



Lessard-Sams Outdoor Heritage Council

ML 2022 Request for Funding

General Information

Date: 06/02/2021

Proposal Title: Lime Lake and Lake Sarah Dam Replacements

Funds Requested: \$1,420,400

Manager Information

Manager's Name: Jean Christoffels

Title: Zoning and Environmental Administrator

Organization: Murray County

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Location Information

County Location(s): Murray.

Eco regions in which work will take place:

- Prairie

Activity types:

- Enhance
- Restore

Priority resources addressed by activity:

- Habitat

Narrative

Abstract

Murray County will restore and enhance habitat to facilitate fish passage by retrofitting existing dams at the outlets of Lime Lake and Lake Sarah. The project includes the implementation of a rock arch rapids that will provide

critical spawning habitat for northern pike and walleye and will help to connect both Lime Lake and Lake Sarah to their downstream habitats as well as more than 12 miles and approximately 190 acres of upstream tributary habitat and wetlands. The improved connectivity of the lakes will help to improve species diversity within the greater Des Moines River Watershed in southwest Minnesota.

Design and Scope of Work

Many native fish species migrate from the West Des Moines River to tributary streams, such as Lime Creek and the Lake Sarah outlet stream. At various times of the year, native species make their spawning runs up these streams to reproduce in riffles and rapids in high gradient areas. Barriers to fish passage, such as dams, prevent fish from making this seasonal spawning run. Restoring connections from the West Des Moines River to these critical habitats helps to re-establish and maintain healthy, robust native fish communities with greater resiliency to invasion by exotic species. Historically, Lime Lake has been managed as a pike/perch fishery because of the extensive network of wetlands that are connected upstream of the lake (Big Slough), which provided ideal spawning areas for northern pike.

MN Department of Natural Resources Stream management plans identify dam removal as a priority in the West Des Moines River Watershed. Both low head dams at Lime Lake and Lake Sarah are deteriorating and will need to be replaced or significantly modified in the near future. Failure of the structures would significantly alter lake levels, would have negative impacts on upstream and downstream aquatic habitat, and would have an adverse effect on fishing opportunities. Replacing these structures prevents negative impacts should they fail, and it also provides an opportunity to enhance the access of the aquatic habitat both upstream and downstream of the current dam locations. Additionally, improved fish passage and connectivity of lakes within the Des Moines River Watershed will be achieved through the construction of this project.

The scope of work will involve the modifications of the existing low head dam structures at Lime Lake and Lake Sarah. In place of the existing dam, there will be construction of a rock arch rapids, which are conducive for fish passage. Similar projects have been constructed in the nearby communities of Jackson and Windom, Minnesota where anglers have reported catching species that had previously not been documented in the upper reaches of the Des Moines River. Boulder weirs and resting pools would be implemented within the rock ramp to create varied flow conditions through the rock arch rapids. Low velocity areas of the channel, or pool areas, are locations that fish tend to frequent. Minimal disturbance to the adjacent floodplain area is expected. At both dam locations, the current elevation and hydraulic function of the outlet will be maintained so that upstream habitat is not impacted in an adverse way. The removal of the existing structure at Lime Lake will involve the removal of an existing pedestrian bridge that will need to be replaced at that location. The bridge will provide a location for fishing access over the installed rock arch rapids.

Input from project stakeholders has been attained through public meetings used to address comments, concerns, and questions related to the project. Continued informational meetings and involvement from project stakeholders is expected as the project progresses forward. Stakeholders are optimistic about the improved fish passage at both locations.

How does the proposal address habitats that have significant value for wildlife species of greatest conservation need, and/or threatened or endangered species, and list targeted species?

Species of greatest conservation need have not been identified in this region of the Des Moines River Watershed. However, a low head dam was replaced with rock arch rapids in Windom, MN, which is downstream of both Lime Lake and Lake Sarah, and anglers have reported catching Yellow Bass (listed as a species of special concern) upstream of that location after removal of the dam. Though there are other barriers on the Des Moines River

between Lime Lake/Lake Sarah that would impede fish passage, future consideration for removal of these structures combined with the dam replacements at Lime Lake and Lake Sarah may allow for improved habitat for Yellow Bass.

