



**CLFLWD**  
WATERSHED DISTRICT

# **Comfort Lake-Forest Lake Watershed District**

## 2024 Progress Summary

## TABLE OF CONTENTS

List of Figures .....	2
List of Tables .....	3
List of Appendices .....	3
Introduction .....	4
5100 Floodplain.....	5
5200 Lakes.....	7
Example Lake Summary Page.....	12
5221 Moody Lake Summary.....	15
5222 Bone Lake Summary.....	18
5223 Birch Lake Summary.....	21
5224 School Lake Summary.....	21
5225 Little Comfort Lake Summary.....	24
5226 Shields Lake Summary.....	27
5227 Lake Keewahtin Summary.....	30
5228 Forest Lake Summary.....	31
5229 Comfort Lake Summary.....	37
5300 Rivers & Streams.....	40
5400 Wetlands.....	42
5500 Upland Resources.....	43
5600 Groundwater.....	44
Appendices.....	45

## LIST OF FIGURES

Figure 1. Planning Process Comparison Graphic: Water Quality Diagnostic Studies and Flood Resiliency Planning.....	6
Figure 2. Example Phosphorus Reduction Goals and Project Progress Graph.....	13
Figure 3. Moody Lake Phosphorus Reduction Goals and Project Progress Graph.....	15
Figure 4. Moody Lake Phosphorus Concentration History.....	17
Figure 5. Bone Lake Phosphorus Reduction Goals and Project Progress Graph.....	18
Figure 6. Bone Lake Phosphorus Concentration History.....	20
Figure 7. School Lake Phosphorus Concentration History.....	23
Figure 8. Little Comfort Lake Phosphorus Reduction Goals and Project Progress Graph.....	24
Figure 9. Little Comfort Lake Phosphorus Concentration History.....	26
Figure 10. Shields Lake Phosphorus Reduction Goals and Project Progress Graph.....	27
Figure 11. Shields Lake Phosphorus Concentration History.....	29
Figure 12. Lake Keewahtin Phosphorus Reduction Goals and Project Progress Graph.....	30
Figure 13. Forest Lake Phosphorus Reduction Goals and Project Progress Graph.....	31
Figure 14. Forest Lake West, Middle, East Phosphorus Concentration History.....	35
Figure 15. Comfort Lake Phosphorus Reduction Goals and Project Progress Graph.....	37
Figure 16. Comfort Lake Phosphorus Concentration History.....	39

## LIST OF TABLES

Table 1. Lake Goals.....	9
Table 2. Example Lake Goals & Status Summary .....	12
Table 3. Example Lake Phosphorus Reduction Goals .....	12
Table 4. Example State Standard Evaluation Table.....	14
Table 5. Example Trend Table .....	14
Table 6. Moody Lake Goals & Status Summary .....	15
Table 7. Moody Lake Phosphorus Reduction Goals.....	15
Table 8. Moody Lake Water Quality Sample Evaluation.....	16
Table 9. Moody Lake Trend Evaluation.....	17
Table 10. Bone Lake Goals & Status Summary .....	18
Table 11. Bone Lake Phosphorus Reduction Goals.....	18
Table 12. Bone Lake Water Quality Sample Evaluation.....	19
Table 13. Bone Lake Trend Evaluation.....	20
Table 14. Birch Lake Goals & Status Summary .....	21
Table 15. School Lake Goals & Status Summary .....	21
Table 16. School Lake Water Quality Sample Evaluation .....	22
Table 17. School Lake Trend Evaluation .....	23
Table 18. Little Comfort Lake Water Quality Goals & Status Summary.....	24
Table 19. Little Comfort Lake Phosphorus Reduction Goals.....	24
Table 20. Little Comfort Lake Water Quality Sample Evaluation.....	25
Table 21. Little Comfort Lake Trend Evaluation.....	26
Table 22. Shields Lake Water Quality Goals & Status Summary.....	27
Table 23. Shields Lake Phosphorus Reduction Goals.....	27
Table 24. Shields Lake Water Quality Sample Evaluation.....	28
Table 25. Shields Lake Trend Evaluation.....	29
Table 26. Lake Keewahtin Water Quality Goals & Status Summary.....	30
Table 27. Lake Keewahtin Phosphorus Reduction Goals.....	30
Table 28. Forest Lake Water Quality Goals & Status Summary.....	31
Table 29. Forest Lake Phosphorus Reduction Goals.....	31
Table 30. Forest Lake West Water Quality Sample Evaluation.....	32
Table 31. Forest Lake Middle Water Quality Sample Evaluation.....	33
Table 32. Forest Lake East Water Quality Sample Evaluation .....	34
Table 33. Forest Lake Trend Evaluation .....	35
Table 34. Comfort Lake Water Quality Goals & Status Summary.....	37
Table 35. Comfort Lake Phosphorus Reduction Goals.....	37
Table 36. Comfort Lake Water Quality Sample Evaluation.....	38
Table 37. Comfort Lake Trend Evaluation.....	39
Table 38. River/Stream Goals and Starting Point .....	40

## LIST OF APPENDICES

Appendix A – Clean Water Fund Grant Award Comparison (FY2014-2025)

Appendix B – Project Implementation Update

Appendix C – Portfolio of Projects

Appendix D – Progress at a Glance

CLFLWD Staff Author: Emily Heinz, Planning Coordinator

## INTRODUCTION

MN Rules 8410.0150, subpart 3, item E, states that watershed districts shall provide a report including: “E. at a minimum of every two years, an evaluation of progress on goals and the implementation actions, including the capital improvement program, to determine if amendments to the implementation actions are necessary according to part 8410.0140, subpart 1, item C, using the procedures established in the goals and implementation sections of the plan under parts 8410.0080, subpart 1, and 8410.0105, subpart 1.”

In 2015, the Comfort Lake-Forest Lake Watershed District (CLFLWD or District) began a comprehensive effort to evaluate progress toward the goals and metrics described in the District’s 10-Year Watershed Management Plan, resulting in the creation of the first comprehensive Progress Report in 2016. The District has produced this report on an annual basis from 2016-2021. Starting with reporting year 2022, the District scaled back its reporting efforts on a biennial basis. Every other year (odd years) the District produces a comprehensive Progress Report evaluating progress toward all of the goals in the Watershed Management Plan. In the even years, the District produces an abridged Progress Summary focusing on the highest priority water quality goals and capital improvement projects.

The Comfort Lake-Forest Lake Watershed District engages in a multitude of activities to realize water quality improvements as well as achieve additional benefits for water resources. For more information on District accomplishments in 2024, see the 2024 Yearend Summary Infographic and 2024 Annual Report. Both are available at [www.clflwd.org](http://www.clflwd.org).

### Why We Want to Meet Water Quality Goals and Standards

#### Cleaner, clearer water means:

- Better visibility/clarity
- Less frequent and less severe algae blooms
- Healthy native aquatic plant community
- Thriving gamefish population (muskie, northern, walleye, etc.)

#### MN Clean Water Council Goals (source: [Clean Water Council Strategic Plan](#))

1. Protect groundwater from degradation and support effective measures to restore degraded groundwater.
2. Ensure groundwater use is sustainable and avoid adverse impacts to surface water features due to groundwater use.
3. Public Water Systems--Ensure that users of public water systems have safe, sufficient, and equitable drinking water.
4. Private Water Supply Wells—Ensure that private well users have safe, sufficient, and equitable access to drinking water.
5. Monitor, assess, and characterize Minnesota’s surface waters.
6. Protect and restore surface waters to achieve 70% swimmable and 67% fishable waters by 2034 by prioritizing and targeting resources by major watershed.
7. Protect and restore surface waters to achieve 70% swimmable and 67% fishable waters by 2034 via through statewide, regional, or issue-specific programs that help meet water quality goals but are not necessarily prioritized and targeted according to geography.
8. Build capacity of local communities to protect and sustain water resources.

# 5100 FLOODPLAIN

## Floodplain 10-Year (2031) Measurable Goals

- **Goal 1:** Reduce or mitigate flooding in areas with known flooding and/or high water problems by achieving the interim measurable goal of increasing water storage by an additional 99 ac-ft (or 0.16 inches over 7,397 acres of upland) over the next 10 years (2022-2031) based on the Lower St. Croix 1W1P. The District will determine LMD-specific measurable goals from modeling floodplain conditions under future rainfall scenarios.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 2:** Maintain and improve community preparedness and emergency response capacity to flooding and/or high water problems by sharing floodplain modeling and mapping results under future climate conditions with counties and District communities.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

Water Resource	Parameter	2021 Starting Point	10-year (2031) Measurable Goal
Floodplain (District-Wide)	Increase in Storage	65 ac-ft	≥99 ac-ft

## Floodplain Progress Evaluation Metrics

- 99 ac-ft of storage added District-wide.
- Floodplain Vulnerability Assessment and hydrologic & hydraulic (H&H) modeling completed; results provided to counties and District communities.
- Annual check-in with District communities’ vulnerability planning.

## Floodplain Evaluation in 2024

- **Goal 1:** Reduce or mitigate flooding in areas with known flooding and/or high water problems by achieving the interim measurable goal of increasing water storage by an additional 99 ac-ft (or 0.16 inches over 7,397 acres of upland) over the next 10 years (2022-2031) based on the Lower St. Croix 1W1P. The District will determine LMD-specific measurable goals from modeling floodplain conditions under future rainfall scenarios.

- **2024 Evaluation:** Storage added prior to 2021 (totaling 65 ac-ft) is not counted toward the 99 ac-ft goal. Completed and in-progress projects, which count toward 99 ac-ft goal are listed below. The District is in the process of prioritizing and targeting additional water storage projects to fully achieve this goal.
  - Tax Forfeit Wetland Restoration: 26.3 ac-ft (project completed in 2023)
  - Bone Lake Northeast Legacy Wetland Restoration: 3.5 ac-ft (project completed in 2022)
  - WJD-6 Wetland Restoration: 8.7 ac-ft (project completed in 2024)
  - Moody Lake Capstone Projects: 1.3 ac-ft (project completed in 2024)
  - **Total: 39.8 ac-ft**

- **Goal 2:** Maintain and improve community preparedness and emergency response capacity to flooding and/or high water problems by sharing floodplain modeling and mapping results under future climate conditions with counties and District communities.

**2024 Evaluation:** The District has finished updating its hydrologic & hydraulic (H&H) model District wide, and has shared the updated model with local partners. The Floodplain Vulnerability Assessment is in progress; it will be completed in 2025 and results shared with local partners and communities. These efforts allow the District to prioritize and target flood resiliency projects and practices. Resulting flood resiliency actions may include water storage and runoff rate control projects, policymaking and regulatory changes, local infrastructure upgrades, and public awareness campaigns. See planning process graphic below.

Planning Process (source: Climate Adaptation Planning, FEMA 2024)

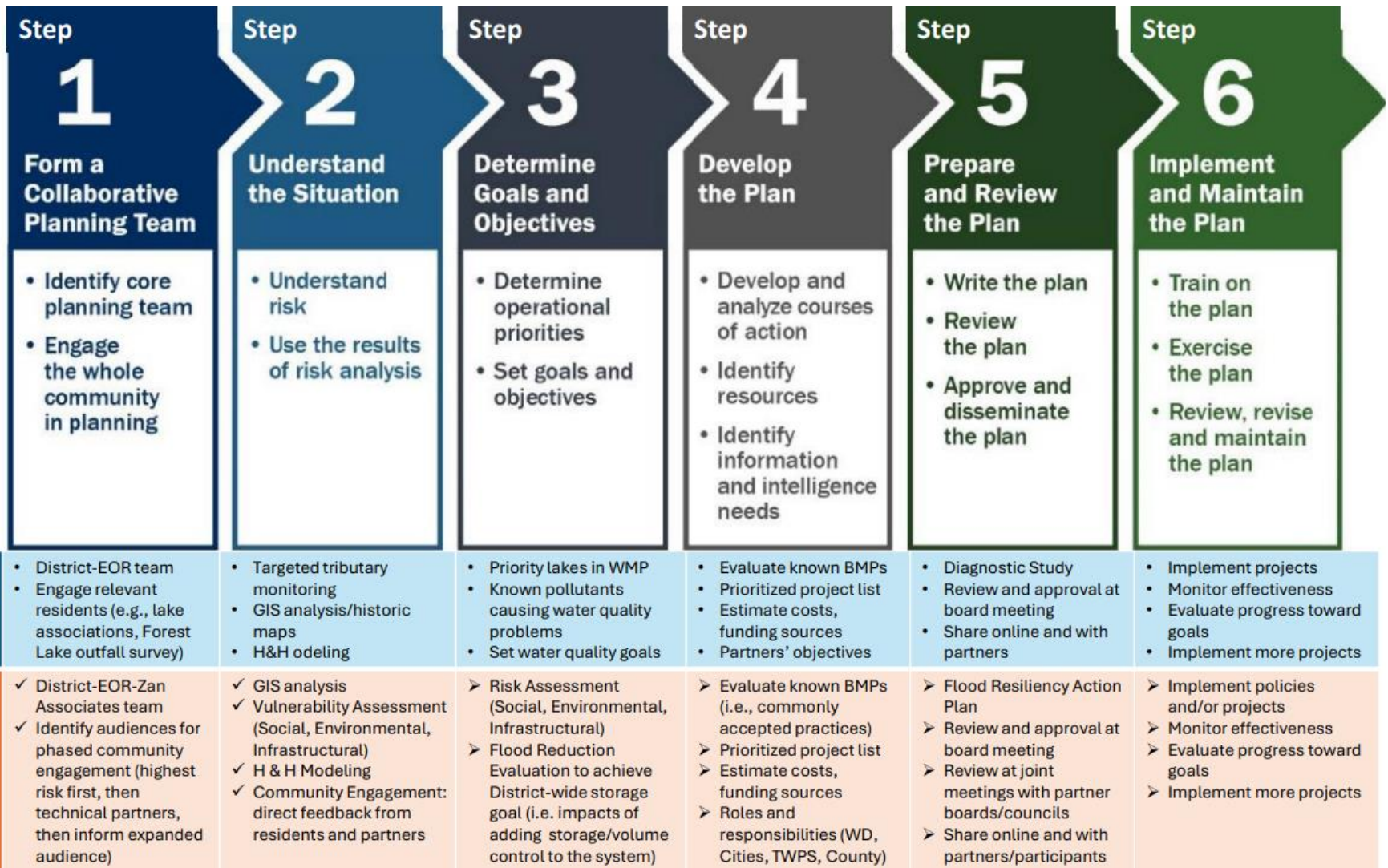


Figure 1. Planning Process Comparison Graphic: Water Quality Diagnostic Studies and Flood Resiliency Planning

## 5200 LAKES

The goals described in this section are those set forth in the 2022-2031 Watershed Management Plan for nine priority lakes. Priority lakes and their associated Watershed Management Plan numerical identifiers are listed below.

### Priority Lakes

5221 Moody Lake	5222 Bone Lake	5223 Birch Lake
5224 School Lake	5225 Little Comfort Lake	5226 Shields Lake
5227 Lake Keewahtin	5228 Forest Lake	5229 Comfort Lake

### Water Quality Highlights and Trends

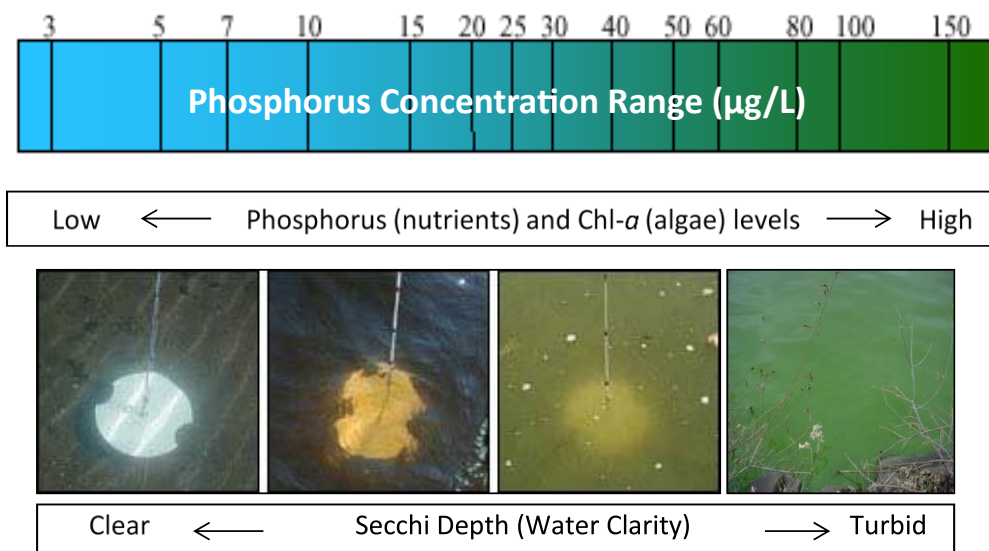
- 2024 was an above average year for precipitation; heavy rains meant heavy stormwater runoff and more pollutants being flushed into lakes and streams; 2024 water quality readings reflected the increased pollutant runoff
- The prior two summers were comparatively dry (and had lighter runoff), so the 2024 monitoring data is comparatively poorer than the previous two years
- Water quality is generally improving in District lakes compared to just 5-10 years ago
- There is still a need for stormwater treatment in the watershed to combat pollutant loading from heavy rain events; examples include enhanced street sweeping, stormwater system maintenance, installation of new stormwater treatment projects, and wetland restorations

The District’s science-based diagnostic monitoring approach and commitment to using economic principles are the main drivers for the District’s success toward restoring lakes to pre-development conditions within a short timeframe. Based on the successful use of adaptive management, diagnostic monitoring and cost-benefit analysis, the District expects to delist nutrient impaired priority lakes, and furthermore, achieve pre-settlement conditions in priority lakes by 2031.

### The Impact of Phosphorus on Water Quality

This report quantifies the District’s progress toward achieving its long-term phosphorus load reduction goals through project implementation. Phosphorus loading is a main contributor to lake water quality (phosphorus concentration, Secchi depth). It is estimated that *1 pound of phosphorus can support up to 500 pounds of algae growth*. Progress toward reducing phosphorus loads to waterbodies generally results in progress toward achieving water quality goals.

#### More Phosphorus = More Algae = Less Clarity



## Lakes 10-Year (2031) Measurable Goals

- **Goal 1:** Adaptively manage District lakes to reduce phosphorus loads and de-list impaired lakes with Total Maximum Daily Loads (TMDLs) to achieve state water quality eutrophication standards (total phosphorus, chlorophyll-a and Secchi).

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 2:** Adaptively manage District lakes to improve water quality by achieving the 10-year (2031) total phosphorus and Secchi goals.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 3:** Partner with agencies to manage District lakes for healthy fish and aquatic plant communities.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 4:** Establish bottom water chloride trends in District lakes and provide resources to salt applicators on ways to reduce chloride inputs.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

- **Goal 5:** Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of lakeshore parcels have at least 75% natural shoreline condition. For example, in its last shoreline survey 55% of parcels on Bone Lake were covered in at least 75% natural shoreline vegetation; the goal is to ensure 75% of parcels are vegetated thusly.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

Table 1. Lake Goals

Water Resource	Parameter	2021 Starting Point	10-year (2031) Measurable Goal
Moody Lake	5-Year Mean Phosphorus Concentration	78 µg/L	≤40 µg/L
	5-Year Mean Secchi Depth	2.4 ft	≥4.6 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	TBD <sup>3</sup>	≥75%
Bone Lake	5-Year Mean Phosphorus Concentration	31 µg/L	≤30 µg/L
	5-Year Mean Secchi Depth	5.1 ft	≥7 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	55%	≥75%
Birch Lake	5-Year Mean Phosphorus Concentration	91 µg/L	≤60 µg/L
	5-Year Mean Secchi Depth	4.7 ft	≥3.3 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	TBD <sup>3</sup>	≥75%
School Lake <sup>1</sup>	5-Year Mean Phosphorus Concentration	51 µg/L	≤40 µg/L
	5-Year Mean Secchi Depth	3.1 ft	≥4.6 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	TBD <sup>3</sup>	≥75%
Little Comfort Lake <sup>2</sup>	5-Year Mean Phosphorus Concentration	49 µg/L	≤30 µg/L
	5-Year Mean Secchi Depth	4.5 ft	≥7 ft
	10-Year Mean Bottom Water Chloride	TBD	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	82%	≥75%
Shields Lake	5-Year Mean Phosphorus Concentration	153 µg/L	≤60 µg/L
	5-Year Mean Secchi Depth	2.6 ft	≥4.26 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	TBD <sup>3</sup>	≥75%
Lake Keewahntin	5-Year Mean Phosphorus Concentration	15 µg/L	≤20 µg/L
	5-Year Mean Secchi Depth	14.3 ft	≥10 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	67%	≥75%
Forest Lake <sup>2</sup>	5-Year Mean Phosphorus Concentration (Average)	37 µg/L	≤30 µg/L
	<i>Forest West (1<sup>st</sup> Lake), Middle (2<sup>nd</sup>), East (3<sup>rd</sup>)</i>	<i>29, 40, 41 µg/L</i>	
	5-Year Mean Secchi Depth (Average)	6.2 ft	≥7 ft
	<i>Forest West (1<sup>st</sup> Lake), Middle (2<sup>nd</sup>), East (3<sup>rd</sup>)</i>	<i>5.4, 6.8, 6.4 ft</i>	
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
% of Parcels with ≥75% Natural Shoreline	27%	≥75%	
Comfort Lake	5-Year Mean Phosphorus Concentration	32 µg/L	≤30 µg/L
	5-Year Mean Secchi Depth	5.6 ft	≥7 ft
	10-Year Mean Bottom Water Chloride	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Shoreline	61%	≥75%

<sup>1</sup> Paleolimnological core data collected in 2019 indicate that in-lake phosphorus concentrations under pre-development conditions were 50 µg/L; the Board may pursue a site-specific standard for this lake.

<sup>2</sup> Paleo cores collected in 2021 to determine if phosphorus conc. of 30 µg/L was achieved under pre-development conditions and is therefore a feasible goal.

<sup>3</sup> Data is not available for these resources on the percent of parcels with >75% natural shoreline/streambank. Lake shoreline and streambank goals will be determined following completion of shoreline/streambank inventories (3004A).

