Prospectus of Proposed Project Opportunity

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Opportunity Title

Little Creek (LC5 and LC6) Fish Passage Design

Opportunity Lead

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Landowners

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Contacted: No
Supportive: The irrigation ditch user groups associated with both the Weaver Lane diversion (LC5) and the Israel Ames diversion (LC6) were presented information on improving fish passage and structure improvements in 2011 by the Union SWCD (USWCD) and Bureau of Reclamation (Reclamation). Reclamation completed Alternative Evaluation reports and conceptual design drawings for both sites. The

irrigation ditch user groups were supportive of the concepts and interested in further pursuing project improvements. The USWCD is currently reengaging with each of the irrigation ditch user groups and with the landowners of each diversion site.
Contribution: The landowners will be providing technical assistance through the design review process to determine the most appropriate design alternative that both facilitates their irrigation needs and fish passage requirements.

River

Name: Little Creek
Mile: River Mile 3.41-3.86
Tributary: Catherine Creek

Restoration Atlas

BSR: CC2C
Tier: Tier 2
Initial Score: 51
Proposed Score:

Restoration Activities

23. Structural Passage (Diversions)

Species Affected

Focal: Snake River Spring/Summer Chinook, Snake River steelhead and bull trout
Other: redband trout, bridgelip sucker, northern pikeminnow, longnose dace, speckled dace, and pacific lamprey

Description

Little Creek flows through a valley setting with two separate and distinct landforms that influence the channel. The upstream reach is predominately located in a confined canyon and is relatively high gradient ranging from 4-10%. Land use in the upstream reach predominantly consists of grazing and timber harvest. As Little Creek exits this canyon and enters the Grande Ronde Valley floor, the gradient is reduced to less than 2% and the channel flows through urban (City of Union, Oregon) and rural agricultural areas. Six irrigation diversion structures are located on Little Creek within the downstream valley reach. With the exception of the most downstream diversion, White Diversion (LC1), all of the structures are currently unscreened and several have been identified as obstructions to fish migration. Low instream flow is also considered to be a limitation for water quality and fish migration as water rights on Little Creek are over-

appropriated. Physical improvements to the diversion structures that include the installation of ditch screens and flow meters could improve habitat conditions for fish and lead to augmentation of instream flow.
From 2010 to 2013 the U. S. Bureau of Reclamation (USBR) began collecting data on the Israel Ames (LC6) and the Weaver Lane (LC5) diversion structures which resulted in an Alternatives Evaluation Report (AER) for both diversion sites. Much of the data presented is a result of that scoping and created a baseline for improving conditions for fish migration in the valley reach of Little Creek. Both ditch associations ultimately agreed to alternatives selected from that AER produced by the USBR in 2011 and voted to proceed with plans for diversion updates and construction of fish passage. Due to a lack of funding and shifting of project priorities, the planning process was put on hold at that time. The USWCD has indications that water users on both diversion structures are presently willing to move forward with plans for diversion updates and fish passage improvements. The USWCD is confident we will be successful in updating the 15% concepts produced by the USBR and finalizing a design that will be permittable, sustainable, and easily maintained at a reasonable cost.
To understand fish distribution and limiting factors in the Little Creek basin, USBR contracted with ODFW to collect fish and habitat data from 2011 through 2015. The studies included Aquatic Inventory habitat surveys (ODFW 2011), spawning ground surveys for adult steelhead and Chinook salmon (2013-2015), and presence-absence fish sampling surveys (2011-2015) for juvenile Chinook and steelhead. In addition, stream temperature and flow measurements were collected. ODFW also collected information on six irrigation diversion structures that were presumed to impede fish migration. Surveys were conducted from the confluence of Little Creek with Catherine Creek and upstream to RM 5.97. Chinook and steelhead were found to be present in Little Creek, but bull trout were not documented during these surveys.
Historic data indicates that Chinook salmon and steelhead spawned in the Little Creek basin in the past. During more recent spawning ground surveys conducted by ODFW (2013-2015), Chinook redds were not observed throughout the survey reach. Steelhead were observed spawning in the months of April and May over the course of the surveys and steelhead redds were observed in both the mid and upper reaches of Little Creek. Adult bull trout were not observed during the ODFW surveys.
Juvenile fish sampling completed by ODFW in Little Creek was focused on identifying the species present from the confluence to river mile 5.97, directly downstream of the Buffalo Flats project area. Data has not been collected in the Little Creek basin to estimate population densities for either Chinook or steelhead juveniles. Juvenile steelhead were found throughout the survey reach, using an electroshocking methodology. Juvenile Chinook were also found during surveys, but only from the mouth to approximately river mile 1.20. The observed lack of juvenile Chinook upstream of river mile 1.20 is thought to be a result of a potential passage barrier located downstream of Godley Road. While juvenile Chinook presence was documented in the Little Creek basin, adult spawning has not been documented in the past 10 years and the presence of juvenile Chinook is hypothesized to be juveniles seeking temperature refuge and moving into Little Creek from Catherine Creek.
Data collected by ODFW indicates that Little Creek instream habitat through

the city limits of Union and downstream to the confluence with Catherine Creek is in fair to poor condition for juvenile salmonids. Spawning habitat is limited lower in the Little Creek basin with better habitat higher upstream. Stream temperatures in Little Creek remain cooler than those found in Catherine Creek. During the five years of sampling in the Little Creek basin, ODFW found that stream temperatures remained below 18°C for all stream reaches, with the exception of the lowest reach where stream temperatures were a few degrees warmer.

