Watershed Management Plan
January 2020

Pelican River
watershed district

211 Holmes St. W. Suite 201 | Detroit Lakes MN 56501
Pelican River Watershed District
Watershed Management Plan Update
Adopted XXXX XX, 2020

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Dennis Kral, President
Orrin Okeson, Vice President
Janice Haggart, Secretary
Rick Michaelson, Treasurer
Ginny Imholte, Manager
Lowell Deede, Manager
Chris Jasken, Manager

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Rodger Hemphill, Minnesota Department of Natural Resources
Brett Arne, Minnesota Board of Soil and Water Resources
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Wenck File 1311-0024
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### Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS</td>
<td>Aquatic Invasive Species</td>
</tr>
<tr>
<td>BMP</td>
<td>Best Management Practice</td>
</tr>
<tr>
<td>BWSR</td>
<td>Board of Water and Soil Resources</td>
</tr>
<tr>
<td>cfs</td>
<td>Cubic Feet per Second</td>
</tr>
<tr>
<td>Chl-a</td>
<td>Chlorophyll-a</td>
</tr>
<tr>
<td>Board</td>
<td>Pelican River Watershed District Board of Managers</td>
</tr>
<tr>
<td>CIP</td>
<td>Capital Improvement Program</td>
</tr>
<tr>
<td>COLA</td>
<td>Coalition of Lake Associations</td>
</tr>
<tr>
<td>District</td>
<td>Pelican River Watershed District</td>
</tr>
<tr>
<td>ECS</td>
<td>Ecological Classification System</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>IBI</td>
<td>Index of biotic integrity</td>
</tr>
<tr>
<td>lbs/yr</td>
<td>Pounds per Year</td>
</tr>
<tr>
<td>LGU</td>
<td>Local Government Unit</td>
</tr>
<tr>
<td>LWQMA</td>
<td>Lake Water Quality Management Area</td>
</tr>
<tr>
<td>MDA</td>
<td>Minnesota Department of Agriculture</td>
</tr>
<tr>
<td>MDH</td>
<td>Minnesota Department of Health</td>
</tr>
<tr>
<td>MDNR</td>
<td>Minnesota Department of Natural Resources</td>
</tr>
<tr>
<td>MnDOT</td>
<td>Minnesota Department of Transportation</td>
</tr>
<tr>
<td>MPCA</td>
<td>Minnesota Pollution Control Agency</td>
</tr>
<tr>
<td>MS4</td>
<td>Municipal Separate Storm Sewer System</td>
</tr>
<tr>
<td>NFIP</td>
<td>National Flood Insurance Program</td>
</tr>
<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Association</td>
</tr>
<tr>
<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
</tr>
<tr>
<td>NRCS</td>
<td>Natural Resources Conservation Service</td>
</tr>
<tr>
<td>NSFHA</td>
<td>No Special Flood Hazard Area</td>
</tr>
<tr>
<td>NWI</td>
<td>National Wetland Inventory</td>
</tr>
<tr>
<td>NWS</td>
<td>National Weather Service</td>
</tr>
<tr>
<td>ppb</td>
<td>Parts per billion (also known as µg/L)</td>
</tr>
<tr>
<td>Plan</td>
<td>Watershed Management Plan</td>
</tr>
<tr>
<td>PRWD</td>
<td>Pelican River Watershed District</td>
</tr>
<tr>
<td>RWMP</td>
<td>Revised Watershed Management Plan</td>
</tr>
<tr>
<td>SWCD</td>
<td>Soil and Water Conservation District</td>
</tr>
<tr>
<td>SWPPP</td>
<td>Storm Water Pollution Prevention Program</td>
</tr>
<tr>
<td>TMDL</td>
<td>Total Maximum Daily Load</td>
</tr>
<tr>
<td>TP</td>
<td>Total Phosphorus</td>
</tr>
<tr>
<td>TSS</td>
<td>Total Suspended Solids</td>
</tr>
<tr>
<td>µg/L</td>
<td>Micrograms per liter (also known as ppb)</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
</tr>
<tr>
<td>WCA</td>
<td>Wetland Conservation Act</td>
</tr>
<tr>
<td>WLA</td>
<td>Wasteload Allocation</td>
</tr>
<tr>
<td>WMD</td>
<td>Water Management District</td>
</tr>
<tr>
<td>WRAPS</td>
<td>Watershed Restoration and Protection Strategy</td>
</tr>
</tbody>
</table>
Executive Summary

The Pelican River Watershed District (the District) was established by the State of Minnesota, on May 27, 1966 (Minnesota Water Resources Board). It covers approximately 120 square miles in Becker and Otter Tail Counties and includes the upper reaches of the Pelican River, which eventually drains to the Otter Tail and Red Rivers (Figure 1-1). According to the order prescribing the District, its general purposes are:

Conserving/making provident use of waters and other natural resources to:

1. Reduce the pollution of the waters of the Pelican River Chain of Lakes;
2. Slow down the eutrophication of the lakes;
3. Regulate the water levels in the Pelican River Chain of lakes;
4. Enhance their recreational facilities and protect and improve the scenic beauty thereof;
5. Improve the needed drainage;
6. Provide needed soil and water conservation practices on the land; and
7. For other purposes as found in the Minnesota Watershed Act.

The District completed its first Watershed Management Plan in 1967 and a revised Plan in 1994. That Plan was amended in 1997, primarily to incorporate ditch management actions and to establish stormwater management districts and procedures to be used when establishing a future stormwater utility. The District’s rules governing practices that might negatively impact the watershed’s lakes were significantly revised in 2003, and a permitting program was established. An updated Revised Management Plan was adopted in 2005.

The Board of Managers adopted a new Mission Statement in 1994, reaffirming its commitment to protecting and improvement the water resources in the watershed.

MISSION STATEMENT

The mission of the Pelican River Watershed District is to enhance the quality of water in the lakes within its jurisdiction. It is understood that to accomplish this, the District must ensure that wise decisions are made concerning the management of streams, wetlands, lakes, groundwater, and related land resources which affect these lakes.

The Managers and District Staff chose to go forward with this Plan Revision using the Board of Water and Soil Resources (BWSR) One Watershed One Plan approach to watershed planning. This approach brings together various units of government who are all charged with managing various aspects of water planning, to develop a unified understanding of issues so that each of these parties can use their unique strengths, authorities and resources to achieve common goals. This type of approach is intended to streamline planning and implementation, reduce duplication of effort, and increase capacity.
Figure 1-1. Pelican River Watershed District location.
Priority Issues, Goals and Action Items

Managers and staff met with a number of stakeholder advisory groups and individuals over the course of 2017 to better understand the issues affecting the water resources in the watershed and the priority goals they believe are achievable over the planning period, 2020-2029. A comprehensive list of the issues identified can be found in Chapter 2. These issues fall into four categories: water quality (Section 2.1), water quantity (Section 2.2), ecological integrity (Section 2.3) and administration and education (Section 2.4). Because the District does not have the resources to tackle all of these issues in the next ten years, these issues were prioritized. Five issues were eventually chosen as high priority. These high priority issues are listed below. Chapter 3 contains a description of the District’s issue prioritization process and lists of high, medium and low priority issues. For each of these issues, goals, objectives and action items were developed aimed at resolving each issue. A comprehensive list of goals, objectives and action items can be found in Chapter 4. Those that pertain only to high priority issues are listed below. Action items are

Priority Issues

- Water Quality - Lakes
- Water Quality - Wetlands
- Water Quality - Rivers, streams and ditches
- Water Quantity - Lake Levels
- Ecological Integrity - Aquatic Invasive Species

Goals & Objectives

1. Water Quality - Lakes

   **Goal:** Adaptively manage District lakes to protect, enhance and restore lake water quality and recreational utility as appropriate to each lake.

   **Objective A.** Reduce excess nutrient and sediment loading to lakes through best management practices, capital improvement projects and regulatory controls.

   **Objective B.** Reduce rate and volume of stormwater runoff entering lakes to help meet water quality loading goals.

   **Objective C.** Reduce internal phosphorus loading (from bottom sediments) to lakes.

   **Objective D.** Monitor and reduce chloride loading to lakes.

   **Objective E.** Reduce and assess loading of pharmaceuticals and personal care products to wastewater.

   **Objective F.** Protect the public from mercury exposure due to mercury-impaired lakes.
Objective G. Acquire data necessary to better understand water quality trends and threats in order to most effectively implement water quality improvement practices.

See action items associated with each of these objectives in Section 4.1.1 (and summarized in Table 4-2).

2. Water Quality - Wetlands

**Goal:** Protect, enhance and restore wetland water quality and function.

**Objective A.** Inventory wetland water quality and function.

**Objective B.** Restore hydrology of altered wetlands and surrounding areas that are contributing excess nutrients to downstream waters.

**Objective C.** Protect high quality wetlands.

**Objective D.** Help implement requirements for wetland management.

See action items associated with each of these objectives in Section 4.1.2 (and summarized in Table 4-3).

3. Water Quality - Rivers, streams and ditches

**Goal:** Protect, enhance and restore rivers, tributary streams and other waterways, such as ditches.

**Objective A.** Monitor streams for water quality and other indicators of ecosystem health.

**Objective B.** Inventory water quality and function of public drainage systems in the District in accordance with Minnesota State Statute 103E.

**Objective C.** Restore stream water quality and stream ecosystem health.

**Objective D.** Protect high quality stream reaches.

See action items associated with each of these objectives in Section 4.1.3 (and summarized in Table 4-4).

4. Water Quantity - Lake Levels

**Goal:** Promote shoreline resilience to fluctuations in water levels of lakes, streams and drainage systems.

**Objective A.** Monitor lake, stream and drainage system water levels.

**Objective B.** Promote shoreline that is resilient under fluctuating water levels through shoreline rehabilitation.
See action items associated with each of these objectives in Section 4.2.1 (and summarized in Table 4-6).

5. Ecological Integrity - Aquatic Invasive Species

**Goal**: Prevent establishment of new invasive species and manage invasive species that already exist in the watershed.

**Objective A**: Manage priority invasive species using the best available methods and technology.

**Objective B**: Monitor for new invasive species.

**Objective C**: Stay current with new management strategies and aquatic invasive species research.

See action items associated with each of these objectives in Section 4.3.1 (and summarized in Table 4-9).

**Implementation Programs**

The District has many overarching programs that are used to implement the actions identified in Chapter 4. Chapter 5 lays out these overarching programs. Section 5.1 describes how the District operates, such as the how the District handles advisory committees, funding, and Revised Watershed Management Plan (RWMP) updates. Section 5.2 describes the District’s ongoing programs, such as the regulation and enforcement program, the monitoring program, and the capital improvement project program. These overarching, ongoing programs are critical to accomplishing the District’s planned action items and ultimately achieving the District’s goals.
1.0 Introduction

This Revised Watershed Management Plan (RWMP) describes how the Pelican River Watershed District will manage water resources activities in the watershed from 2020 to 2029.

1.1 DISTRICT PURPOSE AND MISSION

The Pelican River Watershed District is a special unit of government organized under Minnesota Statutes 103D to manage water resources in the watershed. It covers approximately 120 square miles in Becker and Otter Tail Counties and includes the upper reaches of the Pelican River which eventually drains to the Otter Tail and Red Rivers (Figure 1-2; Appendix A). According to the order prescribing the District, its general purposes are conserving and making provident use of waters and other natural resources to:

1. Reduce the pollution of the waters of the Pelican River Chain of lakes;
2. Slow down the eutrophication of the lakes;
3. Regulate the water levels in the Pelican River Chain of lakes;
4. Enhance their recreational facilities and protect and improve the scenic beauty thereof;
5. Improve the needed drainage;
6. Provide needed soil and water conservation practices on the land; and
7. For other purposes as found in the Minnesota Watershed Act.

The Board of Managers adopted a new Mission Statement in 1994, and in this Plan reaffirms its commitment to protecting and improvement the water resources in the watershed.

MISSION STATEMENT

The mission of the Pelican River Watershed District is to enhance the quality of water in the lakes within its jurisdiction. It is understood that to accomplish this, the District must ensure that wise decisions are made concerning the management of streams, wetlands, lakes, groundwater, and related land resources which affect these lakes.

1.2 BOARD OF MANAGERS

The Pelican River Watershed District is led by a seven-person Board of Managers that guides the implementation of goals and objectives set forth in PRWD Watershed Management Plan. Board Managers are appointed by the Becker County Board of Commissioners and serve a three-year term. Table 1-1 lists the PRWD’s Board of Managers as of February of 2019.
Table 1-1. 2019 PRWD Board of Managers.

<table>
<thead>
<tr>
<th>Name</th>
<th>Seat</th>
<th>Term Expires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dennis Kral</td>
<td>President</td>
<td>May 2022</td>
</tr>
<tr>
<td>Orrin Okeson</td>
<td>Vice President</td>
<td>May 2021</td>
</tr>
<tr>
<td>Janice Haggart</td>
<td>Secretary</td>
<td>May 2022</td>
</tr>
<tr>
<td>Rick Michaelson</td>
<td>Treasurer</td>
<td>May 2022</td>
</tr>
<tr>
<td>Ginny Imholte</td>
<td>Manager</td>
<td>May 2020</td>
</tr>
<tr>
<td>Lowell Deede</td>
<td>Manager</td>
<td>May 2021</td>
</tr>
<tr>
<td>Chris Jasken</td>
<td>Manager</td>
<td>May 2020</td>
</tr>
</tbody>
</table>

1.3 HISTORY OF THE DISTRICT AND WATERSHED PLANNING

The Pelican River Watershed District (PRWD) was established by the State of Minnesota, May 27, 1966 (Minnesota Water Resources Board). The District completed its first Watershed Management Plan in 1967 and a revised Plan in 1994. The 1994 Plan was amended in 1997, primarily to incorporate ditch management actions and to establish stormwater management districts and procedures to be used when establishing a future stormwater utility. The District’s rule, which govern practices that might negatively impact water resources in the District, were significantly revised in 2003, and a permitting program was established. An updated Revised Management Plan was adopted in 2005.

The District has conducted numerous assessments such as diagnostic studies and feasibility studies to develop and prioritize capital improvement projects and programs that protect or restore the health of the lakes, streams, wetlands, and groundwater. Through these assessments, the District has employed an adaptive management approach. Adaptive management recognizes that protecting and restoring water resources is rarely a linear endeavor where one can develop a plan, implement the plan, and come to the predicted result without any changes along the way (i.e., incorporating what is learned into ongoing or future management decisions). Adaptive management requires the following steps:

1. Data collection
2. Interpretation
3. Solution identification
4. Implementation
5. Return to step 1 to adjust the plan based on evaluations of results

1.4 PLAN APPROACH AND LAYOUT

The Managers and District Staff chose to go forward with this Plan Revision using the Board of Water and Soil Resources (BWSR) One Watershed One Plan approach to watershed planning. This approach brings together various units of government who are charged with managing various aspects of water planning, to develop a unified understanding of issues so that each of these parties can use their unique strengths, authorities and resources to achieve common goals. This type of approach is intended to streamline planning and implementation, reduce duplication of effort, and increase capacity. The Managers also agreed that this Plan should build on the District’s 2005 RWMP, including its existing goals and programs, and the two-tiered approach where actions may have 1) District-wide benefits and consequences such as education, monitoring, rules/regulation, septic system management, lake management, and drainage system management and 2) a second-tier of actions which are targeted for the Lake Water Quality Management Areas, or LWQMA's.
(Floyd-Campbell, Detroit-Rice, Sallie-Melissa, Long, Pearl-Loon, Brandy, Munson-Fox, Small Lakes), and individual lake plans.

The main body of this Plan details watershed issues and concerns raised during the planning process by various stakeholders, including the Board of Managers, staff, staff from the local units of government having land in the watershed, other local, regional, and state agencies, and the general public. An extensive process was completed to prioritize not only the order in which those concerns should be addressed but also the types of actions that should be considered and the resources to be dedicated to each. This planning process also included establishing measurable goals achievable within the ten-year period of this Plan and developing a ten-year Implementation Plan and Schedule to achieve these goals.

Five Appendices are attached to this Plan. Appendix A is a Land and Water Resource Inventory that reviews the current conditions of lands and waters in the watershed. Appendix B summarizes current data and sets forth individualized plans for many of the lakes in the watershed. Appendix C contains letters in which the District solicits input for the RWMP and in which plan partners provide input. Appendix D contains the District’s Water Management Rules. Appendix E contains project LMP-01, AIS management plan.
Figure 1-1. Lake Water Quality Management Areas in the District.
2.0 Issue Identification

This chapter summarizes the issues and concerns raised during the planning process by various stakeholders, including the Board of Managers, staff, staff from the local units of government having land in the watershed, other local, regional, and state agencies, and the general public. Issues are broken into four major categories: (1) water quality, (2) water quantity, (3) ecological integrity and (4) administration and education. Within each of these four categories, there are several topics. For example, under the Water Quantity (Section 2.2), the topics discussed are lake levels (Section 2.2.2), flooding (Section 2.2.2) and groundwater (Section 2.2.3). For each topic, background about the topic is given, issues are identified, and finally, “drivers” or the problems causing the issues are discussed.

2.1 WATER QUALITY

Water quality issues are identified and discussed below for each type of water body in the District: lakes, wetlands, rivers, and groundwater. The primary issues facing surface waters in the District (i.e., lakes, wetlands, rivers) are high phosphorus and suspended solids levels, but mercury, dissolved oxygen, chloride, pharmaceuticals personal care products, and E. coli bacteria can also pose problems for surface waters. The primary issue in groundwater is arsenic, which is naturally high in some areas of District groundwater. Other areas of District groundwater are susceptible to pollution by man-made hazardous substances.

Many water quality issues are driven by changes in the use of land. Land use changes associated with development and agriculture tend to increase stormwater volume and runoff rates and the pollutant loads carried by this stormwater. In addition, there is a lack of public knowledge about the District’s water quality issues and what drives these issues. Many property owners and agricultural producers are not aware that simple changes to how they manage their land can have a direct impact on the District’s water quality. Predicted changes to climate may also exacerbate the District’s water quality issues. The sections below explain the District’s water quality issues and their drivers in more depth, as they relate to each type of water body.

2.1.1 Lakes

Background: Lakes are numerous in the watershed, and many have high recreational benefit. Of the 144 basins in the District the District’s primary focus is on 18 basins in the watershed. Specific water quality information for each of these lakes is included in Appendix B. For management purposes, the District is divided into eight Lake Water Quality Management Areas (LWQMAs). These include the Floyd-Campbell, Detroit-Rice, Sallie-Melissa, Brandy, Fox-Munson, Pearl-Loon, Long and Small Lakes LWQMAs (Figure 5-1 to Figure 5-9).

Issues: Several lakes have elevated levels of phosphorus. Excess phosphorus inhibits recreation by causing nuisance algal blooms. It can also harm fish and other organisms because decomposition of large algal blooms causes hypoxia in the water. St. Clair and Wine Lakes are listed as impaired by the MPCA due to excess phosphorus. A 2014 TMDL has been written for
Lake St. Clair, and according to BWSR, a WRAPs report for Otter Tail River Watershed should be finished by 2020. Several lakes are also at risk of becoming impaired due to excess phosphorus. Especially at risk are North Floyd, Muskrat, Brandy and Sallie Lakes. Melissa, Detroit, Curfman, Munson, Fox, Pearl, Johnson, Reeves and Little Floyd Lakes are moderately at risk. Other lakes, such as Floyd, Long and Meadow Lakes do not have excess phosphorus, but need protection.

Mercury, suspended solids and several contaminants of emerging concern also impact water quality in the District. Several lakes are listed as impaired for mercury, including Detroit, Sallie, Melissa, Floyd, Little Floyd, Mud and Muskrat Lakes. Other lakes in the District would most likely be listed if they had been tested for mercury levels. Total suspended solid loads are high in some areas of the District, especially in the Floyd-Campbell LWQMA and near the City of Detroit Lakes. Finally, rising levels of chloride, pharmaceuticals, personal care products and \textit{E. coli} bacteria may be emerging issues, and levels should be monitored.

Increasing public knowledge about water quality issues is necessary in the District. Many property owners are not aware that their stormwater drainage systems, septic systems, and use of products such as fertilizers, sand, salt, pharmaceuticals and cosmetics can have a direct impact on water quality of nearby lakes. Increasing the engagement of landowners and operators in the District is also necessary to curb water quality impacts from agriculture.

**Drivers:**

Internal and external loads drive elevated phosphorus levels in the District’s lakes. External loads come primarily from stormwater runoff, which carries phosphorus from fertilizers, pet and wildlife waste, leaking sanitary and septic systems, sediment, dead leaves and grass, and other phosphorus-containing material. Stormwater runoff has increased in volume and phosphorus content in recent decades due to increases in impervious surface, increases in stormwater conveyance capacity, removal of perennial and woody vegetation, and hydrologic alterations to streams and wetlands. Streambank erosion upstream of lakes can also influence particulate phosphorus concentrations. For example, parts of Campbell Creek experience substantial bank erosion, contributing sediment to Floyd and Little Floyd Lakes downstream. Internal loading, or the process of lake sediment contributing phosphorus to the water column, also contributes to elevated phosphorus concentrations in some lakes. In Lake St. Clair, for example, a large pool of phosphorus exists in the sediment because the City of Detroit Lakes’ wastewater treatment plant has discharged effluent into the lake since the early 1900s. In 1998, Lake St. Clair’s sediment was treated with alum, which binds phosphorus and prevents it from entering the water, but the alum’s binding capacity has likely become saturated.

Drivers of other water quality issues are diverse. Mercury comes from atmospheric deposition, which is ultimately a result of emissions from coal-burning power plants. Suspended solids come from stream bank erosion, as in parts of Campbell Creek, and from stormwater runoff, which carries sediment from roads, other impervious surfaces, improperly
managed construction sites and agricultural fields. Chloride comes partly from road salt, which is applied in winter to melt snow and ice, and also from residential water softening systems. Pharmaceuticals and personal care products enter natural waters in wastewater effluent due to excretion of pharmaceuticals and disposal of both pharmaceuticals and personal care products into sanitary sewer systems.

Climate change may exacerbate some of the existing water quality issues in District lakes. For example, if winters become shorter, ice-off periods will become longer, increasing lake stratification and the potential for bottom anoxia and subsequent internal phosphorus loading. Climate change may also increase the frequency and intensity of storms, increasing volume of stormwater runoff and the pollutant loads carried by runoff to lakes.

2.1.2 Wetlands

**Background**: There are numerous wetlands scattered throughout the watershed, totaling approximately 12,000 acres. Two large wetland complexes exist—one north of the City of Detroit Lakes, which includes the Rice Lake Wetland, and one on Ditch 14, which surrounds much of St. Clair Lake. Nearly one third of all wetlands in the District have been drained, and a number of additional wetlands have been ditched or altered in some other way.

**Issues**: Historical alteration of wetlands and their surrounding areas has impacted wetland function. Although wetlands are traditionally thought of as sinks for phosphorus—because they slow down water and allow particulate phosphorus to settle—several wetlands in the District have become sources of phosphorus. For example, as the Pelican River runs through the Rice Lake Wetland, the water’s dissolved phosphorus levels sometimes double. The wetland fringes of St. Clair Lake, which were created by substantial drainage of the lake, may also export phosphorus. Moreover, wetland water quality continues to be altered by external stormwater inputs containing elevated nutrient and sediment loads.

Not all wetlands in the watershed are sources of phosphorus. The District owns high quality wetlands north of Little Floyd Lake and south of Melissa Lake. These wetlands and other riparian wetlands like them need monitoring and protection. At this point, water quality of many wetlands in the watershed has not been monitored, nor have wetlands been systematically inventoried or assessed for restoration or protection.

As mentioned in section 2.1.1, it is necessary to increase public knowledge about water quality issues so that the use of land by property owners and agricultural producers minimally impacts wetland water quality.

**Drivers**: Stormwater runoff carries phosphorus and other pollutants to wetlands. Riparian buffers could help protect wetlands from runoff, but several wetlands in the District lack buffers. Ditching, drainage or other
alterations have also impacted the biogeochemical functioning of wetlands in the watershed, turning wetlands from phosphorus sinks to phosphorus sources.

Climate change may exacerbate these issues. For example, if wetland temperatures increase, this may cause microbial activity in the sediment to increase, which would make wetlands even larger sources of phosphorus. In addition, climate change may cause storms to increase in frequency and intensity, causing more stormwater runoff to carry more pollutants to wetlands.

2.1.3 Rivers, tributary streams, ditches, and legal drainage systems

**Background:** There are approximately 60 miles of river, tributary streams, and public and private ditches in the watershed. The primary water channels in the District are Campbell Creek (including Ditch 11 and Ditch 12), the Pelican River (including Ditch 13), Ditch 14 and Sucker Creek. These streams connect district lakes, which means they can convey excess phosphorus or other pollutants from upstream to downstream lakes. There are about 18 stream monitoring locations throughout the District, which have been operated since 1995.

