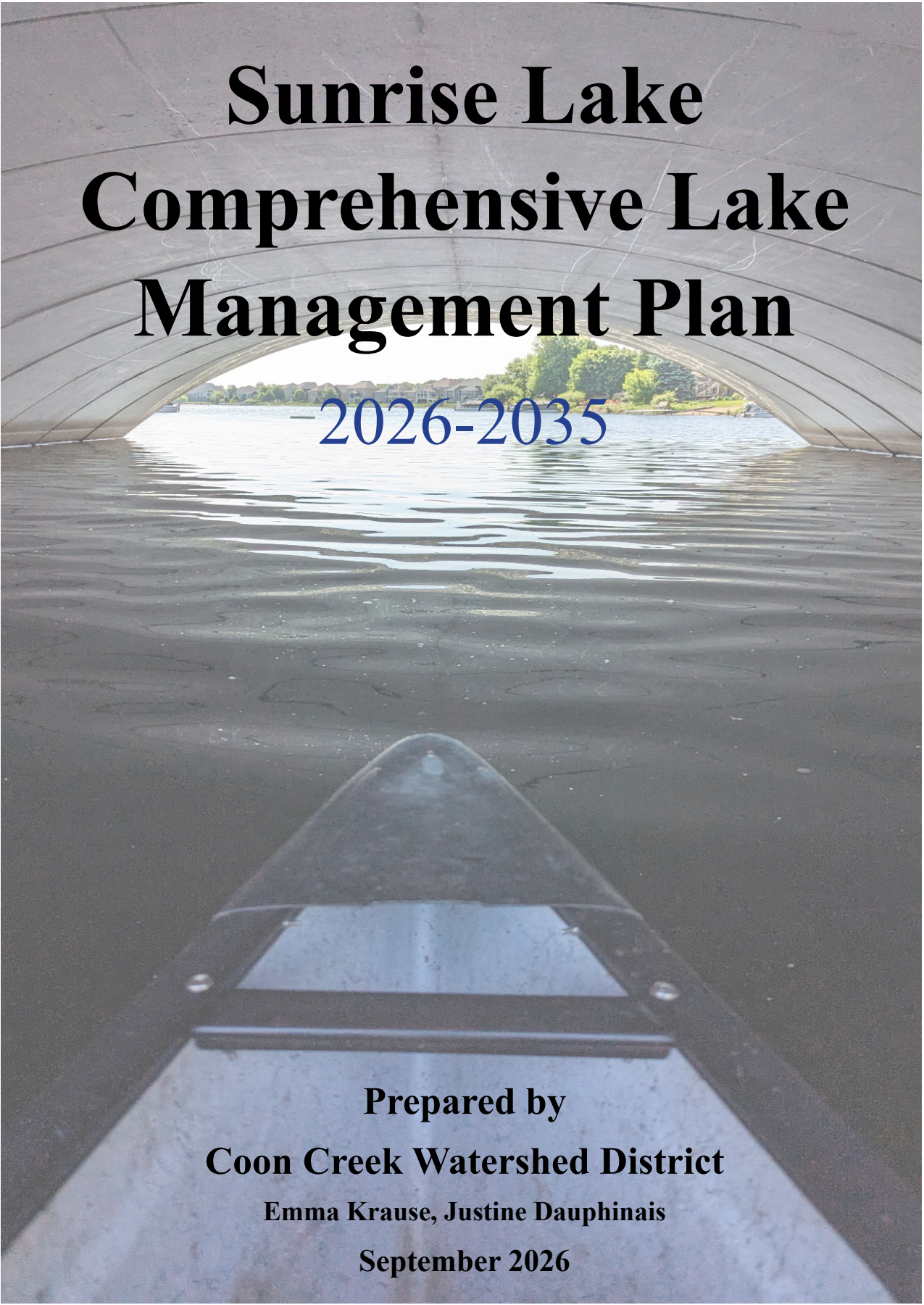




Sunrise Lake Comprehensive Lake Management Plan

-2026-2035

**Prepared by
Coon Creek Watershed District**

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Table of Contents

1.0 Introduction6

1.1 Background 6

1.2 Scope and Purpose 6

1.3 Location and Setting 7

2.0 Lake and Watershed Characteristics10

2.1 Geologic and Physical Setting 10

2.2 Hydrology 10

2.3 Watershed Land Use and Development 13

2.3.1 Land Use 13

2.3.2 Land Ownership 13

2.3.3 Lakeshed Development Characteristics 14

2.4 Physical attributes of Sunrise Lake 15

2.4.1 Lake Morphology & Bathymetry 15

2.4.2 Lake Levels 16

2.4.3 Lake Stratification & Mixing 18

2.5 Sunrise Lake’s Water Quality 20

2.5.1 Pollution Standards and Impairments 20

2.5.2 Water Clarity 21

2.5.3 Chlorophyll-a 23

2.5.4 Total Phosphorus 25

2.5.5 Chloride 28

2.5.6 Nutrient Loading Model 29

2.6 Biological Attributes of Sunrise Lake 33

2.6.1 Aquatic Macrophytes 33

2.6.2 Fish Community 37

2.7 Social Attributes of Sunrise Lake 38

2.7.1 Demographics 38

2.7.2 Lake Use 39

3.0 Management Priorities, Objectives, and Actions40

3.1 Identification of Issues and Concerns 40

3.2 Management Objections and Actions 42

3.2.1 Water Quality 42

3.2.2 Aquatic Invasive Species and Nuisance Wildlife 46

3.2.3 Regulation and Enforcement 48

3.2.4 Recreation and Aesthetics 50

4.0 Implementation Plan53

4.1 Organizations involved in Sunrise Lake Management 53

4.1.1 Lakes of Radisson Master HOA and Sub-Associations 53

4.1.2 City of Blaine 53

4.1.3 Coon Creek Watershed District 54

4.1.4 Anoka Conservation District 55

4.2 Implementation Schedule 56

5.0 References64

List of Figures

Figure 1. Location of Sunrise Lake in Anoka County, MN, USA 7

Figure 2. Location of Sunrise Lake within the Coon Creek Watershed District 8

Figure 3. Sunrise Lake before and after its creation as a man-made lake 8

Figure 4. Sunrise Lake lakeshed bedrock geology 10

Figure 5. Subwatersheds within Sunrise Lake lakeshed 11

Figure 6. Stormwater conveyance system and direction surrounding Sunrise Lake 11

Figure 7. Locations of Sunrise Lake outlet and downstream culverts 12

Figure 8. Land use in the Sunrise Lake lakeshed 13

Figure 9. Land ownership along the shoreline of Sunrise Lake 14

Figure 10. Timeline of residential development in Sunrise Lake lakeshed. 15

Figure 11. Sunrise Lake bathymetric map showing 2-ft depth contours 16

Figure 12. Sunrise Lake elevation summary from 2018 to 2024 17

Figure 13. Water elevation data for Sunrise Lake from 2018 to 2024 18

Figure 14. Biweekly dissolved oxygen profiles in Sunrise Lake 19

Figure 15. Secchi depth (ft) in Sunrise Lake from 2018 to 2023 22

Figure 16. Monthly variation in secchi depth (ft) 22

Figure 17. Interannual variation in chlorophyll-a (µg/L) 23

Figure 18. Monthly variation in chlorophyll-a (µg/L) 24

Figure 19. Chlorophyll-a concentrations (µg/L) over five years 24

Figure 20. Total phosphorus concentrations (ug/L) from 2018 to 2023 25

Figure 21. Total phosphorous concentrations by year 26

Figure 22. Monthly variation in total phosphorous (µg/L). 27

Figure 23. Hypolimnetic concentrations of dissolved orthophosphate compared to surface total phosphorus concentrations from 2021 to 2023. 27

Figure 24. Chloride concentrations in Sunrise Lake 28

Figure 25. Heat map of total phosphorus loading rates across subwatersheds. 30

Figure 26. Mean annual phosphorus budget for Sunrise Lake from 2012 to 2022 31

Figure 27. Phosphorus lake response model performance 32

Figure 28. Abundance of aquatic vegetation growth in Sunrise Lake 34

Figure 29. Known locations of invasive plants in Sunrise Lake 35

Figure 30. Curlyleaf pondweed treatment areas in Sunrise Lake 36

Figure 31. Sunrise Lake lakeshed tapestry segmentation classifications 38

Figure 32. Lake use survey results for different recreational activities at Sunrise Lake ... 39

Figure 33. Word cloud generated based on write-in survey responses 39

Figure 34. Word cloud survey responses displaying the main areas of concern 40

List of Tables

Table 1. Key physical characteristics of Sunrise Lake

9

Table 2. Summary for single-family residential parcels in Sunrise Lake lakeshed

15

Table 3. Recreation-based water quality standards

20

Table 4. Model predictions for external watershed phosphorus loading to Sunrise Lake
by subwatershed area.

31

Table 5. Summary of Sunrise lake’s aquatic plant community metrics

33

Table 6. Lake management implementation plan for Sunrise Lake

56

1.0 Introduction

1.1 Background

To protect and enhance the health of Sunrise Lake, the Coon Creek Watershed District (CCWD), in partnership with the Lakes of Radisson Master Homeowners Association (Master HOA), initiated the development of this comprehensive lake management plan. Although multiple stakeholders contribute to the health of Sunrise Lake, the lack of a cohesive management strategy has led to fragmented efforts to address the lake’s challenges.

The overarching goal of this plan is to consolidate information on Sunrise Lake including a summary of current conditions and ongoing management efforts and to provide suggested strategies for continued preservation of the lake’s ecological, recreational, and aesthetic values. The planning process was initiated in response to several identified issues, including occurrences of algal blooms, threats from aquatic invasive species, rising conflicts over aesthetics and recreation, and how all of these factors could impact property values. These concerns have motivated lake residents, the Master HOA, and natural resource specialists to collaborate on a forward-thinking and adaptive plan.

The Sunrise Lake Comprehensive Lake Management Plan has been informed by community feedback and evaluation of past and present scientific data; it represents a dynamic framework to address immediate concerns while maintaining the flexibility to adapt to emerging threats. As part of the plan development process, CCWD technical staff compiled and summarized environmental data, past and present management efforts, and input from area residents and lake users via a voluntary survey. The Master HOA served as the steering committee, facilitating communication between sub-associations and residents. By focusing on the interconnectedness of the lake’s ecological, social, and economic aspects, this plan aims to ensure the health of Sunrise Lake for the next ten years and beyond.

1.2 Scope and Purpose

The purpose of the Sunrise Lake Management Plan is to provide a comprehensive understanding of the lake’s current status and to outline actionable strategies that maintain or improve its condition over the next ten years. This plan aims to protect and enhance the lake’s water quality, habitat, and recreational value while fostering partnerships among lake users and other stakeholders.

This plan provides an overview and assessment of Sunrise Lake’s characteristics, conditions, and previous management efforts and develops objectives and paired actions to address current and forecasted issues. Implementation of the plan is intended to be a collaborative effort shared by lakeshore owners, watershed residents, homeowner associations, and local units of government. The outlined actions and implementation schedules are not binding but are designed to facilitate incorporation into annual or long-term budgeting and capital investment processes.

Successful lake management requires a strong commitment to adaptive management. This approach allows

stakeholders to respond to changing conditions, address unforeseen challenges, and integrate new scientific findings into decision-making processes. Given that lake conditions, resources, and stakeholder capacities are dynamic, a flexible and iterative strategy is essential for long-term success. To support this adaptive framework, periodic assessments of lake health trends, management needs, and the implications of implemented actions are conducted. This document focuses on addressing current issues facing Sunrise Lake and the proposed management strategies for 2026–2035. It is intended to be revisited and revised as needed, with updates occurring at least every 10 years.

The primary goals of this plan are to:

1. Foster partnerships and coordinated actions among lakeshore owners, watershed residents, homeowner associations, and local units of government.
2. Enhance understanding of the lake’s physical, biological, and social attributes while setting realistic expectations for its health as a manmade lake.
3. Identify and prioritize key concerns and challenges facing Sunrise Lake based on scientific analysis and community input.
4. Develop management objectives with paired implementation strategies to protect and enhance water quality, habitat value, and recreational uses.
5. Sustain the lake’s ecological integrity and aesthetic appeal for the benefit of current and future generations.

By focusing on these goals, the Sunrise Lake Management Plan serves as a dynamic tool to guide collaborative and effective lake stewardship.

1.3 Location and Setting

Sunrise Lake is located in Blaine, MN, in south-central Anoka County within the greater Twin Cities Metropolitan Area (Figure 1). Sunrise Lake is a manmade lake constructed starting in 2003 as part of the “Lakes of Radisson” Development.

Sunrise Lake and its drainage area are wholly contained within the Coon Creek Watershed District boundary, although a small portion on the eastern fringe of the housing development is located within the Rice Creek Watershed District and drains to the east to a large wetland complex (Figure 2). Sunrise Lake is not included on the State Public Waters Inventory and thus not currently under the regulatory authority of the Minnesota Department of Natural Resources (DNR), but it is considered a water of the state that the public may access and use from public

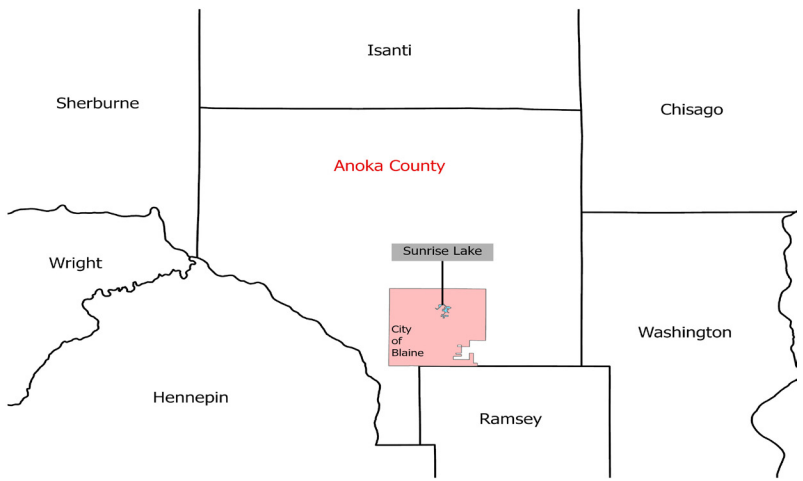


Figure 1. Location of Sunrise Lake in Anoka County, MN, USA.

land. Furthermore, Anoka County Public Ditch 41 flows through Sunrise Lake and is managed by CCWD for the purposes of drainage, flood control, and stormwater conveyance and quality (Figure 3). Most of the land surrounding Sunrise Lake, including the boat launch, is privately owned and only available for use by residents of the Lakes development.

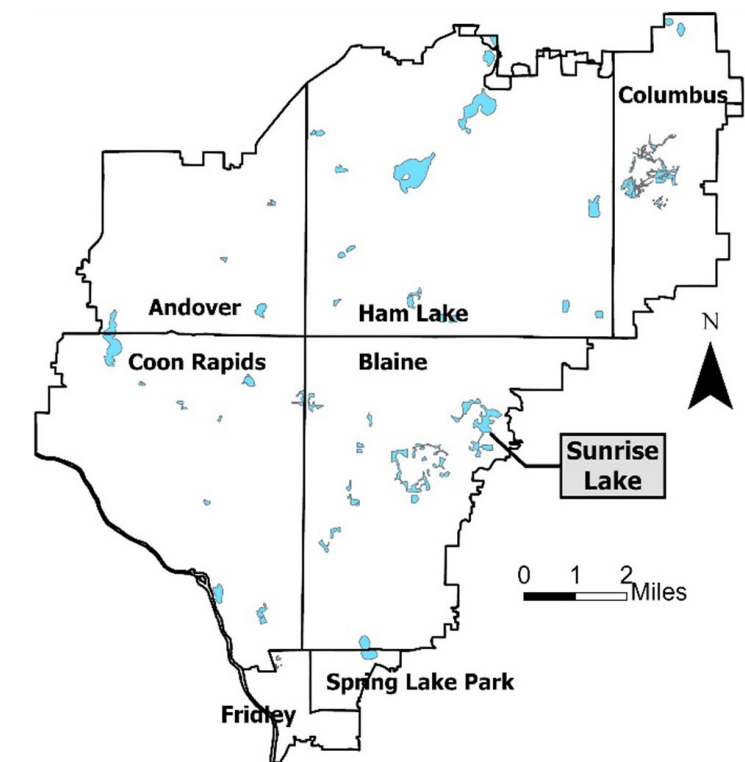


Figure 2. Location of Sunrise Lake within the Coon Creek Watershed District in Blaine, MN.



Figure 3. Location of Sunrise Lake before (2000) and after (2022) its creation as a man-made lake. The legal flow path of the Anoka County Ditch 41 system was maintained.

Sunrise Lake is comprised of five basins connected by navigable channels, with a combined surface area of 158 acres. The lake is relatively shallow, with an average depth of 8 feet and a maximum depth of 16 feet with an estimated volume of 1,324 ac-ft (Table 1). Its dendritic shape contributes to an extensive shoreline length, which provides ample near-shore habitat, but also presents unique management challenges given the high-density of residential development.

Key geographical and hydrological attributes of Sunrise Lake include:

- **Location and Context:** The lake is a central feature of the Lakes of Raddison residential development, with trail connections to nearby local parks and nature preserves. The recreational and aesthetic value of the lake directly impacts property values.
- **Watershed:** Sunrise Lake is at the headwaters of the Ditch 41 drainage system; the quantity and quality of water discharging from Sunrise Lake has impacts on downstream resources including Sand Creek, Coon Creek, and the Mississippi River. Numerous wetlands and storm ponds provide stormwater runoff treatment and critical habitat. The topography is very flat, exacerbating the impacts of any drainage obstructions.
- **Littoral Zone:** The expansive shoreline supports aquatic vegetation and serves as vital habitat for fish and wildlife, but also allows for very dense development. The density of homes and steep slopes characteristic of manmade systems creates a narrower, highly vulnerable littoral zone compared to natural basins.
- **Access and Use:** While public land allows access to the water for swimming, fishing, and paddlecrafts, motorized boating is limited to residents of the Lakes development due to the privately owned boat launch. Gas-powered motors are prohibited.

As a central feature of the community, it is important to balance the ecological, social, and economic functions of Sunrise Lake. Its management requires careful coordination to maintain water quality, preserve natural habitats, and support recreational activities and property values for residents and other lake users.

Table 1. Key physical characteristics of Sunrise Lake.

Surface area	158 acres
Average depth	8.0 feet
Maximum depth	16 feet
Volume	1,324 acre-feet

2.0 Lake and Watershed Characteristics

2.1 Geologic and Physical Setting

Sunrise Lake is situated within the Anoka Sand Plain, a region characterized by flat topography, predominantly sandy soils, and a shallow water table. This landscape was shaped by glacial activity during the last Ice Age, particularly by the retreat of the Des Moines lobe and its Grantsburg sublobe of the Laurentide Ice Sheet. The surficial geology primarily consists of glacial outwash deposits, which are sediments carried and deposited by meltwater from the retreating glaciers. These deposits have resulted in well-drained sandy soils that influence the hydrology and ecology of the area.

The bedrock underlying the Sunrise Lake lakeshed (total area that drains to the lake) is part of the Tunnel City Group, formerly known as the Franconia Formation. This formation is composed mainly of sandstone and siltstone, dating back to the Cambrian period (Figure 4). These geological features play a crucial role in groundwater flow and the overall hydrological dynamics of Sunrise Lake.

2.2 Hydrology

Sunrise Lake is sustained by a combination of groundwater inputs and surface water runoff. The area that drains to Sunrise Lake, the lakeshed, is approximately 1,275 acres in size, resulting in a modest watershed to lake area ratio of approximately 8:1, highlighting the importance of groundwater influence. The surface water lakeshed is comprised of 50 minor catchments that can be combined to form 16 subwatersheds that discharge to the lake via stormwater pipes, small drainage ditches, or overland (Figure 5). The flow of water within the lakeshed follows a network of interconnected storm pipes and ditches, moving from higher elevations to lower elevations, ultimately draining into the lake (Figure 6).

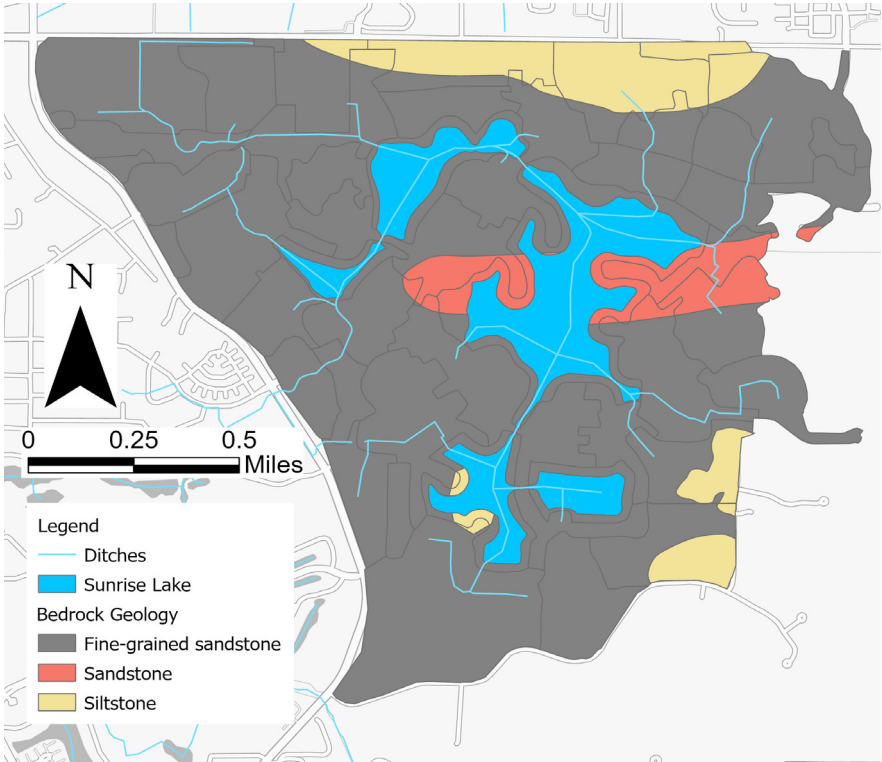


Figure 4. Sunrise Lake lakeshed bedrock geology.

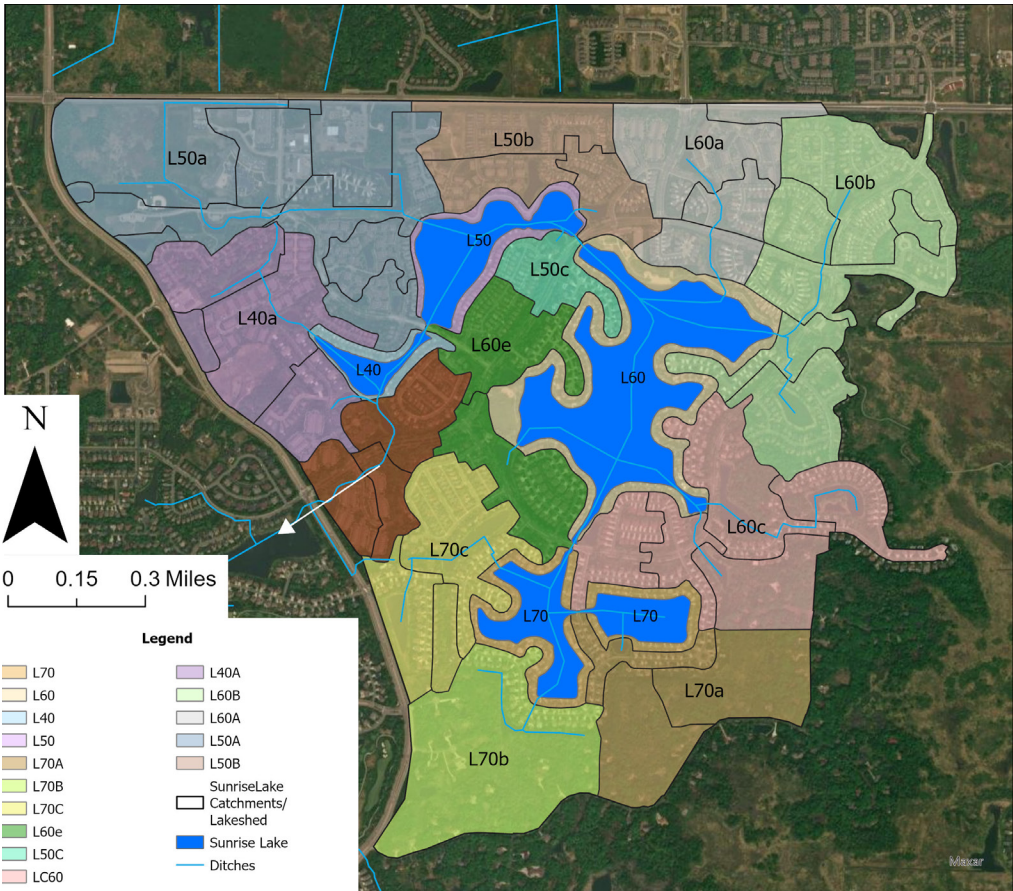


Figure 5. Subwatersheds (areas with a common discharge point) within Sunrise Lake lakeshed.

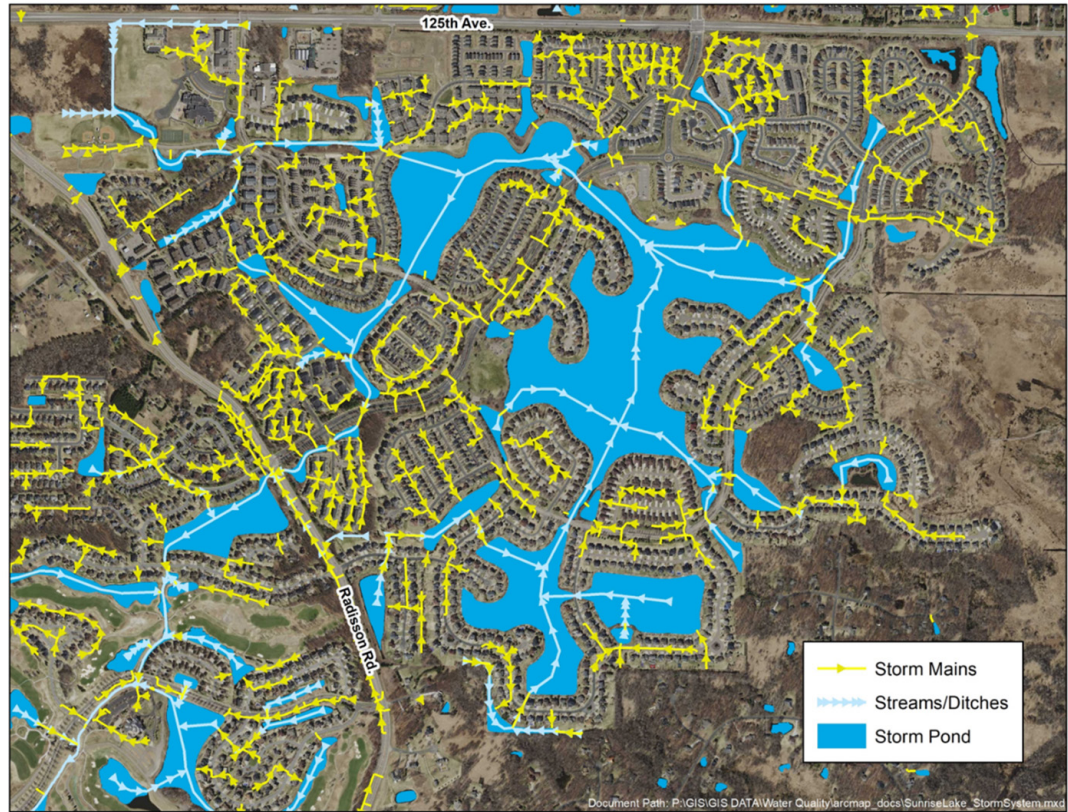


Figure 6. Stormwater conveyance system and direction of flow surrounding Sunrise Lake.

Sunrise Lake’s outlet is located in subwatershed L60d, where water flows south through a storm pond before heading southwest under Radisson Road and entering Tournament Player’s Club (TPC) Golf Course (Figure 7). Given flat topography, the outlet culvert and downstream culverts just south of the lake’s outlet are at equilibrium with the lake’s water level. Water level of Sunrise Lake is therefore controlled by a series of culverts between Sunrise Lake and TPC. Because there is no specific water level control mechanism for Sunrise Lake, the water level is largely influenced by the regional groundwater table and flow through these culverts. Many of these structures are equipped with trash racks which can be prone to obstructions from debris, beaver activity, or sediment buildup. As a result, the flow of water out of Sunrise Lake, which directly affects the lake’s water level, depends on the functionality of these culverts. Therefore, it is crucial to regularly inspect and clear these culverts of debris to ensure water flow and maintain proper lake levels.

During periods of drought when the regional water table is depressed, the water surface elevation of Sunrise Lake sometimes falls below the elevation of the outlet culverts and is then at the mercy of mother nature to refill the lake. During these periods, Sunrise Lake is vulnerable to shallow groundwater pumping for purposes such as irrigation.

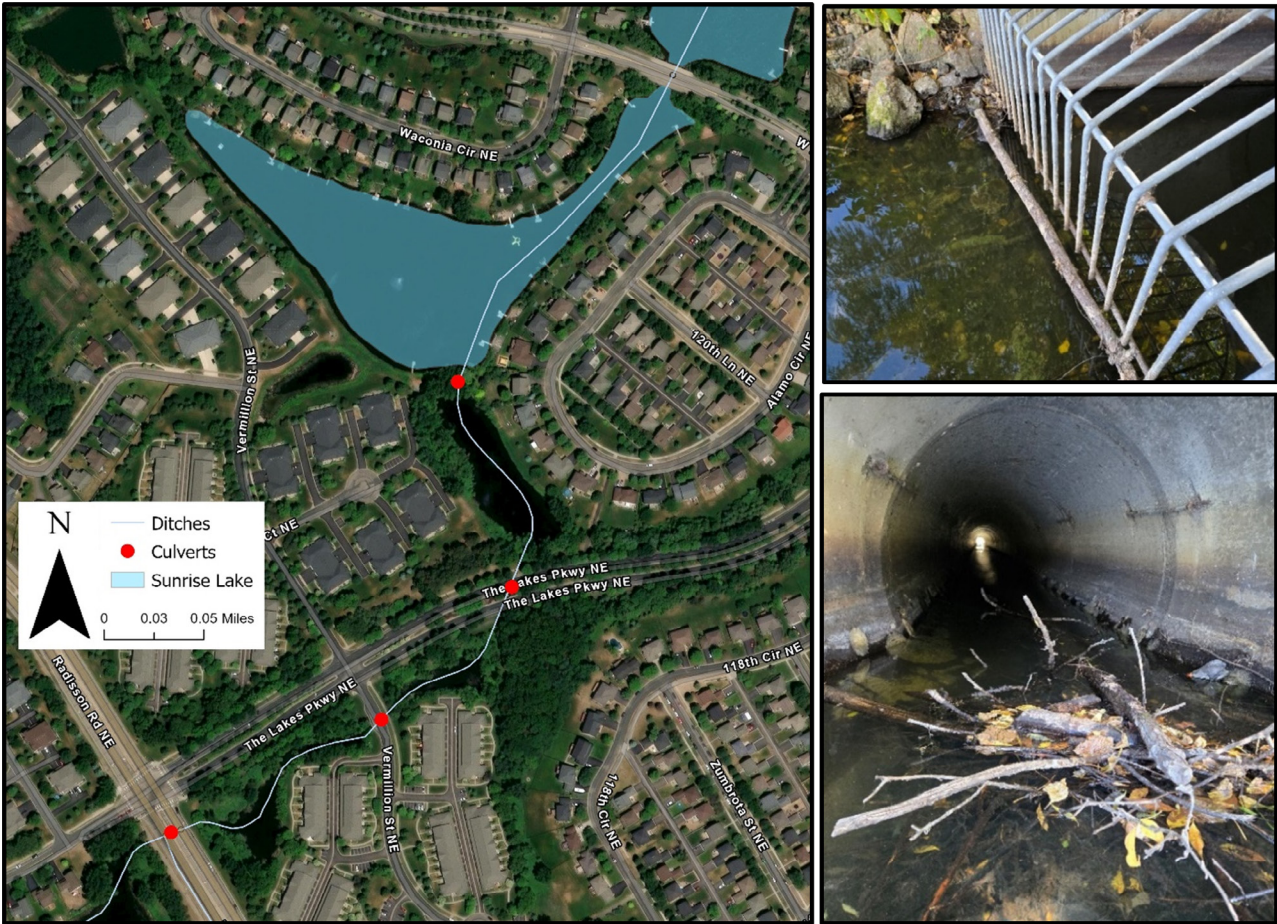


Figure 7. Locations of Sunrise Lake outlet and downstream culverts (left). Image of Sunrise Lake outlet structure showing trash rack and culvert (upper and lower right).

2.3 Watershed Land Use and Development

2.3.1 Land Use

Sunrise Lake is situated within a residential area, primarily consisting of single-family and multi-family homes with a few legacy rural residential lots remaining in the southern portion of the lakeshed (Figure 8). The northern part of the lakeshed includes a few light industrial and commercial properties. The lakeshed also contains four parks and approximately 244 acres of wetland area (NWI Types 1-8). Despite the presence of ample green space, impervious surface coverage is moderately high given the density of development and large footprints of residential structures relative to average lot size.

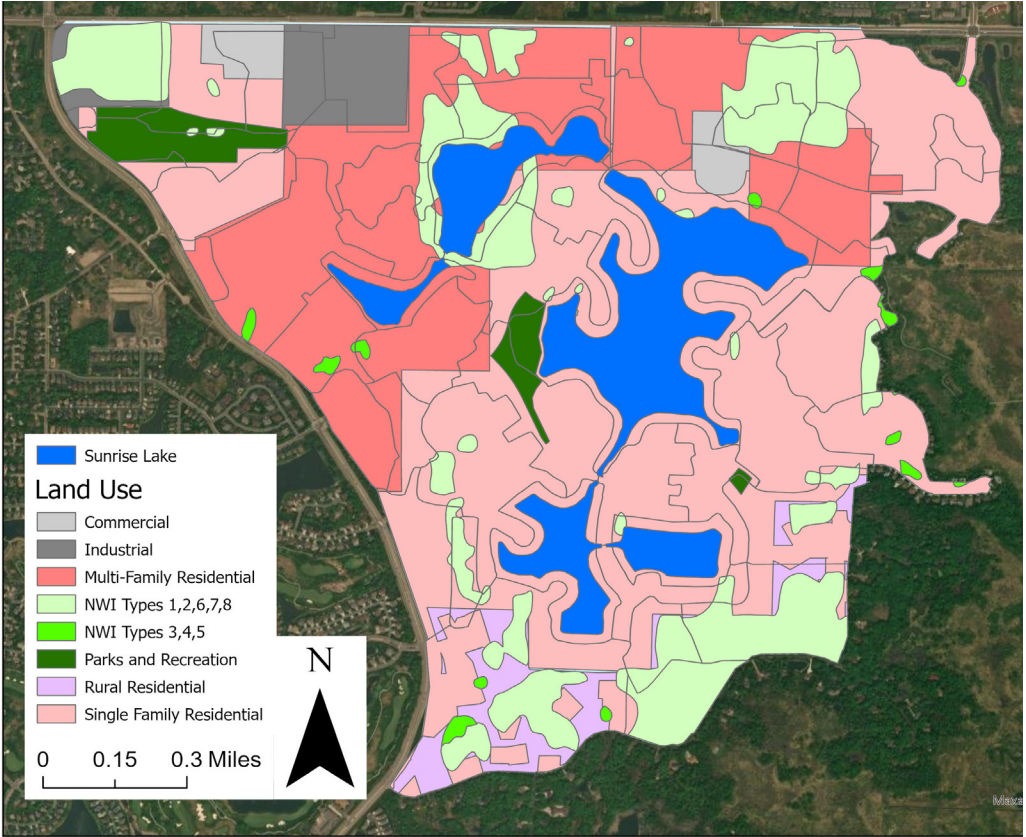


Figure 8. Land use in the Sunrise Lake lakeshed. City of Blaine’s Lakeside Commons Park, along the northern shore of the main lake basin, is not pictured.

2.3.2 Land Ownership

Land ownership in the Sunrise Lake lakeshed is divided between private individuals and entities and public properties, with private residential properties comprising the largest portion of shoreline ownership (Figure 9). The City of Blaine owns a large park (Lakeside Commons Park) on the north end of the lake, which provides public access to amenities such as a beach, splash pad, boathouse with paddlecraft rentals, concessions, playground, volleyball court, and a rentable picnic pavilion. Additionally, the city owns another park (West Lake Park) on the west side of the lake that features a playground, basketball court, and gazebo along the shoreline. In addition to residential and city ownership, multiple homeowner associations also own portions of the shoreline; these parcels often support shared communal access to the lakefront for their respective communities.