While species of greatest conservation need and targeted species have not been identified for this portion of the Des Moines River Watershed, the proposed rock arch rapids design will help to improve habitat for several aquatic species in southwest Minnesota. There is a known spawning run upstream of Lime Lake for Northern Pike. This project will improve connectivity and improve movement of the Northern Pike through the proposed rock arch rapids to known spawning areas at and upstream of Lime Lake.

Several fish species have been identified in Lake Shetek, which is located a few miles downstream of the Lake Sarah outlet, and not in Lake Sarah. In addition to fish species being able to travel upstream from Lake Shetek, the Walleye species found in Lake Sarah are of significant value to the surrounding region. Walleye are not capable of natural reproduction in many of the lakes in southwest Minnesota. However, the Walleye species found in Lake Sarah are able to reproduce naturally. Because of this, the Minnesota DNR has been actively trying to spread the genetics of this Walleye strain throughout the region. The implementation of the rock arch rapids will allow for natural movement of the Walleye from Lake Sarah to other lakes in the region. Connectivity of the lakes could help to improve Walleye populations in Lake Shetek and in the greater Des Moines River Watershed.

What is the degree of timing/opportunistic urgency and why it is necessary to spend public money for this work as soon as possible?

The most important timing of this request is a willingness of the current County Board and the current landowner adjacent to the Lake Sarah dam to support modification of the structures at Lime Lake and Lake Sarah. Additionally, OHF funding to modify the structures would ensure replacement of the structures with fish passage friendly structures. This project should be implemented as soon as possible because of the deteriorating condition of the existing structures at Lime Lake and Lake Sarah. If these structures were to fail, lake levels would decrease and adversely affect aquatic habitat upstream, shoreline habitat, and aquatic habitat downstream. Due to the shallow nature of the lakes, there is the potential for significant fish kills if lake levels are lowered far enough. There would also be significant sediment transport/erosion at the lake outlets if failure of the structures were to occur.

Describe how the proposal uses science-based targeting that leverages or expands corridors and complexes, reduces fragmentation or protects areas identified in the MN County Biological Survey:

It is recognized that dams create significant fragmentation of aquatic habitat. This project eliminates the fragmentation and will allow fish passage of all of the fish species in the river system. The improved connectivity of lakes in southwest Minnesota will allow for improved biodiversity within the Des Moines River Watershed. The project will expand habitat corridors by opening up areas upstream of Lake Sarah and Lime Lake for fish access to potential spawning habitat. Both game and non-game species will benefit from the project.

Which two sections of the Minnesota Statewide Conservation and Preservation Plan are most applicable to this project?

- H3 Improve connectivity and access to recreation
- H6 Protect and restore critical in-water habitat of lakes and streams

Which two other plans are addressed in this proposal?

- Long Range Plan for Fisheries Management

- National Fish Habitat Action Plan

Describe how your program will advance the indicators identified in the plans selected:

This project will provide fish passage and improved connectivity for the rivers and streams in the Des Moines River Watershed. The project will help to reconnect rivers and streams to their natural habitats. Additionally, the project will help to maintain and protect a healthy aquatic system while preventing further degradation of the habitat upstream of each of the dams. Ideally, the project will help to increase the quality and quantity of fish habitats within the watershed.

Which LSOHC section priorities are addressed in this proposal?

Prairie

- Restore or enhance habitat on public lands

Describe how your program will produce and demonstrate a significant and permanent conservation legacy and/or outcomes for fish, game, and wildlife as indicated in the LSOHC priorities:

This project will permanently restore and enhance habitat of Lime Lake and Lake Sarah by reconnecting the streams downstream of each lake to the upstream habitat. The project will allow fish and mussel species to navigate up and downstream of the lakes with higher frequency thereby increasing the overall biodiversity of the lakes. The project is expected to increase fishing opportunities upstream of where the existing dam structures are located. This project is a step in providing full connectivity in the upper Des Moines River Watershed. Continued modifications of other low head dams in the region will provide increased connectivity in the future.

What other fund may contribute to this proposal?

- N/A

Does this proposal include leveraged funding?

No

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.

The funding provided by the Outdoor Heritage Fund does not supplant or substitute for any previous funding.

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

Murray County will maintain the installed project features into the future. Initially, the project will be monitored to ensure that the project is functioning as intended. The project will follow natural channel design principles, which create habitat conditions that are self-sustaining. Significant long-term maintenance costs are not expected. Murray County will use funds currently used for dam maintenance to conduct required project maintenance.