**Issues:** Water quality in the watershed’s streams is generally good, although some streams have elevated total suspended solids and phosphorus concentrations. For example, Campbell Creek has elevated total suspended solids and phosphorus, which it conveys downstream to Floyd and Little Floyd Lakes. In 2010-2013, the District installed terrace tiling and buffers in agricultural areas surrounding Campbell Creek to reduce sediment loads in agricultural runoff. These practices helped reduce sediment loads, but suspended solids and phosphorus remain elevated in Campbell Creek due to other drivers such as bank erosion (see below). In addition, dissolved phosphorus concentrations increase in the Pelican River as it runs through Rice Lake Wetland and the City of Detroit Lakes, and in Ditch 14 as it runs through the St. Clair Lake wetland complex to the Pelican River, just upstream of Lake Sallie.

Some streams, such as Sucker Creek, have excellent water quality and should be protected. Sucker Creek, which flows into Big Detroit Lake, is a designated trout stream, so dissolved oxygen must remain at healthy levels. Dissolved oxygen has been monitored in many streams in the watershed, and although concentrations decrease in the summer, they have not neared impaired levels.

Alterations to natural stream hydrology in the district affect the overall health of the stream. Anthropogenic alterations in the district alter the natural flow and function of streams. These alterations can increase stream velocities and erosion to subsequent reaches.

As mentioned in section 2.1.1, it is necessary to increase public knowledge about water quality issues so that the use of land by property
owners and agricultural producers minimally impacts the water quality of rivers, streams, ditches and outfalls.

**Drivers:** There are several drivers of high suspended solids and phosphorus. One driver is stream bank erosion. This is the case in Campbell Creek, which explains why addressing agricultural runoff with terrace tiling and buffers was not enough to restore the Creek's water quality. Stream bank erosion is considerable in the reaches between 230th Street and North Floyd Lake. This part of Campbell Creek is not ditched, but it drops about 40 feet in elevation in one mile of reach, causing fast currents and consequent stream bank erosion. Increased discharge due to recently installed upstream tiling could also be contributing to bank erosion, and this potential driver is being assessed.

Also driving high suspended solids and phosphorus loads is stormwater runoff from urban and agricultural areas. This is discussed in more depth in section 2.1.1, but stormwater runoff carries dissolved as well as particulate phosphorus, which is another reason reducing sediment loads in runoff did not adequately curb phosphorus loads to Campbell Creek. Wetlands, depending on their hydrology and history of external phosphorus inputs, can also cause elevated dissolved phosphorus in streams that travel through them. This is the case in the Pelican River (Ditch 13) as it runs through Rice Lake Wetland, and in Ditch 14 as it runs through wetlands surrounding St. Clair Lake.

Several of the watershed’s streams have also been straightened, widened, or relocated to accommodate land use change. Dams and culverts have also modified streams, causing issues with connectivity and stream velocity. Dams create barriers for fish passage up the stream as well as increasing velocity in the tailrace of the dam. Dams can also capture sediments in their reservoirs starving downstream communities of necessary sediments driving geomorphological processes. Culverts create “bottlenecks” on streams, increasing stream velocities and impeding passage of some fish species. These alterations can increase stream bank and channel erosion and degrade habitat quality and stream function. Degraded water quality can also be observed from these alterations, including decreased dissolved oxygen and increased phosphorous loading from sediment.

Climate change could exacerbate some of the above issues. For example, increased frequency and intensity of storms could increase stream flow and consequent stream bank erosion. It could also increase stormwater runoff volumes and pollutant loads carried to streams.

**2.1.4 Groundwater**

**Background:** All residents in the District obtain their drinking water from the ground, so quality of groundwater in the watershed is critical for public health. The City of Detroit Lakes supplies drinking water through four public wells, which have associated Wellhead Protection Plans. Outside the city limits of Detroit Lakes, rural properties are served by private wells. Groundwater.
discharge also supports the base flow and water levels of several streams, lakes and wetlands in the watershed, so groundwater pollution has the potential to affect surface water quality.

**Issues:**
Groundwater quality in the District is generally good. The wells used by the City of Detroit Lakes meet current MDH standards for construction and maintenance. The wells are located in a glacial drift aquifer covered by layers of fine-grained materials, which protect groundwater from potential sources of contamination. Arsenic levels are above standards in some of the watershed’s groundwater, particularly in the Long Lake LWQMA. Some areas such as the Pelican River Sand Plains are also more susceptible to groundwater pollution due to high soil permeability, so preventing pollution in these areas is important. Sealing abandoned wells continues to be a priority.

As mentioned in section 2.1.1, it is necessary to increase public knowledge about water quality issues. Perhaps even more so than with surface water, there is lack of public awareness regarding the connectivity between surface pollutants and groundwater quality. Education is necessary to inform the public that groundwater can be easily contaminated if soil or wells are used for the disposal of hazardous waste.

**Drivers:**
Arsenic in the groundwater comes from natural sources (i.e. soil and rock). Other contamination could come from improperly installed or maintained septic systems, and releases of hazardous materials.

### 2.2 WATER QUANTITY

Water quantity issues are identified below and are discussed based on where water quantity is an issue: in lakes, on land or in the ground. In lakes, water level fluctuation is the issue, both too much or too little water is a problem. On land, issues are about too much water, i.e. flooding. In the ground, issues are usually a matter of too little water. Neither lake level fluctuation, flooding nor groundwater depletion is a serious concern at this time in the District. However, climate change may increase the risk of water quantity issues by increasing the frequency and intensity of storms and/or drought.

A lack of attention to the quantity of water resources could also cause issues. Lake communities should build resilience around fluctuating lake levels. Areas that provide floodwater storage should also be preserved, and infrastructure such as bridges and culverts should be maintained. Finally, attention should be paid to using groundwater sustainably, so that withdrawal rates do not exceed recharge rates. The sections below explain the District’s water quantity issues and their drivers in more depth, as they relate to lake levels, flooding, and groundwater quantity.

#### 2.2.1 Lake Levels

**Background:** Many District residents live around and recreate in the District’s lakes, and it is important to residents that water levels of these lakes are maintained within normal ranges.
Issues: The normal water level of some lakes has fluctuated in recent years, especially affecting residents and boaters on Lakes Little Floyd, Detroit, Sallie and Melissa. High water levels can exacerbate bank erosion issues from wave action to sensitive areas of the bank in the summer and stress from ice-jacking to these areas in the winter. In addition to increased bank erosion, flooding to typically dry areas is made more likely by high water levels. Low water levels can interfere with recreation, making it difficult to launch boats by causing docks to sit out of water. Low water levels also cause aquatic plant die-offs, which are detrimental to the aesthetics of the shoreline and come with strong odors. Aquatic plant die-offs also reduce areas that serve as fish habitat and spawning areas.

Drivers: High lake water levels are driven by high precipitation. Low water levels are driven by drought, or in some cases surface- or ground-water withdrawal. Climate change may increase the frequency and intensity of precipitation events and/or drought.

2.2.2 Flooding

Background: Historically the District has not had problems with flooding. Becker County participates in the National Flood Insurance Program (NFIP). However, the entire unincorporated area is identified as No Special Flood Hazard Area (NSFHA). The City of Detroit Lakes also participates in the NFIP, and the City is mapped with corresponding flood boundaries.

Issues: Although flooding is generally not an issue in the District, localized road flooding has been observed due to storm sewer capacity issues, most notably at the crossing of Anchor Road over the Pelican River, at the intersection of Washington and Willow Avenues and at the intersection of Washington Avenue and West Lake Drive. The region may experience increased frequency and intensity of storms with climate change, which could cause more serious flooding in the District. Further, in recent decades, the District has lost flood storage capacity to development in floodplain and wetlands, which also increases the chance of larger flood events. Floodplain maps for the District are based on historic precipitation data and topography, and must be updated, so that remaining floodplain can be protected from development.

Stormwater conveyance capacity must also be evaluated, especially for sewers serving the District’s arterial roads. Most stormwater systems were sized on precipitation models developed in the 1960s, but new precipitation models have been developed (e.g., NOAA Atlas 14) that predict an increased frequency and intensity of storms. This could result in stormwater capacity issues. Bridges, culverts, and other water-related infrastructure in the District are in good condition, so if they have enough capacity, they should continue to be properly maintained.

Drivers: Climate change may drive increased frequency and intensity of storms, which in turn will increase the risk of flooding. Poorly sized or maintained infrastructure could also drive flooding issues.
2.2.3 Groundwater

**Background:** Groundwater is the source of drinking water for District residents and is obtained through municipal or private wells. Groundwater also maintains the water levels of many lakes and streams.

**Issues:** Groundwater capacity in the District is not a concern at this time. However, in the long term, the District’s water use may not be sustainable if there is greater withdrawal than recharge (i.e., aquifer draw-down) or if groundwater becomes contaminated. Groundwater withdrawal from the Pelican River sandplain aquifer is predicted to be between 1.5 and 1.9 billion gallons per year by 2030, according to a 2007 USGS report. There is a lack of public awareness about the potential unsustainability of current groundwater withdrawal practices, and more education is necessary to encourage water conservation practices. In addition, further examination of groundwater use in certain areas may be helpful. For example, groundwater pumping for gravel mining in the Pearl-Loon, Sallie-Melissa and Long LWQMAs may have the potential to affect water levels of certain lakes, especially Pearl and Long Lakes.

**Drivers:** Groundwater withdrawal has increased recently due to increased population, industry, and agricultural groundwater irrigation practices. For example, gravel mining in the Pearl-Loon LWQMA uses large quantities of groundwater, as does agricultural irrigation, which is common in the Small Lakes LWQMA, which is in the south part of the District. At the same time that groundwater withdrawal has increased, groundwater recharge is at risk of decreasing due to increased impervious ground cover, which prevents infiltration of stormwater. Climate change may also decrease groundwater recharge if it brings drought to the District.

2.3 ECOLOGICAL INTEGRITY

Ecological integrity in the District is generally good but changing land and water use have created several issues regarding invasive species, wildlife habitat, and fish communities. First, several aquatic invasive species have been detected in the District and spread of these species must be managed. Second, wildlife habitat has been lost, degraded and fragmented, primarily as a result of shoreline development, hydrologic alteration of streams and wetlands, impairments to water quality and quantity, and recreational boating. Third, fish communities in the District are healthy, but must continue to be protected and enhanced.

Climate change also threatens the ecological integrity of the District in a number of ways, so it is necessary to promote climate change resilience in the District’s aquatic ecosystems. Public awareness of the District’s ecological issues is also critical. The sections below explain the District’s issues of ecological integrity as they relate to invasive species, wildlife habitat and fish communities.

2.3.1 Invasive Species

**Background:** Invasive species are species not endemic to the ecosystems in the District. Invasive species often displace native species that are more desirable for water quality, habitat, or recreation.
**Issues:** Several invasive species have been detected and managed in the District, including Zebra mussels, Curly-leaf pondweed, Flowering rush and Chinese mystery snails. Appendix B contains aquatic invasive species information for each of the District’s main lakes. The District has spent over a decade managing Flowering rush in the District. Management of flowering rush has involved the input from District, the City of Detroit Lakes, and the MDNR. However, eradication may not be possible and continued management is necessary. Zebra mussels and Curly-leaf pondweed management is also necessary.

District waters are also at risk of becoming infested with new invasive species. Species of particular concern include Eurasian watermilfoil, Starry stonewort, Hydrilla, Quagga mussels, Spiny waterfleas, Rusty crayfish, Red swamp shrimp and several species of carp.

**Drivers:** Dispersal is the primary driver of aquatic invasive species infestations in the District. This can occur through human-facilitated dispersal, such as the transport of a watercraft from one lake to another without removing attached aquatic invasive species and draining water, or the transport of other water-related equipment without cleaning and draining water. Public awareness of these dispersal mechanisms is critical for controlling the spread of invasive species and must be increased. Dispersal can also occur through connectivity. For instance, if a stream connects two lakes, aquatic invasive species could move through the stream from one lake to the other.

Climate change may also in part drive invasive species infestations by creating conditions that are advantageous to invasive species and/or disadvantageous to native species. For example, longer periods of open water on lakes (i.e., no ice) and decreased snowfall can increase density of Curly-leaf pondweed.

### 2.3.2 Wildlife Habitat

**Background:** The Ecological Classification System (ECS) developed by the MDNR states most of the District is located in the Eastern Broadleaf Forest Province, Hardwood Hills Subsection, with a small part in the Prairie Parkland Province, Red River Prairie Subsection. Many species of wildlife in this area rely on the District’s lakes, streams and wetlands for habitat, including fish, amphibians, reptiles, waterfowl, other water birds, and aquatic furbearers. The District contains private wildlife lands as well as the MDNR’s Frank and Becker State Wildlife Management Areas, which are located north of the City of Detroit Lakes. Appendix A contains more information on wildlife habitat and species listed on the Minnesota Species of Greatest Conservation Need (SGCN) list in the District.

**Issues:** The District contains important wildlife habitat that should be restored, enhanced and protected. In recent decades, as the District has become more developed, habitat has been lost, degraded and fragmented, especially on shorelines. Fragmentation of the landscape makes it difficult
for wildlife species to find new habitat, and more riparian corridors are necessary to allow species to move between habitat patches.

Shallow lakes in the watershed provide some of the most important habitat, and the MDNR has designated several lakes as “priority shallow lakes” for protection and enhancement of wildlife habitat. This includes Schultz, Abbey, Oak, Rice (Main Basin), Rice (Southeast Bay), Brandy and Unnamed Lake #3028400.

Drivers: Several factors drive the loss, degradation and fragmentation of habitat, including development in areas that previously provided habitat, hydrologic alteration of streams and wetlands to accommodate development, and water quality and quantity impairments that may affect aquatic habitat. Further, climate change may exacerbate some of these factors. Habitat can also be disturbed by recreational boating, such as waterfowl habitat on Floyd Lake.

2.3.3 Fish Communities

Background: Many species of fish occupy the District’s lakes, streams and wetlands, including sport fish such as walleye, bass, pike, panfish, lake sturgeon, tullibee, bullhead, bowfin, rock bass, sucker, and muskellunge and numerous non-game species. The MDNR stocks lake sturgeon on Detroit Lake and walleye on Floyd, Little Floyd, Sallie, Melissa, Pearl, Munson, and Detroit Lakes.

Issues: The District has several excellent fish communities that should be protected. Excessive anthropogenically driven declines in species populations disrupt ecosystem dynamics and could affect the recreational fishing industry, a key component of the District’s regional economy.

To protect fish communities, fish habitat and spawning areas should be protected. The Rice Lake Wetland, wetland fringes to the west of Long Lake as well as other beds of submergent and emergent vegetation throughout the district provide excellent habitat and spawning areas. The watershed has excellent connectivity, which allows fish to migrate when necessary and find appropriate spawning areas. In fact, culverts were installed under Highway 10 in about 2005, and boulders placed in these culverts have become a walleye spawning area. Notable impairments to fish habitat connectivity are dams on Mill Pond and Little Floyd Lake. These dams may prevent carp from entering new lakes, however they also prevent passage of desirable native species. In addition to connectivity, water quality and ecological integrity of water bodies in the watershed should be maintained and improved to support the watershed’s fish communities.

Drivers: Fish communities can be threatened by overfishing, which is not currently a problem in the District. However, multiple species are currently impacted by the 2 major fish passage barriers in the District, Bucks Mill Dam and Little Floyd Lake Dam. Fish populations can also be threatened by impairments to habitat, spawning areas, and water quality. Although
none of these threats are imminent in the District, climate change may change this. For example, warmer air temperatures could increase water temperatures to non-optimal conditions for trout and other cool-water fishes, such as walleye and northern pike. Drought could also impair fish migration by causing streams to dry up and impact valuable spawning areas. Finally, climate change could increase competition for resources between invasive and native fish species.

2.4 ADMINISTRATION AND EDUCATION

Administrative and educational issues are identified below. These issues could also have fit into each of the previous categories (Sections 2.1-2.3) because in many cases, drivers of water quality, water quantity and ecological integrity issues include a lack of administrative efficiency or public education about an issue. However, here, administration and education issues are presented under a generalized Administration and Education category.

2.4.1 General Administration

**Background:** The mission statement for the Pelican River Watershed District states that the District must ensure that wise decisions are made concerning the management of its resources. Therefore, it is imperative to ensure that administrative processes and procedures are reviewed, refined and enhanced where possible.

**Issues:** Through the development of this RWMP, it was identified that some administrative processes, procedures and rules need updates. Improving efficiency and effectiveness of administrative elements will allow improvement of water quality, water quantity and ecological integrity.

**Drivers:** The District has a small staff and a large number of responsibilities. As a result, administrative procedures are not always as efficient or effective as they could be.

2.4.2 Education

**Background:** Providing informational and educational opportunities to stakeholders within the District is a cost-effective approach to make a positive impact on efforts to improve water quality, water quantity and ecological integrity.

**Issues:** Through the development of the RWMP, it was identified that educational opportunities should be continued, and in some cases expanded. These opportunities could have a positive impact on water quality, water quantity and ecological integrity.

**Drivers:** There are many residents and stakeholders in the District, and some do not know a lot about water resources protection.
3.0 Issue Prioritization

This Issue Prioritization chapter first summarizes how the issues described in Chapter 2 were prioritized by the District (Section 3.1). Next, the chapter lays out the order in which the issues from Chapter 2 are prioritized by the District (Section 3.2). Issues were sorted into high, medium and “as opportunities arise” priority categories.

3.1 ISSUE PRIORITIZATION PROCESS

3.1.1 Summary of Issue Prioritization Process

As evidenced in Chapter 2, the District faces many water-related challenges. District resources are limited, however, so the order in which these challenges are resolved must be decided, i.e., these issues must be prioritized. The process by which District issues were prioritized is summarized in this section and described in more detail in Sections 3.1.2 through 3.1.4. In essence, the prioritization process involved soliciting input to create a comprehensive list of issues, and then choosing which issues took priority based on 1) the popularity of the issue (i.e., how many times the issue was raised) and 2) the resources that would be needed to resolve the issue. Ultimately, the recreational, economic and aesthetic impacts of each issue were considered against the costs of trying to resolve it.

The issue prioritization process ensured that diverse viewpoints were heard and considered, including those of the Board of Managers, staff, staff from the local units of government managing land in the watershed, other local, regional, and state agencies, and the general public. First, State and local plans were reviewed, such as the Minnesota Nonpoint Priority Funding Plan, the Becker County Local Water Management Plan and the City of Detroit Lakes Wellhead Protection Plan (Section 3.1.2). Studies such as the St. Clair Lake TMDL and a USGS groundwater-use study were also reviewed (Section 3.1.2). Next, input letters were solicited from cities, counties and state agencies, and reviewed upon receipt (Section 3.1.3). Additionally, five meetings were held to identify priority issues for the general public and for specific subsets of the public such as lakeshore landowners (Section 3.1.4). District staff also identified potential non-point and point-sources of pollutants in the District. They also analyzed long-term watershed monitoring data to identify water quality trends and compare District water resources to state water quality standards. The rate and intensity of land-use and land management changes were also evaluated by District staff. This process generated a comprehensive list of water-related issues in the District, which was synthesized and organized into four categories: Water Quality, Water Quantity, Ecological Integrity, and Administration & Education (Chapter 2).

After a comprehensive list of water-related issues was generated, issues had to be prioritized. Issues were ranked and placed in one of three categories: High, Medium and “As opportunities arise.” Although this third category is for issues of lowest priority, it was not named as such in order to signify that all issues are important. Issues were designated as High, Medium, or “As opportunities arise” based on popularity of the issue and based on the resources required to resolve the issue. Issues that arose many times in plans, studies, letters and meetings were given higher priority. Issues that seemed feasible to tackle were also given higher priority. For example, water quality of lakes arose as an issue many times throughout the prioritization process, so it was designated as a high priority issue. Concerns
about groundwater contamination were also raised, but because the District does not have as many resources to tackle this issue, it was ranked as a medium priority issue.

3.1.2 Issues Identified in Other Plans and Studies

Several plans and studies were reviewed to help identify water resource related issues. These plans and studies are listed below. In addition, Table 3-1 summarizes the major issues identified from each plan or study.

Plans reviewed include:

- Minnesota Nonpoint Priority Funding Plan, 2016-2018
- Becker County Local Water Management Plan, 2017-2027
- Becker County Comprehensive Plan, 2003
- Otter Tail County Local Water Management Plan, 2014
- City of Detroit Lakes Storm Water Pollution Prevention Program, 2013
- City of Detroit Lakes Wellhead Protection Plan, 2009

Studies reviewed include:

- St. Clair Lake TMDL, 2014
- MDNR Lakes of Phosphorus Sensitivity Significance Study, 2017

Table 3-1. Issues identified from each reviewed plan and study.

<table>
<thead>
<tr>
<th>Plan/Study</th>
<th>Priority Issues Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota Nonpoint Priority Funding Plan</td>
<td>• Impaired waters that are closest to meeting state water quality standards must be restored</td>
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<tr>
<td></td>
<td>• High quality unimpaired waters at greatest risk of becoming impaired must be protected</td>
</tr>
<tr>
<td></td>
<td>• Water resources must be restored and protected for public use and public health, including drinking water</td>
</tr>
<tr>
<td>Becker County Local Water Management Plan</td>
<td>• Surface water quality issues are a top priority, including stormwater management; erosion control on agricultural land; nutrient, turbidity and bacteria reductions in impaired waters; aquatic invasive species prevention; shoreland protection; wetland protection; development pressure and land use change; water quality monitoring</td>
</tr>
</tbody>
</table>

Responsive partner. Exceptional outcomes.
<table>
<thead>
<tr>
<th>Plan/Study</th>
<th>Priority Issues Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Groundwater quality issues are another top priority, including septic system maintenance, inspection and compliance; wellhead protection; irrigation water management; nutrient management; solid and hazardous waste disposal; groundwater monitoring</td>
</tr>
<tr>
<td>Becker County Comprehensive Plan</td>
<td>• Lake and watershed carrying capacity should be determined</td>
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<tr>
<td></td>
<td>• Performance standards for gravel mining on county-managed land should be developed</td>
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<tr>
<td></td>
<td>• The shoreland septic monitoring program must be expanded</td>
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<td></td>
<td>• Agricultural conservation areas should be designated</td>
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<td></td>
<td>• Private conservation efforts should be promoted</td>
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<td>• Trail networks should be created</td>
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<td>• On-site wastewater treatment performance standards should be developed</td>
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<td></td>
<td>• Additional anti-dumping strategies should be developed</td>
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<td></td>
<td>• A green infrastructure education program should be implemented</td>
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<td></td>
<td>• The solid waste education and promotion efforts should be continued</td>
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<tr>
<td></td>
<td>• Incentives should be created for private shoreland restoration</td>
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<tr>
<td></td>
<td>• Watershed zoning districts or watershed overlay districts should be created</td>
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<tr>
<td></td>
<td>• Sustainable use of the County’s natural resources should be encouraged</td>
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<tr>
<td>Becker Soil &amp; Water Conservation District Annual Plan of Operations</td>
<td>• Water erosion should be reduced in critical areas</td>
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<td></td>
<td>• Becker County’s surface water resources should be protected through existing regulations, use of</td>
</tr>
<tr>
<td>Plan/Study</td>
<td>Priority Issues Identified</td>
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<tr>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Plan/Study Priority Issues Identified</td>
<td>existing programs and development of new programs</td>
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<tr>
<td>• Groundwater quality in Becker County should be protected and preserved</td>
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<tr>
<td>• A Becker County shoreland program should be administered and implemented</td>
<td></td>
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<tr>
<td>• The agricultural inspector program should be administered and implemented</td>
<td></td>
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<tr>
<td>• A balanced educational and promotional outreach program should be carried out</td>
<td></td>
</tr>
<tr>
<td>Otter Tail County Local Water Management Plan</td>
<td>• Surface water quality is impaired in areas and should be restored</td>
</tr>
<tr>
<td>• It is necessary to adopt new shoreland rules and implement better enforcement of existing shoreland regulations</td>
<td></td>
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<tr>
<td>• The ordinary high-water level should be established for all lakes, and localized flooding issues must be resolved</td>
<td></td>
</tr>
<tr>
<td>• Groundwater must be protected from contamination</td>
<td></td>
</tr>
<tr>
<td>• Groundwater quantity must be preserved. Irrigation has increased in Otter Tail County since the early 1990’s.</td>
<td></td>
</tr>
<tr>
<td>City of Detroit Lakes SWPPP</td>
<td>• Illicit discharges to storm sewers must be prevented</td>
</tr>
<tr>
<td>• Sediment in runoff from construction sites must be controlled</td>
<td></td>
</tr>
<tr>
<td>• Sediment and other pollution in runoff from non-construction areas must be minimized through street sweeping, inspection of BMPs, etc.</td>
<td></td>
</tr>
<tr>
<td>• The public should be educated about and involved in prevention of runoff pollution</td>
<td></td>
</tr>
<tr>
<td>City of Detroit Lakes Wellhead Protection Plan</td>
<td>• There are areas of groundwater that must be protected from contamination</td>
</tr>
<tr>
<td>Plan/Study</td>
<td>Priority Issues Identified</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>St. Clair Lake TMDL</td>
<td>• St. Clair Lake is impaired for aquatic recreation due to excess nutrients</td>
</tr>
<tr>
<td>Estimated Groundwater Use in Becker, Clay, Douglas, Grant, Otter Tail, and Wilkin Counties, Minnesota for 2030 and 2050</td>
<td>• Groundwater withdrawal is expected to increase over the next several decades mainly for domestic water use and irrigation</td>
</tr>
<tr>
<td>MDNR Lakes of Phosphorus Sensitivity Significance Study</td>
<td>• Many lakes are sensitive to phosphorus loading</td>
</tr>
</tbody>
</table>

### 3.1.3 Issues Identified in Input Letters

The District identified additional issues by sending letters soliciting input from several state and local government organizations and by holding forums for targeted groups and the general public.