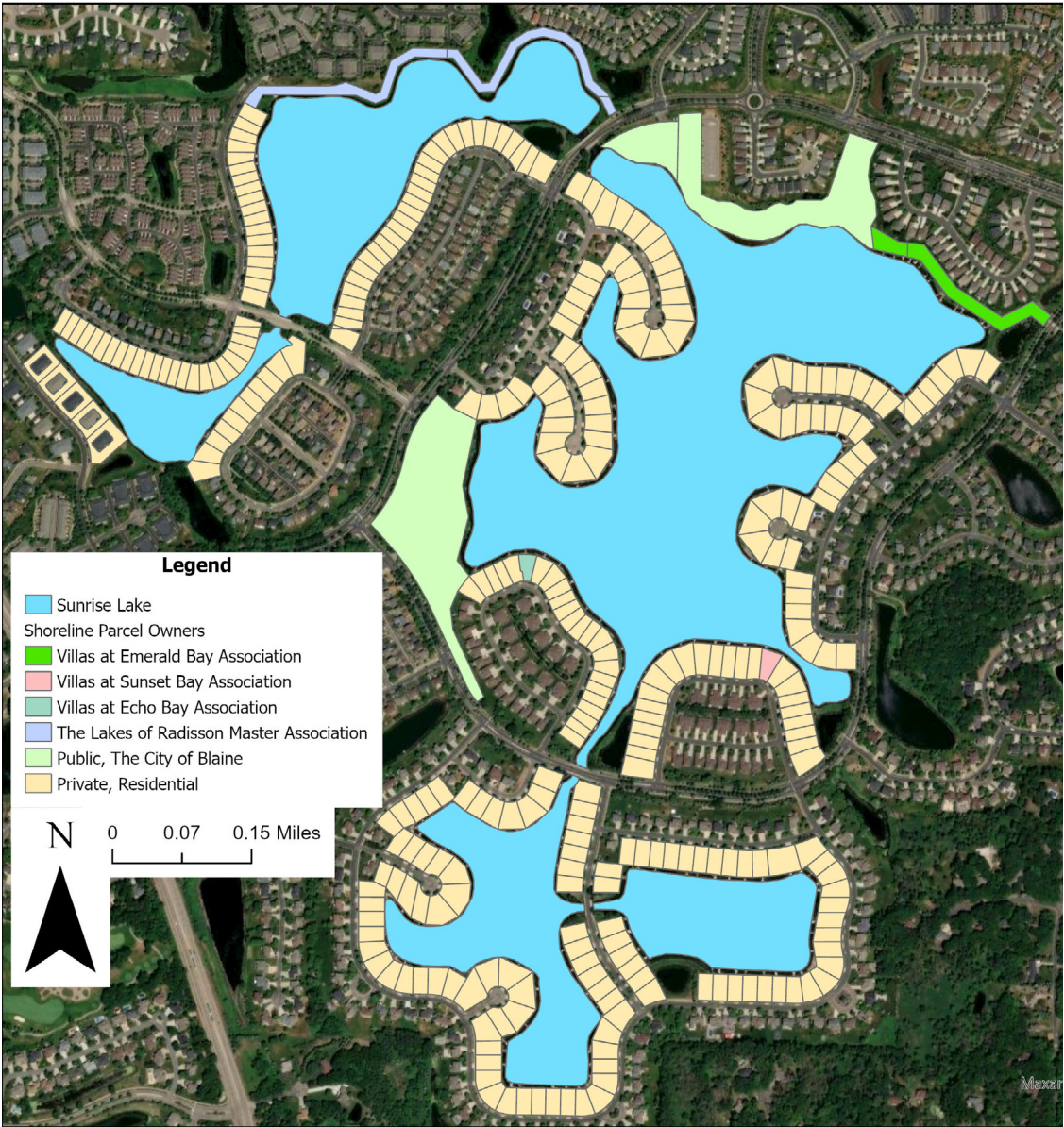


Figure 9. Land ownership along the shoreline of Sunrise Lake.

2.3.3 Lakeshed Development Characteristics

As of 2025, there are 2,892 parcels located within or partially within the Sunrise Lake lakeshed, with 339 parcels characterized as lakefront properties. The majority of these parcels are classified as single-family residential. Residential development in the lakeshed area began in 1977 but significant development did not take off until 2005 after the lake was fully excavated.

The average single-family home in the lakeshed is approximately 1,897 square feet in size, featuring three bedrooms and two bathrooms. These homes typically sit on 0.22-acre lots and are an average of 18 years old, with construction years centering around 2007. The oldest home in the lakeshed was built 48 years ago in 1977, while the newest home was completed just three years ago in 2023 (Table 2, Figure 10).

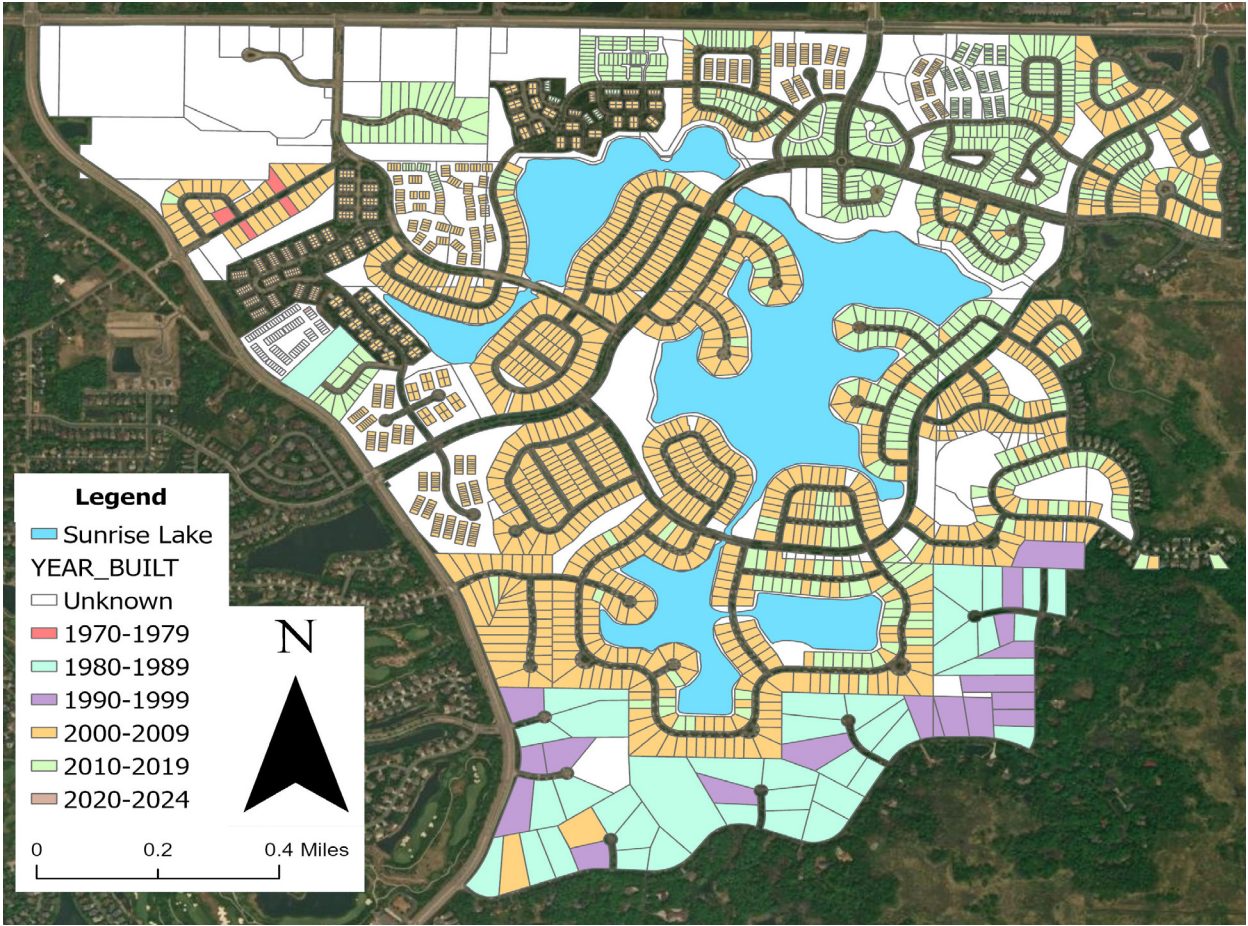


Figure 10. Timeline of residential development in Sunrise Lake lakeshed.

Table 2. Summary statistics for single-family residential parcels in Sunrise Lake lakeshed.

Average lot size	0.22 acres
Average house Size	1,897 sq ft; 3-bedroom, 2 bath
Average house age	18 years (built in 2007)
Oldest house	48 years (built in 1977)
Newest house	2 years (built in 2023)

2.4 Physical attributes of Sunrise Lake

2.4.1 Lake Morphology & Bathymetry

Sunrise Lake is a manmade lake that was formed as part of the Lakes of Radisson housing development. Sunrise Lake has a surface area of approximately 158 acres, with a mean depth of 8 feet and a volume of approximately 1,324 acre-feet. It is classified as a shallow lake with a maximum depth of 16 feet (Figure 11). Sunrise Lake has a meandered shoreline length of approximately 6.9 miles.

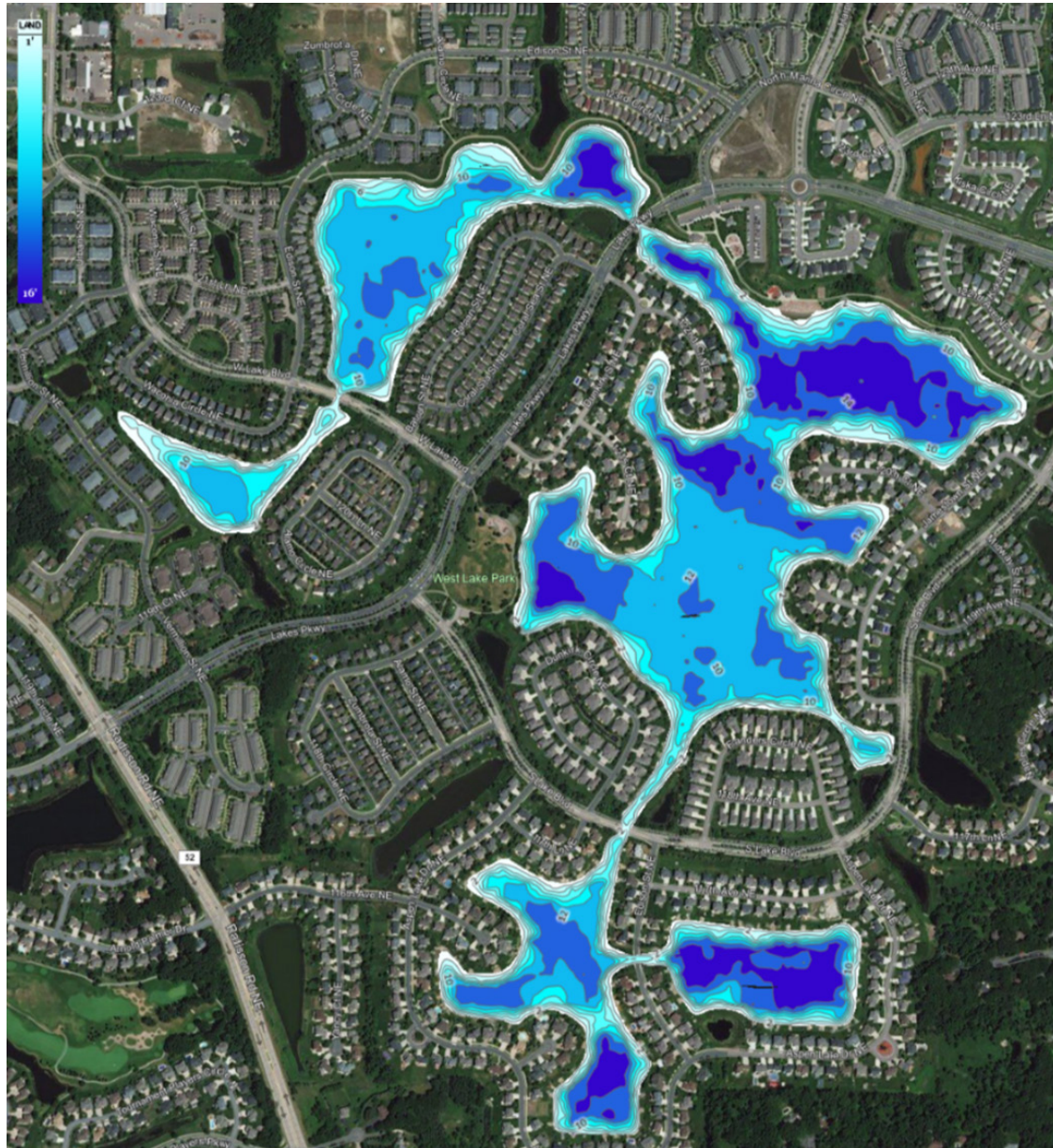


Figure 11. Sunrise Lake bathymetric map showing 2-ft depth contours.

2.4.2 Lake Levels

The water level of Sunrise Lake is primarily controlled by a series of culverts located upstream and downstream of the lake. The total variation, also known as the difference between the highest and lowest recorded levels is 2.71 feet over the seven-year period of record (Figure 12). However, intra-annual fluctuations are typically closer 1 foot, indicating a relatively stable water level (Figure 13). The average elevation is approximately 891.0 feet above sea level. Note that continuous water level readings are only available from 2022 to 2024; earlier records from 2018-2021 are spot readings from City of Blaine staff compiled by the Anoka Conservation District. A new elevation benchmark was surveyed by CCWD staff in 2022, so it is possible that past years used a slightly different reference value, but this could not be verified.

Flooding concerns for Sunrise Lake are minimal due to its relatively small drainage area to storage ratio with plentiful low-lying wetlands and storm ponds in the lakeshed that act as a buffer against rising waters. Given

the flat topography and that the water level of the lake is controlled by a series of downstream culverts, obstructions in these culverts could impede the flow of water and cause temporary flooding. According to the most current FEMA floodplain maps, there are presently no residential structures surrounding Sunrise Lake within the regulated 100-yr floodplain (area with greater or equal to 1% chance of flooding annually).

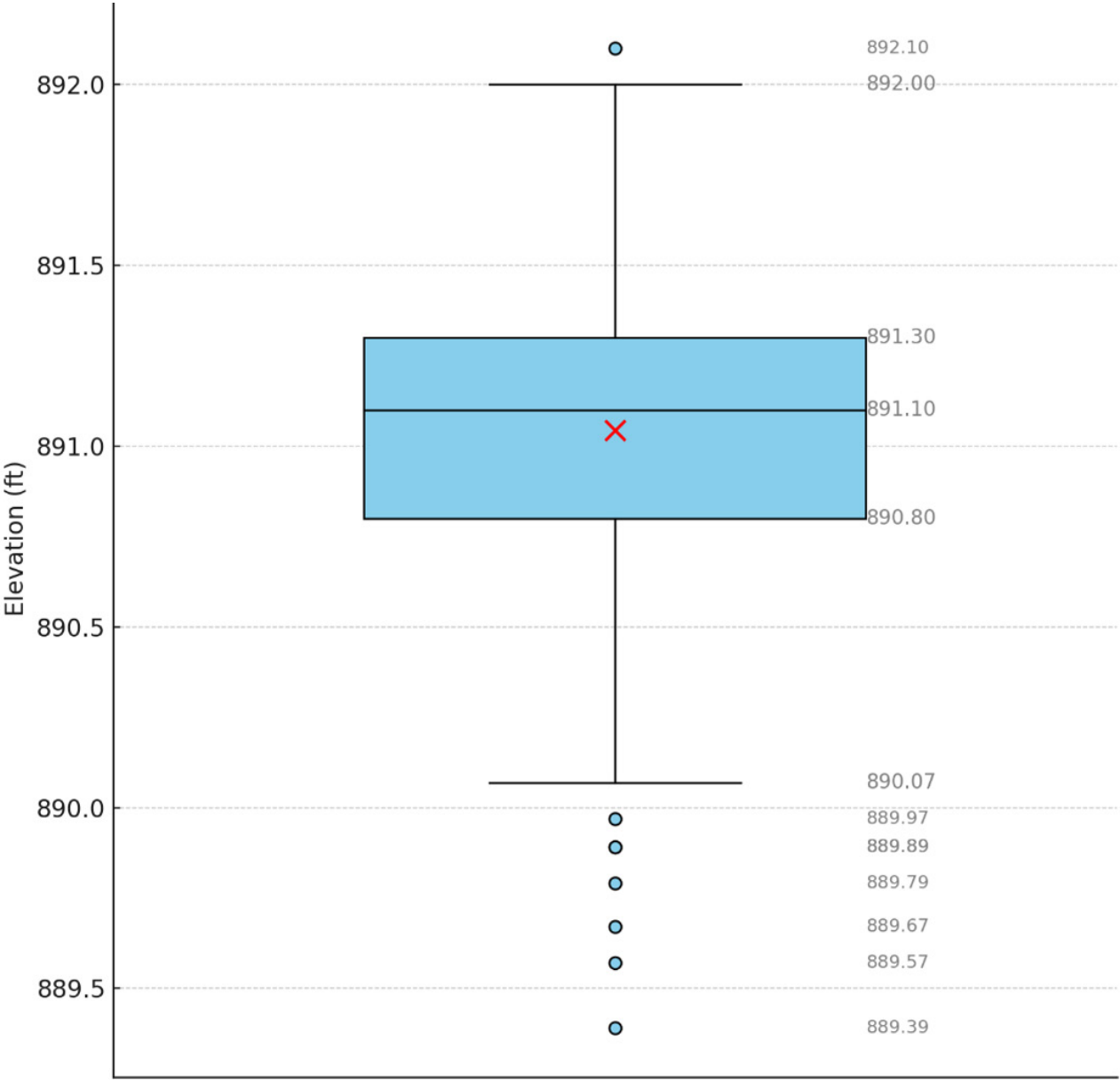


Figure 12. Sunrise Lake elevation summary for 2018-2024. The box plot shows the minimum, 25th percentile, median, 75th percentile, and maximum. The mean is marked with an "X"; outliers are shown as points.

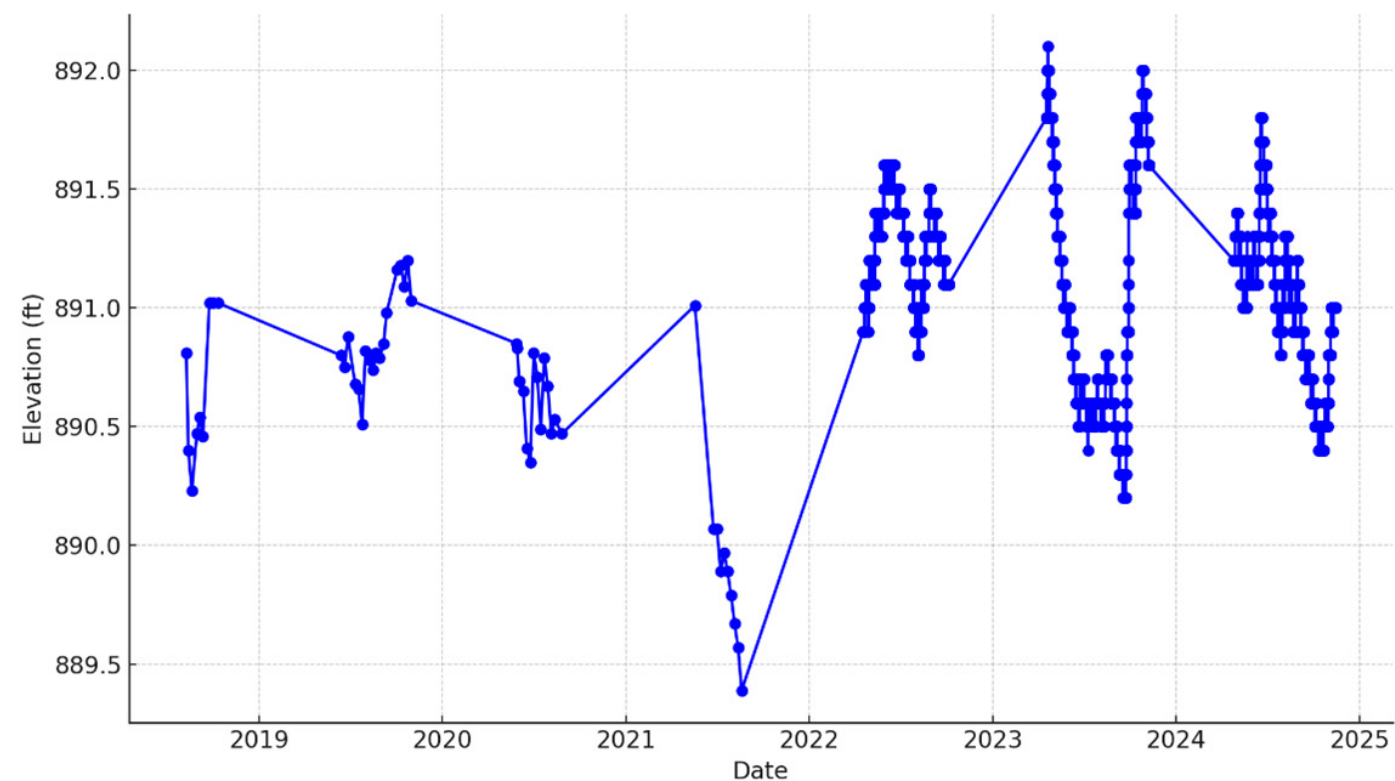


Figure 13. Water elevation data for Sunrise Lake from 2018 to 2024. Data from 2018-2021 are from tape-down measurements by City of Blaine and Anoka Conservation District; 2022-2024 data were collected via pressure transducer by Coon Creek Watershed District.

2.4.3 Lake Stratification & Mixing

Thermal stratification and lake mixing play critical roles in lake ecology, particularly in nutrient cycling and the spatial distribution of aquatic organisms. Water stratifies based on temperature and density differences caused by uneven heating and cooling at different depths. Wind and wave action can prevent stratification by mixing the water column down to the bottom, especially in shallow lakes. If a lake is stratified, the bottom unmixed layer, known as the hypolimnion, gradually loses oxygen and may become anoxic. When the bottom of a lake is anoxic, chemical reactions can occur that release phosphorus from the sediment. Phosphorus-rich water may remain sequestered at the bottom of the lake if stratification is strong or it can become mixed into surface waters due to uneven heating/cooling, wind and wave action, or other disturbances just as bottom-feeding common carp or improper use of hydraulic jets or other water circulation devices. Periodic mixing during the growing-season can often lead to algal blooms given the influx of nutrients from the bottom of the lake to the surface where sunlight is available to support biological growth. This phenomenon is known as internal loading.

Most lakes in Minnesota are dimictic, meaning they mix twice a year—once in spring and once in fall (also known as lake turnover)—and remain stratified during summer and winter. Shallow lakes, however, often behave differently, mixing more frequently (polymictic) due to more uniform heating and cooling of the water and less resistance to wind-induced mixing. Sunrise Lake is considered a shallow lake by definition (80% of the

lake shallow enough to support rooted aquatic plants, generally <15'), but may behave more like a deep lake given its unusually steep slopes, wind sheltering from dense shoreline development, and low coverage of rooted aquatic plants.

The presence and extent of lake stratification can be observed by measuring temperature and/or dissolved oxygen at various depths throughout the year. Despite being a relatively shallow lake, Sunrise Lake exhibits clear evidence of stratification based on dissolved oxygen profiles (Figure 14). Profiles from early May 2023 (dark blue) show relatively uniform oxygen levels down to 4m of depth, with reduced but ample oxygen at the bottom, indicating a relatively well-mixed lake. By late May-June (light blue, orange), dissolved oxygen levels drop to 2.5 mg/L at 4m depth, indicating that stratification is developing. In July-early September (green, red, dark purple), the strength of stratification intensifies with low oxygen levels observed at 3m and below. Finally, by mid-September (light purple), some mixing has occurred, restoring oxygen levels at depth. It follows that areas of the lake deeper than 3m are likely to experience hypoxia (low oxygen) or anoxia (no oxygen) by mid-summer and could be a source of internal phosphorus loading during periodic or end-of-year mixing events. The timing of this mixing in any given year relative to timing of the growing season would determine the likelihood of contributing to nuisance algal growth. For example, in 2021, there was strong stratification in August, but evidence of mixing as early as 9/8/21, which corresponded with a very large spike in phosphorus concentrations and subsequent late summer algae bloom as measured by chlorophyll-a (data not shown). Stratification and mixing patterns can be different in different parts of the lake due to differences in depth, temperature, and wind sheltering.

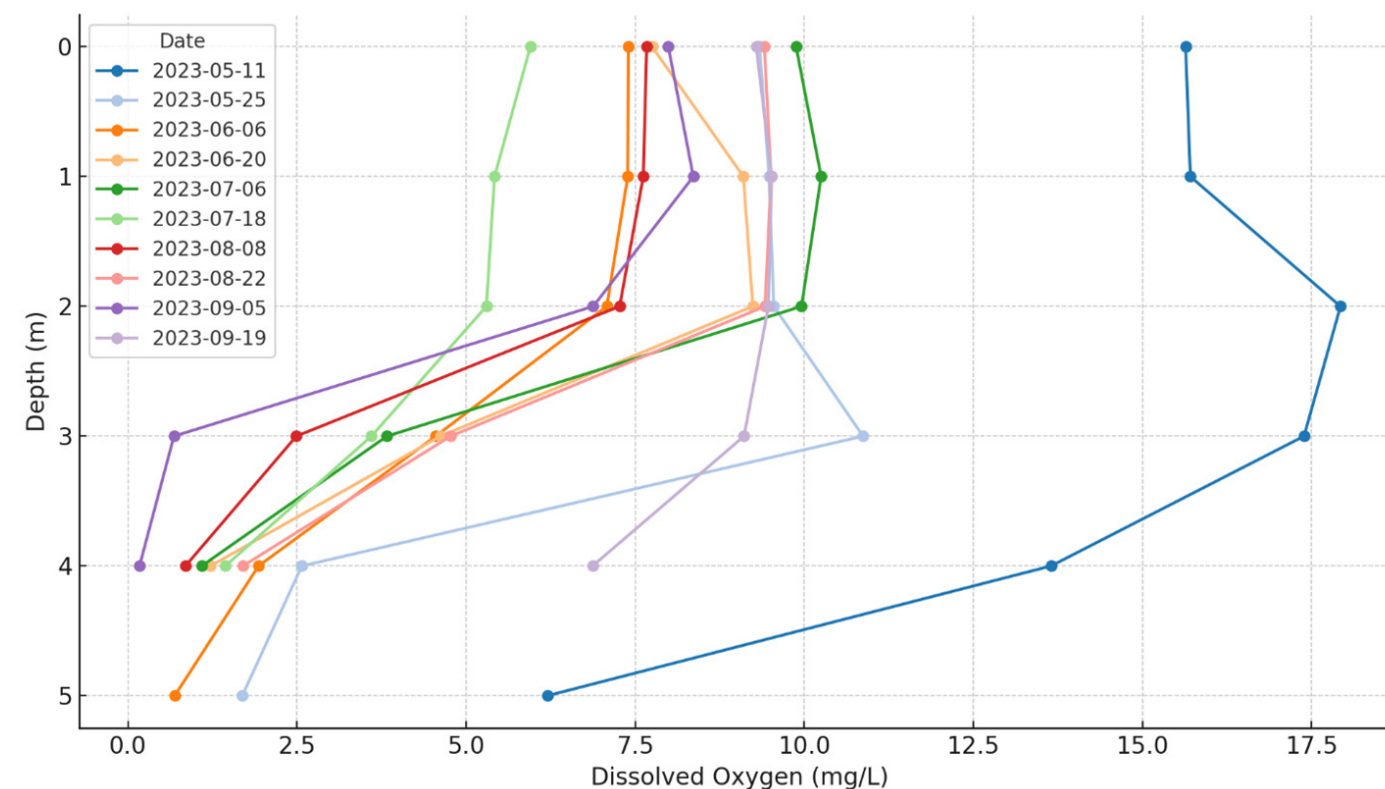


Figure 14. Biweekly dissolved oxygen profiles in Sunrise Lake from May to September in 2023.

2.5 Sunrise Lake’s Water Quality

2.5.1 Pollution Standards and Impairments

Sunrise Lake’s support for recreational uses and fish consumption has not been formally assessed by the Minnesota Pollution Control Agency, but can be evaluated using Minnesota state water quality standards as a reference (MN Statute 7050.0222; Table 3). For a lake to be considered impaired for recreation under the Federal Clean Water Act, it must exceed the applicable State total phosphorus standard and also fail to meet standards for either chlorophyll-a (a pigment found in plants and algae) or Secchi depth (clarity). Presently, Sunrise Lake

meets criteria for total phosphorus and would therefore be considered to support recreational uses despite some exceedances of chlorophyll-a levels and instances of poor clarity (see sections below for more detailed information and monitoring results).

Table 3. Recreation-based water quality standards for Class 2 shallow lakes in the North Central hardwood Forest Ecoregion (M.S. 7050.0222). The standards are compared against summer-average (June-Sept) concentrations or measurements.

Parameter	Standard
Total Phosphorus	<60 µg/L
Chlorophyll-a	<20 µg/L
Secchi depth (transparency)	>1.0 meters

For a lake to be considered impaired for consumption, contaminants in fish tissue need to be tested and compared against thresholds protective of human health. Fish tissue samples have not been collected from Sunrise Lake, but it should be noted that other local lakes (i.e. Ham, Crooked) do have fish consumption advisories due to elevated Mercury levels, so it would not be surprising if the same was true for Sunrise Lake. For these lakes, people from sensitive groups (those who are pregnant or breastfeeding and children under the age of 15) should limit consumption to 1 meal per month of select species. It is recommended that other individuals limit consumption to 1 meal per week. Mercury levels in fish from Sunrise Lake are likely similar to these nearby lakes given they are largely driven by broader atmospheric conditions versus local point sources of pollution. Fish tissue samples from a nearby lake in Lino Lakes, Peltier, have also recently tested positive for polyfluoroalkyl substances (aka PFAS or “forever chemicals”), with consumption recommendations of sunfish limited to one serving per week for the general population and one serving per month for sensitive populations. The source of PFAS in Peltier Lake is presently unknown and no testing has been performed in Sunrise Lake.

Several branches of the Anoka County Public Ditch 41 system flow through Sunrise Lake and eventually merge with other local ditch systems (i.e. Ditch 60, Ditch 39) to become Sand Creek in Coon Rapids. Sand Creek has been formally assessed against state water quality standards for streams and has been designated under the Federal Clean Water Act as impaired for recreation due to excess *E. coli* bacteria and for aquatic life due to poor macroinvertebrate and fish communities compared to undisturbed reference streams. The quality of the water leaving Sunrise Lake influences these sensitive waterbodies downstream. It should be noted that exceedances of the recreation-based chronic exposure standard for *E. coli* (geometric mean of no more than 126 billion organisms per 100 ml) have been observed as far upstream as Ditch 41-4 which is the outlet channel of

Sunrise Lake where it crosses Radisson Avenue before entering TPC. Concentrations of *E. coli* are not measured as part of routine lake monitoring activities, but the City of Blaine does regularly monitor *E. coli* levels at the public swimming beach at Lakeside Commons Park and rarely observes concentrations exceeding standards for safe contact recreation (violation of chronic standard based on 30-day average or any single sample >1260 billion organisms per 100ml). If standards are exceeded, the City of Blaine issues a public notice and temporarily closes the beach. According to the City of Blaine’s Local Surface Water Management Plan last updated in 2018, the long-term average *E. coli* levels observed at Lakeside Commons Beach over nine seasons of monitoring were 5.98 billion organisms per 100 ml, well below the standard for safe contact recreation.

2.5.2 Water Clarity

Lake transparency in Sunrise Lake is influenced by nutrient concentrations, algal and plant growth, sediment loading, and resuspension. Based on the past five years of monitoring results from 2018 through 2023, the average growing-season clarity is approximately 6.1 feet (Figure 15), well above the state standard of 3.28 ft (1 m), indicating support of recreation. Transparency typically is moderate to low in Sunrise Lake in early spring likely due to snow melt and lack of rooted plant growth to sequester nutrients. Transparency then peaks in late spring or early summer, with Secchi depths reaching up to 13.1 feet during May and June. This high clarity likely reflects rapid growth of rooted plants using up nutrients, lower algal activity with cooler water temperatures, and reduced nutrient inputs from external sources. As the summer progresses, water clarity gradually declines, with Secchi depths often falling to around 3.3 feet by late August or September. This seasonal reduction in clarity is likely influenced by increased algal blooms with higher temperatures and internal nutrient cycling of total phosphorus that builds up in anoxic areas and mixes into the water column. Internal loading is also possible from senescence of curlyleaf pondweed and sediment disturbances by common carp or boating activity, but these stressors would more commonly lead to mid-summer clarity declines, so are likely less impactful in Sunrise Lake. The recurring seasonal trends across these five years highlight the dynamic interplay of biological and physical processes affecting water quality and clarity in Sunrise Lake, where early summer conditions consistently support greater transparency prior to late summer declines (Figure 16). Historical records of lake clarity are less robust, but early neighborhood newsletters indicate that mid-summer clarity typically ranged from 5-6’ in 2005-2008, indicating relatively stable conditions over time.

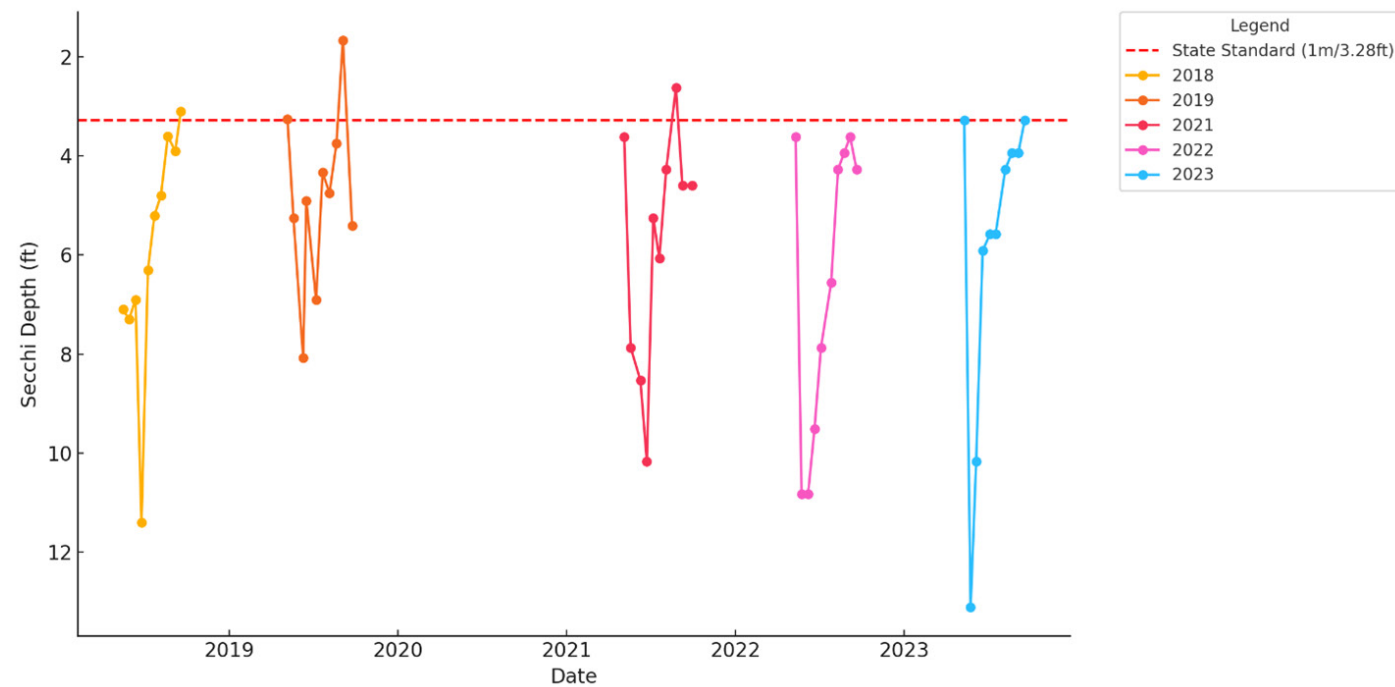


Figure 15. Secchi depth (ft) in Sunrise Lake over five years (2018-2023) shown against the state water quality standard (>1m/3.28ft).