<sup>4</sup>Chloride and total suspended solids concentrations will be determined within the first five years of the planning period.

## **Lakes Progress Evaluation Metrics**

- Total Maximum Daily Load (TMDL) phosphorus reductions needed to meet State and District Goals.
- Remaining phosphorus load reductions for priority District lakes based on implementation of projects completed or grant-funded through 2020 (benchmark year with respect to watershed management plan goals) to meet long-term goals are as follows:
  - Moody Lake: 169 lb/yr
  - Bone Lake: 50 lb/yr
  - Birch Lake: 323 lb/yr
  - School Lake: 477 lb/yr
  - Little Comfort Lake: 366 lb/yr
  - Shields Lake: 0 lb/yr
  - Lake Keewahtin: 0 lb/yr
  - Forest Lake: 155 lb/yr
  - Comfort Lake: 193 lb/yr
- Fish index of biological integrity (IBI) scores.
- Aquatic point intercept surveys.
- Determine trends in lake bottom water chlorides.
- Number of salt applicators participating in MPCA's Smart Salting training programs.
- Number of landowners contacted.
- Number of workshops.
- Percent shoreline/shoreland in vegetated buffer/natural upland.

## **Lakes Evaluation in 2024 (District-Wide)**

- **Goal 1:** Adaptively manage District lakes to reduce phosphorus loads and de-list impaired lakes with Total Maximum Daily Loads (TMDLs) to achieve state water quality eutrophication standards (total phosphorus, chlorophyll-a and Secchi).
  - **2023 Evaluation:** Most District lakes are showing an improving water quality trend. See District-Wide Lake Water Quality section and individual lake summary pages for detailed analysis of progress toward water quality goals.
- **Goal 2:** Adaptively manage District lakes to improve water quality by achieving the 10-year (2031) total phosphorus and Secchi goals.
  - **2023 Evaluation:** Most District lakes are showing an improving water quality trend. See District-Wide Lake Water Quality section and individual lake summary pages for detailed analysis of progress toward water quality goals.
- **Goal 3:** Partner with agencies to manage District lakes for healthy fish and aquatic plant communities.
  - **2023 Evaluation:** CLFLWD adheres to MN Department of Natural Resources (DNR) regulations with all of its aquatic invasive species (AIS) treatments in order to avoid undue harmful impacts to native aquatic plants. The District coordinates with DNR on the scheduling and performance of fish surveys within District lakes in order to keep track of both native and invasive fish populations. See Program 3011 AIS Prevention & Management for more information.
- **Goal 4:** Establish bottom water chloride trends in District lakes and provide resources to salt applicators on ways to reduce chloride inputs.
  - **2023 Evaluation:** Chloride trends were not yet established in 2023, but the District will work on establishing trends in 2024.

- **Goal 5:** Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of lakeshore parcels have at least 75% natural shoreline condition. For example, in its last shoreline survey 55% of parcels on Bone Lake were covered in at least 75% natural shoreline vegetation; the goal is to ensure 75% of parcels are vegetated thusly.
  - **2023 Evaluation:** The District created a comprehensive shoreline program in 2023. See Program 3002 Permitting and 3004 Non-Point Source Pollution Abatement for more information.

## District-Wide Lake Water Quality

Charts are meant to better assist with visualizing the District’s progress toward its long-term phosphorus reduction goals for each lake. Status charts in this section are reflective of the District’s long-term (2031) estimated phosphorus reduction goals from all loading sources (watershed, upstream lakes, and internal). The figures in these charts and graphs are based on monitoring data collected through 2023 and hydrologic/lake water quality response modeling.

Note that while the information contained in this section can be useful for high-level implementation planning, the data is always associated with some level of uncertainty. Watersheds are dynamic systems that are subject to frequent changes. Annual water monitoring data is subject to many different variables such as weather events and land use changes. Because of this annual variability, multi-year averages are generally used when evaluating progress toward goals. This report attempts to reflect actual conditions as accurately as possible but recognizes the limitations of the data and associated margin of error. The standard margin of error for water quality goals is 10%.

Furthermore, while modeling can be used to estimate phosphorus load reductions for many of the District’s capital improvement projects (e.g., wetland restorations and stormwater basins), some projects have impacts that are more difficult to estimate (e.g., public education projects, regulatory measures, curly-leaf pondweed management). While such projects are difficult to quantify, and therefore would not be reflected in the status charts, they are nonetheless important in protecting and improving water resources. Additional notable projects and programs that have been completed to date, or are ongoing, are listed under some of the bar graph charts below.

A table which further summarizes capital improvement project implementation progress can be found in Appendix B.

## Example Lake Summary Page

Explanations regarding tables and figures are provided in the following Example Lake Summary Page.

**Example 2024 Water Quality Grade:** lake grade will be outlined in bold borders

Excellent	Good	<b>Average</b>	Marginal	Poor
A All or most samples meet the desired threshold	B Many samples meet or are near the desired threshold	<b>C Some samples meet or are near desired threshold</b>	D Many samples no not meet the desired threshold	F Most samples do not meet the desired threshold

## Example Lake Goals & Status Summary

Table 2. Example Lake Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration <sup>1</sup>	(µg/L) micrograms per liter	(µg/L) micrograms per liter	(lb/yr) pounds per year phosphorus load still in need of removal
5-Year Average Secchi Depth <sup>1</sup>	(ft) feet	(ft) feet	
10-Year Average Bottom Water Chloride <sup>2</sup>	(mg/L) milligrams per liter	(mg/L) milligrams per liter	TBD
% of Parcels with ≥75% Natural Shoreline <sup>3</sup>	(%) percentage of parcels	(%) percentage of parcels	(%) percentage of parcels without natural shorelines

<sup>1</sup>5-year average phosphorus concentration and Secchi depth goals are based on the summertime (June-September) averages for each of the five most recently-monitored years. While state standards are based on the most recent 10-year summer average, District goals take the most recent 5-year summer average, which is a stricter measure.

<sup>2</sup>Chloride concentrations for each lake will be determined between 2022-2026.

<sup>3</sup>Data is not available for some lakes on the percent of parcels with >75% natural shoreline/streambank. Lake shoreline and streambank goals will be determined following completion of shoreline/streambank inventories.

Table 3. Example Lake Phosphorus Reduction Goals

Watershed Management Plan Code, Lake Name	Phosphorus Reduction (lb/yr)
<b>Load Reduction to Achieve Long-term Goal of X µg/L:</b> (based on YEAR benchmark of X µg/L)	Phosphorus reduction needed, compared to benchmark (starting place), for the lake to achieve District long-term sustainable water quality goals (stable natural waterbody state, sometimes stricter than state standards)
Load reduction progress through 2024	Phosphorus reduction achieved between benchmark load date and December 31, 2024
<b>2024 Remaining Load Reduction</b>	Phosphorus reduction needed, compared to most recent available data, for the lake to achieve District long-term sustainable water quality goals (stable natural waterbody state, sometimes stricter than state standards)

## Example Project Implementation Progress

This figure illustrates progress achieving the necessary phosphorus load reductions described in the table above.

- **Completed:** Phosphorus reductions achieved by projects that are completed as of the end of 2024.
- **In Progress:** Reductions that will be achieved by projects that are in progress as of the end of 2024.
- **Planned:** Reductions that will be achieved by projects that are planned, but not yet started, as of the end of 2024.
- **Current Status:** Aligns with completed projects and emphasizes phosphorus reductions achieved by completed projects as of the end of 2024. Includes a 10% margin of error.

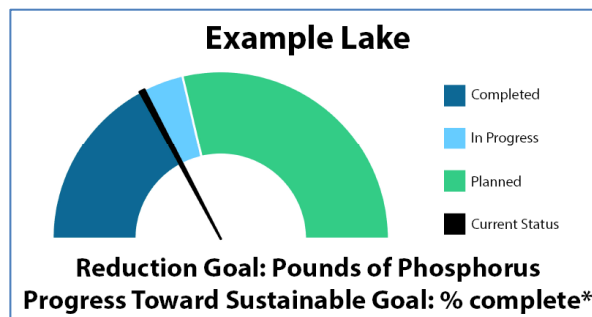


Figure 2. Example Phosphorus Reduction Goals and Project Progress Graph

\*The District bases its water quality goals on historic data, collecting actual lake sediment cores in some cases, in order to determine the water quality level which each lake can sustain in the long-term. In many cases, the District goal exceeds the minimum state water quality standards.

## Example Progress Toward State Standards

Six CLFLWD priority lakes are on the impaired waters list for nutrients: Moody Lake, Bone Lake, School Lake, Shields Lake, Little Comfort Lake and Comfort Lake. Forest Lake is not listed as impaired for nutrients, but its summertime water quality readings occasionally exceed state standards. Bone Lake was delisted for its nutrient impairment in 2024. The lake summaries for these seven lakes contain an additional section evaluating progress toward meeting State nutrient standards and de-listing (or prevention of being listed) for nutrient impairments. The District's ultimate goal is to delist impaired waters and prevent unimpaired waters from becoming impaired. In the meantime, an impairment listing, or even being close to the state standard, can put a lake into a higher priority ranking for certain water quality improvement grant programs.

The following criteria are summarized from the MN Pollution Control Agency's Impairment Assessment Manual (April 2024). Visit <https://www.pca.state.mn.us/air-water-land-climate/minnesotas-impaired-waters-list> for the full Assessment Manual. The District must coordinate closely with MPCA to proceed with delisting any waterbodies, and a full data review will occur as part of that process. **This report summarizes delisting criteria at a basic level.**

All State water quality standards are based on growing season (June-September) averages. To be removed from the impaired waters list, a lake must meet minimum requirements in the following two categories.

1. **Water Quality Samples:** Meet the phosphorus standard and the chlorophyll-a or Secchi depth standard based on at least 8 samples collected from at least 2 years within the most recent 10-year period. Chlorophyll-a samples are pheophytin-corrected. The MN Pollution Control Agency considers 10-year average phosphorus concentrations in addition to the 2 most recent summer averages and the individual samples of the most recent 2 years.
2. **Trend/Management:** In addition, there must be an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations. The local entity must provide information that details how the response conditions will be met over time for a lake to be de-listed.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.

The most recent 2-year period of data will be outlined in black. Up to eight samples are shown in each table. In some cases, more than eight samples are collected within a single growing season. The summer average includes all samples taken between June-September, but all individual samples may not be shown.

Table 4. Example State Standard Evaluation Table

<b>Example Lake Phosphorus</b>		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\leq 40 \mu\text{g/L}$											
Shallow Lake State Std $\leq 60 \mu\text{g/L}$											
<b>Summer Average</b>											
Samples 1-8. Sample dates vary by year. All samples shown were taken between June-September.		Orange cells indicate samples that do not meet state standards					Blue cells indicate samples that meet state standards				

<b>Example Lake Secchi</b>		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\geq 4.6 \text{ ft}$											
Shallow Lake State Std $\geq 3.3 \text{ ft}$											
<b>Summer Average</b>											
Samples 1-8. Sample dates vary by year. All samples shown were taken between June-September.		Orange cells indicate samples that do not meet state standards					Blue cells indicate samples that meet state standards				

<b>Example Lake Chlorophyll-a</b>		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\leq 14 \mu\text{g/L}$											
Shallow Lake State Std $\leq 20 \mu\text{g/L}$											
<b>Summer Average</b>											
Samples 1-8. Sample dates vary by year. All samples shown were taken between June-September.		Orange cells indicate samples that do not meet state standards					Blue cells indicate samples that meet state standards				

**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

**Trend:** Phosphorus trend is the criterion necessary for de-listing. Chlorophyll-a and Secchi trends are shown for reference.

Table 5. Example Trend Table

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Example Lake	Significantly Improving Trend Improving Trend Declining Trend Significantly Declining Trend	Significantly Improving Trend Improving Trend Declining Trend Significantly Declining Trend	Significantly Improving Trend Improving Trend Declining Trend Significantly Declining Trend

**Management Activities:** List of management activities in place, as well as in-progress/future activities

**Conclusion:**

This section will conclude whether the lake meets de-listing criteria. Once reliable data shows that the lake meets the de-listing criteria, the District may contact the MN Pollution Control Agency to proceed with the de-listing process. The District will consider management activities in place to protect water quality when evaluating lakes for de-listing.



Qualifies for de-listing



To be determined



Does not qualify for de-listing

## 5221 Moody Lake Summary

### Moody Lake 2024 Water Quality Grade: C

Excellent	Good	Average	Marginal	Poor
A All or most samples meet the desired threshold	B Many samples meet or are near the desired threshold	<b>C</b> <b>Some samples meet or are near desired threshold</b>	D Many samples do not meet the desired threshold	F Most samples do not meet the desired threshold

### Moody Lake Goals & Status Summary

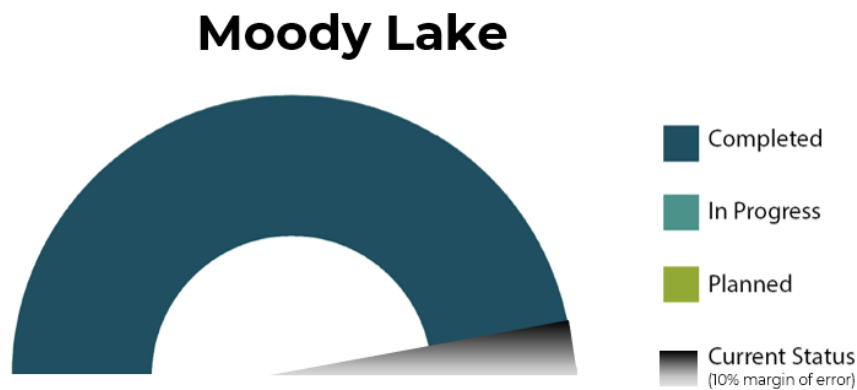
Table 6. Moody Lake Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤40 µg/L	42.2 µg/L	Load reduction goal achieved
5-Year Average Secchi Depth	≥4.6 ft	5.2 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2024 Shoreland Inventory	≥75% of parcels	98% of parcels	Currently meeting goal

Table 7. Moody Lake Phosphorus Reduction Goals

5221 Moody Lake	Phosphorus Reduction (lb/yr)
<b>Load Reduction to Achieve Long-term Goal of 40 µg/L:</b> (based on 2004 benchmark of 152 µg/L; 10% margin of error = 88 lbs)	<b>879</b>
Load reduction progress through 2024	837
<b>2024 Remaining Load Reduction (cross-referenced w/ in-lake data and trends)</b>	<b>Load reduction goal achieved</b>

### Moody Lake Project Implementation Progress



**Phosphorus Reduction Goal: 879 lbs**  
**Progress Toward Goal & State Standards: 100%**

Figure 3. Moody Lake Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: annual curly-leaf pondweed management, permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## Moody Lake Progress Toward State Standards

Moody Lake is nutrient impaired for aquatic recreation.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.



**#1 – Water Quality Samples:** Moody Lake meets criterion #1 for de-listing because seasonal averages of at least two years out of the last 10 years meet phosphorus, chlorophyll-a, and Secchi standards. However, state standard exceedances occurred within the last two years, and the 10-year average is still above the state standard; MPCA also considers these factors in delisting evaluations.

Table 8. Moody Lake Water Quality Sample Evaluation

<b>Moody Lake Phosphorus</b>										
Deep Lake State Standard $\leq 40 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $68 \mu\text{g/L}$										
<b>Summer Average</b>	<b>122</b>	<b>104</b>	<b>86</b>	<b>92</b>	<b>60</b>	<b>36</b>	<b>33</b>	<b>36</b>	<b>27</b>	<b>79</b>
Sample 1	79	59	101	73	75	58	30	46	22	68
Sample 2	114	72	107	103	83	24	62	39	13	170
Sample 3	158	130	152	84	67	45	47	51	38	91
Sample 4	175	106	63	153	109	31	55	37	20	88
Sample 5	195	91	68	112	64	34	14	44	24	61
Sample 6	138	117	72	112	57	30	14	26	22	45
Sample 7	89	162	71	41	37	40	11	17	20	62
Sample 8	84	91	54	60	40	32	27	20	34	44
<b>Moody Lake Secchi</b>										
Deep Lake State Standard $\geq 4.6 \text{ ft}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $3.7 \text{ ft}$										
<b>Summer Average</b>	<b>2.1</b>	<b>2.7</b>	<b>1.9</b>	<b>1.8</b>	<b>2.4</b>	<b>3.6</b>	<b>8.7</b>	<b>4.2</b>	<b>5.5</b>	<b>4.0</b>
Sample 1	3.0	4.0	4.0	2.5	1.5	2.6	8.9	5.9	5.6	3.3
Sample 2	3.5	3.0	1.0	1.0	2.0	4.3	8.5	5.6	4.6	3.0
Sample 3	1.5	2.0	1.2	1.5	1.7	2.0	7.2	4.9	3.3	3.9
Sample 4	1.0	2.5	1.5	0.5	0.8	3.6	7.9	3.6	5.6	4.1
Sample 5	2.0	2.0	1.5	1.2	1.5	3.3	7.2	3.0	5.6	3.6
Sample 6	1.5	1.5	2.0	1.0	1.0		7.2	3.3	7.5	4.6
Sample 7	1.5	3.0	2.0	3.5	4.0	5.2	9.8	4.3	5.6	4.3
Sample 8	1.5	3.0	2.0	3.5	2.0	3.9	12.5	5.2	7.2	4.9
<b>Moody Lake Chlorophyll-a</b>										
Deep Lake State Standard $\leq 14 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $34 \mu\text{g/L}$										
<b>Summer Average</b>	<b>59</b>	<b>42</b>	<b>44</b>	<b>77</b>	<b>41</b>	<b>22</b>	<b>4</b>	<b>24</b>	<b>9</b>	<b>14</b>
Sample 1	46	28	22	34	60	33	3	8	7	44
Sample 2	17	38	80	110	45	11	5	11	16	8
Sample 3	67	48	66	73	63	41	4	23	21	5
Sample 4	110	30	72	130	45	17	2	20	6	5
Sample 5	67	47	34	84	19	27	7	20	7	18
Sample 6	69	74	27	93	46	23	5	20	6	11
Sample 7	65	44	30	43	22	9	5	11	4	11
Sample 8	47	33	24	30	54	17	1	8	4	9

**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

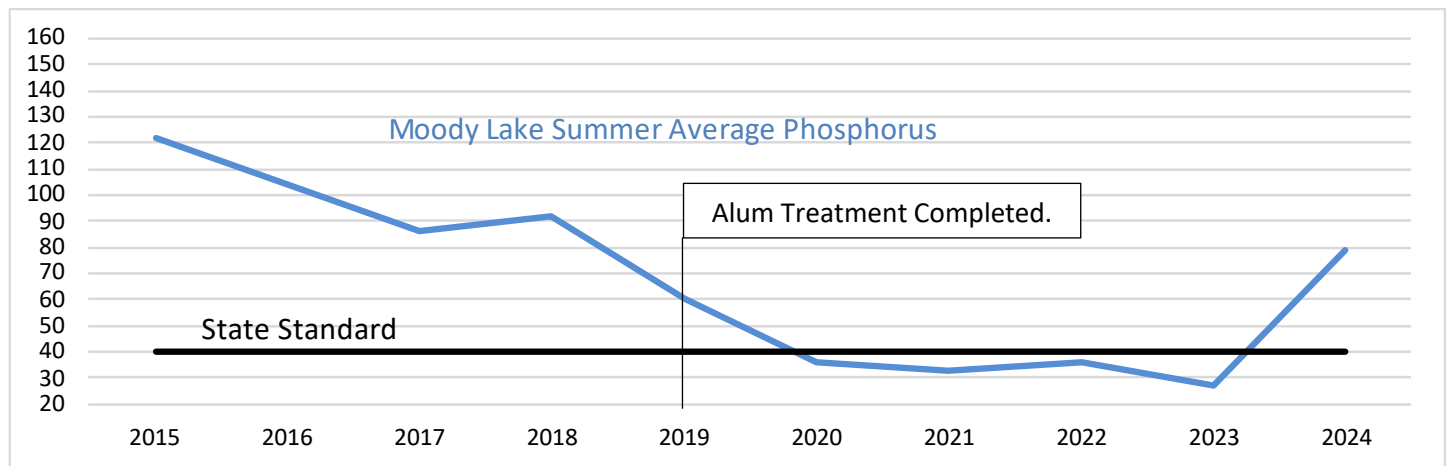
✓ **#2 Trend/Management:**  
 Management activities are in place to maintain improved chlorophyll-a and Secchi observations in Moody Lake. The phosphorus trend is improving. Moody Lake meets criterion #2 for de-listing.

**Trends:**

*Table 9. Moody Lake Trend Evaluation*

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Moody Lake	<b>Significantly Improving Trend Since 2005</b>	<b>Significantly Improving Trend Since 2005</b>	<b>Significantly Improving Trend Since 2005</b>

*\*Trends that are not "significantly" improving or declining are not statistically significant.*



*Figure 4. Moody Lake Phosphorus Concentration History*

**Management Activities:**

- Wetland Restoration Projects (445 lb/yr phosphorus reduction)
- Whole Lake Alum Treatment (324 lb/yr phosphorus reduction, completed in 2019 – split application '18 and '19)
- Rough Fish Harvest (performed in 2009)
- Winter Aeration System (operated annually by CLFLWD)
- Downstream Fish Barrier at Bone Lake Inlet (operated annually by CLFLWD)
- Curly-leaf Pondweed Treatments (performed annually by CLFLWD)
- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)
- Moody Lake Agricultural Practices and Farmer Led Council (ongoing)
- Moody Lake Capstone Projects (60 lb/yr phosphorus reduction)

✓ **Conclusion:**  
 Moody Lake qualifies for de-listing at this time. However, water quality readings are still close to and occasionally exceeding state standards. More years of monitoring data should reflect the improving long-term trends. In all cases, the District would need to undergo a detailed data review with MPCA if it wanted to request delisting.