On April 29, 2016, the District sent a letter to representatives of the following organizations. The letter, which is included in Appendix C, included a notice of the decision to revise and update the RWMP and invited all recipients of this notice to submit water management issues they felt the plan should focus on.

- Burlington Township
- Detroit Township
- Erie Township
- Holmesville Township
- Lake Eunice Township
- Lake View Township
- Richwood Township
- Candor Township
- City of Detroit Lakes (multiple representatives)
- City of Detroit Lakes School District
- Becker County (multiple representatives)
- Becker County Soil & Water Conservation District
- Otter Tail County (multiple representatives)
- West Otter Tail County Soil & Water Conservation District
- Minnesota Board of Water & Soil Resources (multiple representatives)
- Minnesota Department of Agriculture
- Minnesota Department of Health
- Minnesota Department of Natural Resources (multiple representatives)
- Minnesota Pollution Control Agency
- Environmental Quality Board

The District received input from several of these organizations (Appendix C). For example, the MDNR recommended that the RWMP continue to be consistent with recommendations in
other plans such as the Becker County Comprehensive Plan and the Becker County Local Water Management Plan. The MDNR also recommended incorporation of the Minnesota Buffer initiative into the planning process and use of data from the MDNR’s shallow lake program. A different representative at the MDNR mentioned that shoreline development impacts emergent vegetation, which in turn impacts wildlife, and asked that this issue be addressed in the RWMP. The MDA recommended that the District encourage landowners and farmers to implement drainage water management practices and consider implementing a formal process for prioritizing lake management and protection efforts. The MDH emphasized a need for including groundwater protection in the RWMP and suggested implementing a well-sealing cost share program and conducting well inventories. The MDH also provided a map of the Detroit Lakes Drinking Water Supply Management Area.

### 3.1.4 Issues Identified in Meetings

Meetings were held for the public and for specific groups such as lake association members in order to gather input. The five meetings identified a wide variety of issues, although water quality of lakes was consistently the highest priority issue. Specifically, most water quality concerns centered around phosphorus, algae and sediment. The following five meetings were held throughout the planning process; meeting notes are included in Appendix C.

- **Public Meeting**, March 27, 2017
- **Public Meeting**, May 2, 2017
- **Long, St. Clair, Sallie and Melissa Lakes Area Meeting**, May 10, 2017
- **Floyd Lake Area Meeting**, May 16, 2017
- **Detroit Lakes Area Meeting**, May 23, 2017

The initial public meetings on March 27 and May 2, 2017 identified a wide variety of issues, including untreated urban runoff entering surface waters, erosion in agricultural areas, degradation of wetlands, the need for resilience to flooding, groundwater contamination, increased groundwater withdrawal from industrial and agricultural irrigation and increases in the frequency and severity of storms due to climate change. Although these two meetings were open to the public, they were mostly attended by water professionals, such as the Becker County Aquatic Invasive Species Coordinator, a BWSR representative, and several Board members.

To ensure input was received from a representative sample of District residents, meetings on May 10, May 16 and May 23, 2017 targeted specific areas of the District. Further, District Board members called residents to personally invite them to these meetings. The main issue identified in the Long, St. Clair, Sallie and Melissa Area meeting was that St. Clair Lake has a water quality problem driven by excess phosphorus and needs a second alum treatment. Because St. Clair Lake drains to Sallie and Melissa, residents of all three lakes were concerned with this issue. Long Lake residents also expressed concern about gravel mining in their area and the potential for surface- or ground-water contamination from mining activities. The Floyd Lake Area meeting also brought up water quality of surface waters but focused on sediment input to surface waters from agricultural areas. Residents also raised concerns about the need for septic system updates and potential effects of faulty septic systems on groundwater quality. The Detroit Lakes Area meeting also raised issues of water quality. Untreated stormwater was a concern, as were strategies for increasing stormwater treatment. Several people at this meeting also voiced their support for shoreline development but recognized that shoreline development loses value if lake water quality is
poor. The need for revision of District rules, especially shoreline rules, was also discussed at this final meeting.

3.2 PRIORITY ISSUES

As mentioned in Section 3.1.1., the first step in issue prioritization was generating a comprehensive list of water-related issues in the District and placing these issues into one of four categories: Water Quality, Water Quantity, Ecological Integrity, and Administration & Education (Chapter 2). The second step was to consider support for and feasibility of tackling an issue and using this information to designate each issue as High, Medium or “As opportunities arise.” (Although this third ranking is for issues of lowest priority, it was not named, “Low” in order to signify that all issues are important to the District.) Definitions of these categories are below:

**High** - The focus of implementation in this RWMP. These are issues that arose many times throughout the prioritization process, and issues for which resources are available to help resolve. Focusing on these issues will greatly enhance recreational, economic and/or aesthetic value to the District.

**Medium** - Addressed in this RWMP, but to a lesser extent than High priority issues. These issues were raised less often than High priority issues during the prioritization process and/or tackling these issues is less feasible than tackling High priority issues. Medium issues are addressed in this RWMP, but with fewer District resources than High priority items.

**As opportunities arise** - These issues are not as important as High and Medium priority issues, or opportunities for addressing these issues are currently unavailable. These issues should be addressed after High and Medium issues have been addressed or if an opportunity arises (e.g., grant funding) to address the issue.

Issues were designated High, Medium, or “As opportunities arise” based on:

1. Popularity (i.e., how many times the issue arose during the prioritization process or how strongly stakeholders felt about the issue)

2. The resources required to resolve the issue (e.g., how much available funding, how many partners)

For example, issues regarding the water quality of lakes arose many times throughout the prioritization process, especially excess algae, sediment phosphorus, so “Water Quality- Lakes” was designated as a high priority issue. Concerns about groundwater contamination were also raised, but because the District does not have as many resources to tackle this issue (the MDH has more jurisdiction), “Water Quality- Groundwater” was ranked as a medium priority issue.

Sections 3.2.1, 3.2.2 and 3.2.3 list High, Medium and “As opportunities arise” priority issues. Table 3-2 also summarizes these issues and their designated priority.

3.2.1 High Priority Issues

Below are the issue categories designated as high priority:
• Water Quality- Lakes
• Water Quality- Wetlands
• Water Quality- Rivers, streams and ditches
• Water Quantity- Lake Levels
• Ecological Integrity- Aquatic Invasive Species

3.2.2 Medium Priority Issues

Below are the issue categories designated as medium priority:

• Water Quality- Groundwater
• Water Quantity- Flooding
• Administration & Education – Administration
• Administration & Education – Education

3.2.3 “As opportunities arise” Priority Issues

Below are the issue categories designated as “as opportunities arise” priority:

• Water Quantity- Groundwater
• Ecological Integrity- Wildlife habitat
• Ecological Integrity- Fisheries
Table 3-2. Summary of the District’s issues.
Issues are organized within the four categories of Water Quality, Water Quantity, Ecological Integrity and Administration & Education. High priorities are colored in green, medium priorities are colored in orange and “as opportunities arise” categories are colored in red.

<table>
<thead>
<tr>
<th>Water Quality</th>
<th>Water Quantity</th>
<th>Ecological Integrity</th>
<th>Administration &amp; Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue Category</td>
<td>Priority</td>
<td>Issue Category</td>
<td>Priority</td>
</tr>
<tr>
<td>Lakes</td>
<td>High</td>
<td>1. Lake levels</td>
<td>High</td>
</tr>
<tr>
<td>Wetlands</td>
<td>High</td>
<td>2. Flooding</td>
<td>Medium</td>
</tr>
<tr>
<td>Rivers, streams and ditches</td>
<td>High</td>
<td>3. Groundwater</td>
<td>As opportunities arise</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.0 Goals, Objectives, Actions & Implementation

This chapter covers goals of the District and a concrete plan for achieving these goals. The sections in this chapter mirror the sections in Chapter 2, Issue Identification. Each issue category that was identified has a corresponding section in this chapter. For example, lake water quality issues are identified in Section 2.1.1, so lake water quality goals, objectives and action items are identified in Section 4.1.1.

Here, goals are treated as broad ambitions, objectives are more specific ambitions that fit under each goal, and action items are prioritized, measurable, often location-specific activities that the District can complete in order to work towards achieving its goals. Each action item includes several pieces of information associated with the action item: location of the action item, partners who will collaborate on the action item, the funding required for the action item to be completed, the time window in which the action item should be completed, how the District has prioritized this action item (high, medium or “as opportunities arise”) and a measure of success to indicate that proper action has been taken. At the end of each section, a table summarizes the information from each section.

4.1 WATER QUALITY

4.1.1 Lakes

**Goal**: Adaptively manage District lakes to protect, enhance and restore lake water quality and recreational utility as appropriate to each lake.

**Objective A.** Reduce excess nutrient and sediment loading to lakes through best management practices, capital improvement projects and regulatory controls.

1. Meet each District lake’s water quality goal through phosphorus load reduction. The following Table 4-1 summarizes several lakes’ load allocation and water quality goals. More information about these goals can be found in the lake report cards in Appendix B.
   - **Location**: District lakes
   - **Partners**: MPCA
   - **Funding**: $500,000
   - **Timeline**: 2020-2029
   - **Priority level**: High
   - **Measure of success**: Total phosphorus concentrations equal to or below water quality goals in each lake.
Table 4-1. Summary of lake load allocations and goals.

<table>
<thead>
<tr>
<th>Lake</th>
<th>Estimated Total Phosphorus Load (lbs/yr)</th>
<th>Total Phosphorus Load Goal (lbs/yr)</th>
<th>Reduction Goal (lbs/yr)</th>
<th>Reduction Goal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floyd</td>
<td>1,039</td>
<td>987</td>
<td>52</td>
<td>5%</td>
</tr>
<tr>
<td>Little Floyd</td>
<td>1,063</td>
<td>1,010</td>
<td>53</td>
<td>5%</td>
</tr>
<tr>
<td>Detroit</td>
<td>3,757</td>
<td>3,568</td>
<td>188</td>
<td>5%</td>
</tr>
<tr>
<td>Curfman</td>
<td>87</td>
<td>83</td>
<td>4</td>
<td>5%</td>
</tr>
<tr>
<td>Long</td>
<td>190</td>
<td>180</td>
<td>10</td>
<td>5%</td>
</tr>
<tr>
<td>Sallie</td>
<td>6,267</td>
<td>5,954</td>
<td>313</td>
<td>5%</td>
</tr>
<tr>
<td>Melissa</td>
<td>4,987</td>
<td>4,737</td>
<td>249</td>
<td>5%</td>
</tr>
<tr>
<td>Fox</td>
<td>37</td>
<td>25</td>
<td>1.8</td>
<td>5%</td>
</tr>
<tr>
<td>Munson</td>
<td>62</td>
<td>59</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Loon</td>
<td>294</td>
<td>374</td>
<td>20</td>
<td>7%</td>
</tr>
<tr>
<td>Pearl</td>
<td>304</td>
<td>259</td>
<td>15</td>
<td>5%</td>
</tr>
<tr>
<td>St. Clair*</td>
<td>1,190</td>
<td>904</td>
<td>286</td>
<td>24%</td>
</tr>
<tr>
<td>Johnson</td>
<td>463</td>
<td>440</td>
<td>23</td>
<td>5%</td>
</tr>
<tr>
<td>Reeves</td>
<td>449</td>
<td>427</td>
<td>22</td>
<td>5%</td>
</tr>
<tr>
<td>Meadow</td>
<td>31</td>
<td>29</td>
<td>1.5</td>
<td>5%</td>
</tr>
<tr>
<td>Abbey</td>
<td>156</td>
<td>148</td>
<td>7.8</td>
<td>5%</td>
</tr>
<tr>
<td>Sands</td>
<td>63</td>
<td>59</td>
<td>3</td>
<td>5%</td>
</tr>
</tbody>
</table>

*These estimates come from the MDNR Lakes Phosphorus Sensitivity Significance Study, except the estimates for St. Clair Lake, which come from the St. Clair Lake TMDL.

2. Establish load allocation and water quality goals for North Floyd, Wine, Abbey, and Lind Lakes.
   - **Location:** North Floyd, Wine, Abbey and Lind Lakes
   - **Partners:** MPCA, MDNR
   - **Funding:** $20,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Establishment of load allocations/goals

3. Write and/or update lake-specific management plans for main District lakes to achieve necessary nutrient reductions and water quality goals.
   - **Location:** District lakes
   - **Partners:** MPCA, MDNR, Becker County SWCD, Otter Tail County SWCD, Lake associations, Becker County COLA
   - **Funding:** $150,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Completion of up-to-date implementation plans for each District lake.

4. Work with the MPCA to conduct a Wine Lake TMDL study.
   - **Location:** Wine Lake
   - **Partners:** MPCA
5. Reduce Lake St. Clair phosphorus loading to 2.75 pounds per day or 1,005 pounds per year through activities outlined in the Lake St. Clair TMDL implementation plan.
   - **Location:** Lake St. Clair
   - **Partners:** City of Detroit Lakes, BWSR, MPCA
   - **Funding:** $1,000,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Reduce phosphorus loading to 2.75 pounds per day.

6. Develop and implement a phosphorus load tracking and credit system for Lake St. Clair, as discussed in the Lake St. Claire TMDL.
   - **Location:** Lake St. Clair
   - **Partners:** City of Detroit Lakes
   - **Funding:** $20,000
   - **Timeline:** 2020-2021
   - **Priority level:** High
   - **Measure of success:** Establish tracking and credit system.

7. Identify and target critical agricultural erosion and sediment transport areas in the North Floyd and Little Floyd sub-watersheds.
   - **Location:** North Floyd and Little Floyd Lakes
   - **Partners:** Becker County SWCD, NRCS
   - **Funding:** $250,000
   - **Timeline:** 2022-2025
   - **Priority level:** High
   - **Measure of success:** Completion of geomorphological assessment and report.

8. Develop and implement a stream bank stabilization plan for Campbell Creek to reduce TSS and TP loading from Campbell Creek to the Floyd Lakes.
   - **Location:** Campbell Creek
   - **Partners:** Becker County SWCD, MDNR, MPCA
   - **Funding:** $900,000 ($200-$300 per linear foot)
   - **Timeline:** 2025-2029
   - **Priority level:** High
   - **Measure of success:** Completion of Campbell Creek streambank stabilization project.

9. Monitor existing agricultural BMPs in the Floyd-Campbell and Pearl-Loon LWQMAs to evaluate BMP phosphorus removal efficiency.
   - **Location:** Floyd-Campbell and Pearl-Loon LWQMAs
   - **Partners:** BCSWCD, NRCS
   - **Funding:** $25,000
   - **Timeline:** 2020-2029
10. Retrofit existing and/or construct new regional wet/dry stormwater basins east of the City of Detroit Lakes (in between Pelican River Station 3 and Pelican River Station 4).
   - **Location:** East of Detroit Lakes
   - **Partners:** City of Detroit Lakes
   - **Funding:** $400,000
   - **Timeline:** 2020-2026
   - **Priority level:** High
   - **Measure of success:** Retrofitting or construction of at least one basin.

11. Enforce the Minnesota Buffer Law.
   - **Location:** Watershed-wide
   - **Partners:** BWSR, Becker County SWCD
   - **Funding:** $5,000/yr.
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** 100 percent landowner compliance with Minnesota Buffer Law.

12. Conduct periodic shoreline surveys to evaluate changes and identify areas for protection or improvements on lakes with potential for increased development.
   - **Location:** Floyd, Little Floyd, Sands, Detroit, Curfman, Long, Sallie, Melissa, Monson, Fox, Pearl, Meadow, Johnson-Reeves, Glawe, and Abbey Lakes.
   - **Partners:** BWSR, MPCA, MDNR
   - **Funding:** $5,000/yr.
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Completion and documentation of at least two shoreline surveys per lake.

13. Evaluate opportunities for capital improvement projects that reduce stormwater nutrient and sediment loads.
   - **Location:** Watershed-wide
   - **Partners:** City of Detroit Lakes, Becker County
   - **Funding:** $100,000
   - **Timeline:** 2020
   - **Priority level:** Medium
   - **Measure of success:** Perform at least one formal evaluation which generates at least ten project opportunities.

14. Through cost-sharing, support SWCD efforts to identify and target critical erosion areas in the District and to promote the use of erosion control measures such as perennial cover, conservation tillage, residue management, buffers, and structural practices.
   - **Location:** Watershed-wide
• **Partners:** Becker County SCWD, Ottertail SWCD  
  • **Funding:** $5,000  
  • **Timeline:** 2020- 2029  
  • **Priority level:** Medium  
  • **Measure of success:** Provide at least $2,000 for installation of erosion control measures in the District.

15. Develop a comprehensive street sweeping management program within the City of Detroit Lakes to enhance existing street sweeping capabilities.
   • **Location:** City of Detroit Lakes  
   • **Partners:** City of Detroit Lakes  
   • **Funding:** $20,000  
   • **Timeline:** 2022- 2024  
   • **Priority level:** Medium  
   • **Measure of success:** Completion of a detailed street sweeping program document.

16. Explore the feasibility of financially assisting the City of Detroit Lakes in purchasing a street sweeper that removes fine particles.
   • **Location:** City of Detroit Lakes  
   • **Partners:** City of Detroit Lakes  
   • **Funding:** $150,000  
   • **Timeline:** 2024  
   • **Priority level:** Medium  
   • **Measure of success:** Spend 16 hours of staff time researching grants, evaluating the District budget and brainstorming other methods for financial assistance.

17. Identify areas that need stormwater BMPs retrofitted or installed, and alert landowners about the District’s cost-share assistance and technical assistance programs. High priority areas include: City of Detroit Lakes north industrial park, West Lake Drive drainage area, Campbell Creek, Rice Lake wetland drainage area, Holmes Street drainage area, and St. Clair Lake drainage area.
   • **Location:** High priority areas above  
   • **Partners:** Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, Becker County Zoning Administration, BWSR, affected stakeholders  
   • **Funding:** $10,000  
   • **Timeline:** 2020- 2021  
   • **Priority level:** Medium  
   • **Measure of success:** At least three landowners alerted per year about potential BMP retrofit or installation projects.

18. Maintain a cost-share program to implement voluntary stormwater BMPs (e.g., rain gardens, lake-edge vegetation).
   • **Location:** Watershed-wide  
   • **Partners:** Becker County SWCD  
   • **Funding:** $20,000/yr.  
   • **Timeline:** 2020- 2029  
   • **Priority level:** Medium  
   • **Measure of success:** Fund at least one voluntary BMP per year.
19. Promote or assist in promoting proper maintenance of septic systems through flyers, booklets and social media.
   - **Location:** Watershed-wide
   - **Partners:** Becker County, Coalition of Lake Associations
   - **Funding:** $1,500
   - **Timeline:** 2020-2029
   - **Priority level:** Medium
   - **Measure of success:** Produce one flyer, booklet or social media post per year pertaining to septic system maintenance.

20. Develop a cost-share program to encourage the use of innovative or demonstration technologies and to evaluate the effectiveness of these technologies.
   - **Location:** Watershed-wide
   - **Partners:** Becker and Ottertail SWCDs, City of Detroit Lakes, MDNR, MPCA
   - **Funding:** $3,000
   - **Timeline:** 2020
   - **Priority level:** As opportunities arise
   - **Measure of success:** Develop cost-share program and fund at least two innovative technology projects.

21. Upgrade water-related infrastructure in the City of Detroit Lakes to increase efficiency of phosphorus removal (e.g., install sumps, SAFL Baffle, Preserver, iron-sand filters, etc.).
   - **Location:** City of Detroit Lakes
   - **Partners:** City of Detroit Lakes
   - **Funding:** $500,000
   - **Timeline:** 2020-2029
   - **Priority level:** As opportunities arise
   - **Measure of success:** Completion of at least three upgrades.

22. Collaborate with other organizations to develop and implement a winter road and sidewalk maintenance program that dictates appropriate amounts of sand, salt, and other ice melting products use on municipal, county and township roads.
   - **Location:** Watershed-wide
   - **Partners:** City of Detroit Lakes, Becker County, Townships
   - **Funding:** $2,000
   - **Timeline:** 2025-2027
   - **Priority level:** As opportunities arise
   - **Measure of success:** Completion of a road and sidewalk maintenance program document and hosting of at least two trainings.

**Objective B.** Reduce rate and volume of stormwater runoff entering lakes to help meet water quality loading goals.

1. Maintain a cost-share program for the installation of agricultural volume reduction BMPs.
   - **Location:** Watershed-wide
2. Maintain a cost-share program to implement voluntary stormwater BMPs (e.g., rain gardens, lake-edge vegetation).
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD
   - **Funding**: $20,000/yr.
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Fund at least one voluntary BMP per year.

3. Evaluate opportunities for capital improvement projects that reduce stormwater volume and peak flows.
   - **Location**: Watershed-wide
   - **Partners**: City of Detroit Lakes, Becker County
   - **Funding**: $100,000
   - **Timeline**: 2028
   - **Priority level**: As opportunities arise
   - **Measure of success**: Perform at least one formal evaluation which generates at least ten project opportunities.

**Objective C.** Reduce internal phosphorus loading (from bottom sediments) to lakes.

1. Calculate necessary internal phosphorus load reduction on Lake St. Clair and, if appropriate, perform a second alum treatment.
   - **Location**: Lake St. Clair
   - **Partners**: MPCA, BWSR
   - **Funding**: $400,000
   - **Timeline**: 2020-2023
   - **Priority level**: High
   - **Measure of success**: Completion of internal phosphorus load reduction study, and if appropriate, completion of an alum treatment.

2. Assess internal phosphorus loading in North Floyd Lake and perform alum treatment or other appropriate practice to reduce loading.
   - **Location**: North Floyd Lake
   - **Partners**: MPCA, BWSR
   - **Funding**: $400,000
   - **Timeline**: 2025-2027
   - **Priority level**: As opportunities arise
   - **Measure of success**: Completion of internal phosphorus loading study, and if appropriate, completion of an alum treatment or other practice.

**Objective D.** Monitor and reduce chloride loading to lakes.
1. Develop and implement a winter road and sidewalk maintenance program that dictates appropriate amounts of de-icing salt use on municipal, county and township roads.
   - **Location**: Watershed-wide
   - **Partners**: City of Detroit Lakes, Becker County, townships
   - **Funding**: $2,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Completion of a road and sidewalk maintenance program document and hosting of at least two trainings.

2. Develop a chloride assessment program and monitor chloride levels in suspected hotspots, such as Big and Little Detroit Lake.
   - **Location**: Big Detroit Lake and Little Detroit Lake
   - **Partners**: MPCA, BWSR
   - **Funding**: $15,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Completion of a chloride assessment program document and collection of samples for at least two years.

**Objective E.** Inform and educate regarding loading of pharmaceuticals and personal care products to wastewater.

1. Educate public about proper use and disposal of household hazardous waste, pharmaceutical products, and other personal care products with at least two social media posts and/or flyers per year.
   - **Location**: Watershed-wide
   - **Partners**: Becker County Household Hazardous Waste Program, Hospitals
   - **Funding**: $1,500
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Make two social media posts and/or flyers per year.

2. Attend one workshop on contaminants of emerging concern.
   - **Location**: Watershed-wide
   - **Partners**: Becker County, City of Detroit Lakes
   - **Funding**: $2,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Attendance of one workshop

**Objective F.** Protect the public from mercury exposure due to mercury-impaired lakes.

1. Distribute MDH and MPCA materials about safe consumption of fish through at least two social media posts and/or flyers per year.
   - **Location**: Watershed-wide
   - **Partners**: MDH, MPCA
2. Reduce atmospheric mercury deposition by supporting legislative initiatives which reduce mercury emissions.
   - **Location**: Watershed-wide
   - **Partners**: MPCA
   - **Funding**: $1,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: At least one letter to government representatives, two social media posts or one other acknowledgement of support.

**Objective G.** Acquire data necessary to better understand water quality trends and threats in order to most effectively implement water quality improvement practices.