LC5 is located on Little Creek just upstream of the Weaver Lane Bridge near the city of Union, Oregon. The existing concrete diversion structure has three bays, each approximately 6 feet in width. Stoplogs are used to check water up approximately 3 feet to make the required irrigation delivery. Without the stoplogs in place, the structure backs up no water; however, there is a small drop from the downstream face of the structure to the channel bottom due to scour from the water spilling over the checked structure. In the current configuration, the structure is a passage barrier when the stoplogs are in place. It is estimated through water rights records that the diversion rate ranges from 0.5 cfs to 5.0 cfs. The LC5 measurement site is an orifice plate structure with two different settings for the plate that measure a range of lower flows and a range of upper flows. The lower setting has the ability to measure from 0.19 cfs to 0.97 cfs, and the upper setting has the ability to measure from 0.58 cfs to 2.91 cfs. The box was installed in mid-July 2011 near the road. It has been observed that that water diverted from this site does not return any water back to Little Creek.

LC6 is located on Little Creek just upstream of the bridge on the Cove Highway near the city of Union, Oregon. The existing concrete diversion structure is about 25 feet in width with a 15-foot-long stoplog slot used to check water up to make the required irrigation delivery. Without the boards in place, the structure raise water elevation approximately one foot and results in approximately a 3-foot-high drop from the sill of the structure to the channel bottom. This drop may have increased over the years due to scour from water spilling over the checked structure. With the boards in place, water elevation is increased approximately 3 feet behind the diversion structure. In the current configuration, the structure is not passable by fish under most flow scenarios. Orifice boxes were installed in 2011 and are similar to the LC5 orifice box with two different settings for the plate that measure a range of lower flows and a range of upper flows which are designed to work on differential head from upstream to downstream. This plate has two different settings that measure a range of lower flows and a range of upper flows. The lower setting has the ability to measure from 0.19 cfs to 0.97 cfs, and the upper setting has the ability to measure from 0.58 cfs to 2.91 cfs. The box was installed in mid-July 2011 near the road. It has been observed that diverted water does not return to Little Creek as surface flow. The diversion has a water right of 3.0 cfs but has only been observed to divert up to 1.7 cfs.

The Catherine Creek Tributary Assessment completed by the USBR in 2012 identified the middle and upper reaches of Little Creek that LC5 and LC6 occupy as critical spawning and rearing habitat for federally listed Summer Steelhead (Oncorhynchus mykiss). Presently Chinook Salmon (Oncorhynchus tshawytscha) have not been observed above either diversion structure. Little Creek is currently designated as a Tier 2 stream in the Atlas process. Creating passage at the LC5 and LC6 diversion structures will

create the potential for over7 miles of additional spawning and rearing habitat for juvenile and adult salmonids.
The goal of this project is to help meet requirements of the 2008 Biological Opinion for the Federal Columbia River Power System (FCRPS BiOp) for improving conditions for ESA-listed fish species by providing fish passage to important habitat in the Grande Ronde River and its tributaries. The output of this technical assistance funding will be implementation-ready designs which include: construction specifications and drawings, construction cost estimates, a Revegetation Plan, and environmental permits including: Oregon Removal/Fill permit and CWA Section 404 permit through the DSL/ COE Joint Permit Application, NHPA Section 106 requirements, and DEQ Section 401 permit. Design development and completion is planned for 2021 with implementation anticipated to begin during the 2021 instream water work window.

Objectives

Design objectives include the following:
1) Develop and select fish passage design alternatives for juvenile and adult spring/summer Chinook salmon and summer steelhead during periods of migration that achieve Oregon Department of Fish and Wildlife (ODFW) and National Marine Fisheries Service (NMFS) fish passage criteria to the greatest extent possible.
2) Develop a fish passage design that maintains access and use of irrigation water for water right holders.
3) Provide a sustainable, permittable, easily maintained design at a reasonable cost.

Major Risks

The risks associated with the project at this time are completing project designs that are agreeable to the ditch association members, securing design and construction funding, and completing all permit and regulatory requirements. USWCD is reengaging with the ditch associations to communicate the project intent and actions and will inform each group of progress at specific milestones. Once technical assistance funding is secured the USWCD will rapidly secure an engineering firm and work diligently through the design process to expedite permitting and implementation.

Permits and Consultation

ESA Section 7 USFWS: Applicable
ESA Section 7 NMFS: Applicable
COE or DSL Permit: Applicable
Cultural Resources Section 106: Applicable
DEQ 401 Water Quality Permit: Applicable

Project Schedule

Year: 2022

Monitoring: Temperature and flow monitoring will begin in the Spring of 2020 and continue through 2021. No other monitoring for the design stage of this project will be conducted.

Project Relations

Multi-phase Effort: No

Preliminary Cost Estimate

Total: 225000
BPA Funding: 225000
OWEB Funding:

Design Funding

Design Funds Requested: No