



Prospectus of Proposed Project Opportunity **Submitted Sep 26, 2018**

Opportunity Title

Project 608746

Opportunity Lead

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Technical Contact

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Landowners

Oregon Parks and Recreation Department
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Contacted: Yes
Supportive: Yes
Contribution: OPRD will be providing most of the wood for the project.

River

Name: Catherine Creek
Mile: RM 48.5-49.2
Tributary: Grande Ronde River

Restoration Atlas

BSR: CC3B1

Tier: Tier 1

Initial Score: 68

Proposed Score:

Restoration Activities

1. Protect Land and Water (Easement, Acquisition, Management)
2. Channel Reconstruction
3. Pool Development
9. Restoration of Floodplain Topography and Vegetation
11. Perennial Side Channel
12. Secondary (non-perennial) Channel
14. Alcove
15. Hyporheic Off-Channel Habitat (Groundwater)
18. Riparian Buffer Strip, Planting
19. Thinning or removal of understory
26. Boulder Placement
27. LWD Placement
28. Modification or Removal of Bank Armoring
29. Restore banklines with LWD - Bioengineering
31. Improve Thermal Refugia (spring reconnect, other)

Species Affected

Focal: Snake River spring Chinook salmon and summer steelhead, bull trout, lamprey, redband trout.

Other:

Description

Catherine Creek State Park is located at RM 48.5-49.2 on Catherine Creek, tributary to the Grande Ronde River in Union County Oregon, within Catherine Creek Atlas BSR CCC3B1. This reach of Catherine Creek is Tier 1 habitat. The project reach runs adjacent to Highway 203 and supports all freshwater life stages of ESA listed spring Chinook salmon, summer steelhead and Oregon state sensitive species redband trout. It is also a migration corridor for ESA listed bull trout. Spawning and rearing of spring Chinook salmon and summer steelhead annually occur in the project reach. The limiting factors for Chinook salmon and steelhead in this reach of Catherine Creek include a lack of juvenile rearing habitat, a lack of adult holding habitat, anchor ice, and a lack of deep pools. Habitat for all life stages of Chinook and steelhead is rated fair.

Water quality (high summer water temperature), water quantity (low summer flows), excess fine sediment, reduced habitat quantity/diversity (wetted widths, lack of pools, and large wood), and impaired riparian

conditions limit spring Chinook salmon and summer steelhead abundance and productivity in the Catherine Creek watershed (NPCC 2004, USBR2011). Habitat degradation has reduced flows and increased temperatures in the summer season and have significantly influenced adult and juvenile migration opportunity and availability of adult holding habitat. Habitat modifications have also reduced availability of summer and winter rearing habitat for juvenile spring Chinook salmon and summer steelhead. Past and present land use practices have contributed to these factors through wetland draining, water withdrawals, degradation of riparian areas and floodplain connectivity, removal of riparian vegetation, stream channel modification, and introduction of fine sediment and pollution to streams. Cumulatively, these changes have greatly reduced available salmon and steelhead habitat quantity and complexity in Catherine Creek.

Much of the decline in spring Chinook salmon abundance reflects the significant habitat changes that have occurred in Catherine Creek relative to historic conditions. Surveys conducted by McIntosh (1994) comparing historic and current stream habitat conditions found that pool frequency decreased by 67% in Catherine Creek, 43% in North Fork Catherine Creek, and 59% in South Fork Catherine Creek from 1934 to 1992. Recent studies by the Bureau of Reclamation also show the loss of habitat complexity and connectivity to support summer and winter juvenile rearing (USBR 2011).

The primary limiting factors and threats for spring Chinook salmon and summer steelhead in the project reach identified in the Draft Recovery plan are low summer flows; excess fine sediment; water quality (high summer temperatures, low dissolved oxygen levels); habitat diversity (low pool frequency and large wood, substandard streambank conditions); impaired riparian condition; and fish passage. These limiting factors affect all life stages and overall abundance and productivity. Causes include historic and some current agriculture and grazing practices; irrigation diversions; adjacent roads; and rural residences within the riparian area.

The project is located within and along Catherine Creek state park which includes, camping, day use, and picnic areas. The historic channel has been blocked off by gravel upstream of Catherine Creek State Park's day use area. There is a tributary draining into the old channel as well as a spring seep. Both of these water sources are backed up in area by beaver activity, wood, and sediment. Both of these water sources drain into the main creek channel through this old channel. There is no livestock grazing within the state park.

Riparian clearing and vegetation has been altered within the state park for roads, campsites, buildings, and a pedestrian path. Vegetation density has increased significantly in the last 65 years. Floodplain connectivity within the accessible floodplain is low compared to historical conditions. Channel straightening has reduced length and increased slope, leading to incision, which is likely exacerbated by natural and anthropogenic bank armoring in the vicinity of the project. Highway 203 has also reduced floodplain connectivity by occupying a portion of the valley bottom. The historical main channel on river right now provides limited off-channel connectivity during high flows.

Catherine Creek Chinook are rated as being at high risk and non-viable in their current state. The population has a significant level of direct hatchery supplementation. Upper Grande Ronde River steelhead are provisionally rated as viable (NWFSC 2015).