1. Continue the District’s annual chemical water quality monitoring program to assess lake health, guide adaptive management, and provide measures of progress.
   - **Location**: Watershed-wide
   - **Partners**: MDNR, MPCA
   - **Funding**: $30,000/yr.
   - **Timeline**: 2020-2029
   - **Priority level**: High
   - **Measure of success**: Completion of annual monitoring report.

2. Evaluate and update lake monitoring plans to incorporate collection of additional data for special projects or studies.
   - **Location**: Main District lakes
   - **Partners**: MPCA
   - **Funding**: $15,000
   - **Timeline**: 2023-2025
   - **Priority level**: High
   - **Measure of success**: Updates for at least two lake monitoring plans.

3. Acquire Otter Tail WRAPS study data and use the study to update lake management plans as necessary.
   - **Location**: Otter Tail watershed
   - **Partners**: MPCA
   - **Funding**: $5,000
   - **Timeline**: 2021-2024
   - **Priority level**: High
   - **Measure of success**: Incorporation of all applicable WRAPS action items into lake management plans.
Table 4-2. Lakes Water Quality- Actions Summary & Schedule. Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Years</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Meet each District lake’s water quality goal through phosphorus load reduction (Appendix B for details).</td>
<td>2020-2029</td>
<td>$500,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Establish load allocation and water quality goals for North Floyd, Wine, Abbey, and Lind Lakes.</td>
<td>2020-2029</td>
<td>$20,000</td>
<td>H</td>
</tr>
<tr>
<td>A3</td>
<td>Write and/or update lake-specific management plans for main District lakes to achieve necessary nutrient reductions and water quality goals.</td>
<td>2020-2029</td>
<td>$150,000</td>
<td>H</td>
</tr>
<tr>
<td>A4</td>
<td>Work with the MPCA to conduct a Wine Lake TMDL study and implement activities recommended by the TMDL implementation plan.</td>
<td>2023-2026</td>
<td>$35,000</td>
<td>H</td>
</tr>
<tr>
<td>A5</td>
<td>Reduce Lake St. Clair phosphorus loading to 2.75 pounds per day through activities outlined in the Lake St. Clair TMDL implementation plan.</td>
<td>2020-2029</td>
<td>$1,000,000</td>
<td>H</td>
</tr>
<tr>
<td>A6</td>
<td>Develop and implement a phosphorus load tracking and credit system for Lake St. Clair.</td>
<td>2020-2021</td>
<td>$20,000</td>
<td>H</td>
</tr>
<tr>
<td>A7</td>
<td>Identify and target critical agricultural erosion and sediment transport areas in the North Floyd and Little Floyd sub-watersheds.</td>
<td>2021-2025</td>
<td>$250,000</td>
<td>H</td>
</tr>
<tr>
<td>A8</td>
<td>Develop and implement a streambank stabilization plan for Campbell Creek to reduce TSS and TP loading from Campbell Creek to the Floyd Lakes.</td>
<td>2025-2029</td>
<td>$900,000 ($200-$300/Linear Foot)</td>
<td>H</td>
</tr>
<tr>
<td>A9</td>
<td>Monitor existing agricultural BMPs in the Floyd Lake and Pearl-Loon Lake WQMs to evaluate phosphorus removal efficiency.</td>
<td>2020-2029</td>
<td>$25,000</td>
<td>H</td>
</tr>
<tr>
<td>A10</td>
<td>Retrofit existing and/or construct new regional wet/dry stormwater basins east of the City of Detroit Lakes.</td>
<td>2021-2025</td>
<td>$400,000</td>
<td>H</td>
</tr>
<tr>
<td>A11</td>
<td>Enforce the Minnesota Buffer Law.</td>
<td>2020-2029</td>
<td>$5,000/yr</td>
<td>H</td>
</tr>
<tr>
<td>A12</td>
<td>Conduct shoreline surveys on lakes with potential for increased development.</td>
<td>2020-2029</td>
<td>$5,000/yr</td>
<td>M</td>
</tr>
<tr>
<td>A13</td>
<td>Evaluate opportunities for capital improvement projects that reduce stormwater nutrient and sediment loads.</td>
<td>2020</td>
<td>$100,000</td>
<td>M</td>
</tr>
<tr>
<td>A14</td>
<td>Through cost-sharing, support SWCD efforts to promote the use of erosion control measures in critical erosion areas.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>A15</td>
<td>Develop a comprehensive street sweeping management program within the City of Detroit Lakes.</td>
<td>2022-2025</td>
<td>$20,000</td>
<td>M</td>
</tr>
<tr>
<td>A16</td>
<td>Explore the feasibility of financially assisting the City of Detroit Lakes in purchasing a street sweeper that removes fine particles.</td>
<td>2025</td>
<td>$150,000</td>
<td>M</td>
</tr>
<tr>
<td>A17</td>
<td>Identify areas that need stormwater BMPs retrofitted or installed, and alert landowners about the District’s cost-share assistance and technical assistance programs.</td>
<td>2020-2021</td>
<td>$10,000</td>
<td>M</td>
</tr>
<tr>
<td>#</td>
<td>Action</td>
<td>Years</td>
<td>Cost</td>
<td>Priority</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------</td>
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<td>----------</td>
</tr>
<tr>
<td>A18</td>
<td>Maintain a cost-share program to implement voluntary stormwater BMPs.</td>
<td>2020-2029</td>
<td>$20,000/yr</td>
<td>M</td>
</tr>
<tr>
<td>A19</td>
<td>Promote or assist in promoting proper maintenance of septic systems through flyers, booklets and social media.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>M</td>
</tr>
<tr>
<td>A20</td>
<td>Develop a cost-share program to encourage the use of innovative demonstration technologies.</td>
<td>2021</td>
<td>$3,000</td>
<td>L</td>
</tr>
<tr>
<td>A21</td>
<td>Upgrade water-related infrastructure in the City of Detroit Lakes to increase phosphorus removal.</td>
<td>2020-2029</td>
<td>$500,000</td>
<td>L</td>
</tr>
<tr>
<td>A22</td>
<td>Collaborate to develop and implement a winter road and sidewalk maintenance program that dictates appropriate amounts of sand use on municipal, county and township roads.</td>
<td>2025-2027</td>
<td>$2,000</td>
<td>L</td>
</tr>
</tbody>
</table>

Objective B. Reduce rate and volume of stormwater runoff entering lakes to help meet water quality loading goals.

| B1  | Maintain a cost-share program for installation of agricultural volume reduction BMPs. | 2020-2029   | $50,000    | H        |
| B2  | Maintain a cost-share program to implement voluntary stormwater BMPs.              | 2020-2029   | $20,000    | M        |
| B3  | Evaluate opportunities for capital improvement projects that reduce stormwater volume and peak flows. | 2028        | $100,000   | L        |

Objective C. Reduce internal phosphorus loading to lakes.

| A1  | Calculate necessary internal phosphorus load reduction on Lake St. Clair and, if appropriate, perform a second alum treatment. | 2021-2024   | $400,000   | H        |
| A2  | Assess internal phosphorus loading in North Floyd Lake and perform alum treatment of other appropriate practice to reduce loading. | 2027-2029   | $400,000   | L        |

Objective D. Monitor and reduce chloride loading to lakes.

| D1  | Develop and implement a winter road and sidewalk maintenance program that dictates appropriate amounts of de-icing salt use on municipal, county and township roads. | 2020-2029   | $2,000     | L        |
| D2  | Develop a chloride assessment program and monitor chloride levels in suspected hotspots, such as Big and Little Detroit Lake. | 2020-2029   | $15,000    | L        |

Objective E. Reduce and assess loading of pharmaceuticals and personal care products to wastewater.

| E1  | Educate public about proper use and disposal of household hazardous waste, pharmaceutical products and other personal care products with at least two social media posts and/or flyers per year. | 2020-2029   | $1,500     | L        |
| E2  | Attend one workshop on contaminants of emerging concern.                         | 2020-2029   | $2,000     | L        |

Objective F. Protect the public from mercury exposure due to mercury-impaired lakes.
<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Years</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Distribute MDH and MPCA materials about safe consumption of fish through at least two social media posts and/or flyers per year.</td>
<td>2020-2029</td>
<td>$1,000</td>
<td>L</td>
</tr>
<tr>
<td>F2</td>
<td>Reduce atmospheric mercury deposition by supporting legislative initiatives which reduce mercury emissions.</td>
<td>2020-2029</td>
<td>$1,000</td>
<td>L</td>
</tr>
</tbody>
</table>

Objective G. Acquire data necessary to better understand water quality trends and threats in order to most effectively implement water quality improvement practices.

| G1 | Continue the District’s annual chemical water quality monitoring program to assess lake health, guide adaptive management, and provide measures of progress. | 2020-2029   | $30,000/yr | H        |
| G2 | Evaluate and update lake monitoring plans to incorporate collection of additional data for special projects or studies. | 2023-2026   | $15,000   | H        |
| G3 | Acquire Otter Tail WRAPS study data and use the study to update lake management plans as necessary. | 2021-2024   | $5,000    | H        |

### 4.1.2 Wetlands

**Goal:** Protect, enhance and restore wetland water quality and function.

**Objective A.** Restore hydrology of altered wetlands and surrounding areas that are contributing excess nutrients to downstream waters.

1. Design and complete the Rice Lake Wetland restoration project, which includes installing water control structures, replacing culverts and securing easements.
   - **Location:** Rice Lake Wetland
   - **Partners:** NRCS, MDNR, MPCA, BWSR
   - **Funding:** $2.5 million
   - **Timeline:** 2020-2022
   - **Priority level:** High
   - **Measure of success:** Completion of 461 acre Rice Lake Wetland restoration project, impounding approximately 691 acre-ft of water.

2. Evaluate the potential for restoration of altered wetlands, especially the wetlands near Ditch 14, Lake St. Clair, and Campbell Creek.
   - **Location:** Ditch 14, Lake St. Clair, Campbell Creek
   - **Partners:** NRCS, DNR, MPCA, BWSR
   - **Funding:** $50,000
   - **Timeline:** 2023-2025
   - **Priority level:** High
   - **Measure of success:** Completion of wetland restoration feasibility study and report.
Objective B. Inventory wetland water quality and function.

1. Conduct a systematic wetland inventory throughout the District that identifies, functionally assesses and prioritizes wetlands for protection and restoration.
   - **Location**: Watershed-wide
   - **Partners**: BWSR, MDNR, MPCA, Becker County SWCD, Otter Tail County SWCD
   - **Funding**: $50,000
   - **Timeline**: 2025-2029
   - **Priority level**: Medium
   - **Measure of success**: Completion of wetland inventory.

Objective C. Protect high quality wetlands as identified in wetland inventory to be performed.

1. Identify and explore opportunities to protect high quality wetlands through easements, fee title, or wetland bank.
   - **Location**: Watershed-wide
   - **Partners**: BWSR, MDNR, MPCA, NRCS, The Nature Conservancy, The Trust for Public Land, Ducks Unlimited, Pheasants Forever, The Izaak Walton League
   - **Funding**: $25,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Spend 16 hours of staff time exploring (and if possible, securing) opportunities.

Objective D. Help implement requirements for wetland management.

1. Help implement wetland requirements such as buffers, setbacks, and pretreatment of stormwater prior to discharge into wetlands.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, Otter Tail County SWCD, Becker County Zoning Administration, Otter Tail County Land & Resource Management, City of Detroit Lakes, BWSR, MDNR
   - **Funding**: $5,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Assist with implementation of at least one requirement.
### Table 4-3. Wetlands Water Quality- Actions Summary & Schedule.

Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Conduct a systematic wetland inventory throughout the District that identifies, functionally assesses and prioritizes wetlands for protection and restoration.</td>
<td>2025-2029</td>
<td>$50,000</td>
<td>M</td>
</tr>
<tr>
<td>B1</td>
<td>Design and complete the Rice Lake Wetland restoration project.</td>
<td>2020-2022</td>
<td>$2,500,000</td>
<td>H</td>
</tr>
<tr>
<td>B2</td>
<td>Evaluate the potential for restoration of altered wetlands with a restoration feasibility study.</td>
<td>2023-2025</td>
<td>$50,000</td>
<td>H</td>
</tr>
<tr>
<td>C1</td>
<td>Identify and explore opportunities to protect high quality wetlands through easements, fee title or wetland bank.</td>
<td>2020-2029</td>
<td>$25,000</td>
<td>L</td>
</tr>
<tr>
<td>D1</td>
<td>Help implement wetland requirements such as buffers, setbacks and pretreatment of stormwater prior to discharge into wetlands.</td>
<td>2029</td>
<td>$5,000</td>
<td>L</td>
</tr>
</tbody>
</table>

### 4.1.3 Rivers, streams and other waterways

**Goal:** Protect, enhance and restore rivers, tributary streams and other waterways, such as ditches.

**Objective A.** Monitor streams for water quality and other indicators of ecosystem health.

1. Update the annual stream monitoring plan for Campbell Creek and Public Drainage Systems 11 & 12; the Pelican River and Public Drainage System 13; Public Drainage System 14; and smaller waterways. The monitoring plan should assess chemical water quality parameters and flow at minimum, but also bank erosion and runoff when possible.
   - Location: Waterways listed above
   - Partners: MPCA, MDNR
   - Funding: $10,000
   - Timeline: 2020-2029
   - Priority level: High
   - Measure of success: Completion of updated annual stream monitoring plan document.
2. Evaluate and update the stream monitoring plan for special projects.
   - **Location:** Watershed-wide
   - **Partners:** MPCA, MDNR, BWSR
   - **Funding:** $20,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Completion of updated special projects monitoring plan document.

3. Develop and implement a Sucker Creek monitoring plan.
   - **Location:** Sucker Creek
   - **Partners:** Sucker Creek Preserve
   - **Funding:** $4,000
   - **Timeline:** 2021-2022
   - **Priority level:** Medium
   - **Measure of success:** Completion of a Sucker Creek monitoring plan document.

**Objective B.** Inventory water quality and function of public drainage systems in the District in accordance with Minnesota State Statute 103E.

1. Conduct annual drainage system inspection reports for Drainage Systems 11, 12, 13 and 14.
   - **Location:** Drainage Systems 11, 12, 13 and 14
   - **Partners:** BWSR
   - **Funding:** $10,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Completion of inspection reports.

2. Develop and implement a drainage system records modernization program to retain historic information, maintain as-constructed conditions, retrieve/maintain information on benefitted area, and increase accessibility of information.
   - **Location:** Watershed-wide
   - **Partners:** BWSR
   - **Funding:** $50,000
   - **Timeline:** 2025-2027
   - **Priority level:** Medium
   - **Measure of success:** Development of records database.

3. Identify unstable reaches that degrade water quality using Campbell Creek, Pelican River and Sucker Creek data.
   - **Location:** Campbell Creek, Pelican River, Sucker Creek
   - **Partners:** Becker County SWCD, Otter Tail County SWCD, MPCA, BWSR, MDNR
   - **Funding:** $50,000
   - **Timeline:** 2020-2029
   - **Priority level:** Medium
   - **Measure of success:** Completion of geomorphological assessment and report.
**Objective C.** Restore stream water quality and stream ecosystem health.

1. Develop and implement a stream restoration plan for Campbell Creek to reduce sediment and phosphorus loading to the Creek based upon Ottertail WRAPS findings and subsequent TMDL.
   - **Location:** Campbell Creek
   - **Partners:** Becker County SWCD, MDNR, MPCA
   - **Funding:** $2,000,000 ($200-$300 per linear foot)
   - **Timeline:** 2022-2024
   - **Priority level:** High
   - **Measure of success:** Completion of streambank stabilization project.

2. Design and complete the Rice Lake Wetland restoration project in order to reduce Rice Lake Wetland’s release of phosphorus to the Pelican River.
   - **Location:** Rice Lake Wetland
   - **Partners:** NRCS, MDNR, MPCA, BWSR
   - **Funding:** $2.5 million
   - **Timeline:** 2020-2021
   - **Priority level:** High
   - **Measure of success:** Completion of Rice Lake Wetland restoration project.

3. Evaluate the potential for restoration of the wetland bordering Lake St. Clair, which releases phosphorus to Public Drainage System 14.
   - **Location:** Lake St. Clair wetland
   - **Partners:** NRCS, MDNR, MPCA, BWSR
   - **Funding:** $50,000
   - **Timeline:** 2023-2028
   - **Priority level:** High
   - **Measure of success:** Completion of restoration feasibility study.

4. Evaluate the potential for improving geomorphology of the Pelican River between Highway 34 and Highway 10.
   - **Location:** Pelican River
   - **Partners:** MDNR, PRWD, City of Detroit Lakes
   - **Funding:** $850,000 ($200-$300 per linear foot)
   - **Timeline:** 2025-2029
   - **Priority level:** Medium
   - **Measure of success:** Completion of restoration feasibility study.

**Objective D.** Protect high quality stream reaches.

1. Protect Sucker Creek by continuing to serve on the Sucker Creek Preserve technical advisory committee (quarterly meetings), supporting protection and enhancement of Sucker Creek, and education about the Sucker Creek ecosystem.
   - **Location:** Sucker Creek
   - **Partners:** Sucker Creek Preserve, City of Detroit Lakes, MDNR
   - **Funding:** $5,000
   - **Timeline:** 2020-2029
Priority level: High
Measure of success: Attendance of all technical advisory committee meetings.

Table 4-4. Watercourses Water Quality- Actions Summary & Schedule. Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Objective A. Monitor streams for water quality and other indicators of ecosystem health.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Update all annual stream monitoring plans to include assessment of chemical water quality parameters and flow at minimum, but also bank erosion and runoff when possible.</td>
<td>2020-2029</td>
<td>$10,000</td>
<td>H</td>
</tr>
<tr>
<td>A1</td>
<td>Evaluate and update the stream monitoring plan for special projects.</td>
<td>2020-2029</td>
<td>$20,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Develop and implement a Sucker Creek monitoring plan.</td>
<td>2020-2029</td>
<td>$4,000</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Objective B. Inventory water quality and function of public drainage systems in the District in accordance with Minnesota State Statute 103E.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct annual drainage system inspection reports for Drainage Systems 11, 12, 13 and 14.</td>
<td>2020-2029</td>
<td>$10,000</td>
<td>H</td>
</tr>
<tr>
<td>B1</td>
<td>Develop and implement a drainage system records modernization program.</td>
<td>2025-2027</td>
<td>$50,000</td>
<td>M</td>
</tr>
<tr>
<td>B2</td>
<td>Identify unstable reaches that degrade water quality.</td>
<td>2020-2029</td>
<td>$50,000</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Objective C. Restore stream water quality and stream ecosystem health.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and implement a streambank stabilization plan for Campbell Creek.</td>
<td>2022-2024</td>
<td>$2,000,000</td>
<td>H</td>
</tr>
<tr>
<td>C1</td>
<td></td>
<td></td>
<td>($200-$300/Linear Foot)</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>Design and complete the Rice Lake Wetland restoration project.</td>
<td>2020-2021</td>
<td>$2,500,000</td>
<td>H</td>
</tr>
<tr>
<td>C3</td>
<td>Evaluate the potential for restoration of the wetland bordering Lake St. Clair to reduce phosphorus release to Public Drainage System 14.</td>
<td>2023-2028</td>
<td>$50,000</td>
<td>H</td>
</tr>
<tr>
<td>C4</td>
<td>Evaluate the potential for improving geomorphology of the Pelican River between Highway 34 and Highway 10.</td>
<td>2025-2029</td>
<td>$850,000</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>($200-$300/Linear Foot)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Objective D. Protect high quality stream reaches.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protect Sucker Creek by continuing to serve on the Sucker Creek TAC (quarterly meetings) and supporting protection of and education about the Sucker Creek ecosystem.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>H</td>
</tr>
</tbody>
</table>
4.1.4 Groundwater

**Goal**: Protect aquifers and maintain or improve groundwater quality, so that drinking water is safe.

**Objective A.** Protect groundwater quality and ensure safe drinking water.

1. Explore opportunities for a cost-share program or low-interest revolving loan program that offers rebates to residents who bring septic systems up to code.
   - **Location**: Watershed-wide
   - **Partners**: Becker County
   - **Funding**: $5,000
   - **Timeline**: 2022-2027
   - **Priority level**: Medium
   - **Measure of success**: Spend 16 hours of staff time exploring (and if possible, securing) opportunities.

2. Act as an information source to identify potential financial assistance such as grants, loans, and cost-share programs for well and septic system work, including sealing unused wells, repairing failing septic systems, and filling abandoned septic systems.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, Otter Tail County SWCD, MDA, Agricultural BMP Loan Program, City of Detroit Lakes, rural residents, lake associations, contractors
   - **Funding**: $1,500
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Identification of financial assistance for at least two well or septic system projects.

3. Offer assistance to Becker County and MDH in their efforts to test for potential groundwater contaminants and ensure that all wells in high arsenic areas have water treatment.
   - **Location**: Watershed-wide
   - **Partners**: Becker County, MDH
   - **Funding**: $1,500
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Conduct conversation (at least every three years) with Becker County or MDH staff expressing availability to assist with outreach, etc.

4. Implement infiltration and other BMPs according to the City of Detroit Lakes Wellhead Protection Plan.
   - **Location**: City of Detroit Lakes
   - **Partners**: City of Detroit Lakes, MDH
   - **Funding**: $1,500
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
Measure of success: Zero projects that violate the Wellhead Protection Plan.

5. Develop or compile inventories for irrigation wells and areas of high groundwater sensitivity.
   - **Location:** Watershed-wide
   - **Partners:** Becker County SWCD, Ottertail County SWCD, MDNR, MDA
   - **Funding:** $2,000
   - **Timeline:** 2026-2028
   - **Priority level:** As opportunities arise
   - **Measure of success:** Completion of inventory.

Objective B. Increase public awareness of groundwater protection issues and of the City of Detroit Lakes Wellhead Protection Plan.

1. Educate, at least once per year, about proper septic system tank management and the effects of failing septic systems on drinking water through flyers, booklets, newsletters, social media, and local television.
   - **Location:** Watershed-wide
   - **Partners:** Becker County, Coalition of Lake Associations, Septic System Installers and Inspectors
   - **Funding:** $1,500
   - **Timeline:** 2020-2029
   - **Priority level:** Medium
   - **Measure of success:** At least one educational activity (above) per year.

2. Assist Becker County and local SWCDs, at least once per year, in promoting proper management of private wells through flyers, booklets, newsletters, social media, and local television.
   - **Location:** Watershed-wide
   - **Partners:** Becker County, Becker County SWCD, Otter Tail SWCD, Coalition of Lake Associations, Septic System Installers and Inspectors
   - **Funding:** $1,500
   - **Timeline:** 2020-2029
   - **Priority level:** Medium
   - **Measure of success:** At least one promotional activity (above) per year.

3. Assist the City of Detroit Lakes, at least once per year, in educating residents about wellhead protection and BMPs through utility bill inserts, newsletters, the District website, and social media.
   - **Location:** City of Detroit Lakes
   - **Partners:** City of Detroit Lakes, Lake Detroiters Association, Long Lake Association, contractors
   - **Funding:** $1,500
   - **Timeline:** 2020-2029
   - **Priority level:** Medium
   - **Measure of success:** At least one educational activity (above) per year.
Table 4-5. Groundwater Water Quality- Actions Summary & Schedule. Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Explore opportunities for a cost-share program or low-interest revolving loan program that offers rebates to residents who bring septic systems up to code.</td>
<td>2022-2027</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>A2</td>
<td>Act as an information source to identify potential financial assistance such as grants, loans, and cost-share programs for well and septic system work.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>M</td>
</tr>
<tr>
<td>A3</td>
<td>Offer assistance to Becker County and MDH in their efforts to test for potential groundwater contaminants and ensure that all wells in high arsenic areas have water treatment.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>L</td>
</tr>
<tr>
<td>A4</td>
<td>Implement infiltration and other BMPs according to the City of Detroit Lakes Wellhead Protection Plan.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>L</td>
</tr>
<tr>
<td>A5</td>
<td>Develop or compile inventories for irrigation wells and areas of high groundwater sensitivity.</td>
<td>2026-2028</td>
<td>$2,000</td>
<td>L</td>
</tr>
</tbody>
</table>

Objective A. Protect groundwater quality and ensure safe drinking water.

Objective B. Increase public awareness of groundwater protection issues and of the City of Detroit Lakes Wellhead Protection Plan.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Educate about proper septic system tank management and the effects of failing septic systems through flyers, booklets, newsletters, social media, and local television.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>M</td>
</tr>
<tr>
<td>B2</td>
<td>Assist Becker County and local SWCDs in promoting proper management of private wells through flyers, booklets, newsletters, social media, and local television.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>M</td>
</tr>
<tr>
<td>B3</td>
<td>Assist the City of Detroit Lakes in educating about wellhead protection and BMPs through utility bill inserts, newsletters, the District website, and social media.</td>
<td>2020-2029</td>
<td>$1,500</td>
<td>M</td>
</tr>
</tbody>
</table>

4.2 WATER QUANTITY

4.2.1 Water Levels

**Goal**: Promote shoreline resilience to fluctuations in water levels of lakes, streams and drainage systems.

Objective A. Monitor lake, stream and drainage system water levels.

