GRANDE RONDE MODEL WATERSHED

Watershed Enhancement Project Proposal

1. **Project Name:** Wallowa River/6-Ranch Habitat Restoration Project 2

2. **Applicant:** Grande Ronde Model Watershed

3. **Participating Landowner(s) and Agencies:**

Participant	Contact	Role	Address	Phone	Email
GRMW	Coby Menton	Project Manager	1114 J Ave. La Grande, OR 97850	541.663.0570	coby@grmw.org
ODFW	Jeff Yanke	Technical	65495 Alder Slope Road Enterprise, OR 97828	541.426.3279	Jeff.Yanke@state.or.us
Anderson Perry	Chas Hutchins	Design & Engineering	PO Box 1107 La Grande, OR 97850	541.963.8309	chutchins@andersonperry.com
Craig and Liza Jane Nichols	Liza Jane	Landowner	65717 Sunrise Road Enterprise, OR 97828	406.223.5789	6ranch@gmail.com

4. **Project Contact(s):**
   List the **technical and administrative contacts with address, email and phone #.**

Contact	Role	Address	Phone	Email
Coby Menton	Technical	1114 J Ave. La Grande, Or. 97850	541.663.0570	coby@grmw.org
Mary Estes	Administrative	1114 J Ave. La Grande, Or. 97850	541.663.0570	mary@grmw.org

5. **Project Location:**
   The project area is located in the Wallowa River subbasin (HUC 6 – 170601050302). The legal description is Township 1 South, Range 44 East, Sections 29 and 32 W.M. and the study area is entirely contained within tax lot 4502. The center of the project area is at latitude 45.4429°N and longitude -117.3463°W and elevation is approximately 3,580 feet above sea level.

6. Project Objectives:

The goal of the project is to restore 2,000 lineal feet of the Wallowa River to a more historic and natural condition with functioning wetlands and floodplain, along with a stable stream channel. Improving fish habitat and water quality is the primary focus of this project with the following objectives:

1. Improve water quality and hydraulic complexity throughout this reach.
2. Improve terrestrial and aquatic macro-invertebrate population composition.
3. Increase use of the project reach by anadromous fish.
4. Maintain streambank stability.
5. Reconnect to the historic floodplain by increasing flooding frequency and depth on the floodplain.
6. Provide sediment transport continuity throughout the project reach.

The Wallowa River/6-Ranch Habitat Restoration project 2 will be implemented in Wallowa County, approximately 2.5 miles northwest of Enterprise, on the Wallowa River adjacent to State Highway 82. The majority of the project site is currently managed as a seasonal pasture for Corriente cattle with the minority managed for grass hay production. The Wallowa County Salmon Habitat Recovery Plan (WCSHRP) and the Grande Ronde Subbasin Plan (GRSBP) both identify this reach of the Wallowa River as deficient for several habitat, water quality and stream function parameters. The WCSHRP (Wallowa River – Spring Creek to head of Wallowa Canyon, pages 108 to 110) identifies the following concerns that will be addressed by this project:

1. Water quality; temperature (high priority)
2. Water quality; excess fine sediment (high priority)
3. Stream structure; woody debris (high priority)
4. Stream structure; pool/riffle ratio (high priority)
5. Stream structure; channelization (low priority)
6. Stream structure; bank form (low priority)
7. Substrate; excess fine sediment (high priority)

The GRSBP supplement further describes Wallowa River parameters of concern in the project area:

1. Table 3-1 page 15 (spring Chinook): Wallowa-Lostine, upper Wallowa River. Identified key limiting factors are habitat diversity, key habitat quantity, and sediment.
2. Table 3-2 page 16 (steelhead): Wallowa, upper Wallowa River. Identified key limiting factors are key habitat quantity and sediment.
3. Table 3-3 page 17 (restoration priorities): Restoration impacts on Chinook abundance and productivity would be large with moderate impact on steelhead abundance, productivity and diversity. Upper Wallowa is listed as a priority geographic area.

4. Table 5-6 page 50: The Wallowa-Lostine watershed is identified as having the highest potential impact to steelhead and spring Chinook populations (abundance and productivity) from comprehensive habitat restoration.

The limiting factors identified above will be addressed at the project scale and partially addressed at the reach scale. Limiting factors improved at the project scale include: 1) Woody debris, 2) Pool/riffle ratio, 3) Channelization, 4) Bank form, 5) Habitat diversity, and 6) Key habitat quantity. At the reach scale temperature and sediment/excess fine sediment will be improved. Fish habitat, water quality, riparian condition, and floodplain characteristics are all resources that will be improved on the project site and contribute to incremental improvement at the reach scale.