ODFW conducted an aquatic habitat survey on Catherine Creek in 2010, describing the channel morphology, riparian characteristics, and features and quality of instream habitat during summer flow. Results of the survey indicate that within the project reach, the channel is constrained by alternating high terraces and hillslopes in a broad valley floor. The valley width index is 11.0 and there are 288 meters of secondary channel habitat. Land uses are greenway and old growth forest. The primary vegetation classes are hardwoods 3-15 cm and conifers 30-50 cm dbh. The average unit gradient is 1.0 percent. The stream habitat is mostly riffle (73%). Gravel (33%), fine sediments (32%), and cobble (28%) are the predominant stream substrates. The width to depth ratio is 22.8. Large wood debris volume was 5.8m³/100 m at the time of survey. The trees found most frequently in the riparian zones are hardwoods 3-15 cm dbh. Various sizes of conifers are also present. Shade averages 62%, ranging from 19-100% (ODFW AQI 2010).

ODFW (2010) used the HabRate model to assess overall habitat quality based on habitat attributes relative to the freshwater life stages of spring Chinook salmon and summer steelhead. Habitat quality was described for 1) spawning, egg survival, and emergence, 2) summer rearing, and 3) winter rearing. Within the project reach, spring Chinook salmon spawning habitat is fair. Riffles are prevalent and the substrate is gravel with few fines, but little cobble. For 0+ Summer Rearing and Overwintering, the project reach is fair. The project reach lacks suitable pool area, undercut banks, large wood, and cobble substrate.

Steelhead spawning habitat quantity and quality is fair in the project reach. Habitat quality for summer and winter rearing of age-0 and age-1 juvenile steelhead is fair. Summer Rearing habitat for 1+ summer steelhead is less widely available than overwintering habitat. Better winter rearing conditions for steelhead are present because of a combination of cover factors - boulders, undercut banks, and/or wood availability.

The Project Goal is to improve spawning, rearing, and holding habitat for ESA listed spring Chinook salmon and summer steelhead by addressing limiting factors for each species.

Objectives

Improve sediment sorting and routing by installing four bar apex jams to increase deposition and stabilize aggraded material into bars/islands.

Excavate and reconnect historic side channel/mainstem, which will be active at low flows and provide low velocity habitat and cover.

Increase activation of side channel and reactivate floodplains through

installation of apex large wood in combination with margin jams.

Install 43 bank margin habitat cover wood jams along the mainstem of Catherine Creek as well as the reactivated side channel complex, to:

- Mimic natural log jams that form through tree fall;
- Catch fluviially-transported wood; and to
- Maintain scour pools and provide cover and complexity to juvenile salmonids during rearing and migration.

Increase planform complexity in mainstem Catherine Creek by installing hillslope wood habitat on the left bank in 5 locations, to guide flow toward the side channel complex or river left.

Place large boulders to provide hydraulic complexity, encourage local scour, and provide brace points for large wood placement.

Excavate high flow channel connection near Station 20+00 on the main channel to increase channel complexity during high flow events and provide additional discharge to existing alcove for periodic sediment flushing and alcove maintenance.

Excavate existing alcove to ensure connectivity during low flows.

Enhance gravel bars at 2 locations in the upstream portion of the project to narrow the channel and provide planform complexity.

Install wood and boulder structures at enhanced gravel bars to facilitate increased lateral channel migration and increase channel sinuosity.

Plant willows in trenches along gravel bar fill to enhance riparian establishment.

Increase abundance of LWD and habitat structures to maintain pool scour, narrow and deepen the channel, and protect banks against winter ice flows.

Increase riparian function with planting of site-appropriate native vegetation and vegetation protected from browsing and human disturbance.

Create flood swale in side channel complex active at 1.5-2 year event.

Excavate pools around large wood structures.

Major Risks

Minimizing impacts to campground and park users. We are working closely with OPRD to ensure project design and implementation will benefit salmon and steelhead while minimizing adverse use and enjoyment of the park.

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: 2019

Monitoring: Monitoring will be conducted by ODFW to conduct due diligence and evaluate project effectiveness at meeting objectives.

Monitoring will include the following:

1. Pre-project photo points will be established in 2018 and photos taken prior to project construction. Photographs will be taken the first five years post project completion and then every subsequent three years to qualitatively document riparian and channel condition;
2. Aerial videos will be recorded pre-project and in years 1, 2, 3, 6, 10, and 15 years post construction;
3. Summer steelhead and spring Chinook salmon spawning ground surveys will be conducted 2-3 times annually to note presence or absence of spawning and to document redd locations;
4. Salmonid presence/absence surveys of juvenile rearing will be conducted post-project construction to document usage of project area;
5. Channel cross sections will be established along the restored channel to assess channel development and form over time. The number and location of cross-sections will be determined following project completion and will at a minimum be placed to characterize built features. Channel cross sections will be surveyed 1, 3, 5, 10, and 15 years post project completion.
6. Topographical surveys of the as built project will be conducted 1, 3, 5, 10, and 15 years post project completion to develop a longitudinal profile of the channel and determine changes in mainstem and side channel stream profiles and morphology; and
7. A final report documenting project implementation and monitoring will be submitted.

Project Relations

Multi-phase Effort: No

Preliminary Cost Estimate

Total: \$350,000
BPA Funding: \$350,000
OWEB Funding:

Design Funding

Design Funds Requested: No