1. Maintain water level gauges at lake outlets and at key locations in Campbell Creek, Public Drainage Systems 11, 12, 13 and 14, the Pelican River, and Sucker Creek. Record water levels at least weekly during ice-off season.
   - **Location**: Lake outlets and key locations listed above
   - **Partners**: MDNR, lakefront homeowners
Objective B. Promote shoreline that is resilient under fluctuating water levels through shoreline rehabilitation (e.g., with deep-rooted plants, soft-armor plantings, etc.)

1. Maintain a cost-share program for lakeshore landowners to convert shoreline turf grass into “lake-friendly” buffer, which tolerates fluctuating lake levels.
   - Location: Watershed-wide lakeshore
   - Partners: Becker County SWCD, Otter Tail County SWCD, MDNR, BWSR, lake associations
   - Funding: $50,000 (~$500/site)
   - Timeline: 2020-2029
   - Priority levels: High
   - Measure of success: Fund at least 20 projects in 10 years.

Table 4-6. Water levels- Actions Summary & Schedule.
Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Objective A. Monitor lake, stream and drainage system water levels.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Maintain water level gauges at lake outlets and at key locations in several streams.</td>
<td>2020-2029</td>
<td>$2,000</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Objective B. Promote shoreline that is resilient under fluctuating water levels.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Maintain a cost-share program for lakeshore landowners to convert shoreline turf grass into “lake-friendly” buffer, which tolerates fluctuating lake levels.</td>
<td>2020-2029</td>
<td>$50,000 (~$500/Site)</td>
<td>H</td>
</tr>
</tbody>
</table>

4.2.2 Localized Flooding

**Goal:** Mitigate localized flooding issues and prevent flooding-related damages to property, public safety and water resources.

Objective A. Gather baseline floodplain data.

1. Explore the opportunity for a District-wide or Otter Tail River watershed-wide flood insurance study to protect critical infrastructure.
   - Location: Watershed-wide
Partners: MDNR, BWSR
Funding: $5,000
Timeline: 2023-2028
Priority level: Medium
Measure of success: Spend 40 hours of staff time researching grants, developing collaborations and exploring other methods for completing a flood insurance study.

**Objective B.** Mitigate current flooding and prevent future flooding.

1. Conduct a hydrologic modeling study to identify urban flood prone areas, potential damages and critical infrastructure that may need updates to accommodate greater precipitation events.
   - Location: Watershed-wide
   - Partners: MDNR, MPCA, BWSR
   - Funding: $50,000
   - Timeline: 2020-2029
   - Priority level: High
   - Measure of success: Completion of hydrologic modeling study and report documenting flood prone areas/potential damages.

2. Meet with City of Detroit Lakes staff to review and discuss FEMA flood insurance rate maps, flood insurance studies and Atlas 14 data in order to prevent loss of flood storage capacity/fill in the floodplain.
   - Location: City of Detroit Lakes
   - Partners: City of Detroit Lakes, MDNR
   - Funding: $2,500
   - Timeline: 2023-2024
   - Priority: High
   - Measure of success: Meeting is held that covers above topics.

3. Identify and preserve critical area necessary for the conveyance or temporary storage of stormwater runoff.
   - Location: Watershed-wide
   - Partners: MDNR, BWSR, MnDOT
   - Funding: $5,000
   - Timeline: 2025-2027
   - Priority: Medium
   - Measure of success: Completion of study and report documenting critical area for stormwater; lack of construction/fill in this area.

4. Implement design standards for bridges, culverts or other water-related infrastructure to ensure integrity of road system and infrastructure while maintaining connectivity where needed.
   - Location: Watershed-wide
   - Partners: Becker County, City of Detroit Lakes, MnDOT, MDNR, local townships
   - Funding: $2,000
   - Timeline: 2020-2029
   - Priority level: Medium
Objective C. Prepare for emergency flood scenarios.

1. Collaborate with Becker and Otter Tail Counties and the City of Detroit Lakes to develop an Emergency Response Plan for flood-prone areas.
   - **Location**: Watershed-wide
   - **Partners**: Becker County, Otter Tail County, City of Detroit Lakes, MnDOT, local townships, local residents
   - **Funding**: $15,000
   - **Timeline**: 2026-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Development of Emergency Response Plan.

**Table 4-7. Localized Flooding- Actions Summary & Schedule.**
Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Objective A. Gather baseline floodplain data.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explore the opportunity for a flood insurance study to protect critical infrastructure.</td>
<td>2023-2028</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>B1</td>
<td>Objective B. Mitigate Current Localized Flooding and Prevent Future Flooding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct a hydrologic modeling study to identify flood prone areas, potential damages and critical infrastructure that may need updates.</td>
<td>2020-2027</td>
<td>$50,000</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Meet with the City of Detroit Lakes staff to review and discuss FEMA flood insurance rate maps, flood insurance studies and Atlas 14 data to prevent filling of floodplain in the City of Detroit Lakes.</td>
<td>2023-2024</td>
<td>$2,500</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Identify and preserve critical area necessary for the conveyance or temporary storage of stormwater runoff.</td>
<td>2025-2027</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>Develop and implement design standards for bridges, culverts or other water-related infrastructure to ensure integrity of road system and infrastructure while maintaining connectivity where needed.</td>
<td>2020-2029</td>
<td>$2,000</td>
<td>M</td>
</tr>
<tr>
<td>C1</td>
<td>Objective C. Prepare for emergency flood scenarios.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop an Emergency Response Plan for flood-prone areas with Becker and Otter Tail Counties and the City of Detroit Lakes.</td>
<td>2026-2029</td>
<td>$15,000</td>
<td>L</td>
</tr>
</tbody>
</table>
4.2.3 Groundwater

**Goal:** Ensure groundwater supply is sustainable.

**Objective A.** Reduce groundwater withdrawal.

1. Through the Becker County technical advisory committee, annually review Conditional Use Permits, Environmental Assessment Worksheets and Environmental Impact Statement applications for large-scale projects involving industrial water use and potential groundwater withdrawal/aquifer alterations, such as gravel extraction in the Pearl-Loon and Long Lake LWQMA.
   - **Location:** Becker County
   - **Partners:** Becker County, MDNR, Becker County SWCD
   - **Funding:** $20,000.
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Fulfill Becker County technical advisory committee responsibilities (e.g., attend meetings, review permits, etc.).

2. Increase efficiency of agricultural water use by contacting five agricultural landowners about adoption of low-pressure irrigation systems, use of precision weather data to estimate crop needs, and planting of drought-tolerant crops.
   - **Location:** Watershed-wide
   - **Partners:** Becker County SWCD, Otter Tail County SWCD, MDA
   - **Funding:** $2,000
   - **Timeline:** 2027-2028
   - **Priority level:** As opportunities arise
   - **Measure of success:** Contact with five agricultural landowners about topics above.

3. Assist with contacting landowners and making flyers to advertise irrigation workshops and other groundwater-related workshops sponsored by the MDA, Becker County SWCD and Otter Tail County SWCD.
   - **Location:** Watershed-wide
   - **Partners:** Otter Tail and Becker SWCDs, MDA
   - **Funding:** $2,000
   - **Timeline:** 2022-2029
   - **Priority level:** As opportunities arise
   - **Measure of success:** One advertisement or landowner contact per irrigation workshop.

**Objective B.** Increase groundwater recharge.

1. Maintain cost-share program for installation of stormwater management BMPs, including BMPs that encourage infiltration.
   - **Location:** Watershed-wide
   - **Partners:** Permit applicants (commercial, government and non-government organizations), Becker SWCD
2. Explore opportunities for potential cisterns/water reuse systems, especially on community athletic fields, golf courses, and other venues that both irrigate and have impervious surface.
   - **Location**: Watershed-wide
   - **Partners**: MPCA, MDNR
   - **Funding**: $5,000
   - **Timeline**: 2020-2025
   - **Priority level**: Medium
   - **Measure of success**: Spend 32 hours of staff time exploring opportunities and summarizing findings in memo.

3. Implement a water reuse project (as described above) if funding arises.
   - **Location**: To be determined
   - **Partners**: City of Detroit Lakes, MPCA, MDH, MDNR, local golf courses, businesses and municipal buildings
   - **Funding**: $100,000
   - **Timeline**: 2022-2029
   - **Priority level**: Medium
   - **Measure of success**: Completion of water reuse project.

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**Table 4-8. Groundwater- Actions Summary & Schedule.**

Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Objective A. Reduce groundwater withdrawal.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Review Conditional Use Permits, Environmental Assessment Worksheets and Environmental Impact Statements for projects involving groundwater through the Becker County TAC.</td>
<td>2020-2029</td>
<td>$20,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Increase efficiency of agricultural water use by contacting five agricultural landowners about sustainable water practices.</td>
<td>2027-2028</td>
<td>$2,000</td>
<td>L</td>
</tr>
<tr>
<td>A3</td>
<td>Assist with advertising irrigation workshops and other groundwater-related workshops sponsored by the MDA, Becker County SWCD and Otter Tail County SWCD.</td>
<td>2022-2029</td>
<td>$2,000</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td><strong>Objective B. Increase groundwater recharge.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Maintain cost-share program for installation of stormwater BMPs, including BMPs that encourage infiltration.</td>
<td>2020-2029</td>
<td>$200,000</td>
<td>H</td>
</tr>
<tr>
<td>B2</td>
<td>Explore opportunities for potential cisterns/ water reuse systems.</td>
<td>2020-2025</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>B3</td>
<td>Implement a water reuse project (as described in B2) if funding arises.</td>
<td>2022-2029</td>
<td>$100,000</td>
<td>M</td>
</tr>
</tbody>
</table>
4.3 ECOLOGICAL INTEGRITY

4.3.1 Aquatic Invasive Species

**Goal:** Prevent establishment of new invasive species and manage invasive species that already exist in the watershed.

**Objective A.** Manage priority invasive species using the best available methods and technology.

1. Update and implement the flowering rush management plan on infested waters to maintain less than 2 percent occurrence in littoral zone.
   - **Location:** Detroit, Sallie, Melissa Lakes
   - **Partners:** MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding:** $800,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Less than 2 percent occurrence of flowering rush in littoral zones of Detroit, Sallie and Melissa Lakes.

2. Conduct or continue chemical and mechanical treatments to control curly-leaf pondweed infestations, so that frequency of occurrence, biomass, and turion product can be reduced by 90 percent.
   - **Location:** Detroit, Sallie, Melissa Lakes
   - **Partners:** MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding:** $800,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** 90 percent reduction in occurrence of curly-leaf pondweed in Detroit, Sallie and Melissa Lakes.

3. Continue the aquatic plant roadside pickup program for Detroit, Sallie, Melissa, and Curfman Lakes.
   - **Location:** Detroit, Sallie, Melissa, and Curfman Lakes
   - **Partners:** AIS Experts (Universities, Researchers, etc), MDNR
   - **Funding:** $200,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Weekly roadside pickup services provided from June through September.

4. Develop readiness response plans for priority invasive species.
   - **Location:** Watershed-wide
   - **Partners:** MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding:** $200,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Completion of a Rapid Response Plan document with a plan for each priority invasive species.

5. Provide readiness response treatments if necessary.
Objective B. Monitor for new invasive species.

1. Survey submerged aquatic vegetation, including aquatic invasive species, on Lakes Floyd, Little Floyd, Detroit, Curfman, Long, Sallie, Melissa, Pearl and other identified lakes if needed.
   - **Location**: Floyd, Little Floyd, Detroit, Curfman, Long, Sallie, Melissa Lakes
   - **Partners**: MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding**: $400,000
   - **Timeline**: 2020-2029
   - **Priority level**: High
   - **Measure of success**: Completion of at least two aquatic vegetation surveys on each of the above lakes in 10 years.

2. Amend standard monitoring protocol to include monthly inspections of boat access points and additional areas for starry stonewort or other new invasive species.
   - **Location**: Boat access points and other key areas
   - **Partners**: Becker County, Becker County SWCD, MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding**: $1,000

6. Manage zebra mussels and Chinese Mystery Snails on Lakes Floyd, Little Floyd, Sallie, Melissa, Detroit and Curfman, and other lakes that may become infested using methods devised by the University of Minnesota and other AIS Experts (Universities, Researchers, etc).
   - **Location**: Sallie, Melissa, Detroit, Floyd, Curfman Lakes
   - **Partners**: MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding**: $1,000,000
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Completion of zebra mussel management activities on one or several of the above lakes.

7. Conduct research to identify alternative treatment practices for flowering rush (to prevent resistance to existing chemical treatment products).
   - **Location**: Detroit, Sallie, Melissa Lakes
   - **Partners**: AIS Experts (Universities, Researchers, etc)
   - **Funding**: $500,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Completion of report summarizing alternative treatment practices, as well as pros and cons.
Objective C. Stay current with new management strategies and aquatic invasive species research.

1. Continue to attend and present at aquatic invasive species workshops and conferences.
   - **Location**: Watershed-wide
   - **Partners**: MDNR, AIS Experts (Universities, Researchers, etc)
   - **Funding**: $15,000
   - **Timeline**: 2020-2029
   - **Priority level**: High
   - **Measure of success**: At least one conference (attending or presenting) per year.

2. Continue communications and develop a research partnership with University of Minnesota’s Aquatic Invasive Species Center, as well as other research centers and institutions.
   - **Location**: Watershed-wide
   - **Partners**: AIS Experts (Universities, Researchers, etc), MDNR
   - **Funding**: $75,000
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Meet with Aquatic Invasive Species Center staff at least once per year and if possible, also collaborate on one of their studies.

Table 4-9. Aquatic Invasive Species- Actions Summary & Schedule.
Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Implement the flowering rush management plan on infested waters to achieve less than 2% occurrence.</td>
<td>2020-2029</td>
<td>$800,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Conduct/continue curly-leaf pondweed treatment to reduce frequency of occurrence by 90%.</td>
<td>2020-2029</td>
<td>$800,000</td>
<td>H</td>
</tr>
<tr>
<td>A3</td>
<td>Continue the aquatic plan roadside pickup program.</td>
<td>2020-2029</td>
<td>$200,000</td>
<td>H</td>
</tr>
<tr>
<td>A4</td>
<td>Develop readiness response plans for priority invasive species.</td>
<td>2020-2029</td>
<td>$200,000</td>
<td>H</td>
</tr>
<tr>
<td>A5</td>
<td>Provide readiness response treatments if necessary.</td>
<td>2020-2029</td>
<td>$5,000,000</td>
<td>H</td>
</tr>
<tr>
<td>#</td>
<td>Action</td>
<td>Year</td>
<td>Cost</td>
<td>Priority</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------------------------</td>
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<td>----------</td>
</tr>
<tr>
<td>A6</td>
<td>Manage zebra mussels and Chinese Mystery Snails on infested waters using methods devised by the University of Minnesota.</td>
<td>2020-2029</td>
<td>$1,000,000</td>
<td>M</td>
</tr>
<tr>
<td>A7</td>
<td>Conduct research to identify alternative treatment practices for flowering rush.</td>
<td>2020-2029</td>
<td>$500,000</td>
<td>L</td>
</tr>
</tbody>
</table>

Objective B. Monitor for new invasive species.

| B1 | Survey submerged aquatic vegetation, including aquatic invasive species, on Lakes Floyd, Little Floyd, Curfman, Long, Sallie and Melissa. | 2020-2029  | $400,000  | H        |
| B2 | Amend standard monitoring protocol to include monthly inspections of boat access points and additional areas for starry stonewort or other new invasive species. | 2020-2021  | $1,000    | L        |

Objective C. Stay current with new management strategies and aquatic invasive species research.

| C1 | Continue to attend and present at aquatic invasive species workshops and conferences. | 2020-2029  | $15,000   | H        |
| C2 | Continue communications and develop a research partnership with University of Minnesota’s Aquatic Invasive Species Center and other institutions. | 2020-2029  | $75,000   | L        |

### 4.3.2 Wildlife Habitat

**Goal:** Protect, enhance and restore wildlife habitat.

**Objective A.** Search for opportunities to partner on multi-benefit projects that will enhance water quality and create new wildlife habitat.

1. Maintain cost-share program for lakeshore landowners to convert shoreline turf grass to "lake-friendly" buffer that tolerates fluctuating lake levels.
   - **Location:** Watershed-wide lakeshore
   - **Partners:** Becker County SWCD, MDNR, lake associations
   - **Funding:** $50,000 (~$500/site)
   - **Timeline:** 2020-2029
   - **Priority levels:** High
   - **Measure of success:** Fund at least 20 projects in 10 years

2. Maintain cost-share program for installation of stormwater management BMPs such as rain gardens, which provide pollinator habitat.
   - **Location:** Watershed-wide
   - **Partners:** Permit applicants (commercial, government and non-government organizations), Becker County SWCD
   - **Funding:** $20,000/yr.
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Fund at least one project per year.
3. Design and complete the Rice Lake Wetland restoration project, which will create new wildlife habitat.
   - **Location**: Rice Lake Wetland
   - **Partners**: NRCS, MDNR, MPCA, BWSR
   - **Funding**: $2.5 million
   - **Timeline**: 2020-2022
   - **Priority level**: High
   - **Measure of success**: Completion of Rice Lake Wetland restoration project.

4. Encourage wildlife and pollinator-friendly seed mixes and plantings in buffers or linear projects.
   - **Location**: Watershed-wide
   - **Partners**: MnDOT, BWSR, Becker County SWCD
   - **Funding**: $5,000
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Note that wildlife-friendly seed mixes should be used in every permit review involving buffers or linear projects.

5. Assist in enforcing the new Minnesota Buffer Law as appropriate.
   - **Location**: Watershed-wide
   - **Partners**: MDNR, U.S. Fish & Wildlife Service, Pheasants Forever, BWSR
   - **Funding**: $50,000
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: 100 percent landowner compliance with the Minnesota Buffer Law.

6. Prevent habitat degradation and fragmentation through conversations with MDNR staff about their activities and how the District can help.
   - **Location**: Watershed-wide
   - **Partners**: MDNR
   - **Funding**: $5,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Contact MDNR at least once per year.
Table 4-10. Wildlife Habitat- Actions Summary & Schedule. Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Maintain cost-share program for converting shoreline turf grass to lake-friendly buffer.</td>
<td>2020-2029</td>
<td>$500,000 (~$500/Site)</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Maintain cost-share program for installation of stormwater BMPs such as rain gardens, which provide pollinator habitat.</td>
<td>2020-2029</td>
<td>$200,000</td>
<td>H</td>
</tr>
<tr>
<td>A3</td>
<td>Design and complete the Rice Lake Wetland restoration project.</td>
<td>2020-2022</td>
<td>$2,500,000</td>
<td>H</td>
</tr>
<tr>
<td>A4</td>
<td>Encourage wildlife and pollinator-friendly seed mixes and plantings in buffers or linear projects.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>A5</td>
<td>Assist in enforcing the new Minnesota Buffer Law as appropriate.</td>
<td>2020-2029</td>
<td>$50,000</td>
<td>M</td>
</tr>
<tr>
<td>A6</td>
<td>Prevent habitat degradation and fragmentation through conversations with MDNR staff.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>L</td>
</tr>
</tbody>
</table>

Objective A. Search for opportunities to partner on multi-benefit projects that will enhance water quality and create new wildlife habitat.

4.3.3 Fish Communities

**Goal:** Maintain healthy fish communities.

Objective A. Prioritize areas for aquatic habitat protection.

1. Through the Ottertail WRAPS Cycle 2, assess the following streams for index of biological integrity (IBI): Campbell Creek, Pelican River and Sucker Creek.
   - **Location:** Campbell Creek, Pelican River, Sucker Creek
   - **Partners:** MPCA, MDNR, Becker County SWCD, Otter Tail SWCD
   - **Funding:** $100,000
   - **Timeline:** 2026- 2027
   - **Priority level:** High
   - **Measure of success:** Obtain IBI values for the streams above.

2. Develop an assessment program to identify priority areas (reaches, lakes, wetlands) for aquatic habitat protection.
   - **Location:** Watershed-wide
   - **Partners:** MDNR
   - **Funding:** $15,000
   - **Timeline:** 2025- 2027
   - **Priority level:** As opportunities arise
Objective B. Protect, enhance, and restore fish habitat, especially when projects have multiple benefits that meet District objectives.

1. Utilize completed studies to identify river segments for complete connection (e.g., dam removal, fish passage improvements at road culverts), partial connection (e.g., barriers for certain taxa or life stages, seasonal barriers), or no connectivity (e.g., maintain natural barriers, construct/maintain artificial barriers).
   - **Location:** Watershed-wide
   - **Partners:** MDNR, MPCA, University of Minnesota
   - **Funding:** $100,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Identification of river segments needing changes.

2. Conduct a feasibility study to prioritize practices identified in the river ecosystem connectivity study (above).
   - **Location:** Watershed-wide
   - **Partners:** MDNR, MPCA, University of Minnesota
   - **Funding:** $100,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Completion of feasibility study.

3. Implement the priority recommendations from the river ecosystem connectivity feasibility study (above).
   - **Location:** To be determined
   - **Partners:** MDNR, MPCA, University of Minnesota
   - **Funding:** $100,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Implementation of at least five recommended practices.

4. Prevent the introduction of invasive species and manage existing invasive species to support healthy ecosystems for fisheries.
   - **Location:** Watershed-wide
   - **Partners:** MDNR, University of Minnesota
   - **Funding:** $100,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Implementation of invasive species management action items, listed above in Section 4.3.1.

5. Promote aquatic vegetation species diversity and density to support ecosystem health and fish habitat.
   - **Location:** Watershed-wide
6. Start a cost-share program to remove seawalls and install shoreline practices that provide or promote aquatic habitat.
   - **Location**: Watershed-wide shoreline
   - **Partners**: Becker County SWCD, Otter Tail County SWCD, Becker County, City of Detroit Lakes, BWSR
   - **Funding**: $50,000
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Fund at least five projects.

7. Incorporate fish spawning areas into projects when feasible.
   - **Location**: Watershed-wide
   - **Partners**: MDNR
   - **Funding**: $5,000
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Construction of a fish spawning area during at least one project.

8. Assist the MDNR in replacing the weir on Little Floyd Lake with rock rapids.
   - **Location**: Little Floyd Lake
   - **Partners**: MDNR, BWSR
   - **Funding**: $50,000
   - **Timeline**: 2025-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Replacement of weir with rock rapids.

9. Assist the MDNR in replacing Bucks Mill Dam with rock rapids.
   - **Location**: Mill Pond/Buck Lake
   - **Partners**: MDNR, BWSR
   - **Funding**: TBD (~$2,000,000)
   - **Timeline**: 2020-2029
   - **Priority level**: As opportunities arise
   - **Measure of success**: Replacement of Bucks Mill Dam with rock rapids.
Table 4-11. Fish Communities- Actions Summary & Schedule.
Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Objective A. Prioritize areas for aquatic habitat protection.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Through the Ottertail WRAPS Cycle 2, assess the following streams for index of biological integrity (IBI): Campbell Creek, Pelican River and Sucker Creek.</td>
<td>2020-2021</td>
<td>$100,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Develop an assessment program to identify priority areas (reaches, lakes, wetlands) for aquatic habitat protection.</td>
<td>2025-2027</td>
<td>$15,000</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>Objective B. Protect, enhance, and restore fish habitat, especially when projects have multiple benefits that meet District objectives.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Conduct a study to assess river ecosystem connectivity and identify river segments that need more or less connectivity.</td>
<td>2020-2029</td>
<td>$100,000</td>
<td>H</td>
</tr>
<tr>
<td>B2</td>
<td>Conduct a feasibility study to prioritize practices identified during the river ecosystem connectivity study (see B1).</td>
<td>2020-2029</td>
<td>$100,000</td>
<td>H</td>
</tr>
<tr>
<td>B3</td>
<td>Implement the priority recommendations from the river ecosystem connectivity feasibility study (see B2).</td>
<td>2024-2029</td>
<td>$100,000</td>
<td>H</td>
</tr>
<tr>
<td>B4</td>
<td>Prevent the introduction of invasive species and manage existing invasive species to support healthy ecosystem for fisheries.</td>
<td>2020-2029</td>
<td>$100,000</td>
<td>H</td>
</tr>
<tr>
<td>B5</td>
<td>Promote aquatic vegetation species diversity and density to support ecosystem health and fish habitat.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>B6</td>
<td>Start a cost-share program to remove seawalls and install shoreline practices that provide fish habitat.</td>
<td>2020-2029</td>
<td>$50,000 (~$10,000/Site)</td>
<td>M</td>
</tr>
<tr>
<td>B7</td>
<td>Incorporate fish spawning areas into projects when feasible.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>L</td>
</tr>
<tr>
<td>B8</td>
<td>Assist the MDNR in replacing the weir on Little Floyd Lake with rock rapids.</td>
<td>2025-2029</td>
<td>$50,000</td>
<td>L</td>
</tr>
<tr>
<td>B9</td>
<td>Assist the MDNR in replacing Bucks Mill Dam with rock rapids.</td>
<td>2020-2029</td>
<td>TBD (~$2,000,000)</td>
<td>M</td>
</tr>
</tbody>
</table>
4.4 ADMINISTRATION AND EDUCATION

4.4.1 General Administration

**Goal:** Provide efficient and effective administrative services.

**Objective A.** Improve water resources by enhancing and refining administrative procedures.

1. **Enhance local intra-agency administration effectiveness through semi-annual meetings, service delivery agreements, memoranda of understanding, administrative procedures, process methods and timelines and other collaborative opportunities.**
   - **Location:** Watershed-wide
   - **Partners:** Becker County, Becker County SWCD, Otter Tail County SWCD, City of Detroit Lakes, MDNR, MPCA, BWSR, lake associations
   - **Funding:** $10,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** At least three intra-agency enhancement activities (such as those mentioned above) per year.