From a landscape and physical need restoration issues are prioritized with the two aforementioned documents. Not all high priority restorative actions can be realized for a multitude of reasons including landowner constraints, magnitude of action, economics, or social limitations. This proposed project and its restoration actions contain high social, habitat & watershed benefits representing a project not only of high watershed value but the overcoming of many traditional barriers.

7. Project Description

Introduction

Much of the Wallowa River below Enterprise, Oregon has been moved, straightened & channelized to accommodate agriculture, the railroad and Highway 82. In cooperation with the landowner the GRMW intends to restore 2000 feet of river channel over a 2,600 foot reach of the Wallowa River. A variety of improvements will be implemented including installation of an engineered logjam, woody debris and habitat structures, fish rocks, bio-engineered stream banks and channel re-meandering. These improvements will benefit fish habitat, channel form and function, channel and floodplain interaction and riparian condition. Anticipated funding partners are GRMW/BPA and OWEB equally contributing to the construction of the project. At completion enrolling the property into CREP or a similar conservation easement will protect the public restoration investment.

Existing condition

Extensive historic channelization along this reach of the Wallowa River has resulted in a straightened and simplified channel. This type of channel lacks complexity of habitat and, as a result, contains limited spawning and rearing habitat for steelhead and Chinook salmon. There are few pools and, therefore, very limited amounts of slow water holding habitat where migrating salmonids can rest. The sinuosity is low, the river is entrenched with very little connectivity to the historic floodplain, and the river lacks pool habitat.

The project reach of the Wallowa River supports three salmonid species listed under the Endangered Species Act: spring Chinook salmon, summer steelhead, and bull trout. The project area is within designated critical habitat for all three species. Juvenile spring Chinook and summer steelhead inhabit the project reach year-round. Both species utilize the area for juvenile rearing; however, limited suitable spawning habitat exists due to the riffle-dominated, high gradient nature of the channelized river. Bull trout are likely to inhabit the reach during winter and spring, using it as a migration reach, and the reach is considered habitat for bull trout foraging, migration and overwintering. Other fish species such as mountain whitefish, chiselmouth, dace, Sculpin, pike minnow, and suckers could be present in the project reach as well.

Specific Problem(s)	Root Cause(s) of the Problem
Water Quality; temperature	While abnormally high summer and low winter temperatures are a cumulative effect of land management upstream of the project area the site specific contribution to abnormal temperatures is riparian area modifications from channelization and agricultural practices resulting in the following problems: 1. Degraded riparian vegetation contributing to increased solar heating in summer months and reduced thermal cover during winter months. 2. Decreased out of bank flow due to channelization and dikes resulting in decreased bank storage of water during high flow, reduced aquifer recharge and lowered water table all contributing to low flow during the late summer months.
Water Quality; excess fine sediment Substrate; excess fine sediment	Excess fine sediment at the project site is a cumulative effect of upstream land management practices along the Wallowa River and tributaries (Hurricane Creek, Prairie Creek & Trout Creek), yet agricultural practices on site contribute sediment to the Wallowa River. Localized problems include: 1. Livestock grazing in the area causes trailing, compaction, loss of riparian vegetation, and erosion contributing sediment to the Wallowa River. 2. Lack of riparian fencing allows livestock access to the river degrading riverbanks and suspending fine sediment. 3. Wetland, vegetated filter strips & bank vegetation are not locally adequate to filter mobilized sediment.
Stream Structure; woody debris	The root cause of reduced woody debris, poor pool/riffle ratio, and degraded bank form is channelization for flood control and to accommodate

Stream Structure; channelization Stream Structure; pool/riffle ratio Stream Structure; bank form	the railroad and Highway 82. Channelization results in channel simplification, reduced habitat complexity, increased channel gradient, & increased water velocity. Project site problems include: 1. Degraded habitat, reduced floodplain interaction, and reduced water storage through channelization. 2. Current channel dimension, sinuosity, and water velocity will not allow woody debris to stay on site. 3. Channelization has turned this section of river into a continuous riffle lacking the pool & riffle sequences expected for the valley type. 4. Channelization and dikes have degraded bank form.

