



## Lessard-Sams Outdoor Heritage Council

Lake Alice - Fergus Falls  
ML 2024 Request for Funding

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### General Information

**Date:** 05/31/2023

**Proposal Title:** Lake Alice - Fergus Falls

**Funds Requested:** \$686,000

**Confirmed Leverage Funds:** -

**Is this proposal Scalable?:** Yes

### Manager Information

**Manager's Name:** Klara Beck

**Title:** Community Development Manager

**Organization:** City of Fergus Falls

**Address:** 112 W Washington Ave

**City:** Fergus Falls, MN 56537

**Email:** klara.beck@ci.fergus-falls.mn.us

**Office Number:** 2183325428

**Mobile Number:** 2187707357

**Fax Number:**

**Website:**

### Location Information

**County Location(s):** Otter Tail.

**Eco regions in which work will take place:**

- Prairie

**Activity types:**

- Restore

**Priority resources addressed by activity:**

- Wetlands

## Narrative

### Abstract

Prior to urban development, Lake Alice in Fergus Falls supported a diverse array of vegetation and wildlife. Presently, stormwater enters the lake at the heart of the city through two major storm sewers, resulting in excessive phosphorus, sediment loading, cyanobacteria, and fecal coliform in receiving waters. This project, to be performed by the City of Fergus Falls in FY25, will remove the primary source of phosphorus and total suspended solids through the addition of sediment traps and updated catch basins in the stormwater system flow.

### Design and Scope of Work

#### Problem:

Lake Alice is a 39 acre prairie pothole lake in the heart of Fergus Falls. Prior to urban development, Lake Alice supported a diverse array of vegetation and wildlife. Presently, a significant storm water system flow is discharged into the lake, carrying runoff from the upstream residential area that carries sediment which includes significant amount of phosphorus. A report by the City of Fergus Falls and MPCA identified excessive phosphorus, sediment loading, cyanobacteria, and fecal coliform in receiving waters as water quality concerns. As an extreme case of hypereutrophy, Lake Alice offers relatively little in terms of beneficial uses or ecosystem services. Stakeholder awareness of the degradation of the lake ecosystem continues to draw attention to remediation of the lake's degraded condition, but true understanding of the lake's unique role in the watershed is lacking amongst the public. An education campaign accompanying remediation attempts is due. A goal of altering the contemporary trophic state and attendant elimination of harmful algal blooms and odors associated with decaying plant material may be accomplished by achieving a condition of mesotrophy in Lake Alice that supports aquatic and wetland plant communities similar in abundance and diversity to those of other prairie pothole lakes in the region.

#### Scope:

This project, an initial phase of a larger remediation and education project, will remove the primary source of phosphorus and total suspended solids before stormwater enters the lake through two major storm sewers. This phase is critical to the overall remediation project as it eliminates the primary source of pollutants entering the lake so subsequent clean up efforts can be effective in the long term. The City of Fergus Falls will construct two sediment traps "upstream" of Lake Alice in the storm water system flow in order to collect sediment from the two major storm sewer inputs that discharge into the lake. Each sediment trap will consist of a 6 ft by 10 ft by 60 ft precast concrete box culvert. The trap has a series of baffles that slow down the flow of water and allow the sediment to settle out. The sediment can then be removed from the trap and disposed of. The City is also seeking funding through this project to replace three storm inlets with catch basins containing sumps and porous baffles for capturing sediments. The catch basins replaced will be connected to smaller storm sewers which discharge to Lake Alice as a smaller, less expensive sediment collection option.

#### Priority/ Urgency:

Having failed to meet one or more water quality standards, Lake Alice was finally placed on the TMDL List under Section 303d of the Clean Water Act in 2022 and is predicted to meet its TMDL by 2025. The Section 303(d) list also acts as a "trigger", signaling the need for immediate management actions to address water quality impairments and making this project a high priority to begin to remediate the damage caused by the discharge of sediment into Lake Alice in order to meet federal requirements.

