



# **GRMW PROPOSAL APPLICATION - DRAFT**

**Project/Application Title:** Elmer Dam Fish Passage and Flow Improvement

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This proposal is for a RESTORATION type project!

## **Location/Abstract**

<b>General Location</b>	<b>Downstream Extent</b>	<b>Upstream Extent</b>
Latitude: 45.3683440 Longitude: 117.8632670	Latitude: 45.3683440 Longitude: 117.8632670	Latitude: 45.3549360 Longitude: 117.8415050

## Opportunity Map

**Due to a limitation of the framework tool used to create PDFs, we are unable to display the opportunity map within this document. However, you may still view the opportunity map using the following link:**  
**[Opportunity Map Link](#)**

## Abstract

Elmer Dam is located on Catherine Creek (RM 13.1), Union County, Oregon. The dam significantly effects the creek's water quality, hydraulics, habitat complexity, and fish passage. The goal of this work at Elmer Dam is to improve fish passage for all native fishes at all water levels (with a focus on Chinook and steelhead), decrease the negative hydrologic effects associated with the dam in its current state, and increase the efficiency of the landowner's agricultural systems.

Lengthy data collection and alternatives analysis concluded that the current fishway at Elmer Dam was no longer suitable for current fish passage standards and should be replaced.

The project team will construct a new fishway structure around Elmer Dam that meets ODFW and NOAA fish passage standards. Improving the passage structure around Elmer Dam will allow for more suitable attractive flow, while also allowing for different passage options throughout many flow scenarios. The fishway and dam improvements coupled with on farm updates to off channel reservoirs and intakes will create more natural hydrologic scenarios through a key migration corridor for listed Catherine Creek Salmonids. All permitting is being completed under the ongoing TA project. The only exception is the construction contractor will be responsible for the DEQ 1200-C

## **Stepwise & Atlas**

**Prospectus submitted and review by Atlas Implementation Team:** Yes

**Project prospectus title and/or ID# (if applicable):** Elmer Dam Fish Passage and Flow Improvement

**Associated Subwatershed:** CC2B

**Associated Opportunity:** CC2B - CC 11.4 - 13.8: Elmer Dam

## Problem Statement & Opp Score

The problem statement described the critical/limiting life stages and limiting habitat factors identified in the Atlas for the subwatershed in which this project is located and explain which of these species, life stages and limiting factors will be addressed in this project (how the problems will be addressed should be discussed in the 'Proposed Solution' section). This includes past land use history with respect to the project reach and larger watershed—especially any land use that has led to the current impaired condition.

Catherine Creek originates high in the Willowa Mountains of northeast Oregon. The 402 mi.<sup>2</sup> watershed drains into the Grande Ronde River in the Grande Ronde Valley. Catherine Creek contains critical spawning and rearing habitat for ESA-listed Snake River Chinook salmon and steelhead, bull trout, and State Sensitive Redband trout. Restoration actions were identified in the Grande Ronde and Catherine Creek Restoration Atlas prioritization strategy led by BPA and GRMW. These actions have led to numerous projects that have been implemented in Catherine Creek over the last several years by local restoration practitioners. Much of this work is occurring upstream of Elmer Dam, a concrete flashboard irrigation structure located in Catherine Creek at RM 13.1 and an obstruction to fish migration. Improving fish passage, water use efficiency and aquatic habitat quality in this reach of Catherine Creek is important to the long-term aquatic connectivity and hydrologic regime in this priority watershed.

The Bureau of Reclamation's (BOR) detailed Site Description from The Catherine Creek Tributary Assessment, Grande Ronde River Basin Tributary Habitat Program (2012), describes the problems associated with the dam and its effects on the creek's hydrology, water quality, geomorphology, and fish passage.

"In addition to rerouting the Grande Ronde River and channel straightening, Elmer Dam, located mid-way within the reach at RM 13.1, has significant effects on the hydraulics, water quality, and habitat complexity within this reach. Elmer Dam is used for agricultural irrigation storage within the Catherine Creek channel. The dam backs up water for up to 14.6 miles (to near Godley Lane at RM 26.7). Water is pumped from the resulting "reservoir" at multiple locations. Water rights associated with Elmer Dam total approximately 29 cfs in addition to water storage rights for another 298 acre-feet. Pump capacity likely limits withdrawals to less than 20 cfs, which is further reduced later in the summer (Hattan 2011). The water rights are enough to completely and regularly dry Catherine Creek below the dam during the irrigation season. The dam itself has multiple effects on the creek: it acts as an artificial grade control structure preventing vertical migration of the channel, it develops a backwater pool, and it disconnects upstream and downstream movement of aquatic species, nutrients, and detritus that form the food base for salmonids. The backwater area upstream has a reduced ability to carry sediment due to the reduced slope and has aggraded in response to the artificial grade control imposed by the structure. This has caused any natural pools to fill with sediment. Multiple delta deposits of fine-grained sediment were observed during the summer of 2010 in the backwater areas of Elmer Dam, which further indicates that the reservoir area has limited sediment transport capacity.