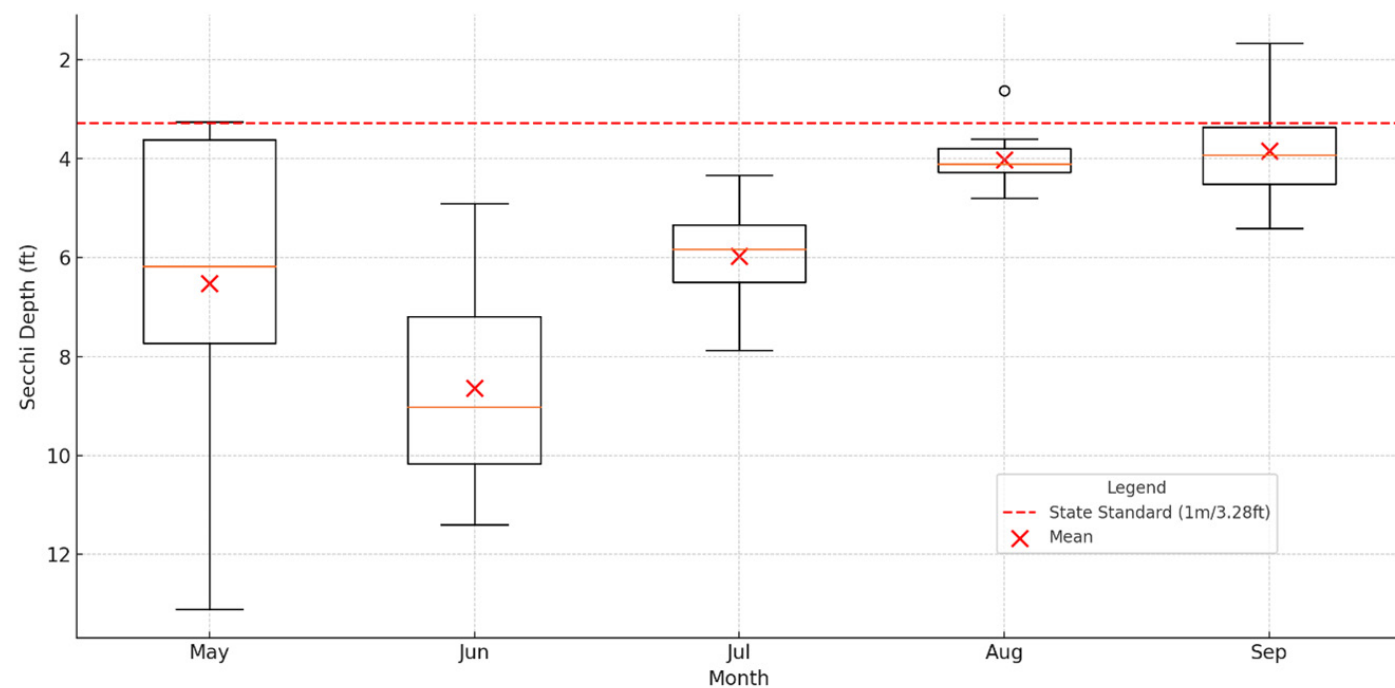


Figure 16. Monthly Variation in Secchi depth (ft) shown against the state standard threshold (>1m/3.28ft). The box plot shows maximum, 75th percentile, median, 25th percentile, and minimum. The mean is indicated with an X and any outliers are shown as points.

2.5.3 Chlorophyll-a

Chlorophyll-a is a pigment used in photosynthesis by plants and algae. Measuring chlorophyll-a concentrations provides an indicator of algal abundance in the lake. Algal growth is influenced by nutrient availability, lake clarity (sunlight penetration), temperature, and predation by zooplankton.

The average growing-season concentration of chlorophyll-a in Sunrise Lake based on five years of monitoring from 2018 to 2023 is 17.0 µg/L, which is below the State pollutant standard of 20 µg/L, but approaching this threshold (Figure 17). Seasonal patterns in chlorophyll-a concentrations are strongly inversely correlated to patterns observed for lake clarity, indicating that poor clarity is being driven largely by algal blooms in Sunrise Lake versus sediment resuspension or other forms of turbidity (Figure 18). Chlorophyll-a concentrations have typically been favorable for the first half of the growing season, but rapidly increase during mid to late summer, with peaks >30 µg/L most years (Figure 19). These late summer peaks may be caused by an influx of phosphorus from runoff, mixing (internal loading), or die-off of rooted, submersed plants (naturally or via herbicide treatments).

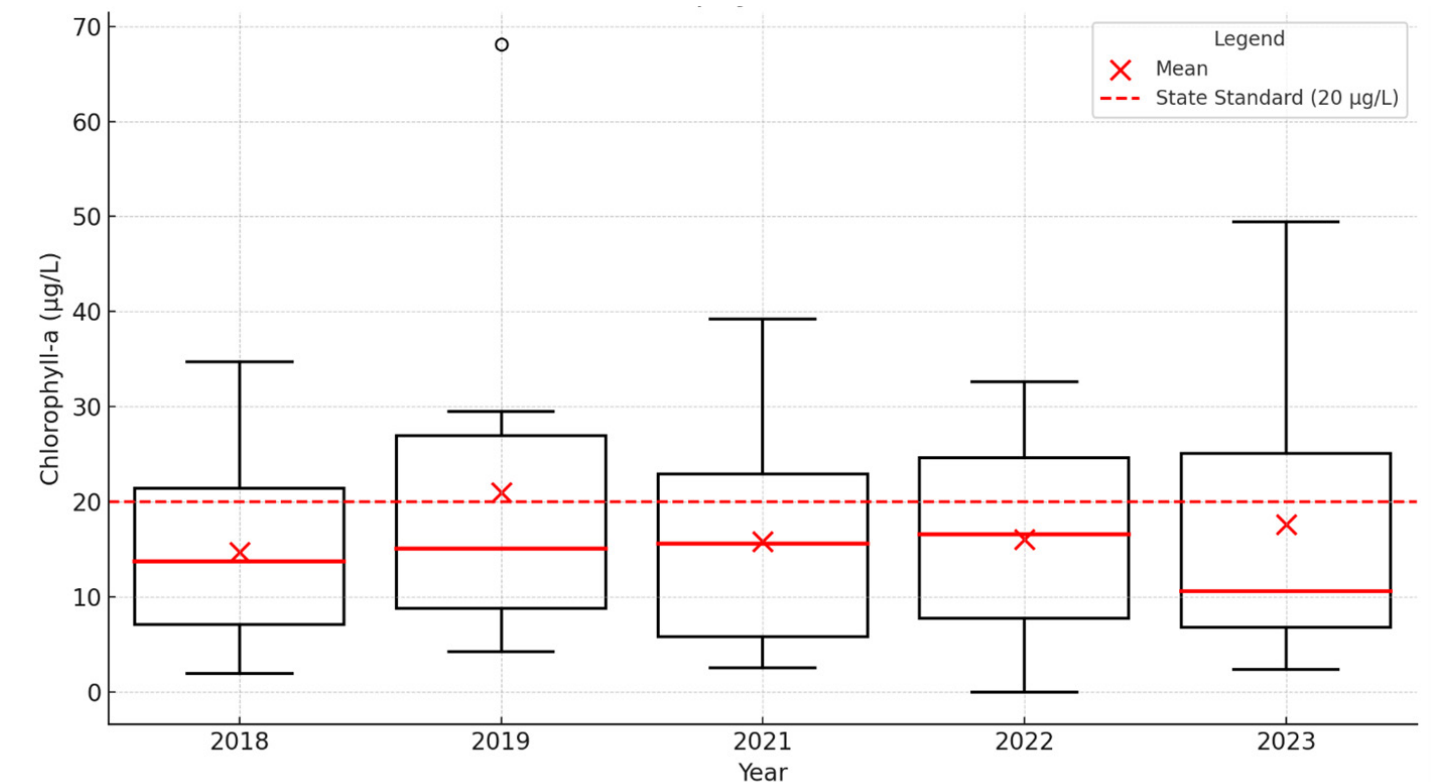


Figure 17. Interannual Variation in chlorophyll-a (µg/L) shown against the state standard threshold (<20 µg/L). The box plot shows minimum, 25th percentile, median, 75th percentile, and maximum. The mean is indicated with an X and any outliers are shown as points.

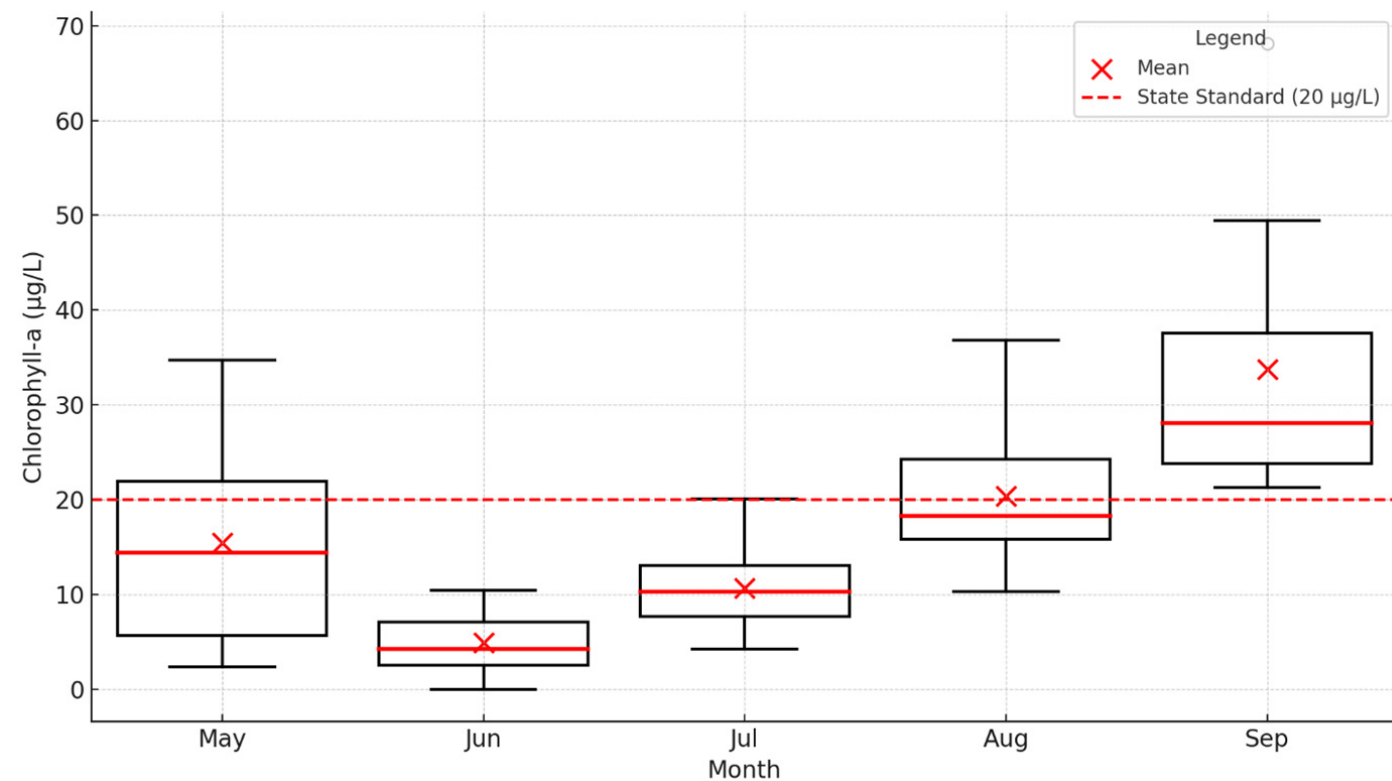


Figure 18. Monthly Variation in chlorophyll-a (µg/L) shown against the state standard threshold (<20 µg/L). The box plot shows minimum, 25th percentile, median, 75th percentile, and maximum. The mean is indicated with an X and any outliers are shown as points.

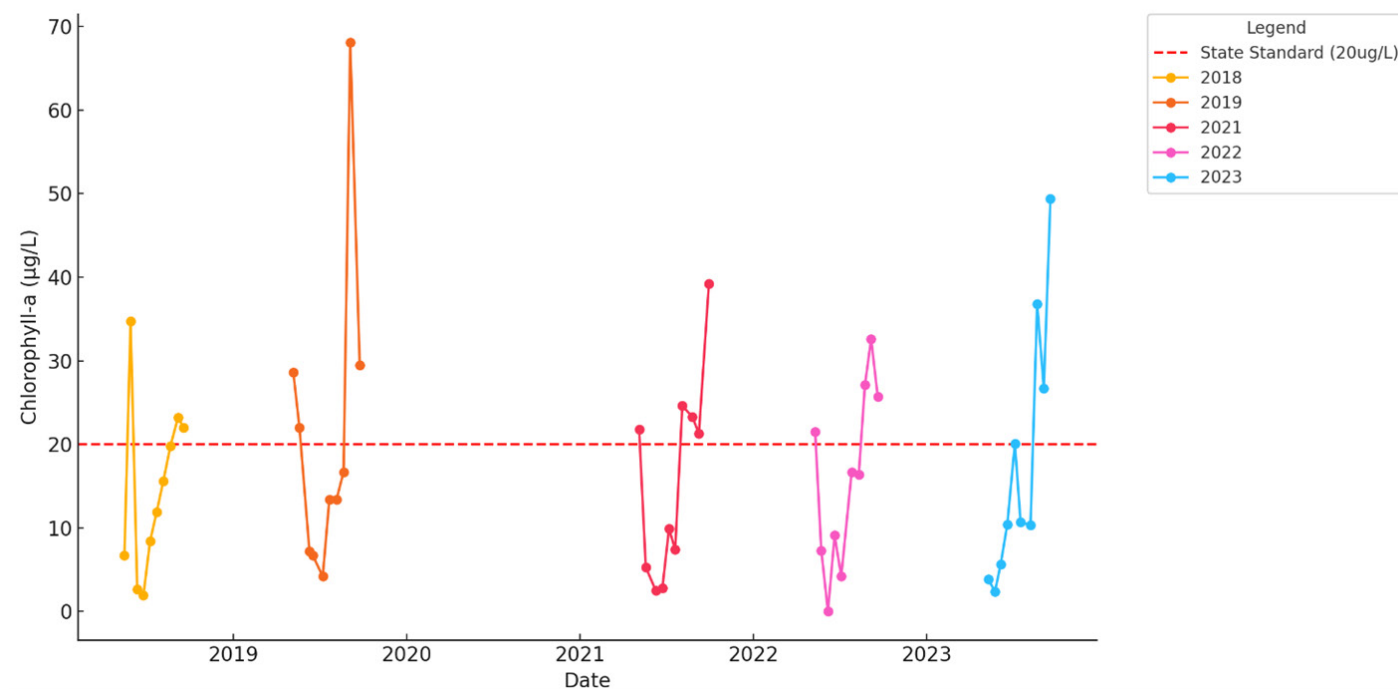


Figure 19. Chlorophyll-a concentrations (µg/L) in Sunrise Lake over five years shown against the state water quality standard threshold (growing-season average <20 µg/L).

2.5.4 Total Phosphorus

Total phosphorus (TP) measures both dissolved and particulate forms of phosphorus in the water column, providing an indicator of nutrient enrichment (“lake eutrophication”). Phosphorus is commonly used as a benchmark for eutrophication in Minnesota lakes because it is often the limiting nutrient that drives plant and algal growth.

The average growing-season concentration of total phosphorus in Sunrise Lake over the past 5 years (2018–2023) is 34 µg/L, which is below the state water quality standard of 60 µg/L for shallow lakes in the North Central Hardwood Forests ecoregion. Over the past five years, total phosphorus concentrations have exhibited typical seasonal variations without any notable short-term trends (Figures 20). Inter and intra-annual variation in total phosphorus concentrations is consistent between years, indicating stable conditions (Figure 21). An early neighborhood newsletter from 2005, shortly after construction of the lake, indicated that total phosphorus concentrations measured in July of that year ranged from 16 to 23 ug/L. July samples over the last 5 years range from 22 to 39 ug/L, indicating a 35-70% increase in total phosphorus concentrations over the past 20 years. More robust data needs to be collected into the future to better evaluate long-term trends. Seasonal variation in total phosphorus closely mirrors trends observed for clarity and chlorophyll-a where concentrations are highly variable, but generally moderate in early spring, improve during late spring and early summer, and then rapidly degrade in late summer and fall (Figure 22). It follows that algae growth is driven by increasing total phosphorus which then decreases water clarity.

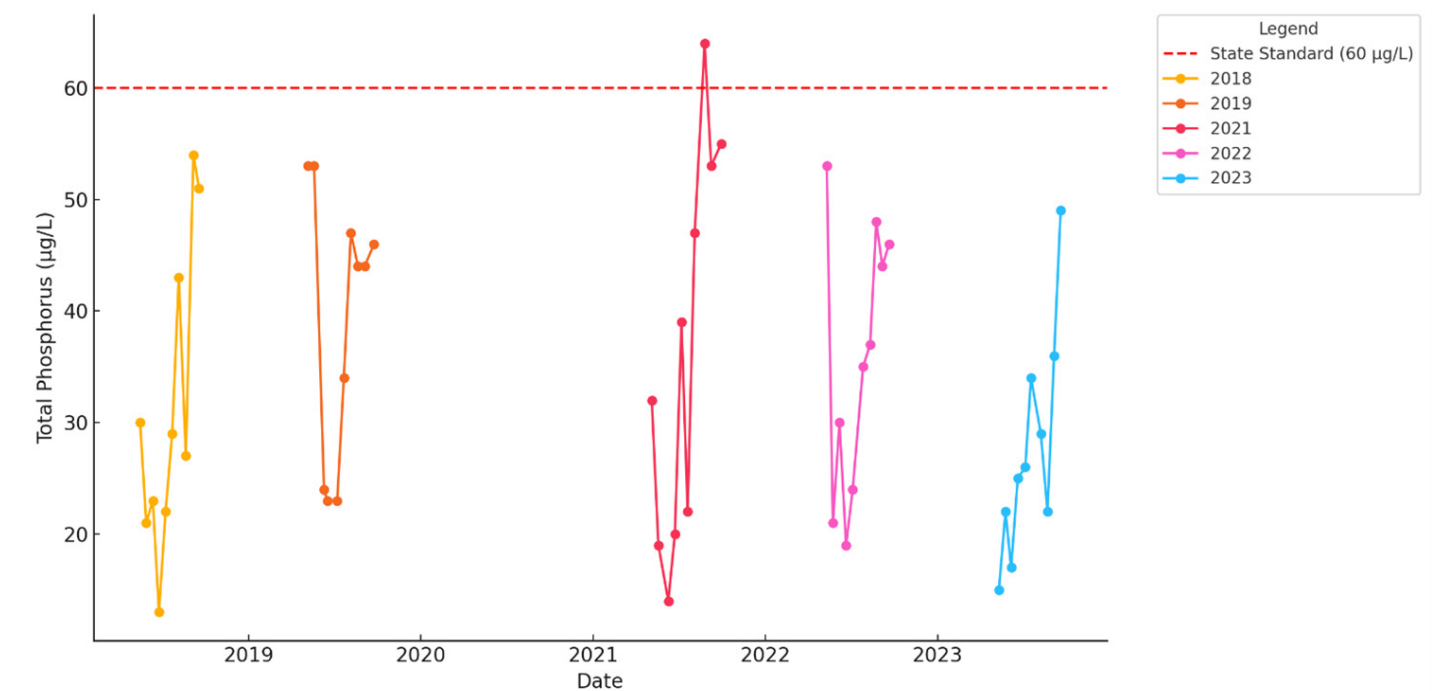


Figure 20. Total phosphorus concentrations (ug/L) in Sunrise Lake over five years (2018-2023) shown against the state water quality standard threshold (growing-season average <60 µg/L).

One sample in 2021 exceeded the state standard for total phosphorus of 60 ug/L, indicating that Sunrise Lake can and does experience excessive nutrient concentrations under select conditions. Investigating this outlier further, concentrations of dissolved orthophosphate collected from the bottom of the lake (“hypolimnion”) were also at the highest levels on record, exceeding 200 ug/L compared to long-term average hypolimnetic concentrations of just 19 ug/L (Figure 23). It is likely that this exceedance of the state standard was therefore driven by internal loading from dissolved orthophosphate in the hypolimnion mixing into the rest of the water column. There was a subsequent increase in algae growth as measured by chlorophyll-a and sharp decline in water clarity. The strength and frequency of lake stratification and mid-summer mixing events in Sunrise Lake likely has a large influence on nutrient conditions in the upper water column where phosphorus fuels algae growth.

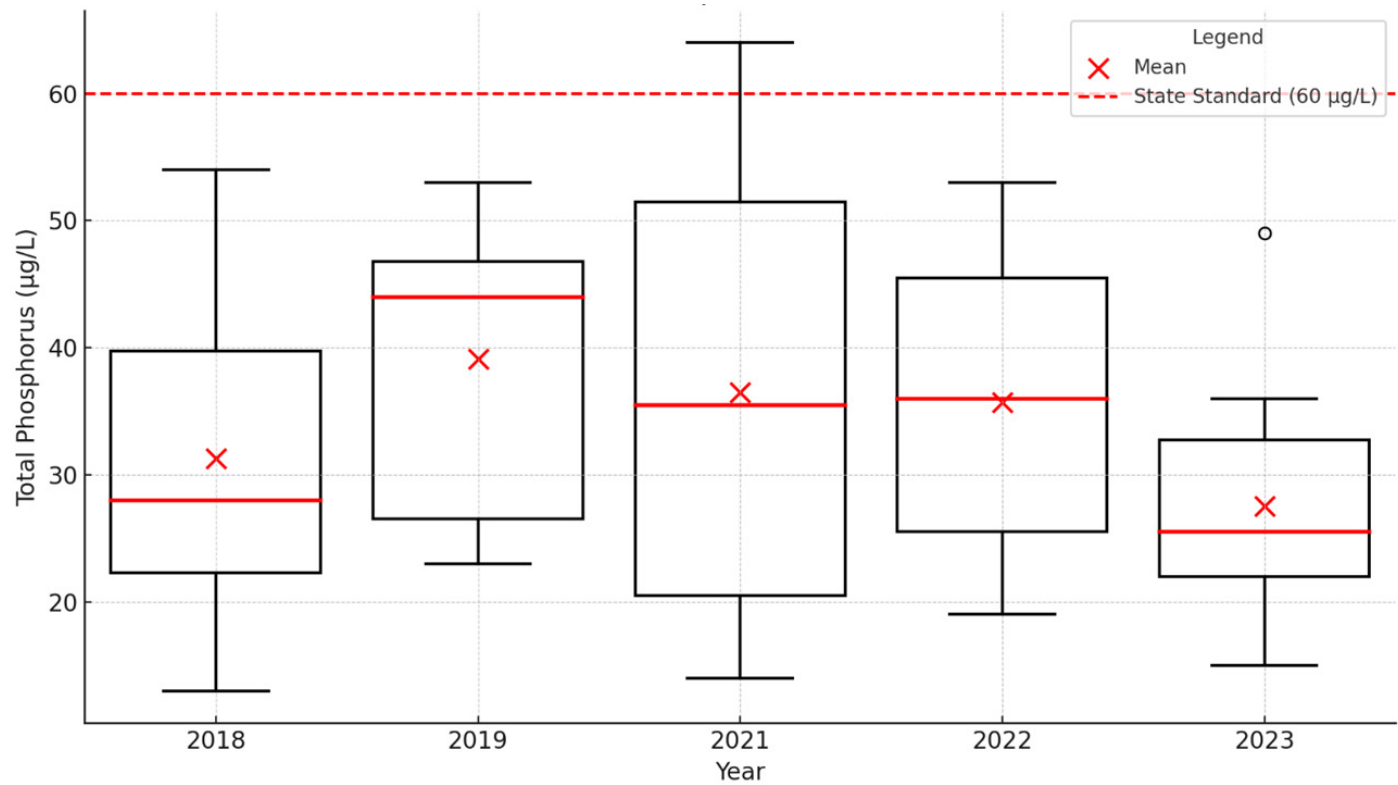


Figure 21. Total phosphorous concentrations by year shown against the state water quality standard threshold (growing-season average <60 µg/L). Box plots show minimum, 25th percentile, median, 75th percentile, and maximum. The mean is indicated with an X and any outliers are shown as points.

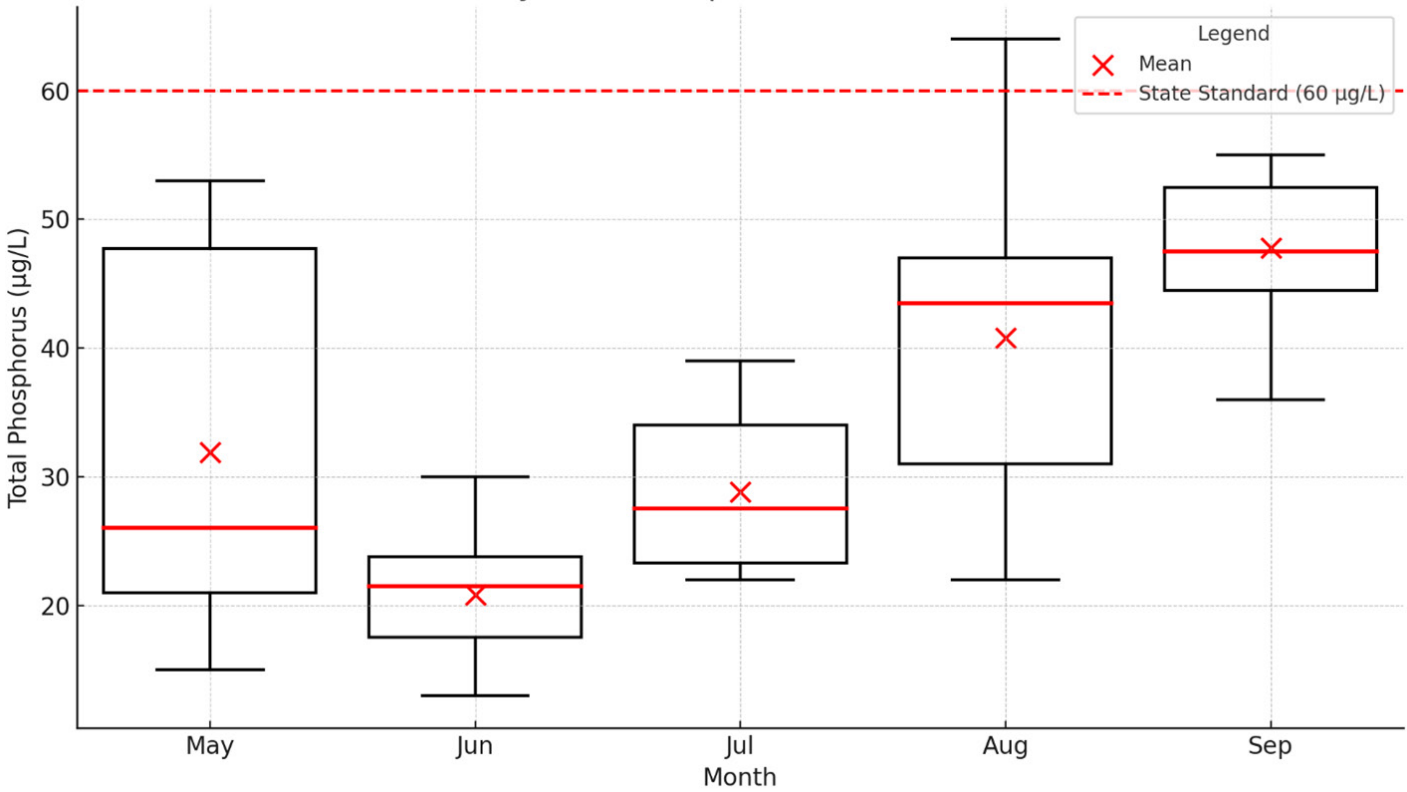


Figure 22. Monthly variation in total phosphorous (µg/L) compared against the state standard threshold (<60 µg/L). The box plot shows minimum, 25th percentile, median, 75th percentile, and maximum. The mean is indicated with an X and any outliers are shown as points.

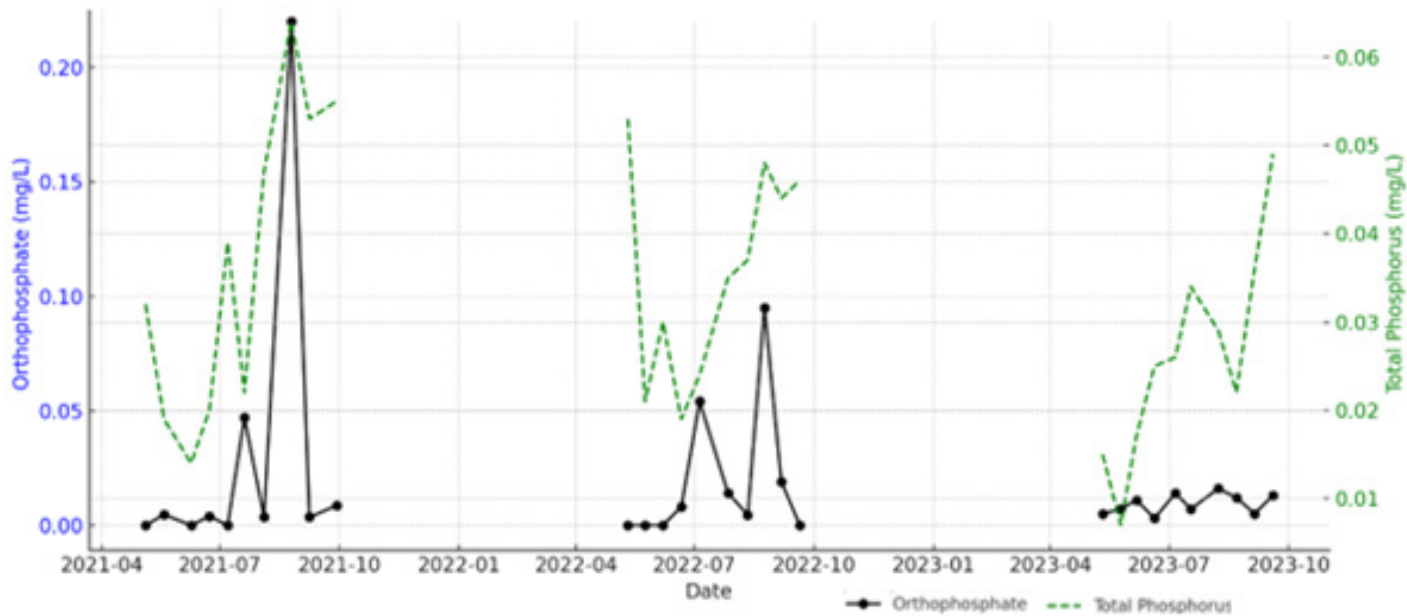


Figure 23. Hypolimnetic (bottom) concentrations of dissolved orthophosphate (mg/L; primary axis) compared to surface total phosphorus concentrations (mg/L; secondary axis) in Sunrise Lake from paired grab samples collected in 2021 to 2023.

2.5.5 Chloride

Chloride is a naturally occurring ion in freshwater systems, but its levels can significantly increase due to human activities such as road salting, agricultural runoff, wastewater discharge, and industrial inputs. Elevated chloride concentrations in lakes can be toxic to aquatic life and can alter mixing dynamics and water chemistry, disrupting ecosystem balance. Chronic chloride exposure can affect macroinvertebrate and fish reproduction, reduce biodiversity, disrupt food webs, and increase the prevalence of invasive species that thrive in high-salinity conditions. The Minnesota Pollution Control Agency has set a chloride chronic exposure threshold for aquatic life of 230 mg/L. Freshwater lakes generally have low natural chloride levels, often below 10 mg/L. However, lakes near urban or agricultural areas are more prone to chloride pollution, with concentrations that may exceed thresholds for aquatic life.

Chloride levels in Sunrise Lake were monitored during two distinct periods, the winter/spring periods of 2018-2019 and again in 2023–2024, revealing an increasing trend in concentrations over time. In 2018-19, the average chloride concentration was 76 mg/L, while in 2023–24, the average increased to 95.6 mg/L, representing a difference of 19.6 mg/L or a 25% increase in just 5 years (Figure 24). There is no historical chloride data available for Sunrise Lake itself, but chlorides were measured in Ditch 41-4 at Radisson Rd (the Sunrise Lake outlet channel) from 2010-2012 with an average concentration during baseflow conditions of 54 mg/L. Between 2010 and 2024, chloride levels have therefore increased about 4.5% per year on average; if this trend continues, conditions in Sunrise Lake would exceed the chronic toxicity threshold considered protective of aquatic life by approximately 2043. This alarming rise in chloride levels highlights long-term impacts from surrounding land use and management practices. Chloride levels should continue to be monitored to evaluate long-term trends and efforts to reduce salt use in the lakeshed should be prioritized. Chloride is a permanent pollutant with no largescale treatment options available that are economically feasible.

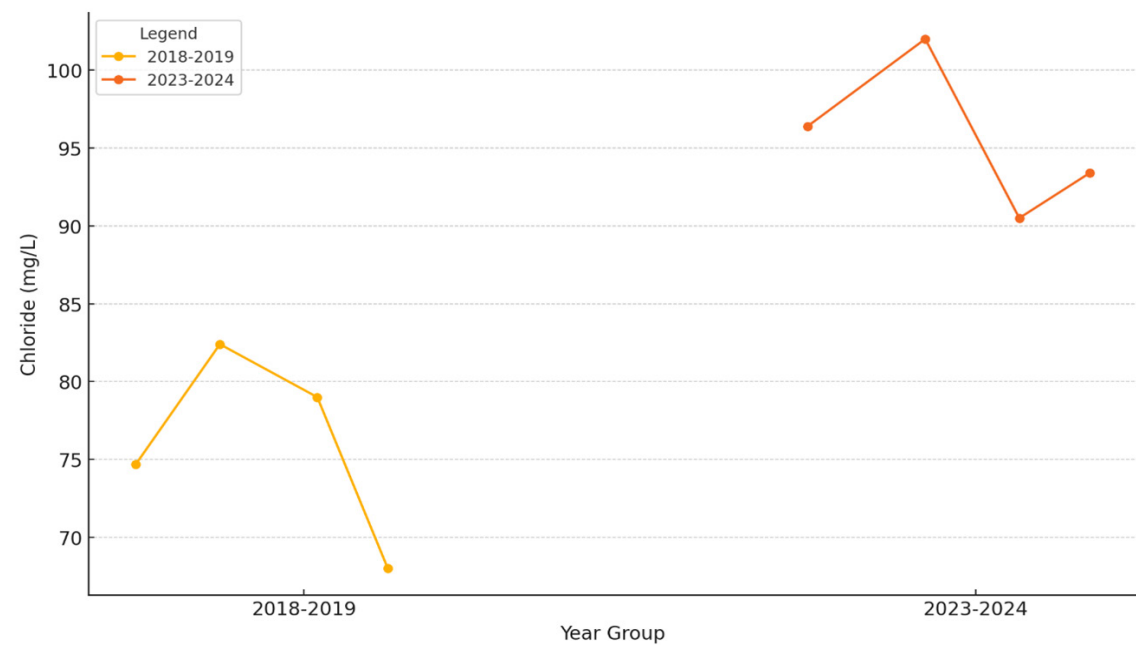


Figure 24. Chloride concentrations in Sunrise Lake during winter/spring seasons of 2018-2019 and 2023-2024.

2.5.6 Nutrient Loading Model

To analyze sources of nutrient loading to Sunrise Lake, a phosphorus watershed and lake response model was developed by the CCWD’s Engineering firm, Stantec. The model assumptions, methods, and results for each component of the phosphorus budget are summarized below.

Atmospheric Load

Atmospheric inputs of phosphorus to Sunrise Lake were estimated at 24.9–29.0 kg/km²/year using rates outlined in the MPCA report, “Detailed Assessment of Phosphorus Sources to Minnesota Watersheds” (Barr Engineering 2004). For Sunrise Lake, these rates equate to mean 2012-2022 annual phosphorus loads of approximately 38 pounds per year.

Internal Load

Internal loading from in-lake processes occurs when organic matter decays (e.g., chemical treatment or natural die off of vegetation) or when organics built up in lake sediments release phosphorus to the water column during low oxygen conditions. Water column temperature and dissolved oxygen profiles measured during the summer growing season (See Figure 14) were used to determine the volume of water under anoxic conditions. This volume is used to calculate an anoxic factor normalized over the lake basin and reported in units of number of days (Nürnberg 2004). Based on modeling, the average anoxic factor of Sunrise Lake between 2012-2022 was approximately 36.09 days per year.

To calculate the total internal load for Sunrise Lake, the anoxic factor is multiplied by the lake surface area that experiences anoxia and an estimated or measured phosphorus release rate. A release rate of 2.55 mg/m²/day was determined for Sunrise Lake based on average release rates across 2012-2022. Using this release rate (2.55 mg/m²/day), the lake area exposed to anoxia (65.2 acres), and the anoxic factor (36.09 days), the estimated internal load is approximately 130 pounds of P per year.

