Prospectus of Proposed Project Opportunity

Opportunity Title: Catherine Creek Weir RM42.5 Passage Project
Planning, Alternatives Development, and 30% Design

Opportunity Lead Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

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Landowner
City of Union/BPA Site Lease/David Ricker POD
Contacted: BPA and Ricker. Need to coordinate with City of Union
Supportive: BPA, yes, Ricker, yes
Contributions: Participation in project planning and alternatives development related to water right intake and off channel habitat opportunities

River
Name: Catherine Creek
Mile: 42.5
Tributary: Grande Ronde River

Restoration Atlas
BSR: Catherine Creek CC3b1
Tier: 1
Initial Score:
Proposed Score:

Restoration Activities
1. Fish Passage
2. Perennial side channel

Species Affected
Focal: ESA-listed Snake River spring Chinook salmon, Snake River summer steelhead, bull trout, Pacific lamprey, and resident fish

Introduction

This project prospectus outlines a framework for a future funding proposal to initiate detailed project planning and design to restore year-long fish passage at the CTUIR's adult collection facility located approximately two miles upstream of Union, Oregon near RM 42.5 (Figure 1). Through the Grande Ronde Model Watershed Program Step-Wise process, the CTUIR is requesting review, input, discussion, and approval to move forward towards a formal project funding proposal. With prospectus support, the proposal would be drafted and submitted by early summer for August 2021 funding approval. Project planning and preliminary design would conducted beginning late fall with completion in mid-2022.

The facility is operated by the CTUIR to collect adult spring Chinook salmon for the Catherine Creek supplementation program. Adult summer steelhead are also enumerated at the site.

Figure 1. Catherine Creek Adult Weir Collection Facility

Figure 2: Aerial view of Weir and Fish Ladder

The fish collection facility consists of a picket weir which is attached at the bottom sill of a full channel width pool and Denil ladder. The picket weir is typically installed the first week of March in order to enumerate summer steelhead. Trapping of adult summer steelhead and spring Chinook is accomplished by directing adults into a fish ladder and off channel trap with a fyke opening and holding area that is 25 feet long and 6 feet wide. The depth is operated at about 6 feet (900 ft3). The designed adult Chinook holding capacity is 90 using 10 ft3/adult. There is also a recovery area in the ladder above the trap that the fish can remain in until ready to continue upstream. Trapping occurs March through July to collect data and adult brood stock for the Catherine Creek Chinook supplementation program. An ODFW juvenile screw trap is located immediately upstream of the project to sample juvenile Chinook and steelhead during out-migrating seasons.

The site includes a POD that services four water rights. The POD head gate is controlled by backwater provided by the concrete weir and diverts irrigation and stock water into an historic Catherine Creek side channel. The approximate 1,200 foot side channel includes two small fish ladders, two culverts, and an additional irrigation gate in the upper segment of the side channel to provide water to adjacent farm fields (Figure 3).