Another effect of the structure is the documented thermal stratification of the water column in the backwater of the structure (Watershed Sciences 2000). The stratification results in the warmest water being at or near the surface, and this is the water that flows into the fish ladder. This may increase the potential for the development of a thermal barrier for upstream migrating fish. While most of the adults have already passed upstream before this temperature gradient would become a problem, it is possible that late returning adults would encounter these conditions."

The BOR assessment also states the below information about water quality in Reach 1 of Catherine Creek (RM 0 - 22.5).

"Reach 1 has significant water quality problems with several parameters exceeding ODEQ's Section 303(d) list for violation of water quality standards: temperature; aquatic weeds (or algae); dissolved oxygen; nutrients; and pH (ODEQ 2000). All of these parameters can be associated with flow and habitat modifications to the stream both upstream and within reach 1. The Catherine Creek TMDL (ODEQ 2000) reported several issues within reach 1 that contribute

to poor water quality that include substandard riparian conditions, low summer flows, high summer temperatures, limited dilution, and streambank erosion. Severely reduced summer flows together with reduced riparian shading and the overly wide channel relative to low flows exacerbate high water temperatures in the summer."

In addition, the Grande Ronde River can create backwater effect upstream in Catherine Creek to Elmer Dam and possibly beyond. The mainstem Grande Ronde River spring high flow peaks occur approximately 7 days earlier than the Catherine Creek peaks (BOR 2012). The backwater effect may be compounded by the dam's effect (hydrologic control), and associated flow velocities downstream of the dam during run-off. The stream gradient through Reach 1 (TM 0-22.5) of Catherine Creek increases below Elmer Dam. Based on recent studies of Chinook smolt outmigration in Catherine Creek, there appears to be a lag in speed at which the fish move downstream through the system in the reach around Elmer Dam (ODFW 2018), which could be influenced by the hydrologic effects associated with the dam.

Final Opportunity Score (Atlas opportunity score)

**None**

# Permits

All permits associated with the project are listed below along with a date of acquisition and date of expiration.

<b>Permit Name</b>	<b>Date Acquired</b>	<b>Expiration Date</b>
DSL Removal Fill	Jan. 31, 2023	Jan. 31, 2025
Army Core 404	Jan. 31, 2023	Jan. 31, 2025
DEQ 401	Jan. 31, 2023	Jan. 31, 2025
NHPA Sec 106	Jan. 31, 2023	Jan. 31, 2025
ESA - HIP IV Biological Opinion	Jan. 31, 2023	Jan. 31, 2025
Union County Floodplain Development	Jan. 31, 2023	Jan. 31, 2025

# Restoration Actions

Below is a list of all restoration actions applicable to this project.

Restoration Action	Justification
23. Structural Passage (Diversions)	
32. Irrigation System Upgrades -Water Management	Several project elements are aimed at mutually improving agricultural operations and achieving fish and hydrologic related objectives. Relocating pumping stations to off channel wet well locations allow the landowner/irrigator to more efficient use of the off channel and in channel reservoirs by allowing access to a greater volume of reservoir 4. Additionally, piping the off channel reservoirs together, and decreasing the amount of intake locations allows easier and more efficient management of reservoir elevations.

## Proposed Solution

The proposed solution states the project goals and articulates the expected outcomes of the project. It explains how the restorations actions selected will address the problems stated in the problem statement.