External Watershed Load

Phosphorus load generation and delivery to Sunrise Lake from external sources (“watershed runoff”) were estimated by Stantec using the P8 Urban Catchment Model. The Sunrise Lakeshed was divided into 50 minor catchments which were merged into 16 subwatersheds (an area that drains to a common pour point) using storm sewer location data and high-resolution LiDAR elevation contours (See Figure 5). The Sunrise Lake lakeshed contains over 40 stormwater ponds and wetlands that receive and treat stormwater runoff before discharging into Sunrise Lake. To estimate watershed runoff volumes, the percent impervious fractions and pervious curve numbers for each subwatershed were estimated based on current land use and soil type. Impervious percentages were assigned using literature values by land use type, while runoff curve numbers were determined based on soil type. The model was run for the 10-year period 2012 to 2022 and averaged to predict annual phosphorus loading for each subwatershed (Table 4). For subwatersheds with ample stormwater treatment via storm ponds, phosphorus loads were adjusted by applying a 34% reduction based on average performance of level 1 storm ponds as reported in the MPCA’s Minnesota Stormwater Manual. For subwater-

sheds with direct overland drainage to the lake, this portion of the phosphorus load was reduced by 50% to reflect treatment by robust vegetated buffers (Helmert et al. 2008 [USDA Forest Service]). It should be noted that these modeling inputs assume that storm ponds and buffers are in place and functioning as designed which is not always accurate.

On average, the subwatersheds with the highest phosphorus loading rates per acre were L60b, L50c, L60e, and L40a consisting of direct drainage to the lake from adjacent properties, the upstream northeast portion of the lakeshed, and the western portion of the lakeshed draining into the downstream-most basin (Figure 25). These modeling results indicate that the majority of phosphorus loading originates from the central portion of the lakeshed surrounding the lake. In total, the external portion of the phosphorus load to Sunrise Lake from watershed sources after treatment by ponds and buffers was estimated to be 475 pounds

per year. This portion of the total load was further split into direct, overland loading to the lake (37 pounds per year) and indirect loading via storm pipes and ponds (438 pounds per year). It should be noted that the total estimated watershed phosphorus load before any treatment was 755 lbs/year, indicating that the ensuring ongoing performance of storm ponds and buffers is very important to lake water quality protection.

Across all modeled years, loading from external watershed runoff represents a majority (74.7%) of the average annual total phosphorus (TP) load to Sunrise Lake. Internal loading accounts for the second largest source of total phosphorus (19.6%), while atmospheric loading is minimal, contributing only 5.7% of the annual phosphorus budget (Figure 26). This indicates that efforts to reduce total phosphorus concentrations in Sunrise Lake should focus on reducing external sources of total phosphorus in stormwater runoff and maintaining performance of existing storm ponds and buffers.

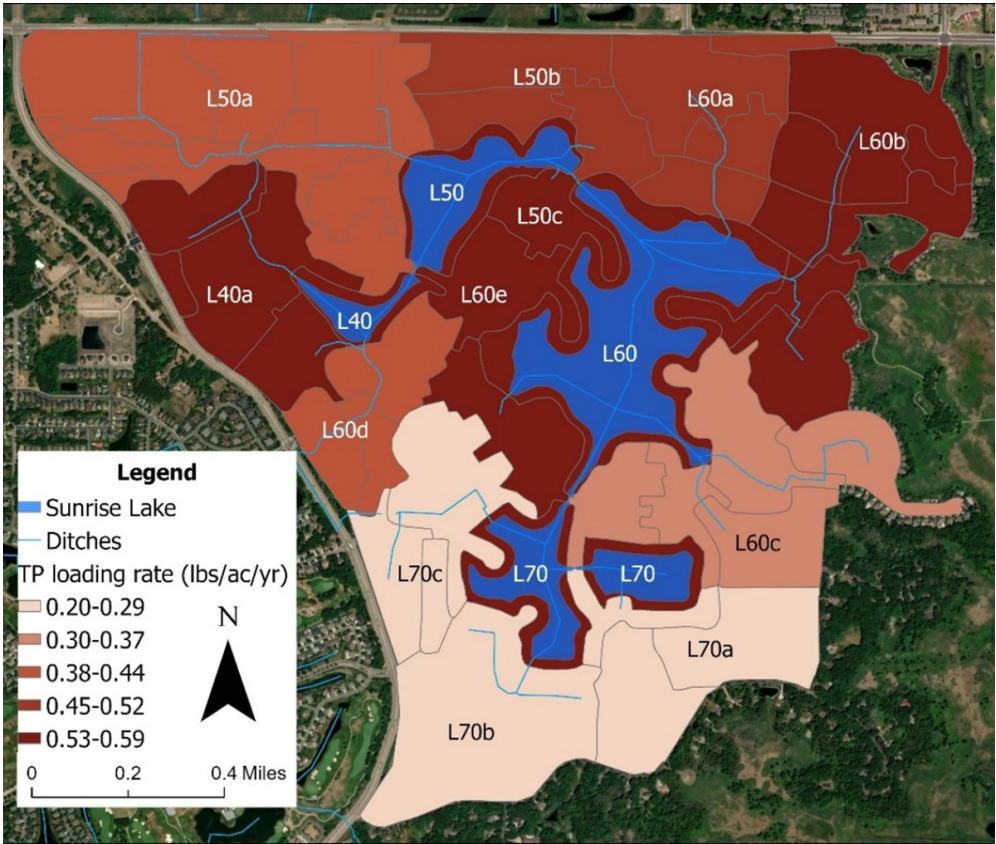


Figure 25. Heat map of total phosphorus loading rates across Sunrise Lake's subwatersheds.

Table 4. Model predictions for external watershed phosphorus loading to Sunrise Lake by subwatershed area.

Watershed ID	Years Modeled	Discharge (ac-ft/ yr)	Total Phospho- rus (mg/L)	Unadjusted TP Load (lbs/year)	TP Load adjusted for treatment by ponds & buffers (lbs/year)
L50a	2012-2022	140.21	0.30	121.1	78.0
L60b	2012-2022	104.28	0.40	92	59.2
L50	2012-2022	24.13	0.30	16.4	5.9
L40a	2012-2022	84.6	0.40	74.9	48.2
L70a	2012-2022	33.6	0.30	28.5	18.4
L60a	2012-2022	126.23	0.40	111.4	71.7
L60d	2012-2022	46.9	0.40	41	26.4
L60e	2012-2022	61.59	0.40	54.2	34.9
L70c	2012-2022	4.15	0.40	3.6	2.3
L40	2012-2022	7.77	0.30	5.5	3.9
L70	2012-2022	30.85	0.30	22	11.8
L60c	2012-2022	51.87	0.40	45.3	29.2
L50b	2012-2022	58.72	0.40	51.5	33.1
L50c	2012-2022	20.08	0.40	17.7	11.4
L60	2012-2022	62.71	0.30	41.9	22.5
L70b	2012-2022	32.62	0.30	27.8	17.9
Total	2012-2022	890.31	5.70	755	475

Sunrise Lake TP Load (2012-2022 Average)

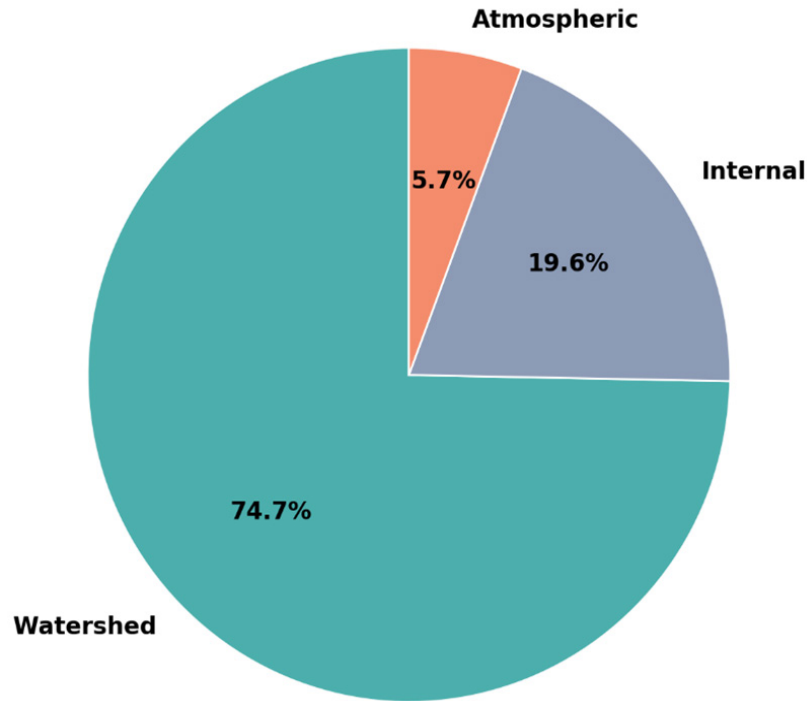


Figure 26. Mean annual phosphorus budget for Sunrise Lake (2012-2022).

Water Quality Response Modeling

The modeled phosphorus loading rates for Sunrise Lake were used as inputs in the Canfield-Bachman lake response model (1981) to predict in-lake total phosphorus concentrations. Predicted results from the lake response model were compared to measured phosphorus concentrations obtained from in-lake monitoring efforts as a way of verifying the validity of the loading model (Figure 27). The lake response model performed well for the modeled years, indicating that the loading model provides a reasonable representation of the nutrient dynamics within Sunrise Lake and its watershed. The model slightly overpredicted in-lake total phosphorus concentrations by about 15% compared to observed concentrations which could indicate that the watershed loading model slightly overestimates total phosphorus loading to the lake from the watershed or internal sources. This could indicate that stormwater runoff generated in the lakeshed is cleaner than expected based on existing land use, that storm ponds and/or buffers are currently functioning better than expected to remove total phosphorus, or that lake sediments are releasing less total phosphorus or water column mixing is happening less frequently than expected. This also means it would not be surprising if future in-lake phosphorus concentrations were about 15% higher than current conditions if any of these factors change over time.

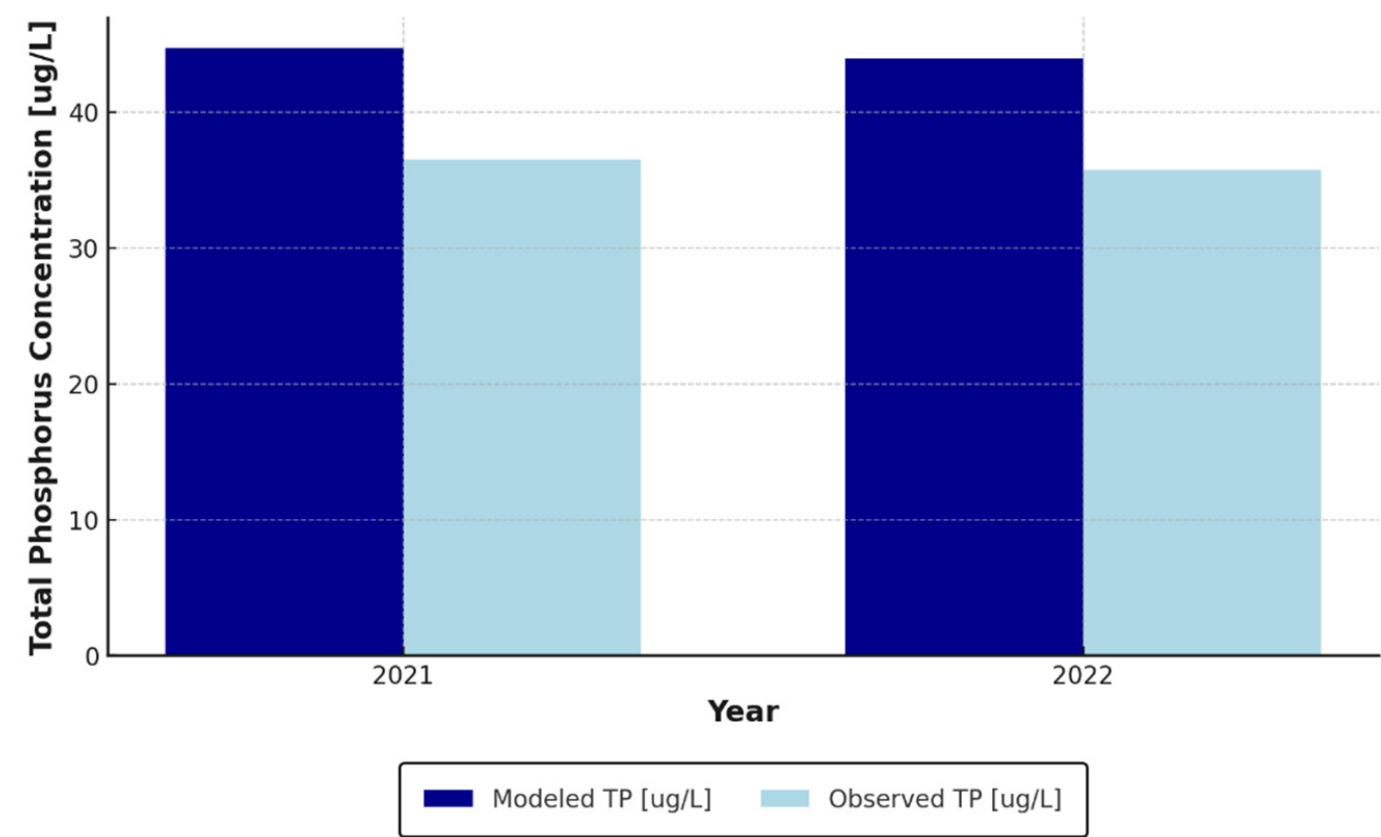


Figure 27. Phosphorus lake response model performance for Sunrise Lake showing predicted growing season average in-lake total phosphorus concentrations compared to observed monitoring results.

2.6 Biological Attributes of Sunrise Lake

2.6.1 Aquatic Macrophytes

Healthy shallow lakes are characterized by abundant and diverse macrophytes or aquatic plants. Aquatic plants are an important source of food and habitat for invertebrates, fish, and wildlife. Many aquatic organisms rely on aquatic plants for at least a portion of their life cycle such as spawning, foraging, or for shelter from predators. Additionally, aquatic plants promote increased water clarity and reduced algal growth by sequestering nutrients and reducing sediment resuspension through stabilization of the lake bottom. Emergent plants such as bulrush and cattails are also important for preventing shoreline erosion and intercepting and filtering overland runoff. It is however possible for aquatic plants to reach nuisance conditions and interfere with access to the lake and/or recreation, especially given the presence of excess nutrients or invasive species that grow in dense monotypic stands.

Unlike the robust native plant communities of nearby natural shallow lakes, Sunrise Lake has a relatively poor aquatic plant community based on the results of a comprehensive aquatic vegetation survey completed in September of 2019. This survey showed that only 30% of the lake’s littoral area (area <15ft) was vegetated, plants grew to a maximum depth of just 9.5 feet, and the plant community was comprised of only eight native submersed species and two additional invasive species (Table 5). In contrast, a typical healthy shallow lake generally has 50-90% vegetation coverage, supports plant growth to a depth of at least 15 feet, and contains closer to 20 unique native species. Furthermore, Sunrise Lake has a Floristic Quality Index score of 13.5 which would fall short of meeting the impairment threshold to be considered supportive of aquatic life in this ecoregion of MN. Aquatic plant growth in Sunrise Lake is likely limited by the steep constructed slopes creating a very narrow shallow nearshore area as well as the basin being relatively young without centuries to establish a robust seed bank. Other factors that could be limiting the aquatic plant community are active management with herbicides and algaecides and the presence of invasive common carp.

Table 5. Summary of Sunrise lake’s aquatic plant community metrics from a comprehensive point-intercept survey on September 6, 2016 conducted by AIS Consulting Services.

Surface Area	160 ac	Frequency of Occurrence:	
Maximum Lake Depth	16 ft	Coontail	11.6%
Max Depth of Plant Growth	9.5 ft	Muskgrass	11.2%
Total # of Sample Points	250	Narrow Leaf Pondweed	4%
% Sample Points Vegetated	21.6%	Spiny Naiad	4%
% Lakewide Vegetative Cover	30.6%	Bladderwort	1.6%
Native Species Richness	8	Long Leaf Pondweed	0.4%
Nonnative Species Richness	2	Wild Celery	<0.4%
Mean # species per point	0.33	Bullhead Pondlily	0.4%
MN DNR Floristic Quality Index	13.5	Non-native water lily	<0.4%

Despite these constraints, a narrow strip of vegetation persists along the shoreline. The biovolume of vegetation (percent of the water column occupied with vegetation) ranges from 0% to 100%, with a lakewide average of 7.2% and an average of 24% if considering only the areas where at least some vegetation is present (Figure 28). The September 2019 plant survey shows that nuisance growth at or near the surface (i.e., >90% biovolume) only occurs in very small areas, at least at the time of the survey. Although dense plant growth is natural in a healthy shallow lakes, excessive vegetation can become a nuisance in locations like narrow channels between basins or designated swimming areas. Invasive species are especially problematic as they can often out-compete native species and form dense stands. Sunrise Lake is known to contain at least two invasive aquatic species, curlyleaf pondweed (CLP) and an ornamental water lily, and at least three emergent invasive wetland plants including European phragmites, purple loosestrife, and pale yellow iris.

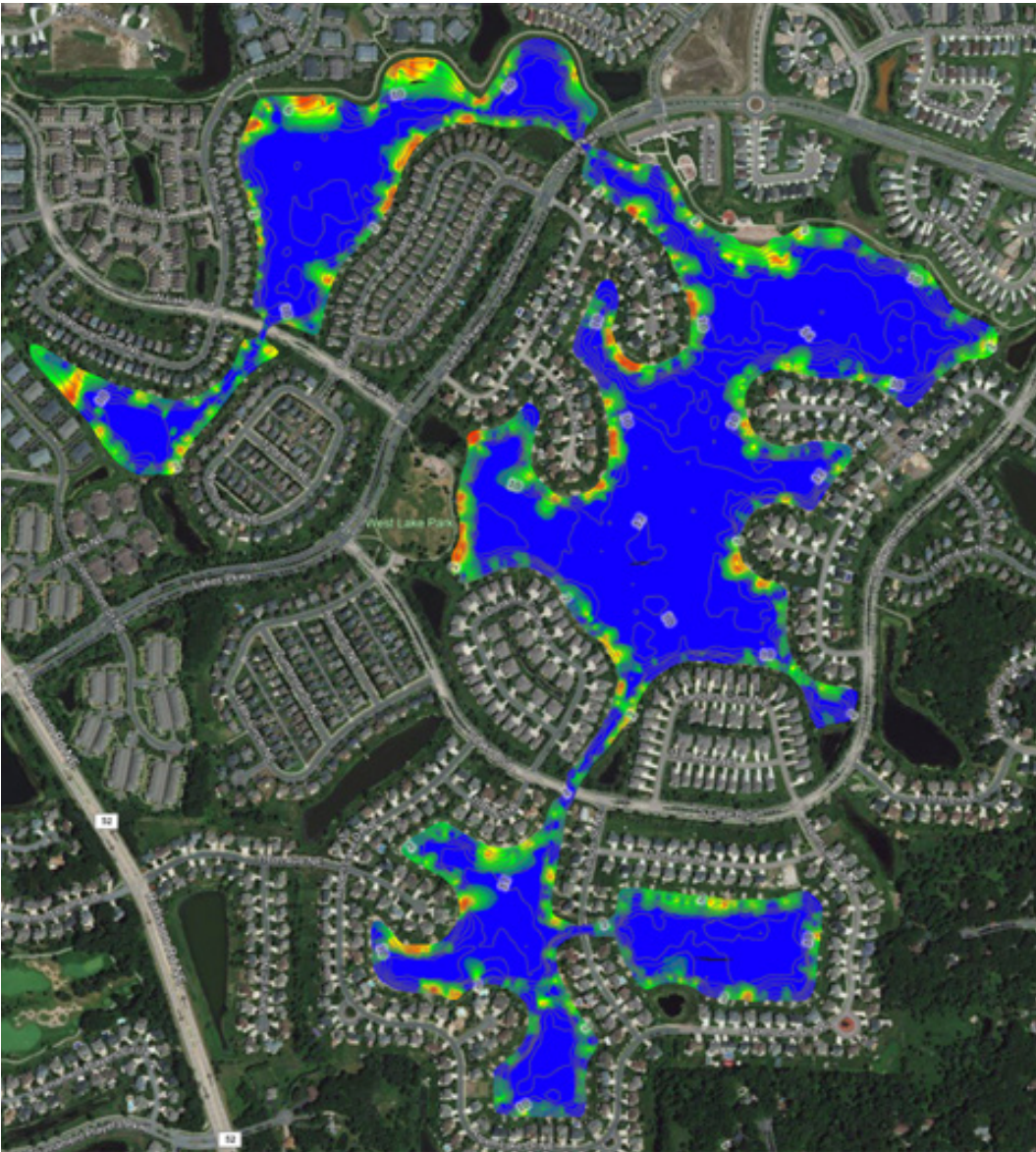


Figure 28. Abundance of aquatic vegetation growth in Sunrise Lake as measured as percent biovolume (the amount of water column volume occupied by vegetation).

To alleviate nuisance conditions and prevent the dominance of invasive species, proposed plant management activities should focus on targeted invasive species control while minimizing impacts on the native plant community. It is important to note that improper or excessive removal of aquatic plants can release nutrients stored in plant tissues back into the water column, leading to increased nutrient levels and the potential for algal blooms. This can degrade water quality and clarity and thus further disrupt native plant growth. The current extent of invasive curlyleaf pondweed is presently unknown as it grows very early in the year under the ice and dies off by mid-summer and was thus not well-represented in the comprehensive September 2019 plant survey. Past herbicide treatment records indicate that curlyleaf growth is likely widespread. The other four invasive plants have only been documented in one or more small patches within the lake or along the shoreline (Figure 29).

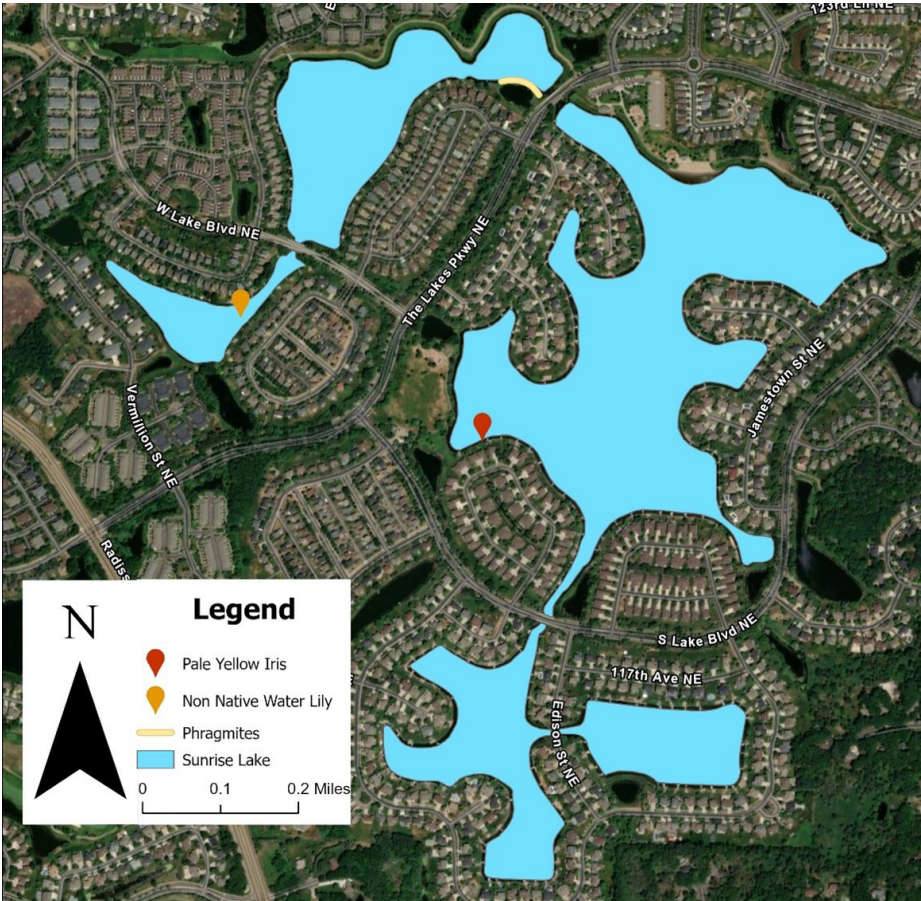


Figure 29. Known locations of invasive plants in Sunrise Lake. Not pictured is widespread curlyleaf pondweed and purple loosestrife which is sporadic throughout the lakes buffer.

Aquatic Plant Management

Efforts to manage aquatic vegetation in Sunrise Lake have included small-scale and large-scale chemical treatments, such as endothall, diquat, flumioxazin, and copper sulfate as well as mechanical control by property owners via manual removal or via automated devices like weed rollers or hydraulic jets. Aquatic herbicide treatment records for Sunrise Lake date back to at least 2006 including large scale annual treatments for invasive curlyleaf pondweed (CLP) ranging between 5-15 acres per year through at least 2013 (Figure 30). As recently as 2023-2025, it appears that at least some level of treatment of submersed vegetation is ongoing

based on observations of advisory signage posted along shorelines. A treatment proposal dated January 2025 indicated that 5.3 acres of broad-spectrum control was conducted by Lake Management Inc on behalf of the Master HOA for channel areas in 2025. There was also a note included regarding pricing for individual homeowner sign-ups, but the extent of privately coordinated herbicide treatments is unknown. The goals of active aquatic plant management activities occurring in Sunrise Lake is presently unclear, but use of broad-spectrum herbicides and algaecides indicates that non-selective control is currently being pursued.

Given the importance of aquatic plants in shallow lakes and the current poor conditions of the aquatic plant community in Sunrise Lake, plant management efforts should be undertaken with caution. If active plant management continues, the focus should be on preventing spread of invasive species with limited distributions such as phragmites and yellow iris and controlling nuisance growth of established invasive species like curly-leaf pondweed while preserving the native plant community. Non-selective control of aquatic plants by HOAs or individual property owners should be minimized given the narrow littoral area suitable for rooted plant growth and poor existing community. Plant management efforts should instead be undertaken with the goal of increasing percent coverage and biovolume in areas without direct conflicts with access and recreation. These efforts will help maintain a healthy ecosystem, prevent the dominance of invasive species, and support better water quality via sequestration of nutrients.

Additionally, ongoing surveillance monitoring for potential new invasive species such as hybrid Eurasian watermilfoil or starry stonewort is crucial to enable a rapid response to new infestations before they can spread and establish. Coon Creek Watershed District staff have been performing semiannual surveillance surveys and should continue these efforts. For invasive species that are already widely established in Sunrise Lake where eradication is infeasible, like curlyleaf pondweed, an argument could be made that lakewide herbicide treatments could be doing more harm than good. Control efforts should focus on areas of nuisance growth where biovolume is impeding access or recreation; if baywide treatments are warranted, they should be conducted on a rotating schedule to avoid lakewide disruptions to nutrient cycling.



Figure 30. Copy of a map showing curlyleaf pondweed treatment areas in Sunrise Lake. The map is undated, but was saved to CCWD file management system in 2014.

2.6.2 Fish Community

Given that Sunrise Lake is not a mapped public water managed by the MN DNR, there is limited data available on the fish community present. Piecemeal records of past fisheries management activities were provided to CCWD and are summarized below, but this does not reflect a complete history. The fisheries management activities in Sunrise Lake have included stocking of desirable game species and forage fish and efforts to control invasive common carp (*Cyprinus carpio*). To our knowledge, assessments of species diversity, size structure, or age structure to evaluate stocking and reproductive success are not available. Anecdotal reports however indicate that anglers have had success targeting largemouth bass and panfish in Sunrise Lake. There have also been observations of partial fish kills of panfish in Sunrise Lake that occur periodically. The cause of these kills is unknown, but is often related to lake turnover causing crashes in dissolved oxygen or stress from disease.

Historical stocking records were not provided to CCWD, but records from 2021-2025 indicate that the lake is currently being stocked by a private contractor with walleye, perch, sunfish, crappies, and minnows as forage. Most of the fish being stocked are fry or fingerlings with periodic stocking of adult panfish depending on availability. Stocking typically occurs biannually in spring and fall and appears to be coordinated by a private individual with all required permits and health certification forms on file with the MN DNR.

Invasive common carp are present in Sunrise Lake. In 2019, the LoR Master HOA hired a consultant, Carp Solutions, to conduct electrofishing surveys and a mark-recapture study on Sunrise Lake to evaluate the abundance and biomass of carp to compare results against thresholds known to cause ecological damage (i.e., >100 kg carp per hectare). Over a two-year period, carp were marked and released during electrofishing surveys and 291 carp were captured and removed using baited box nets. The ratio of marked to unmarked fish during sampling and removal events indicated that the initial carp population size in Sunrise Lake was approximately 1,127 (400-1,600) individuals with a total biomass of roughly 3,339 kg or 51.6 kg/ha based on average size. Estimates from 2021, after removals, indicated fewer individuals (n=445), but the average size of fish increased, so biomass remained relatively stable (43-51 kg/ha). Carp ranged from 10" to 34", with an average length of about 25".

Carp biomass exceeding 100 kg/ha is known to negatively impact water quality by increasing sediment resuspension and disrupting rooted plant growth and nutrient cycling (Bajer et al. 2009). In populations exceeding 100 kg/ha, carp have been shown to significantly contribute to internal phosphorus loading in shallow lakes which can accelerate eutrophication (algae blooms, reduced clarity). Monitoring and management of invasive common carp should continue with a goal of maintaining biomass below 100 kg/ha. Developing an understanding of carp migration and reproduction patterns will likely be necessary for sustainable long-term control. In 2022, Carp Solutions recommended that further harvest of adult carp was not currently needed, but that future electrofishing surveys should be conducted to monitor carp abundance, biomass, and patterns of reproduction.

In 2025, the LoR Master HOA again hired Carp Solutions to evaluate if carp abundance and biomass remained stable and below damaging thresholds. Fall electrofishing surveys revealed that the carp population in Sunrise

Lake had grown to an estimated 4,796-12,862 individuals with a biomass of 386-481 kg/ha, roughly four times the threshold where ecological damage is observed. Most concerning, juvenile carp were observed, providing evidence of successful reproduction occurring. Developing an understanding of carp migration and reproduction patterns will likely be necessary for sustainable long-term control. The current management recommendations include implanting adult carp with radio tags to develop an understanding of their movement patterns, likely nursery habitats, and to inform options to harvest adults via baited boxnets, trapping during migrations, or targeting aggregations with seine nets in open water or under the ice. Depending on the results of a tagging and tracking study, additional efforts may be needed to identify successful nursery habitats such as conducting fish surveys in connected storm ponds or carp ageing analyses.

2.7 Social Attributes of Sunrise Lake

2.7.1 Demographics

Based on 2020 census data, an estimated 5,574 individuals reside within the Sunrise Lake lakeshed, an increase from 3,977 residents in 2010. There are 2,892 parcels located within the lakeshed, with 360 parcels characterized as lake-front property. The median age of Sunrise Lake residents is 40 years, and the median household income is approximately \$132,000.

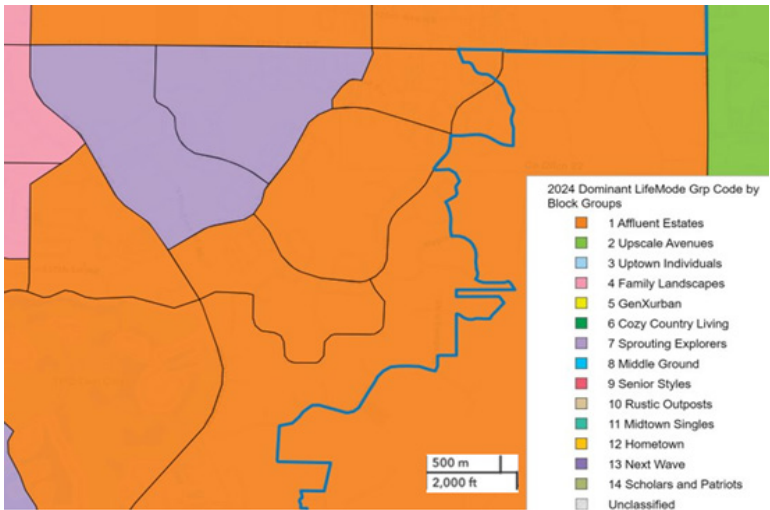


Figure 31. Sunrise Lake lakeshed tapestry segmentation classifications from ESRI 2024 LifeMode Grp Code refers to the most common lifestyle group found within a specific Census Block Group.

The lakeshed is composed of distinct demographic regions, each with unique characteristics. Environmental Systems Research Institute (ESRI), a global leader in geographic information systems, analyzes spatial demographic, social, and consumer data to classify U.S. neighborhoods into lifestyle groups known as tapestry segments. This information is often used for targeted marketing purposes, but can also be used to help organizations better understand and serve their audiences. In the Sunrise lakeshed, the neighborhood in the northwest portion is identified as “Sprouting Explorers,” which is described as “up-and-coming families.” This area is characterized by ambitious young residents with growing families seeking to establish roots in the community. The central region of the lakeshed is categorized as “Affluent Estates” and specifically labeled as “Boomburbs” subtype. This area features young families who chose to upgrade to newly developed suburban housing. Similarly, the southern and southeastern portions of the lakeshed are also classified as “Affluent Estates,” but with a subtype of “Professional Pride.” This region is notable for its middle-aged, well-educated residents who lead suburban lifestyles and exhibit a strong sense of professional accomplishment (Figure 31). A few key commonalities between all of the dominant lifestyle groups in the Sunrise Lake lakeshed is a focus of family, community, quality education and being aspiration-driven.

2.7.2 Lake Use

Based on a questionnaire distributed to Lakes of Radisson residents in 2022 with 232 responses, the primary uses of Sunrise Lake include passive enjoyment such as using the adjacent trails or viewing wildlife as well as a variety of active recreational activities such as fishing, boating, swimming, and paddling. The most popular active recreational uses of Sunrise Lake were swimming and paddling, with over 72% and 60% of respondents reporting engaging in these activities at least once per year, respectively (Figure 32). Conversely, motorized boating (electric motors) saw limited engagement, with over 70% of respondents indicating they never participate in this activity. Fishing participation was more evenly split, with 46% of respondents participating at least once a year, but 54% reported never fishing. Over 97% of respondents reported using the trails adjacent to the lake for walking or biking with 85% of those indicating they participated in wildlife viewing. When asked if there were other lake-based activities their household participated in, several respondents wrote in additional activities as visualized in Figure 33. Many of these were winter activities such as ice skating, snowshoeing, hockey, and cross country skiing that were initially overlooked in drafting the lake user questionnaire.

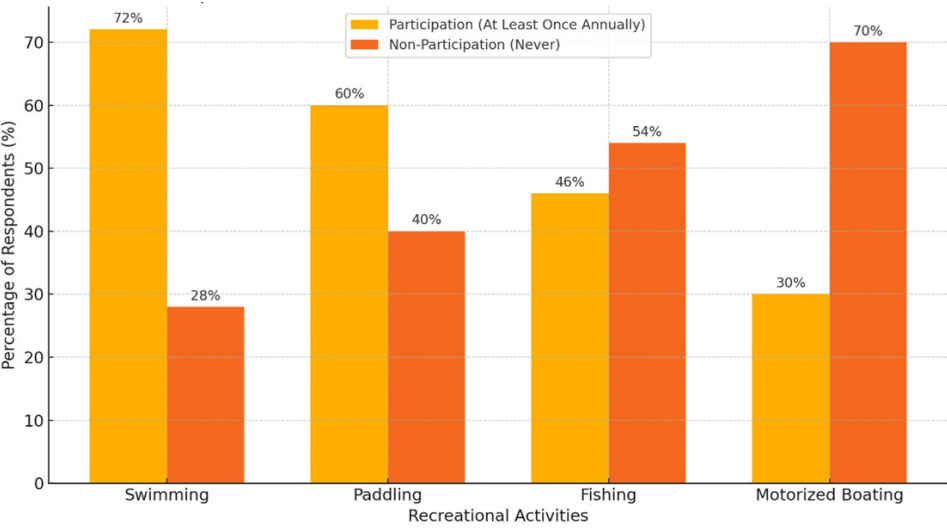


Figure 32. Lake use survey results for participation rates in different recreational activities at Sunrise Lake.

This data highlights a trend favoring low-impact recreational activities such as passive enjoyment, swimming, and paddling over motorized activities. These results align with a preference for preserving a tranquil lake environment that was noted as a theme based on write-in survey responses.



Figure 33. Word cloud generated based on write-in survey responses (n=59) to the following prompt “Are there any other activities you use Sunrise Lake for? If so, please list them below”.

3.0 Management Priorities, Objectives, and Actions

3.1 Identification of Issues and Concerns

The issues and concerns facing Sunrise Lake were identified through stakeholder input as well as professional judgment of CCWD staff after reviewing available data records summarized in the previous sections of this document. Feedback on issue identification and plan development was collected at an HOA Master Association meeting on 11/15/2022 and via an electronic questionnaire distributed to residents via email in November-December 2022. The purpose of this questionnaire was to gather insights on lake use patterns, what residents value most about Sunrise Lake, and key issues and concerns facing the lake. The survey presented a list of potential broad lake management areas of concern including aesthetics, aquatic invasive species, fish and wildlife, recreation, pollution, and regulation with more specific issues listed under each category. Residents were asked to indicate how concerned they were regarding each specific issue and to write in any other lake-related concerns. These rankings helped prioritize areas of focus included in the implementation section of this lake management plan. The main areas of concern identified in the survey responses are summarized in Figure 34. The survey had a great response rate with a total of 232 participants, with 138 (59%) being non-lakeshore residents of the Lakes of Radisson Development and 94 (41%) being lakeshore residents. It is the intent of this lake management plan to address both immediate and long-term concerns facing Sunrise Lake as identified by the lake users and in accordance with observed physical, chemical, and biological trends based on monitoring results.