2. **Assess permitting application procedures; then identify and implement solutions to better streamline permitting application procedures and to better coordinate with other local governments.**
   - **Location:** Watershed-wide
   - **Partners:** Becker County, Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, BWSR
   - **Funding:** $50,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Identification and implementation of at least three strategies for the permit application process.

3. **Develop software to facilitate permit application and approval process.**
   - **Location:** Watershed-wide
   - **Partners:** Becker County, City of Detroit Lakes
   - **Funding:** $45,000 ($20,000 for package; $2,000 for annual maintenance)
   - **Timeline:** 2024-2025
   - **Priority Level:** High
   - **Measure of success:** Development and implementation of permitting software.

4. **Sponsor regular events such as workshops, seminars, and brown bags for LGU staff, developers, and other interested parties to provide practical information and opportunities for sharing experiences.**
   - **Location:** Watershed-wide
   - **Partners:** Becker County, Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, BWSR and affected stakeholders
   - **Funding:** $100,000
5. Continually update the District’s website, Facebook page, and other social media outlets.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, BWSR
   - **Funding**: $30,000
   - **Timeline**: 2020-2029
   - **Priority level**: High
   - **Measure of success**: Website update at least once per year; Facebook post at least once per month.

6. Utilize a Technical Advisory Committee (TAC) to engage local, state and federal government agencies and stakeholders.
   - **Location**: Watershed-wide
   - **Partners**: BWSR, MDNR, Becker County SWCD, Otter Tail County SWCD, City of Detroit Lakes, stakeholders
   - **Funding**: $5,000
   - **Timeline**: 2020-2029
   - **Priority level**: High
   - **Measure of success**: Convene a monthly TAC meeting.

7. Establish a baseline resource risk analysis through assessment of targeted lakesheds, based on predetermined criteria such as percent impervious, slope, development pressure, impairments, etc.
   - **Location**: Targeted lakes (and lakesheds), to be determined
   - **Partners**: Becker County, Becker County SWCD, Otter Tail County SWCD, City of Detroit Lakes, landowners
   - **Funding**: $250,000
   - **Timeline**: 2024-2029
   - **Priority level**: Medium
   - **Measure of success**: Completion of resource risk analysis report.

8. Develop a stormwater certification program to ensure contractors and developers are aware of regulations, rules and ordinances pertaining to water quality and quantity issues.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, MPCA, Becker Zoning Administration, City of Detroit Lakes
   - **Funding**: $10,000
   - **Timeline**: 2020-2029
   - **Priority level**: Medium
   - **Measure of success**: Development of contractor certification program and at least five contractors certified.

9. As projects develop (e.g., gravel mining, subdivisions), continue to provide technical input in order to protect surface water and groundwater.
   - **Location**: Watershed-wide
10. Develop and maintain an inventory of District-owned or financed stormwater management facilities, including facility locations, characteristics, and maps.
   - **Location**: Watershed-wide
   - **Partners**: BWSR, City of Detroit Lakes, stakeholders
   - **Funding**: $30,000
   - **Timeline**: 2020-2021
   - **Priority level**: Medium
   - **Measure of success**: Development of stormwater facility inventory.

**Objective B.** Improve water resources by developing new District rules or refining existing rules.

1. Refine rules to restrict new developments from increasing the volume or rate of runoff leaving a site.
   - **Location**: Watershed-wide
   - **Partners**: City of Detroit Lakes, Becker County Zoning Administration
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020-2021
   - **Priority level**: High
   - **Measure of success**: Publication of new rules and standards with the above refinement.

2. Refine rules to prevent building or filling in the 100-year floodplain.
   - **Location**: Watershed-wide
   - **Partners**: City of Detroit Lakes, MDNR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020-2021
   - **Priority level**: High
   - **Measure of success**: Publication of new rules and standards with the above refinement.

3. Ensure that rules support the Becker County Shoreland Ordinance, the City of Detroit Lakes Shoreland Ordinance, the MS4 Ordinance, and the City of Detroit Lakes Wellhead Protection Plan.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, Becker County Zoning Administration, BWSR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020-2021
   - **Priority level**: High
   - **Measure of success**: Publication of new rules and standards with the above refinement.
4. Ensure that rules reflect Minnesota Buffer Law enforcement responsibilities.
   - **Location**: Watershed-wide
   - **Partners**: BWSR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020- 2021
   - **Priority level**: High
   - **Measure of success**: Publication of new rules and standards with the above refinement.

5. Consider developing rules to require wetland buffers and/or structure setbacks from wetland edge.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, City of Detroit Lakes, MDNR, Becker County Zoning Administration, BWSR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020- 2021
   - **Priority level**: High
   - **Measure of success**: Consideration of this topic during the rule revision process, and if appropriate, a revised rule.

6. Consider developing rules to protect groundwater.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, Becker County Zoning Administration, BWSR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020- 2021
   - **Priority level**: Medium
   - **Measure of success**: Consideration of this topic during the rule revision process, and if appropriate, a revised rule.

7. Consider adopting and enforcing a standard for minimum low floor elevation of buildings.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, Becker County Zoning Administration, BWSR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020- 2021
   - **Priority level**: Medium
   - **Measure of success**: Consideration of this topic during the rule revision process, and if appropriate, a revised rule.

8. Consider a filtration requirement for wellhead protection areas.
   - **Location**: Watershed-wide
   - **Partners**: Becker County SWCD, City of Detroit Lakes, MDNR, MPCA, Becker County Zoning Administration, BWSR
   - **Funding**: $15,000 for total rule revision
   - **Timeline**: 2020- 2021
   - **Priority level**: Medium
   - **Measure of success**: Consideration of this topic during the rule revision process, and if appropriate, a revised rule.
Table 4-12. General Administration Actions Summary & Schedule.  
Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Enhance local intra-agency administration effectiveness through meetings, agreements, procedures, etc.</td>
<td>2020-29</td>
<td>$10,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Identify and implement solutions to streamline permit application process.</td>
<td>2020-29</td>
<td>$50,000</td>
<td>H</td>
</tr>
<tr>
<td>A3</td>
<td>Develop software to facilitate permitting process.</td>
<td>2020-29</td>
<td>$45,000</td>
<td>H</td>
</tr>
<tr>
<td>A4</td>
<td>Sponsor regular events to facilitate exchange of practical information.</td>
<td>2020-29</td>
<td>$100,000</td>
<td>H</td>
</tr>
<tr>
<td>A5</td>
<td>Continually update the District’s website and social media pages.</td>
<td>2020-29</td>
<td>$30,000</td>
<td>H</td>
</tr>
<tr>
<td>A6</td>
<td>Utilize a Technical Advisory Committee.</td>
<td>2020-29</td>
<td>$5,000</td>
<td>H</td>
</tr>
<tr>
<td>A7</td>
<td>Perform a baseline resource risk analysis of targeted lakesheds.</td>
<td>2024-29</td>
<td>$250,000</td>
<td>M</td>
</tr>
<tr>
<td>A8</td>
<td>Develop a stormwater certification program for contractors and developers.</td>
<td>2020-29</td>
<td>$10,000</td>
<td>M</td>
</tr>
<tr>
<td>A9</td>
<td>Provide technical input to development projects.</td>
<td>2020-29</td>
<td>$2,000</td>
<td>M</td>
</tr>
<tr>
<td>A10</td>
<td>Develop and maintain inventory of District-owned or financed stormwater management facilities.</td>
<td>2020-25</td>
<td>$30,000</td>
<td>M</td>
</tr>
</tbody>
</table>

Objective A. Improve water resources by enhancing and refining administrative procedures.

Objective B. Improve water resources by developing new District rules or refining existing rules.
4.4.2 Education

**Goal:** Provide effective education services for the purpose of improving water resources.

**Objective A.** Improve water resources through programs and practices that encourage residents and businesses to reduce their phosphorus “footprints,” reduce stormwater runoff volume, and enhance ecosystem health through other means.

1. Continue an education program that promotes a basic understanding of watershed principles and consists of 12 social media posts per year, 12 radio interviews by District employees per year, 6 educational talks to community groups per year, 1 message to Detroit Lakes residents per year (included in city utility bills), and 1 mailing to Becker County residents every 10 years (included in tax statements).
   - **Location:** Watershed-wide
   - **Partners:** Becker County Coalition of Lake Associations, City of Detroit Lakes, Becker County SWCD
   - **Funding:** $20,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** 12 social media posts/yr., 12 radio interviews/yr., 6 educational talks/yr., 1 Detroit Lakes message/yr., and 1 Becker County mailing/10 yrs.

2. Post educational signs near the Rice Lake Wetland restoration project about the purpose of the project.
   - **Location:** Rice Lake Wetland
   - **Partners:** BWSR, MDNR
   - **Funding:** $5,000
   - **Timeline:** 2020-2021
   - **Priority level:** High
   - **Measure of success:** Informational signs posted.

3. Provide information on the District’s website about District-owned or financed stormwater management facilities and their importance in meeting District goals.
   - **Location:** Watershed-wide
   - **Partners:** BWSR, MDNR, Becker County SWCD, Otter Tail County SWCD, City of Detroit Lakes, stakeholders
   - **Funding:** $2,000
   - **Timeline:** 2020-2029
   - **Priority level:** High
   - **Measure of success:** Website updated with appropriate information.

4. Pilot an outreach program to encourage targeted properties with the greatest phosphorus load and runoff volume reduction potential to implement BMPs that reduce load and runoff. Targeted groups could include fully developed commercial properties, multi-family housing properties and government properties.
5. Conduct door-to-door outreach two days per year in which educational materials are distributed and discussed, and on-site phosphorus reduction assessments are provided to residents if desired. District incentives for phosphorus reduction should also be discussed.
   - **Location:** Watershed-wide
   - **Partners:** MPCA, BWSR, affected stakeholders
   - **Funding:** $20,000
   - **Timeline:** 2024-2029
   - **Priority level:** Medium
   - **Measure of success:** Two days of door-to-door visits per year.

6. Assist with the Sucker Creek education program at least twice per year to increase watershed literacy among high school students and to help students understand the unique function of Sucker Creek.
   - **Location:** Sucker Creek
   - **Partners:** Detroit Lakes High School, City of Detroit Lakes, MPCA, Red River Basin Institute
   - **Funding:** $2,000
   - **Timeline:** 2020-2029
   - **Priority level:** Medium
   - **Measure of success:** Assistance with two educational events per year.

7. Hold three rain garden or rain barrel workshops, potentially partnering with Blue Thumb.
   - **Location:** Watershed-wide
   - **Partners:** Community Ed
   - **Funding:** $3,000
   - **Timeline:** 2021-2027 (once every three years)
   - **Priority level:** Medium
   - **Measure of success:** Three rain barrel workshops hosted.

8. Develop and post signage to identify lakes, streams and high-quality wetland complexes by name throughout the District.
   - **Location:** Watershed-wide
   - **Partners:** Becker County, City of Detroit Lakes
   - **Funding:** $5,000
   - **Timeline:** 2025-2026
   - **Priority level:** Medium
   - **Measure of success:** At least 20 signs posted.
9. Conduct one BMP workshop per year for stakeholders.
   o **Location**: Watershed-wide
   o **Partners**: City of Detroit Lakes, Becker County, BCSWCD, MDNR
   o **Funding**: $10,000
   o **Timeline**: 2020-2029
   o **Priority level**: Medium
   o **Measure of success**: One workshop per year conducted.

10. Host or support attendance of an Aqua Chautauqua, a water-focused festival with artists, politicians, spiritual leaders, etc., to increase public awareness of water resources issues, including the importance of groundwater.
    o **Location**: Watershed-wide
    o **Partners**: Otter Tail County, Minnesota Extension, Chamber of Commerce, Becker and Otter Tail County Libraries, local artists, members of the public
    o **Funding**: $5,000
    o **Timeline**: 2020-2029
    o **Priority level**: As opportunities arise
    o **Measure of success**: Aqua Chautauqua hosted, or at least advertised.

11. Develop a salt/chloride education program, in collaboration with other entities responsible for de-icing, using targeted marketing approaches, including at least three Facebook posts during winter and one “All Over Media” workshop for businesses.
    o **Location**: Watershed-wide
    o **Partners**: MnDOT, MPCA, City of Detroit Lakes, Becker County, Townships, large campuses (e.g., colleges)
    o **Funding**: $5,000
    o **Timeline**: 2020-2025
    o **Priority level**: As opportunities arise
    o **Measure of success**: At least three Facebook posts and one “All Over Media” workshop hosted.

**Objective B.** Maximize visibility and public use of data collected by the District.

1. Utilize the District’s website and social media sites to distribute data that the District has collected.
   o **Location**: Watershed-wide
   o **Partners**: MPCA, MDNR
   o **Funding**: $2,000
   o **Timeline**: 2020-2029
   o **Priority level**: High
   o **Measure of success**: Data from every year of monitoring available on website.

2. Develop reports and educational materials with the data the District has collected to convey resource conditions and trends to the public, policymakers and stakeholders.
   o **Location**: Watershed-wide
   o **Partners**: MPCA, MDNR
- Funding: $10,000
- Timeline: 2020-2029
- Priority level: High
- Measure of success: Each year, produce annual monitoring report and at least two types of educational materials that summarize findings from annual monitoring report.

**Table 4-13. Education Actions Summary & Schedule.**
Green cells with “H” indicate high priority items, orange cells with “M” indicate medium priority items, and red cells with “L” indicate “as opportunities arise” items.

<table>
<thead>
<tr>
<th>#</th>
<th>Action</th>
<th>Year</th>
<th>Cost</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Continue education program, including social media, radio interviews, talks, mailings.</td>
<td>2020-2029</td>
<td>$20,000</td>
<td>H</td>
</tr>
<tr>
<td>A2</td>
<td>Post educational signs at the Rice Lake Wetland restoration project.</td>
<td>2020-2021</td>
<td>$5,000</td>
<td>H</td>
</tr>
<tr>
<td>A3</td>
<td>Add stormwater facility info. to District website.</td>
<td>2020-2029</td>
<td>$2,000</td>
<td>H</td>
</tr>
<tr>
<td>A4</td>
<td>Pilot a phosphorus/ runoff reduction outreach program.</td>
<td>2024-2029</td>
<td>$20,000</td>
<td>M</td>
</tr>
<tr>
<td>A5</td>
<td>Conduct door-to-door outreach two days per year.</td>
<td>2020-2029</td>
<td>$20,000</td>
<td>M</td>
</tr>
<tr>
<td>A6</td>
<td>Assist with Sucker Creek education program.</td>
<td>2020-2029</td>
<td>$2,000</td>
<td>M</td>
</tr>
<tr>
<td>A7</td>
<td>Hold three rain garden/rain barrel workshops.</td>
<td>2021-2027</td>
<td>$3,000</td>
<td>M</td>
</tr>
<tr>
<td>A8</td>
<td>Post signage to identify lakes, streams and wetlands.</td>
<td>2025-2029</td>
<td>$5,000</td>
<td>M</td>
</tr>
<tr>
<td>A9</td>
<td>Conduct one BMP workshop per year for stakeholders.</td>
<td>2020-2029</td>
<td>$10,000</td>
<td>M</td>
</tr>
<tr>
<td>A10</td>
<td>Host or support attendance of Aqua Chautauqua, a water-focused festival.</td>
<td>2020-2029</td>
<td>$5,000</td>
<td>L</td>
</tr>
<tr>
<td>A11</td>
<td>Develop a salt application education program.</td>
<td>2020-2025</td>
<td>$5,000</td>
<td>L</td>
</tr>
</tbody>
</table>

Objective A: Improve water resources through programs/practices that encourage residents and businesses to reduce their phosphorus “footprints,” reduce stormwater runoff volume, and enhance ecosystem health through other means.

Objective B: Maximize visibility and public use of data collected by the District.

| B1 | Put data on website and social media.                                  | 2020-2029  | $2,000 | H        |
| B2 | Develop data reports.                                                  | 2020-2029  | $10,000 | H        |
5.0 Implementation Programs

This chapter summarizes the activities that the District seeks to accomplish during the life of this RWMP, including ongoing projects, programs, studies, and other activities. Section 5.1 describes how the District operates, such as the how the District handles advisory committees, funding, and RWMP updates. These operations are what enables success of the District’s implementation program, or action plan. Section 5.2 describes the District’s implementation program, including regulation and enforcement activities, monitoring activities, and capital improvement projects.

5.1 DISTRICT OPERATIONS

5.1.1 District Administration

A seven-person Board of Managers and three full-time employees comprise the District’s administration. The seven Managers are appointed by the Becker County Commissioners and each represent distinct geographic areas within the District. Each Manager serves a three-year term but can be reappointed indefinitely. The District’s three full-time employees include the Administrator, who oversees daily operations and represents the District on numerous state-wide committees; the Water Resource Coordinator, who assists with the District’s permitting, water monitoring, and outreach programs; and the Office Coordinator, who manages payroll and bookkeeping activities and assists with other day-to-day District operations. In addition, the District hires seasonal employees to assist with the summer monitoring program and the roadside aquatic plant pick-up program. Finally, the District contracts services of an engineering consultant, a legal advisor and an accounting firm.

5.1.2 Collaboration with Other Units of Government and Partners

Success in addressing the priority concerns within the plan area cannot be achieved solely by the District, but requires coordination with state agencies, federal agencies, non-profit organizations, private entities, and individuals residing within and beyond the District’s boundary (Table 5-1). The District coordinates with federal and state agencies such as BWSR, MDNR, MPCA, MnDOT, MDH, MDA, and the U.S. Army Corps of Engineers, sometimes due to legislative and permit requirements. The District also coordinates with other local units of government, such as municipalities, soil and water conservation districts, township boards, county boards, watershed district boards, and joint powers boards. These include, but are not limited to, City of Detroit Lakes, Becker County, Becker SWCD, Otter Tail County, and Otter Tail SWCD. The District also works with many other partners, including schools, universities, lake associations, service organizations, non-profit organizations, and sporting clubs. The District often works with these entities to host public education events and workshops relating to water quality, groundwater, soil health, aquatic ecosystem health, climate change or urban development. These partners include, but are not limited to, the University of Minnesota Aquatic Invasive Species Research Center, Detroit Lakes Public Schools, the Isaac Walton League- Prairie Woods Chapter, Friends of Sucker Creek Preserve, and the Becker, Hubbard and Otter Tail Counties’ Coalitions of Lake Associations.

Coordination with these partners, from federal agencies to local non-profit organizations, is necessary to facilitate watershed-wide activities, considering there is significant overlap.
between the District’s objectives and those of each collaborating organization. The District will continue to foster an environment that enhances administrative and technical cooperation and coordination with other organizations. This may include serving as a fiscal and administrative agent for collaborative project grants, convening committee meetings, preparing work plans, preparing annual fiscal reports, preparing and submitting grant applications, or compiling annual results for assessments.

Table 5-1. PRWD collaborators and explanation of how collaboration occurs.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Water Management Activities in District</th>
<th>Examples of District Interaction with Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDNR</td>
<td>Responsible for public waters, oversees shoreland standards, enhances fisheries, supervises aquatic plant management/AIS, enhances wildlife, conducts data collection, has MDNR groundwater management areas</td>
<td>Reviews permit applications, coordinates Rules with shoreland regulations, obtains assistance for hydrological measurements and modelling, provides data, coordinate aquatic plant and AIS prevention/research/response/management, collaborates on habitat enhancements, assists with writing lake management plans</td>
</tr>
<tr>
<td>MDH</td>
<td>City of Detroit Lakes wellhead protection planning, MDH Well Management Program (public health &amp; groundwater), construction of new wells and borings, sealing of unused wells and borings</td>
<td>Provide input with Wellhead Protection Plan; Bacteria and <em>E. coli</em> sampling</td>
</tr>
<tr>
<td>MPCA</td>
<td>MS4, TMDLs, Otter Tail WRAPS, St. Clair Lake TMDL, Curly-leaf pondweed Diagnostic Studies for Detroit, Sallie, Pearl Lakes; Minnesota Nutrient Reduction Strategy</td>
<td>Coordinates rules with NPDES and MS4, uses expertise with monitoring program and lake restoration programs, uses water quality data</td>
</tr>
<tr>
<td>MnDOT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agency</td>
<td>Water Management Activities in District</td>
<td>Examples of District Interaction with Agencies</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Road Building, Reconstruction, and Maintenance; Bridges and Culverts.</td>
<td>“Memorandum of Understanding” which outlines procedures for reviewing MnDOT road projects within the District</td>
</tr>
<tr>
<td>Becker County</td>
<td>Regulates land development by zoning ordinances, comprehensive planning, highway construction and maintenance</td>
<td>Coordinates Rules with zoning ordinance and stormwater management, comments on proposed developments and projects, including EAW technical review panel, reviews and participates in comprehensive plan and ordinance updates, collaborates on water quality education events, trainings, and publications</td>
</tr>
<tr>
<td>City of Detroit Lakes</td>
<td>Regulates land development by zoning ordinances, comprehensive planning, wastewater treatment and stormwater treatment, Wellhead Protection Plan, floodplain regulation</td>
<td>Coordinates Rules with zoning ordinance and storm water management, comments on proposed developments and projects, including EAW technical Review panel, reviews and participates in comprehensive plan, wellhead protection plan, MS4, and ordinance updates, comments on wastewater and storm water treatment and other projects, collaborates on water quality education events, trainings, and publications</td>
</tr>
<tr>
<td>Becker SWCD</td>
<td>Wetland Conservation Act regulation (Becker County and City of Detroit Lakes), cost-share for conservation projects, prepares and implements Becker County Water Plan, implements Becker County AIS program</td>
<td>Assists in evaluating District permits, coordinates Rules with WCA regulations, participates in cost-share (riparian buffers, rain gardens, agricultural practices, etc.), assists with reviewing County Water Plan, collaborates on water quality education events, trainings, and publications, collaborates with AIS projects and education</td>
</tr>
</tbody>
</table>

### 5.1.3 Advisory Committees
The District has a Citizen Advisory Committee (CAC) and a Technical Advisory Committee (TAC). Functioning like a planning commission does for a city council, these committees meet on an annual and ad hoc basis to identify water resource issues, generate new ideas and approaches, provide input on programs and projects, review and comment on the annual work plan, identify collaborative funding opportunities, and generally provide recommendations to the Board of Managers. The CAC is currently composed of citizens representing several of the LWQMA as well as the Becker County Commissioner and a local landscaper but could also include representatives from special interest groups (e.g., conservation, agriculture), lake associations, and more. The TAC is currently composed of representatives from BWSR, MDNR, MPCA, MnDOT, the Becker County Highway Department and the Becker County SWCD but could include representatives from other local and state agencies. Together, the CAC and TAC help strengthen the District’s connections with the public and other agencies, respectively.

5.1.4 Annual Planning and Reporting

On an annual basis, the District completes an activity report and fiscal audit, as required by Minnesota Rules 8410.0150, and submits both to BWSR. The activity report must be submitted to BWSR within the first 120 days of the calendar year, and the fiscal audit must be submitted within the first 180 days. Both these reports enable the District to measure its progress towards achieving goals outlined in the 10-year RWMP and if necessary, adapt to changing conditions. The annual activity report includes, among other things, an assessment of the previous year’s annual work plan that indicates which activities were completed, a work plan and budget for the current year, and a summary of significant trends of monitoring data.

During compilation of the annual report, the District may also review city, township, or county ordinance revisions that pertain to management of water resources (e.g., lakes, wetlands, erosion and sediment control). If review of city, township, or county practices reveals that the revisions themselves or implementation of revisions is inconsistent with this Plan or District rules, the District will communicate the inconsistency to the appropriate governing body. If the issue is not resolved, the District may consider taking action to ensure that District rules and requirements are being met.

The District will continue to keep its website current. The website will contain the location, time, agenda, and minutes for District meetings; a list of District staff and their contact information; a list of the District’s board members; the current RWMP; annual activity reports; and District rules and requirements. The website is located at www.prwd.org.