## 5222 Bone Lake Summary

### Bone Lake 2024 Water Quality Grade: B

Excellent	Good	Average	Marginal	Poor
A	<b>B</b>	C	D	F
All or most samples meet the desired threshold	<b>Many samples meet or are near the desired threshold</b>	Some samples meet or are near desired threshold	Many samples do not meet the desired threshold	Most samples do not meet the desired threshold

### Bone Lake Goals & Status Summary

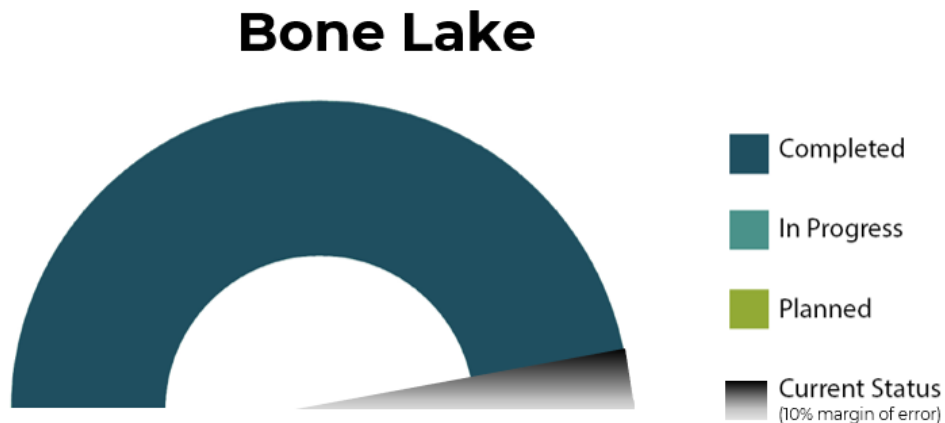
Table 10. Bone Lake Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤30 µg/L	24.6 µg/L	Load reduction goal achieved
5-Year Average Secchi Depth	≥7 ft	6.4 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2023 Shoreland Inventory	≥75% of parcels ≥69 parcels	53% of parcels 49 parcels	22% of parcels 20 parcels

Table 11. Bone Lake Phosphorus Reduction Goals

5222 Bone Lake	Phosphorus Reduction (lb/yr)
Load Reduction to Achieve Long-term Goal of 30 µg/L: (based on 2004 benchmark of 60 µg/L; 10% margin of error = 78 lbs)	786
Load reduction progress through 2023	821
2024 Remaining Load Reduction (cross-referenced w/ in-lake data and trends)	Goal achieved

### Bone Lake Project Implementation Progress



**Phosphorus Reduction Goal: 786 lbs**  
**Progress Toward Goal & State Standards: 100%**

Figure 5. Bone Lake Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: cost-share projects, annual curly-leaf pondweed management, permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## Bone Lake Progress Toward State Standards

Bone Lake was delisted for excess nutrients for aquatic recreation in 2024.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.

Table 12. Bone Lake Water Quality Sample Evaluation

<b>Bone Lake Phosphorus</b>										
Deep Lake State Standard $\leq 40 \mu\text{g/L}$ 10-Year Average: 28 $\mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Summer Average</b>	<b>39</b>	<b>39</b>	<b>30</b>	<b>22</b>	<b>29</b>	<b>26</b>	<b>26</b>	<b>25</b>	<b>20</b>	<b>26</b>
Sample 1	44	35	35	22	24	30	32	24	12	19
Sample 2	26	37	41	21	23	45	36	37	11	20
Sample 3	32	58	38	24	28	13	31	26	22	18
Sample 4	36	31	28	26	35	20	17	16	18	23
Sample 5	45	51	20	22	30	31	28	29	22	32
Sample 6	53	28	23	20	29	22	18	24	26	27
Sample 7	42	41	26	19	30	18	22	19	30	29
Sample 8	37	42	23	20	33		22	28		29

<b>Bone Lake Secchi</b>										
Deep Lake State Standard $\geq 4.6 \text{ ft}$ 10-Year Average: 5.7 ft	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Summer Average</b>	<b>3.9</b>	<b>4.2</b>	<b>5.8</b>	<b>6.5</b>	<b>5.0</b>	<b>5.8</b>	<b>7.3</b>	<b>5.9</b>	<b>5.5</b>	<b>7.4</b>
Sample 1	4.0	3.5	2.5	6.5	7.0	4.9	6.2	4.3	7.2	13.8
Sample 2	3.5	4.0	4.5	7.0	6.0	5.6	6.9	5.2	6.6	13.5
Sample 3	4.5	4.5	3.5	6.5	5.0	8.5	7.9	6.6	5.2	12.0
Sample 4	4.0	3.5	4.5	7.5	4.5	5.6	7.5	8.2	6.9	10.5
Sample 5	3.0	3.5	6.5	4.5	3.0	5.6	8.2	6.9	4.9	4.3
Sample 6	3.5	5.5	9.5	5.0	4.5	6.6	8.2	5.9	4.3	3.9
Sample 7	4.0	5.5	8.5	9.0	4.5	3.9	8.2	5.6	3.6	4.9
Sample 8	4.0	4.0	7.0	6.0	5.5		4.9	4.3		4.9

<b>Bone Lake Chlorophyll-a</b>										
Deep Lake State Standard $\leq 14 \mu\text{g/L}$ 10-Year Average: 17 $\mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Summer Average</b>	<b>30</b>	<b>22</b>	<b>20</b>	<b>10</b>	<b>21</b>	<b>12</b>	<b>8</b>	<b>14</b>	<b>13</b>	<b>15</b>
Sample 1	14	26	59	9	10	16	10	11	9	3
Sample 2	13	20	15	6	11	11	6	18	8	8
Sample 3	20	27	26	1	15	4	6	8	6	22
Sample 4	36	21	12	12	26	9	6	10	7	18
Sample 5	56	24	11	20	40	12	6	15	10	18
Sample 6	33	15	7	10	18	19	6	18	26	20
Sample 7	43	17	9	7	26	11	5	18	24	23
Sample 8	37	33	17	16	21		15	16		20

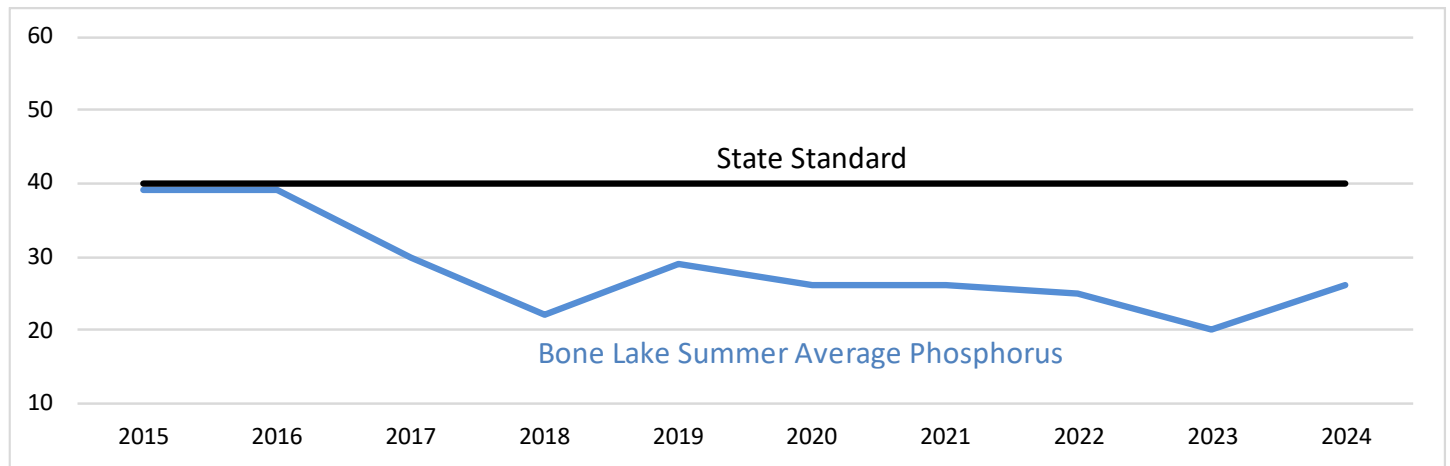
**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

**Trends:**

*Table 13. Bone Lake Trend Evaluation*

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Bone Lake	Improving Trend Since 2015	Significantly Improving Trend Since 2001	Significantly Improving Trend Since 1984

*\*Trends that are not “significantly” improving or declining are not statistically significant.*



*Figure 6. Bone Lake Phosphorus Concentration History*

**Management Activities:**

- Melanie Trail Row Crop Conversion to Perennial (34 lb/yr phosphorus reduction)
- Southeast (Meadowbrook) Drained Wetland Restorations (35 lb/yr phosphorus reduction)
- Northeast Legacy Wetland Restoration (15 lb/yr phosphorus reduction)
- Inlet and Outlet Fish Barriers (operated annually by CLFLWD)
- Curly-leaf Pondweed Treatments (performed annually by CLFLWD)
- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)
- Bone Lake Agricultural Practices (ongoing, estimated 90 lb/yr phosphorus reduction)



**Conclusion:**

Bone Lake was de-listed in 2024 and remains within state standard delisting criteria.

## 5223 Birch Lake Summary

### Birch Lake 2021 Water Quality Grade (last year monitored): C

Excellent	Good	Average	Marginal	Poor
A All or most samples meet the desired threshold	B Many samples meet or are near the desired threshold	<b>C Some samples meet or are near desired threshold</b>	D Many samples do not meet the desired threshold	F Most samples do not meet the desired threshold

### Birch Lake Goals & Status Summary

Table 14. Birch Lake Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤60 µg/L	81 µg/L	TBD
5-Year Average Secchi Depth	≥3.3 ft	5.0 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2024 Shoreland Inventory	≥75% of parcels	100% of parcels	Currently meeting goal

Birch Lake is very shallow and has characteristics similar to an open water wetland. Birch Lake is located downstream of Bone Lake and is connected by a tributary stream. As such, improvements to Bone Lake will result in improvements to Birch Lake. Within the Birch Lake direct drainage area, a large portion of cropland was converted to residential subdivision in recent years. Conversion from row crop to residential is estimated to actually result in reduced phosphorus and sediment loading to Birch Lake. The District will continue to monitor Birch Lake in order to determine whether upstream improvements to Bone Lake result in reduced phosphorus concentrations in Birch Lake.

## 5224 School Lake Summary

### School Lake 2024 Water Quality Grade: B-

Excellent	Good	Average	Marginal	Poor
A All or most samples meet the desired threshold	<b>B Many samples meet or are near the desired threshold</b>	C Some samples meet or are near desired threshold	D Many samples do not meet the desired threshold	F Most samples do not meet the desired threshold

### School Lake Goals & Status Summary

Table 15. School Lake Goals & Status Summary

	Long-Term Goal/ State Standard	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤60 µg/L	42.2 µg/L	No load reduction goal set
5-Year Average Secchi Depth	≥3.3 ft	5.7 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2024 Shoreland Inventory	≥75% of parcels	96% of parcels	Currently meeting goal

School Lake is located downstream of Birch Lake and, similarly to Birch Lake, will see improvements resulting from upstream improvements to Bone Lake. Additionally, the District is in the process of working with a rural landowner in the School Lake direct drainage area to implement best management practices to reduce phosphorus and sediment loading from a cattle feedlot. School Lake is classified as a shallow lake, and therefore the state standard is 60 µg/L for phosphorus concentration and 3.3 feet for Secchi depth.

## School Lake Progress Toward State Standards

School Lake is nutrient impaired for aquatic recreation.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.



**#1 – Water Quality Samples:** School Lake meets criterion #1 for de-listing because seasonal averages of at least two years out of the last 10 years meet phosphorus, chlorophyll-a, and Secchi standards. Additionally, the 10-year average is below the state standard. However, state standard exceedances occurred within the last two years; MPCA also considers this factor in delisting evaluations.

Table 16. School Lake Water Quality Sample Evaluation

<b>School Lake Phosphorus</b>										
Shallow Lake State Standard $\leq 60 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $45 \mu\text{g/L}$										
<b>Summer Average</b>			<b>51</b>	<b>53</b>		<b>49</b>	<b>40</b>	<b>28</b>	<b>28</b>	<b>66</b>
Sample 1			54	38		49	52	37	28	60
Sample 2			53	40		49	39	29	28	82
Sample 3			41	49		64	72	14	24	71
Sample 4			59	125		34	17	27	20	49
Sample 5			34	62			70	33	20	
Sample 6			31	56			30		22	
Sample 7			116	40			27		38	
Sample 8			40	48			21		42	

<b>School Lake Secchi</b>										
Shallow Lake State Standard $\geq 3.3$ feet	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: 4.9 ft										
<b>Summer Average</b>			<b>2.8</b>	<b>2.5</b>		<b>4.8</b>	<b>5.3</b>	<b>6.1</b>	<b>7.1</b>	<b>5.4</b>
Sample 1			4.5	4.0		3.0	7.5	7.4	9.2	6.6
Sample 2			2.5	3.0		3.3	5.6	6.6	7.5	4.6
Sample 3			1.0	2.0		6.6	7.2	5.2	7.5	5.6
Sample 4			1.5	1.0		6.2	4.3	5.9	6.2	4.9
Sample 5			3.0	1.5			3.8	5.6	9.2	
Sample 6			3.5	1.5			4.3		6.9	
Sample 7			3.0	4.0			4.3		4.6	
Sample 8			3.0	3.0			4.6		5.6	

<b>School Lake Chlorophyll-a</b>										
Shallow Lake State Standard $\leq 20 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $21 \mu\text{g/L}$										
<b>Summer Average</b>			<b>31</b>	<b>50</b>		<b>24</b>	<b>12</b>	<b>14</b>	<b>9</b>	<b>10</b>
Sample 1			24	46		38	4	13	6	14
Sample 2			42	22		29	4	14	4	6
Sample 3			61	44		17	5	16	8	8
Sample 4			56	69		13	17	19	20	11
Sample 5			19	75			16	10	7	
Sample 6			19	54			15		7	
Sample 7			38	47			17		9	
Sample 8			32	46			17		10	

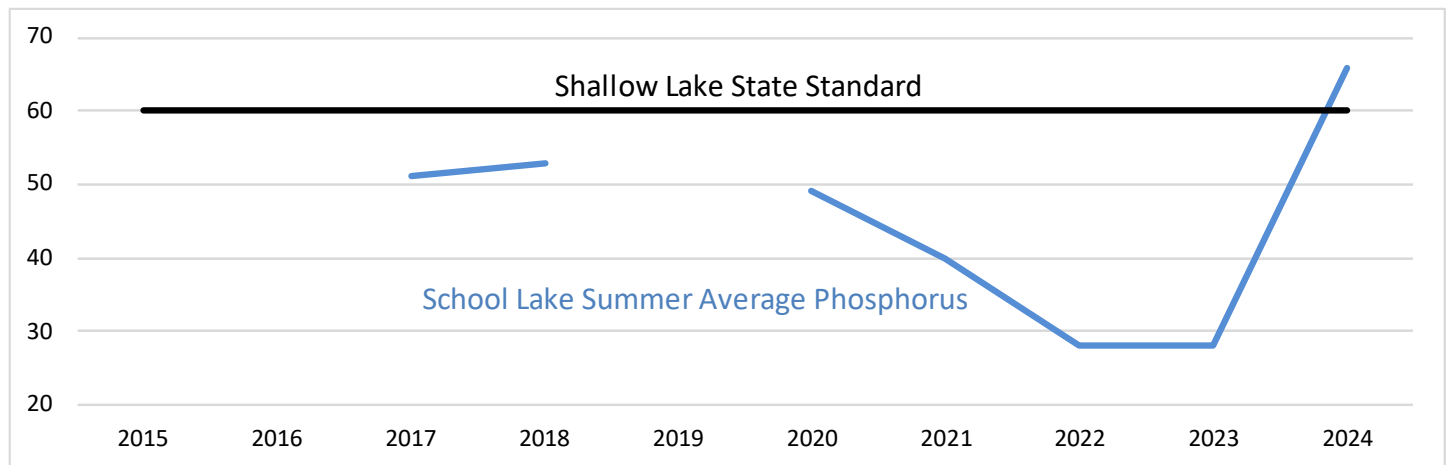
**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

**#2 Trend/Management:**  
 ✓ School Lake does not have enough water quality data collected to calculate long-term trends. However, most of the recent summer average phosphorus concentrations have been below the state standard, and several management activities are in place for Bone Lake which is located upstream of School Lake and Birch Lake.

**Trends:**

*Table 17. School Lake Trend Evaluation*

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
School Lake	Not enough data exists to calculate long-term trends for School Lake.		



*Figure 7. School Lake Phosphorus Concentration History*

**Management Activities:**

- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)
- Project currently in-progress: School Lake Agricultural BMPs (61 lb/yr phosphorus reduction)

**Conclusion:**  
 ✓ School Lake qualifies for de-listing at this time. However, water quality readings are still close to and occasionally exceeding state standards. More years of monitoring data should reflect the improving long-term trends. In all cases, the District would need to undergo a more detailed data review with MPCA if it wanted to request delisting.

## 5225 Little Comfort Lake Summary

### Little Comfort Lake 2024 Water Quality Grade: B-

Excellent	Good	Average	Marginal	Poor
A All or most samples meet the desired threshold	B Many samples meet or are near the desired threshold	C Some samples meet or are near desired threshold	D Many samples do not meet the desired threshold	F Most samples do not meet the desired threshold

### Little Comfort Lake Goals & Status Summary

Table 18. Little Comfort Lake Water Quality Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤30 µg/L	35.3 µg/L	336 lb/yr phosphorus load
5-Year Average Secchi Depth	≥7 ft	6.8 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2015 Shoreland Inventory	≥75% of parcels ≥25 parcels	82% of parcels 27 parcels	[maintain]

Table 19. Little Comfort Lake Phosphorus Reduction Goals

5225 Little Comfort Lake	Phosphorus Reduction (lb/yr)
Load Reduction to Achieve Long-term Goal of 30 µg/L: (based on 2004 benchmark of 72 µg/L; 10% margin of error = 84 lbs)	839
Load reduction progress through 2023	503
2024 Remaining Load Reduction (cross-referenced w/ in-lake data and trends)	336

### Little Comfort Lake Project Implementation Progress

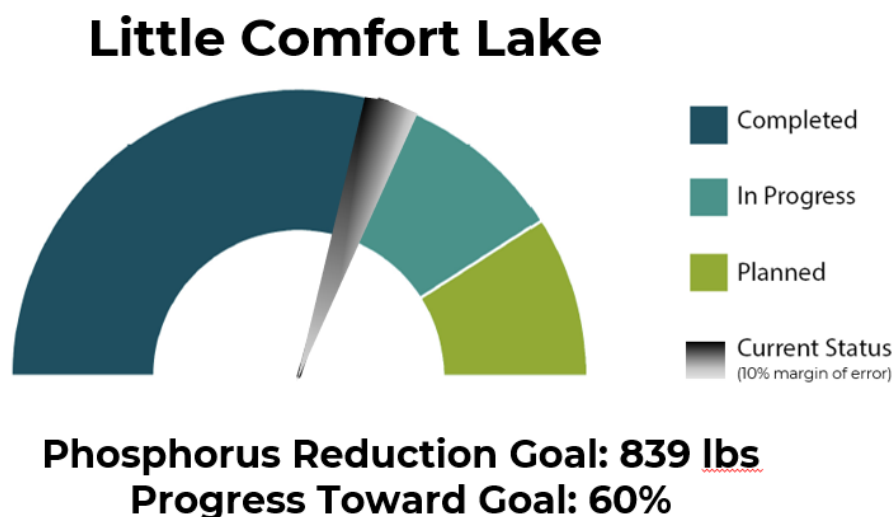


Figure 8. Little Comfort Lake Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## Little Comfort Lake Progress Toward State Standards

Little Comfort Lake is nutrient impaired for aquatic recreation.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.



**#1 – Water Quality Samples:** Little Comfort Lake meets criterion #1 for de-listing because seasonal averages of at least two years out of the last 10 years meet phosphorus, chlorophyll-a, and Secchi standards. However, state standard exceedances occurred within the last two years, and the 10-year average is still above the state standard; MPCA also considers these factors in delisting evaluations.

