



# **Prospectus of Proposed Project Opportunity**

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## **Opportunity Title**

Lookingglass Fish Habitat Restoration

## **Opportunity Lead**

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## **Technical Contact**

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## **Landowners**

Contacted: No  
Supportive:  
Contribution:

## **River**

Name: Lookingglass Creek  
Mile: RM 3.5-RM 6.5  
Tributary: Grande Ronde River

## **Restoration Atlas**

BSR: UGR1  
Tier: Tier 3

Initial Score: 67

Proposed Score:

### **Restoration Activities**

1. Protect Land and Water (Easement, Acquisition, Management)
2. Channel Reconstruction
3. Pool Development
4. Riffle Construction
7. Levee Modification: Removal, Setback, Breach
8. Remove - Relocate Floodplain Infrastructure
9. Restoration of Floodplain Topography and Vegetation
10. Floodplain Construction
11. Perennial Side Channel
12. Secondary (non-perennial) Channel
13. Floodplain Pond - Wetland
14. Alcove
15. Hyporheic Off-Channel Habitat (Groundwater)
16. Beaver Restoration Management
20. Remove non-native plants
26. Boulder Placement
27. LWD Placement
31. Improve Thermal Refugia (spring reconnect, other)
35. Road Decommissioning or abandonment
36. Road Grading - Drainage Improvements

### **Species Affected**

Focal: ESA Listed: Spring Chinook, summer steelhead, Bull Trout, Pacific lamprey.

Other: All other native species.

### **Description**

The Lookingglass Creek Fish Habitat Enhancement Project is located in the Grande Ronde River Basin along Lookingglass Creek, a tributary of the Grande Ronde River, between river miles 3.5 to 6.5. The project reach sits at an elevation of approximately 2,800 feet with contributing watershed area of 95 mi<sup>2</sup>, which is predominantly spring-fed and snowmelt driven. Most of the basin is forested (over 90 percent) and has very little development (less than 0.1 percent estimated impervious area) (USGS 2014). The project reach is under ownership of the CTUIR and is bordered by Umatilla National Forest and private lands within the Grande Ronde recovery plan assessment unit UGR-1. The property and resource values are protected by a permanent Bonneville Power Administration conservation easement.

### **Objectives**

- Restore process and functions of 124 acres of historic floodplain.
- Increase the number and quality of large pools in the main and/or side channels. Develop 12+ sustainable and complex pools per mile for fish use (adult holding and juvenile summer/winter rearing) at completion of project.
- Create and enhance channel margin slow water areas in the main and/or side channels.
- Add lateral and vertical complexity to the channel planform and bed morphology to increase hyporheic exchange.
- Improve the pattern, profile, structure and dimensions of side channel habitats in order to promote the processes of pool formation, wood inputs, and gravel sorting and retention.
- Maximize off-channel features such as alcove and off-channel pond habitats with preferred depth, velocity, and cover for refuge and rearing of juvenile Chinook.
- Foster channel plan form evolution towards a stable multi-thread pattern with relatively narrow, deep channels between vegetated islands.
- Improve juvenile salmonid rearing and seasonal high flow refuge through active restoration of side channel, off-channel, and floodplain habitat.
- Maximize and promote ephemeral and perennial side channels that include complex cover and perennial alcove features.
- Support diverse geomorphic processes, features, and patterns of sediment movement, sorting and deposition within the active channel(s), including flushing of fine sediment.
- Supplement riparian planting where needed to maintain a minimum of 250 + woody plants per acre by 5-years post project including dominant cottonwood, alder, and willows within the limitations of soil structure and hydrology within the project reach to maximize shade on water surfaces 10-years following project completion.
- Prevent the establishment and control non-native weeds within the project boundary for first
  - 5-years after construction through active weed management.
- Improve suspended sediment retention on floodplain surfaces within the project area by increasing floodplain acres inundated at all flow conditions greater than base flow, and increasing number of floodplain roughness features after project completion.
- Improve thermal diversity at base flow and over winter conditions by increasing hyporheic conductivity pathways by maximizing sinuosity of the main channel alignment within site geomorphic constraints/conditions.
- Increase main channel sinuosity from ~1.1 to 1.4+ by increasing current channel by a net gain of at least 2000 linear feet.
- Improve cool water supply and thermal diversity potential within the project area by increasing water storage within the floodplain through increased annual and low flow water table elevation.
- Maximize floodplain connectivity and activate the floodplain on an annual basis during spring freshets and increase floodplain acres inundated at all flow conditions greater than base flow after project completion, including 50% increase in inundated acres at bankfull.
- Increase the quantity of suitable habitat for juvenile Chinook winter rearing, emigration, and summer rearing.
- Increase the quantity of suitable habitat for adult salmonid use by

connecting floodplain ponds and constructing reinforced habitat structures and/or beaver dam analogs (BDAs).

## **Major Risks**

The major barriers to implementation would be delays due to environmental compliance factors (primarily cultural resource concerns). Additionally, there are six artificial spring-fed ponds within the project area, ranging in size from .28 acres to 1.9 acres, totaling approximately 5.22 acres. Ponds were constructed starting in the 1950's, and stocked with non-native brook trout and hatchery-origin rainbow trout. Due to bank erosion along one of the ponds adjacent to Lookingglass, there is potential for brook trout entering Lookingglass Creek and competing/hybridizing with native bull trout.

The current bull trout population in Lookingglass Creek is estimated to be one of the most robust populations in the Grande Ronde River basin and is increasing. For example, from 1999 to 2011, bull trout non-lethal take by CTUIR research and monitoring activities was approximately 249 per year. However, for the period 2012 to 2017, non-lethal take was approximately 451 per year. In anticipation of a continued increase in the bull trout population within Lookingglass Creek the northeast Oregon-southeast Washington, Hatchery Biological Opinion terms and conditions for incidental take of bull trout (# 01EOFW00-2015-F-0154) was increased to 585 per year in May 2018. The primary threat to bull trout in Lookingglass Creek is connectivity impairment due to the weir at Lookingglass Fish Hatchery (USFWS Revised Draft Recovery Plan, 2014).

## **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: 2026

Monitoring: Water temperature monitoring and fish presence and use monitoring began in 2017 and is ongoing. Photo points were established in 2018 to provide comparative progress of riparian condition, vegetation, channel conditions, and habitat complexity. Stream channel morphology (profile, x-sections, and pebble counts) have been conducted and will continue post-project.

Biological

Spring Chinook and Bull trout redd surveys have been conducted annually in the Lookingglass watershed since the 1960's and will continue as funding permits.

Adult weir and juvenile out migrant screw trapping is funded by LSRCP/BPA

as part of the evaluation of the re-introduction of Chinook and monitoring of the native steelhead population. For Chinook the spring out-migrants have the highest survival rate to Lower Granite Dam amongst all Lookingglass Creek juveniles. However, only approximately 13% of juvenile Chinook out-migrate in the spring, possibly due to a lack of over winter habitat. Outmigration data will be collected by CTUIR RM&E and will provide information on changes in outmigration timing/size at outmigration/survival to Lower Granite Dam/ post restoration compared to 16 seasons of pre-restoration data.

## **Project Relations**

Multi-phase Effort: No

## **Preliminary Cost Estimate**

Total: 3,373,300  
BPA Funding: 2,373,300  
OWEB Funding:

## **Design Funding**

Design Funds Requested: Yes  
Design Option: Option 2  
Type of Work:  
Hydrology, geomorphology, or river hydraulic modeling  
Stream and fisheries habitat design

Specialties:  
Stream restoration engineer  
Fluvial geomorphologist  
Suveryor