5.1.5 Fiscal Management and Funding

The projected cost to implement the actions contained in this Plan is $24,071,500 (Section 4.0). The success of implementing this plan will depend on local funding, reliable watershed-based funding implementation dollars, and collaboratively sought state, federal, and private grant dollars. In order to both serve the District as a whole and address specific issues, the District uses a variety of funding sources through Watershed District Law (MS 103D) and Drainage Law (MS 103E).

Programs and projects of district-wide benefit are generally funded through ad valorem levies. District projects or programs that are not district-wide may be paid for by assessment of the benefited properties, as determined by appraisers or viewers (MS103D &
103E). As another funding mechanism, a water management district (WMD) may be established for the purpose of collecting revenues and paying costs of projects initiated under Minnesota Statutes sections M103D.601, MS103D.605, MS103D.611, and MS103D.730.

In addition to these District derived funding mechanisms, there are several funding sources available to the District from outside resources such as various federal, state, and local grants, Clean Water Partnership funds, MN Buffer Law Enforcement, and One Watershed One Plan implementation funds. The District may also receive direct legislative funding in the form of state bonding. Lastly, the District may choose to borrow funds to finance projects over a longer timeframe.

**Ad Valorem Levy**

The ad valorem levy produces revenue from all taxable properties within the watershed based upon property valuation.

- **General Fund (MS 103D.905)** The ad valorem levy is used to pay most of the general operating costs of the District and may be used for the construction, or implementation, and maintenance of projects that are of common benefit to the District. The annual ad valorem tax levy may not exceed 0.048 percent of taxable market value or $250,000, whichever is less. The District is also permitted under MS 466.06 to levy outside of the general fund levy for liability insurance. The District is required to include the liability insurance premium as a separate line item in its levy certification to the county. Since this fund is normally used for the basic organizational needs of the District, it is difficult to fund large projects using this funding source.

- **Basic Water Management Project Fund (MS 103D.605)** An ad valorem levy can also be used to pay the costs attributable to the basic water management features of projects initiated by petition of a political subdivision (county, city, township, SWCD, school district, or other political subdivision of the state, but not another watershed district) within the District or by petition of at least 50 resident owners whose property is within the watershed district. The annual levy cannot exceed 0.00798 percent of taxable market value for more than 15 consecutive years.

- **Survey and Data Acquisition Fund (MS103D.905).** The District may also make a special levy once every five years to pay for making necessary surveys and acquiring data. The ad valorem levy may not exceed 0.02418 percent of estimated market value.

- **Emergency Projects of Common Benefit Fund (MS 103D.615).** Under certain conditions, the District may declare an emergency and order work to be done without a contract. The cost of work can be paid for by an ad valorem tax levy, if the cost is not more than 25 percent of the most recent administrative ad valorem levy (MS 103D.615) or in combination with a special assessment.

**Special Assessments**

A special assessment is a tax levied on a property to pay for local public improvement that will benefit that property, such as a drainage ditch or a targeted benefit project.
o **Preliminary Fund (MS 103D.905).** This fund is used for preliminary work on proposed projects of the District.

o **Emergency Projects of Common Benefit Fund (MS 103D.615).** Under certain conditions, the District may declare an emergency and order work to be done without a contract. The cost of work can be paid for by a special assessment or in combination with an ad valorem levy.

o **Construction or Implementation Fund (MS 103D.905).** The construction or implementation fund is used to establish an account for funding sources from ad valorem levies, special assessments, stormwater charges, loans, grants, or bonds for the construction or implementation of projects.

o **Repair and Maintenance Fund (103D.905 & 631).** The Repair and Maintenance Fund is for repairing and maintaining District projects. The parcel assessment must be made pro rata according to original benefits determined at the time of project implementation or construction.

**Bonds and Loans**

**Bond Sales (MS 103D.905).** The District may establish an account for the proceeds of special assessments, stormwater charges, loan repayments, and ad valorem tax levies pledged by the District for the payment of bonds or notes issued by the District. The fund is to be used for the payment of the principal, premium, administrative surcharge, or interest on the bonds and notes issued by the District and for payments required to be made to the Federal government.

**Loans.** The District may borrow funds from federal, state, member county, or financial institutions authorized to do business in Minnesota under 103D. The District has used 10-year, low-interest Clean Water Partnership loans from the MPCA to build storm water facilities, conduct lake alum treatments, and purchase land rights easements. Current and past loans and their original amounts are listed below:

<table>
<thead>
<tr>
<th>Projects</th>
<th>MPCA Loan</th>
<th>Amount</th>
<th>Rate</th>
<th>Issued</th>
<th>Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Lake Nutrient Reduction - Easements</td>
<td>SRF0154</td>
<td>$297,073</td>
<td>2%</td>
<td>11/1/2010</td>
<td>6/15/2020</td>
</tr>
</tbody>
</table>

**Permitting: Fees, Bonds, Sureties, Escrows, Letter of Credit (MS 103D.345).** The District may establish fees to implement the District’s Rules permitting program such as site investigation, project review, engineer or other consultant services, post construction monitoring. Government agencies (federal, state, political subdivision) are exempt from the
fee charges.

- **Permit application fee:** An application fee of $10 for processing applications.

- **Field Inspection Fees:** The inspection fees are used to cover the actual costs related to a field inspection. Inspection costs include investigation of the area affected by the proposed activity, analysis of the proposed activity, services of a consultant or engineer, and any required subsequent monitoring of the proposed activity. Costs of monitoring an activity authorized by permit may be charged and collected as necessary after issuance of the permit.

- **Permit Performance:** The District may require an applicant for a permit to file a bond, surety, escrow, or letter of credit with the District in an amount set by the Board of Managers or the District Engineer and conditioned on performance by the applicant of authorized activities in conformance with the terms of the permit.

**Other Funding Sources.**

The District may use funds from state, federal, and local government organizations and other resources such as technical assistance to implement programs and projects. The District may also use funding and technical assistance from Universities, non-profits, conservation organizations, and citizen volunteers. Future funding is anticipated through the Otter Tail One Watershed One Plan for programs and projects located within District boundaries.

**Water Management Districts**

A water management district (WMD) may be established for the purpose of collecting revenues and paying costs of projects initiated under Minnesota Statutes sections M103D.601, MS103D.605, MS103D.611, and MS103D.730. A WMD is different from an assessment or ad valorem tax as charges are based on a prescribed method, such as a property’s contribution of stormwater or pollutants to a receiving water body, rather than the value of the property. The provision for collection of stormwater charges (MS103D.729 and 444.075) allows Districts the authority to establish one or more WMD’s. To use this funding method, Minnesota law (MS103D.729) requires an identification of the area to be included in the WMD, the amount to be charged, the methods used to determine the charges, and the length of time the WMD is expected to remain in force.

In 1997, the District amended the 1994 Water Management Plan to provide the WMD funding mechanism to finance water quality improvement projects. The 1997 amendment stated any WMD created would be permanent and funds may be collected via stormwater charges (MS 444.075) apportioned amongst the property owners in the WMD on the basis on their relative contribution of sediments and nutrients in stormwater runoff.

In February of 2000, the District Board of Managers ordered the establishment of the Stormwater Treatment Facility Project (MS103D.730) and to fund the project through a district wide WMD (MS103D.729) by collecting stormwater charges (MS444.075). The 2005-2014 Revised Management Plan stated the maximum annual amount of charges for the Stormwater Treatment Facility Project would be capped at $500,000. For this planning period, the District is not proposing an increase to this amount. **These funds can be used by the District to build, construct, reconstruct, repair, enlarge, improve, or in any**
other manner obtain stormwater systems, including mains, holding areas and ponds, and related facilities for the collection and disposal of stormwater.

The 2005-2014 RWMP provided the framework for the establishment of eight (8) WMD’s based upon the Lake Water Quality Management Areas (LWQMA’s) as outlined in Section 5.2.7 to fund projects not considered to have district-wide benefit or impact. This plan will continue to use the LWQMA’s to allow for up to 8 additional WMD’s for projects that are not of District-wide benefit. It is the intent that these smaller WMD’s would be perpetual, the maximum annual charge would be capped at $50,000 for this plan period and will use the methods to determine charges as outlined below. Changes to these proposed planning regions, methods to determine charges, the length of time in force, or the amount charged will require a plan amendment.

**Stormwater Utility Charges.** The purpose of the Stormwater Utility charge is to collect revenue to pay the cost of WMD’s programs and projects. As outlined in the 1997 Plan Amendment, WMD charges are based on the parcel’s relative contribution of nutrients (phosphorus and sediment) and the rate of stormwater runoff to a downstream waterbody within the WMD area. Factors such as slope, land use, and the proportion of impervious surface to pervious surface may be used to further refine the runoff estimate from an acre of land. Total fees are based upon the amount of the funds that must be expended to control or treat the runoff. Fees are apportioned based upon each parcel’s proportionate share of the runoff divided into the planned expenditures. The following options may be used to establish charges with the WMD’s:

- **Option 1: Runoff Volume** – This approach uses standard runoff coefficients for parcels having different land use characteristics. The basis for this is that average discharge is affected by land use in predictable ways. The approach makes no allowance for differences in a parcel’s slope or soil type, except those differences which are generally associated with the differences in land uses. Standard “delivery rates” estimated for the region are applied to take into account the amount of the runoff which is actually expected to reach a downstream waterbody.

- **Option 2: Total Phosphorous Export** - This approach takes into account the stormwater discharges from different land uses parcels have significantly different downstream impacts on lake water quality. The key nutrient is phosphorous, so using standard phosphorous export coefficients for different land uses permits assignment of treatment costs to the parcels that create the problem. Standard “delivery rates” estimated for the region are applied to take into account the amount of the runoff which is actually expected to reach a downstream waterbody.

- **Option 3: A combination of runoff volume and phosphorus export.** Using the standard “delivery rates”, runoff coefficients and total phosphorous export coefficients are used to determine the total phosphorous contribution for each type of land use in the WMD. This contribution is then converted to a percent of the total phosphorous runoff for the entire WMD. This percent is then multiplied by the dollar amount needed on an annual basis to fund the project then divided again by the number of acres of each land use in the WMD to determine the charge per acre for the land use. These charges are then applied to each parcel to determine the charge per parcel.
A per parcel minimum and maximum will be assessed each year (For example: for 2020 the minimum was $32 per parcel and the maximum was $70 per parcel). These charges are collected by the Becker County Auditor. The 2005-2014 Revised Management Plan stated the maximum annual amount of charges would be capped at $500,000 for the District-wide Stormwater Treatment Facility Project and the District does not foresee increasing the project fund cap for this plan period. Credits may be assigned to a parcel where best management practices have been implemented or for properties with internal drainage.

**Process to Create Water Management Districts.** BWSR has provided guidance for creating WMD’s as outlined below. The first two steps have been addressed in previous RWMP’s as well as by this plan. If during this plan period, if the District determines a new WMD will fund projects stormwater charges to fund projects within one of the eight LWQMA’s, Steps 3 through 8 must be completed prior to any collection of charges.

**Step 1. Amend comprehensive watershed management plan to create a WMD.** Amendment must include:
- Description of area to be in the WMD
- The amount to be raised by charges (total amount is necessary if fixed time for WMD to be in force, otherwise annual maximum (cap) amount)
- The method that will be used to determine the charges
- The length of time the WMD will be in force (perpetuity is acceptable)

**Step 2. Approval of plan amendment under M.S. § 103D.411 or as part of a revised plan under M.S. § 103D.405:**
- Revised plan, or petition and amendment, send to BWSR
- BWSR gives legal notice, and holds hearing if requested
- BWSR orders approval or prescribes plan or amendment
- BWSR notifies Watershed District managers, counties, cities, SWCDs

**Step 3. Watershed District establishes project(s) in the WMD:**
- Project(s) implemented must be ordered by the Watershed District managers
- Order for project(s) must specify funding method(s)
- Watershed District must notify counties, cities, and townships within the affected area at least 10 days prior to hearing or decision on projects(s) implemented under this section of statute

**Step 4. Watershed District refines methodology for computing charges based on final project scope.**

**Step 5. Watershed District determines and sets charges for all properties within the WMD after identifying scope of project and deciding method(s) of funding.**

**Step 6. Watershed District develops collection mechanism:**
- Request county or counties to collect,
- Contract with a private vendor (e.g. electric cooperative), or
- Billing and collection by Watershed District

**Step 7. Watershed District establishes a separate fund for proceeds collected from the fee or stormwater utility charges.**
Step 8. Resolution of disputes—local governments may request BWSR to resolve disputes pursuant to M.S. § 103D.729, Subd. 4, except a local appeal process must be completed first for disputes involving WMDs established in perpetuity.

Local Appeal Process. Because WMDs established under this plan are proposed to be perpetual, the following local appeal procedure is established from the resolution adopting the plan establishing a WMD:

1. Upon receipt of the BWSR order approving the plan establishing a WMD, the Watershed District shall publish notice of its resolution adopting the plan in a newspaper in general circulation within the District.

2. Any landowner affected by the WMD may, within 30 days of first publication of notice of the resolution, appeal the establishment of the WMD to the Watershed District by filing a letter stating the basis for the appeal.

3. Within 30 days of receiving a letter of appeal, the Watershed District shall hold a hearing on the appeal, giving the appellant an opportunity to be heard and to present evidence why the WMD should not be established. The hearing shall be noticed as required for a special meeting under statutes chapter 103D.

4. The hearing shall be recorded in order to preserve a record for further review. The record of the appeal shall include the recording, any documentary evidence provided by the appellant, and all records related to the establishment of the WMD.

5. Within 30 days of the hearing, the Watershed District shall adopt and mail findings and an order on the appeal to the appellant and the BWSR.

6. Further appeal, if any, shall be as provided in Statutes Chapter 103D and existing authorities and procedures of the BWSR Board.

5.1.6 Assessment and Evaluation

Consistent assessment and evaluation of goals is an integral part of achieving one’s goals. As discussed in 5.1.4, the District annually evaluates its progress against the objectives that were set in the RWMP, and adjusts objectives based on measured progress. In addition, every five years, the District performs a more systematic review in which amendments can be made to RWMP action items and the capital improvement plan. Progress is measured through activities such as assessing monitoring data trends; tracking the number and type of participants in District programs, projects and events; performing financial audits; and deploying surveys.

5.1.7 Amendments to Plan

This RWMP will guide the District’s activities through 2029, or until superseded by adoption of a subsequent RWMP. However, the RWMP may need to be periodically amended to remain useful as a long-term planning tool. Therefore, the District may revise its RWMP through an amendment if a) minor changes are required, b) problems arise that are not addressed in the Plan, or c) new projects need to be added to the implementation program.
Plan amendments may be proposed to the PRWD Board not only by District staff, but by any person. However, only the PRWD Board may approve a RWMP amendment. All proposed amendments must be submitted to the PRWD Board in writing, along with a rationale for the amendment and if applicable, estimated cost.

The District will follow the plan amendment procedures described in Minnesota Statutes 103D.411, as required. The District will also try to follow the plan amendment procedures described in Minnesota Rules 8410.0140, which lays out requirements for watershed districts in the Twin Cities Metropolitan Area and does not apply to the District, but nonetheless lays out a logical approach. The District will maintain a distribution list of everyone who receives a copy of the RWMP. Within 30 days of adopting an amendment, the District will distribute copies of the amendment to everyone on the distribution list and post the amendment on the District website. For changes to the RWMP that do not require a plan amendment, the District will distribute replacement pages.

5.2 IMPLEMENTATION PROGRAMS AND PROJECTS

5.2.1 Project Establishment

The purpose of this section is to introduce the types of projects that can be initiated and established and how they may be done. District projects can be established in one of the following manners specified in M.S. 103D.601-103D.615:

- by a vote of the managers;
- by a petition;
- by a contract with a government entity;
- through establishment of an emergency project; or
- through Drainage Law (M.S. Chapter 103E).

The law has been summarized to highlight the key elements. These statutes should be referred to prior to initiating a project.

Projects Initiated by Managers. The District may initiate a project by resolution of at least a majority of the managers, if the project is financed by grants totaling at least 50 percent of the estimated project cost, and the engineer's estimate of costs to parties affected by the watershed district, including assessments against benefited properties but excluding state, federal, or other grants, is not more than $750,000 for the project. The District may not establish a project by resolution if drainage is the essential nature and purpose. The District does not currently have any projects initiated by this method.

Construction Projects with Government Aid. These are projects to be constructed within the District under a contract between the District and the State or Federal government (M.S. 103D.611) and the cost of the project is to be paid for in whole or in part by the state or federal government, but the rights-of-way and the cost of the project are assumed by the watershed district. The District does not currently have any projects initiated by this method.

Basic Water Management Projects. Basic water management projects must be identified in the District’s watershed management plan or constructed within the District under an agreement between the District and the State or Federal government. Projects initiated under this section may be linked to M.S.103D.905, Subd. 3, which allows the use of a District-wide ad valorem levy if the project is initiated by a municipality and the cost is
attributable to implementing and managing the basic water management features of projects identified in the plan. An example would be the District's LMP-01 project, initiated by the city of Detroit Lakes, to undertake AIS research, education, treatments, and management.

**Emergency Projects of Common Benefit.** If the District finds that conditions exist that present a clear and imminent danger to the health or welfare of the people of the watershed district, and that to delay action would prejudice the interests of the people of the District or would be likely to cause irreparable harm, the District may declare the existence of an emergency and designate the location, nature, and extent of the emergency. The District may order that work be done under the direction of the managers and the engineer, without a contract. The cost of work undertaken without a contract may be assessed against benefited properties or, if the cost is not more than 25 percent of the most recent administrative ad valorem levy of the watershed district and the work is found to be of common benefit to the watershed district, funding may be raised by an ad valorem tax levy upon all taxable property within the watershed district, or both. The District does not currently have any projects initiated by this method.

**Drainage Systems and Projects** A county board or a joint county drainage authority may direct the District to assume responsibility for a drainage system within the District (M.S.103D.621-103D.625). After the transfer, any repairs, improvements, or construction must take place in accordance with Minnesota Drainage Law (M.S. Chapter 103E). The cost of routine maintenance and repair of the District’s projects (M.S.103D.631, 103D.635 and 103D.641), including the cost of removing obstructions and accumulations of foreign substances from drainage systems, must be paid from the District’s maintenance fund. If the cost of maintenance or repair, including all fees and costs relating to it, is less than $25,000, the District may have the work done by contract without advertising for bids (M.S.103D.641). An example would be the District’s maintenance funds for maintaining the function of Becker County Ditches 11, 12, 13, and 14.

**5.2.2 Regulation and Enforcement**

Per the authorities granted in Minnesota Statutes 103D, the District has rules to regulate the use and development of land within its jurisdiction. In 2003, the District’s rules were revised to adopt a permit system. The permit system requires installation of BMPs under certain land development scenarios in order to manage stormwater runoff from impervious surfaces and to minimize alterations along shorelines. For example, a District permit is required if a project creates more than 1 acre of impervious surface, disturbs near shore areas, or includes floodplain, wetland, or public waters. Other criteria trigger a watershed permit as well. In 2018, the District assumed jurisdiction to enforce the Minnesota Buffer Law (MN Statutes 103F.48) and adopted rules enabling enforcement of this law on the drainage systems within its jurisdiction, i.e., Becker County Drainage systems 11, 12, 13, and 14. The District will continue to enforce its rules, using District staff and qualified professional consultants.

It is the District’s intent to revise the rules as we learn more about development impacts on water quality of lakes, streams, wetlands, and groundwater and the means to reduce them. In particular, it seems likely the District will adopt rules to encourage practices pertaining to stormwater infiltration, shoreline vegetative buffers, wetland building setbacks, erosion and sediment control, off-site stormwater mitigation for linear reconstruction projects, groundwater protection, and wetlands and shoreline preservation. When District rules are
revised, the District will attempt to coordinate efforts with other government organizations and look for ways to streamline regulatory burden on the public.

In addition to maintaining its own rules, the District regularly reviews and offers advice to other agencies concerning their rules and how these rules could better protect water resources. The idea behind this cooperation and oversight is to coordinate regulatory efforts and avoid duplication of rules. The District will continue to work closely with state, county, city and township officials to strengthen regulations that protect water resources, especially those that protect sensitive shoreline areas and enhance stormwater management. The District will also revise its own rules in response to changes in the rules of other agencies in order to eliminate duplication or gaps.

5.2.3 Data Collection and Monitoring

The District understands that data collection and studies are necessary for making informed management decisions, and therefore has an extensive monitoring program for water quality, water quantity, and land use. Like most watershed monitoring programs in Minnesota, the District’s water quality monitoring focuses on phosphorus, but also includes data collection of several other water chemistry parameters at regular intervals throughout the summer. The District also monitors submerged aquatic vegetation as well as zooplankton, phytoplankton, and invertebrate communities, as part of the water quality monitoring program. The water quantity monitoring program includes flow monitoring in creeks and water level monitoring in lakes. Finally, the District collects data on land use change such as shoreline development and impervious surface coverage to study how that may impact water quality.

Following each year of monitoring, an annual report is created that summarizes data collected. Water quality data is also annually uploaded to the MPCA’s Environmental Quality Information System (EQuIS) database. The data collected in any given year varies, depending on special information needs, weather conditions, and availability of equipment and staff. The District adds monitoring stations and upgrades equipment and software as needed. For all monitoring efforts, focus is given to those water bodies identified as impaired or at risk.

Lake and Stream Monitoring

Currently, stream monitoring occurs twice per month at twelve sites on Campbell Creek, Pelican River and Ditch 14, April through September. Water quality and quantity are monitored, with continuous flow data collected at seven of the twelve sites. In addition to these core stream sites, the District also monitors at special stream sites, which often include the site of a proposed project, where pollutant loads are being investigated, or the site of a past projects, where the effectiveness of the project is being evaluated.

Lake monitoring occurs twice per month on seven core lakes (Big Floyd, North Floyd, Little Floyd, Detroit, Little Detroit, St. Clair, Sallie and Melissa Lakes), June through September. Water quality and quantity parameters are measured, including lake levels, which are recorded biweekly from ice-out to ice-in, except on Detroit Lake, which has lake levels continuously recorded. Additional small lakes are monitored in the same way every 2-3 years, following MPCA guidelines that dictate these lakes must be monitored for a minimum of three years within a ten-year period. The District also collects zooplankton and phytoplankton samples on Detroit, Sallie and Melissa Lakes once per month, June through
September, to assess the health of these communities, and to track population changes that may occur due to zebra mussel infestation (this monitoring program began in 2018).

**Aquatic Invasive Species Management**

The District currently monitors and manages the spread of AIS in District Lakes through projects 1-B, 1-C, and LMP-01. Projects 1-B and 1-C were authorized in the 1980’s to manage nuisance levels of aquatic vegetation for recreation and ecosystem management for Detroit Lake, Curfman Lake, Lake Sallie, and Lake Melissa. Project LMP-01 was authorized in 2010 to undertake district-wide AIS research, education, treatments, and management. The District will continue to research, develop, and implement new strategies to limit the spread of AIS into new lakes, and control AIS populations in infested lakes.

**Aquatic Vegetation Monitoring**

Aquatic vegetation surveys are conducted on core District lakes (Big, North Floyd, Little Floyd, Detroit, St. Clair, Sallie and Melissa Lakes) on a rotating basis, with the goal of performing a survey on each lake at least once every five years. Additional surveys may be conducted more frequently to aid in the specific management decisions.

**Land Use Change Data Collection**

The District compiles data on land use change, specifically land use change relating to shoreline development and impervious surface coverage. Shoreline surveys have been conducted on all the District’s core lakes to assess the amount of development on the shoreline. The District records the extent of sand blankets, rip rap, retaining walls, and natural shoreline as well as the number of boats, docks, and lifts. Photographs of shoreline have also become part of the survey protocol; photographs of each house’s shoreline are then linked to taxpayer IDs. Shoreline surveys have been conducted every 5-10 years since 1997.

**5.2.4 Education and Outreach Programs**

The District’s education and outreach program exists to improve water quality and ecosystem health by leveraging the power of the community to effect positive change. It is clear that if the public had a better understanding of water problems and their respective causes and solutions, water resources would be better protected. Accordingly, the District has been involved in producing publications for the general public (reports, brochures, news articles); maintaining social media pages and a website; appearing monthly on the local radio station to discuss water topics; hosting technical trainings for contractors and landscapers; leading workshops on AIS; organizing river cleanup events; opening internship positions for college students; developing curricula for teachers; preparing and disseminating BMP materials for realtors, land owners and developers; presenting information to students, service groups and governmental organizations; and providing assistance to lake associations and the Becker County Coalition of Lake Associations.

The education and outreach programs need to be adaptive and responsive to keep up with evolving environmental concerns, communication approaches, and strategies. The District will continue to engage and foster partnerships with the following groups:
Residents. This is a diverse audience that includes homeowners, landowners, renters, and seasonal visitors. Their local identity may be influenced by where they reside, their proximity to a water body, occupation, and the community groups they belong to. These groups can be formal or informal including community, agricultural, and neighborhood organizations, lake and homeowner associations, and outdoor groups.