## **Explain how the proposal addresses habitat protection, restoration, and/or enhancement for fish, game & wildlife, including threatened or endangered species conservation**

Prairie pothole lakes are home to a variety of wildlife, including waterfowl, fish, amphibians, and reptiles. They are also important for water storage and provide habitat for migratory birds. The goal of this project is habitat restoration through improvements to water quality. The Otter Tail River Watershed (OTRW) encompasses approximately 1,952 square miles in west-central Minnesota. Within the geography of the OTRW, the Lake Alice watershed is 232 acres, of which 39 acres are the Lake Alice basin. The Otter Tail River Watershed TMDL report and the Otter Tail River Watershed WRAPS report, both completed in 2021, indicate that water quality conditions in the OTRW are generally good. However, a number of impaired waters (as indicated by the TMDL List) are scattered throughout the watershed. Having failed to meet one or more water quality standards, Lake Alice was placed on the TMDL List in 2022 and discharges directly into the Otter Tail River. Having an impaired body of water discharge into the Otter Tail River ultimately endangers the water quality of the Otter Tail River. Therefore any mitigation and remediation projects completed at Lake Alice ultimately protect the water quality of the Otter Tail River and the diverse wildlife habitat of which it is a part.

Water quality degradation leading to lost beneficial use and impaired ecosystem services in Lake Alice relates almost exclusively to manifestations of cultural eutrophication, i.e. excessive inputs of phosphorus. This project is therefore focused on making incremental progress toward meaningful and achievable nutrient load reduction milestones to support aquatic and wetland plant communities similar in abundance and diversity to those of other prairie pothole lakes in the region and for the health of the overall watershed. The memorandum "Updating Nutrient Reduction Strategy to Strengthen Linkages with Watersheds and WRAPS" (LimnoTech 2020) calls for common percentage or "fair share" reductions across Minnesota's 80 major watersheds, which focus efforts on both local waterbodies and nutrient reductions downstream. The "fair share" reductions provided for the OTRW by the year 2040 are 20.7% for phosphorous and 29.7% for Nitrogen.

## **What are the elements of this proposal that are critical from a timing perspective?**

Lake Alice was placed on the TMDL (total maximum amount of a pollutant a body of water can receive without violating water quality standards) List under Section 303d of the Clean Water Act in 2022 and is predicted to meet its TMDL by 2025. The Section 303(d) list acts as a "trigger", signaling the need for the City to enact management actions to address water quality impairments through mitigation and seek solutions for compensatory restoration.

## **Describe how the proposal expands habitat corridors or complexes and/or addresses habitat fragmentation:**

Wetlands in the prairie pothole region are traditionally home to a diverse range of species, including fish, amphibians, reptiles, small mammals, and birds. Prairie pothole wetlands are well-known as prime nesting and migratory habitat for waterfowl, with over 115 species of breeding or migrating waterbirds dependent on prairie pothole wetlands during their life cycle. The urbanization that has taken place around Lake Alice began in the late 1800s, greatly affecting the lake's ecosystem and separating the habitat from its surrounding systems. Stormwater has been discharged directly into the prairie pothole lake without any water quality control mechanisms for over 100 years, disturbing the natural habitat over time, including the growth of aquatic/ wetland plant communities. Without intervention, water quality in Lake Alice will continue to degrade, contributing negatively toward the overall health of the broader watershed and connections for wildlife between other patches of ecosystem contained within the urban area. The mitigation techniques proposed in this project will result in progress toward nutrient load reduction, reducing phosphorus and total suspended solids from the water to better support the aquatic and wetland plant communities that fish, amphibians, reptiles, small mammals, and migratory birds rely on.

**Which Conservation Plans referenced in MS97A.056, subd. 3a are most applicable to this project?**

- Managing Minnesota's Shallow Lakes for Waterfowl and Wildlife
- U.S. Prairie Pothole Joint Venture Plan

**Explain how this proposal will uniquely address habitat resilience to climate change and its anticipated effects on game, fish & wildlife species utilizing the protected or restored/enhanced habitat this proposal targets.**

Prairie pothole lakes are a vital part of the North American ecosystem, providing habitat for millions of birds and other wildlife. They also play an important role in the water cycle. Prairie pothole lakes help to regulate the flow of water and provide a place for water to collect and filter. Heavier rainfall events are becoming more and more common, and with them, more runoff from roads, parking lots, farms, and other areas is being carried into our water system. Pollutants abundant in the runoff can harm fish, wildlife, and plants. By improving the water quality of Lake Alice through the addition of sediment traps and catch basins containing sumps and porous baffles, we hope to improve the quality of our water and restore some of the biodiversity that once existed at Lake Alice.