Figure 34. Word cloud displaying the main areas of concern identified for Sunrise Lake based on lake user survey responses (n=232).

The following lake management issues were identified for Sunrise Lake and summarized by general area of concern (in no particular order):

- 1. Water Quality:**
 - I. The occurrence of harmful blue-green algae blooms (aka cyanobacteria)
 - II. Excess nutrients, bacteria, or other harmful chemicals entering the lake via polluted stormwater runoff (e.g., phosphorous fertilizers, over-irrigation, dog and goose excrement, de-icing chemicals, pesticides, storm pond performance)
 - III. Shoreline erosion due to unprotected banks, concentrated flows, poor lawn care practices (mowing to the edge), and wake caused by higher powered electric motors
- 2. Aquatic Invasive Species and Nuisance Wildlife:**
 - I. The potential for negative impacts of existing invasive species (e.g., common carp, curlyleaf pondweed, phragmites, purple loosestrife, yellow iris, and non-native lily) with uncontrolled spread at nuisance levels
 - II. Potential establishment of new invaders in Sunrise Lake such as zebra mussels, Eurasian water-milfoil, or starry stonewort
 - III. Damage to properties and clogged stormwater infrastructure due to beaver and muskrat activity
- 3. Regulation and Enforcement:**
 - I. Potential conflicts arising from increasing development or overcrowding, especially impacting public and private infrastructure or safety (e.g., unsafe boat operation, vandalism, rude or unsafe behavior at beach, unauthorized access, noise complaints)
 - II. Lack of enforcement regarding individual property owner water and land use violations (e.g., unauthorized buffer zone modifications, improper installation of sand blankets, docks and water toys, improper pet waste disposal, feeding wildlife, overaggressive aquatic plant management, lack of awareness)
 - III. Some residents feel that lake and shoreline use regulations are too strict (excessive no wake zones, should allow storage of docks and lifts on lakeshore, more lenient buffer and waterfront development requirements)
- 4. Recreation and Aesthetics:**
 - I. Possible periodic unsafe swimming conditions due to harmful algal blooms, elevated *E. coli* bacteria, swimmer's itch (see Water Quality Concerns). No formal channel for communication to lake users
 - II. Poor water clarity/ nuisance algae blooms (e.g., foul odors, green appearance)
 - III. Limited angling opportunities due to poor fish community size structure, species selection, lack of habitat, and limited shore fishing access
 - IV. Risk of sediment accumulation under bridges impacting future navigability
 - V. Insufficient maintenance of common grounds and shoreline buffers (e.g., litter, graffiti, dog-waste, weedy unmanicured appearance, ageing built infrastructure, clogged culverts)

3.2 Management Objections and Actions

For each identified concern facing Sunrise Lake listed above in Section 3.1, specific management objectives and recommended actions to achieve these objectives have been outlined. These paired objectives and actions are presented below for each category of concern, along with relevant background information specific to Sunrise Lake. A summarized implementation plan outlining responsibilities, roles, estimated costs, and a draft timeline for these actions is presented in Section 4.

3.2.1 Water Quality

Specific Concerns Identified

- The occurrence of harmful blue-green algae blooms (aka cyanobacteria)
- Excess nutrients, bacteria, or other harmful chemicals entering the lake via polluted stormwater runoff (e.g., phosphorous fertilizers, over-irrigation, dog and goose excrement, de-icing chemicals, pesticides, unknown storm pond performance)
- Shoreline erosion due to unprotected banks, concentrated flows, poor lawn care practices (mowing to the edge), and wake caused by higher powered electric motors operated too close to shorelines



Harmful algal bloom (Cyanobacteria) on Sunrise Lake

Background

Sunrise Lake experiences periodic cyanobacteria blooms or “harmful algal blooms (HABs)”, especially in late summer and early fall. Cyanobacteria (also referred to as blue-green algae) are types of bacteria found throughout the world that photosynthesize like algae. Cyanobacteria can produce toxins known as cyanotoxins that pose threats to human and animal health. Not all blooms are toxic, but there is no visual way to

predict the toxicity of a bloom. When cyanotoxins are present, humans and animals can become sick if they have contact with, swallow, or inhale water or airborne water droplets. Symptoms from acute environmental exposure to cyanotoxins include skin rash, eye irritation, headache, vomiting, and diarrhea. Long-term chronic exposure to cyanotoxins can lead to nerve and liver damage. Symptoms in domestic pets, livestock, and wild-life are often more severe and include death given these animals often use natural surface waters as a drinking water source.

Cyanobacteria blooms typically form in warm, shallow, stagnant, nutrient-rich waters. They generally appear blue-green but can also have hues of brown, orange, or red. These blooms often look like spilled paint or pea soup and may emit a swampy odor. Once a bloom forms, there is no immediate solution. To reduce the frequency of these blooms, it is essential to improve water quality by minimizing nutrient inputs, particularly phosphorus and nitrogen. These nutrients can be reduced by limiting fertilizer applications and irrigation, maintaining robust vegetated buffers along the shoreline, keeping lawn clippings, leaves, and other yard waste out of storm sewers, properly disposing of pet waste, and preventing soil erosion. Aeration and water circulation systems can also help reduce the suitability of conditions for dense blooms. Although algacide treatments can control cyanobacteria growth, these treatments can actually increase the concentrations of cyanotoxins in the water during an active bloom by damaging the cyanobacteria cells causing a release of toxins. The best management strategy for an active bloom is to avoid contact with the water until the bloom naturally subsides.

In addition to fostering cyanobacteria growth, excess nutrients can also contribute to nuisance algal and plant growth of other species. Phosphorus is the limiting nutrient for most species in freshwater systems, meaning it controls the rate of algae and plant growth in most MN lakes. When excess phosphorus enters Sunrise Lake, it accelerates the natural eutrophication process as waterbodies age over time, leading to either nuisance rooted plant growth, nuisance algae or cyanobacteria blooms, or both. The growth of rooted plants and algae is often in a delicate equilibrium in shallow lakes as rooted plants can sequester large amounts of phosphorus during the growing season. Given that rooted plant growth is generally confined to a narrow band in Sunrise Lake, there is active aquatic plant control being conducted by both the Master HOA and individual property owners, and there is an influx of nutrients entering the lake from urban stormwater inputs throughout the growing-season, it is not surprising that nuisance algal blooms and cyanobacteria blooms occur when this balance is disrupted. Decomposition of aquatic plants via natural senescence, large scale aquatic plant control efforts, or non-target impacts of terrestrial herbicide runoff also directly releases phosphorus into the water column, fueling algae growth, reducing clarity, and further limiting growth of rooted aquatic plants that require sunlight penetration to the lake bottom. This feedback loop can create a cycle favoring algae growth over rooted plants that is difficult to break, posing long-term risks to the lake’s water quality and ecosystem.

Another pollutant of concern for Sunrise Lake is *E. coli* bacteria. Urban stormwater is known to be high in *E. coli* and *E. coli* is known to reproduce outside of warm-blooded animal hosts in nutrient-rich environments. Not all strains of *E. coli* are pathogenic, but some strains can cause serious illness from exposure via contact recreation. Given that the City of Blaine manages a public swimming beach on Sunrise Lake, City staff perform

weekly tests for *E. coli* and have protocols in place to temporarily close the beach if conditions are unsafe. Historical monitoring records indicate that concentrations rarely exceed State recreation standards at the beach, but stream monitoring results from just downstream of Sunrise Lake show consistent exceedances of the chronic exposure standard for safe contact recreation. The outlet channel, Ditch 41-4 between Radisson Rd and TPC Golf Course, was formally listed as impaired for recreation due to excess *E. coli* by the Minnesota Pollution Control Agency in 2024.

In addition to nutrient and bacteria pollution, the rise in chloride levels (from salt and fertilizers) in Sunrise Lake is a growing concern. Elevated chloride levels can have serious impacts on freshwater ecosystems given that high concentrations are toxic to aquatic invertebrates and fish. Chloride is persistent in the environment as it does not break down naturally and cannot be economically removed via water treatment. The increasing chloride levels in Sunrise Lake are presumably due to surrounding land cover and land use changes and management practices, specifically an increase in impervious surfaces and the widespread use of road salt as part of municipal, commercial, and private de-icing activities. Reducing the use of road salt and adopting best practices for de-icing, such as using mechanical snow and ice removal methods and applying salt only when necessary and in appropriate quantities, will be essential for protecting the long-term health of Sunrise Lake’s water quality.

Another pressing concern that could impact water quality is inadequate inspection and maintenance of stormwater pollution controls, particularly stormwater ponds and vegetated buffers. Given that the lakeshed area runoff contributes the largest phosphorus load, as outlined in section 2.5.5, ensuring the proper function of stormwater ponds and buffers is critical for reducing external sources of sediment, nutrient, and bacteria loading to the lake. These engineered systems work by slowing stormwater flow, allowing suspended particles and associated pollutants to settle or become intercepted before reaching the lake. Phosphorus and bacteria, which bind to sediment particles, are effectively removed during this process. However, the ability of stormwater practices to reduce pollution diminishes over time without proper maintenance as ponds fill up with sediment or buffers are thinned or replaced. Regular upkeep, such as periodic sediment removal from ponds, is necessary to maintain the ponds’ capacity and prevent the release of accumulated phosphorus back into the water column.

The water quality of Sunrise Lake is currently monitored by CCWD staff on a rotating schedule, at least 2 years out of every 3 years. Sunrise Lake is monitored for total phosphorus, dissolved orthophosphorus, chlorophyll-a, water clarity, temperature, dissolved oxygen, specific conductivity, and pH. Measurements are taken every two weeks from May through September at the deepest part of the basin nearest the private launch. The lake is also periodically monitored for chloride, including during snow melt and winter. Although recent monitoring results indicate stable conditions overall, comparing current conditions to historical observations and spot measurements indicates that nutrient-enrichment has occurred since 2005. Chloride concentrations have also been increasing in Sunrise Lake and in the shallow groundwater that contributes to Sunrise Lake.

Management Objectives

1. Minimize the threat to human and animal health caused by cyanobacteria blooms by reducing the frequency of blooms and reducing contact with blooms
2. Ensure non-degradation of Sunrise Lake’s key water quality parameters including phosphorus, chlorophyll-a, clarity, *E. coli*, and chlorides to maintain state water quality standards for safe recreation and aquatic life

Management Actions

1. Promote awareness of cyanobacteria blooms and a “when in doubt, stay out” message through education and outreach efforts including newsletter content, email advisories, and signage
2. Optimize operation of the lake aeration system to reduce conditions suitable for cyanobacteria blooms in priority areas with contact recreation
3. Promote healthy rooted aquatic plant coverage by reducing non-selective herbicide use and mechanical removals (cutting, weed rollers, hydraulic jets)
4. Continue lake water quality monitoring and analysis of long-term trends
5. Continue *E. coli* monitoring at public swimming beach
6. Implement and promote lake-friendly property management practices intended to reduce pollutant runoff through education, regulation, and enforcement
 - a. Ensure robust vegetative buffers along shorelines; enforce violations
 - b. Address areas of active erosion through stabilization practices including deep-rooted native vegetation, re-grading steep slopes, or armoring with riprap where needed
 - c. Reduce fertilizer and irrigation use by contractors and property owners; allow and promote low-maintenance turf alternatives
 - d. Encourage proper disposal of yard waste & pet waste through education, enforcement of violations, and implementation of programs such as operating pet waste disposal stations or community yard waste pick up events
 - e. Hire smart salt certified winter maintenance contractors and encourage adoption of smart salting practices by individuals
 - f. Implement enhanced street sweeping and smart salting within the lakeshed
7. Inventory, inspect, and evaluate the performance of existing structural water quality best management practices in the lakeshed including stormwater ponds and infiltration basins
 - a. Determine ownership and maintenance responsibility for all assets (City, Master HOA, Sub-Association, Private landowners)
 - b. Perform desktop analysis and field inspections noting condition of infrastructure and maintenance needs
 - c. Perform more detailed evaluations of performance as needed (paired inlet vs outlet pollutant sampling)
 - d. Schedule and budget for needed maintenance and repairs of stormwater infrastructure
8. Pursue control of aquatic invasive species when impacting water quality (see AIS section below)

3.2.2 Aquatic Invasive Species and Nuisance Wildlife

Specific Concerns Identified

- The potential for existing aquatic invasive species (e.g., common carp, curlyleaf pondweed, phragmites, purple loosestrife, yellow iris, and non-native lily) to reach nuisance levels and negatively impact recreation and/or water quality
- Potential establishment of new invaders in Sunrise Lake such as zebra mussels, Eurasian watermilfoil, or starry stonewort
- Damage to properties and clogged stormwater infrastructure due to beaver and muskrat activity



Aquatic invasive species (AIS) present in Sunrise Lake: Common Carp (Left), Purple Loosestrife (top middle), non-native water lily (top right), European Phragmites (bottom middle), and Curlyleaf pondweed (bottom right) Not pictured: yellow iris

Background

Aquatic invasive species (AIS) are non-native species that spread quickly from their point of introduction, dominate new environments, and cause harm. Damage caused by AIS includes ecological impacts such as reduced abundance and diversity of native species, degraded habitat, and altered nutrient cycling and food webs. AIS can also lead to economic impacts such as increased management costs, damage to infrastructure, loss of tourism dollars, and diminished property values. For these reasons, AIS are often the subject of management efforts aimed at controlling existing infestations and preventing further spread and establishment of new infestations. It is also possible for native species to become overabundant and cause nuisance conditions. This is especially true in urban areas with unnatural conditions such as excessive nutrients or reduced tolerance to natural disturbances such as tree damage and flooding caused by beaver activity.

Five species of aquatic invasive plants are known to be established in and around Sunrise Lake: Curlyleaf pondweed (CLP), a non-native ornamental water lily, European phragmites, yellow iris, and Purple Loosestrife. CLP is well-established throughout the lake and has historically reached nuisance conditions impacting navigation and recreation and triggering management intervention. Large-scale herbicide treatments for CLP have

been effective at relieving nuisance surface-matting, but have not resulted in long-term lakewide control. Given the resilience of CLP and poor condition of the native submerged plant community, continued widespread herbicide use should be reconsidered. If there is pushback from property owners and other lake users, rotating baywide treatments may be a better alternative than lakewide control to avoid mass decomposition of plant biomass and the resulting nutrient fluxes favoring algal blooms. The other four AIS documented in Sunrise Lake have been detected sporadically and could be controlled while populations are small to prevent future expansion and the need for more aggressive control strategies in the future. There is also one species of invasive fish present in Sunrise Lake, Common Carp (*Cyprinus carpio*). Although initial survey data suggested that carp densities and biomass were below thresholds that cause ecological harm, recent follow-up surveys in fall of 2025 indicated that the carp population is growing and has now exceeded damaging levels. Efforts to better understand carp population dynamics and reduce existing biomass are needed to protect rooted aquatic plants and water quality.

Sunrise lake also supports populations of native beaver and muskrat; although these species are not invasive, their impacts to shorelines, trees, and drainageways can be considered problematic in densely developed urban areas like Sunrise Lake. The Lake Users Survey responses included several comments about unwanted damage caused by high water levels due to beavers damming culverts, damage to trees, and damage to lawns from muskrat burrows. Conversely, there were also survey responses indicating high value placed on Sunrise Lake providing habitat for native wildlife species including both beaver and muskrat. Any management actions proposed for mitigating the damaging impacts of these species should balance the coexistence of all species of wildlife in the built environment.

Management Objectives

1. Minimize the harm caused by established aquatic invasive species by managing populations below nuisance levels and thresholds where ecological damage is known to occur
2. Prevent establishment and spread of new aquatic invasive species
3. Mitigate damage caused by nuisance native wildlife while allowing populations to persist

Management Actions

1. Annually delineate curlyleaf pondweed extent to inform management strategies and evaluate success of past treatments. If long-term control has been unsuccessful, adapt treatment strategy to only control areas of nuisance growth interfering with navigation
2. Undertake efforts to better understand and sustainably manage common carp to maintain biomass below 100 kg/ha. Needed actions include movement studies, investigation and mitigation of identified nursery habitats, and biomass harvest.
3. Implement control activities aimed at eradicating invasive species where populations are limited to a few locations and small established areas including non-native water lily, European phragmites, yellow iris, and purple loosestrife
4. Increase awareness of AIS and prevention strategies through education and outreach including newsletter content, emails, and/or signage

5. Ensure all lake service providers working on Sunrise Lake are trained in AIS prevention best practices and are adhering to State laws
6. Perform annual surveillance surveys to detect presence of new invaders as early as possible to enable rapid response
7. Establish a contingency fund to enable rapid response to new invaders
8. Attempt to mitigate property damage caused by nuisance native wildlife through tree and bank protection efforts prior to removing individuals
9. Inspect culverts regularly to remove beaver debris prior to extensive damming. Trap and remove beaver in areas with repeated dam construction that are sensitive to flooding
10. Regularly monitor water levels and consider real-time notifications to identify possible drainage issues

3.2.3 Regulation and Enforcement

Specific Concerns Identified

- Increase use of the lake and common areas in violation of local ordinances or laws, especially impacting public and private infrastructure or safety (e.g., unsafe boat operation, vandalism, disrespectful or unsafe behavior at beach, unauthorized access, noise complaints)
- Lack of enforcement of individual property owner water and land use violations (e.g., unauthorized buffer zone modifications, improper installation of sand blankets, docks and water toys, improper pet waste disposal, feeding wildlife, overaggressive aquatic plant management)
- Some residents feel that lake and shoreline use regulations are too strict (excessive no wake zones, should allow storage of docks and lifts on lakeshore, more lenient buffer and waterfront development requirements)



Sunrise Lake's private boat launch

Background

As the area continues to develop and grow, Sunrise Lake has become a popular community amenity, especially Lakeside Commons Park and beach. This has led to growing conflicts between community residents and visiting lake users. Responses from the Lake User Survey indicate growing tensions related to overcrowding of the beach area including an influx of poorly behaved teenagers and observations of illegal activities such as loitering after hours, vandalism of common property and private infrastructure, trespassing, and jumping from bridges. Survey respondents also point to growing issues within the Lakes of Radisson community pertaining to unsafe or disrespectful boat operation, reportedly by unsupervised youth.

Sunrise Lake residents are increasingly concerned about regulatory and enforcement issues affecting the lake's health. A key issue that surfaced in the responses to the Lake User Survey is the lack of enforcement of existing rules, which has reportedly resulted in property owners deliberately ignoring rules such as waterfront development standards including required vegetated buffers. One reason identified for bypassing the existing regulatory mechanisms is the complexity of the permitting process and stringent standards. Shoreline owners are required to maintain a 25' wide vegetated buffer along the lake's edge with no more than 30% of area and shoreline cleared for access and recreation, but with limited enforcement, violations such as the removal of native plants, the introduction of non-native species, and expansion of impervious areas or beach areas have been occurring. This situation can lead to degradation of the buffer zone's ability to filter pollutants and prevent erosion, contributing to degradation of water quality. Some residents disagree with the existing regulations and standards, finding them too numerous and/or too stringent.

Management Objectives

1. Work cooperatively with City of Blaine to address illegal activity at Lakeside Commons Park and other public access points
2. Increase awareness of, and compliance with, community regulations and standards and related city ordinances

Management Actions

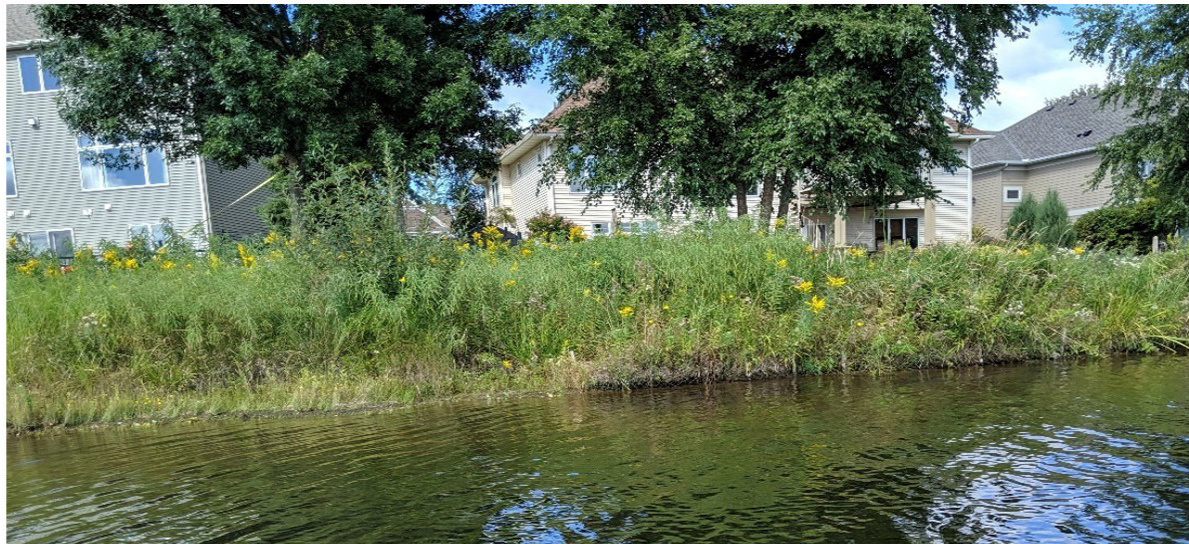
1. Encourage use of City of Blaine's "Report It" website to report non-emergency public safety or nuisance issues impacting the health and enjoyment of Sunrise Lake
2. Support increased presence of City of Blaine police, Parks, and Code Enforcement staff in the community
3. Review, revise as needed, and advertise current land and water use regulations and procedures in a manner that facilitates increased awareness, acceptance, and compliance
 - a. ensure adequate stakeholder education on existing regulations and meaningful engagement for any proposed changes via regular communication channels (eNewsletter articles, mailings, posted signage).
 - b. ensure consistency of any proposed changes to community standards with other overlapping local regulations (e.g. City of Blaine zoning & stormwater ordinances, Watershed District Rules) and state laws

- c. Consider hosting a shoreline buffer themed outreach event such as a planting or maintenance workshop or tour of compliant demonstration sites
- 4. Consider establishment of a community regulations violation tracking and enforcement system for issues impacting the health of the lake (e.g. buffer violations, erosion, illicit discharges of chemicals or yard waste, invasive species)
- 5. Increase enforcement of violations impacting lake health such as non-compliance with buffer requirements; consider a tiered escalation system
 - a. The “Lakeshore Buffer Zone Alteration Permit Application Process & Alteration Regulations and Standards” document last updated March 20, 2025 is attached as Exhibit A.

3.2.4 Recreation and Aesthetics

Specific Concerns Identified

- Possible periodic unsafe swimming conditions due to harmful algal blooms, elevated *E. coli* bacteria, swimmer’s itch. No formal channel for communication to lake users.
- Poor water clarity/nuisance algae blooms (e.g., foul odors, green appearance)
- Limited angling opportunities due to poor fish community size structure, species selection, lack of habitat, and limited shore fishing access.
- Risk of sediment accumulation under bridges impacting future navigability
- Insufficient maintenance of common grounds and shoreline buffers (e.g., litter, graffiti, dog waste, weedy unmanicured appearance, ageing built infrastructure, clogged culverts)



Native Vegetation Buffer on Sunrise Lake

Background

Use and enjoyment of Sunrise Lake encompasses more than water quality but also involves supporting a variety of recreational uses including passive recreation like appreciating its aesthetic value. Based on the Lake

User Survey feedback, aesthetics has increasingly become a concern for the residents of Sunrise Lake. Over the years, the visual appeal of the lake and surrounding common areas has been impacted by several factors including algae blooms, litter accumulation, vandalism, and dog waste, all of which can detract from the natural beauty and enjoyment of the area. This reported decline in the aesthetic quality of the lake has sparked concern among residents who are dedicated to enhancing residents and visitor satisfaction and property values. Managing for aesthetics is challenging due to its subjective nature and resulting conflicts. One example is complaints about “weedy, unkept common areas and buffers” which may be visually unappealing to some, but provide better protection to the lake’s water quality compared to manicured turf or hardscapes.

In addition to the challenges faced around the lake’s perimeter, the water quality itself has also become a critical factor in maintaining the overall aesthetic appeal and enjoyment value. Clear, clean water is desirable for aesthetics, public safety, and property values, yet algae blooms have become an ongoing issue. These blooms, which flourish in warm, nutrient-rich waters, can cause the lake to appear murky and discolored and are often accompanied by unpleasant odors that further degrade the experience of those who visit or live near the lake. The management actions discussed in the water quality section are ultimately key to reducing the frequency and occurrence of unsightly blooms in the long-term. Strategies such as water circulation devices (bubblers, fountains) or small-scale algaecide treatments do not address the underlying cause of the blooms, but can sometimes be used to improve conditions in limited areas or for short periods of time.

Active forms of recreation such as swimming, paddling, fishing, and boating are very popular among Sunrise Lake users. Some conflicts have been identified surrounding overcrowding, limited access, or quality of certain recreational opportunities. There are strong and conflicting opinions about recreational opportunities and activities occurring at public access areas including City of Blaine parks and trails. These issues must be communicated to the City of Blaine and worked on cooperatively. The LoR Master HOA can take an active roll in improving some popular forms of lake-based recreation such as fishing opportunities through stocking and/or habitat improvement projects. Concerns have been raised about sediment accumulation in channels impacting the future navigability of boating between connected basins. Repeated bathymetric surveys in these areas are needed to verify these claims and determine the extent and timing of dredging needs. Any dredging in the main lake basins would be the responsibility of the Master Association.

Management Objectives

1. Increase awareness of lake-related public safety issues such as occurrences of harmful algal blooms, elevated bacteria levels, or swimmer’s itch
2. Work cooperatively with the City of Blaine to support multiple types of recreation while addressing conflicts at Lakeside Commons Park and other public access points
3. Maintain clean and safe spaces around the lake, including trails, parks, and other common areas
4. Improve water quality (see implementation actions in Water Quality section)
5. Improve fishing opportunities
6. Maintain navigability between and within the major lake basins

Management Actions

1. Implement warning and notification systems (e.g., advisory signage, social media posts, email blasts) related to public safety issues such as occurrences of harmful algal blooms, elevated bacteria levels, and swimmer’s itch
2. Enure open lines of communication and respectful dialogue between lake users, the HOA, City of Blaine, and resource management organizations
 - a. Host listening sessions or other input gathering methods (surveys, web-based issue reporter, etc) to seek feedback from residents on priority issues and potential solutions
 - b. Invite relevant local government staff to participate and present at HOA meetings on current lake-related issues and rotating topics of interest
 - c. Ensure representation at relevant City Parks Advisory Board and Council meetings
3. Engage local volunteer groups and residents to participate in periodic community clean up events
4. Develop and implement of a fisheries management plan for Sunrise Lake;
 - a. Engage local stakeholders to determine priority issues and goals
 - b. Compile past stocking activities and collect current fish community survey data to evaluate success and inform future actions
5. Conduct periodic bathymetry surveys in channel areas to quantify sediment buildup over time and plan for future dredging if warranted

4.0 Implementation Plan

Implementation of the management actions identified for Sunrise Lake in Section 3.0 will be a collaborative effort between multiple entities and individual property owners and lake users. Below, the key organizations that play a role in the management of Sunrise Lake are introduced, roles and responsibilities of each organization are outlined, and a 10-year implementation schedule is proposed along with rough cost estimates.

4.1 Organizations involved in Sunrise Lake Management

In addition to individual lakefront property owners and lake users, four local organizations have a role in the management of Sunrise Lake: The Lakes of Radisson Master Homeowners Association and its sub-associations, City of Blaine, Coon Creek Watershed District, and Anoka Conservation District. Other state agencies such as the Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Minnesota Department of Health, and Minnesota Board of Water and Soil Resources are involved in monitoring and managing public water resources, but do not have specific programming for manmade lakes like Sunrise Lake. This Plan discusses only the local organizations with direct roles in the management of Sunrise Lake.

4.1.1 Lakes of Radisson Masters Homeowners Association (HOA) and Sub-Associations

7100 Madison Ave W,
Golden Valley, MN 55427
www.LakesofRadissonMaster.connectresident.com

The Lakes of Radisson Master Association, a homeowners’ association in Blaine, Minnesota, is governed by an elected Board and managed by FirstService Residential of Bloomington, MN. In addition to traditional HOA responsibilities like overseeing infrastructure and common area maintenance and maintaining insurance coverage, the Master Association is responsible for managing the community’s central water feature, Sunrise Lake. To date, the master HOA has undertaken various lake management activities such as coordinating control of invasive curlyleaf pondweed, fish stocking, common carp control, and installation and operation of an aeration system (four aerators). The Master HOA, and delegated committees such as the Architectural Control Committee (ACC), are also responsible for enforcing select community-wide regulations and standards such as buffer zone compliance. Individual sub-associations are responsible for coordinating maintenance and other enforcement actions in their respective communities.

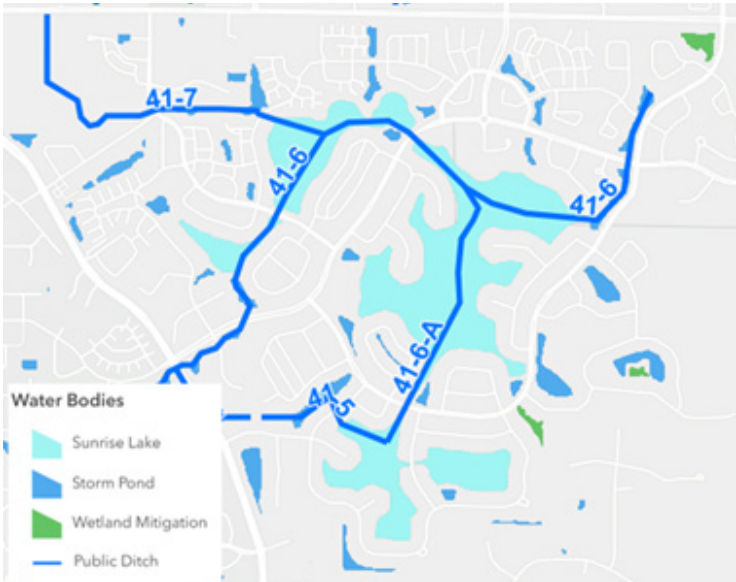
4.1.2 City of Blaine

10801 Town Square Dr NE,
Blaine, MN 55449
<https://www.blainemn.gov>

The City of Blaine has a population of approximately 75,000, of which approximately 5,500 reside within the

Sunrise Lake lakeshed area. The City of Blaine has various ordinances and areas of programming pertaining to protection of local water resources including Sunrise Lake. Most notably, the City of Blaine has a robust stormwater management program with more details found here: <https://www.blainemn.gov/4058/Stormwater-Management> and here: <https://www.blainemn.gov/DocumentCenter/View/379/Blaine-Surface-Water-Management-Plan-PDF>

The City of Blaine owns and maintains four public parks in the Lakes of Raddison development, with two directly adjacent to Sunrise Lake. Lakeside Commons Park, situated on the north end of the central lake basin, provides public access to amenities such as a swimming beach, splash pad, boathouse with paddlecraft rentals, concessions, playground, volleyball court, and rentable picnic pavilion. West Lake Park features a playground, basketball court, gazebo, and trails along the western shoreline of the central basin. The City of Blaine administers a beach monitoring program testing for *E. coli* bacteria during the summer season to inform beach closures if necessary. The City of Blaine is also responsible for inspecting and maintaining the constructed stormwater ponds that treat runoff from the lakeshed, unless otherwise identified in a Development Contract to be maintained by a separate homeowners association.



4.1.3 Coon Creek Watershed District

13632 Van Buren St NE,
Ham Lake, MN 55304
www.cooncreekwd.org

The Coon Creek Watershed District is a special purpose unit of government charged with managing the water resources within a 107-square mile area of Anoka County including the Sunrise Lake Lakeshed and branches of the Ditch 41 public drainage system that flow through it. The CCWD’s mission is to manage surface water and groundwater systems and contributing lands to provide for and balance the competing uses of development, drainage, flood prevention, and the protection and restoration of water quality and habitat for the benefit of our communities now and in the future.

The District operates several programs that directly relate to Sunrise Lake including Watershed Development, Water Quality Research & Monitoring, Public & Government Relations, Operation & Maintenance, and Planning. Through these programs, CCWD regulates land-disturbing activities and impacts to wetlands, inspects and maintains drainageways including the Public Ditch 41 system, provides water-related educational information and involvement opportunities, monitors the hydrology and quality of surface waters including Sunrise Lake, performs aquatic invasive species surveillance surveys, and develops long-range plans to protect and enhance local water resources.

4.1.4 Anoka Conservation District

1318 Mckay Dr NE Ste 300,
Andover, MN 55304
<https://www.anokaswcd.org>

The Anoka Conservation District (ACD) is a non-regulatory county level subdivision of state government that provides technical and financial assistance to manage local natural resources. The mission of ACD is to conserve and enhance the natural resources of Anoka County by conducting monitoring and analysis, informing landowners and local government in natural resource management, and leveraging technical and financial resources to promote nature resource stewardship practices. ACD serves as a local resource for information and assistance with water quality best management practices including shoreline buffers and for control of noxious species including invasive purple loosestrife and phragmites through the Anoka Cooperative Weed Management Area program.

4.2 Implementation Schedule

A 10-year implementation schedule has been drafted which includes management strategies for all concerns facing Sunrise Lake that were identified during the plan development process and summarized in Section 3 (Table 6). Approximate costs have been estimated for each management strategy and specific roles have been assigned to one or more relevant organizations. This plan is subject to change and is not binding. Implementation of many of the proposed actions involves hiring consultants and contractors who provide specialized services. Lists of certified aquatic plant surveyors, aquatic herbicide applicators, and lake service providers are curated by the MN Department of Natural Resources and found here:

- https://files.dnr.state.mn.us/eco/invasives/surveyors_aq_plants.pdf
- https://files.dnr.state.mn.us/fish_wildlife/fisheries/apm/commercial_aquatic_pesticide_applicators.pdf
- https://apps.dnr.state.mn.us/ais_business_training/lake_service_provider_permits/public_website_list

Note: omission of a company from the referenced lists is not meant to exclude any legitimate firms from consideration, nor is inclusion in the referenced lists intended as an endorsement.