Table 20. Little Comfort Lake Water Quality Sample Evaluation

<b>Little Comfort Lake Phosphorus</b>										
Deep Lake State Standard $\leq 40 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $48 \mu\text{g/L}$										
<b>Summer Average</b>	<b>88</b>	<b>68</b>	<b>43</b>	<b>50</b>	<b>56</b>	<b>34</b>	<b>43</b>	<b>23</b>	<b>23</b>	<b>53</b>
Sample 1	26	28	19	33	74	33	54	24	17	58
Sample 2	67	176	42	33	37	29	86	24	19	79
Sample 3	74	44	26	45	41	44	34	31	22	66
Sample 4	366	50	63	114	76	30	12	26	13	60
Sample 5	56	61	71	52	113	36	22	24	22	47
Sample 6		56	34	50	39		34	17	18	36
Sample 7	23	71	36	33	29		100	12	26	42
Sample 8	28	92	50	43	39		24	10	24	33

<b>Little Comfort Lake Secchi</b>										
Deep Lake State Standard $\geq 4.6 \text{ ft}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $5.4 \text{ ft}$										
<b>Summer Average</b>	<b>4.3</b>	<b>3.5</b>	<b>3.6</b>	<b>4.2</b>	<b>4.5</b>	<b>5.8</b>	<b>8.4</b>	<b>7.5</b>	<b>6.9</b>	<b>5.4</b>
Sample 1	6.0	5.0	3.5	6.0	5.5	5.7	9.8	8.5	5.9	5.6
Sample 2	3.5	2.5	3.0	4.5	4.5	4.8	9.8	8.2	7.2	5.9
Sample 3	2.0	4.0	1.5	3.0	5.5	6.2	9.5	7.2	3.3	5.2
Sample 4	3.5	3.0	2.0	2.5	2.0	5.6	10.2	7.1	7.9	5.6
Sample 5	4.5	2.5	3.0	3.0	3.5	6.6	7.2	7.5	9.8	3.9
Sample 6	4.5	4.0	3.5	3.5	4.8		5.9	6.9	9.2	5.9
Sample 7	4.5	3.0	5.0	4.5	5.5		4.6	8.5	6.2	6.2
Sample 8	4.5	4.0	7.0	7.0	4.5		7.2	7.2	8.5	5.2

<b>Little Comfort Lake Chlorophyll-a</b>										
Deep Lake State Standard $\leq 14 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $20 \mu\text{g/L}$										
<b>Summer Average</b>	<b>28</b>	<b>47</b>	<b>26</b>	<b>26</b>	<b>27</b>	<b>13</b>	<b>7</b>	<b>7</b>	<b>10</b>	<b>7</b>
Sample 1	7	19	29	5	15	23	3	3	11	12
Sample 2	37	43	26	7	13	16	3	7	8	3
Sample 3	77	27	44	30	19	12	4	7	36	3
Sample 4	24	36	28	41	30	10	3	7	5	4
Sample 5	20	51	20	43	35	2	13	8	6	11
Sample 6		31	23	24	36		15	6	2	11
Sample 7	23	90	19	28	27		12	6	5	9
Sample 8	28	77	17	27	41		10	8	3	7

**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

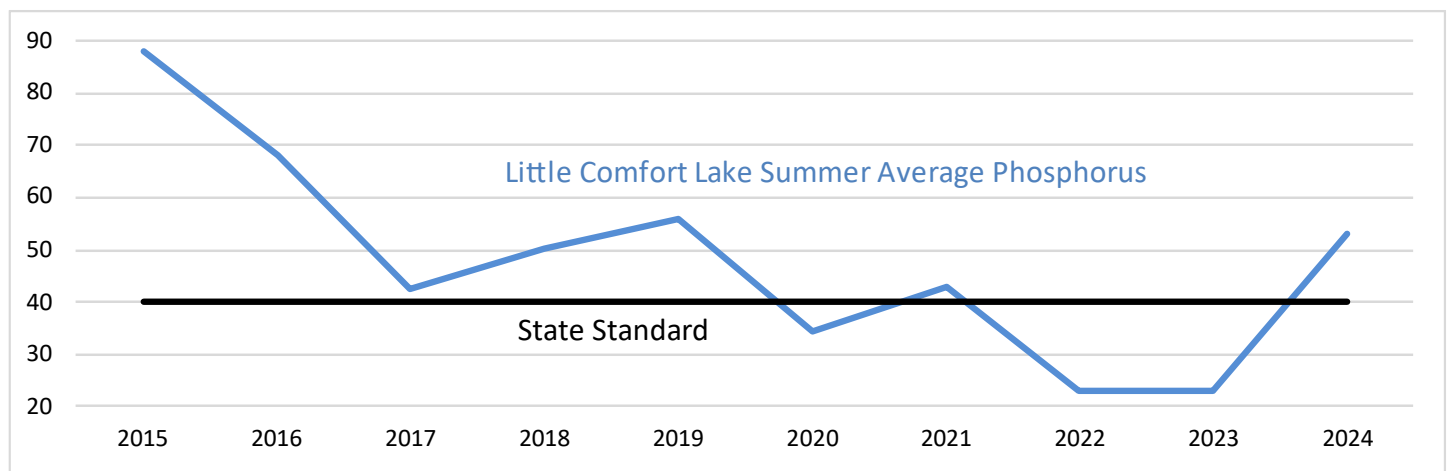
**#2 Trend/Management:**  
 ✓ Little Comfort Lake meets criteria #2 for de-listing because phosphorus trends are improving. However, the District is putting additional management activities into place to protect water quality.

**Trends:**

*Table 21. Little Comfort Lake Trend Evaluation*

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Little Comfort Lake	Improving Trend Since 2015	Significantly Improving Trend Since 2013	Significantly Improving Trend Since 2015

*\*Trends that are not "significantly" improving or declining are not statistically significant.*



*Figure 9. Little Comfort Lake Phosphorus Concentration History*

**Management Activities:**

- Curly-leaf Pondweed Surveys (performed annually by CLFLWD, treatment usually not warranted- due to low density growth)
- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)
- In progress projects:
  - School Lake Agricultural BMPs (estimated 61 lb/yr phosphorus reduction for upstream School Lake)
  - Heath Ave Iron Enhanced Sand Filter (estimated 75 lb/yr phosphorus reduction)
- Potential future projects:
  - Livestock Management
  - Whole Lake Alum Treatment (estimated 59 lb/yr phosphorus reduction)

**Conclusion:**  
 ✓ Little Comfort Lake qualifies for de-listing at this time. However, water quality readings are still close to and occasionally exceeding state standards. Completion of water quality projects will protect water quality, and more years of monitoring data should reflect the improving long-term trends. In all cases, the District would need to undergo a detailed data review with MPCA if it wanted to request delisting.

## 5226 Shields Lake Summary

### Shields Lake 2024 Water Quality Grade: C-

Excellent	Good	Average	Marginal	Poor
A	B	C	D	F
All or most samples meet the desired threshold	Many samples meet or are near the desired threshold	Some samples meet or are near desired threshold	Many samples do not meet the desired threshold	Most samples do not meet the desired threshold

### Shields Lake Goals & Status Summary

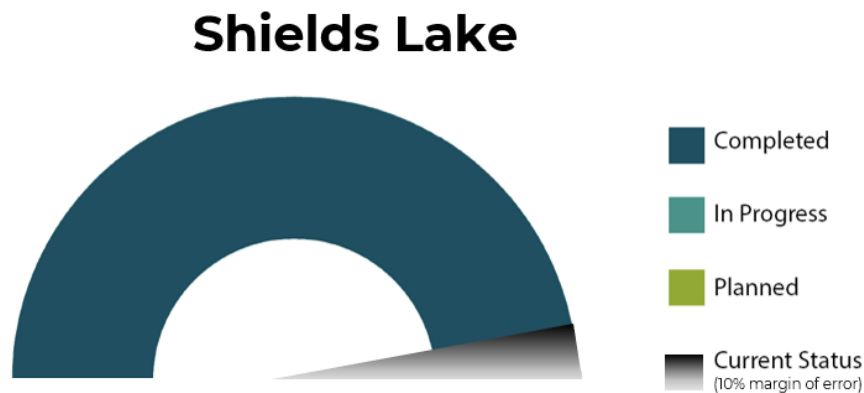
Table 22. Shields Lake Water Quality Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤60 µg/L	48.6 µg/L	Goal achieved
5-Year Average Secchi Depth	≥4.26 ft	5.8 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2024 Shoreland Inventory	≥75% of parcels	94% of parcels	Currently meeting goal

Table 23. Shields Lake Phosphorus Reduction Goals

5226 Shields Lake	Phosphorus Reduction (lb/yr)
Load Reduction to Achieve Long-term Goal of 60 µg/L: (based on 2006-2015 benchmark of 241 µg/L; 10% margin of error = 102 lbs)	1,023
Load reduction progress through 2023	1,023
2024 Remaining Load Reduction (cross-referenced w/ in-lake data and trends)	Goal achieved

### Shields Lake Project Implementation Progress



**Phosphorus Reduction Goal: 1,023 lbs**  
**Progress Toward Goal & State Standards: 100%**

Figure 10. Shields Lake Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: curly-leaf pondweed management in 2019, permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## Shields Lake Progress Toward State Standards

Shields Lake is nutrient impaired for aquatic recreation.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.



**#1 – Water Quality Samples:** Shields Lake meets criterion #1 for de-listing because seasonal averages of at least two years out of the last 10 years meet phosphorus, chlorophyll-a, and Secchi standards. However, state standard exceedances occurred within the last two years, and the 10-year average is still above the state standard; MPCA also considers these factors in delisting evaluations.

Table 24. Shields Lake Water Quality Sample Evaluation

<b>Shields Lake Phosphorus</b>										
Shallow Lake State Standard $\leq 60 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: 129 $\mu\text{g/L}$										
<b>Summer Average</b>	<b>349</b>	<b>194</b>	<b>191</b>	<b>180</b>	<b>128</b>	<b>54</b>	<b>38</b>	<b>27</b>	<b>20</b>	<b>104</b>
Sample 1	358	121	74	222	102	19	27	22	18	99
Sample 2	366	238	170	210	150	45	27	33	16	171
Sample 3	333	317	262	283	212	66	28	32	11	91
Sample 4	346	241	300	201	141	81	25	23	19	66
Sample 5	329	153	203	174	138	75	104	21	24	119
Sample 6	383	128	226	149	93	65	36	36	24	102
Sample 7	303	190	190	122	82	24	51	22	20	114
Sample 8	582	168	118	76	114		23	14	22	72

<b>Shields Lake Secchi</b>										
Shallow Lake State Standard $\geq 3.3$ feet	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: 4.0 ft										
<b>Summer Average</b>	<b>1.9</b>	<b>2.7</b>	<b>2.2</b>	<b>1.9</b>	<b>2.5</b>	<b>3.7</b>	<b>8.4</b>	<b>6.5</b>	<b>5.9</b>	<b>4.5</b>
Sample 1	3.5	5.0	6.5	4.0	5.5	5.9	13.6	7.9	7.5	4.3
Sample 2	1.0	3.0	4.5	0.5	2.0	3.6	14.4	6.6	4.6	3.0
Sample 3	1.5	2.5	1.0	1.0	1.5	5.2	14.4	5.2	6.2	4.3
Sample 4	1.5	2.5	1.0	1.5	3.2	3.3	8.4	5.9	6.6	5.2
Sample 5	1.0	2.0	1.5	1.7	0.5	2.5	2.6	6.9	4.6	4.3
Sample 6	1.0	1.5	1.5	1.5	2.0	2.0	6.6	6.6	3.6	5.6
Sample 7	1.0	2.5	1.0	2.0	2.0	3.6	4.3	7.9	6.9	4.9
Sample 8	1.5	3.5	2.0	3.0	2.5		5.9	6.9	8.9	4.6

<b>Shields Lake Chlorophyll-a</b>										
Shallow Lake State Standard $\leq 20 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: 39 $\mu\text{g/L}$										
<b>Summer Average</b>	<b>77</b>	<b>52</b>	<b>64</b>	<b>67</b>	<b>52</b>	<b>31</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>22</b>
Sample 1	59	22	7	21	25	14	1	9	9	44
Sample 2	120	37	35	160	88	25	2	1	8	21
Sample 3	64	76	160	99	52	13	4	5	4	34
Sample 4	75	82	97	56	28	48	9	7	5	14
Sample 5	86	59	92	68	62	45	9	8	12	28
Sample 6	98	41	55	47	68	58	10	7	6	8
Sample 7	64	51	58	52	73	13	5	5	2	15
Sample 8	126	65	39	36	51		14	5	7	13

**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

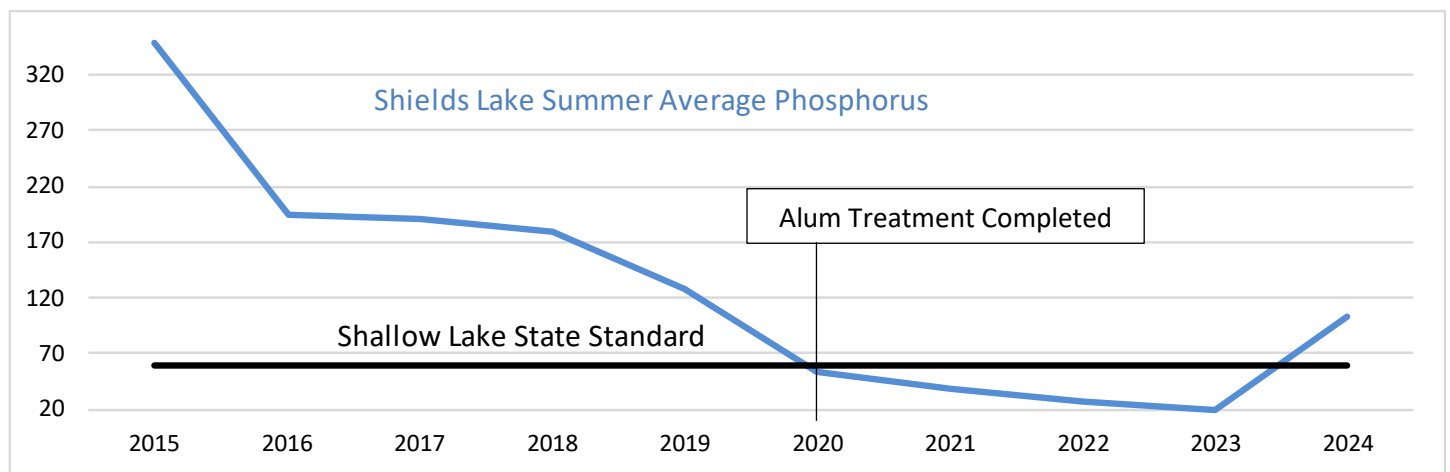
✓ **#2 Trend/Management:**  
 Management activities are in place to maintain improved chlorophyll-a and Secchi observations in Shields Lake. The phosphorus trend is improving. Shields Lake meets criterion #2 for de-listing.

**Trends:**

*Table 25. Shields Lake Trend Evaluation*

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Shields Lake	Significantly Improving Trend Since 1993	Significantly Improving Trend Since 2001	Significantly Improving Trend Since 1993

\*Trends that are not "significantly" improving or declining are not statistically significant.



*Figure 11. Shields Lake Phosphorus Concentration History*

**Management Activities:**

- Stormwater Harvest & Irrigation Reuse System (94 lb/yr phosphorus reduction completed in 2018)
- Whole Lake Alum Treatment (913 lb/yr, completed in 2020 – split application between fall '19 and fall '20)
- Winter Aeration System (upgraded in 2021, operated annually by CLFLWD)
- Downstream Fish Barriers (operated annually by CLFLWD)
- Curly-leaf Pondweed Treatments (performed annually by CLFLWD)
- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)

✓ **Conclusion:**  
 Shields Lake qualifies for de-listing at this time. However, water quality readings are still close to and occasionally exceeding state standards. More years of monitoring data should reflect the improving long-term trends. In all cases, the District would need to undergo a detailed data review with MPCA if it wanted to request delisting.

## 5227 Lake Keewahtin Summary

### Lake Keewahtin 2024 Water Quality Grade: A

Excellent	Good	Average	Marginal	Poor
<b>A</b> All or most samples meet the desired threshold	<b>B</b> Many samples meet or are near the desired threshold	<b>C</b> Some samples meet or are near desired threshold	<b>D</b> Many samples do not meet the desired threshold	<b>F</b> Most samples do not meet the desired threshold

### Lake Keewahtin Goals & Status Summary

Table 26. Lake Keewahtin Water Quality Goals & Status Summary

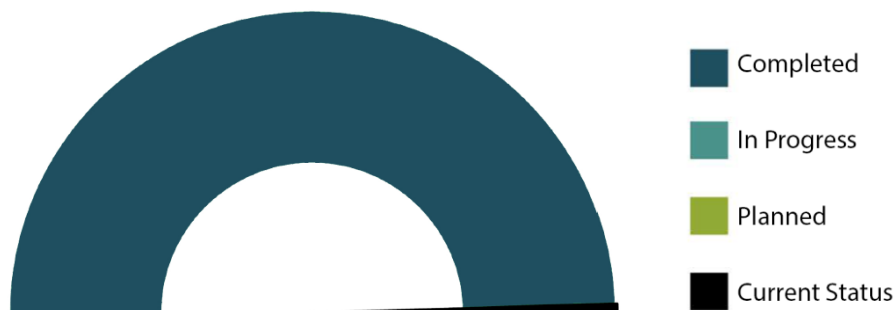
	Long-Term Goal	Current Status*	Remaining
5-Year Average Phosphorus Concentration	≤20 µg/L	14 µg/L	0 lb/yr phosphorus load*
5-Year Average Secchi Depth	≥10 ft	12.7 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline <a href="#">Source: 2016 Shoreland Inventory</a>	≥75% of parcels ≥57 parcels	67% of parcels 50 parcels	8% of parcels 7 parcels

\*Currently meets goal, no further reductions needed until the next round of diagnostic monitoring.

Table 27. Lake Keewahtin Phosphorus Reduction Goals

5227 Lake Keewahtin	Phosphorus Reduction (lb/yr)
Load Reduction to Achieve Long-term Goal of 20 µg/L: (based on 2004 benchmark of 20 µg/L)	0
Load reduction progress through 2023	0
2024 Remaining Load Reduction	0

### Lake Keewahtin Project Implementation Progress



**Reduction Goal: 0 lbs**

**Progress (Completed + In Progress Projects): N/A**

Figure 12. Lake Keewahtin Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: cropland conversion cost-share projects, permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## 5228 Forest Lake Summary

### Forest Lake 2024 Water Quality Grade Average: C

West Basin: B-

Middle Basin: C+

East Basin: C

Excellent	Good	Average	Marginal	Poor
A	B	C	D	F
All or most samples meet the desired threshold	Many samples meet or are near the desired threshold	Some samples meet or are near desired threshold	Many samples do not meet the desired threshold	Most samples do not meet the desired threshold

### Forest Lake Goals & Status Summary

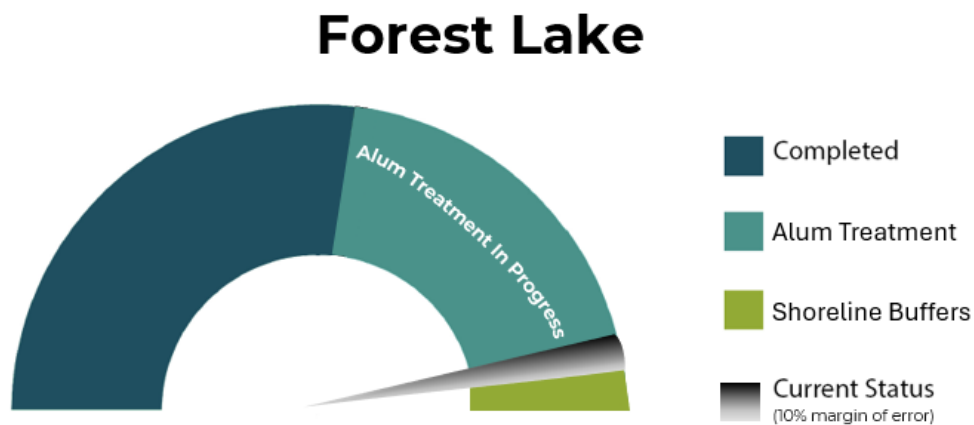
Table 28. Forest Lake Water Quality Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤30 µg/L	24 µg/L	627 lb/yr phosphorus load
5-Year Average Secchi Depth	≥7 ft	6.6 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2023 Shoreland Inventory	≥75% of parcels ≥750 parcels	30% of parcels 300 parcels	45% of parcels 450 parcels

Table 29. Forest Lake Phosphorus Reduction Goals

5228 Forest Lake	Phosphorus Reduction (lb/yr)
Load Reduction to Achieve Long-term Goal of 30 µg/L: (based on 2007-2016 benchmark of 35 µg/L; 10% margin of error = 145 lbs)	1,450
Load reduction progress through 2023	823
2024 Remaining Load Reduction (cross-referenced w/ in-lake data and trends)	627

### Forest Lake Project Implementation Progress



**Phosphorus Reduction Goal: 1,450 lbs**  
**Progress Toward Goal: 56% before alum, 93% after alum**

Figure 13. Forest Lake Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: cost-share projects, educational storm drain stenciling, annual curly-leaf pondweed management, permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## Forest Lake State Standards Status

Forest Lake is **not** nutrient impaired for aquatic recreation, but water quality readings are sometimes close to or exceed the state standard. Forest Lake is impaired for polychlorinated biphenyls (PCBs) in fish tissue.

## Forest West State Standards Status

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.

Table 30. Forest Lake West Water Quality Sample Evaluation

<b>Forest Lake West Phosphorus</b>										
Deep Lake State Standard $\leq 40 \mu\text{g/L}$ 10-Year Average: $28 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Summer Average</b>	<b>37</b>	<b>40</b>	<b>25</b>	<b>37</b>	<b>26</b>	<b>27</b>	<b>24</b>	<b>20</b>	<b>23</b>	<b>25</b>
Sample 1	22	24	22	46	13	21	24	25	30	20
Sample 2	15	29	27	44	23	26	38	22	24	22
Sample 3	42	27	23	35	24	26	19	23	32	25
Sample 4	21	30	28	45	30	38	17	22	24	19
Sample 5	41	35	30	39	38	32	19	20	26	24
Sample 6	39	44	26	31	26	22	19	21	20	30
Sample 7	43	90	21	30	25	32	24	17	15	27
Sample 8	28	45	25	29		19	28	12	24	30

<b>Forest Lake West Secchi</b>										
Deep Lake State Standard $\geq 4.6 \text{ ft}$ 10-Year Average: $6.0 \text{ ft}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Summer Average</b>	<b>4.7</b>	<b>4.3</b>	<b>6.2</b>	<b>4.9</b>	<b>7.1</b>	<b>5.7</b>	<b>7.5</b>	<b>7.3</b>	<b>6.7</b>	<b>5.9</b>
Sample 1	7.5	6.5	6.5	5.0	12.0	8.2	11.2	8.5	4.8	7.5
Sample 2	7.0	5.0	6.5	5.0	7.0	5.6	10.2	9.5	4.6	6.2
Sample 3	6.5	3.5	6.5	4.5	5.0	6.9	6.2	5.9	5.9	5.9
Sample 4	5.0	5.0	5.5	4.5	6.5	5.2	7.9	5.2	5.2	5.6
Sample 5	3.5	4.5	6.5	4.5	5.5	4.8	5.9	6.2	7.2	4.4
Sample 6	3.0	3.5	6.5	5.0	6.0	4.8	5.6	7.5	8.9	4.3
Sample 7	3.0	3.0	6.0	5.5	7.5	4.3	5.1	7.2	11.5	4.3
Sample 8	3.0	4.0	5.5	5.5		6.2	6.7	8.5	8.2	4.3

<b>Forest Lake West Chlorophyll-a</b>										
Deep Lake State Standard $\leq 14 \mu\text{g/L}$ 10-Year Average: $10 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Summer Average</b>	<b>19</b>	<b>19</b>	<b>8</b>	<b>13</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>9</b>	<b>10</b>
Sample 1	5	7	6	13	2	4	2	3	11	4
Sample 2	5	11	8	9	6	4	2	3	13	8
Sample 3	13	14	6	15	8	6	6	5	10	11
Sample 4	16	12	6	15	6	8	7	8	11	5
Sample 5	22	13	8	15	13	10	8	8	8	9
Sample 6	21	23	9	11	9	10	8	7	6	17
Sample 7	29	53	10	12	9	12	11	9	2	17
Sample 8	10	22	9	11		7	6	5	1	18

## Forest Middle State Standards Status

**#1 – Water Quality Samples:** If seasonal averages of the last two years of data (minimum of 8 samples) meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.

