Prospectus of Proposed Project Opportunity

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Opportunity Title

Sheep Creek Stewardship Project (RM 5.41-8.65)

Opportunity Lead

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Technical Contact

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Landowners

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Contacted: Yes
Supportive: Yes
Contribution: In-kind staff time resources (compliance and technical expertise, agreements, funding etc.), materials (large wood material, etc.), and match funding (ex. USFS Reforestation Grant recently secured by

Sarah and Levi, and BLM small stewardship contributions).

River

Name: Sheep Creek
Mile: 5.41-7.85; 8.55-8.65
Tributary: Grande Ronde River Tributary

Restoration Atlas

BSR: UGR19
Tier: Tier 1
Initial Score: 34.6
Proposed Score: ?

Restoration Activities

3. Pool Development
6. Spawning Gravel Cleaning and Placement
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
17. Riparian Fencing
18. Riparian Buffer Strip, Planting
19. Thinning or removal of understory
20. Remove non-native plants
24. Addition of organic and inorganic nutrients
27. LWD Placement
31. Improve Thermal Refugia (spring reconnect, other)
34. Upland Vegetation Treatment - Management
35. Road Decommissionsing or abandonment
36. Road Grading - Drainage Improvements

Species Affected

Focal: Snake River Chinook Salmon, Snake River Steelhead, Bull Trout (Critical Habitat), Pacific Lamprey (re-introduced), Redband trout, Columbia Spotted Frogs, Beaver
Other: Most all fauna species in this region would use a functioning Blue Mountain system if it exhibited the appropriate healthy habitat elements. This is also a key spot for flora diversity. By restoring the wetland complexes we expect an increase in vegetative heterogeneity and wetland plant species. This is being monitored via various long-term protocols.

Description

Background Overview: The Sheep Creek Stewardship Project is located on Sheep Creek, a tributary of the upper Grande Ronde River. The project area includes 4.5 miles of the creek (RM 5.41-8.65). The US Forest Service in partnership with Trout Unlimited will design and implement the project.

Sheep Creek, and its meadow habitats are not in proper functioning ecological condition (hydrologic, geomorphic, vegetative composition), due to historical anthropogenic influences including beaver trapping, overgrazing, logging, road building, and an altered fire regime.

The overall goal of this project is to achieve proper ecological form and function of Sheep Creek and its meadows, and thereby restore spawning and rearing habitat for Snake River Basin Spring/Summer Chinook, Snake River Basin steelhead, resident redband trout, bull trout (critical habitat) and numerous other aquatic and terrestrial species.

The Sheep Creek Stream and Floodplain Project kickstarted in 2019 with the implementation of a 4.5-mile floodplain habitat project. Numerous miles of tributary streams were treated as well. The project continued into 2020. This funding request would support the project team in taking a long-term adaptive management and stewardship approach to healing the appropriate natural processes needed to set the system on a trajectory towards full ecological health.

The project team's restoration strategies to date include the placement of wood structures, the reconstruction/realignment of an existing cattle exclosure fence, riparian planting, and browse protection. There are several long-term monitoring efforts that have been established for the project too.

Proposed Actions: Based on an in-depth analysis of best available science, expert opinion and observation, and technical tools, the project team has developed a suite of actions that they believe will help this critical Blue Mountain meadow system return to a high-functioning system in the next 10 years. Please see the attached project description for details.

Objectives

The Goals and Objectives from the 2019 Sheep Creek implementation effort will continue to be used and amended as needed. See additional goals and initial objectives outlined for the Stewardship Project in the attached project description.

Initial Goals and Objectives:

Goal

Overall Goal: To achieve proper ecological form and function of Sheep Creek and its meadows, and thereby restore habitat for the imperiled Snake River

Basin Spring/Summer Chinook and Snake River Basin Steelhead.

Subgoal 1: Physical - Restore Hydrologic Function
In the meadow reach (Rosgen channel type C and E) increase hydration of laterally confined channel to improve groundwater retention. Use Large Woody Debris (LWD) to restore stream grade, reduce hydraulic efficiencies, and increase floodplain meadow inundation time. LWD structures will be placed in locations to increase roughness and back up water. Restoring hydraulic form and function will facilitate an increase in floodplain water storage, flow attenuation, and spring and seep connection. Longer periods of floodplain inundation will moderate extreme high and low seasonal temperatures. Instream LWD structure types designed to meet these goals include channel spanning structures, lateral forcing structures, and floodplain wood.

Subgoal 2: Biological - Improve Fish Habitat
Restore channel habitat complexity. Existing LWD fish habitat structures constructed in 2013 will be modified, and additional LWD structures will be constructed. These structures will enhance scour pool habitat, cover, and floodplain connection. The structures will increase hydraulic complexity and zero velocity refugia on active channel margins. This will facilitate water retention, gravel deposition and sorting, and LWD recruitment. LWD structure types designed to meet fish habitat goals include: adjusting and adding racking material to existing habitat structures; gravel bar wood placements to improve sediment routing and storage; and channel spanning structures to back water into pool habitat around existing structures.