The goal of the Elmer Dam project is to improve fish passage for all native fishes at all water levels (with a focus on Chinook and steelhead), decrease the negative hydrologic effects associated with the dam in its current state, and increase the efficiency of the landowner's agricultural systems. Individual project objectives are as follows;

**Objective #1 - Improve Fish passage for all native fish species at all water levels.**

- The fishway has been designed to actively accommodate multiple operating conditions. These operating conditions are intended to facilitate fish passage between the 5th (449 cfs) and 95th (20 cfs) percentile flow rates within the typical expected operating conditions in Reservoir 4, and to provide hydraulic connectivity through the fishway at very low flow in-stream rates down to 8.5 cfs or during time periods (primarily outside of the irrigation season) when maintaining reservoir storage is not a priority. Fishway design features include two exit openings each measuring 1.5 feet wide and 4 feet high. The upper exit is intended for use during the irrigation season when the operator is managing the reservoir for storage and for high flow conditions up to 449 cfs. The lower exit is intended for use at times when reservoir storage is not a priority. The fishway also includes two entrance openings, each measuring 1.5 feet wide by 3 feet high. The lower entrance will be used during very low flow conditions up to in-stream flows of approximately 100 cfs. At flows above 100 cfs, tailwater depths increase sufficiently to use the higher elevation orifice to maintain attraction flow characteristics.

**Objective #2 - Decrease the negative hydrologic effects created by Elmer Dam in its current state.**

- The removal of the existing 5-foot wide fishway reduces the effective hydraulic capacity of the dam to pass high flows. To offset this reduction in hydraulic capacity, a portion of the dam will be removed and replaced with a 6-foot-wide spillway and overshot gate. The spillway provides more hydraulic capacity than the existing fishway. The new vertical slot fishway also provides additional hydraulic capacity but has been conservatively neglected in the hydraulic analysis relative to performance at high in-stream flow events (greater than the 1.05-year return interval). Additionally, the two existing pumps, one at the dam and one at Booth Lane, will be moved to off channel wet well locations. The relocated pump station will provide the following benefits:
  - The pump station will allow the owner to access a greater volume of storage in Reservoir 4 (the on-channel reservoir) which is currently unavailable due to the elevation of the pump intakes. This

modification will allow the reservoir to be operated consistently at a lower full pool elevation to reduce the total forebay to tailwater elevation difference, thereby reducing the total maximum elevation change through the fishway. • A second intake for this pump station will be provided on the adjacent Reservoir 1 (the most downstream offchannel oxbow reservoir), allowing for more efficient use of the storage in Reservoir 1, and potentially reducing the late season withdrawal demands on Reservoir 4. The existing intake pump at Booth Lane will be relocated to an off-channel intake to accommodate operation at a reduced full pool elevation in Reservoir 4.

Objective #3 - Reduce entrainment of ESA Listed fish in off channel reservoirs.

- NMFS/ODFW compliant fish screens will be installed on new intakes for Reservoirs 1 and 2 to reduce the entrainment of ESA listed steelhead and Chinook juveniles in the oxbows. The Reservoir 1 intake will be combined with the intake infrastructure for the pump station adjacent to Elmer Dam for construction cost and operations/maintenance efficiency. The existing intake for Reservoir 3 will be abandoned as Reservoir 3 will be filled from the adjacent Reservoir 2 using the Off-Channel Reservoir Connection pipelines described above.

Objective #4 - Maintain the landowners water rights while also improving on their current agricultural systems.

- Project elements are aimed at mutually improving agricultural operations and achieving fish and hydrologic related objectives. Relocating pumping stations to off channel wet well locations allow the landowner/irrigator to more efficient use of the off channel and in channel reservoirs by allowing access to a greater volume of reservoir 4. Additionally, piping the off channel reservoirs together, and decreasing the amount of intake locations allows easier and more efficient management of reservoir elevations.

## Objectives

The table below quantifies the appropriate indicators this project will include. Each indicator has a measured current condition, an action taken, a restored condition (post-restoration), a set target condition, and justification/citation explaining why the action will work. Each indicator also includes whether or not the objective will be monitored.

Indicator	Current Condition	Action Taken	Restored Condition	Target Condition	Citation	Monitored?
Quantity of accessible fish habitat	None	0.0	120.0	N/A		No

**Reporting Requirements:** In addition to the objectives outlined above, sponsors who receive funding through GRMW understand they will be required to resubmit the indicators/objectives table and budget after implementation to verify that work was completed as proposed and on budget. If there were any deviations from the proposed actions or budget they will be asked to explain those deviations at that time. If they plan to submit a completion report to BPA or a similar organization, they may include this table as a part of the completion report to meet this requirement. Please note that if they wish to recreate this table in their own document that it must include "proposed" and "actual" columns to accurately reflect the work completed.

## Objectives Narrative

Objective Narrative: This block explains why the objectives selected are relevant to this project and why/how the actions selected in the Restoration Actions section should result in the restored condition proposed.