**Which LSOHC section priorities are addressed in this proposal?**

**Prairie**

- Protect, restore, and enhance shallow lakes

**Describe how this project/program will produce and demonstrate a significant and permanent conservation legacy and/or outcomes for fish, game, and wildlife, and if not permanent outcomes, why it is important to undertake at this time:**

The addition of the two sediment traps and three storm inlets with catch basins containing sumps and porous baffles are a permanent improvement to the City of Fergus Falls stormwater system, resulting in a healthier wetland habitat and contributing to “fair share” nutrient reductions in one of Minnesota’s 80 major watersheds. By stopping the problem from getting worse, we may focus subsequent permanent solutions for the improved health of Lake Alice. This project is the first phase of a larger remediation project will restore ecosystem for local wildlife providing a haven within an urban area. This phase in particular helps to remove the pollutants entering the lake ensuring that once the larger project is complete, the lake ecosystem is protected for years to come.

**Outcomes**

**Programs in prairie region:**

- Protected, restored, and enhanced shallow lakes and wetlands ~ *Water quality analysis has shown phosphorus contents in Lake Alice to be in excess of 1,000 µg/l (micrograms per liter). it is advisable to begin with elimination of stormwater inputs followed by attention to legacy sediment deposits as a phased course of remediation to restore the wetland. An appropriate expectation for water quality in Lake Alice is to equal that of similar, regional systems that do not receive anthropogenic inputs.*

**What other dedicated funds may collaborate with or contribute to this proposal?**

- N/A

**Per MS 97A.056, Subd. 24, Please explain whether the request is supplanting or is a substitution for any previous funding that was not from a legacy fund and was used for the same purpose.**

This request is not supplanting or substituting any previous funding for this purpose.

**How will you sustain and/or maintain this work after the Outdoor Heritage Funds are expended?**

As part of the city's stormwater infrastructure, the cleaning and maintenance of the grit chambers and catch basins will be included in city operations indefinitely. This is considered a first phase of a larger remediation project and the city will continue to work toward obtaining funding to complete the larger project restoring the ecosystem and creating projections for that ecosystem in the future.

**Actions to Maintain Project Outcomes**

Year	Source of Funds	Step 1	Step 2	Step 3
Annually	City of Fergus Falls Stormwater/ General Operations Budget	Remove sediment buildup in grit chambers and catch basins with City-owned vacuum truck.	-	-

**Provide an assessment of how your program may celebrate cultural diversity or reach diverse communities in Minnesota, including reaching low- and moderate-income households:**

Lake Alice has long been a popular attraction in the center of Fergus Falls. The Lake is fully surrounded by city park and available to all to enjoy. Completing this project and restoring the lake to its former state helps maintain a valuable asset to all the residents of Fergus Falls. The lake is used by walkers, runners, and bikers of all ages, cultural backgrounds, and incomes. By including interpretation and education in the budget for this project, residents and visitors to Fergus Falls may learn how the city's mitigation tactics aim to restore habitat and support the health of the Otter Tail River watershed.

**Activity Details**

**Requirements**

**If funded, this proposal will meet all applicable criteria set forth in MS 97A.056?**

Yes

**Will restoration and enhancement work follow best management practices including MS 84.973 Pollinator Habitat Program?**

Yes

**Is the restoration and enhancement activity on permanently protected land per 97A.056, Subd 13(f), tribal lands, and/or public waters per MS 103G.005, Subd. 15 or on lands to be acquired in this program?**

Yes

**Where does the activity take place?**

- Public Waters

**Land Use**

**Will there be planting of any crop on OHF land purchased or restored in this program?**

No

**Will neonicotinoid pesticide products be used within any activities of this proposal?**

No

**Other OHF Appropriation Awards**

**Have you received OHF dollars in the past through LSOHC that are current OPEN appropriations?**

No

**Timeline**

<b>Activity Name</b>	<b>Estimated Completion Date</b>
Design & Engineering	August 2024
Construction Bids	September 2024
Construction	May 2025

**Budget**

**Totals**

Item	Funding Request	Total Leverage	Leverage Source	Total
Personnel	-	-	-	-
Contracts	\$631,000	-	-	\$631,000
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	-	-	-	-
Professional Services	\$55,000	-	-	\$55,000
Direct Support Services	-	-	-	-
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	-	-	-	-
Other Equipment/Tools	-	-	-	-
Supplies/Materials	-	-	-	-
DNR IDP	-	-	-	-
<b>Grand Total</b>	<b>\$686,000</b>	<b>-</b>	<b>-</b>	<b>\$686,000</b>

**Amount of Request:** \$686,000

**Amount of Leverage:** -

**Leverage as a percent of the Request:** 0.0%

**DSS + Personnel:** -

**As a % of the total request:** 0.0%

**Easement Stewardship:** -

**As a % of the Easement Acquisition:** -

**Does this proposal have the ability to be scalable?**

Yes

**If the project received 50% of the requested funding**

**Describe how the scaling would affect acres/activities and if not proportionately reduced, why?**

The number of grit chambers and catch basins would be reduced.