Table 31. Forest Lake Middle Water Quality Sample Evaluation

<b>Forest Lake Middle Phosphorus</b>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\leq 40 \mu\text{g/L}$ 10-Year Average: 36 $\mu\text{g/L}$										
<b>Summer Average</b>	<b>35</b>	<b>41</b>	<b>34</b>	<b>35</b>	<b>61</b>	<b>42</b>	<b>36</b>	<b>31</b>	<b>16</b>	<b>29</b>
Sample 1	32	28	27	21	23	23	19	53	11	18
Sample 2	19	23	29	35	97	30	32	33	15	22
Sample 3	22	22	31	25	39	36	31	34	22	23
Sample 4	26	71	25	51	44	58	21	21	19	28
Sample 5	43	40	51	63	103	33	28	30	11	37
Sample 6	31	35	37	28	50	35	38	30	20	40
Sample 7	46	39	35	29	91	56	57	20	15	35
Sample 8	51	65	35	26	41	64	47	29	13	32

<b>Forest Lake Middle Secchi</b>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\geq 4.6 \text{ ft}$ 10-Year Average: 6.7 ft										
<b>Summer Average</b>	<b>6.4</b>	<b>5.7</b>	<b>8.2</b>	<b>7.7</b>	<b>7.1</b>	<b>5.7</b>	<b>6.9</b>	<b>5.0</b>	<b>9.2</b>	<b>5.2</b>
Sample 1	10.0	8.0	13.0	11.0	15.0	12.1	12.8	6.2	8.2	9.2
Sample 2	10.5	6.5	8.0	10.0	12.0	9.5	9.2	5.6	8.9	7.9
Sample 3	9.5	5.5	9.5	7.5	8.0	6.2	6.9	4.4	8.5	7.2
Sample 4	6.5	6.0	9.5	10.0	5.5	3.9	6.6	5.6	6.9	5.2
Sample 5	4.5	6.0	7.5	5.0	4.0	3.6	5.9	4.6	9.2	3.0
Sample 6	4.5	5.0	5.5	6.5	4.0	2.6	5.2	3.6	8.5	3.0
Sample 7	5.0	4.0	6.0	5.5	4.0	3.0	4.9	4.9	15.1	3.3
Sample 8	3.5	5.5	7.0	6.0	4.0	4.3	5.2	5.2	10.2	3.6

<b>Forest Lake Middle Chlorophyll-a</b>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\leq 14 \mu\text{g/L}$ 10-Year Average: 16 $\mu\text{g/L}$										
<b>Summer Average</b>	<b>21</b>	<b>17</b>	<b>13</b>	<b>15</b>	<b>20</b>	<b>24</b>	<b>9</b>	<b>13</b>	<b>5</b>	<b>21</b>
Sample 1	4	6	4	3	1	3	3	2	5	4
Sample 2	6	10	10	10	8	12	1	12	6	5
Sample 3	8	9	9	10	9	15	7	16	4	6
Sample 4	9	12	5	12	14	32	6	16	5	15
Sample 5	24	11	11	33	28	38	7	11	4	33
Sample 6	28	16	23	18	34	30	12	23	10	45
Sample 7	27	29	21	21	32	36	16	11	4	32
Sample 8	38	20	23	12	31	22	11	12	3	24

## Forest East State Standards Status

**#1 – Water Quality Samples:** If seasonal averages of the last two years of data (minimum of 8 samples) meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.

Table 32. Forest Lake East Water Quality Sample Evaluation

<b>Forest Lake East Phosphorus</b>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\leq 40 \mu\text{g/L}$ 10-Year Average: 34 $\mu\text{g/L}$										
<b>Summer Average</b>	<b>28</b>	<b>44</b>	<b>46</b>	<b>36</b>	<b>34</b>	<b>26</b>	<b>34</b>	<b>38</b>	<b>17</b>	<b>33</b>
Sample 1	15	22	18	24	26	19	13	21	26	20
Sample 2	14	22	38	25	28	19	28	46	22	24
Sample 3	14	24	46	30	31	20	50	48	12	22
Sample 4	27	87	44	39	28	32	29	48	13	31
Sample 5	27	26	51	57	28	40	26	35	17	40
Sample 6	40	56	51	28	39	27	41	38	16	42
Sample 7	43	55	53	47	47		38	34	20	45
Sample 8	34	53	65	37	43		43	36	11	37

<b>Forest Lake East Secchi</b>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\geq 4.6 \text{ ft}$ 10-Year Average: 7.1 ft										
<b>Summer Average</b>	<b>7.8</b>	<b>5.7</b>	<b>8.1</b>	<b>6.4</b>	<b>7.3</b>	<b>9.6</b>	<b>8.1</b>	<b>4.7</b>	<b>8.5</b>	<b>4.9</b>
Sample 1	15.0	8.5	14.0	9.0	14.5	11.8	18.0	9.7	6.6	7.7
Sample 2	10.0	8.0	13.0	9.5	12.0	21.3	14.8	5.9	7.9	6.6
Sample 3	12.0	7.5	8.5	7.5	9.0	6.2	6.6	4.6	8.9	6.2
Sample 4	8.0	7.0	6.5	7.5	6.0	5.2	6.6	3.6	9.2	4.9
Sample 5	6.5	5.0	5.5	4.5	4.5	3.6	4.9	3.3	8.2	3.9
Sample 6	5.0	3.0	6.0	4.5	4.5		4.9	3.0	8.2	3.6
Sample 7	5.5	3.5	6.0	4.5	4.0		4.9	3.9	7.2	3.3
Sample 8	4.0	4.5	5.0	4.5	4.0		4.1	3.6	13.8	3.9

<b>Forest Lake East Chlorophyll-a</b>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Deep Lake State Standard $\leq 14 \mu\text{g/L}$ 10-Year Average: 18 $\mu\text{g/L}$										
<b>Summer Average</b>	<b>19</b>	<b>22</b>	<b>23</b>	<b>22</b>	<b>18</b>	<b>14</b>	<b>14</b>	<b>22</b>	<b>7</b>	<b>21</b>
Sample 1	3	5	7	5	3	3	1	3	16	5
Sample 2	8	10	12	9	5	10	12	9	8	8
Sample 3	7	7	15	11	9	9	14	20	6	9
Sample 4	10	13	26	20	13	34	8	32	5	19
Sample 5	17	23	25	45	29		16	20	5	27
Sample 6	34	45	28	31	34		16	32	4	40
Sample 7	22	33	27	33	24		20	26	6	37
Sample 8	34	24	45	25	25		28	32	4	24

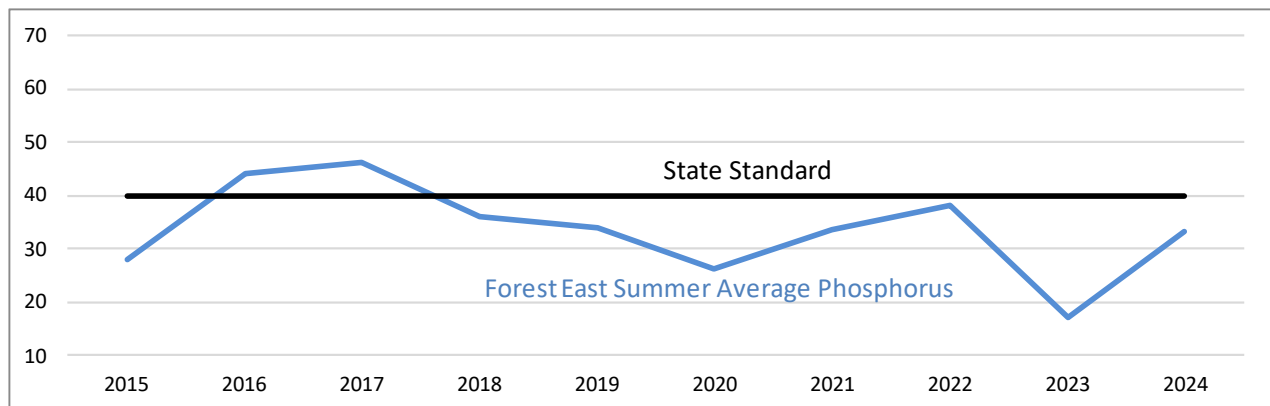
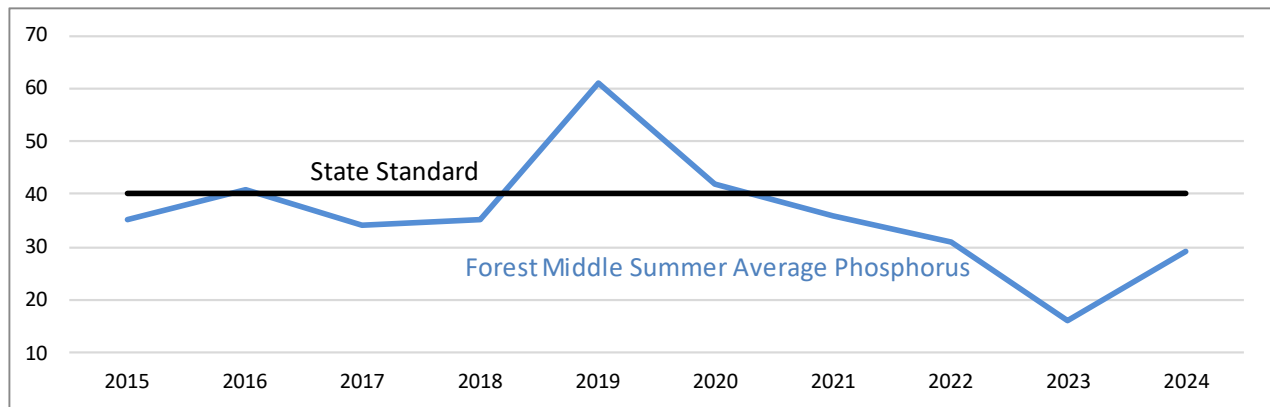
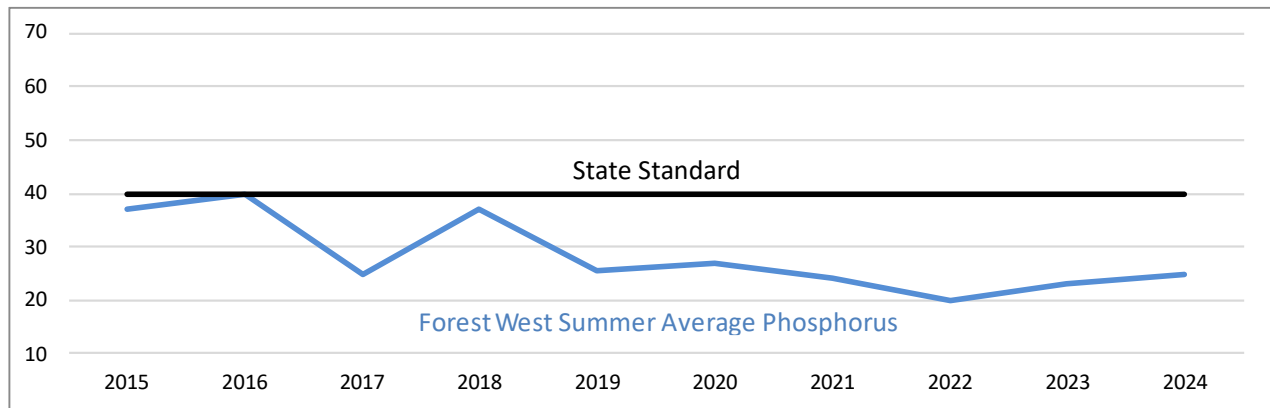
**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

**Trends:**

*Table 33. Forest Lake Trend Evaluation*

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Forest Lake West	Significantly Improving Trend Since 1984	Significantly Improving Trend Since 2001	Improving Trend Since 1984
Forest Lake Middle	Improving Trend Since 2015	Improving Trend Since 2015	Declining Trend Since 2015
Forest Lake East	Improving Trend Since 2015	Improving Trend Since 2015	Declining Trend Since 2015

*\*Trends that are not "significantly" improving or declining are not statistically significant.*



*Figure 14. Forest Lake West, Middle, East Phosphorus Concentration History*

**Management Activities:**

- County Road 50 Iron Enhanced Sand Filter (97 lb/yr phosphorus reduction)
- WJD-6 Wetland Restoration (20 lb/yr phosphorus reduction)
- Shields Lake Improvement Projects (531 lb/yr)
- Hilo Lane Stormwater Retrofit (12 lb/yr phosphorus reduction)
- 3<sup>rd</sup> Lake Pond Wetland Treatment Basin (56 lb/yr phosphorus reduction)
- Enhanced Street Sweeping Program (72 lb/yr)
- Stormwater Management Permits (10 lb/yr)
- Cost-Share Projects (16 lb/yr)
- North Shore Circle Improvements Roadside BMPs (3.4 lb/yr phosphorus reduction)
- Curly-leaf Pondweed Treatment (performed annually by CLFLWD)
- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)
- Additional projects that are currently in-progress or planned for future:
  - Castlewood Agricultural BMPs (estimated 5 lb/yr phosphorus reduction)
  - Direct Drainage Retrofits (estimated phosphorus reduction TBD)
  - Forest Lake Alum Treatment (527 lb/yr)

**Conclusion:**

Forest Lake is **not** nutrient impaired for aquatic recreation, but water quality readings are sometimes close to or exceed the state standard. The District will continue to implement management activities to improve water quality in Forest Lake and monitor in-lake water quality annually.

## 5229 Comfort Lake Summary

### Comfort Lake 2024 Water Quality Grade: C+

Excellent	Good	Average	Marginal	Poor
A	B	C	D	F
All or most samples meet the desired threshold	Many samples meet or are near the desired threshold	Some samples meet or are near desired threshold	Many samples do not meet the desired threshold	Most samples do not meet the desired threshold

### Comfort Lake Goals & Status Summary

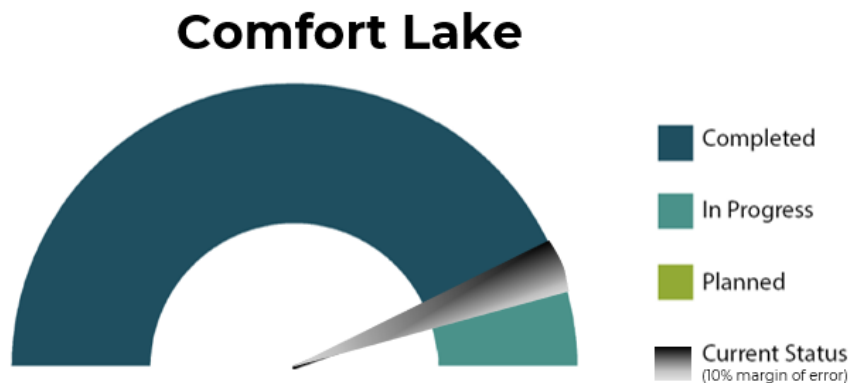
Table 34. Comfort Lake Water Quality Goals & Status Summary

	Long-Term Goal	Current Status	Remaining
5-Year Average Phosphorus Concentration	≤30 µg/L	26.0 µg/L	193 lb/yr phosphorus load
5-Year Average Secchi Depth	≥7 ft	6.4 ft	
10-Year Average Bottom Water Chloride	≤230 mg/L	TBD	TBD
% of Parcels with ≥75% Natural Shoreline Source: 2023 Shoreland Inventory	≥75% of parcels ≥94 parcels	59% of parcels 74 parcels	16% of parcels 20 parcels

Table 35. Comfort Lake Phosphorus Reduction Goals

5229 Comfort Lake	Phosphorus Reduction (lb/yr)
Load Reduction to Achieve Long-term Goal of 30 µg/L: (based on 2004 benchmark of 42 µg/L; 10% margin of error = 83 lbs)	825
Load reduction progress through 2023	697
2024 Remaining Load Reduction (cross-referenced w/ in-lake data and trends)	128

### Comfort Lake Project Implementation Progress



**Phosphorus Reduction Goal: 825 lbs**  
**Progress Toward Goal: 85%**

Figure 15. Comfort Lake Phosphorus Reduction Goals and Project Progress Graph

Additional notable projects: cost-share projects, permitting oversight (e.g., erosion control, stormwater management, and waterbody buffer requirements).

## Comfort Lake Progress Toward State Standards

Comfort Lake is nutrient impaired for aquatic recreation.

**#1 – Water Quality:** If seasonal averages of at least two years (minimum of 8 samples) within the last 10 years meet the total phosphorus standard, and either the Secchi or chlorophyll-a standard, then the lake meets criterion #1 for de-listing.

### #1 – Water Quality Samples:



Comfort Lake meets criterion #1 for de-listing because seasonal averages of at least two years out of the last 10 years meet phosphorus, chlorophyll-a, and Secchi standards. Additionally, the 10-year average is within the state standard. Some state standard exceedances occurred within the last two years, and the MPCA also considers this factor in delisting evaluations.

Table 36. Comfort Lake Water Quality Sample Evaluation

<b>Comfort Lake Phosphorus</b>										
Deep Lake State Standard $\leq 40 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $29 \mu\text{g/L}$										
<b>Summer Average</b>	<b>31</b>	<b>34</b>	<b>33</b>	<b>32</b>	<b>26</b>	<b>31</b>	<b>20</b>	<b>28</b>	<b>16</b>	<b>35</b>
Sample 1	23	16	18	51	57	21	31	26	10	29
Sample 2	14	27	67	20	22	13	44	34	13	71
Sample 3	28	86	27	34	24	17	20	38	25	38
Sample 4	50	28	55	38	20	16	8	25	10	31
Sample 5	38	32	23	24	30	73	12	25	16	32
Sample 6	36	29	23	22	33	45	15	15	22	29
Sample 7	38	29	17		19	30	16	24	17	24
Sample 8	28	27	18		23	18	15	33		26

<b>Comfort Lake Secchi</b>										
Deep Lake State Standard $\geq 4.6 \text{ ft}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $6.2 \text{ ft}$										
<b>Summer Average</b>	<b>5.5</b>	<b>5.5</b>	<b>5.8</b>	<b>7.7</b>	<b>5.3</b>	<b>6.0</b>	<b>8.4</b>	<b>5.9</b>	<b>7.4</b>	<b>4.4</b>
Sample 1	7.5	8.0	7.5	14.0	7.5	6.6	9.8	8.2	5.6	4.9
Sample 2	6.5	6.0	6.5	8.5	6.0	9.5	9.8	6.6	7.9	3.9
Sample 3	4.5	6.5	6.0	7.0	5.5	7.5	8.9	4.6	8.5	4.3
Sample 4	3.0	6.0	4.5	4.5	5.0	5.6	10.2	5.2	7.7	5.2
Sample 5	4.5	3.0	4.5	6.0	4.0	6.0	7.9	4.6	8.0	4.6
Sample 6	4.5	4.5	6.0	6.0	4.5	5.7	9.2	5.9	5.2	3.6
Sample 7	4.5	4.0	5.5		5.5	5.5	6.2	6.9	9.0	3.9
Sample 8	5.0	4.5	6.0		6.0	4.9	5.6	5.6	7.2	4.6

<b>Comfort Lake Chlorophyll-a</b>										
Deep Lake State Standard $\leq 14 \mu\text{g/L}$	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
10-Year Average: $12 \mu\text{g/L}$										
<b>Summer Average</b>	<b>20</b>	<b>16</b>	<b>12</b>	<b>14</b>	<b>16</b>	<b>10</b>	<b>4</b>	<b>10</b>	<b>5</b>	<b>15</b>
Sample 1	10	7	9	4	9	5	4	2	6	8
Sample 2	10	10	1	9	13	7	7	8	3	10
Sample 3	26	9	13	10	21	6	2	16	3	5
Sample 4	27	14	17	33	21	8	1	10	3	15
Sample 5	28	31	13	12	15	16	3	13	8	19
Sample 6	25	22	13	14	27	10	4	8	3	28
Sample 7	26	25	13		20	11	8	8	6	14
Sample 8	24	23	21		15	12	6	13		20

**#2 Trend/Management:** If there is either an improving trend in total phosphorus or management activities in place to maintain improved chlorophyll-a or Secchi observations, then the lake meets criterion #2 for de-listing.

**#2 Trend/Management:**  
 ✓ Phosphorus trend is improving in Comfort Lake. Several management activities are in place to maintain improved chlorophyll-a or Secchi observations in Comfort Lake, but several projects are still in progress. Comfort Lake meets criteria #2 for de-listing, but more management activities are in progress.

**Trends:**

Table 37. Comfort Lake Trend Evaluation

Lake	Total Phosphorus Trend	Chlorophyll-a Trend	Secchi Disk Trend
Comfort Lake	Improving Trend Since 1994	Significantly Improving Trend Since 2001	Significantly Improving Trend Since 1984

\*Trends that are not “significantly” improving or declining are not statistically significant.