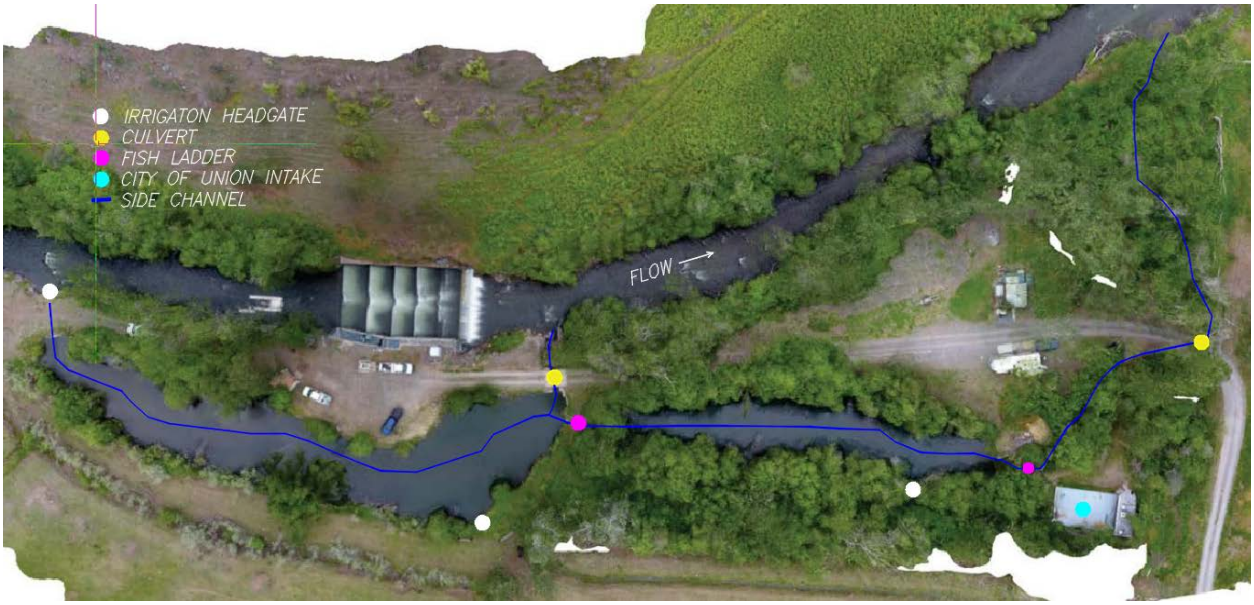

Figure 3. Site Overview

The ODFW recently installed pit tag arrays in the ladder and adjacent side channel to evaluate fish passage and use which will help inform project planning (personal communication with Ted Sedell, May 17, 2021).

Project objectives, as they are preliminarily defined, include:

1. Meet the operational and facility needs of the adult collection facility that are integral to a successful supplementation program.
2. Restore year-long fish passage for all life stages of native fishery resources.

3. Improve sediment transport through site, minimizing need for annual sediment removal.
4. Evaluate POD and water right infrastructure and opportunities for improvements.
5. Evaluate and develop off-channel rearing habitat enhancement opportunities.
6. Evaluate and develop improvements for fisheries monitoring.

Project Needs and Criteria

The existing weir and collection facility is effective for adult fish capture, enumeration, and function for Catherine Creek Chinook supplementation program. However, the weir and fish ladder do not meet current NMFS passage criteria. The Denali ladder exceeds velocity criteria and mortality (rates not available) which occurs frequently at high flows when fish enter the main weir and are impinged on the upstream side of the pickets. Upstream juvenile passage is adversely affected by the velocities through the weir and uncertain through the ladder. Juvenile fish rearing in valley reaches may be negatively affected if upstream migration to cold water refuge is not available during summer periods.

Specific objectives for the facility include:

- Meet State and NMFS fish passage criteria.
- Minimize passage delay and injury.
- Ability to operate in icy conditions.
- Non-obtrusive passage during non-trapping (August – February).
- From March 1 – May 1, passively enumerate adult summer steelhead with efficiency >95%.
- From May 1 – July 31, trap, handle, and enumerate adult Chinook and steelhead with efficiency >98%.
- Ability to handle adult Chinook from May 1 – July 31 to:
    - Collect data: length, sex, record marks, and natural or hatchery origin determination.
    - Collect hatchery brood stock.
    - Mark adult Chinook.
    - Collect genetic samples.
    - Remove surplus hatchery origin adult Chinook.
- Ability to handle adult Chinook under electro-anesthesia with minimal stress on fish and personnel.
- Ability to hold fish for 24 hours.
- Incorporate antenna equipment in fishway to detect and interrogate PIT tags on adult and juvenile Chinook and steelhead.
- Incorporate equipment for safe and efficient loading of adult Chinook into transportation vehicles in-water as much as possible.

<u>Additional Planning and Design Considerations</u>

Irrigation Head gate and Side Channel: An irrigation POD is located approximately 150 feet upstream of the weir and services four water irrigation and livestock watering rights. Water is diverted into an historic Catherine Creek channel approximately 1,200 feet in length and is accessible to fish. The weir creates head to service the intake. Sediment deposition above the weir and at the POD is problematic and requires annual maintenance and removal to keep the head gate functional. Sediment is also removed from side channel periodically to maintain irrigation water capacity.

Historically, the side channel has been managed to provide juvenile access for rearing. Irrigation operations during summer continually alter the amount of flow through the system which presents uncertain impacts on juvenile survival. Fish utilizing the side channel during winter are less likely to be affected by large changes in flow. The question is whether access to the irrigation side channel is a benefit for juvenile salmonid rearing and are there adverse effects associated with the current operations. To help inform analysis of side channel use and value, ODFW is undertaking a fish use evaluation beginning summer 2021.

