survey Date: 08/01/2001
 Inventory Number: 62-0005-00

Public Access Information

Ownership	Type	Description
City	Carry-in	No formal boat access but carry-in possible from parking lot.

Lake Characteristics

Lake Area (acres): 11.60	<u>Dominant Bottom Substrate</u> : N/A
<u>Littoral Area</u> (acres): 11.60	<u>Abundance of Aquatic Plants</u> : N/A
Maximum Depth (ft): 3.50	Maximum Depth of Plant Growth (ft): N/A
<u>Water Clarity</u> (ft): 0.50	

Fish Sampled up to the 2001 Survey Year

Species	Gear Used	Number of fish per net Caught	Normal	Average Fish	Normal
			Range	Weight (lbs)	Range (lbs)
<i>Black Bullhead</i>	Trap net	25.3	N/A - N/A	0.18	N/A - N/A
<i>Black Crappie</i>	Trap net	24.0	N/A - N/A	0.10	N/A - N/A
<i>Common Carp</i>	Trap net	6.3	N/A - N/A	1.30	N/A - N/A
<i>Green Sunfish</i>	Trap net	1.8	N/A - N/A	0.03	N/A - N/A
<i>Snapping Turtle</i>	Trap net	1.5	N/A - N/A	ND	N/A - N/A

Normal Ranges represent typical catches for lakes with similar physical and chemical characteristics.

Length of Selected Species Sampled for All Gear for the 2001 Survey Year

Species	Number of fish caught in each category (inches)								Total
	0-5	6-8	9-11	12-14	15-19	20-24	25-29	>29	
<i>Black Bullhead</i>	0	22	0	0	0	0	0	0	22
<i>Black Crappie</i>	8	4	0	0	0	0	0	0	12
<i>Green Sunfish</i>	4	0	0	0	0	0	0	0	4

Fish Consumption Advisory

No fish consumption information is available for this lake. For more information, see the "[Fish Consumption Advice](#)" pages at the [Minnesota Department of Health](#).

Status of the Fishery (as of 08/01/2001)

Casey Lake is located in Casey Lake City Park (City of North St. Paul). It is roughly 12 acres and has a maximum depth of 3.5'. Water quality is poor, with a secchi depth of only 0.5 feet on 8/1/01. There is no designated access, but carry-in access is possible from the parking lot. Local ordinance prohibits the use of motors on Casey Lake.

Black bullhead were the most abundant species sampled. Lengths ranged from 6.5" to 9". Black crappeie were also abundant, but small. Lengths ranged from 5" to 7", with a 6" average. Common carp were abundant, with lengths ranging from 10" to 20". Green sunfish were also sampled.

For Additional Information

Area Fisheries Supervisor:

1200 WARNER ROAD
ST. PAUL, MN 55106
(651) 772-7950

Lake maps can be obtained from:

Minnesota Bookstore
660 Olive Street
St. Paul, MN 55155
(651) 297-3000 or (800) 657-3757
To order, use 0000 for the map-id.

General DNR Information:

DNR Information Center
500 Lafayette Road
St. Paul, MN 55155-4040
(651) 296-6157 or (888) MINNDNR
TDD: (651) 296-5484 or (800) 657-3929
E-Mail: info@dnr.state.mn.us



Turn in Poachers (TIP):

Toll-free: (800) 652-9093