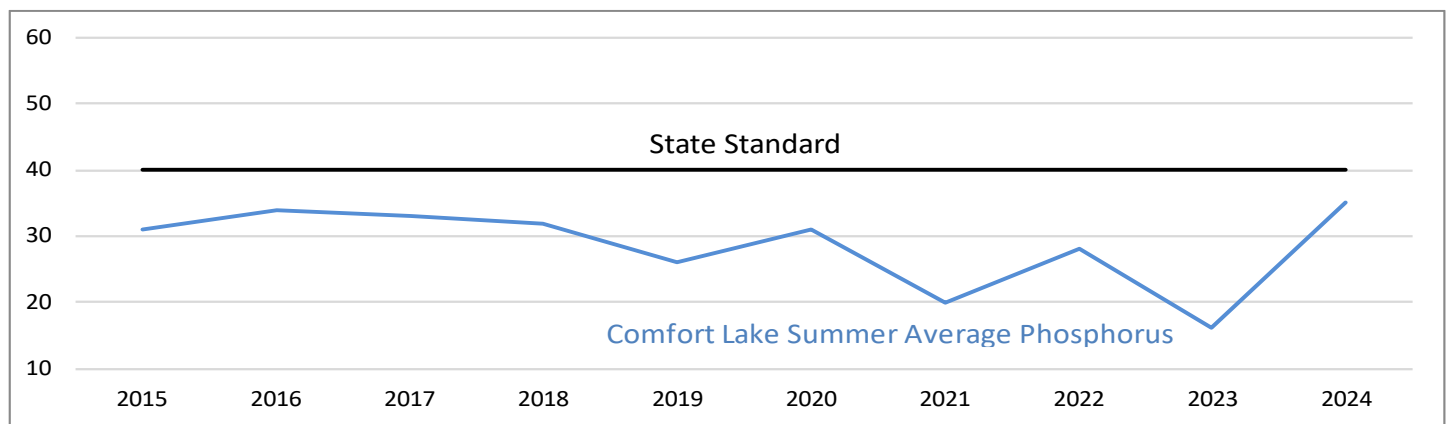


Figure 16. Comfort Lake Phosphorus Concentration History

**Management Activities:**

- Sunrise River/Hwy 61 Wetland Restoration – Chisago Co. Petitioned Project (estimated 65 lb/yr phos. reduction)
- Bixby Park Water Quality Improvement Project – Chisago Co. Petitioned Project (92 lb/yr phosphorus reduction)
- Target Big Box Retrofits (5 lb/yr phosphorus reduction)
- Stormwater Management Permits (43 lb/yr)
- Curly-leaf Pondweed Surveys (annually by CLFLWD, treatment usually not warranted- due to low density growth)
- CLFLWD Rules and Permitting (ongoing program resulting in erosion prevention, stormwater management practices, native buffers, etc. for development projects)
- Additional projects that are currently in-progress or planned for future:
  - Little Comfort Lake Improvement Projects (estimated 64 lb/yr phosphorus reduction)
  - Flood Resiliency Practices and Shoreline Restorations (estimated phosphorus/sediment reduction TBD)

**Sediment Loading**

The District monitors sediment loading at several tributary points entering Comfort Lake each year. Sediment loading is within the normal range for a lake of Comfort Lake’s size and its watershed size.

**Conclusion:**  
 ✓ Comfort Lake qualifies for de-listing at this time. Some water quality readings are still close to and occasionally exceeding state standards, which is a factor to consider in delisting procedures. In all cases, the District would need to undergo a detailed data review with MPCA if it wanted to request delisting.

## 5300 RIVERS & STREAMS

### Rivers & Streams 10-Year (2031) Measurable Goals

- Goal 1:** Adaptively manage District streams to achieve annual total suspended solids (TSS) flow-weighted mean concentrations less than the Ecoregion standard of 30 mg/L.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- Goal 2:** Confirm the headwaters of the Sunrise River.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- Goal 3:** Adaptively manage District streams to achieve stream chloride concentrations less than the State standard of 230 mg/L.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- Goal 4:** Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of streambank parcels have at least 75% natural shoreline condition. Quantified streambank buffer goals will be assessed and established.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

- Goal 5:** Restore abandoned drainage systems to natural conditions (wetlands, bogs, fens, etc.) as opportunity arises.

Priority Ranking by Lake Management District (LMD) <sup>1</sup>	Bone LMD: N/A	Little Comfort LMD: N/A	Forest LMD: N/A	Comfort LMD: N/A
---	---------------	-------------------------	-----------------	------------------

<sup>1</sup>The District Board of Managers chose not to assign a priority ranking for this goal as it will be pursued as opportunity arises.

Table 38. River/Stream Goals and Starting Point

Water Resource	Parameter	2021 Starting Point	10-year (2031) Measurable Goal
Sunrise River	10-Year Mean Total Suspended Solids	TBD <sup>4</sup>	≤30 mg/L
	10-Year Mean Chloride Concentration	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Streambank	TBD <sup>3</sup>	≥75%
Bone-Birch-School-Little Comfort (BBSLC) Tributary	10-Year Mean Total Suspended Solids	TBD <sup>4</sup>	≤30 mg/L
	10-Year Mean Chloride Concentration	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Streambank	TBD <sup>3</sup>	≥75%
Washington Judicial Ditch 6	10-Year Mean Total Suspended Solids	TBD <sup>4</sup>	≤30 mg/L
	10-Year Mean Chloride Concentration	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Streambank	TBD <sup>3</sup>	≥75%
Meadowbrook Tributary	10-Year Mean Total Suspended Solids	TBD <sup>4</sup>	≤30 mg/L
	10-Year Mean Chloride Concentration	TBD <sup>4</sup>	≤230 mg/L
	% of Parcels with ≥75% Natural Streambank	TBD <sup>3</sup>	≥75%

## **Rivers & Streams Progress Evaluation Metrics**

- Stream chloride concentrations and statistical trend analyses.
- Stream total suspended solids flow-weighted mean concentrations and statistical trend analyses.
- Percent of streambank parcels with at least 75% natural shoreline condition.
- District program outputs may include: Number of stream buffer site visits performed, buffer practices installed, grant applications received, applications approved for funding.

## **Rivers & Streams Evaluation in 2024**

- **Goal 1:** Adaptively manage District streams to achieve annual total suspended solids (TSS) flow-weighted mean concentrations less than the Ecoregion standard of 30 mg/L.
  - **2023 Evaluation:** The 2024 water monitoring report includes TSS monitoring.

- **Goal 2:** Confirm the headwaters of the Sunrise River.
  - **2024 Evaluation:** The longest stream reach length and largest drainage area associated with a reach of the Sunrise River is located in the CLFLWD, supporting the idea that the Sunrise River headwaters is in fact located in the CLFLWD.

In 2021 District staff had multiple communications with state agencies on this topic. All of the state agencies indicated that they do not have a procedure for officially naming an area “headwaters.” Staff also corresponded with state agencies and did not find any grant programs that give special consideration to headwaters designations. In 2021 District Engineer, Emmons & Olivier Resources (EOR) conducted a GIS analysis of watercourse length and drainage area of the major tributaries of the Sunrise River to provide supporting data for the determination of the headwaters of the Sunrise River. Washington Judicial Ditch 6 extending south from the east basin of Forest Lake has the longest watercourse length and drainage area of the major tributaries of the Sunrise River. In addition, the Comfort Lake-Forest Lake Watershed recently updated the hydrologic boundary of WJD-6 and determined it extends beyond the MN DNR minor subwatershed layer, further supporting that WJD-6 has the largest drainage area of the major tributaries of the Sunrise River. District staff updated Wikipedia to reflect these findings.

- **Goal 3:** Adaptively manage District streams to achieve stream chloride concentrations less than the State standard of 230 mg/L.
  - **2023 Evaluation:** The 2024 water monitoring report includes chloride monitoring.

- **Goal 4:** Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of streambank parcels have at least 75% natural shoreline condition. Quantified streambank buffer goals will be assessed and established.
  - **2024 Evaluation:** No stream buffers were implemented in 2024. The District continued implementation of both its regulatory permitting program and its voluntary cost-share program in 2024.

- **Goal 5:** Restore abandoned drainage systems to natural conditions (wetlands, bogs, fens, etc.) as opportunity arises.
  - **2023 Evaluation:** The following CLFLWD projects restored ditched wetland systems, improved natural hydrology, and restored native plant communities:
    - Southeast Meadowbrook Wetland Restoration: located on a ditched tributary system flowing to Bone Lake, completed in 2021.
    - Sunrise River/Highway 61 (Tax Forfeit) Wetland Restoration: located on a ditched tributary system flowing to the Sunrise River and Comfort Lake, completed in 2023.
    - WJD-6 Wetland Restoration: Located along a tributary to the Washington Judicial Ditch 6 (WJD-6), completed in 2024.

# 5400 WETLANDS

## Wetlands 10-Year (2031) Measurable Goals

- **Goal 1:** Restore or enhance at least 400 acres of wetlands that support water quality treatment.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 2:** Restore or enhance at least 200 acres of wetlands to support flood attenuation and storage.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 3:** Preserve existing wetland buffers and encourage the establishment of buffers for water quality and habitat benefits through District Programs.

Priority Ranking by Lake Management District (LMD)	Bone LMD: High	Little Comfort LMD: High	Forest LMD: High	Comfort LMD: High
--	----------------	--------------------------	------------------	-------------------

- **Goal 4:** Restore or enhance at least 80 acres of wetlands to support wildlife habitat and recreational opportunities.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

## Wetlands Progress Evaluation Metrics

- Acres of wetland restoration or enhancement that support water quality treatment, flood attenuation and storage, and wildlife habitat and recreational opportunities.
- District program outputs may include: number of wetland buffer permits issued and cost-share grants awarded.

## Wetlands Evaluation in 2024

- **Goal 1:** Restore or enhance at least 400 acres of wetlands that support water quality treatment.
  - **2024 Evaluation:** The following projects result in wetland restoration to support water quality treatment:
    - Sunrise River/Highway 61 (Tax Forfeit) Wetland Restoration: 22.1 ac
    - Bone Lake Northeast Legacy Wetland Restoration: 2.0 ac
    - WJD-6 Wetland Restoration: 3.7 ac
    - Moody Lake Capstone Projects: 0.5 ac
    - **TOTAL: 28.3 ac**
- **Goal 2:** Restore or enhance at least 200 acres of wetlands to support flood attenuation and storage.
  - **2024 Evaluation:** The following projects result in wetland restoration to support flood attenuation and storage:
    - Sunrise River/Highway 61 (Tax Forfeit) Wetland Restoration: 22.1 ac
    - Bone Lake Northeast Legacy Wetland Restoration: 2.0 ac
    - WJD-6 Wetland Restoration: 3.7 ac
    - Moody Lake Capstone Projects: 0.5 ac
    - **TOTAL: 28.3 ac**
- **Goal 3:** Preserve existing wetland buffers and encourage the establishment of buffers for water quality and habitat benefits through District Programs.

**2024 Evaluation:** In 2024 the District issued two wetland buffer permits (permit numbers #22-043 and #22-010) which will result in 8.5 total acres of restored/protected wetland buffer. The District received one new wetland buffer permit application in 2024, which is still in the application review process. The District continued implementation of both its regulatory permitting program and its voluntary cost-share program in 2024.

- **Goal 4:** Restore or enhance at least 80 acres of wetlands to support wildlife habitat and recreational opportunities.
  - **2024 Evaluation:** The following projects result in wetland restoration to support wildlife habitat:
    - Sunrise River/Highway 61 (Tax Forfeit) Wetland Restoration: 22.1 ac
    - Bone Lake Northeast Legacy Wetland Restoration: 2.0 ac
    - WJD-6 Wetland Restoration: 3.7 ac
    - Moody Lake Capstone Projects: 0.5 ac
    - **TOTAL: 28.3 ac**

## 5500 UPLAND RESOURCES

### Upland Resources 10-Year (2031) Measurable Goals

- **Goal 1:** Partner with municipalities to establish at least 1 new natural park open space within a LMD priority area (see LMD profiles).

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

- **Goal 2:** Establish partnerships with agencies and municipalities within 1 greenway corridor in the District as identified in the Greenway Corridor Visioning and Assessment (5120B).

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

### Upland Resources Progress Evaluation Metrics

- Establishment of at least 1 new park open space.
- Establishment of partnerships with agencies and municipalities within at least 1 continuous greenway corridor.
- Annual coordination meeting with partnering agencies and municipalities to discuss upland forest cover protection.

### Upland Resources Evaluation in 2024

- **Goal 1:** Partner with municipalities to establish at least 1 new natural park open space within a LMD priority area (see LMD profiles).
  - **2024 Evaluation:** North Shore Trail Nature Area - In 2022 the District acquired a 19-acre parcel with shoreline frontage on the north side of Forest Lake’s east basin (“3<sup>rd</sup> Lake”). The parcel contains approximately 2-3 acres of mature forested upland, 16 acres of wetland and over 3,000 feet of undeveloped shoreline, all of which provide significant habitat for a variety of terrestrial and aquatic species. Now under public ownership, this parcel may be utilized as a natural park open space within the Forest Lake Management District. In 2024, the District partnered with Great River Greening to use an Environment and Natural Resources Trust Fund grant to restore natural vegetation on the property.
- **Goal 2:** Establish partnerships with agencies and municipalities within 1 greenway corridor in the District as identified in the Greenway Corridor Visioning and Assessment (5120B).
  - **2023 Evaluation:** The District held several meetings with cities and counties regarding greenway corridor visioning in recent years. The 2024 Floodplain Vulnerability Assessment will provide additional direction for this effort by prioritizing sites for flood storage. This effort will dovetail with the greenway visioning and help identify sites that achieve multiple benefits.

# 5600 GROUNDWATER

## Groundwater 10-Year (2031) Measurable Goals

- **Goal 1:** Implement best management practices to protect groundwater (drinking water) from nitrate contamination in three areas of high aquifer vulnerability in order to maintain or improve groundwater quality.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

- **Goal 2:** Complete a groundwater dependent natural resource (GDNR) inventory.

Priority Ranking by Lake Management District (LMD)	Bone LMD: Medium	Little Comfort LMD: Medium	Forest LMD: Medium	Comfort LMD: Medium
--	------------------	----------------------------	--------------------	---------------------

## Groundwater Progress Evaluation Metrics

- Number of best management practices implemented to protect groundwater (drinking water) from nitrate contamination in three areas of high aquifer vulnerability.
- Number of groundwater dependent natural resources (GDNRs) with groundwater supply as baseflow protected through District programs or projects.
- Number of GDNRs protected from degradation through District programs or projects.

## Groundwater Evaluation in 2024

- **Goal 1:** Implement best management practices to protect groundwater (drinking water) from nitrate contamination in three areas of high aquifer vulnerability in order to maintain or improve groundwater quality.
  - **2023 Evaluation:** The District’s cost-share program offers financial and technical assistance for landowners to protect and conserve groundwater. Cropland conversion projects result in reduced nitrogen inputs from not using fertilizer, reduced sediment runoff due to the perennial vegetation stabilizing the soil, and carbon sequestration.

Groundwater protection projects between 2022-2024 included:

- **Bone Lake Cropland Conversion:** Maintained 30 acres of cropland conversion to perennial cover. In addition to groundwater protection, this project reduces phosphorus loading by 34 lbs/yr.
- **Lake Keewahtin Hay/Pasture Planting:** Provided technical assistance for the conversion of 31 acres of cropland to hay and forage production. In addition to groundwater protection, this project is estimated to reduce 5.6 lbs/yr phosphorus and 3.27 tons/yr total suspended solids.
- **Lake Keewahtin Prairie Planting:** Converted 1 acre of row crops to conservation cover. In addition to groundwater protection, this project is estimated to reduce 1.2 lbs/yr phosphorus and 0.6 tons/yr total suspended solids.
- **Heims Lake Irrigation Control System:** This project is estimated to reduce groundwater consumption by 300,000 gallons/yr.
- **Shields Lake Irrigation Reuse:** Partnered with Forest Hills Golf Club to maintain the stormwater harvest and irrigation reuse system, reducing groundwater consumption by up to 26 million gallons/yr.

- **Goal 2:** Complete a groundwater dependent natural resource (GDNR) inventory.
  - **2024 Evaluation:** This activity was completed in 2023 including mapping of groundwater elevation contours and groundwater dependent lakes, wetlands, streams and springs.

# APPENDICES

## Appendix A - Clean Water Fund Grant Awards (FY 2014-2025)

(Grant program from 2008 MN constitutional amendment. Projects and Practices category only.)

	Organization	Total Projects and Practices Grants Awarded (FY 2014-2025)
1	<b>Comfort Lake-Forest Lake WD</b>	<b>\$6,656,334</b>
2	Becker SWCD	\$5,233,710
3	Benton SWCD	\$3,658,210
4	Bois de Sioux WD	\$3,355,010
5	Crow Wing SWCD	\$3,335,000
6	Coon Creek WD	\$3,094,023
7	Vermillion River JPB/JPO	\$3,023,950
8	Chisago SWCD	\$2,952,500
9	Rice Creek WD	\$2,732,104
10	Anoka Conservation District	\$2,477,200
11	Stearns SWCD	\$2,369,737
12	Pope SWCD	\$2,361,300
13	Shingle Creek WMC	\$2,057,550
14	Red Lake SWCD	\$2,042,261
15	Bassett Creek WMC	\$1,900,000
16	Capitol Region WD	\$1,835,000
17	Douglas SWCD	\$1,666,908
18	City of Anoka	\$1,662,146
19	Pomme de Terre River Association	\$1,635,325
20	Wilkin SWCD	\$1,541,000
21	Buffalo-Red River WD	\$1,500,000
22	Lower Mississippi River WMO	\$1,472,000
23	Pelican River WD	\$1,470,108
24	Minnehaha Creek WD	\$1,400,240
25	Okabena-Ocheda WD	\$1,398,312

	Organization	Total Projects and Practices Grants Awarded (FY 2014-2025)
26	Middle St. Croix River WMO	\$1,370,450
27	Carlton SWCD	\$1,341,444
28	Dakota County	\$1,295,724
29	Dakota SWCD	\$1,285,000
30	Pennington SWCD	\$1,255,142
31	Valley Branch WD	\$1,216,000
32	Cedar River WD	\$1,208,000
33	Middle Fork Crow River WD	\$1,176,250
<b>34</b>	<b>City of Forest Lake</b>	<b>\$1,107,000</b>
35	Scott SWCD	\$1,101,430
36	Prior Lake-Spring Lake WD	\$1,082,675
37	Redwood-Cottonwood Rivers Contr	\$1,048,880
38	Carnelian-Marine-St. Croix WD	\$996,481
39	Isanti SWCD	\$950,055
40	Wright SWCD	\$928,375
41	Brown's Creek WD	\$927,950
42	Martin County	\$882,000
43	Pioneer-Sarah Creek WMC	\$821,000
44	Clearwater River WD	\$812,906
45	Fillmore SWCD	\$804,385
46	Mississippi WMO	\$800,000
47	Renville SWCD	\$773,133
48	Nine Mile Creek WD	\$750,000
49	Todd SWCD	\$745,260
50	Wild Rice WD	\$700,000
	<b>Total</b>	<b>\$88,209,468</b>

WD = Watershed District      SWCD = Soil and Water Conservation District      CA = Control Area  
WMB = Watershed Management Board      WMC = Watershed Management Commission      WMO = Watershed Management Org.

CLFLWD assisted the City of Forest Lake with its FY18 CWF grant proposal for Forest Lake Enhanced Street Sweeping Implementation (award = \$220,000) by performing the comprehensive street sweeping study and report in 2017 and assisting with the FY18 grant proposal and work plan. CLFLWD also assisted the City of Forest Lake with its FY17 CWF grant proposal for Forest Lake High School Stormwater Reuse (award = \$505,000) by performing initial coordination with the Forest Lake High School and project engineers.

## Appendix B – Project Implementation Update

Projects are color-coded by lake management district: *green = Bone Lake, yellow = Little Comfort Lake, pink = Forest Lake, purple = Comfort Lake*

Project Phases:

- Phase 0. Not Started
- Phase 1. Planning
- Phase 2. Feasibility
- Phase 3. Design
- Phase 4. Implementation
- Phase 5. Operations & Maintenance (O&M)

Project Name 2024 Active Projects	Project Description	Project Outcomes/Outputs Phosphorus (P), Sediment, Storage, Restored Feet/Acres	Progress Update Project Phase as of 12/31/24
District-Wide Shoreline Restoration Program	Utilizes public-private partnerships to implement a shoreline buffer restoration program to prevent erosion, improve water quality, and improve habitat on lakeshore properties.	Restore at least 75% of shoreline buffers on priority District lakes to achieve multiple benefits.  Moody Lake: Currently meets goals Birch Lake: Currently meets goals School Lake: Currently meets goals Shields Lake: Currently meets goals Bone Lake: 3,300 ft to restore Forest Lake: 30,300 ft to restore Comfort Lake: 1,900 ft to restore	Multiple Projects In Progress  Shoreline inventories completed for Bone, Forest, Comfort, Moody, Birch, School, and Shields Lakes. Inventories for Little Comfort Lake and Lake Keewahtin slated for 2025.  Implement CLFLWD Education & Outreach, Cost-Share, Interagency Communication, and Permitting programs to implement shoreline restoration and protection projects.
District-Wide Floodplain Vulnerability Assessment	Identify and evaluate flood risk and vulnerabilities within the watershed. Prioritize flood resiliency projects and practices.	Flood volume storage and other benefits to be determined.	Phase 1. Planning  The District made progress on its floodplain vulnerability assessment in 2024 and will complete a prioritized action plan in 2025.

Project Name 2024 Active Projects	Project Description	Project Outcomes/Outputs Phosphorus (P), Sediment, Storage, Restored Feet/Acres	Progress Update Project Phase as of 12/31/24
Moody Lake Capstone Projects	Target projects to achieve the remaining phosphorus load reduction to Moody Lake in order for Moody Lake to maintain long-term water quality goals. Projects include: excavation of phosphorus-laden soils, raingarden and other park improvements, wetland dredging, and agricultural best management practices.	To Moody Lake: 60 lb/yr P reduction 2,140 lb/yr sediment reduction  Storage added: 1.3 acre-ft  Wetland restored: 0.5 acres	Phase 4. Implementation  Completed construction of 3 out of 4 best management practices in 2024: Moody Lake South Wetland Restoration, Round Barn Soil Excavation, and Park Improvements. The fourth and final element of the project, Moody Lake Agricultural Best Management Practices, will be completed in 2025.
Bone Lake South Property Acquisition	Phase 1: Purchase property south of Bone Lake containing 119 acres of wetland and 110 acres of restorable upland habitat.  Phase 2: Restore wetland and upland.	Potential outcomes: P/TSS removal: TBD Storage added: up to 300 ac-ft Wetland restored: up to 119 acres Upland restored: up to 110 acres	Phase 1. Planning  Landowner discussions regarding acquisition in progress. Lessard-Sams OHF and Conservation Partners Legacy grants have been awarded.
Heath Iron Enhanced Sand Filter	Implement an iron enhanced sand filter project to address nutrient loading from the Heath Avenue subwatershed, which is one of the major pollutant loading sources to Little Comfort Lake.	To Little Comfort Lake: 86 lb/yr P reduction	Phase 3. Design  FY25 Clean Water Fund grant awarded and executed. Project feasibility complete. Project design and land acquisition underway. Project completion by end of 2027.
School Lake Agricultural Practices	Address nutrient loading from an agricultural operation draining to School Lake, which ultimately flows to Little Comfort Lake. This project entails livestock waste management and cover crops.	To School Lake: 61 lb/yr P reduction 117,000 lb/yr sediment reduction 184 lb/yr nitrogen reduction	Phase 4. Implementation  Grant application awarded. Landowner coordination and project design in 2024. Implementation of livestock waste management BMPs began in 2024.