Actions to Maintain Project Outcomes

Year	Source of Funds	Step 1	Step 2	Step 3
Annually	Murray County	Inspect Rock Arch Rapids Fishway	Perform maintenance/repairs as needed	-
One year after project completion	MN DNR Fisheries	Fish survey conducted by Minnesota DNR Fisheries	-	-

5 years after project completion	MN DNR Fisheries	Fish survey conducted by Minnesota DNR Fisheries	-	-
10 years after project completion	MN DNR Fisheries	Fish survey conducted by Minnesota DNR Fisheries	-	-

Identify indicator species and associated quantities this habitat will typically support:

The implementation of the rock arch rapids fishway will benefit both Walleye and Northern Pike species in Lime Lake and Lake Sarah. Increased populations of Walleye and Northern Pike are expected as a result of this project.

How will the program directly involve, engage, and benefit BIPOC (Black, Indigenous, People of Color) and diverse communities:

This project will provide public fishing opportunities at Lime Lake County Park. Many different groups of people can benefit from this enhanced recreational opportunity.

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?

Yes

Where does the activity take place?

- Public Waters
- County/Municipal

Land Use

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

No

Other OHF Appropriation Awards

Have you received OHF dollars in the past through LSOHC?

No

Timeline

Activity Name	Estimated Completion Date
Finalize Rock Arch Rapids Construction Plans	October 2022
Complete Project Permitting	November 2022
Begin Construction	December 2022
Complete Construction	October 2023
Full Project Maintenance Begins	November 2023

Budget

Totals

Item	Funding Request	Antic. Leverage	Leverage Source	Total
Personnel	-	-	-	-
Contracts	\$1,135,400	-	-	\$1,135,400
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	-	-	-	-
Professional Services	\$285,000	-	-	\$285,000
Direct Support Services	-	-	-	-
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	-	-	-	-
Other Equipment/Tools	-	-	-	-
Supplies/Materials	-	-	-	-
DNR IDP	-	-	-	-
Grand Total	\$1,420,400	-	-	\$1,420,400

Amount of Request: \$1,420,400

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 70% of the requested funding

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

It is anticipated that only one of the two sites could be fully completed through construction. Final construction plans for the second site may be able to be completed. Lack of funding would prevent construction of the final site.

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

N/A

If the project received 50% of the requested funding

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

Ability to scale down to this level would require very favorable construction bids and would likely be for only one site.

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?

All costs to construct the rock arch rapids fishway at the outlets of Lime Lake and Lake Sarah Dams as well as the removal and replacement of the pedestrian bridge near the outlet of Lime Lake.

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	0	0	0	2	2
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
Total	0	0	0	2	2

Total Requested Funding by Resource Type (Table 2)

Type	Wetland	Prairie	Forest	Habitat	Total Funding
Restore	-	-	-	\$1,420,400	\$1,420,400
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	-	-
Total	-	-	-	\$1,420,400	\$1,420,400

Acres within each Ecological Section (Table 3)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Acres
Restore	0	0	0	2	0	2
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
Total	0	0	0	2	0	2

Total Requested Funding within each Ecological Section (Table 4)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Funding
Restore	-	-	-	\$1,420,400	-	\$1,420,400
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	-	-	-	-	-
Total	-	-	-	\$1,420,400	-	\$1,420,400

Average Cost per Acre by Resource Type (Table 5)

Type	Wetland	Prairie	Forest	Habitat
Restore	-	-	-	\$710,200
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	-	-	-	\$710,200	-
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

2

Outcomes

Programs in prairie region:

- Protected, restored, and enhanced shallow lakes and wetlands ~ *The partial replacement of low head dams at the outlets of Lime Lake and Lake Sarah with rock arch rapids fishways will help to restore habitat in these areas and enhance aquatic habitat upstream of the outlets by increasing fish passage and improving species diversity upstream and downstream of the lake outlets.*

Parcels

Sign-up Criteria?

