NORTHWESTERN ENERGY 2021 MADISON TAC PROPOSAL

Project Title: Indian Creek Irrigation Infrastructure Improvement and Streamflow Enhancement Project

Date: January 1, 2021-December 31, 2022

How this project addresses a specific Project 2188 License Article: This project is a Priority 2 project that intends to restore year-round streamflows to a primary tributary of the Madison River.

Project Sponsor: Trout Unlimited, Jeff Dunn and Pat Byorth

Location of Proposed Project: This project is located on the Indian Creek Ditch, which diverts water from Indian Creek at the mouth of the canyon, immediately downstream of the National Forest boundary.

Geocode: Lat: 45.10300 Long: -111.56673

Total Project Cost: $65,875.50

INTRODUCTION

Indian Creek, a tributary of the Madison River, is seasonally dewatered due to irrigation withdrawals via the Indian Creek Ditch. In response, Trout Unlimited proposes to conduct a hydrologic study of the Indian Creek Ditch that will quantify current water use and identify reaches where ditch loss is occurring. The results of the hydrologic study will be used to develop a suite of alternatives for improving irrigation infrastructure and ensuring there is enough water in Indian Creek so that it remains hydrologically connected to the Madison River year-round. Trout Unlimited will present the findings of the hydrologic study and alternatives analysis to the Indian Creek Ditch Company, which will select a preferred alternative for irrigation infrastructure improvements. A 35% complete engineering design will be then be developed for the preferred alternative. During this timeframe, Trout Unlimited will also undertake an evaluation of the water rights and begin developing the necessary framework to protect water instream and get authorization for any water right changes required for the project.

OBJECTIVES

The goal of this project is to identify a remedy for the seasonal dewatering of Indian Creek resulting from diversions into the Indian Creek Ditch. To achieve this goal, the following objectives will be accomplished:

1) Analyze existing data and develop a plan for expanded monitoring during the 2021 irrigation season
2) Perform ditch and stream flow monitoring during the 2021 irrigation season
3) Perform ditch loss analysis in the fall of 2021

4) Develop a suite of alternatives for reducing ditch loss and ensuring Indian Creek flows year-round in the fall 2021 and winter 2022; present findings to ditch company and select a preferred alternative for irrigation infrastructure improvements by April 2022
5) Develop a 35% complete engineering design and cost estimate for the preferred alternative by September 2022
6) Evaluate water rights and develop a strategy for protecting water instream in conjunction with irrigation infrastructure improvements.

METHODS

Task 1 - Analyze Existing Data and Develop Monitoring Plan for 2021
Trout Unlimited conducted flow monitoring at four sites on the Indian Creek Ditch in 2017 and 2018. Data loggers were installed at each site and ditch flow measurements were made in the spring and fall, with 41 cfs measured at the point of diversion in October 2018, and 19 cfs measured at the most downstream monitoring site located near the Highway 287 crossing. In addition, the ditch company performed periodic flow measurements during the 2020 irrigation season. This information will be used to describe existing conditions and identify additional monitoring needs for the 2021 irrigation season, including both ditch and stream flow measurements. A monitoring plan will be produced outlining the monitoring strategy by April 2021.

Task 2 – 2021 Ditch and Stream Flow Monitoring
During the 2021 irrigation season (May through early-October), ditch and stream flow monitoring will be conducted throughout the hydrologically connected Indian Creek ditch/stream network. Data loggers will be deployed at sites identified in the monitoring plan and periodic flow measurements will be taken in order to develop rating curves.

Task 3 – Ditch Loss Analysis and Summary Report
Following the 2021 irrigation season, the results of the ditch and stream flow monitoring will be evaluated to identify areas of significant ditch loss. This analysis will provide the foundation for identifying water conservation solutions and will be presented in a summary report.

Task 4 – Irrigation Infrastructure Improvement Alternatives Analysis and Selection of a Preferred Alternative
A suite of irrigation infrastructure improvement alternatives will be developed. Potential alternatives will focus on providing water to water users when and where it is needed, while maintaining year-round streamflows in Indian Creek. Potential alternatives range from lining or piping the ditch to developing alternative water sources. The alternatives will incorporate a water rights analysis as well as input from water users on the timing, location, and challenges of their irrigation practices. The suite of alternatives will be presented to the water users by April 2022, who will select a preferred alternative.

Task 5 - Develop 35% Complete Design and Cost Estimate
A 35% complete engineering design will be developed for the preferred irrigation infrastructure improvement alternative by September 2022. This design will provide the foundation for final design, permitting, bidding and construction during 2023, with a target timeline for construction in the fall of 2023 or spring of 2024.

Task 6 – Water Rights Evaluation
Beginning in 2021, Trout Unlimited will evaluate existing water rights on the ditch and identify opportunities to work with water right holders to increase water conservation. In conjunction with irrigation infrastructure improvements, Trout Unlimited will develop short and long-term strategies for enhancing and protecting water instream in Indian Creek.

SCHEDULE

The six tasks outlined above will be completed between January 2021 and December 2022 as presented in **Table 1**.

Table 1. Project Timeline

Task	2021												2022											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1																								
2																								
3																								
4																								
5																								
6																								

PERSONNEL

Trout Unlimited staff, Jeff Dunn, Pat Byorth, Morgan Case and Meg Casey will be responsible for the work associated with this project. A water resource-focused engineering firm will be retained to support the ditch and stream flow monitoring, ditch loss analysis, alternatives analysis, and development of 35% complete engineering designs.

PROJECT BUDGET

The proposed budget for this project is presented in **Table 2**.

Table 2. Project Budget

Direct Labor	$19,360.00
Travel and Living	$862.50
Materials	$3,000.00
Other Direct Expenses	$37,500.00
Direct Overhead	$5,153.00
Cost share / in-kind	$0.00
Total	**$65,875.50**

DELIVERABLES

1) Monitoring plan for 2021 ditch and stream flow monitoring
2) Report summarizing results of ditch loss analysis and suite of alternatives for irrigation infrastructure improvements
3) 35% complete engineering design and cost estimates for preferred alternative
4) Report summarizing water rights assessment and outlining opportunities for instream flow protection

CULTURAL RESOURCES

Since no earthwork is being conducted during this project development phase, an evaluation of cultural resources is not yet necessary. A cultural resource evaluation will be completed during the final design phase and prior to construction.

WATER RIGHTS

Trout Unlimited will complete a water rights evaluation as a component of this project. It will be used to develop short and long-term strategies for enhancing Indian Creek flows and protecting any conserved water resulting from irrigation infrastructure improvements or other efficiencies identified in the assessment.