Project Name 2024 Active Projects	Project Description	Project Outcomes/Outputs Phosphorus (P), Sediment, Storage, Restored Feet/Acres	Progress Update Project Phase as of 12/31/24
Washington Judicial Ditch 6 Western Tributary Wetland Restoration	Restore wetland including sediment excavation and vegetation rehabilitation. The current wetland condition is partially drained by a small private ditch that flows into WJD-6 and eventually into Forest Lake, and 100% dominated by a monotype of reed canary grass.	To Forest Lake: 20 lb/yr P reduction 3,200 lb/yr sediment reduction  Storage added: 8.7 acre-ft  Wetland restored: 3.7 acres	Phase 4. Implementation  Project construction completed in 2024. Informational project signage underway and will be completed in 2025.
Forest Lake Alum Treatment	Apply alum to Forest Lake's middle basin to treat internal phosphorus loading. Results from the treatment will be realized in all three basins.	To Forest Lake: 527 lb/yr P reduction	Phase 4. Implementation  First of two split-dose alum treatments was completed in 2023. Effectiveness monitoring and dose calibration completed in 2024. Second and final dose slated for 2025.
North Shore Trail Nature Area Restoration	Preserve and restore native vegetation on a CLFLWD-owned public property adjacent to Forest Lake's 3 <sup>rd</sup> basin.	Buckthorn removal/management, hazard tree removal and brush pile disposal, tree and shrub planting, prescribed burn, pollinator seeding and planting.	Phase 4. Implementation  Restoration work in progress in partnership with Great River Greening. Vegetation management will take multiple years.
Forest Lake Public Shoreline Restorations	Partner with the City of Forest Lake to restore natural shoreline buffers on city-owned shoreline properties.	Shields Lake Park: 65 feet of shoreline restored with a 10-ft wide native planting buffer completed in 2023.  Forest Lake North Shore Circle Park: 100 feet of shoreline restored with a 20-ft wide native planting buffer in progress.	Phase 3. Design  North Shore Circle City Park Shoreline Restoration project design in 2024. Project agreement between CLFLWD and City of Forest Lake to be executed, and project construction to occur in 2025.

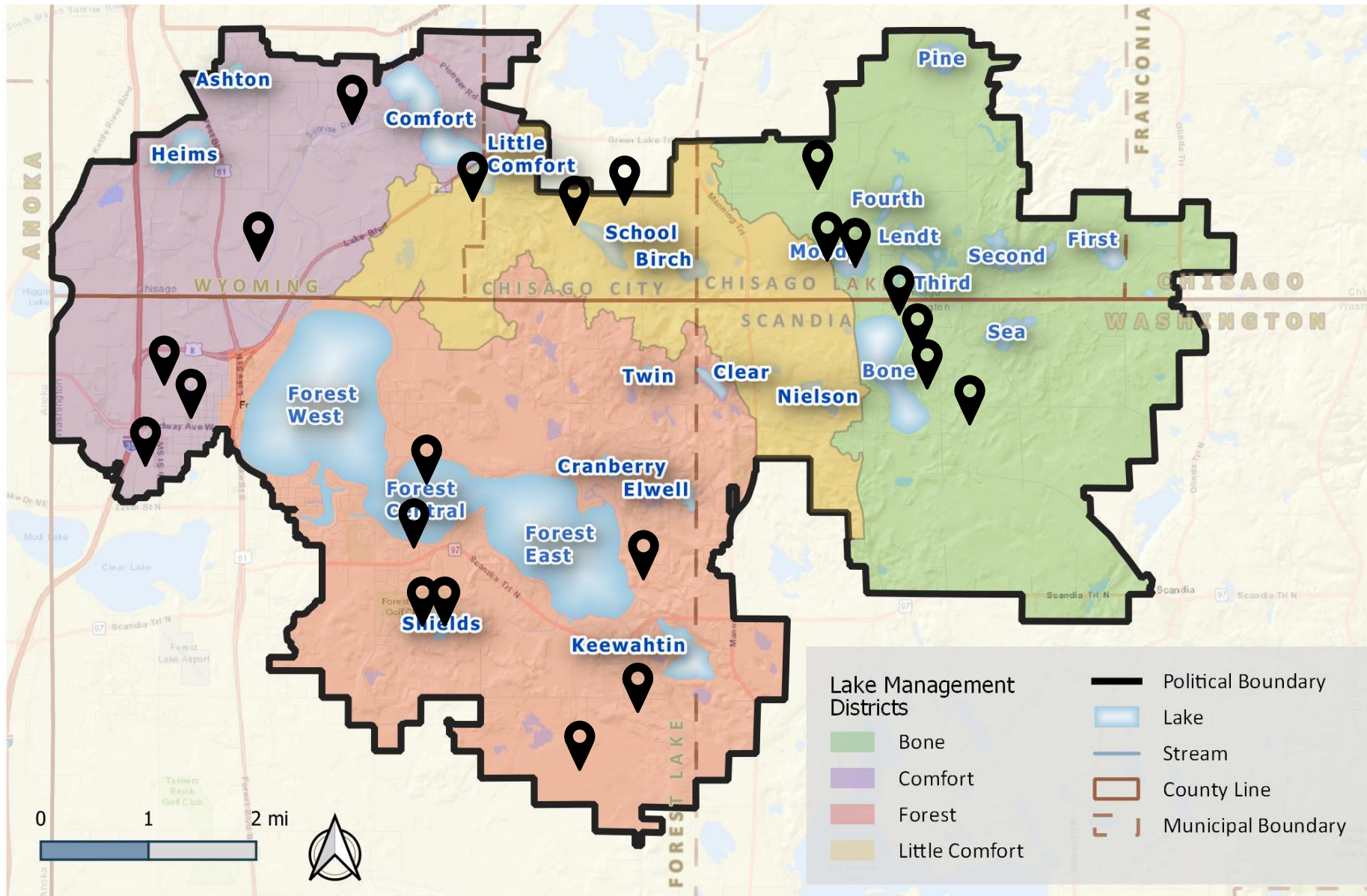
Project Name 2024 Active Projects	Project Description	Project Outcomes/Outputs Phosphorus (P), Sediment, Storage, Restored Feet/Acres	Progress Update Project Phase as of 12/31/24
Forest Lake Enhanced Street Sweeping Plan and Implementation	CLFLWD created a comprehensive street sweeping plan to quantify and optimize phosphorus removal. City of Forest Lake implements the Enhanced Street Sweeping Plan by utilizing a newly purchased a vacuum sweeper and hiring in-house staff to operate it according to frequencies identified in the plan.	<p>Estimated reductions, by lake subwatershed, based on actual 2019 sweeping data. Reductions achieved at the lake are estimated to be approximately 50% of reductions achieved at the source (sweeper).</p> <p>Reductions achieved at the sweeper:            Forest Lake: 143 lb/yr P            Forest Lake: 381,648 lb/yr solids</p> <p>Shields Lake: 11 lb/yr P            Shields Lake: 32,802 lb/yr solids</p> <p>Keewahtin Lake: 2 lb/yr P            Keewahtin Lake: 4,831 lb/yr solids</p> <p>Comfort Lake: 65 lb/yr P            Comfort Lake: 154,814 lb/yr solids</p>	<p>Phase 5. Operations &amp; Maintenance</p> <p>City of Forest Lake continued street sweeper operation in 2024. This program received two awards in 2022: League of Minnesota Cities City of Excellence Award, and Comfort Lake-Forest Lake WD's Watershed Champion Award.</p>

Project Name 2024 Active Projects	Project Description	Project Outcomes/Outputs Phosphorus (P), Sediment, Storage, Restored Feet/Acres	Progress Update Project Phase as of 12/31/24
Regional Stormwater Treatment Facility	Construct a regional stormwater treatment facility to treat runoff from urban areas and increase floodplain storage. The City of Forest Lake contains the most concentrated urban portion of the District which drains to Comfort Lake and is the top priority for implementation.	To Comfort Lake: TBD  Storage added: TBD	Phase 2. Feasibility  Continued coordinating this project closely with the City of Forest Lake. Several potential projects have been identified. Additional feasibility and coordination with the City of Forest Lake is necessary prior to continuing on to project design.
Wyoming Enhanced Street Sweeping	CLFLWD created a comprehensive street sweeping plan to quantify and optimize phosphorus removal. 2023 marked the first year the City of Wyoming implemented the Enhanced Street Sweeping Plan utilizing its own sweeper.	To Comfort Lake: 5-10 lb/yr P removal 5,000-10,000 lb/yr sediment	Phase 5. Operations & Maintenance  City of Wyoming continued implemented street sweeping plan in 2024. City has 3-year funding agreement with Lower St. Croix Watershed Partnership.
Goodwin Avenue Stormwater Wetland	Restore approximately half an acre of wetland and expand a stormwater pond located adjacent to the Sunrise River, treating runoff from a 20-acre developed residential drainage area.	To Comfort Lake: 5.0 lb/yr P removal 1,424 lb/yr sediment removal  Wetland restored: 0.5 acres	Phase 1. Planning  Coordinated with City of Wyoming to plan project in 2024. Applied for grant funding in 2025 and will proceed with project design if grant is awarded.

# Appendix C – Portfolio of Completed & In-Progress Projects



Date: 1/28/2021 9:26am Author: Modeler  
Document Path: X:\Clients\_WD\00376\_CLFLWD\0179\_2022\_WMP\_Update\09\_GIMS\_Project\name\GIS\RM\_WMP\_CLFL.qgz

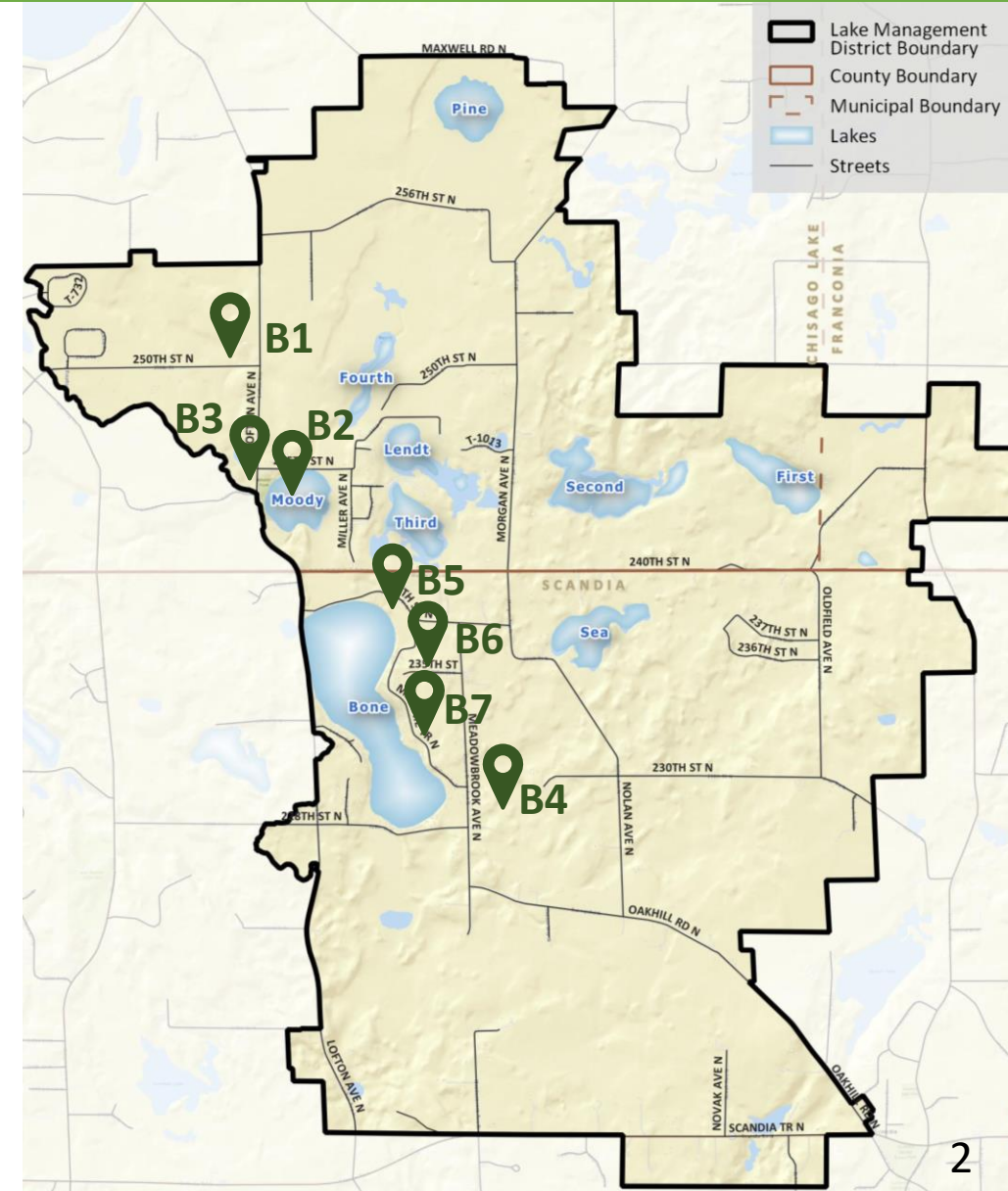


This appendix summarizes programs and projects undertaken by the District and its partners. It is not an exhaustive list of all projects and practices within the watershed, but is merely a summary of some of the activities resulting in significant progress toward nutrient reduction goals.

# Bone Lake Management District Completed & In Progress Projects



Completed and In-Progress Projects	Outcomes at Moody or Bone Lake (reductions)	Outcomes at Edge of Project (reductions)
B1: Moody Wetland Rehabilitation - Completed	455 lb/yr phosphorus (P) 457,120 lb/yr total suspended solids (TSS)	455 lb/yr P 457,120 lb/yr TSS
B2: Moody Lake Alum Treatment - Completed	324 lb/yr P	324 lb/yr P
B3: Moody Lake Capstone Projects – In Progress	60 lb/yr P 2,140 lb/yr TSS	60 lb/yr P 2,140 lb/yr TSS
B4: Bone Lake Southeast Drained Wetland Restorations - Completed	35 lb/yr P 324,640 lb/yr TSS	35 lb/yr P 324,640 lb/yr TSS
B5: Bone Lake Northeast Legacy Wetland Restoration – Completed	15 lb/yr P	15 lb/yr P
B6: Melanie Trail Cropland Conversion – Ongoing	34 lb/yr P 27,600 lb/yr TSS	34 lb/yr P 27,600 lb/yr TSS
B7: Melanie Trail Roadside Practices – Completed	2 lb/yr P	2 lb/yr P
Fish Barriers & Rough Fish Harvest – Completed	Necessary to maintain water quality	Necessary to maintain water quality
Moody/Bone Ag Practices – In Progress	83 lb/yr P 177,293 lb/yr TSS	147 lb/yr P 314,000 lb/yr TSS
<b>TOTAL</b>	1,010 lb/yr P or 504,900 lbs of algae growth	910 lb/yr P



\*Many projects result in multiple additional benefits such as wildlife habitat and flood storage creation.

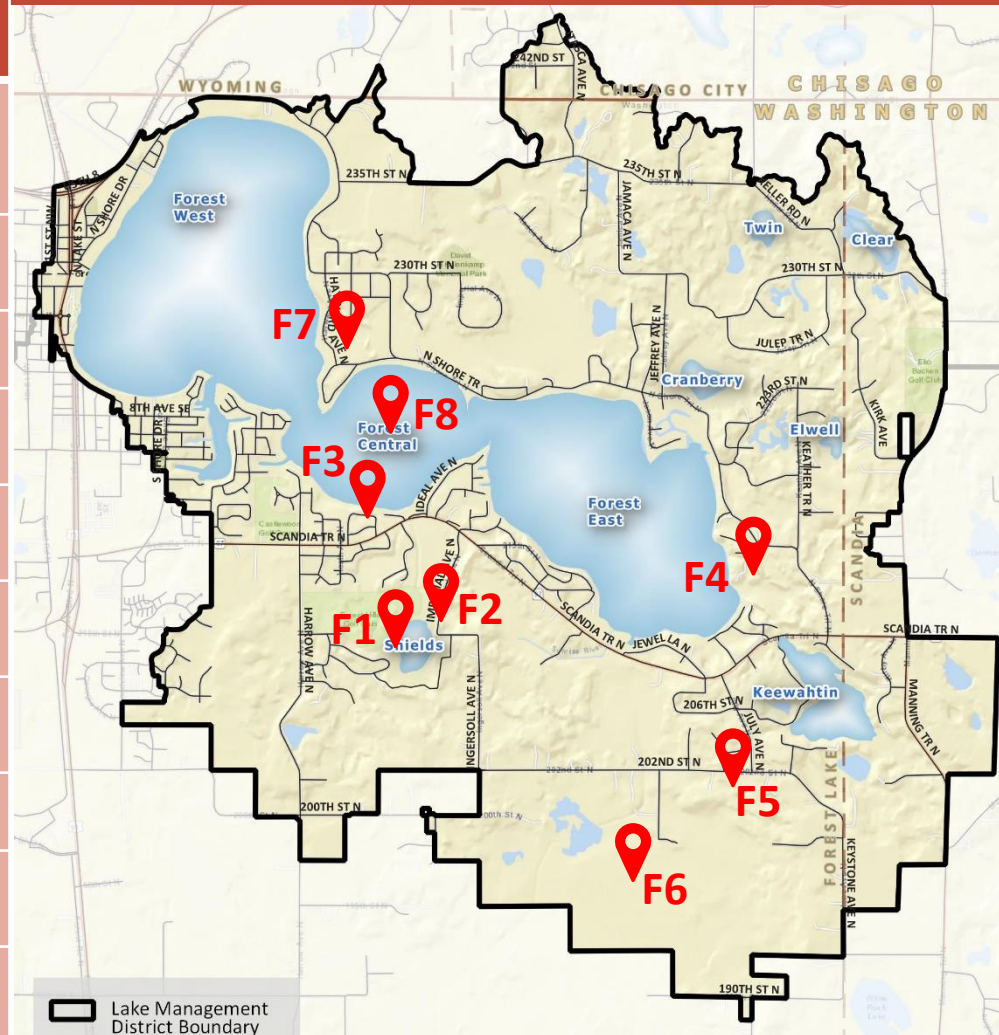
\*Literature values indicate 1 lb of phosphorus can support up to 500 lbs of algae growth.

\*See TSS Footnotes slide after project summary slides.

# Forest Lake Management District Completed and In Progress Projects



Completed and In Progress Projects	Outcomes at Forest Lake (reductions)	Outcomes at Edge of Project (reductions)
F1: Shields Lake Stormwater Reuse & Alum - Completed	531 lb/yr phosphorus (P) to Forest Lake	1,000 lb/yr P to Shields Lake (edge of project) 185 lb/yr TSS
F2: Shields Lake Fish Barrier, Aerator, Shoreline Restoration - Completed	Necessary to maintain water quality	Necessary to maintain water quality
F3: Hilo Lane Stormwater Retrofit - Completed	12 lb/yr P	12 lb/yr P
F4: 3 <sup>rd</sup> Lake Pond Restoration - Completed	56 lb/yr P 1,696 lb/yr TSS	56 lb/yr P 1,696 lb/yr TSS
F5: CR50 Iron Enhanced Sand Filter – Completed	97 lb/yr P 3,000 lb/yr TSS	97 lb/yr 6,000 lb/yr TSS
F6: Washington Judicial Ditch 6 Wetland Restoration – Completed	20 lb/yr P 5,558 lb/yr TSS	20 lb/yr 5,558 lb/yr TSS
F7: N. Shore Circle BMPs (City Forest Lk) – Completed N. Shore Circle Shoreline Restoration – In Progress	6 lb/yr P	6 lb/yr P
F8: Forest Lake Alum Treatment – In Progress	527 lb/yr P	527 lb/yr P
Enhanced Street Sweeping – Ongoing	≤ 72 lb/yr P ≤ 190,824 lb/yr sediment	143 lb/yr P 381,648 lb/yr sediment
<b>TOTAL**</b>	1,321 lb/yr P or 660,300 lbs of algae	1,745 lb/yr P



\*Many projects result in multiple additional benefits such as wildlife habitat and flood storage creation.

\*Literature values indicate 1 lb of phosphorus can support up to 500 lbs of algae growth.