Table 6. Lake Management Implementation Plan for Sunrise Lake. For actions without cost estimates, a scale of \$ to \$\$\$\$\$ was used to signify relative magnitude of potential expenses

	Proposed Action	Timeline	Cost	Lead	Support
Water Quality	Continue routine water quality monitoring and data analysis	≥3 out of every 5 years	\$3,000/yr	CCWD	
	Continue beach monitoring for E. coli	Annually	\$200/wk	City	
	Continue operating pet waste disposal stations (n=6)	Annually	\$2,800/yr	CCWD	Master HOA
	Continue cooperative goose management efforts with USDA Wildlife Services	Annually	\$3,500/yr	Master HOA/USDA	
	Scale back aquatic aquatic plant control efforts (e.g., only treat areas impacting navigation/access, regulate private herbicide applications and mechanical removal methods) [see AIS section]	Annually	\$	Master HOA	
	Evaluate and optimize operation of aeration systems prior to planned replacement . Define goals, evaluate performance, adjust operations accordingly	Before 2034	\$\$\$	Master HOA	Consultant
	Conduct a shoreline erosion inventory	2027-2030	\$	Master HOA	ACD
	Stabilize active shoreline erosion	2030-2035	\$\$\$	Landowners	ACD, Consultant
	Evaluate contracted lawn care services for opportunities to reduce fertilizer and irrigation, including turf replacement with low maintenance alternatives (grants available)	2026-2035	\$	Master HOA, Sub-Associations	ACD

	Proposed Action	Timeline	Cost	Lead	Support
Water Quality	Consider coordinating annual yard waste pick up event(s)	2026-2035	\$\$	Master HOA	City, Waste Hauler
	Implement enhanced street sweeping within the Lakeshed	Annually	\$\$\$	City	CCWD
	Reduce salt use on City-maintained roads (manage level-of-service expectations, implement smart salting strategies)	Annually	\$	City	CCWD
	Require all winter maintenance contractors to be smart salting certified	Annually	\$0	Master HOA, Sub-Assocs	CCWD
	Inventory and inspect structural stormwater assets	≥ once every five years	\$\$	City, Owners	
	Schedule and implement stormwater asset maintenance	Annually	\$\$\$\$\$	City, Owners	Contractor
	Evaluate whether common carp biomass exceeds 100kg/ha threshold for ecological damage via contracted electrofishing [see AIS Section]	Once every five years	\$2,500	Master HOA	Consultant
	Enforce community regulations related to protecting lake water quality [see Regulations section]	Annually	\$	Master HOA, Sub-Associations, ACC	
AIS/Nuisance Wildlife	Ensure all lake service providers with permission to access the lake are trained in AIS laws/ implementing AIS prevention best practices	Annually	\$0	Master HOA, Sub-Associations	
	Conduct late summer AIS early detection surveillance surveys	≥ Annually	\$1,000	CCWD	
	Annually delineate spring curlyleaf pondweed extent	Annually	\$1,500	Master HOA	Consultant
	Conduct targeted CLP control in high-use areas only; avoid broad-scale or non-selective treatments where they may reduce native vegetation and promote algal dominance	Annually/As-needed	\$\$	Master HOA	Contractor
	Conduct control of any new species or species with limited distribution to prevent further spread (grants available)	Annually/As-needed	\$	Master HOA	CCWD, ACD
	Educate landowners on identification and manual control options for purple loosestrife, yellow iris, and any other documented AIS in buffer zone. Consider coordinating contracted control if private efforts are ineffective (Anoka Co Prevention grants available)	Annually/As-needed	\$	Master HOA	CCWD, ACD
	Pursue common carp management efforts if biomass exceeds 100 kg/ha:	As-needed	\$\$\$\$\$	Master HOA	Consultant, Contractor
	Conduct carp radio-tagging and tracking to identify spawning areas and aggregations	2026-2028	\$12,000 + \$7,500/yr	Master HOA	Consultant, CCWD
	Conduct Biomass removal via baited nets, trapping migrating adults, and/or commercial harvest	As-needed, 2027-2035	~\$20,000/yr	Master HOA	Consultant, Contractor

	Proposed Action	Timeline	Cost	Lead	Support
AIS/Nuisance Wildlife	Identify and mitigate nursery habitats depending on results of radio telemetry study (e.g. juvenile carp surveys, barriers, drawdowns, aeration)	As-needed, 2027-2035	\$-\$\$\$	Master HOA	Consultant, Contractor
	Establish a contingency fund to enable rapid response to newly identified AIS	2026-2035	\$-\$\$\$	Master HOA	CCWD
	Attempt to mitigate property damage caused by nuisance native wildlife through tree and bank protection efforts prior to removal	As-needed	\$	Property Owners	
	Inspect culverts regularly to remove beaver debris; Trap and remove beaver in areas with repeated damming that are sensitive to flooding	As-needed	\$\$	CCWD (Ditch 41 only), Owners	Contractor
	Regularly monitor water levels; consider real-time notifications to identify possible drainage issues related to damming	Annually	\$	CCWD	
Recreation	Implement notification systems (e.g., advisory signage, social media posts, email blasts) related to public safety issues such as occurrences of harmful algal blooms, elevated bacteria levels, and swimmer's itch	ASAP	\$	City, Master HOA	
	Create and implement a fisheries management plan for Sunrise Lake. Evaluate desires/goals, current fish community structure, stocking history and success, and future actions needed	2026-2035	\$\$\$	Master HOA	Consultant
	Conduct periodic bathymetric surveys in channel areas and compare results over time to quantify sedimentation rates	≥ once every 10 years	\$\$	Master HOA	Consultant
	Engage local volunteer groups and residents to participate in periodic community clean up events for common spaces	As-needed	\$	All	
	Host listening sessions or other input gathering methods (surveys, web-based issue reporter, etc) to seek feedback from residents and trail users on priority issues related to recreation and aesthetics	2026-2035	\$	Master HOA	
	Ensure community representation at relevant City Parks Advisory Board and Council meetings	2026-2035	\$0	HOA's, Residents	
Regulation	Encourage use of City of Blaine's "Report It" website, https://blainemn.gov/reportit , to report non-emergency public safety or nuisance issues impacting the health and enjoyment of Sunrise Lake	2026-2035	\$0	City	HOAs
	Support increased presence of City of Blaine police, Parks, and Code Enforcement staff in the community	2026-2035	\$\$\$	City	Residents
	Review, and revise as needed, current land and water use regulations and procedures in a manner that facilitates increased awareness, acceptance, and compliance; ensure adequate stakeholder education and meaningful engagement	2026-2035	\$	Master HOA, Sub-Associations, ACC	

	Proposed Action	Timeline	Cost	Lead	Support
Regulation	Ensure common property maintained by Master HOA/Sub-Associations is in compliance with community standards. Evaluate common properties for non-compliance and address as needed	2026-2030	\$\$	Master HOA, Sub-Associations, ACC	
	Implement current regulatory processes including enforcement protocols (e.g., shoreline alterations permitting; see Appendix A)	2026-2035	\$\$	ACC, Master HOA	
	Consider establishment of a violation tracking and enforcement system for community regulations impacting the health of the lake (e.g. buffer, erosion, illicit discharges, invasive species)	2030-2035	\$\$	Master HOA, Sub-Associations, ACC	Consultant
	Increase enforcement of violations impacting lake health such as non-compliance with buffer requirements; consider a tiered escalation system	2026-2035	\$\$	Master HOA, Sub-Associations, ACC	
Multiple	Educate residents via newsletters/online content on: lake-friendly lawn care practices, smart salting, AIS, pet waste disposal, and other topics where individual behaviors can impact lake health	≥ Semiannually	\$	Master HOA	CCWD, City, ACD
	Update Lake Management Plan	≥ once every 10 years	\$0	Master HOA	CCWD
	Develop and Implement Lake Management Funding Plan	≥ once every 10 years	\$0	Master HOA	

5. References

- Bajer, P. G., Sullivan, G., & Sorensen, P. W. 2009. Effects of a rapidly increasing population of common carp on vegetative cover and waterfowl in a recently restored Midwestern shallow lake. *Hydrobiologia*, 632, 235-245.
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- Nürnberg, G. K. 2005. Quantification of internal phosphorus loading in polymictic lakes. *Internationale Vereinigung für theoretische und angewandte Limnologie: Verhandlungen*, 29(2), 623-626.
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- Helmets, M.J., Isenhardt, T.M, Dosskey, M., Dabney, S.M., & Strock, J.S. 2008. *Buffers and Vegetative Filter Strips*. USDA Forest Service. <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1019&context=usdafsfacpub>
- MnDOT. (March 2006). 2.0 geological and archaeological background 2.1. GEOLOGICAL AND ARCHAEOLOGICAL BACKGROUND.

NOTICE

You are hereby notified that the newly revised “Lakeshore Buffer Zone Alteration Permit Application Process & Alteration Regulations and Standards” will take effect on _____ . Refer to attached document.

The revised document is also available online at the Master Association website
www.LakesofRadissonMaster.connectresident.com

This document has been forwarded to all lakeshore property owners. Prior versions of the subject document should be discarded. This document will be a valuable reference.

As its title infers, the subject document prescribes what an owner must do to receive a permit to make proposed improvements within the lakeshore buffer zone, and the regulations and standards that such improvements must comply with.



BUFFER ZONE BUZZ

Prepared by the Lakes of Radisson Architectural Control Committee

Sunrise Lake is the core of the Lakes of Radisson Community. In order to protect the water quality of the lake, the developer surrounded the lakeshore of the lake and its adjoining bays by a continuous peripheral vegetated strip of native grasses and wildflowers. This natural buffer zone was recorded as a "drainage easement" over the rear yard of each lakeshore lot with the intent to limit negative water quality impacts on the lake from the adjacent developed lakeshore.

The drainage easement is shown on a lot's Certificate of Survey, and the qualifying dimension of the designated Buffer Zone measures 25 feet landward from the rear yard lot line.

The Master Association's governing document delegates the responsibility for the continued preservation of the Buffer Zone to an Architectural Control Committee. The Committee is empowered to regulate and oversee all proposed improvements within the Buffer Zone. Such alterations and/or renovations require the submission of a permit application and related graphic plan, and subsequent project (permit) approval by the Committee. (Applications can be downloaded at the Master Association website:

www.LakesofRadissonMaster.connectresident.com

No more than 30 percent of the Buffer Zone area and contiguous shoreline at the water's edge can be altered or improved. Riprap is an exception. At least 70 percent of the Buffer Zone must be covered by a dense growth of native vegetation.

BUFFER ZONE ALTERATION REGULATIONS AND STANDARDS

The Master Architectural Control Committee has recently revised the 30 page document "Lakeshore Buffer Zone Alteration Permit Application Process & Alteration Regulations and Standards." (See and download attachment.)

The subject document includes some reorganization of provisions, rewording and addition of improvement standards. Some of the more important provisions include:

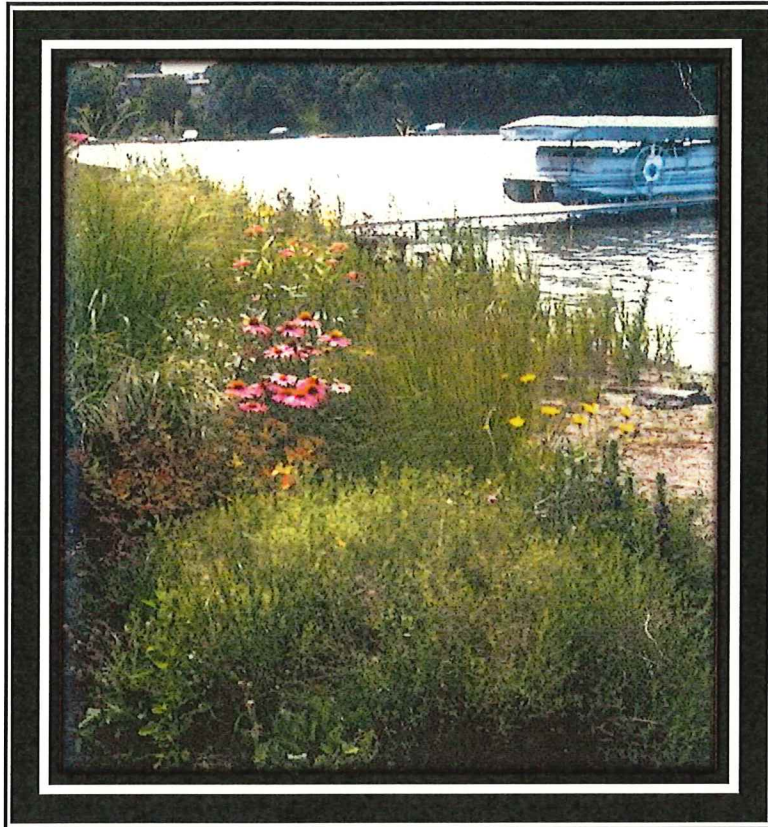
- R-3 redefinition of "normal water level."
- R-7 expanded description of "Protection Zone."
- R-8 usage of Master Association lakeshore common property.
- R-9 voluntary dedication of area of rear yard immediately landward of buffer zone to the "Protection Zone."
- R-11 temporary erosion control installation guidelines.
- R-13 partial retention of escrow fee until satisfactory establishment of seeded vegetation.
- R-31 prohibition of placement of wood mulch or mineral mulch within the "Protection Zone."
- Appendix A revision and addition of predetermined fines.

If you are considering alteration and/or renovation of the Buffer Zone, you and your designer/contractor should review the application process and any specific provisions that correspond to proposed improvements. Compliance with the established regulations and standards will eliminate any possibility of creating a violation. It is not necessary to read the entire document.

This document has been prepared to serve as a guideline for lakeshore property owners (applicants), and a project oversight tool for the Architectural Control Committee.

The goal is to provide for lakeshore use and enjoyment while limiting negative water quality impacts from the adjacent developed lakeshore lots.

The Lakes of Radisson Master Association



Lakeshore Buffer Zone Alteration Permit Application Process & Alteration Regulations and Standards 2025

THIS DOCUMENT WAS DRAFTED BY
AND THESE REGULATIONS AND
STANDARDS ARE IMPOSED BY:
THE LAKES OF RADISSON
ARCHITECTURAL CONTROL COMMITTEE

AMENDED 5-20-2025

CONTENTS

GENERAL INFORMATION

G1-1 Policy	1
G1-2 Intent	1
G1-3 Authority	1
GI-4 Architectural Control Committee Establishment and Duties	1
GI-5 Permit Application/Project Implementation Process Schedule	1
GI-6 Application Availability and Submission	1
Permit Review and Project Oversight Tasks	2
GI-7 Pre-Application Meeting	3
GI-8 Inspection Access	3
GI-9 Fees.....	3
GI-10 Response to Violations and Penalties.....	3
GI-11 Inspections.....	3

APPLICATION PROCEDURES

P-1 Applicant Responsibilities	4
P-2 Application Completeness	4
P-3 Timing.....	4
P-4 Variances	4
P-5 Application Assistance Meeting	4
P-6 Resubmission of Revised Plan	4
P-7 Appeals	4
P-8 Permit Reconsideration.....	5

SUBMISSIONS

S-1 General Information Requirements	5
S-2 Specific Information Requirements	5
Reference Checklist	6
Sample Alteration Plan	7

REGULATIONS AND STANDARDS

R-1 Policy	8
R-2 Buffer Zone	8
R-3 Lake Levels	8
R-4 Scope	8
R-5 Mandatory Pre-Permit Issuance Meeting.....	8
R-6 Alteration Limitations	8
R-7 Protection Zone	9
R-8 Common Property Usage	9
R-9 Property Dedication	10
R-10 Buffer Protection Zone Cutting.....	10
R-11 Temporary Erosion	10
R-12 Riprap.....	11
R-13 Seeded Areas.....	12
R-14 Native Herbaceous Plant Installation	12
R-15 Establishment Period Maintenance.....	13
R-16 Buffer Zone Renovations.....	13
R-17 Ornamental Herbaceous Plant Installation.....	13
R-18 Ornamental Shrub Installation	13
R-19 Berm/Swale Ground Forms	13
R-20 Storm Water Runoff from Lawns.....	14
R-21 Alteration Area Drainage	14
R-22 Grass Pathways	14
R-23 Walkways	14
R-24 Sand Beaches	14
R-25 Decks.....	15
R-26 Patios.....	15
R-27 Walls	15
R-28 Maintenance of Improvements.....	15
R-29 Prohibited Uses.....	15
R-30 Native Herbaceous Plant Maintenance.....	15
R-31 Shredded or Chipped Wood Mulch.....	15
R-32 Mineral Mulch.....	15
R-33 Woody Plant Coverage.....	15
R-34 Woody Plant Removal	16
Note: Copper Bay Projects.....	16

SEVERABILITY AND WAIVER.....	16
-------------------------------------	-----------

REVISIONS.....	16
-----------------------	-----------

APPENDIX A – SCHEDULE OF PREDETERMINED FINES

Authority.	17
Intent.....	17
Policy.....	17
Procedure.....	17
Schedule of Fines for Alteration Permit Violations.....	18

APPENDIX B - BUFFER ZONE MAINTENANCE GUIDELINES

Background	19
Maintenance Schedule Summary	19
Establishment Period Table	19
Post Establishment Period Table	20
Maintenance During Establishment Period	20
First Year	20
M-1 Watering.....	20
M-2 Weed Control	20
M-3 Cutting.....	20
Second	20
M-4 Watering	20
M-5 Weed Control	20
M-6 Cutting	20
Third Year	21
M-7 Watering and Weeding	21
M-8 Cutting	21
Maintenance After Establishment	21
M-9 Woody Plant Invasion	21
M-10 Thriving Vegetation	21
M-11 Dominance by Weeds	21
M-12 Thinning Vegetation.....	21
M-13 Consecutive Cuttings	21
Recommended Herbicides	21

APPENDIX C – APPROVED REGIONAL NATIVE SEED MIXTURES

Policy	22
34-262 Wet Prairie	23
34-271 Wet Meadow South & West	24
35-241 Mesic Prairie General Mix	25
35-641 Mesic Prairie Southeast Mix	26

APPENDIX D – RIPRAP INSTALLATION GUIDELINES

Profile Details	27
Sample Panel.....	27
Painted Landward Limit Line	27
Work Restrictions.....	27
Non-Compliant Installation	27
Example	27-28

APPENDIX E – NATIVE HERBACEOUS PLANT INSTALLATION GUIDELINES 29

**LAKES OF RADISSON MASTER ASSOCIATION
LAKESHORE BUFFER ZONE ALTERATION
PERMIT APPLICATION PROCESS & ALTERATION
REGULATIONS AND STANDARDS**

GENERAL INFORMATION

- GI-1. Policy:** Any proposed alterations or improvements within the designated lakeshore buffer zone having an estimated total cost/value of more than \$500 must be authorized by a written permit issued by the Lakes of Radisson Master Association. Any proposed project having an estimated cost/value of \$500 or less does not require an alteration permit. However, in such a case, the Manager of the Master Association must receive written notification declaring the proposed low cost project and its qualifying estimated cost/value. When the Master Association records indicate that accumulated multiple low cost alteration projects on the same property have a lump sum cost/value that exceeds \$500, any subsequent proposed low cost/value alteration project will require an alteration permit and payment of related fees regardless of the estimated cost/value of the current project. The “in-planting” of forb and grass plants, selected from the list of species that are components of the approved seed mixes specified in **R-13**, within the area of existing native vegetation for the purpose of increasing plant density and diversity and/or enhancing seasonal flower display is included, by default, in the low cost/value category.
- GI-2. Intent:** The purpose of the permitting process and the alteration regulations are to ensure the long term preservation of the health of Sunrise Lake and the protection of its water quality, shoreline habitat, shoreline aesthetics and community property values.
- GI-3. Authority:** The authority to adopt, impose and enforce regulations and standards affecting the preservation and alteration of the lakeshore buffer zone as defined by the Lakes of Radisson Lake Management Plan is established by Article V, Sections 1 as amended, 3-11 and 17; Article VI, Section 3; and Article VII, Section 6 of the Master Declaration of the Lakes of Radisson Master Association made on August 21, 2003.
- GI-4. Architectural Control Committee Establishment and Duties:** The Architectural Control Committee (the Committee or ACC) has been duly established and appointed by the Board of Directors of the Lakes of Radisson Master Association as a permanent committee in accordance with Article V, Section 1 of the Master Declaration and Section 6.13 of the Master By-laws of the Lakes of Radisson Master Association to oversee, review and regulate all matters involving the preservation, restoration and alteration of the lakeshore buffer zone. Accordingly, the Committee may establish and enforce certain reasonable regulations and standards necessary to accomplish its assigned mission. The Committee shall have the right to approve or disapprove any and all proposed alterations and restorations of the lakeshore buffer zone. The Committee may reject or refuse to approve any application that it deems unsuitable, undesirable or inconsistent with the Lakes of Radisson Lake Management Plan or the intent of the Master Association to protect lake water quality and overall integrity of the lakeshore buffer zone. The Committee may require that the plan(s) submitted with an application be prepared by a landscape architect or other qualified person.
- GI-5. Permit Application/Project Implementation Process Schedule:** The chronological scheduling of tasks listed in the table below are put into context by the guidelines following the table.
- GI-6. Application Availability and Submission:** Application forms are available online at the Master Association’s website www.LakesofRadissonMaster.connectresident.com or the Management Company’s website www.fsresidential.com/minnesota/homeowner (see web results: “Find My Community Website – First Service Residential”). Completed applications (i.e., application form, Certificate of Survey & improvement plan) should be submitted to the Lakes of Radisson Master Association at 8100 Old Cedar Avenue, Suite 300, Bloomington, MN 55425 or emailed to the current manager of the Master Association as indicated on the appropriate application form.

PERMIT REVIEW AND PROJECT OVERSIGHT TASKS

Provision	Task	Responsible Party	*Timing (After Receipt, Request or Action)
GI-7	Pre-Application Meeting	Applicant	When ready
GI-6	Submission of Application	Applicant	When ready
P-3	Notification of Receipt of Application	Assn. Manager	Within 3 business days
P-2	Determination of Application Completeness	Assn. Manager	Within 7 business days
P-2	Correction of Any Deficiencies	Applicant	Within 10 business days
P-3	Review of Application	Committee	Within 15 business days
P-3	Notification of Permit Disapproval or Tabling	Assn. Manager	Within 3 business days
P-5	Request Application Assistance Meeting	Applicant	When needed
P-5	Application Assistance Meeting	Committee	Within 7 business days
P-7	Appeal of Permit Disapproval	Applicant	Within 30 days
P-7	Appeal Action	Board of Directors	Within 30 days
P-6	Submission of Revised Plan	Applicant	Within 10 business days
P-3	Notification of Permit & Plan Approval	Assn. Manager	Within 3 business days
GI-9 & S-1g	Payment of Escrow Fee	Applicant	Within 3 business days
P-3 & R-5	Mandatory Pre-Permit Issuance Meeting	Committee	Within 7 business days
P-3	Issuance of Permit	Assn. Manager	Within 3 business days
GI-11a	Request Inspection 1	Applicant	When ready
GI-11a	Schedule Inspection 1	Assn. Manager	Within 3 business days
GI-11a	Inspection 1	Committee	Within 7 business days
GI-11b	Request Inspection 2	Applicant	When ready
GI-11b	Schedule Inspection 2	Assn. Manager	Within 3 business days
GI-11b	Inspection 2	Committee	Within 7 business days
GI-11c	Request Inspection 3	Applicant	When ready
GI-11c	Schedule Inspection 3	Assn. Manager	Within 3 business days
GI-11c	Inspection 3	Committee	Within 7 business days
GI-9	Return Balance of Escrow Fee Based on Inspection 3 Results	Assn. Manager	Within 14 business days

*The above chronological schedule has been organized to fit the 30-day approval/disapproval time frame provision established by the Master Declaration. However, the Committee will attempt to conclude its review, approval/disapproval action and project oversight in a timely manner.

- GI-7. Pre-Application Meeting:** Any applicant may request an informal pre-application consultation with a member of the Committee to consider the application process and its requirements, and details of the proposed project and regulation compliance. The meeting shall be held at the site of the proposed buffer zone improvement and shall be attended by both the applicant and the contractor.
- GI-8. Inspection Access:** Following reasonable notice given to the owner, representatives of the Master Association and members of the Committee may enter upon the property to inspect the buffer zone alteration and/or renovation project that is the subject of a duly submitted permit application for the purpose of determining whether the project is in compliance with the submitted plan and applicable ACC regulations and standards. An owner may waive the need for such reasonable notice and grant permission to access the project site unaccompanied without prior notice during the permitting process and at the start, during and completion of the permitted alterations and/or renovation.
- GI-9. Fees:** The applicant will be charged an application fee and an escrow fee per **S-1g** to ensure performance of the alterations and/or renovation in conformance with the approved plan, and compliance with established regulations and standards, and any related special conditions imposed by the permit. The non-refundable application fee must be included with the submitted application, and will be processed immediately. The escrow fee will be due 3 days after notification of the approval of the application, and prior to the mandatory Pre-Permit issuance Meeting. (**See R-5.**) If an application is withdrawn, the entire escrow fee will be returned to the applicant within 14 business days. Upon completion of a permitted project and its final inspection, the applicant will be entitled to a refund of all, or a portion of, the posted escrow fee within 14 business days. Deductions may be subtracted from the escrow fee as reimbursement for any corrective work done by the Master Association, and imposed fines for permit violations. (**See Appendix A** for a schedule of permit violation fines.) A portion of the escrow may be retained until any seeding of the buffer zone has successfully germinated. The Master Association will not pay interest on escrow deposits
- GI-10. Response to Violations and Penalties:** The Master Association will immediately issue a “cease and desist order” to any person responsible for altering the buffer zone without an approved permit or required notification, and for executing alterations that are not in accordance with an approved plan and related permit. Such persons shall be responsible for the cessation and/or removal of unauthorized alterations, implementation of corrective measures, and the restoration of the natural character of the buffer zone. If required corrections are not made as directed, in a timely manner, the Master Association may order the repairs and assess all related costs against the subject property in accordance with applicable provisions of the Master Declaration. (**See Appendix A**) for a schedule of permit violation fines.)
- GI-11. Inspections:** All approved buffer zone alteration and/or renovation projects shall be subject to at least three (3) sequential inspections by representatives of the Master Association:
- a. Inspection 1: to verify that an adequate silt fence has been properly installed prior to the start of any alteration and/or renovation work. (The fence must remain in place and intact until all work has been completed and the third or final inspection has been done.)
 - b. Inspection 2a: to verify that the required sample riprap panel conforms with the typical section shown on the submitted plan, and that the proposed riprap alignment will be the appropriate distance for the landward boundary of the buffer zone.
 - c. Inspection 2b: to verify that surface water runoff from the rear yard and area of alteration will properly flow into and through the native vegetation of the shoreline buffer zone, to evaluate the relative impact of any grade changes, and to substantiate that existing berm/swale ground forms have been preserved and proposed berm/swale ground forms have been constructed landward of the normal definable shoreline. This inspection shall precede the installation of any ornamental plantings, planting and/or seeding of approved native plant mixes, and soil retaining structures and hardscape features.
 - d. Inspection 3: to verify that the project has been completed in accordance with the approved plan and related alteration and/or renovation regulations and standards.
- It shall be the applicant’s responsibility to notify the Manager of the Master Association of each pending phase of the alteration and/or renovation project, and schedule each related inspection. Such inspections shall be made within seven (7) business days of the applicant’s (permit holder) request for an inspection.

APPLICATION PROCEDURES

P-1. Applicant Responsibilities: It is the responsibility of the applicant:

- a. To be familiar with the permit application process and alteration and/or renovation regulations and standards.
- b. To know the nature and scope of the proposed buffer zone alteration and/or renovation project.
- c. To organize and provide the information required for the Committee's review of the proposed alteration, and/or renovation project.
- d. To ensure that the application and information to be reviewed is complete, accurate and consistent with the lakeshore buffer zone alteration and/or renovation regulations and standards established by the Architectural Control Committee.
- e. To confirm that the collective area of site improvements does not exceed the 30% limitation on the permitted alterations of the lakeshore buffer zone.
- f. To pay all fees and escrows as may be required.

P-2. Application Completeness: A determination of whether a permit application is complete will be made within seven (7) business days following receipt of the application. No application will be considered complete, unless it is accompanied by the non-refundable application fee. If any of the required general or specific information is omitted from the application, and the Manager of the Master Association determines that the application is not complete, the Manager will notify the applicant of the specific deficiencies. The Master Association will take no further action on the application until the deficiencies are remedied. Failure of the applicant to rectify noted deficiencies or provide the requested information within ten (10) business days will be deemed as a withdrawal of the permit application. The Manager of the Master Association may grant an extension to the timeline.

P-3. Timing: The Manager of the Master Association will notify the applicant within three (3) business days that the application has been received. An application deemed to be complete will be reviewed and acted upon (approved, tabled or disapproved) by the Committee at a regularly scheduled meeting within fifteen (15) business days following receipt of the complete application. The Manager will notify the applicant of the Committee's approval within three (3) business days of the Committee's action; schedule the Committee's mandatory Pre-Permit Issuance Meeting with the applicant and contractor within seven (7) business days; and issue the approved alteration permit within three (3) business days after the Pre-Permit Issuance Meeting. If the Committee disapproves or tables the application, it will issue a written notice stating its findings and specific concerns or issues within three (3) business days of its decision.

P-4 Variances: The Committee may grant variances to provisions of the lakeshore buffer zone alteration regulations and standards to provide relief if the applicant can demonstrate that strict compliance will create an undue hardship due to circumstances unique to the property under consideration, and the proposed improvements will not impair nor be contrary to the intent of the Master Association's lakeshore buffer zone regulations, standards and policies.

P-5 Application Assistance Meeting: If an applicant feels stymied and is unable to resolve the issues or findings that contributed to the disapproval or tabling of his/her application, the applicant may request a meeting with a representative of the Committee for assistance and guidance, and to discuss acceptable measures that will correct plan deficiencies and satisfy Committee expectations. The Committee representative will meet with the applicant and contractor within seven (7) business days of the request for such a meeting.

P-6 Resubmission of Revised Plan: An alteration and/or renovation plan that was initially tabled or disapproved and subsequently revised shall be resubmitted to the Master Association within 10 business days, and will be reviewed and acted upon by the Committee within 15 business days.

P-7 Appeals: An applicant may appeal the decision of the Committee to the Board of Directors of the Master Association within thirty (30) days of the Committee's decision. The Master Board will make its determination and notify the applicant within thirty (30) days of receipt of the appeal. The determination of the Master Board shall be final and binding upon the applicant.

P-8 Permit Reconsideration: The Committee may re-evaluate its decision on the approval of a permit at any time the circumstances warrant. Circumstances that could warrant such reconsideration include, but are not limited to the following:

- a. Failure to comply with any special terms and conditions imposed by the permit.
- b. The information stated in the application and/or the improvements depicted and/or described on the supporting plan prove to be false, incomplete, or inaccurate.
- c. Significant new information arises that was not considered when the permit was initially approved.

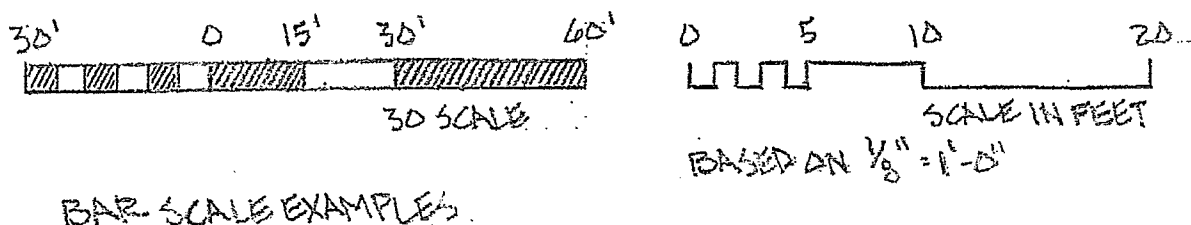
SUBMISSIONS

S-1. General Information Requirements: All applications for a buffer zone alteration and/or renovation permit shall include the following information, unless the submission requirements are modified or waived:

- a. Applicant's name (property owner), address, phone number, and email address.
- b. Builder, contractor, or consultant's name, address, phone number, and email address.
- c. Address of project site, if different than the applicant's address.
- d. Sub-Association name.
- e. Anticipated project start and completion dates.
- f. Itemized estimate of project cost/value.
- g. A non-refundable permit application fee and an escrow fee of \$500 or 10% of the estimated project cost, whichever is greater, (check or money order made payable to Lakes of Radisson Master Association). The escrow fee will be due 3 days after notification of plan approval, prior to the mandatory Pre-Permit Issuance Meeting. (See R-5). The escrow fee will be returned to the applicant within 14 business days if an application is withdrawn or after the final inspection and approval of the permitted alterations, and/or renovation minus any deductions for fines or corrective work done by the Master Association.

S-2. Specific Information Requirements: All applications for a buffer zone alteration and/or renovation permit shall include all of the following pertinent information unless specifically waived and deemed by the Manager not to be applicable to the proposed project or subject site.

- a. Copy of the lot's Certificate of Survey showing the edge of water, drainage easement, direction of surface water flow, finished spot elevations, and the map scale depicted as a graduated linear bar. Note: A Certificate of Survey is typically included in the property closing documents, and is available from the City of Blaine website at www.blainemn.gov.
- b. Legible copy of the buffer zone alteration and/or renovation plan. The following applicable information shall be graphically shown, stated or listed. The Plan (sheet or set of drawings) shall be submitted on an 8.5" x 11" sheet or sheets. The map scale shall be depicted as a graduated linear bar (See example below.) Selection of an appropriate bar scale shall be mutually suitable for the size of the plan and size of the site. (See Sample Alteration Plan on page 7.)



Reference Check the Following When Completed:

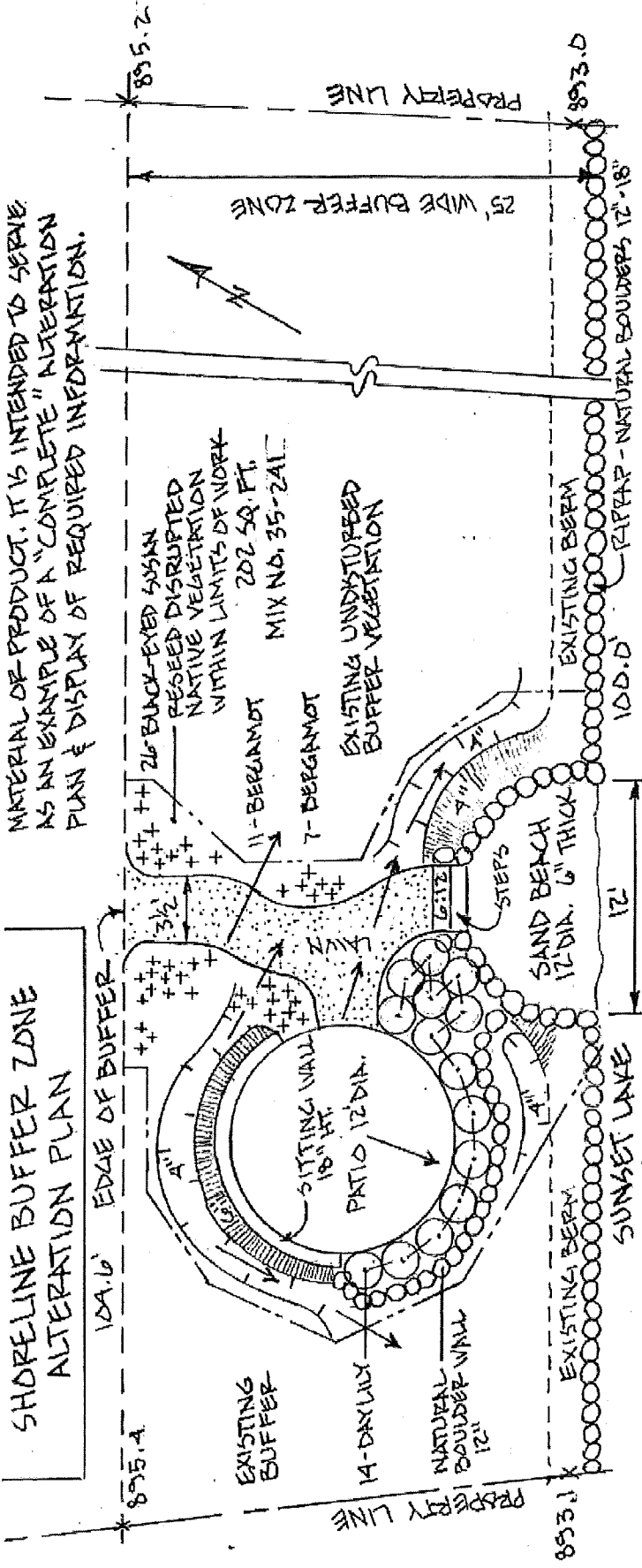
The following checklist itemizes potentially applicable information that should be included on the Plan sheet(s) and thereby help the applicant prepare a complete application.

- ☐ Landward and lakeward boundary of draining easement.
- ☐ Edge of water.
- ☐ Existing and proposed ground forms (berm/swales).
- ☐ Existing and/or proposed patio (include a materials list and pattern).
- ☐ Existing and/or proposed modular unit or boulder walls (include heights, widths, and materials list).
- ☐ Existing and/or proposed deck.
- ☐ Existing and/or proposed stairs (include materials list).
- ☐ Existing and/or proposed lawn areas.
- ☐ Existing and/or proposed gravel, flagstone, paver, turf and wood mulch paths (include materials list).
- ☐ Existing and/or proposed riprap (include size and type of boulders, and typical section). **(See Appendix E)**
- ☐ Access routes through Protection Zone for riprap installation.
- ☐ Individual plant installation locations for all ornamental woody and herbaceous plants (label species).
- ☐ Areas to be seeded with a mixture of grasses and forbs (include square footage, application rates and Minnesota seed mix number). **(See Appendix C.)**
- ☐ Areas to be planted with a mixture of native herbaceous plants (include square footage, spacing pattern, and species). **(See Appendix D.)**
- ☐ Areas to be sodded (include square footage).
- ☐ Area to be covered with beach sand (include depth and square footage).
- ☐ Areas to be covered with decorative landscape rock (include square footage, depth and type).
- ☐ Surface water runoff flow.
- ☐ Areas of existing buffer zone vegetation to be preserved.
- ☐ Plant list of proposed ornamental woody and herbaceous material (include species, size, quantity, type of root).

Plant and construction materials lists may be included as separate sheets.

SHORELINE BUFFER ZONE ALTERATION PLAN

MATERIAL OF PRODUCT. IT IS INTENDED TO SERVE
AS AN EXAMPLE OF A "COMPLETE" ALTERATION
PLAN & DISPLAY OF REQUIRED INFORMATION.



PLANT MATERIALS LIST

QUANT.	SPECIES	SIZE
14	DAYLILY SP.	2' D.C.
18	WILD BERGAMOT	1.5' D.C.
26	BLACK-EYED SUSAN	1.5' D.C.
	MIN STATE SEED MIX NO. 35-241	0.8 LB / 1000 SQ. FT.

LAKE ELEV. ON 8-28-13 890.4
PLAN DATE 8-30-13 SHEET 1 OF 1

BUFFER ZONE ALTERATION PLAN

ANN. APPLICANT PROPERTY 4' 0' 4'
1234 SHORELINE LANE
SCALE 1/8" = 1'-0"

ALTERATIONS AREAS

BUFFER ZONE	2575 SQ. FT.
30% AREA	773 SQ. FT.
30% SHOULDER	30 LIN. FT.
SITTING WALL	12 SQ. FT.
TURF PATH	67 SQ. FT.
BOULDER WALLS	37 SQ. FT.
PERENNIAL BED	56 SQ. FT.
STAIRS	7 SQ. FT.
PATIO	113 SQ. FT.
SAND BEACH (12 LIN. FT.)	67 SQ. FT.
TOTAL	359 SQ. FT.