Specific Actions

It is proposed that two new meanders be placed in the Wallowa River in the project reach with the new banks being embedded with wood structures and planted. Areas relatively void of vegetation would also be planted and a side channel would be created in the portion of the existing river that would be abandoned. An overall proposed site plan is shown on figure 3 in the attached pre-engineering report and includes features such as an engineered log jam, woody debris and habitat structures, fish rocks, bioengineered stream banks, etc.

Meander No. 1 will be constructed from approximately Station 5+50 to 9+50 from the existing alignment shown on Figure 2 in the attached report. Meander No. 2 would be constructed from approximately Station 18+00 to 28+00 from the existing alignment shown on Figure 2. The proposed channel improvements will be modeled in HEC-RAS for these sections of the channel and will match the characteristics of the reference reach and Phase 1 project improvements. Modifications may be needed to maintain sediment transport continuity.

Engineered Log Jam (1): An engineered logjam (ELJ) is proposed at the upstream end of the project where the new channel leaves the existing channel. As shown on Figure 3 (report attached), the ELJ would be constructed in the middle of the existing Wallowa River at this location. The intent of the ELJ is not to completely cut off flow in the existing river, but rather to divert the majority of the flow into the new meander. The ELJ would be constructed using a combination of approximately 50 rootwads and trees. The ELJ would remain partially porous so water would continue to flow in the new side channel.

The purpose of installing the ELJ is to supplement natural fish habitat and livelihood in the river and to increase habitat complexity. The ELJ would provide fish with additional food, cover from predators, and favorable hydraulic features.

Woody Debris (12) and Habitat (9) Structures: These are structures made from wood. They are similar to the ELJ but are smaller in nature and, as opposed to a channel-spanning structure, are generally placed on one side of the streambank. The woody debris structure is composed of approximately three rootwads that are pinned together and secured into the bank by burying the majority of the rootwad with the basal end of the rootwad protruding into the flow of the river. A wood habitat structure is composed of approximately 12 rootwads that are pinned together and secured to the bank in the same manner as the woody debris structure.

Similar to the ELJ, the purpose of these structures is to supplement natural fish habitat and increase habitat complexity. In additions, pools are created in the streambed at the end of each structure and are self-maintained by the increase in water velocity that is experienced at the protruding portion of each structure. The increased velocity induces scour and helps maintain the pools that are desired by several fish species. The water temperature in these pool areas is typically cooler than the surrounding river, which is also a benefit to the fish species of concern.

Fish Rocks (50): Fish rocks are another feature that would be used in the proposed design. The fish rocks would range in size from approximately 36 inches to 48 inches in average diameter and would be placed on the streambed surface and buried 60 percent to keep the rocks from being scoured out and transported downstream.

Installing fish rock provides hydraulic diversity throughout any given cross section of the river and provides resting locations for migrating fish. Hydraulic diversity creates a condition in which all life stages of fish species can navigate up- and downstream as desired.

Bio-engineered Streambanks (1,100 lineal feet): Bio-engineered streambanks would consist of toe wood, toe wood anchors, ballast rock, and brush layering. The toe wood anchors would consist of wood members placed on top of and perpendicular to the streambank and pinned to the toe wood below. Ballast rock would be used to help hold the toe wood in place as well. Above the toe wood and ballast rock, a brush layer would be installed followed by a coconut fiber (COIR) soil wrap. Another brush layer would then be installed followed by a final COIR soil wrap. The brush layers would consist of wood species native to the area and would be installed such that the bottom of the planting would extend below the saturation zone of the soil.

Incorporating this type of bank protection technique would promote growth of brush along the bank. The brush, with its root mass, will provide long-term protection of the bank as well as needed cover. This aids in providing cooler water temperatures and protection of fish from avian predators.

Re-meandering the River (2): In addition to installing various fish habitat structures, this reach of the Wallowa River would be re-routed as shown on Figure 3 in the attached report. The intent of the design would be to have the banks breached at approximately a 1.75-year event, as opposed to the higher flow events that are now required to get water onto the floodplain. Creating meanders through this reach would increase the sinuosity from approximately 1.1 to 1.2, which equates to approximately an additional 250 feet of river.

Increasing the sinuosity addresses many of the project objectives. It increases fish habitat by increasing the length of the stream. As the river flows out of bank on a more regular basis, it will deposit needed nutrients onto the floodplain while, at the same time, collecting nutrients for fish and other aquatic organisms that are conducive to a healthy river. Meandering the river also promotes surface and groundwater interchange, which creates a cooling effect for the river. Raising the local water table can typically be expected when meanders are created along a river, which will activate wetland areas that have progressively been depleted over the years as the river was straightened and as downcutting has occurred.