Fish research and Monitoring: ODFW screw trap operations at the site are challenging due to limited access and ice flows. Site planning will evaluate opportunities to improve screw trap operations and maintenance. Additionally, ODFW pit tag arrays at the site will be incorporated into the site planning to support effective data collection.

Subcontracted Engineering Services

Engineering services will be subcontracted by the GRMW to perform site assessment, assist with stakeholder communication and coordination, conduct hydraulic modeling and sediment analysis, refine project objectives, develop project design criteria, prepare and evaluate alternatives, and prepare 30% construction drawings and design report, and an estimated budget. Draft scope of work for engineering services and project development include:

Task 1 – Data Collection and Analysis of Existing Data

- Conduct an initial site and review existing topographic survey data.
- Conduct additional survey work as needed.
- Review existing 1D hydraulic model.
- Review hydrologic analyses and determine recurrence flows for design.
- Review irrigation POD, side channel functions, fish use and benefits.

Task 2 – Develop Three Conceptual Alternatives (15% Design)

- Create 15% design drawings of conceptual alternatives (in addition to no action alternative) that address project objectives.
- Include project descriptions in written report.
- Develop initial cost estimates for design and implementation of each alternative.

Task 3 – Conceptual Alternatives Scoring and Ranking

- Organize meeting with Project Sponsor, Technical Contacts, ODFW, and NMFS to rank conceptual alternatives.

- Ranking shall consider project objectives, design and implementation cost, sustainability, constructability, permitting, environmental regulations, additional habitat benefits, and public acceptance.
- Summary of alternative ranking to be included in the written report.

Task 4 – Conceptual Design Written Report

- Summarize data collection and assessments of existing data.
- Document calculations, technical analyses, and hydraulic modeling.
- Provide a description of the conceptual alternatives.
- Discuss and detail design and implementation costs for each concept.
- Provide conceptual engineering drawings (15%) of existing conditions and concepts. Drawings shall identify:
    - Landowners and relevant boundaries,
    - Expected Area of Potential Effects (APE),
    - Roads and infrastructure,
    - Profiles and cross sections with water surfaces relevant to designs,
    - Structural conceptual-level details,
    - North arrows and flow directions,
    - Wetlands and ordinary high water delineations, and
    - Structural dimensions.
- Identify and describe criteria for conceptual alternatives scoring.
- Detail and summarize concept scoring.
- Address environmental compliance comments (HIP)

Task 5 – (Optional) 30% Design of Preferred Alternative Basis of Design Report

- Summarize data collection and assessments of existing data.
- Document calculations, technical analyses, and hydraulic modeling.
- Provide a description of the preferred alternative.
- Update estimated implementation cost.
- Provide engineering drawings (30%). Drawings shall identify:
    - Landowners and relevant boundaries,
    - Expected Area of Potential Effects (APE),
    - Roads and infrastructure,
    - Profiles and cross sections with water surfaces relevant to designs,
    - Structural details,
    - North arrows and flow directions,
    - Wetlands and ordinary high water delineations, and
    - Structural dimensions.

Monitoring: Alternatives development and project design planning will incorporate input from basin partners to support and/or improve ongoing monitoring, including juvenile population monitoring (ODFW screw trap and pit tag arrays), CTUIR adult monitoring/collection, and water temperature/quality monitoring. An important data gap related to weir effects on fish passage is upstream juvenile passage during summer periods when parr may be searching for upstream cold water refuge.

Project Phasing
Multi-phase Effort: Yes
Phase Description: Phase 1 Alternatives Development (hydraulic modeling, scoping, alternatives, preferred alternative identification, 30% design drawings and design report). Phase 2 proposal would follow for 100% design for preferred alternatives.

Preliminary Cost Estimate
BPA Funding: Estimated $250,000

Planning and Design Funding
Design Funds Requested:
Design Option: 30%
Type of Work: Hydraulic modeling, structure engineering, engineer drawings and specifications.
Specialties: Fish passage

Attachments
Catherine Creek RM43 Weir Trip Report, Welch 2018