Catherine Creek contains critical spawning and rearing habitat for ESA-listed Snake River Chinook salmon and steelhead. Restoration actions were identified in the Grande Ronde and Catherine Creek Restoration Atlas prioritization strategy led by the Bonneville Power Administration and the Grande Ronde Model Watershed and have been implemented in Catherine Creek over the last several years by local restoration practitioners. Much of this work is occurring upstream of Elmer Dam, a concrete (approx. 8 ft. tall, 80 ft. wide) flashboard irrigation structure located in Catherine Creek at RM 13.1 and an obstruction to fish migration. Improving fish passage, water use efficiency and aquatic habitat quality in this reach of Catherine Creek is important to the long-term aquatic connectivity and hydrologic regime in this priority watershed.

Based on background information gathering on the biological patterns of salmon and steelhead in this reach, it appears that the dam is likely to cause the biggest challenges for fish in these life stages: late returning adults (Chinook); out-migrating smolts - due to backwater; increased predation by non-native fishes, avian and other wildlife; and zero passage for all fish starting in mid-summer. The proposed design will create an alternative to the existing structure and its effects on the creek. The designs will not only improve fish passage but, will also improve hydraulics and allow the landowners to use the in channel reservoir more efficiently, possibly augmenting in stream flow.

Explain Target Condition: This block explains why any of the restored conditions of any objectives selected do not meet the target condition. If all restored conditions meet the corresponding target condition, then this field will appear blank.

Additional Objectives: This block includes any additional objectives not captured in the objectives table. Objectives should be specific, measurable, achievable, relevant, and time-bound.

The on farm elements of the project will allow reservoir 4 (the instream reservoir) to be operated at a lower elevation. Although it is current immeasurable, lowering the forebay of Elmer Dam has the potential to augment instream flow, and improve hydraulic conditions of upstream reaches of Catherine Creek. These two project elements allow for improved access to upper reaches of Catherine Creek and its tributaries.

Entrapment of ESA listed species in the off channel reservoirs has been documented at Elmer Dam. Decreasing the abundance of intakes into off channel reservoirs, piping reservoirs together, and screening the intakes will further improve downstream passage for juvenile ESA listed species.

Climate Change Concerns: This block explains considerations made regarding how this proposed work may address climate change concerns.

The Elmer Dam Fish Passage and Flow Improvement Project aims to improve fish passage and hydrologic function in Catherine Creek throughout the project area. However, the on farm elements of the project have additional resulting benefits. Future climate impacts will likely effect water quality and quantity throughout the project reach. The project will have direct effects on water and energy savings. Additionally, although it may not be immediately measurable, it is believed that the project will result in lowering the forebay of Elmer Dam. Lowering the forebay could in return, allow upstream reaches of Catherine Creek that were previously impounded, to flow freely. Natural hydrologic function could help reduce the amount of thermal loading in Catherine Creek

Previous Work: This block describes any previous work implemented in this reach and how this project connects to or builds upon those previous efforts.

Aside from the current fishway and on farm improvements, no other projects have been implemented in the project reach. The project does build off of restoration efforts in the upper reaches of Catherine Creek. Improving hydraulic conditions and fish passage through the project reach will allow fish to more effectively migrate through the project reach and spawn/rear in upstream reaches.

Other Species: If there any other sensitive or listed species, aquatic or terrestrial, impacted by this project, this block lists them and explains how they might be impacted by this project.

No sensitive or listed species will be impacted by this project.

Is this a phased project?

No

If this is a phased project, can this phase be a standalone project?

None

## Monitoring

This table shows all objectives specified for monitoring. It explains who will be performing this monitoring, how it will be implemented, how long it will take place for, whether or not it will be shared or available to Atlas partners, and how that data will be shared/made available.

Monitoring Indicator	Monitor	Protocol	Time Monitored (yrs)	Availability/Sharing
Adult and Juvenile Fish Migration	ODFW	PIT tag array	indefinitely	

# Landowner Engagement

The following table is applicable to projects which take place on private property. It lists the relevant landowners involved in the project, the landowner agreement, whether or not neighboring landowners have been contacted, and whether or not there were any issues identified (resolved or unresolved) concerning the landowner.

Landowner	File (Click to Download)	Neighbors Contacted?	issues
	None	None	
Phil Hassinger	None	Yes	
Seth Hassinger	None	Yes	
Jed Hassinger	None	Yes	

Landowner Agreements:

Trudy & John P. Hassinger/Neighbors Contacted? Yes/Issues? No/ Link --> [Click to View/Download File \(grmw.org\)](#)

## Timeline

Will this project be completed within 2 years if awarded funding? Projects that will be completed in the first year of the contract in-water work window will be given funding priority over out-year projects (applies to restoration projects only).