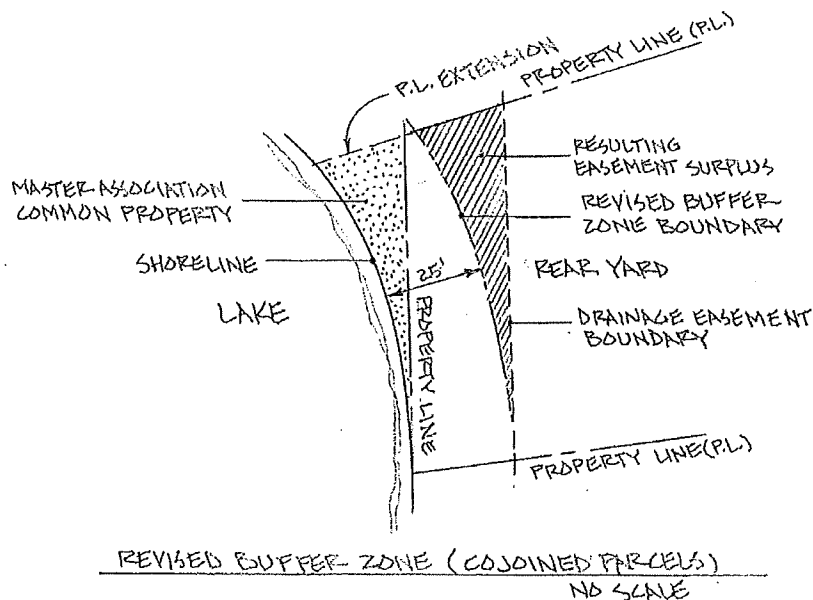
KEY

- LIMITS OF WORK
- RUNOFF FLOW
- NATURAL BOULDERS
- HERBACEOUS PERENNIALS
- + NATIVE HERBACEOUS FORBS
- PROPOSED BERM
- PROPOSED SWALE
- HARDSCAPE MATERIALS LIST
- ° PATIO - BORGERT FINIERS
- ° CRACOVIA, MINNESOTA BLUE
- ° SITTING WALL - BORGERT
- ° MADEIRA, MINNESOTA BLUE
- ° STEPS - BORGERT STEP UNITS
- ° MINNESOTA BLUE

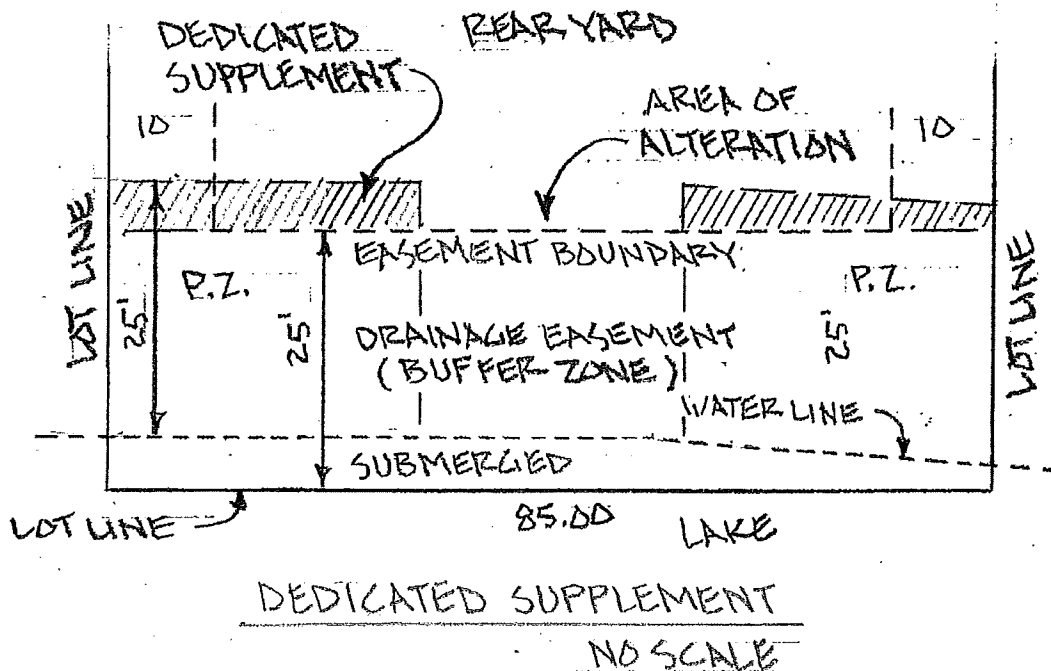
REGULATIONS AND STANDARDS

- R-1. Policy:** No alterations nor improvements shall be made to or within the designated lakeshore buffer zone of Sunrise Lake and its connecting bays without a written permit issued by the Master Association or notification by the property owner, whichever is required, dependent on the estimated project cost/value. (See **GI-1**). Preservation and maintenance of native herbaceous vegetation along the lakeshore of the lake is one of the fundamental measures endorsed by the Lakes of Radisson Lake Management Plan to protect the lake.
- R-2. Buffer Zone:** The 2003 "Lake Management Plan" for Sunrise Lake declares that a 25 foot wide buffer zone of native herbaceous plants shall be established, preserved and maintained around the lakeshore of the lake. In most cases the buffer zone will coincide with a lakeshore lot's rear yard "drainage easement" as defined on the lot's Certificate of Survey, the lakeward boundary being the unsubmerged rear yard lot line or if submerged, the "long-term average water level" shoreline. If the width of the defined or mapped easement is greater than 25 feet (e.g., 30'), only the lakeward 25 feet is subject to the prescribed "Buffer Zone Regulations and Standards". If the width is less than 25 feet (e.g., 15'), legitimate extension of the width and landward boundary of the buffer zone to 25 feet or greater is subject to the property owner's approval and dedication. The landward boundary of the buffer zone or easement that parallels the shoreline shall be determined on site in accordance with the property's Certificate of Survey by measuring the scaled distance from the lakeward wall of the house. Once established, this boundary shall serve as the baseline for all alteration calculations and measurements.
- R-3. Lake Levels:** Since the water level trends of Sunrise Lake have varied over the years, and consequently the "normal water level" is not a consistent elevation, it is more aptly defined as the "long-term average lake water level" or "operational water level" as evidenced by the changing stability. The ordinary high water level of the lake is 891.5. If current lake level information is needed to guide the proposed installation of riprap (See **R-12** and **Appendix D**), the ACC will provide the real time data at the mandatory pre-permit issuance meeting (See **R-5**).
- R-4. Scope:** The following regulations and standards do not address every conceivable alteration of the lakeshore buffer zone. Any proposed structures, landscape features, significant modeling of the ground surface, and use of materials that are not directly covered by this document will be individually evaluated by the Committee during its review of the application.
- R-5. Mandatory Pre-Permit Issuance Meeting:** The applicant and contractor shall attend a mandatory Pre-Permit Issuance Meeting scheduled by the Manager of the Master Association with a member of the Committee at the project site prior to the issuance of a project permit and start of any approved buffer zone alterations and/or renovation. The purpose of the meeting will be to review and discuss applicable provisions and conditions of the buffer zone alteration, and/or renovation permit, related regulations and standards, and required inspections.
- R-6. Alteration Limitations:** No more than 30 percent of the buffer zone (based on square footage) of each lakeshore lot, and no more than 30 percent of the shoreline at the water's edge (based on linear footage) shall be altered or improved. This limitation does not apply to the installation of shoreline riprap. Such alteration can include the removal of existing vegetation for the installation of improvements such as beach sand, sodded lawn, paved patios, walls, paths (paved, gravel, or turf), stairs, retaining walls, wood decks and ornamental plantings. Retaining walls and hardscape features shall not be constructed closer than 5 feet to the edge of the shoreline. If a portion of the designated buffer zone or easement is submerged by lake water at the time of the submission of the alteration permit application, and has been so covered for more than 3 consecutive months (based on lake level records maintained by the City of Blaine), the uncovered area that can be altered in accordance with the provisions of this document shall be adjusted and limited to 30 percent of the remaining regulated area above the current water line.

- R-7. Protection Zone:** Ideally, the Protection Zone is intended to be a “no-touch” undisturbed natural landscape comprised of a dense covering of a diverse mixture of native herbaceous plant species. The Protection Zone is the protected area of the buffer zone that has not been altered, to date and/or is prohibited from being altered at any time. It can be the entire buffer zone if there has been no alteration, and it must always be at least 70 percent of the defined buffer zone area. Although some existing buffer zones may be comprised of woody plants (e.g., willow) and/or herbaceous invasive or weed species (e.g., thistle, nettle), renovation or transformation of such areas to a desired native plant community is an encouraged voluntary initiative, except such work may be a conditional requirement associated with an alteration permit. Such renovation projects shall be done in accordance with the provisions of **R-16**. Work associated with a permitted alteration project shall not encroach into the defined Protection Zone except for authorized shoreline access routes for riprap installation, followed by appropriate restoration measures in accordance with the provisions of **R-13** and **R-14**.
- R-8. Common Property Usage:** In those situations where it is determined that the normal shoreline of Sunrise Lake and its connecting bays is located a discernable distance lakeward beyond a lakeshore unit’s rear yard lot line, and the intervening adjoining area of land (sediment or outlot) is by description “Master Common Property”, the owner of the contiguous lakeshore property can conjoin the abutting properties, thereby reshaping the lakeshore property’s buffer zone and relocating the landward boundary of the buffer zone 25 feet landward from the normal shoreline, subject to Committee approval. In keeping with **Provision R-6**, up to 30 percent of the revised buffer zone formed by the consolidated parcels can be altered or improved, and at least 70 percent must be established as native herbaceous vegetation. The resulting easement area surplus located landward and beyond the redefined buffer zone boundary can be retained as Protection Zone (**R-7**), or improved as part of the proposed area of alteration and/or general rear yard landscape



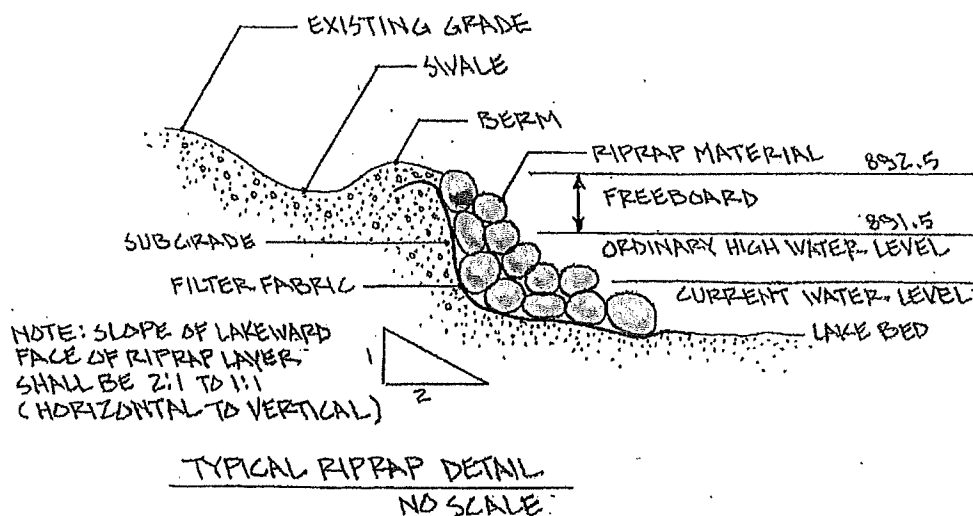
R-9. Property Dedication: In the event that the normal shoreline and rear yard lot line do not coincide due to a portion of the rear yard buffer zone being submerged (i.e., shoreline landward of rear yard lot line), thereby reducing the standard 25 foot width of the buffer zone, the 25 foot width can be realized or restored if the permit applicant/owner voluntarily "dedicates" a compensating full-length equivalent strip of rear yard immediately landward of and adjacent to the landward boundary of the easement/buffer zone. The dedicated strip of land shall be set-aside as part of the Protection Zone.



- R-10. Buffer Protection Zone Cutting:** The cutting or mowing of established native herbaceous vegetation within the Protection Zone shall be restricted to one cutting during early spring and / or one cutting during late summer or early fall, unless otherwise authorized by a written conditional cutting permit issued by the Master Association. (See Appendix B "Shoreline Buffer Zone Maintenance Guidelines").
- R-11. Temporary Erosion Control:** Adequate temporary erosion control measures (e.g., geotextile silt fence) shall be properly installed prior to the start of any work within the buffer zone. The installed silt fence shall be inspected and approved by a representative of the Committee, and must remain in place and intact until all work has been satisfactorily completed and a final inspection has been done, unless prior removal is authorized by the Committee. The fence stakes should be lakeward and the geotextile fabric should be landward. The bottom edge of the fabric, which is a loose flap, should be buried in a small trench when on dry land or forcibly inserted into the lake bottom when installed in the lake. For projects not disturbing the shoreline, the silt fence should be installed along the landward edge of the shoreline, turning landward at the side yard lot lines for the full width of the easement, or at the "limit of work" line or boundary if the subject alteration project area is restricted and will not disturb the entire buffer zone. For riprap projects or alteration projects that include installation of riprap, the silt fence should be installed in the lake at a suitable distance from the shoreline with the ends returning to the shore at the side yard lot lines. If the only disturbance of the shoreline will involve a shoreline improvement such as a sand beach, the silt fence needs only to be installed in the lake, opposite the improvement, returning to and over the shoreline embankment at the extremities of the beach.

R-12. Riprap: Riprap is an aggregated layer of clean (debris and dirt free) well-graded natural boulders or angular stones that shall be no less than 6 inches nor more than 24 inches in diameter, randomly or hand-placed along the shoreline as an erosion deterrent. Being a shoreline protection measure, riprap is not included in the calculation of the 30 percent limitation on the alteration of the buffer zone and shoreline, unless the riprap intrudes landward beyond the rear yard lot line and/or existing upper edge of the shoreline bank if the lot line is submerged.

- a. Riprap shall extend upward from the toe of the bank and lake bottom to an elevation of 892.5 (freeboard of one foot above the ordinary high water level of 891.5). If the existing elevation of the bank is lower than the prescribed freeboard elevation, soil fill that will be added to construct the required berm can provide the necessary subgrade for the extension of the contiguous riprap layer. The finished slope of the lakeward face of the riprap layer shall be no less than 2:1 nor more than 1:1 (horizontal to vertical). The layer of interlocked stone shall be twice as thick as the average diameter of the selected riprap material, and the placement of stone shall produce a surface that appears reasonably uniform. A permeable heavy-duty geotextile filter fabric shall be placed beneath the riprap against the subgrade that shall be free of extraneous and objectionable debris. The upper edge of the filter fabric (flap) shall be buried at least 8 inches below the subgrade. Every reasonable effort shall be exercised to restrain the erratic displacement of riprap material during placement.
- b. Any anticipated disruption of the buffer zone beyond any permitted alteration in order to facilitate the installation of riprap (e.g., access routes) shall be indicated on the plan submitted with the application, and shall be restored in accordance with the provisions of **R-13**, **R-14** and **R-15**, and approved by the Committee prior to implementation.
- c. If not existing, a berm/swale ground form shall be constructed immediately landward of, or abutting newly installed riprap. (**Refer to Appendix E** for the required demonstration of installation practices and results).
- d. If the buffer zone has a uniform slope or gentle grade to the water line without a "cut" shoreline embankment, and is not conducive to the installation of a 1:1 or 2:1 riprap section, the proposed riprap may be installed as a "blanket" that conforms to the existing unaltered contours. If the riprap blanket will extend landward into the buffer zone beyond the rear yard lot line or normal shoreline, as the case may be, the total area of intruding riprap shall be included in the calculation of the 30 percent area of alteration. (See **Appendix D, Section No. 3**).



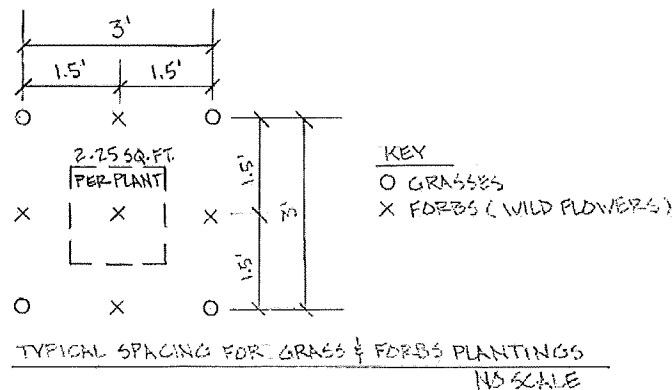
R-13. Seeded Areas: Areas within the Protection Zone that are to be seeded shall be sown with one of the following approved standard or specialty regional native seed mixtures at the application rate for the specified mix as recommended by the supplier, Minnesota Board of Water and Soil Resources (BWSR) or Minnesota Department of Transportation (MN/DOT):

- a. Minnesota State Seed Mix No. 34-262 Wet Prairie
Minnesota State Seed Mix No. 34-271 Wet Meadow South & West
Minnesota State Seed Mix No. 35-241 Mesic Prairie General
Minnesota State Seed Mix No. 35-641 Mesic Prairie Southeast

The state seed mix formulations are available online at www.bwsr.state.mn.us/seed-mixes, and www.dot.state.mn.us/seed-mixes. All seed shall be certified to be of Minnesota or regional origin. Prior to seeding the applicant shall provide documentation (e.g. packet label, seed mix tag or component invoice issued by vendor) that substantiates the specified or selected seed mixture or component species formulation. Any substitute seed mix proposed by the applicant is subject to prior approval by the Committee.

- b. For seedling identification see "Minnesota Wetland Restoration Plant ID Guide" online at www.bwsr.state.mn.us/native-plant-id-and-information.
- c. Seedlings shall be immediately covered by a thin layer of clean weed-free grain straw providing a 90% coverage of the exposed soil surface or seedbed. The straw layer shall be held in place by a thin photodegradable staple anchored netting.
- d. It is expected that any area that is seeded with a native plant seed mix will demonstrate successful germination, survival and commenced establishment as evidenced by a seedbed that has a uniform cover of native plants that is at least 6 inches high. If it is determined that the initial seeding, as a whole, or measurable patches have failed to successfully or significantly germinate by the one-year anniversary date of the seeding, the unacceptable areas shall be reseeded, and continue to be reseeded, until successful germination is achieved. Watering and weed control, as described in **R-15** and **Appendix B**, are essential to a successful outcome. The Master Association will withhold a percentage of the escrow fee, up to \$1500, until successful germination is verified.

R-14. Native Herbaceous Plant Installation: Areas to be planted with native herbaceous plants in the form of cell pack seedlings, plugs or potted plants shall be arranged in a loose grid across the area to be planted with the grass plants installed approximately 3 feet apart and forb plants (wildflowers) interspersed equidistantly between the grass plants at a spacing of 1.5 feet between plants or 2.25 square feet per plant. (See detail below.) The selection of grass and forb species shall correspond with the list of species that are components of the approved seed mixtures specified in **R-13**. The process for determining the arrangement and composition (e.g., plant types, quantities and species diversity) of the proposed planting is described in **Appendix E**.

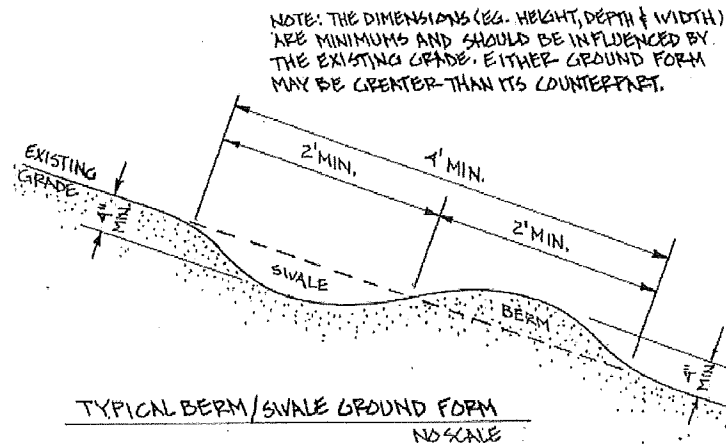


- a. A planted bed of potted plants shall be covered by a thin layer of natural, not color enhanced, shredded hardwood mulch up to 1 ½ inches thick. On steep slopes the mulch should be held in place by a light nylon photodegradable netting.
- b. Plugs and seedlings shall be inserted through a blanket of clean weed-free straw mulch and Photodegradable netting that covers a planting bed sown with a light application of a seed mix composed of species that are the same as or compatible with the plant species being installed.
- c. Purposely selected and scattered groupings of potted plants to be planted into a seedbed sown with an approved native seed mixture at the normal recommended application rate shall be inserted through a blanket of clean weed-free straw mulch and photodegradable netting.

At the time of, or before the final inspection, the applicant shall provide documents to the Committee that Substantiates the species and quantities of containerized plants that have been planted.

- R-15. Establishment Period Maintenance:** Areas that will be seeded and/or planted with native herbaceous plants should receive supplemental watering and diligent weeding during the establishment period. During the first year the areas should be deeply watered at least once a week. During the second and third years watering will be necessary only during periods of droughty conditions. Replacement seeding or plantings should be made where large gaps have developed, using species that have become successfully established (See Appendix B).
- R-16. Buffer Zone Renovation:** The natural character and quality of the Protection Zone may be renovated, restored or enhanced at the same time or independently of a permitted alteration or improvement project. Such renovation can include removal of existing vegetation, site preparation and seeding and/or planting of native forbs and grasses in accordance with the provisions of **R-13**, **R-14** and **R-15**. Existing berm/swale ground form within the Protection Zone or any otherwise unaltered buffer zone area shall be maintained or reconstructed if disrupted during such renovation or restoration. If there is/are no existing identifiable berm/swale ground forms located land ward of the shoreline within the area of renovation or there are existing remnant ground form segments, a berm/swale ground form shall be constructed and/or reconstructed, as needed, within the full-length of the Protection Zone. (See **R-19**). Any renovation of existing buffer zone vegetation must be authorized by a written conditional permit issued by the Master Association.
- R-17. Ornamental Herbaceous Plant Installation:** There are no restrictions on the selection of ornamental herbaceous plant species that are to be planted within the 30 percent area of alteration. However, consideration should be given to the inclusion of herbaceous plant species that are forb and grass components of the approved seed mixtures specified in **R-13**. Planting beds should be covered by a layer of shredded hardwood mulch or 1½" decorative landscape rock underlaid by a permeable 3-4 oz. fabric weed barrier.
- R-18. Ornamental Shrub Installation:** There are no restrictions on the selection of ornamental shrub species that are to be planted within the 30 percent area of alteration except their branching must not overhang the Protection Zone. Planting beds should be covered by a layer of shredded hardwood mulch or 1 ½ inch decorative landscape rock underlaid by a permeable 3-4 oz. fabric weed barrier.
- R19. Berm/Swale Ground Forms:** Existing berm/swale ground forms within the Protection Zone shall be protected during an alteration project. The construction of such ground forms as part of an alteration project within the 30 percent allotted area of alteration may be a conditional requirement of the approved permit imposed by the Committee. The invert depth of such depressions shall be at least 4 inches, the crown height of such soil berms shall be at least 4 inches and they each shall be at least 2 feet wide. Ground forms within the approved area of alteration shall be covered by one or more of the following materials: turf, ornamental herbaceous and/or woody plants, shredded hardwood mulch or 1½" decorative landscape rock. The placement or installation of such materials shall be done in accordance with the applicable provisions of **R-17**, **R-18**, and **R-22**. The inclusion of such ground forms within the permitted area of alteration will be counted as part of the allowable 30 percent area of alteration. Segments of existing ground forms disrupted by alteration actions outside of the perimeter of the permitted area of alteration (limits of work) and within the Protection Zone shall be structurally reconstructed or restored and replanted or seeded in accordance with the applicable provisions of **R-13** and **R-14**.

The reconstruction of original berm/swale ground forms that no longer exist within the buffer zone due to the passage of time is permitted, provided the vegetative cover in disturbed areas is restored by seeding or planting in accordance with the applicable provisions of **R-13** and **R-14**. Such ground form reconstruction and vegetation restoration will not be counted against the 30 percent alteration limit, but does require prior notification of the Manager of the Master Association. If not existing, a berm/swale ground form shall be constructed as an integral part of any riprap improvement project immediately landward of or abutting the newly installed riprap.



- R-20. Storm Water Runoff from Lawns:** Rear yard storm water drainage and runoff shall not flow directly unimpeded to the lake, but instead shall be directed into the buffer zone and any existing ground depressions located within the buffer zone.
- R-21. Alteration Area Drainage:** Any water runoff from hard surface improvements and ornamental planting beds within the area of permitted alterations shall be directed into existing or conditionally required ground depressions within the area of natural vegetation (Protection Zone) or area of permitted alterations.
- R-22. Grass Pathways:** Any mowed grass path within an area of permitted alteration shall meander from the rear yard lawn to the lake and shall be crowned or side-sloped to direct water runoff into the adjacent undisturbed natural areas or ground depressions.
- R-23. Walkways:** Other than grass pathways, any walkways shall be constructed of crushed gravel, poured in-place concrete, natural flagstone, or concrete, stone or brick pavers. Freestanding crushed gravel or paver walkways bordered by the natural vegetation of the Protection Zone shall be edged by aluminum, steel or vinyl edging. The outer margins of an edged walkway shall be level with the surface of any abutting Protection Zone. Stepping-stone units can be placed in a surrounding bed of shredded hardwood mulch that is bordered by landscape edging. If applicable, continuous walkways shall meander from the rear yard lawn to the Lake, and the subgrade shall be crowned or side-sloped to direct water runoff into the adjacent undisturbed natural areas.
- R-24. Sand Beaches:** Beach sand shall be clean and washed free of fine particles and must be of the appropriate grain size (course sand or larger) to stay in place under wave action.. Sand blankets shall not be placed lakeward of the normal shoreline or water's edge. The sand beach area shall be defined or edged with appropriately sized boulders, stone outcroppings, concrete modular units or vinyl landscape edging. The alteration permit could require, as a condition, the construction of a soil berm and/or depression behind or landward of the required edging. (See **R-19**). Subject to prior notification of the Manager of the Master Association, refreshment of the sand blanket will be allowed without an alteration permit issued by the Master Association.

- R-25 Decks:** Decks shall be ground level structures with the top surface being no higher than 12 inches above the underlying ground surface. Decks shall not be placed closer than 5 feet to the edge of the shoreline. Deck framing shall be constructed in accordance with established structural standards. The deck structure shall not be attached to permanent footings. Decking may be treated lumber, or suitable plastic or composite material.
- R-26 Patios:** Patios shall be setback at least 5 feet from the edge of the shoreline. Patios may be constructed of poured in-place concrete, concrete pavers, natural stone pavers, brick pavers, natural flagstone or crushed gravel. Patio surface runoff shall be directed into constructed depressions in the area of alteration and/or existing depressions in the buffer zone. Applicants should consider the use of permeable interlocking concrete pavers placed on permeable open-graded crushed stone bedding and aggregate sub-base.
- R-27 Walls:** Sitting and/or retaining walls shall not be constructed closer than 5 feet to the edge of the shoreline. Walls may be constructed of concrete modular units, natural wall stone, stone outcroppings or boulders.
- R-28 Maintenance of Improvements:** General maintenance of existing alterations or improvements within the 30 percent area of alterations such as replacement of ornamental plants, replacement of pavers and refreshment of hardwood mulch and riprap does not require a permit, payment of fees nor notification.
- R-29 Prohibited Uses:** Buildings, fences, vegetable gardens, organic yard debris deposits, rock piles and storage of any kind, except docks and boat lifts during the post and pre-boating season, is prohibited within the Protection Zone or any otherwise unaltered area of the buffer zone.
- R-30 Native Herbaceous Plant Maintenance:** Existing native herbaceous vegetation (forbs and grasses) that is being retained or preserved within the buffer zone should be periodically inspected to detect invasive herbaceous weeds and woody plants, and continually maintained to promote the growth of desirable plants in accordance with the applicable provisions of the Shoreline Buffer Zone Maintenance Guidelines.(See Appendix B).
- R-31 Shredded or Chipped Wood Mulch:** Generally, any wood mulch material that was permitted by the Master Association and placed within the buffer zone prior to 2015 can be refreshed, as needed. Any refreshment mulch layer shall not exceed 2 inches in depth, and shall be identical to the existing mulch material. Also, wood mulch material can be placed in ornamental landscape planting beds within a permitted area of alteration, and can be refreshed as needed. The placement of any wood mulch, post 2014, is only permitted within the Protection Zone in conjunction with a buffer zone renovation planting of containerized native herbaceous plants (See R-14 and R-16), but shall not be refreshed upon its eventual natural decomposition. Effective measures shall be implemented to prevent the washing of mulch material into the lake.
- R-32 Mineral Mulch:** Mineral mulch or decorative landscape rock (e.g., river rock, pea gravel, crushed stone, crushed brick, lava rock) can be placed in ornamental landscape planting beds within a permitted area of alteration. Such mulch material shall not be placed within the Protection Zone at any time, for any reason.
- R-33 Woody Plant Coverage:** The stems, crown and/or branches of any tree or shrub planted within the 30 percent area of alteration or planted within a rear yard area contiguous to the Protection Zone shall not extend into or over the Protection Zone at the time of planting, nor anytime thereafter. The species and location of any trees that are proposed to be planted within the 30 percent area of alteration shall be approved by the Committee. The planting of woody plants that are not part of an approved comprehensive buffer zone alteration or improvement plan will not be permitted, under any circumstances. The area of canopy coverage and/or foliage mass of existing naturally established woody plants within the Protection Zone and outside of an approved area of alteration shall not be counted as part of the area to be altered. Any woody plants that have been permitted and subsequently planted within the lakeshore buffer zone prior to the submission and approval of a buffer zone alteration plan shall be incorporated, as much as possible, into the proposed area of alteration.

R-34 Woody Plant Removal: All woody plants (e.g., trees and shrubs) within the Protection Zone should be removed to promote the growth of desirable native forbs and grasses. All woody plant removals shall be carefully done at a time when such removal will cause the least amount of damage to the existing native forbs and grasses. The cost of such removals shall be borne by the subject property owner.

- a. Existing naturally, established or invasive volunteer woody plants should be removed to the ground line, and the flush-cut surface of resulting stumps and stubs should be grubbed-out or properly treated with a brushed-on application of a “brush-killer” herbicide.
- b. Any woody plants that have been intentionally planted within the Protection Zone without a written permit issued by the Master Association shall be removed, and the resulting stumps and stubs grubbed-out or properly treated with a with a brushed-on application of a “brush-killer” herbicide.
- c. Any woody plant that was previously “permitted” to be planted within the Protection Zone and is subsequently removed, for any reason, shall not be replaced.
- d. If invasive woody plants such as shrub willow and cottonwood saplings occupy most of the area of the lakeshore buffer zone, it is recommended that all vegetation (woody plants and herbaceous native plants) should be removed, and the “cleared” area renovated in accordance with the provisions of **R-16**.

Note: Copper Bay Projects

A 6-inch water main is located within the buffer zone of Copper Bay. Prior to the start of any excavation within the area of an approved project, the water main alignment must be located (flagged or painted) by Mickman Brothers, Inc. The applicant is responsible for the timely scheduling of the locate and shall be financially responsible for all costs associated with the repair of any damage to the water main that occurs during the permitted alteration project.

SEVERABILITY AND WAIVER

The invalidity or unenforceability of any part of this document shall not impair nor affect in any manner the validity, enforceability or effect of the balance of this document. No regulation, standard, restriction, condition, obligation or provision contained herein shall be deemed to have been abrogated or waived by reason of any failure to enforce the same, irrespective of the number of breaches thereof which may occur.

REVISIONS

This document will be reviewed and revised from time to time, as needed. The latest version will be available at the office of the Master Association.

APPENDIX A

SCHEDULE OF PREDETERMINED FINES FOR BUFFER ZONE ALTERATION VIOLATIONS

Authority: The authority to adopt, levy and impose fines and assessments is established under, Article IV, Section 1 and Article V, Section 3 of the Master Declaration of the Lakes of Radisson Master Association executed and recorded on August 21, 2003.

Intent: The purpose of a schedule of predetermined fines is to:

- a. Discourage irresponsible and/or presumptuous actions.
- b. Notify Owners of potential monetary consequences for noncompliance with regulations, standards and procedures that have been established to protect lake water quality and the related functions of the native vegetation of the lakeshore buffer zone.
- c. Ensure that the penalty imposed on all parties for the same violation is equitable and consistent.

Policy: All alteration and/or renovation activities and resulting improvements within the designated buffer zone of a lakeshore lot are subject to approval of a project permit application and implementation plan by the Master Association's Architectural Control Committee (ACC). Any Owner that fails to apply for and receive such a permit, and facilitates the initiation of any unapproved alteration or improvement is in violation of regulations and standards duly imposed by the ACC. Any such unauthorized actions or alterations are subject to applicable fines.

If an Owner or his/her contractor fails to comply with any buffer zone alteration regulations, standards and procedures established by the ACC, the Owner may be required to pay applicable predetermined fines listed herein. Additional fines may be imposed in response to any unauthorized deviation from the approved project plan and/or failure to comply with any special condition assigned by the approved permit. Such penalties, if imposed, would be totaled and subsequently subtracted from the posted escrow fee. The Master Board may also levy an additional assessment against the violating Owner and subject property if the posted escrow fee is not adequate to cover all assigned monetary penalties or costs associated with the enforcement of applicable buffer zone alteration and preservation regulations and standards and/or the resolution and remediation of alteration permit violations, including without limitation any related fees of attorneys or other professionals.

Procedure: The ACC shall, in its sole discretion, have the exclusive right to recommend that the Master Board impose certain fines, monetary penalties and assessments as prescribed by the "Schedule of Predetermine Fines" for violations of established regulations, standards and procedures relating to the alteration of the shoreline buffer zone. Acting upon any recommendation issued by the ACC, the Master Board may impose such predetermined fines and/or levy such assessments it deems fitting.

Any owner alleged to have violated the shoreline buffer zone regulations (whether such violation was committed by the Owner or hired contractor) is entitled to written notice of the violation and an opportunity to be heard by the Master Board or a committee appointed by the Master Board before a fine is assessed.

Upon receipt of a written notice of violation from the Master Association or its authorized agent, an Owner who desires to having a hearing must make a written request for a hearing by contacting the Master Association's management agent within ten (10) days of the date of the violation notice. If a hearing is timely requested, the Master Association will schedule a hearing to be held within thirty (30) days of receipt of the request for a hearing, and with at least five (5) business days prior to written notice to the offender. If the offending Owner fails to appear at the hearing, then the right to a hearing shall be waived and the Master Board may take such action as it deems appropriate.

The decision of the Master Board and the rules for the conduct of hearings established by the Master Board shall be final and binding to all parties. The Master Board's decision shall be delivered in writing to the offender within a reasonable time following the hearing, if not delivered to the offender at the hearing.

Schedule of Fines for Alteration Permit Violations:

Violation	Fine
1. Starting buffer zone alterations and/or renovation (estimated project cost/value more than \$500) without an approved alteration and/or renovation permit.	\$600
2. Starting minor alterations (cost/value of \$500 or less) without prior notification of the Master Association.	\$100
3. Intentional misrepresentation of the estimated cost of the improvement project (being \$500 or less when, in fact, it will be more than \$500).	\$100
4. Scalping all or a part of the native vegetation in the protected natural area of the buffer zone beyond the limits of an approved alteration project or not done in conjunction with an approved renovation project.	\$100 plus \$1 sq. ft. of scalped area
5. Starting alterations and/or renovation prior to proper installation of temporary erosion control measures (e.g., silt fence).	\$100
6. Starting alterations and/or renovation prior to inspection and approval of installed erosion control measures (Inspection 1).	\$100
7. Starting general installation of riprap prior to the inspection and approval of the required sample panel and delineation of the proposed riprap alignment (Inspection 2a).	\$100
8. Starting installation of ornamental plantings, soil retaining structures and hardscape features within the area to be altered prior to inspection and approval of the directed flow of surface water runoff, grade changes and constructed ground forms (Inspection 2b).	\$100
9. Starting seeding and/or planting of native forbs and grasses within the natural area or Protection Zone prior to inspection and approval of grade changes, constructed ground forms and the directed flow of surface water runoff (Inspection 2b).	\$100
10. Planting or seeding of noncompliant (not preapproved) herbaceous plants or seed mixtures in the Protection Zone.	\$100
11. Installation of alteration improvements not shown nor disclosed on the submitted alteration plan, and/or not in compliance with the approved alteration plan (e.g., dimensions, location) and related regulations and standards, and/or contrary to any condition imposed by the approved project permit. The Owner shall remove or modify any and all alterations that are not authorized by the approved permit or in compliance with established standards or in accordance with the approved alteration plan. The cost of any required remediation shall be borne by the Owner. If required corrections are made by the Master Association, the related costs will be assessed against the subject property in accordance with the applicable provisions of the Master Declaration.	\$100 plus \$100/item
12. Failure to schedule the final inspection to determine that the project has been completed in accordance with the approved plan and permit (Inspection 3).	Forfeiture of posted escrow amount

APPENDIX B

LAKESHORE BUFFER ZONE MAINTENANCE GUIDELINES

Background: The lakeshore buffer zone around Sunrise Lake and its connecting bays was initially established by the developer of the Lakes of Radisson community, and is subsequently being protected by the Master Association through regulations. The initial intent was to provide and secure a strip of native herbaceous vegetation along the lakeshore that would be low maintenance while helping protect lake water quality by filtering rear yard runoff, increasing storm water infiltration, assimilating suspended nutrients and chemical pollutants and reducing shoreline erosion.