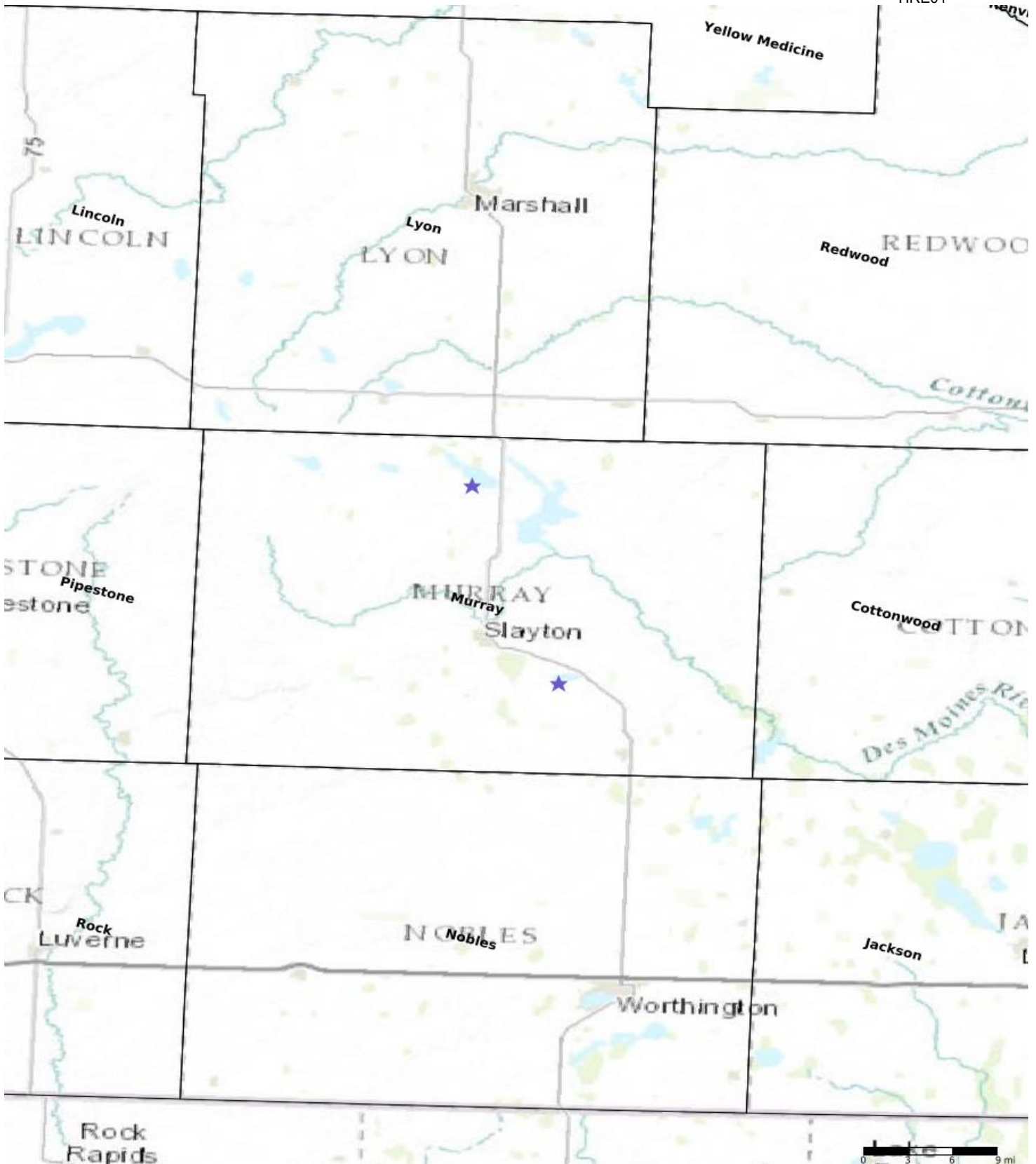
No

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

Parcels where the proposed rock arch rapids will be constructed were identified and selected for this project.

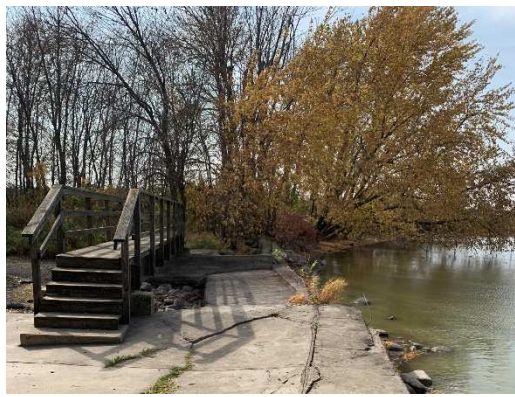
Restore / Enhance Parcels

Name	County	TRDS	Acres	Est Cost	Existing Protection
D P Peterson Family LLC	Murray	10841021	1	\$354,500	-
Murray County Parks System	Murray	10640032	1	\$1,065,900	-