Yes

## Project Elements

The table below identifies the major work elements of this project, when the work for each element is proposed to begin, and when that work is expected to end.

Project Element	Proposed Start Date	Proposed End Date
Commissioning and Startup	July 1, 2024	Dec. 31, 2024
Construction: Fishway and Dam Components	July 1, 2024	Nov. 30, 2024
Construction: Intakes, Diversions, On Farm Elements.	Oct. 31, 2023	July 1, 2024
Mobilization to Project Site	May 1, 2023	Oct. 31, 2023
Contract Firm for Construction	Feb. 28, 2023	April 28, 2023
Advertise Request for Proposal	Jan. 1, 2023	Feb. 1, 2023

# Designs

Level of Current Designs:

100%

Alternatives Analysis:

Three design alternatives were suggested in the early stages of project development. Alternative 1 combined several project elements including; Off channel pump stations and improvements, piping off channel reservoirs together, and screening new intakes. Alternative 2 explored moving portions of the in channel water right to off channel reservoirs. This alternative showed to be very high in cost and had possible water right implications. Alternative 3 posed removing the current fishway and replacing it with a new verticle slot fishway that wil meet ODFW/NMFS passage standards. Data collection in early project development showed that a combination of alternatives 1 and 3 would maximize the fish passage potential throughout the project reach.

Additional Comments:

Designs File:

Download Designs File: [Open File in Web Browser](#)

## Feedback

The section below indicates feedback for this online proposal process. Comments are greatly valued and will be read and internalized by staff upon submission. Comments will be used to guide the refinement of this format to something simple, clean, intuitive, and useful. We (GRMW) express special thanks to our partners for taking the time to fill out this section.

It would be nice to be able to go back in to certain tables that are generated and edit them. Currently users have to add a new element and change metrics, then delete the old. Specific to the; elements, permits, and landowners tabs.

# Budget

Download Budget File: [Open File in Web Browser](#)

Budget Narrative: This block explains the budget and any unusual line items or costs.

Project budgets were based off of engineered estimates provided by the Engineering Firm under contract for the design of the project. Additionally, the budget was compared to current District projects in construction with similar project elements. Inflation was also considered in budget development.

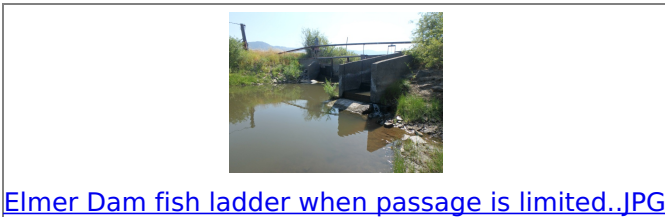
## Cost Share

The table below outlines all cost share included for this project including: the organization/source of the cost share, the amount of the cost share (in dollars), whether or not the funds have been secured, whether the funding is cash or in kind, and the reference or contract number if available.

Organization/Cost Share Source	Amount (\$)	Secured?	Cash/In Kind?	Reference/Contract # (If Available)
OWEB Open Solicitation	\$327,275	No	Cash	
ODFW Restoration	\$193,726	No	Cash	
NOAA Fish Passage	\$539,500	No	Cash	
CTUIR Passage	\$813,020	No	Cash	
Union SWCD	\$15,840	Yes	In Kind	

# Uploaded Photos

By providing pictures the following photos to GRMW the applicant agrees to have their pictures displayed on the GRMW website (grmw.org) and social media accounts.





[Elmer Dam fish ladder providing passage.JPG](#)

## Additional Files

File Name (Click to Download)	Description
<a href="#">Open File in Web Browser</a>	IT review comments and response
<a href="#">Open File in Web Browser</a>	Temporary fish passage plan.
<a href="#">Open File in Web Browser</a>	Basis of Design Report
<a href="#">Open File in Web Browser</a>	30% HIP Comment Tracking
<a href="#">Open File in Web Browser</a>	15% HIP Comment Tracking

# Signature

Signature	Accepted Terms	Draft Signed	Final Signed	Date Signed
James Webster	Yes	Yes	No	Oct. 17, 2022

The signature below affirms everything the applicant has entered into this document is true and accurate to the best of their knowledge and that they agree to stipulations previously outlined in this application such as the sharing of media and reporting requirements should the project be approved by the GRMW Board of Directors.

*James Webster*  
Applicant Digital Signature

Oct. 17, 2022  
Date Signed (Most Recent)