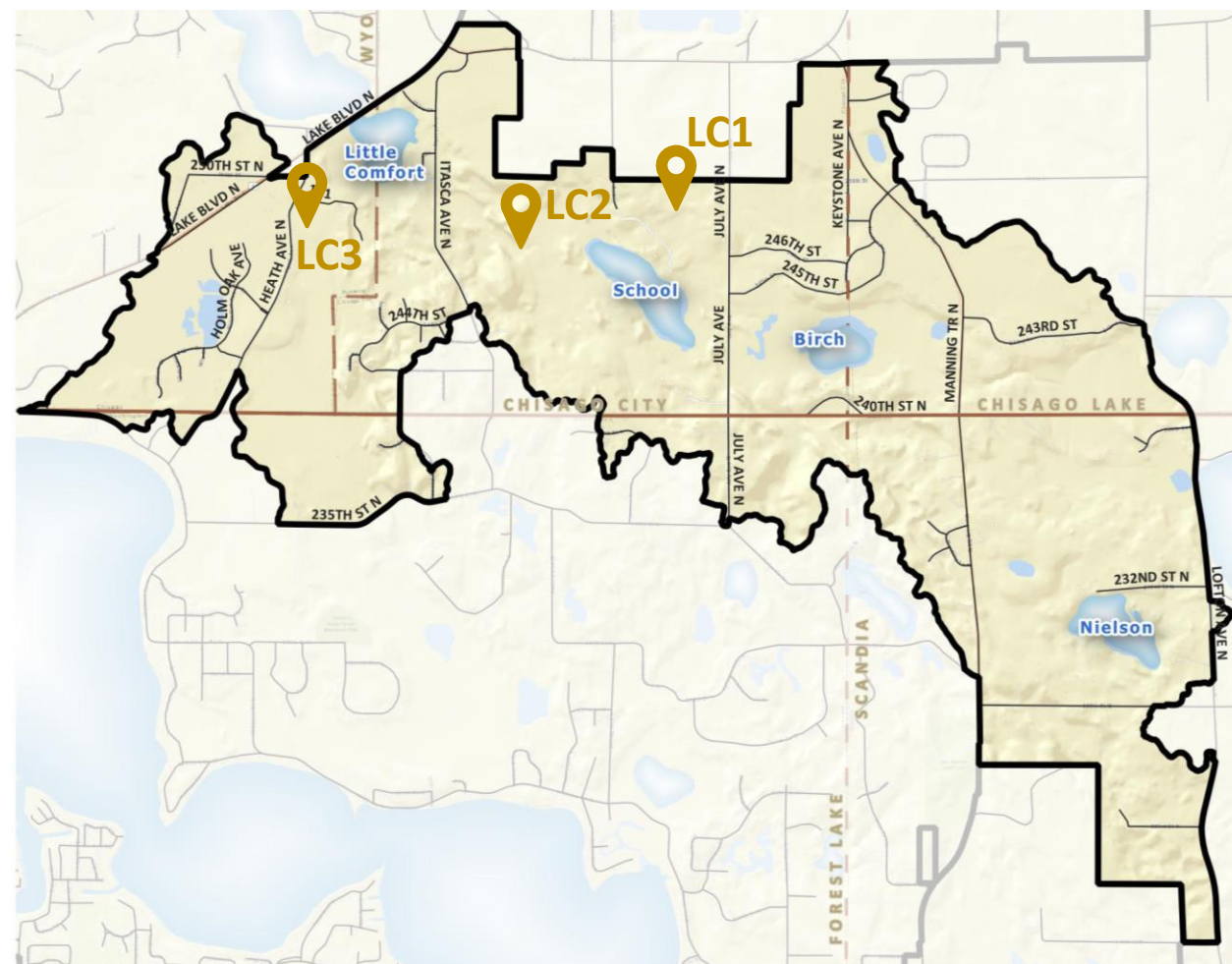
\*Street sweeping estimates are based on material removed from the street surface and do not reflect total load reductions to the downstream lakes. The actual load reduction to downstream water resources is generally 50% or less than the total load recovery and depends on the number and type of BMPs along the treatment train.

\*See TSS Footnotes slide after project summary slides.

# Little Comfort Lake Management District Completed and In Progress Projects



Completed and In-Progress Projects	Outcomes at Little Comfort Lake (reductions)	Outcomes at Edge of Project (reductions)
LC1: School Lake Ag BMPs – In Progress Wetland Restorations – Future	45 lb/yr phosphorus	61 lb/yr phosphorus
LC2: School Lake Outlet Channel Improvements – In Progress	TBD pending feasibility	TBD pending feasibility
LC3: Heath Iron Enhanced Sand Filter– In Progress	86 lb/yr phosphorus	86 lb/yr phosphorus
Little Comfort Alum Treatment – On Hold Until Other Projects Complete	TBD	TBD
<b>TOTAL</b>	131 lb/yr P or 40,000-50,000 lb of algae growth	147 lb/yr phosphorus



\*Many projects result in multiple additional benefits such as wildlife habitat and flood storage creation.

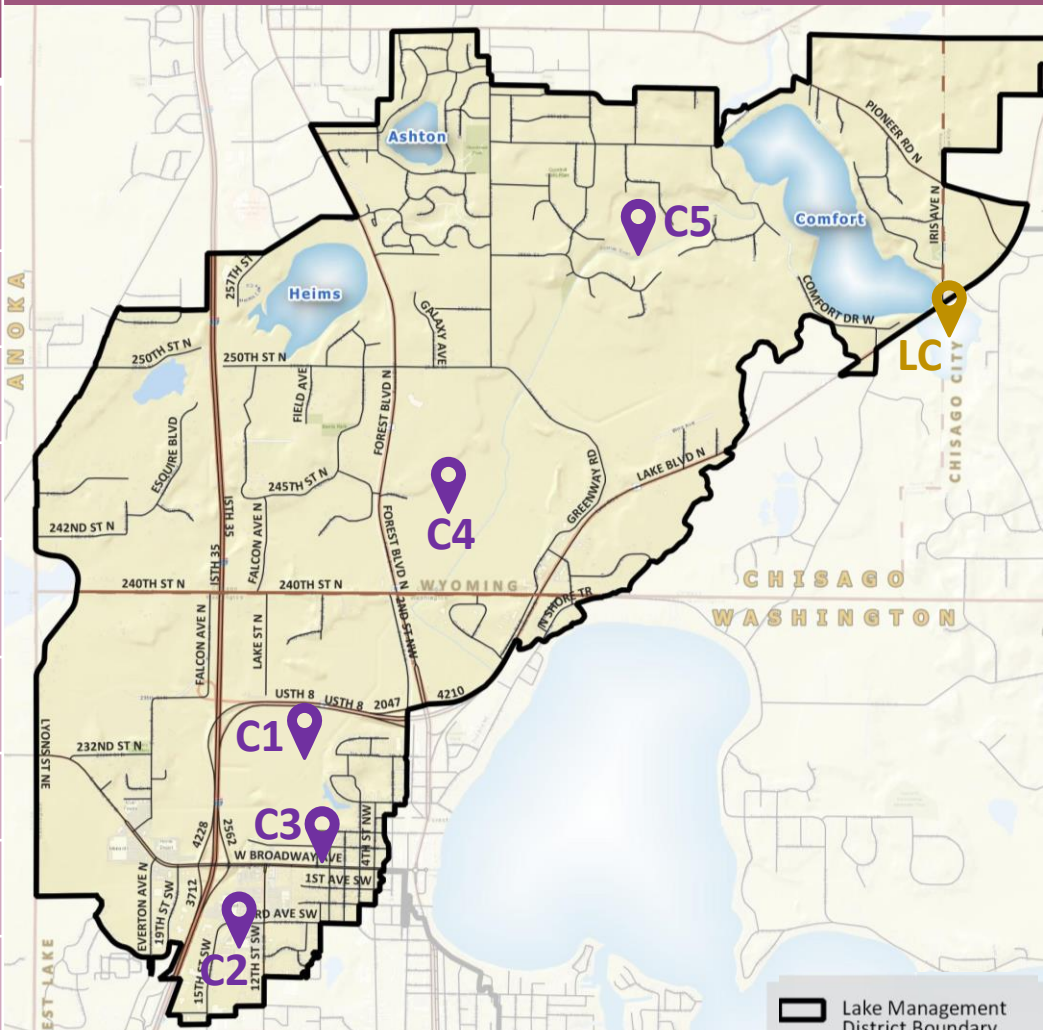
\*Literature values indicate 1 lb of phosphorus can support up to 500 lbs of algae growth.

\*See TSS Footnotes slide after project summary slides.

# Comfort Lake Management District Completed and In Progress Projects



Completed and In Progress Projects	Outcomes at Comfort Lake (reductions)	Outcomes at Edge of Project (reductions)
C1: Bixby Park Wetland Enhancement (Chisago Co. Petition) - Completed	93 lb/yr phosphorus (P) 5,546 lb/yr TSS	206 lb/yr P 55,458 lb/yr TSS
C2: Target Retrofits - Completed	5 lb/yr P	11 lb/yr P
C3: Broadway Ave Iron Sand Filter – Completed	15 lb/yr P 683 lb/yr TSS	33 lb/yr P 6,834 lb/yr TSS
C4: Sunrise River Hwy 61 Wetland Enhancement (Chisago Co Petition) – Completed	65 lb/yr P 18,630 lb/yr TSS	89 lb/yr P 51,740 lb/yr TSS
C5: Goodwin Ave Stormwater Wetland – In Progress	5 lb/yr P 1,424 lb/yr TSS	5 lb/yr P 1,424 lb/yr TSS
Enhanced Street Sweeping (Cities of Forest Lake & Wyoming) – Ongoing	≤ 37 lb/yr P ≤ 83,407 lb/yr TSS	70 lb/yr P 159,814 lb/yr TSS
Regional Treatment Facility (Location TBD) – In Progress	TBD	TBD
Stormwater Permits (Multiple Locations)	28 lb/yr P	33 lb/yr
LC: Little Comfort Lake Projects – In Progress	64 lb/yr to Comfort Lake	(See Little Comfort Lake Management District)
<b>TOTAL**</b>	301 lb/yr P or 150,600 lbs of algae growth	499 lb/yr P



\*Many projects result in multiple additional benefits such as wildlife habitat and flood storage creation.

\*Literature values indicate 1 lb of phosphorus can support up to 500 lbs of algae growth.

\*Street sweeping estimates are based on material removed from the street surface and do not reflect total load reductions to the downstream lakes. The actual load reduction to downstream water resources is generally 50% or less than the total load recovery and depends on the number and type of BMPs along the treatment train.

\*See total suspended solids (TSS) Footnotes slide after project summary slides.



# Total Suspended Solids (TSS) Footnotes

The following notes accompany the total suspended solids (TSS) loading figures on the previous slides

- The District monitors sediment loading annually. View the latest monitoring report at [www.clflwd.org/monitoring.php](http://www.clflwd.org/monitoring.php). [View the presentation on Comfort Lake sediment loading from the 3/24/22 regular board meeting here.](#)
- Moody Lake Wetland Rehabilitation: TSS loading estimated from RUSLE raster layer created by EOR. Assumes 80% TSS removal for the wetland and 85% for the buffer. Removal due to buffer was subtracted from load to wetland (the drainage area to the latter includes that for the former).
- Moody Lake Capstone Projects: TSS loading estimated from RUSLE raster layer created by EOR. Value is for buffer establishment only assuming 85% removal. Not enough information on the gully repair to estimate TSS benefits at this time.
- Bone Lake Southeast Drained Wetland Restorations: TSS loading estimated from RUSLE raster layer created by EOR. Assumes 80% TSS removal for each of the wetland restoration projects.
- Shields Lake Stormwater Reuse Project: TSS loading estimated from modeled flows and TSS grab samples. Ponds immediately upstream and downstream significantly reduce the TSS load reduction impact of this pond on the lake.
- 3<sup>rd</sup> Lake Pond Restoration: TSS loading estimated from RUSLE raster layer created by EOR. Assumes 80% TSS removal for the immediate drainage area only due to the pond immediately upstream.
- CR50 Iron Enhanced Sand Filter: TSS load reductions from the feasibility report. Assumes a 50% impact reduction factor due to the downstream wetland.
- WJD-6 Wetland Restoration: TSS loading estimated from measured flows and TSS grab samples from 2018. Assumes 80% TSS removal.
- Bixby Park Wetland Enhancement (Chisago Co Petition): TSS load reductions from the P8 model. Assumes a 90% impact reduction factor due to the distance from the lake.
- Broadway Avenue Iron Enhanced Sand Filter: TSS loading using the simple method, Met Council Generalized Land Use, and unit area loading values from the MN Stormwater Manual. Assumes 100% TSS removal and a 90% impact reduction factor due to the distance from the lake.

\*Disclaimer: These values represent rough approximations of sediment load reductions based on generalized land use and land cover characteristics and limited monitoring data.

## APPENDIX D – PROGRESS AT A GLANCE

The following table provides a brief overview of progress toward the goals set out in the Watershed Management Plan (WMP). See the full Progress Report for a detailed description of progress toward each goal.

**Progress Rating Key:**  = not started  = in-progress  = ongoing activity w/ milestones achieved  = completed/target met

WMP Code	Goal	Priority Level (same for all Lake Mgmt Districts)	Progress Rating for 2024
<b>3000</b>	<b>Programs</b>		
3001 Rules	Goal 1: Ensure fair and effective implementation of District Rules through the Permitting Program (see goals under 3002 Permitting).	High	<input checked="" type="radio"/>
3001 Rules	Goal 2: Review and update District Rules and standards at least once every ten years, or more often as needed.	High	N/A
3002 Permitting	Goal 1: Hold a meeting prior to permit approval for 100% of stormwater management permit applications to maximize efficiency of the application process and reduce variance requests.	High	<input checked="" type="radio"/>
3002 Permitting	Goal 2: Inspect 90% or more of active permits at least once every two weeks.	High	<input checked="" type="radio"/>
3002 Permitting	Goal 3: Inspect 90% or more of permitted best management practices (BMPs) associated with maintenance instruments at least once a year.	High	<input checked="" type="radio"/>
3002 Permitting	Goal 4: Work with permittees to maintain compliance with District rules to achieve an average annual inspection compliance rating of at least 90%.	High	<input checked="" type="radio"/>
3002 Permitting	Goal 5: Work with maintenance instrument holders to maintain compliance with BMP maintenance instrument requirements to achieve an average annual inspection compliance rating of at least 90%.	High	<input type="radio"/>
3002 Permitting	Goal 6: Obtain 90% or more annual reports from permitted BMP maintenance instrument holders.	High	<input type="radio"/>
3003 Monitoring	Goal 1: Annually perform water monitoring in accordance with the Comprehensive Monitoring Plan to inform future management actions, identify water quality improvement opportunities, and evaluate progress toward goals.	High	<input checked="" type="radio"/>
3004 NPS Abatement	Goal 1: Implement program to achieve shoreline and streambank restoration and maintenance goals under sections 5200 Lakes and 5300 Streams.	High	<input type="radio"/>
3004 NPS Abatement	Goal 2: Reach out to 100% of high priority agricultural landowners identified in District diagnostic studies.	High	<input checked="" type="checkbox"/>

WMP Code	Goal	Priority Level (same for all Lake Mgmt Districts)	Progress Rating for 2024
3004 NPS Abatement	Goal 3: Establish a farmer-led council to inform and influence agricultural land management practices.	High	☑
3004 NPS Abatement	Goal 4: Annually coordinate with District communities on potential Municipal Stormwater Remediation project partnerships.	High	☑
3005 Education	Goal 1: Increase public knowledge of and appreciation for human impacts to surface water, groundwater and natural resources to increase target audiences' behaviors that positively impact water resources.	High	☑
3005 Education	Goal 2: Communicate District programs, projects and other initiatives to the public in a clear, consistent and equitable manner.	High	☑
3006 Interagency	Goal 1: Coordinate efforts with partners to ensure the most efficient and cost-effective use of funds for water resource management.	High	☑
3006 Interagency	Goal 2: Act as the local office for facilitating public input on water resource-related issues, react in a timely manner to the concerns of citizens and operate in an open and transparent manner.	High	☑
3006 Interagency	Goal 3: Participate in the evaluation of Total Maximum Daily Load (TMDL) studies and implementation of projects and programs to address impairments of waters within the District.	High	☑
3006 Interagency	Goal 4: Work with Lower St. Croix River partners to achieve the goals of Lower St. Croix One Watershed One Plan, including associated TMDLs and WRAPS.	High	☑
3007 Research	Goal 1: Initiate, advance or support at least one research initiative each year.	High	☑
3007 Research	Goal 2: Provide at least four updates to the Board of Managers on research topics, whether initiated by the District or other organizations, each year.	High	☑
3008 Measure	Goal 1: Annually complete a detailed Progress Report evaluating the previous year's progress toward all goals and metrics in this Plan.	High	☑
3008 Measure	Goal 2: Every five years perform a comprehensive review of District goals and metrics to evaluate achievability and course-correction actions, if needed.	High	N/A
3009 Grants	Goal 1: Obtain grant awards in an amount at least equal to 25% of the District's levy, as measured on a 3-year average.	High	☑
3009 Grants	Goal 2: Research and apply to at least one new grant program each year.	High	☑

WMP Code	Goal	Priority Level (same for all Lake Mgmt Districts)	Progress Rating for 2024
3009 Grants	Goal 3: Complete grant reporting in accordance with grant contracts to ensure timely disbursement of grant funds.	High	☑
3010 O&M	Goal 1: Ensure all District projects and facilities achieve their designed lifespan.	High	☑
3010 O&M	Goal 2: Develop a Comprehensive Operations & Maintenance Plan.	High	☑
3010 O&M	Goal 3: Complete inspections and maintenance in accordance with the Comprehensive Operations & Maintenance Plan.	High	☑
3011 AIS	Goal 1: Continue use and refinement of the District's prevention and early detection & rapid response initiatives to reduce the risk of new invasive species introductions to District waterbodies and prevent the spread of existing infestations to other waterbodies.	High	☑
3011 AIS	Goal 2: Manage existing populations of AIS to reduce internal phosphorus loading.	High	☑
3011 AIS	Goal 3: Manage existing populations of AIS to improve native plant diversity by managing AIS populations that pose a risk to native plant health.	High	☑
3011 AIS	Goal 4: Ensure ecological integrity is protected by providing guidance and technical support to other organizations and residents who manage AIS for recreational benefits.	High	☑
3012 Land Acq.	Goal 1: Implement the Land Acquisition & Management Program to cost-effectively support capital and other projects.	High	☑
3013 Resiliency	Goal 1: Incorporate climate and flooding resiliency into annual District planning and budgeting efforts.	High	☑
3013 Resiliency	Goal 2: Develop an emergency response plan for the District.	High	☑
<b>5000</b>	<b>Projects</b>		
5100 Floodplain	Goal 1: Reduce or mitigate flooding in areas with known flooding and/or high water problems by achieving the interim measurable goal of increasing water storage by an additional 99 ac-ft (or 0.16 inches over 7,397 acres of upland) over the next 10 years (2022-2031) based on the Lower St. Croix 1W1P. The District will determine LMD-specific measurable goals from modeling floodplain conditions under future rainfall scenarios.	High	○

WMP Code	Goal	Priority Level (same for all Lake Mgmt Districts)	Progress Rating for 2024
5100 Floodplain	Goal 2: Maintain and improve community preparedness and emergency response capacity to flooding and/or high water problems by sharing floodplain modeling and mapping results under future climate conditions with counties and District communities.	Medium	<input checked="" type="radio"/>
5200 Lakes	Goal 1: Adaptively manage District lakes to reduce phosphorus loads and de-list impaired lakes with Total Maximum Daily Loads (TMDLs) to achieve state water quality eutrophication standards (total phosphorus, Chlorophyll-a and Secchi).	High	<input type="radio"/>
5200 Lakes	Goal 2: Adaptively manage District lakes to improve water quality by achieving the 10-year (2031) total phosphorus and Secchi goals. See Table 4-3.	High	<input type="radio"/>
5200 Lakes	Goal 3: Partner with agencies to manage District lakes for healthy fish and aquatic plant communities.	High	<input checked="" type="radio"/>
5200 Lakes	Goal 4: Establish bottom water chloride trends in District lakes and provide resources to salt applicators on ways to reduce chloride inputs. See Table 4-3.	Medium	<input type="checkbox"/>
5200 Lakes	Goal 5: Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of lakeshore parcels have at least 75% natural shoreline condition. For example, in its last shoreline survey 55% of parcels on Bone Lake were covered in at least 75% natural shoreline vegetation; the goal is to ensure 75% of parcels are vegetated thusly. See Table 4-3.	Medium	<input type="radio"/>
5300 Streams	Goal 1: Adaptively manage District streams to achieve annual total suspended solids (TSS) flow-weighted mean concentrations less than the Ecoregion standard of 30 mg/L. See Table 4-3.	High	<input type="radio"/>
5300 Streams	Goal 2: Confirm the headwaters of the Sunrise River. CLFLWD contains the longest reach of contributing streams to the Sunrise River and can therefore be considered the headwaters.	High	<input checked="" type="checkbox"/>
5300 Streams	Goal 3: Adaptively manage District streams to achieve stream chloride concentrations less than the State standard of 230 mg/L. See Table 4-3.	Medium	<input type="radio"/>
5300 Streams	Goal 4: Promote natural, deep rooted, native vegetation buffers to ensure at least 75% of streambank parcels have at least 75% natural shoreline condition. Quantified streambank buffer goals will be assessed and established.	Medium	<input type="radio"/>
5300 Streams	Goal 5: Decommission abandoned drainage systems to restore natural hydrology as opportunity arises (e.g., reconnecting ditched streams to their floodplains).	N/A	<input type="radio"/>

WMP Code	Goal	Priority Level (same for all Lake Mgmt Districts)	Progress Rating for 2024
5400 Wetlands	Goal 1: Restore or enhance at least 400 acres of wetlands that support water quality treatment.	High	○
5400 Wetlands	Goal 2: Restore or enhance at least 200 acres of wetlands to support flood attenuation and storage.	High	○
5400 Wetlands	Goal 3: Preserve existing wetland buffers and encourage the establishment of buffers for water quality and habitat benefits through District Programs.	High	○
5400 Wetlands	Goal 4: Restore or enhance at least 80 acres of wetlands to support wildlife habitat and recreational opportunities.	Medium	○
5500 Uplands	Goal 1: Partner with municipalities to establish at least 1 new natural park open space within a LMD priority area (see LMD profiles).	Medium	○
5500 Uplands	Goal 2: Establish partnerships with agencies and municipalities within 1 greenway corridor in the District as identified in the Greenway Corridor Visioning and Assessment (5120B).	Medium	○
5600 Groundwater	Goal 1: Implement best management practices to protect groundwater (drinking water) from nitrate contamination in three areas of high aquifer vulnerability and high pollution sensitivity of near surface materials.	Medium	○
5600 Groundwater	Goal 2: Complete a groundwater dependent natural resource (GDNR) inventory.	Medium	☑