It remains a primary lakeshore management objective of the Master Association to continue to promote the growth of desirable native grasses and forbs (wildflowers) and the sustainability of the buffer zone as a natural landscape.

Although the lakeshore buffer zone is intended to be a low maintenance landscape, it should be afforded periodic monitoring and directed maintenance, from time to time. Dedicated care will ensure that the associated benefits of a buffer zone are realized by the lake lot owner and the Lakes community as a whole.

Maintenance Schedule Summary: The maintenance tasks listed in the schedule below are discussed in detail following the table.

A. Establishment Period (3 years after installation)

Code	Situation	Task	Frequency/Timing
M-1	First Year	Watering	1 inch/week
M-2	First Year	Weed control	Once every 2 weeks
M-3	First Year	Cut-back vegetation to 4"- 5"	After planting, every 30 days until September 30 th
M-4	Second Year	Watering	During droughty periods
M-5	Second Year	Weed control	Once every 3 weeks
M-6	Second Year	Cut-back vegetation to 4" – 5"	Once between June 1 – August 15
M-7	Third Year	Watering	During droughty periods
M-7	Third Year	Weed control	Once every 3 weeks
M-8	Third Year	Cut-back vegetation to 2" – 3"	Early Spring
M-8	Third Year	Replant or reseed voids	Early Spring

B. Post Establishment Period

Code	Situation	Task	Frequency/Timing
M-9	Woody plant invasion	Woody plant control	Early Fall
M-10	Thriving native vegetation	Weed control	As needed
M-11	Dominance by weeds	Cut-back vegetation to 4" – 5"	Late Summer – Early Fall
M-11	Dominance by weeds	Weed control	Late Summer – Early Fall
M-12	Thinning of native vegetation	Cut-back vegetation to 4" – 5"	Early Spring
M-12	Thinning of native vegetation	Weed control	Early Spring
M-12	Thinning of native vegetation	Plant or seed to increase diversity or enhance color	Early Spring
M-13	Thinning of native vegetation	Consecutive alternation of spring and fall cuttings	Spaced at least a full growing season apart

- A. **Maintenance During Establishment Period:** During the first three years after a new or rejuvenated seeding and/or planting within the lakeshore buffer zone, the focus should be on 1) eliminating or suppressing the growth of invasive weed species and 2) providing supplemental watering. Such regular maintenance will give the desired native plants (e.g. grasses and forbs) the necessary competitive advantage over weed species. Common herbaceous weeds that will be found growing in the buffer zone include thistle, nettle, ragweed, reed canary grass and quack grass. (See identification photos on-line at www.weedimages.org).

Become familiar with the potential weed species as well as the desirable native plant species in order that desirable plants are not mistakenly eradicated. Place a labeled stake next to a selected example of each planted species or sprout a small sample of the native seed mix in a tray for reference.

First Year

M-1. Watering: Seeding or plantings will need at least 1 inch of water per week. (A sprinkler application for 1-2 hours will provide the required deep soaking.) Water with caution on steep slopes to avoid erosion.

M-2. Weed Control: Inspect the seeded or planted area once every two weeks to locate emerging weeds. Detected weeds should be hand-pulled or spot-sprayed with a broadleaf or selective herbicide as per label recommendations. Spray cautiously to avoid damaging nearby desirable plants.

M-3. Cutting: Cut growing vegetation to a height of 4" – 5" every 30 days until September 30th.

Second Year

M-4. Watering: Watering of seedlings or plantings will be necessary only during periods of drought.

M-5. Weed Control: Inspecting for and eradication of detected weeds needs to be done only once every three weeks.

M-6. Cutting: Cut the buffer vegetation to a height of 4" – 5" one time between June 1 – August 15 to prevent the setting and release of weed seeds. Leave the cuttings in place to serve as an organic mulch.

Third Year

M-7. Watering & Weeding: Continue the same watering and weeding program recommended for the second year.

M-8. Cutting: During early spring when weather conditions permit, cut-back all dried herbaceous vegetation from the previous year to within 2" – 3" of the ground. Leave the cuttings in place to serve as an organic mulch. Any significant voids or gaps that have developed in the vegetation should be reseeded or replanted with desirable plant species that have become successfully established.

- A. Maintenance After Establishment:** After the seeded or planted grass and forb species have become established and are able to survive without supplemental watering, and outcompete most weeds except for woody plants such as willow, the focus should be on 1) removing noticeable weed species that occasionally sprout as individuals within the buffer and as colonies along its edges and 2) promoting the sustained density of desirable plants.

M-9. Woody Plant Invasion: Cut-back invasive woody vegetation (trees and shrubs) to the ground line in early fall and treat (brushed-on application) the fresh-cut surface of the stubs with a chemical brush killer.

M-10. Thriving Vegetation: If the desirable plants are thriving, hand-pull or spot-spray young or rejuvenated (previously cut) weed species as noticed or needed. Any broadleaf or selective herbicide should be applied as per label instructions and care should be exercised to shield nearby desirable plants during application. It is advisable to wear heavy-duty leather work gloves when pulling thistle and nettles.

M-11. Dominance by Weeds: If the buffer zone has been overrun by weeds, cut-back the entire area to a height of 4" – 5" during late summer or early fall to eliminate seed production and dispersal by maturing weed plants. The cutting will also facilitate the spot application of an herbicide directly to the base of identified weed plants. Such cutting may need to be repeated the following year to achieve the desired level of weed control. Remove the loose cuttings from the buffer zone.

M-12. Thinning Vegetation: If the density of the desirable plants appears to be thinning, cut-back the entire area to a height of 4" – 5" during early spring to stimulate the growth and spread of these plants. A spring cutting is also the opportune time to alter the dominance of certain species, increase species diversity and/or enhance seasonal flower color displays by spot seeding or planting additional plants. It is recommended that such cutting be done only as needed. Remove cuttings to accommodate seeding and/or planting. The best time for early spring cutting is normally after the snow has disappeared and the soil and plants are dry enough to work with (normally before the new growth has reached a height of 10" – 12").

M-13. Consecutive Cuttings: Any consecutive alternation of spring and fall cuttings should be spaced at least a full growing season apart.

It is likely that the character of the lakeshore buffer zone will continue to naturally change over time, requiring some periodic adjustment of normal maintenance practices. Proper conscientious maintenance will perpetuate the envisioned natural character of the lakeshore buffer zone and, in doing so, will solidify the resulting environmental, aesthetic and wildlife habitat benefits.

Recommended Herbicides: The herbicides are listed by their active ingredients and trade names.

For Broadleaf Weeds

- 2, 4-D & dicamba (e.g. Weed-B-Gon)
- 2, 4-D, dicamba & mecoprop (e.g. Trimec)

For Grassy Weeds

- fluazifop (e.g. Grass-B-Gone, Fusilade II)

For Woody Plants

- triclopyr (e.g. Garlon 4, Brush-B-Gon)
- glyphosate (e.g. Roundup)

APPENDIX C

APPROVED REGIONAL NATIVE SEED MIXTURES

Policy: The following lists of approved regional native seed mixtures are prescribed in **R-13** of the Lakeshore Buffer Zone Alteration Regulations and Standards, and shall be the basis for any restorative or renovative seeding and/or planting within the Protection Zone. (See **R-7**). All seedings and/or plantings within the Protection Zone shall comply with applicable provisions of **R-13**, **R-14** and **R-15** of the Lakeshore Buffer Zone Alteration Regulations and Standards. All proposed native herbaceous plants to be planted within the Protection Zone shall be selected from the list of plant species that are components of the approved seed mixtures.

Note: The renovation of all or a part of the unaltered lakeshore buffer zone or the Protection Zone (minus Area of Alteration) must be authorized by a written conditional permit issued by the Master Association. (See **GI-I** and **R-16**). A permit applicant may propose and submit a modified similar seed mix, as a substitute, for review and approval by the Architectural Control Committee.

34-262 Wet Prairie

Seeding Rate: 14.5 lb/Acre (125.6 Seeds/ft²)

Notes: Wet prairie reconstruction for wetland mitigation or ecological restoration.

SCIENTIFIC NAME	COMMON NAME	% of Mix	Seeds/R ²	Rate/Acre
GRASSES:				
<i>Andropogon gerardii</i>	Big Bluestem	6.90%	3.7	1.00 PLS lb
<i>Bromus ciliatus</i>	Fringed Brome	10.34%	5.5	1.50 PLS lb
<i>Calamagrostis canadensis</i>	Blue Joint Grass	0.28%	4.1	0.04 PLS lb
<i>Elymus virginicus</i>	Virginia Wild Rye	12.07%	2.7	1.75 PLS lb
<i>Glyceria grandis</i>	Reed Manna Grass	1.03%	3.9	0.15 PLS lb
<i>Glyceria striata</i>	Fowl Manna Grass	0.76%	3.6	0.11 PLS lb
<i>Panicum virgatum</i>	Switchgrass	5.17%	3.9	0.75 PLS lb
<i>Poa palustris</i>	Fowl Bluegrass	1.38%	9.6	0.20 PLS lb
<i>Sorghastrum nutans</i>	Indiangrass	3.45%	2.2	0.50 PLS lb
<i>Spartina pectinata</i>	Prairie Cord Grass	3.45%	1.2	0.50 PLS lb
SEDGES & RUSHES:				
<i>Carex pellita</i>	Broad-leaved Woolly Sedge	0.34%	0.5	0.05 PLS lb
<i>Carex stricta</i>	Tussock Sedge	0.14%	0.4	0.02 PLS lb
<i>Carex vulpinoidea</i>	Brown Fox Sedge	0.69%	3.7	0.10 PLS lb
<i>Scirpus atrovirens</i>	Green Bulrush	0.69%	16.9	0.10 PLS lb
<i>Scirpus cyperinus</i>	Woolgrass	0.21%	18.7	0.03 PLS lb
FORBS:				
<i>Anemone canadensis</i>	Canada Anemone	0.21%	0.1	0.03 PLS lb
<i>Asclepias incarnata</i>	Swamp Milkweed	0.55%	0.1	0.08 PLS lb
<i>Aster puniceus</i>	Swamp Aster	0.55%	2.4	0.08 PLS lb
<i>Aster umbellatus</i>	Flat-topped Aster	0.34%	1.2	0.05 PLS lb
<i>Desmodium canadense</i>	Showy Tick Trefoll	3.45%	1.0	0.50 PLS lb
<i>Eupatorium maculatum</i>	Joe Pye Weed	0.28%	1.4	0.04 PLS lb
<i>Eupatorium perfoliatum</i>	Boneset	0.21%	1.8	0.03 PLS lb
<i>Helenium autumnale</i>	Sneezeweed	0.34%	2.4	0.05 PLS lb
<i>Mimulus ringens</i>	Monkey Flower	0.08%	8.4	0.01 PLS lb
<i>Pycnanthemum virginianum</i>	Mountain Mint	0.50%	4.8	0.06 PLS lb
<i>Solidago gigantea</i>	Giant Goldenrod	0.17%	1.8	0.02 PLS lb
<i>Solidago graminifolia</i>	Grass-leaved Goldenrod	0.08%	1.3	0.01 PLS lb
<i>Thalictrum dasycarpum</i>	Purple Meadow Rue	0.08%	0.0	0.01 PLS lb
<i>Verbena hastata</i>	Blue Vervain	1.08%	4.4	0.13 PLS lb
<i>Vernonia fasciculata</i>	Common Ironweed	0.25%	0.3	0.03 PLS lb
<i>Veronicastrum virginicum</i>	Culver's Root	0.08%	2.9	0.01 PLS lb
<i>Zizia aurea</i>	Golden Alexanders	2.08%	1.0	0.25 PLS lb
COVER CROP:				
<i>Avena sativa</i>	Oats	58.33%	3.1	7.00 PLS lb

34-271 Wet Meadow South & West

Seeding Rate: 12 lb/Acre (187 Seeds/ft²)

Notes: Wet meadow/Sedge meadow reconstruction for wetland mitigation or ecological restoration projects.

SCIENTIFIC NAME	COMMON NAME	% of Mix	Seeds/ft ²	Rate/Acre
GRASSES:				
<i>Bromus ciliatus</i>	Fringed Brome	9.17%	4.0	1.10 PLS lb
<i>Calamagrostis canadensis</i>	Blue Joint Grass	0.42%	5.1	0.05 PLS lb
<i>Elymus virginicus</i>	Virginia Wild Rye	8.33%	1.5	1.00 PLS lb
<i>Glyceria grandis</i>	Reed Manna Grass	1.25%	3.9	0.15 PLS lb
<i>Glyceria striata</i>	Fowl Manna Grass	0.83%	3.3	0.10 PLS lb
<i>Leersia oryzoides</i>	Rice Cut Grass	2.08%	3.1	0.25 PLS lb
<i>Poa palustris</i>	Fowl Bluegrass	2.92%	16.7	0.35 PLS lb
SEDGES & RUSHES:				
<i>Carex comosa</i>	Bottlebrush Sedge	1.75%	2.3	0.21 PLS lb
<i>Carex scoparia</i>	Pointed-broom Sedge	0.42%	1.5	0.05 PLS lb
<i>Carex stipata</i>	Fox Sedge	1.42%	2.1	0.17 PLS lb
<i>Carex stricta</i>	Tussock Sedge	0.25%	0.6	0.03 PLS lb
<i>Carex vulpinoidea</i>	Brown Fox Sedge	1.17%	5.1	0.14 PLS lb
<i>Juncus tenuis</i>	Path Rush	0.33%	14.7	0.04 PLS lb
<i>Scirpus atrovirens</i>	Green Bulrush	1.50%	30.4	0.18 PLS lb
<i>Scirpus cyperinus</i>	Woolgrass	0.67%	50.0	0.08 PLS lb
FORBS:				
<i>Asclepias incarnata</i>	Swamp Milkweed	2.00%	0.4	0.24 PLS lb
<i>Aster puniceus</i>	Swamp Aster	1.42%	5.0	0.17 PLS lb
<i>Aster simplex</i>	Panicled Aster	0.25%	1.7	0.03 PLS lb
<i>Eupatorium maculatum</i>	Joe Pye Weed	0.17%	0.7	0.02 PLS lb
<i>Eupatorium perfoliatum</i>	Boneset	0.17%	1.2	0.02 PLS lb
<i>Helenium autumnale</i>	Sneezeweed	0.25%	1.4	0.03 PLS lb
<i>Helianthus grosseserratus</i>	Sawtooth Sunflower	0.33%	0.2	0.04 PLS lb
<i>Lobelia siphilitica</i>	Great Blue Lobelia	0.17%	3.7	0.02 PLS lb
<i>Mimulus ringens</i>	Monkey Flower	0.08%	8.4	0.01 PLS lb
<i>Pycnanthemum virginianum</i>	Mountain Mint	0.50%	4.8	0.06 PLS lb
<i>Solidago gigantea</i>	Giant Goldenrod	0.17%	1.8	0.02 PLS lb
<i>Solidago grammifolia</i>	Grass-leaved Goldenrod	0.08%	1.3	0.01 PLS lb
<i>Thalictrum dasycarpum</i>	Purple Meadow Rue	0.08%	0.0	0.01 PLS lb
<i>Verbena hastata</i>	Blue Vervain	1.08%	4.4	0.13 PLS lb
<i>Vernonia fasciculata</i>	Common Ironweed	0.25%	0.3	0.03 PLS lb
<i>Veronicastrum virginicum</i>	Culver's Root	0.08%	2.9	0.01 PLS lb
<i>Zizia aurea</i>	Golden Alexanders	2.08%	1.0	0.25 PLS lb
COVER CROP:				
<i>Avena sativa</i>	Oats	58.33%	3.1	7.00 PLS lb

35-241 Mesic Prairie General

Seeding Rate: 36.5 lb/Acre (70.2 Seeds/ft²)

Notes: General mesic prairie mix for native roadsides,
ecological restoration, or conservation program plantings.

SCIENTIFIC NAME	COMMON NAME	% of Mix	Seeds/ft ²	Rate/Acre
GRASSES:				
<i>Agropyron trachycaulum</i>	Slender Wheatgrass	2.74%	2.5	1.00 PLS lb
<i>Andropogon gerardii</i>	Big Bluestem	5.48%	7.3	2.00 PLS lb
<i>Bouteloua curtipendula</i>	Sideoats Grama	4.38%	3.5	1.60 PLS lb
<i>Bromus kalmii</i>	Prairie Brome	1.37%	1.5	0.50 PLS lb
<i>Elymus canadensis</i>	Canada Wild Rye	3.21%	2.2	1.17 PLS lb
<i>Panicum virgatum</i>	Switchgrass	0.16%	0.3	0.06 PLS lb
<i>Schizachyrium scoparium</i>	Little Bluestem	4.38%	8.8	1.60 PLS lb
<i>Sorghastrum nutans</i>	Indiangrass	5.48%	8.8	2.00 PLS lb
<i>Sporobolus heterolepis</i>	Prairie Dropseed	0.19%	0.4	0.07 PLS lb
FORBS:				
<i>Agastache foeniculum</i>	Anise Hyssop	0.16%	2.0	0.06 PLS lb
<i>Amorpha canescens</i>	Lead Plant	0.16%	0.4	0.06 PLS lb
<i>Asclepias syriaca</i>	Common Milkweed	0.11%	0.1	0.04 PLS lb
<i>Asclepias tuberosa</i>	Butterfly Milkweed	0.11%	0.1	0.04 PLS lb
<i>Aster ericoides</i>	Heath Aster	0.08%	2.2	0.03 PLS lb
<i>Aster laevis</i>	Smooth Blue Aster	0.16%	1.2	0.06 PLS lb
<i>Astragalus canadensis</i>	Canada Milk Vetch	0.16%	0.4	0.06 PLS lb
<i>Dalea candidum</i>	White Prairie Clover	0.16%	0.4	0.06 PLS lb
<i>Dalea purpurea</i>	Purple Prairie Clover	0.52%	1.0	0.19 PLS lb
<i>Desmodium canadense</i>	Showy Tick Trefoil	0.16%	0.1	0.06 PLS lb
<i>Helianthus laetiflorus</i>	Showy Sunflower	0.16%	0.1	0.06 PLS lb
<i>Helioopsis helianthoides</i>	Ox-eye Sunflower	0.36%	0.3	0.13 PLS lb
<i>Liatris aspera</i>	Button Blazingstar	0.08%	0.2	0.03 PLS lb
<i>Liatris pycnostachya</i>	Prairie Blazingstar	0.08%	0.1	0.03 PLS lb
<i>Monarda fistulosa</i>	Wild Bergamot	0.16%	1.5	0.06 PLS lb
<i>Rudbeckia hirta</i>	Black-eyed Susan	0.85%	10.5	0.31 PLS lb
<i>Solidago rigida</i>	Stiff Goldenrod	0.16%	0.9	0.06 PLS lb
<i>Verbena hastata</i>	Blue Vervain	0.11%	1.4	0.04 PLS lb
<i>Verbena stricta</i>	Hoary Vervain	0.16%	0.6	0.06 PLS lb
<i>Zizia aurea</i>	Golden Alexanders	0.16%	0.2	0.06 PLS lb
COVER CROP:				
<i>Avena sativa</i>	Oats	68.49%	11.0	25.00 PLS lb

35-641

Mesic Prairie Southeast

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	<i>Andropogon gerardii</i>	1.01	0.90	7.49%	3.30
side-oats grama	<i>Bouteloua curtipendula</i>	1.54	1.37	11.38%	3.01
nodding wild rye	<i>Elymus canadensis</i>	1.18	1.05	8.77%	2.01
slender wheatgrass	<i>Elymus trachycaulus</i>	1.01	0.90	7.50%	2.28
switchgrass	<i>Panicum virgatum</i>	0.24	0.21	1.78%	1.10
little bluestem	<i>Schizachyrium scoparium</i>	1.42	1.27	10.59%	7.00
Indian grass	<i>Sorghastrum nutans</i>	2.24	2.00	16.68%	8.82
Total Grasses		8.63	7.70	64.19%	27.52
butterfly milkweed	<i>Asclepias tuberosa</i>	0.07	0.06	0.53%	0.10
whorled milkweed	<i>Asclepias verticillata</i>	0.01	0.01	0.10%	0.05
Canada milk vetch	<i>Astragalus canadensis</i>	0.18	0.16	1.33%	1.00
partridge pea	<i>Chamaecrista fasciculata</i>	0.67	0.60	5.00%	0.60
white prairie clover	<i>Dalea candida</i>	0.01	0.01	0.07%	0.06
purple prairie clover	<i>Dalea purpurea</i>	0.10	0.09	0.76%	0.50
Canada tick trefoil	<i>Desmodium canadense</i>	0.17	0.15	1.24%	0.30
ox-eye	<i>Heliopsis helianthoides</i>	0.06	0.05	0.43%	0.12
rough blazing star	<i>Liatris aspera</i>	0.03	0.03	0.21%	0.15
great blazing star	<i>Liatris pycnostachya</i>	0.03	0.03	0.29%	0.14
wild bergamot	<i>Monarda fistulosa</i>	0.01	0.01	0.06%	0.18
stiff goldenrod	<i>Oligoneuron rigidum</i>	0.02	0.02	0.17%	0.31
gray-headed coneflower	<i>Ratibida pinnata</i>	0.02	0.02	0.15%	0.20
black-eyed susan	<i>Rudbeckia hirta</i>	0.06	0.05	0.38%	1.54
heath aster	<i>Symphotrichum ericoides</i>	0.01	0.01	0.05%	0.40
smooth aster	<i>Symphotrichum laeve</i>	0.06	0.05	0.41%	1.00
bracted spiderwort	<i>Tradescantia bracteata</i>	0.04	0.04	0.34%	0.15
blue vervain	<i>Verbena hastata</i>	0.04	0.04	0.37%	1.50
hoary vervain	<i>Verbena stricta</i>	0.11	0.10	0.85%	1.05
golden alexanders	<i>Zizia aurea</i>	0.08	0.07	0.60%	0.29
Total Forbs		1.79	1.60	13.34%	9.64
Oats or winter wheat (see note at beginning of list for recommended dates)		3.03	2.70	22.47%	1.20
Total Cover Crop		3.03	2.70	22.47%	1.20
Totals:		13.45	12.00	100.00%	38.36
Purpose:	Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.				
Planting Area:	Eastern Broadleaf Forest Province excluding Hardwood Hills subsection. Mn/DOT Districts Metro & 6.				

APPENDIX D

RIPRAP INSTALLATION GUIDELINES

The following guidelines supplement **Provision R-12** of the Lakeshore Buffer Zone Alteration Regulations & Standards.

Profile Details: Every buffer zone alteration application and plan that proposes the installation of riprap shall include section details that represent accurate scaled dimensions depicting (i) the actual shoreline (existing land surface contour and edge, lake bottom and current water level), (ii) proposed shoreline regrading, if applicable, (iii) proposed riprap installation (lakeward slope of boulders stating horizontal to vertical ratio and fabric placement), and (iv) berm (soil fill placement) and swale construction. Since the profiles of existing shorelines may vary from site to site, as well as along the subject alignment, more than one typical section detail may be necessary to describe the proposed riprap installation. (Actual elevations are not required). See example Sections below.

Sample Panel: The applicant or engaged contractor shall construct, in place, a ten (10) foot long section of the proposed riprap to serve as a "sample panel" that will demonstrate the dimensions, cross-section, structure, material and general character of the proposed riprap installation. Upon notification, the Architectural Control Committee will inspect the sample panel to verify compliance with the approved plan and profile details, and authorize continuance of the proposed riprap installation.

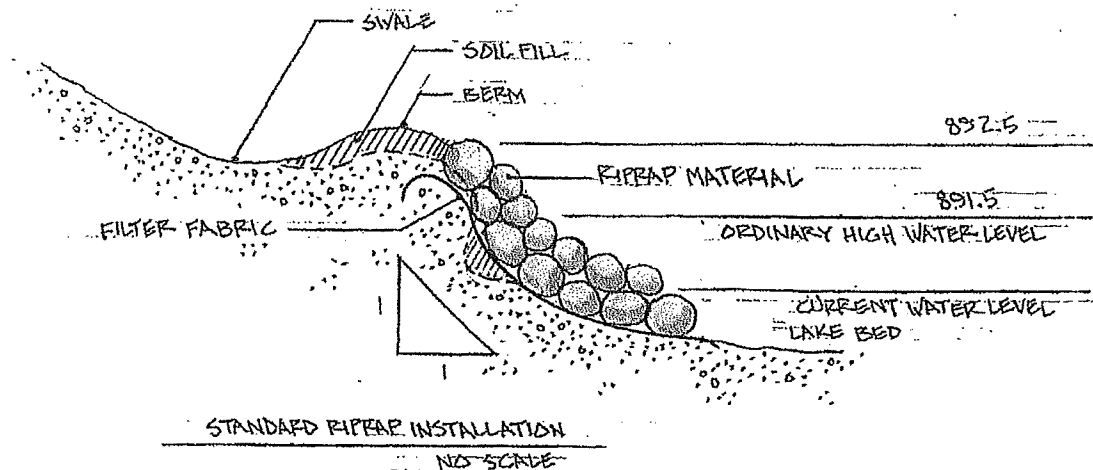
Painted Landward Limit Line: The applicant or engaged contractor shall paint a solid or dashed line on the ground along the full-length of the proposed riprap alignment to delineate the landward limit of riprap installation. The placement of any riprap landward of the existing established brink or upper edge of the shoreline cut will be counted or calculated as part of the 30% area of alteration. **Provision R-10** prescribes that the typical expected riprap installation be placed lakeward of the brink or upper edge of the shoreline. Stakes or other permanent markers shall be placed at the outer limits of the painted line and preserved, until after the "berm/swale" inspection (Inspection No. 2b). The painted line and the markers shall be in-place and ready for review by the Architectural Control Committee at the time of the special inspection of the sample panel.

Work Restrictions: The slope and character of the shoreline shall not be altered nor shall any riprap material be placed along the shoreline except for the riprap sample panel prior to the "special" inspection and approval of the sample panel by the Architectural Control Committee.

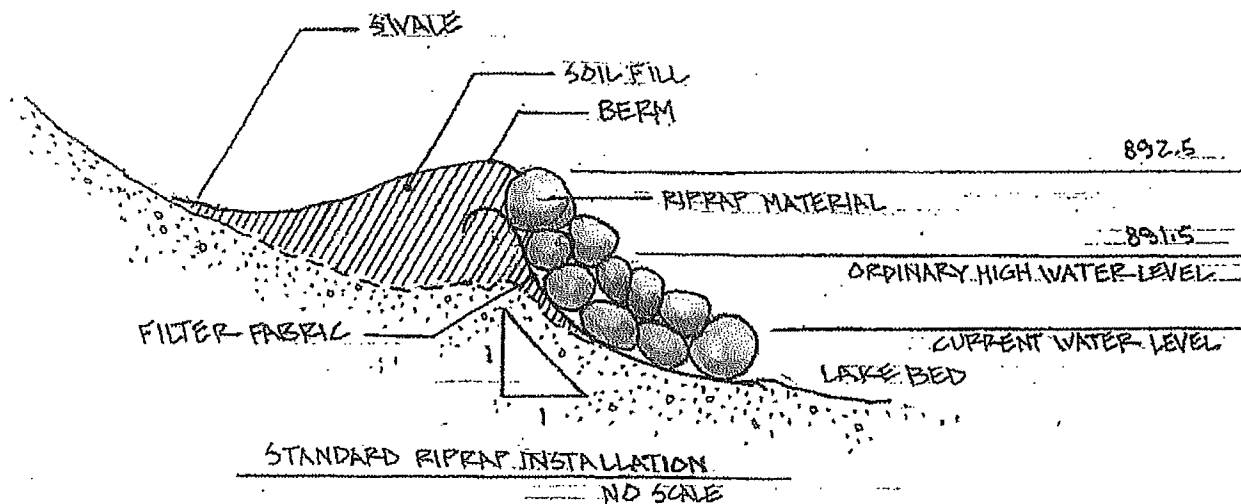
Non-Compliant Installation: Any riprap installation that is non-compliant or deviates from the approved plan, accompanying profile sections and/or the approved riprap sample panel at the time of the final inspection shall be immediately corrected to fulfill the requirements of the approved permit.

Example Sections: The following typical sections are representative examples of installation solutions related to typically encountered shoreline embankment contours:

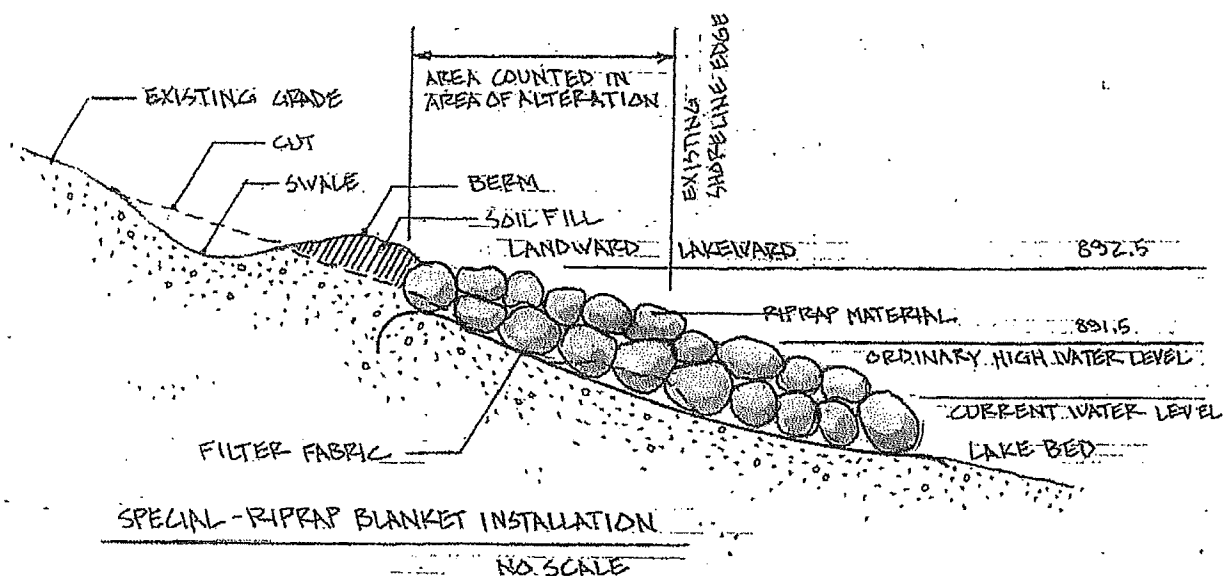
Section No. 1



Section No. 2



Section No. 3



Required Inspections:

- Inspection No. 1 – Silt Fence Installation;
- Special Inspection No. 2a – Sample Riprap Panel and Painted Landward Alignment;
- Inspection No. 2b – Completed Riprap Installation, Completed Berm/Swale Construction; and
- Inspection No. 3 (Final) – Application of Specified Seed Mix and Placement of Biodegradable Netting.

APPENDIX E

NATIVE HERBACEOUS PLANT INSTALLATION GUIDELINES

The following guidelines supplement **Provision R-14** of the Lakeshore Buffer Zone Alteration Regulations & Standards (Native Herbaceous Plant Installation).

The placement of native herbaceous plants (e.g., grasses and forbs) within the Protection Zone (**See R-7**) as part of a buffer zone alteration (**See R-6**) or renovation (**See R-16**) project can be the product of a random arrangement, an organized design, or a combination thereof. The prescribed modular grid pattern (**See R-14**) shall control the overall placement of the proposed plantings. The selection of plant species from the approved regional native plant “pick lists” (**See Appendix C**) is based on the applicant’s personal preferences. The intended result is to establish a diverse mix or composition of plants that, while being resilient and sustainable, will when established fulfill the functions of a lakeshore buffer zone.

The following table prescribes the minimum quantities of plant types (e.g., grasses and forbs) and selected species that will be required to be planted in given example areas:

		TOTAL PLANT TYPE		NUMBER OF SPECIES*		SPECIES % OF PLANT TYPES	
Example Area Sq. Ft.	Total Plants	Grass (29%)	Forb (71%)	Grass	Forb	Grass	Forb
250	111	32	79	2	4	50%	25%
500	222	64	158	3	6	33%	17%
750	333	97	236	4	8	25%	12%
1,000	444	129	315	5	10	20%	10%
1,500	666	193	473	6	12	17%	8%

*Any increase in the “number of species” should be matched by a proportional decrease in the “species percentage of plant types”.

The quantity of plants (e.g., type and species) required for any area measurement between the example areas can be calculated by applying the predetermined factors listed in the table above.

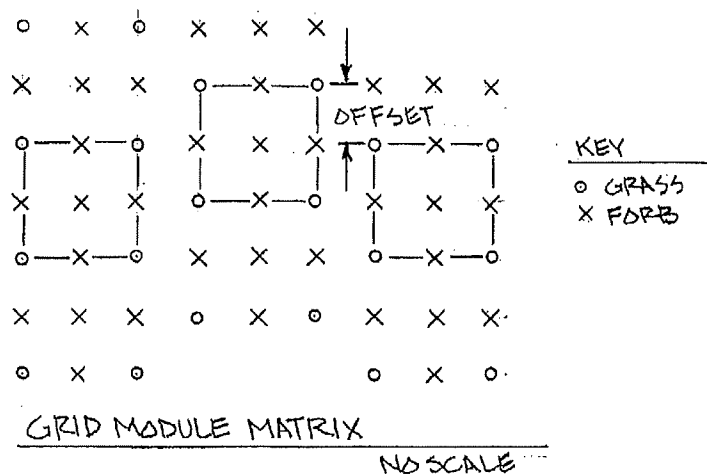
Step One: Number of Plants = (Total Area) / (2.25 Sq. Ft. per plant).

Step Two: Number of Species = Number (quantity) assigned to the preceding given table area.

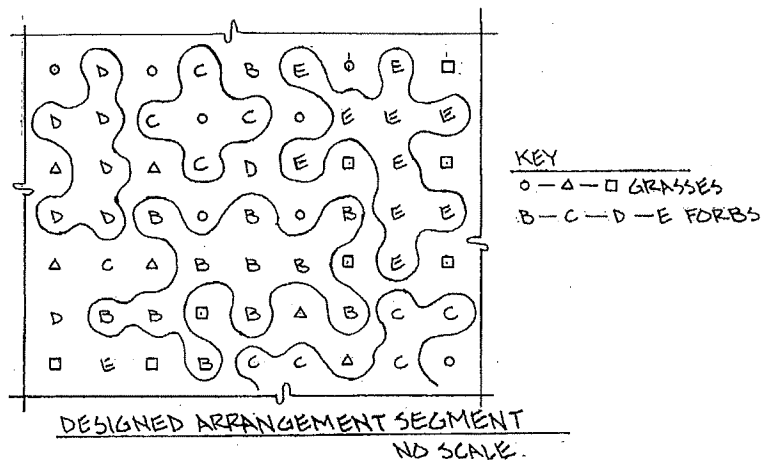
Step Three: Species Percentage of Plant Type = Number (%) assigned to the preceding given table area.

Arrangement Options:

- A. **Random Arrangement of Selected Species:** As the term “random” implies, aside from following the typical grid pattern module with grasses placed at the corners of the module and forbs equidistantly interspersed between the grassy corners, the actual plant species selection (albeit from an approved species list) and placement do not adhere to a predetermined composition arrangement. The established result will resemble the randomness of an area seeded with an approved seed mix (**See Appendix C**).
- B. **Designed Arrangement of Selected Species:** If it is intended that the established planting feature massing or collections of certain plant species that exhibit desired characteristics (e.g., flower color, height, texture), the matrix of connected grid pattern modules can serve as a map to organize the predetermined species placement. During the plan sheet and on-the-ground layout of predetermined species arrangements, each row of connected grid modules should be offset or displaced from the contiguous parallel row by one line to facilitate the intentional species massing’s (See example below).



The diagrammed arrangement plan depicting the collective massing of forb species will resemble the shape of fitted jigsaw puzzle pieces (See example below). Such arrangements can also include solitary species and/or a variety of single species placement.



Note: The Arrangement Example is not a recommendation of any particular placement, positioning or pattern.

- A. Combination of Random and Designed Arrangement of Selected Species: This hybrid arrangement option will produce a predetermined intermixing of scattered or intermittent designed grid modules within a dominant matrix of grid modules composed of random species arrangements.