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

Parcel Map
Lime Lake and Lake Sarah Dam Replacements
(Data Generated From Parcel List)



Lime Lake and Lake Sarah Dam Replacements

Project Background & Scope

Two low head dams at Lime Lake and Lake Sarah in Murray County, MN are deteriorating and will need to be replaced or significantly modified in the near future. This creates a once in a lifetime opportunity to ensure the new structures are fish friendly. Failure of the structures would significantly alter lake levels and would have negative impacts on upstream and downstream aquatic habitat. Replacing these structures prevents negative impacts from their eminent failure, and it also provides an opportunity to enhance the aquatic habitat both upstream and downstream of the current dam locations. Additionally, improved fish passage and connectivity of lakes within the Des Moines River Watershed will be achieved through the construction of this project.

The project involves the partial removal of the existing low head dam structures at Lime Lake and Lake Sarah. The removal of the existing structure at Lime Lake will involve the removal and replacement of an existing pedestrian bridge at that location. In place of the existing dam, there will be construction of a rock ramp that is conducive for fish passage. Boulder weirs would be implemented within the rock ramp. The boulder weirs are positioned in a parabolic shape to concentrate high velocity flows towards the middle of the channel and create low velocity flows closer to the channel banks. The

low velocity areas of the channel, or pool areas, are locations that fish tend to frequent. The proposed channel will tie into the natural channel banks so that minimal disturbance to the adjacent floodplain area is achieved. At both dam locations, the current elevation and hydraulic function of the outlet will be maintained so that upstream habitat is not impacted in an adverse way.

Input from project stakeholders has been attained through public meetings used to address comments, concerns, and questions related to the project. Continued informational meetings and involvement from project stakeholders is expected as the project progresses forward. The lake outlet for Lime Lake is located within Lime Lake County Park, which is available to the public. Stakeholders are encouraged by the idea of enhancing fish passage through the park and look forward to improved fishing opportunities. The outlet for Lake Sarah is located along a public water crossing on private land. An on-site meeting has been held with the landowners to answer any questions that they have had, and to provide some additional information on the project footprint. The private landowners are willing to work with Murray County throughout this process and are optimistic about the potential outcomes of the project.



Outcomes/Benefits

- Restored outlets at Lime Lake and Lake Sarah
- Enhanced aquatic habitat upstream of lake outlets
- Improved recreation opportunities at Lime Lake Park
- Reduced long-term maintenance at both outlet locations
- Improved spawning habitat for Walleye and Northern Pike
- Increased connectivity of fish species within the Des Moines River Watershed



Enhanced Fish Passage



October 2022
Finalize rock arch rapids project construction plans



November 2022
Complete project permitting



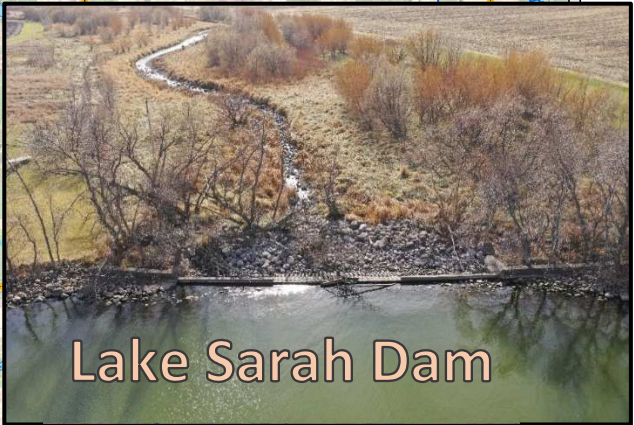
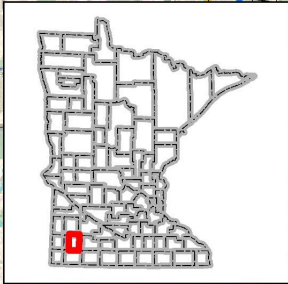
December 2022
Begin construction



October 2023
Complete construction



November 2023
Full project maintenance begins



Lake Sarah Dam



Lime Lake Dam

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