Hypotheses Strategies and Objectives

Hypothesis 1: If channel spanning wood structures using trees and racking material are constructed in strategic locations to slow down and back up stream flows then:
- 2 years post implementation 30% more of the floodplain will be inundated in the late summer season (July 20-September 1) than in 2017-18
- Water storage will be quantified in terms of acres of inundated floodplain using drone technology

Strategy and Objectives 1: Mimic beaver dam function at pool tails and in areas where accessible side channel habitats exist by constructing channel spanning wood structures to:
- Deflect water into the floodplain for groundwater storage (hyporheic activity) and off channel fish habitat
- Back water into existing fish habitat structures
- Recruit fluvially sorted wood
- Promote gravel deposition and spawning gravel recruitment
- Recruit deciduous vegetation by increasing groundwater storage
- Improve habitat for future use by beaver populations
- Decrease conifer encroachment in Sheep Creek

Hypothesis 2: If key wood member pieces on existing habitat structures are adjusted (moved into stream) and racking material is added to structures

then:
- Fish habitat will be increased at a greater range of flows
- A measurable result will be seen in Level II habitat surveys conducted post-restoration year 1 and year 5. Pre-restoration habitat survey monitoring is complete and would be used to detect improvement in fish habitat (cross sections, pool quality and quantity, large woody debris quantity, substrate)

Strategy and Objectives 2: Improve function of existing fish habitat structures placed in 2013 by adjusting wood and adding racking material to:
- Increase scour pool quality and quantity
- Increase residual pool depth
- Increase cover for fish
- Increase stream shade
- Increase quantity of zero velocity habitats for fish refuge

Hypothesis 3: If lateral forcing wood structure types are placed then (similar to hypothesis 1):
- Hydraulic efficiencies will be reduced, and area and time of floodplain and wetland/wet meadow interaction and flooding will increase
- Seasonal high and low stream temperatures will be buffered
- The USFS has 17 years of temperature data from a site in the middle of the project area. Changes in stream temperature from floodplain restoration would be expected in 5 years or less

Strategy and Objectives 3: Place lateral forcing wood structures to:
- Deflect water into the floodplain for groundwater storage and off channel fish habitat
- Provide habitat complexity features for fish and wildlife
- Recruit deciduous vegetation through groundwater storage
- Promote gravel deposition and spawning gravel recruitment
- Improve habitat for future use by beaver populations
- Decrease conifer encroachment in Sheep Creek meadow habitats

Hypothesis 4: See hypotheses 1 and 2

Strategy and Objectives 4: Restore floodplain function by placing floodplain wood to:
- Deflect, retain, and capture water once it reaches the floodplain
- Recruit deciduous vegetation through groundwater storage
- Improve habitat for future use by beaver populations

No hypothesis will be tested for objectives 5 - 7.

Strategy and Objectives 5: Place woody debris on rock bars to:
- Improve sediment routing and storage
- Create areas for deciduous woody vegetation to establish

Strategy and Objectives 6: Exclude cattle from riparian area and stream to:
- Reconstruct 5.25 miles of current fence to increase its effectiveness
- Exclude livestock grazing from 145 acres (3 miles) of riparian and stream habitat
- Relocate current fence alignment farther from the stream and meadow

riparian habitats

Strategy and Objectives 7: Utilize hand crews as a low disturbance and effective approach to add racking material and small diameter trees to instream structures. Lead and mentor young adult stewardship crews and volunteers to:
- Use a low impact method for wood addition in sensitive areas
- Learn about watershed restoration
- Learn about natural resource careers
- Create a stewardship ethic

Major Risks

There could be potential challenges associated with cultural resources compliance on the material augmentation portion to the project. This may have to be limited in scope or not used as a technique due to cultural sensitivities. If it is limited or not used, the project team will use the funds to do more beaver mimicry and in-stream wood placement work.

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:

Project Schedule

Year: 2022

Monitoring: There are several in-depth (but rapid) monitoring exercises set up for this project. There is a draft adaptive management and monitoring plan set up to guide the project team. These monitoring components include:

Vegetation Trend Monitoring -
Analysis of 30+Years of Satellite Data,
Plant Species Transects across numerous valley wide plots
Photo Monitoring transects
Drone - Yearly timed high and low water flights
Inundation Mapping
Temperature trend monitoring
Geomorphic change detection (GCP) and LIDAR Change Detection

There is also several agency driven data collection efforts including:
ODFW AQI Survey
USFS Stream Habitat Level II Survey
CHAMP Sites

Project Relations

Multi-phase Effort: Yes
Phase Description: The initial Sheep Creek construction implementation occurred in 2019-20. This is a continued effort on that project.
Could Phase 1 be a Stand Alone Project: False
Would the project lose value if future phases don’t happen: If Phase 1 is a stand alone project it is likely more restoration actions will need to take place in the future and the momentum may put the project behind its current positive trajectory from an ecological standpoint.

Preliminary Cost Estimate

Total: 397,856
BPA Funding: 198928
OWEB Funding: 198928

Design Funding

Design Funds Requested: No