**Describe how personnel and DSS expenses would be adjusted and if not proportionately reduced, why?**

N/A

**If the project received 30% of the requested funding**

**Describe how the scaling would affect acres/activities and if not proportionately reduced, why?**

The number of grit chambers and catch basins would be reduced.

**Describe how personnel and DSS expenses would be adjusted and if not proportionately reduced, why?**

N/A

### **Contracts**

**What is included in the contracts line?**

Construction contract

### **Professional Services**

**What is included in the Professional Services line?**

- Design/Engineering
- Other : Legal

### **Federal Funds**

**Do you anticipate federal funds as a match for this program?**

No



## Output Tables

### Acres by Resource Type (Table 1)

Type	Wetland	Prairie	Forest	Habitat	Total Acres
Restore	39	0	0	0	39
Protect in Fee with State PILT Liability	0	0	0	0	0
Protect in Fee w/o State PILT Liability	0	0	0	0	0
Protect in Easement	0	0	0	0	0
Enhance	0	0	0	0	0
<b>Total</b>	<b>39</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>39</b>

### Total Requested Funding by Resource Type (Table 2)

Type	Wetland	Prairie	Forest	Habitat	Total Funding
Restore	\$686,000	-	-	-	\$686,000
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	-	-
<b>Total</b>	<b>\$686,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$686,000</b>

### Acres within each Ecological Section (Table 3)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Acres
Restore	0	0	0	39	0	39
Protect in Fee with State PILT Liability	0	0	0	0	0	0
Protect in Fee w/o State PILT Liability	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0
Enhance	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>0</b>	<b>39</b>

### Total Requested Funding within each Ecological Section (Table 4)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Funding
Restore	-	-	-	\$686,000	-	\$686,000
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	-	-	-	-	-
<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$686,000</b>	<b>-</b>	<b>\$686,000</b>

### Average Cost per Acre by Resource Type (Table 5)

Type	Wetland	Prairie	Forest	Habitat
Restore	\$17,589	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-
Protect in Easement	-	-	-	-
Enhance	-	-	-	-

### Average Cost per Acre by Ecological Section (Table 6)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest
Restore	-	-	-	\$17,589	-
Protect in Fee with State PILT Liability	-	-	-	-	-

Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	-	-

**Target Lake/Stream/River Feet or Miles**

Parcels

**Sign-up Criteria?**

No

**Explain the process used to identify, prioritize, and select the parcels on your list:**

**Restore / Enhance Parcels**

Name	County	TRDS	Acres	Est Cost	Existing Protection
71-003-99-1819-000	Otter Tail	13343234	2	\$340,500	-
71-002-99-0747-001	Otter Tail	13343234	2	\$340,500	-

Parcel Map



- Protect in Easement
- ▲ Protect in Fee with PILT
- Protect in Fee W/O PILT
- ★ Restore
- ✕ Enhance
- ⊕ Other

- 1-48" to lake - 15.44 ha
- 6-48" flow meter/  
sampling location - 13.08 ha
- 18-30" to lake- 39.94 ha
- 19- 30" flow meter/  
sampling location- 39.21 ha
- 42 - 12" to lake - 6.45 ha
- 44- 18" to lake - 4.66 ha
- 47 - 12" to lake - 0.85 ha
- 48 - 12" to lake - 0.52 ha
- 49 - 12" to lake - 1.06 ha
- 50 - 12" to lake - 1.42 ha
- 51 - 12" to lake - 0.31 ha
- 52 - 12" to lake - 0.47 ha
- 53 - 12" to lake - 0.83 ha
- 55 - 12" to lake - 0.01 ha
- 59 - 12" to lake - 1.42 ha

City of Fergus Falls  
LAKE ALICE STORM  
SEWER MAP  
Storm sewer locations  
indicate options for input  
mitigation tactics;  
to be designed.





Improvement  
Area  
Boundary

# LAKE ALICE

Figure 1: Lake Alice Improvement Area