Local Leaders. Local elected and appointed leaders may include mayors, city council members and county commissioners. This audience generally includes individuals with decision-making power on a local (city, county, state) level.

Students. There is one school district within the District containing elementary, middle and high schools. There are both public and private schools in the District, preschool programs, and several nearby colleges and universities.

Businesses and Professionals. Local businesses have the potential to be leaders in the implementation of best practices to protect water. Business campuses often have large footprints and their own community of employees who are impacted by the business culture. Professionals are those who do work that impacts water resources and may be in private businesses or government. These include individuals who manage winter snow and ice or turf grass as well as landscapers, builders and developers.

5.2.5 Drainage System Management

The District serves as the public ditch authority within its jurisdictional boundary and has been since 1997 when Becker County elected to turn over responsibility of County Ditches 11, 12, 13, and 14 to the District. In 2018, the District became the authority to enforce the Minnesota Buffer Law for ditches in its jurisdiction, which states that all public ditches must have perennial vegetative buffers of 16.5 feet along their shores. The County SWCDs inspect the ditches to verify compliance with the Buffer Law, but the District is notified if enforcement action is required. The District receives annual funding from the State for this enforcement.

The District recognizes that the ditches in its jurisdiction were originally constructed to provide drainage for agricultural lands, and intends to maintain the ditches for this purpose, in accordance with Minnesota Statutes 103E. However, the District intends to simultaneously minimize the ditches’ past and present downstream impacts on District lakes through restorations, installation of BMPs, and other measures consistent with multi-purpose drainage criteria outlined in Minnesota Statute 103E.015, Subd. 1. The primary duties that come with managing public ditches include performing annual inspections, reviewing plans for bridge and culvert installations or replacements, mitigating flowage obstructions and sediment accumulation (for example, build up caused by debris or beaver dams), and enforcing use of vegetated buffers.

5.2.6 Incentive Programs

The District’s main incentive program is its cost-share program. This program has provided cost-share assistance for implementing BMPs (structural, non-structural and management BMPs) in rural, urban, and shoreland settings. Examples of activities that are eligible for cost-share assistance include native shoreline buffers, streambank and lake shoreline
stabilization, and stormwater treatment practices (e.g., rain gardens, infiltration swales, etc.). Projects are ineligible for funding assistance if the project is a requirement of any federal, state, or local government regulation, including variance, conditional use, required mitigation, or correction of a violation. Priority is given to projects that treat stormwater at the source or that are located near shoreland or streambanks. The cost-share program is funded through the district-wide utility fund. Depending on the project, there may be other funding sources, such as the State of Minnesota’s Clean Water Fund or grants from other government agencies or foundations. Projects and practices funded by the District’s cost-share program are typically much smaller in size than capital improvement projects.

5.2.7 Capital Improvement Projects

The District has several capital improvement projects planned, which are listed in Table 5.2. These projects have been identified through TMDL and WRAPS studies and other investigations. In many cases, the PRWD will be the lead agency for implementing the activities, but in some cases, the District will cooperate with other agencies and organizations to plan and fund the project.

Many of the projects included in Table 5-2 are planned at the conceptual or feasibility-study level. These estimated costs are total project costs; the District will pursue collaborative and grant opportunities to reduce cost borne by the District. As projects become better defined, so will the estimated project costs and responsibilities of the District and its partners. At this time, Table 5-2 may be revised. BWSR may require a plan amendment if the anticipated cost is significantly greater than the original estimate, as adjusted to reflect inflation. Any proposed amendments to the Plan will follow the procedures described in Section 5.2.7. Additionally, if a funding mechanism changes for any of the capital improvement projects listed in Table 5-2 such that the financial obligation to the District is increased, the District may hold a public hearing on the proposed change before ordering the project. In addition to costs of capital improvement projects, timelines of these projects may also change. The District implements capital improvement projects as circumstances dictate, and to fit in with the District’s financing strategies. For example, the availability of grants and partnerships could result in either the acceleration or delay of projects. For capital improvement projects not included in the Plan, the PRWD will initiate a plan amendment to add the proposed capital project to Table 5-2 prior to implementation.

The District will follow the process outlined in the applicable statutes for implementing proposed capital improvement projects. The District will coordinate with and involve the affected local units of government and other agencies in the implementation of these projects. If the District orders the project, then the District prepares project plans and bidding documents, finalizes the funding mechanism, and advertises the project for bid. Through its capital improvement projects program, the District completes the work, oversees the project construction, manages the project’s finances, and provides monitoring and evaluation.

Table 5-2. PRWD Capital Improvement Program 2020-2029.
<table>
<thead>
<tr>
<th>Project and Description</th>
<th>Funding</th>
<th>Responsible Parties</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025-2029</th>
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<td>Campbell Creek Watershed Restoration— <em>including streambank stabilization, wetland restoration, installation of agricultural BMPs</em></td>
<td>$4 million Grants, PRWD</td>
<td>PRWD, Becker County SWCD</td>
<td>X</td>
<td>X</td>
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<td>PRWD, City of Detroit Lakes</td>
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<td>X</td>
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<tr>
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<td>$2 million Grants, PRWD, City of Detroit Lakes</td>
<td>PRWD, City of Detroit Lakes</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Ditch 14 Wetland Complex Nutrient Reduction</td>
<td>$5 million Grants, PRWD</td>
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<td>Otter Tail WRAPS Actions</td>
<td>Unknown Grants, PRWD, City of Detroit Lakes</td>
<td>PRWD, City of Detroit Lakes, Becker County SWCD</td>
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<td>X</td>
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<td>X</td>
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<tr>
<td>Lake Alum Treatments – including St. Clair and Floyd</td>
<td>$1.5 million Grants, PRWD</td>
<td>PRWD</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td><strong>TOTAL</strong></td>
<td>$25 Million</td>
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</tbody>
</table>

### 5.2.8 Lake Water Quality Management Areas

In order to more efficiently address the water quality problems facing different lakes, the District has identified eight Lake Water Quality Management Areas (LWQMAS) into which the District’s lakes and streams are grouped. To form these LWQMAS, lakes were grouped first based on proximity and drainage, and then by characteristics such as water quality issues, physical attributes, and watershed and shoreline land use. **Figure 5-1** depicts the eight LWQMAS: Campbell-Floyd, Detroit-Rice, Sallie-Melissa, Pearl-Loon, Brandy, Long, Munson-Fox, and Small Lakes. There are many action items within Chapter 4 that pertain specifically to one of these LWQMAS.
Figure 5-1. LWQMAs in the District.
The Floyd-Campbell LWQMA consists of 17,000 acres that drain towards the Floyd Lakes, which are among the most valuable recreational lakes in the area (Figure 5-2). The prominent water bodies within the Floyd-Campbell LWQMA include Floyd Lake (which has two basins locally known as North Floyd and Big Floyd Lakes), Little Floyd Lake, and Campbell Creek (which includes Ditch 11 and Ditch 12). However, the Floyd-Campbell LWQMA also includes several smaller lakes such as Campbell Lake, Fish Lake, Harding Lake, Sands Lake, Kennedy Lake, and Tamarac Lake, as well as several ditches (public and private) and natural waterways.

The Floyd-Campbell LWQMA is approximately one third forested, with most of the remaining land used for agriculture or left as wetland. Little land in the Floyd-Campbell LWQMA is developed, with only about 5 percent impervious cover. That said, much of the development that does occur takes place along the shores of the Floyd Lakes. The District’s rules certainly influence how development happens on these shorelines and in the LWQMA generally, but the rules of other authorities can sometimes prevail, which are not always protective of water quality.

The Floyd Lakes are heavily used for game-fishing, boating and other summer and winter recreational activities. Big Floyd has very good water quality compared to other District Lakes. Most of the time its water is clear, with moderate phosphorus and algae concentrations, and with good game fish populations and moderate vegetation growth. Occasionally the lake experiences algae blooms in September or October. In contrast, North Floyd suffers high phosphorus concentrations, severe algae blooms, and poor water clarity in the summer, as does Little Floyd because it is directly downstream of North Floyd. The Floyd Lakes also contain Zebra mussels, an aquatic invasive species.

The poor water quality in North Floyd is likely a result of several factors. First, North Floyd receives large phosphorus and sediment loads from Campbell Creek. Before reaching North Floyd, Campbell Creek passes through highly erodible soil and loses almost 80 feet of elevation in 2 miles. As a result, streambank erosion occurs and causes Campbell Creek to carry large sediment loads to North Floyd Lake. Campbell Creek also drains several nutrient-rich wetlands and agricultural fields, which also contribute phosphorus to North Floyd Lake. In addition, internal loading occurs in North Floyd Lake, transferring dissolved phosphorus.
from the lake sediments to the water column during mid- to late summer. Finally, shoreline development and septic system use likely contribute further phosphorus loads to the Floyd Lakes.

Small lakes in the Floyd-Campbell LWQMA, such as Campbell Lake, Fish Lake, Harding Lake, Sands Lake, Kennedy Lake, and Tamarac Lake, are mostly shallow, subject to winterkill, and have little shoreline development. Little is known about the water quality and ecological integrity of most of these lakes.

The District’s main goals for the Floyd-Campbell LWQMA are to prevent degradation of Big Floyd, to improve the condition of North and Little Floyd, and to manage degradation to Campbell Creek to limit pollution to Floyd Lakes. There are many action items throughout Chapter 4 that work towards achieving this goal.

**Detroit-Rice LWQMA**

The Detroit-Rice LWQMA consists of approximately 25,000 acres, including the City of Detroit Lakes (Figure 5-3). The main water bodies in the LWQMA are Detroit Lake (locally split into Big Detroit, Little Detroit and Cufman Lakes) and the Pelican River (Ditch 13), and Rice Lake Wetland. There are also smaller waterways, including Sucker Creek (a trout stream) and several private ditches, as well as smaller lakes, including Saint Patrick, Schultz and Leitheiser Lakes.

Though the Detroit-Rice LWQMA contains a large portion of the City of Detroit Lakes, almost 90 percent is forest, wetland, grassland or cropland. About 5 percent is impervious, although surrounding Detroit Lake, impervious surface is about 18 percent of land cover. Extensive shoreline alteration over the past 75 years has attributed to this increase of impervious land-cover around Detroit Lake. Originally lined with summer cottages and resorts, nearly all of the properties around Detroit Lake are now used for year-round purposes, and most resorts have been converted to commercial or high-density residential uses. The shorelines of Saint Patrick, Schultz and Leitheiser remain largely undeveloped.

**Figure 5-3. Detroit-Rice LWQMA.**
Comprised of two main basins, Big and Little Detroit, Detroit Lake accounts for 85 percent of the surface water of the Detroit-Rice LWQMA. The remaining lakes consist of Curfman Lake which is connected to Big Detroit, but is considered a separate lake, and shallow lakes Saint Patrick, Schultz and Leitheiser Lakes, which relatively little is known about. Big Detroit is much bigger and deeper than Little Detroit. Both are heavily used for a broad range of summer and winter recreational activities. Big and Little Detroit Lakes enjoy relatively good water quality. Big Detroit has worse water quality than Little Detroit, exhibiting mid-summer episodes of moderate to severe algae blooms. This is in part because Big Detroit receives large phosphorus loads from the Pelican River, which inlets directly into Big Detroit after draining Rice Lake Wetland and the Detroit Lake industrial park, among other areas. There is some evidence that Big Detroit’s water quality may also be worsened by internal loading, but this needs to be further investigated. Untreated urban stormwater runoff from Detroit Lakes likely also contributes to Big Detroit Lake’s phosphorus load. Little Detroit Lake has exhibited some improvement over the last decade, presumably because sanitary sewer lines (versus septic systems) now serve almost all lakefront properties, and because most untreated stormwater runoff has been diverted.

The Pelican River runs through Rice Lake Wetland and is also known as Ditch 13 in the Detroit-Rice LWQMA. High \textit{E. coli} levels have been found in the Pelican River recently between Highway 34 and North Shore Drive. \textit{E. coli} sources to the Pelican River should be investigated.

Big and Little Detroit Lakes are both impacted by the presence of aquatic invasive species and nuisance growth of native plant species. Currently there are four known aquatic invasive species present in Detroit and Curfman Lakes: Flowering rush, Curly-leaf pondweed, Zebra mussel, and Chinese mystery snails. A native algae species, Chara, also grows in thick beds in some shallow areas, causing boating and swimming issues. While the District is successfully controlling the nuisance and invasive vegetation (i.e., Flowering rush, Curly-leaf pondweed, Chara) with herbicides (the District found harvesting was exacerbating the spread of flowering rush), Chinese Mystery snails and Zebra mussel populations are greatly increasing.

The District’s main goals for the Detroit-Rice LWQMA are to decrease eutrophication in Detroit Lake and manage aquatic invasive species in Detroit Lake. There are many action items throughout Chapter 4 that work towards achieving this goal.
The Sallie-Melissa LWQMA is comprised of 11,400 acres, including Sallie and Melissa Lakes, the Pelican River (downstream of Little Detroit Lake), Ditch 14, and several small lakes called St. Clair, Muskrat, Mud, and Mill Pond (Figure 5-4). There are also numerous wetlands, many of which are associated with Ditch 14 and have been drained or partially drained.

There has been increased development pressure in this LWQMA. There is dense development surrounding Sallie and Melissa Lakes, with relatively small lots and extensive shoreline modifications. Little shoreline remains undeveloped, and in recent years, summer cottages have been converted to homes for year-round use. There is also residential development along the south side of Muskrat Lake and near the western shores of St. Clair Lake.

Sallie and Melissa are the largest lakes in the Sallie-Melissa LWQMA, and together they account for about 90 percent of this LWQMA’s surface water. Sallie and Melissa are relatively deep lakes and support important game fish opportunities and other recreational opportunities. St. Clair, Muskrat and Mill Pond are subject to winterkill, and therefore have little importance to anglers.

Water quality concerns in this LWQMA center around improving water quality in Lake Sallie and St. Clair. Lake Sallie is currently considered vulnerable to nutrient impairment, and experiences nuisance algae blooms most summers. Improving water quality in Sallie should also help water quality in Melissa because Sallie is just upstream of Melissa. Lake St. Clair is also listed as impaired by the MPCA for excess nutrients and has an approved TMDL. St. Clair’s poor water quality is largely the result of its use as a receiving pond for partially treated sewage effluent for over 50 years. Thick, phosphorus-enriched sediments in St. Clair release phosphorus to the water column and cause severe algae blooms. An alum treatment in 1998 reduced phosphorus loading from to the lake, but after 20 years, the effectiveness of the alum treatment may be waning, as phosphorus concentrations are increasing back to impairment levels.

Aquatic invasive species are another big issue in the Sallie-Melissa LWQMA, particularly in Sallie, Melissa and Muskrat Lakes. Invasive aquatic vegetation such as Flowering rush and Curly-leaf pondweed interfere with boating and swimming, cause some damage to shorelines, and invade desirable native plant populations such as Bulrush. Since the 1960s,
the District has employed mechanical harvesting and herbicide treatments as a means of mitigating aquatic vegetation problems. However, research conducted by the District determined that harvesting exacerbated the spread of Flowering rush, so the District discontinued harvesting practices in 2016. Herbicides are used to effectively manage Flowering rush as well as Curly-leaf pondweed. Zebra mussels are also present in Lake Melissa, Lake Sallie, and Muskrat Lake.

The District’s main goal for the Sallie-Melissa LWQMA is to increase water quality of Lake Sallie and Lake St. Clair and to continue to manage invasive aquatic vegetation in Sallie, Melissa, and Muskrat. There are many action items throughout Chapter 4 that work towards achieving this goal.

**Long LWQMA**

The Long LWQMA is 2,384 acres and includes Long and Strunk Lakes. Strunk Lake, a small 24-acre basin, drains to Long Lake via a series of wetlands, but little is known about the lake itself (Figure 5-5). Long Lake is the main lake in this LWQMA, with 407 acres and 6 miles of shoreline. Most of Long Lake’s water comes from groundwater sources, although there is some surface flow from its direct watershed and from wetlands near Strunk Lake. Long Lake eventually drains through a small outlet to St. Clair Lake.

Most of the land in the Long Lake LWQMA has been greatly altered. Gravel mining takes place in this LWQMA, highways have impacted drainage patterns, and 9 percent of land is impervious. Still, 20 percent of land is forested and there are some large wetland areas. Shoreline along Long Lake has also been greatly modified. The lake has had shoreline development for decades, but in the last 10 years, conversion of resort land to residential land has further increased shoreline development. There are some important areas of shoreline wetlands and emergent aquatic plants on Long Lake that need special protection from development, namely Long Lake’s three aquatic management areas located on the west and north sides of the lake. Recreational pressure on the lake is also very high. Boat traffic and noise have sometimes emerged as issues, especially with the advent of wake surfing boats.

*Figure 5-5. Long LWQMA.*
The water quality in Long Lake is very good. There is some evidence that clarity has decreased in recent years, but other eutrophication indicators are either unchanged (e.g., chlorophyll-a) or improved (e.g., total phosphorus). Residents have complained of shoreline erosion and other water quality issues resulting from boat traffic, but a 1997 District study could not detect the impact of boating on turbidity or phosphorus levels. However, wakeboard boats have been introduced since that time. Phosphorus loading from septic systems is not an issue because most areas along and near Long Lake’s shores are served by sanitary sewer. Watershed nutrient loading is the largest threat to Long Lake’s water quality at present. The watershed is becoming more impervious, native shoreline vegetation is being removed, drainage is being altered, etc., all of which promote nutrient runoff.

The District’s main goals for the Long LWQMA is to maintain the good water quality of Long Lake, in part through focusing on improved management of shoreline and near-shore areas. There are several action items throughout Chapter 4 that work towards achieving this goal.

**Pearl–Loon LWQMA**

The Pearl–Loon LWQMA is about 5,400 acres and contains Pearl and Loon Lakes as well as several smaller lakes called Little Pearl, Spear, Rider, Holstad, Samson and Dart (Figure 5-6). All these lakes are relatively small and shallow waterbodies in the western edge of the District, and all depend primarily upon groundwater.

Most land in this LWQMA is used for agricultural purposes, although there are also numerous wetlands. Development may occur in this LWQMA at some point, however. Though essentially rural in character, the land surrounding Pearl Lake is almost completely platted for residential development.

Water quality data has only been collected for the two main lakes in this LWQMA, Pearl and Loon. The District began to collect water quality data on Pearl Lake in 1998. Data from the lake has been difficult to interpret, however. Pearl exhibits relatively clear conditions, but phosphorus and chlorophyll-a levels are much higher than would be expected, given the lake’s clarity. To help make sense of the data, an MPCA Clean Water Partnership diagnostic study was completed on Pearl Lake in 2012. The study noted large year-to-year water quality and water level fluctuations and concluded that the primary source of nutrients is lake sediments. Agricultural runoff and shoreline alteration also contribute to nutrient load. Curly-leaf pondweed, an invasive species that has also been known to contribute to poor water quality, has also spread to
most of Pearl Lake since about 2010, when it was discovered. Loon Lake was sampled 2006 through 2008, and this demonstrated good water quality for a shallow lake. No data has been collected on Spear, Rider, or any of the other smaller lakes.

The District’s main goal for the Pearl-Loon LWQMA is to monitor conditions on Pearl and Loon Lakes and to maintain the current good water quality. There are several action items throughout Chapter 4 that work towards achieving this goal.

**Brandy LWQMA**

The Brandy LWQMA contains about 3,000 acres ([Figure 5-7](#)). Four named exist within this area, Brandy, Wine, Oak and Oar, although several very small unnamed lakes and wetlands also dot the LWQMA. Brandy Lake is the largest lake, at 323 acres. The other lakes are smaller and have small watersheds.

Land in the Brandy LWQMA is mostly used for cultivated crops or pasture. Shoreline along the lakes is mostly undeveloped. This is partly because the shallow nature of these lakes makes them ill-suited for recreation. Approximately 10 percent of the LWQMA is owned by the U.S. Fish and Wildlife Service.

Water quality of Brandy Lake has improved in recent years and has gone from eutrophic to meeting water quality standards. Brandy has a small inlet with surface drainage that originates near a former Becker County landfill. Water quality improvements may have to do with remediation of this former landfill, where groundwater is currently extracted, aerated, and then discharged to Brandy Lake as part of remediation procedures. Wine Lake is a shallow lake and is listed as impaired due to excess nutrients. It has average annual phosphorus concentrations of 87 ug/L, which is well above the shallow lake standard of 60 ug/L. A TMDL study will be completed by the MPCA and the District. At present, no data has been collected for the other lakes in this LWQMA. However, it seems the health of all the lakes in this LWQMA is impacted by the shallowness of the lakes and past and present land-use practices.

The District’s main goals for the Brandy LWQMA are to improve Wine Lake’s water quality so that it is removed from the MPCA’s impaired waters list and to monitor and maintain the...
good water quality on Brandy Lake. There are several action items throughout Chapter 4 that work towards achieving this goal.

**Munson-Fox LWQMA**

The Munson-Fox LWQMA contains about 1,350 acres (Figure 5-8). The only lakes in this LWQMA are Munson and Fox Lakes. Both are small lakes, at 129 and 138 acres, respectively, but both are also elongated, giving them good amounts of shoreline. Both lakes are fed by groundwater and have adjacent wetlands and some shoreline runoff, but neither has a significant inlet stream. Both lakes have small outlets.

Both Munson and Fox are heavily used for game-fishing, boating and other summer and winter recreational activities. Munson Lake has a public access, and therefore provides recreational opportunities to non-residents as well as residents.

Munson and Fox lakes have relatively small watersheds. Land within these watersheds is a little more than 25 percent forested, and 50 percent cultivated, grassland or pastureland. Less than 2 percent is covered by impervious surface. Some major gravel mining operations are found in the area.

Much of the shoreline around Munson and Fox is heavily developed. There have been extensive modifications to the shorelines as a result of riprap, retaining walls, shore-impact zone structures, and the addition of sand blankets. The occurrence of these shoreline alterations has increased in recent years, as have the number of boats. Given the Munson-Fox LWQMP’s proximity to Detroit Lakes, development is expected to continue on the shorelines and farther from the lakes.

Both Munson and Fox have relatively good water quality and have had stable phosphorus and water clarity readings for the past 10 years. There are no known major upstream phosphorus sources. Shoreland development and agricultural practices surely provide some phosphorus load, and the nutrient load from gravel mining, if any, is not known. In addition, Fox Lake residents have formed a lake association and have expressed interest in helping monitor water quality and other parameters.
The District’s main goal for the Munson-Fox LWQMA is to monitor and maintain the good water quality conditions on Munson and Fox Lakes. There are several action items throughout Chapter 4 that work towards achieving this goal.

**Small Lakes LWQMA**

The Small Lakes LWQMA consists of about 11,000 acres in the southeastern corner of the District (Figure 5-9). This LWQMA extends into Ottertail County and contains numerous small lakes and wetland areas. Lakes within this area include Johnson, Reeves, Abbey, Meadow, Lind, Nottage, Senico (also known as Senical), Slough, Cottage, and Glawe. Many of the lakes are connected by means of wetlands, and the overall drainage of the area is indistinct.

Land use in this LWQMA can be roughly divided into the northwest half and the southeast half. The northwest half of the LWQMA contains significant agricultural areas, as well as most of the lakes and wetlands in the LWQMA. The southeast half of the LWQMA is mostly forested with steep slopes. Less than 2 percent of the LWQMA is covered by impervious surface, and most lakes have relatively high watershed to lake ratios. The shorelines of the lakes in this LWQMA are sparsely settled but have recently seen more development interest. Johnson and Reeves Lakes, in particular, have experienced some development pressures. The north area of Reeves Lake was recently platted for residential development. However, the lot sizes are large and have significant wetland shoreline fringes.

Water quality data has been collected since 1998 for Abbey, Meadow, Johnson and Reaves Lakes. Water quality data was collected for Glawe in 2006 through 2009, 2013 and 2017. These lakes all exhibit good water quality, with Abbey being the exception. Abbey is shallow and has been impacted by agricultural practices in the past. That said, in 2018, Abbey’s water quality was substantially improved from past years, although the cause of this change is unknown. Senico and Slough have not been sampled but seem to be in similar condition to the lakes listed above.

Lind Lake was monitored in 2015 and in 2018 and according to the data, does not have good water quality. It is suspected that agricultural land use, cattle grazing and internal sediment loading area all contributing to poor overall water quality conditions. Lind drains into Melissa Lake in the Sallie-Melissa LWQMA.
Meadow Lake is of special interest because of its very deep, possessing a maximum depth of 72 feet. Meadow Lake has very good water quality and is a designated trout lake. There is some development on the lake, including a resort.

The District’s main goal for this LWQMA is to monitor and maintain water quality on monitored lakes and acquire information about currently unmonitored lakes. There are several action items throughout Chapter 4 that work towards achieving this goal.
6.0 References


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