Streambed Simulation Material: One aspect to consider when meandering a river is sediment transport. Installing fish rocks and wood structures will create a hydraulically diverse environment in which sediment transport is anticipated to be maintained. Bed Class 6 streambed simulation material will be used in areas where additional fill material is required during the construction process. This will aid in natural sediment transport through the project reach.

Benefits

The Wallowa River in this reach has a low sinuosity and high width to depth ratio; the proposed improvements will restore as much as possible the natural characteristics and function of the river. The improvements will provide greater habitat complexity (including a greater number of pools), reduce the stream gradient, and increase the sinuosity. A plan view and typical sections are shown on Figure 3 for the proposed improvements in the attached pre-engineering report. Wood habitat structures, woody debris structures, and fish rocks will be installed in order to provide greater complexity of habitat and promote the formation of pools. The woody debris structures will also stabilize the banks and prevent the channel from migrating. Segments of the river will be abandoned and new river channel constructed, which will create larger bends in the river. The abandoned channel will be used as a side channel that will be activated during high flow events. The bends will reduce the stream gradient by maintaining the existing elevation drop over a longer distance and increase the sinuosity in the project reach of the river.

Project Maintenance

Name of Person Agency/Organization	Contact Information	What will be done and for how long?
Landowners Craig and Liza Jane Nichols	Phone: 541.426.3827 Email: 6ranch@gmail.com	1. Fence maintenance 2. Weed control 3. Pertain to conservation easement guidelines.
GRMW	Phone: 541.663.0570 Email: coby@grmw.org	1. Monitoring 2. Evaluation 3. Adaptive management & maintenance prescription.

Permits -list any permits needed and who will obtain them, ESA consultation, etc.

ESA Consultation: With BPA as the action agency the GRMW will complete ESA consultation with the assistance of Anderson Perry, Inc. A biological assessment will be written, reviewed by the GRMW and submitted to BPA for submission to US Fish & Wildlife Service and National Marine Fisheries Service.

Removal/Fill Permits: The GRMW will complete joint removal/fill permit application with the assistance of Anderson Perry, Inc. The joint permit application will be submitted to both Oregon Department of State Lands and the US Army Corps' of Engineers. If necessary Oregon DEQ water quality certification permits will be obtained at this time.

Cultural Resources: Cultural resources clearance will be completed by the GRMW with assistance from Bruce Womack, RPA. The completed cultural resources survey and report will be submitted to BPA who will then seek clearance for the Oregon State Historic Preservations Office and the NPT and CTUIR Historic Preservation offices.

Monitoring Plan

1. Channel cross sections will be established along the restored channel to assess channel development over time. The number and location of cross-sections will be determined following project completion and will at minimum be placed to characterize built features including one pool, riffle, glide and tail-out. Surveys will occur at project completion, year 5, and year 10.
2. Baseline photo points have been established throughout the project area. Additional photo points will be established at each cross-section where photos will be replicated annually looking both up-stream and down-stream from both sides of the cross-section.
3. Aquatic habitat and plant community conditions will be monitored through various protocols. Habitat conditions will generally be measured using

longitudinal profile surveys (thalweg profile from top of project to bottom) and cross sections of pool and riffle habitat types. Vegetation survival counts will be used to assess plant stocking survival and plant community development.

4. Juvenile fish population index site sampling will be repeated at least every 3 years to compare baseline data collected in 2008. Annual redd surveys will be completed for summer steelhead.
5. Noxious weed surveys.
6. Stream temperature loggers will be installed above and below project in the Wallowa River. Stream temperature data will be collected for at least 10 years following project completion.

Measurable Objectives	Type of Monitoring	Monitor for What?	Frequency and Duration of Monitoring	Protocols to be used	Who Will Monitor?
Improved channel morphology & habitat conditions.	Channel morphology cross-sections	Lateral & vertical channel change, stability, & maturation.	Surveys at completion, 5th, and 10th years following project implementation.	Rosgen	GRMW staff, partner or contractor.
Improved channel morphology & habitat conditions.	Longitudinal profile.	Channel gradient change, stability, & maturation.	Survey at completion, 5th, and 10th years following project implementation.	Rosgen	GRMW staff, partner, or contractor.
Improved veg. species composition & distribution. Surrogate for reduced water temperature & increased fine sediment retention	Vegetation transects	Vegetation change, species presence, abundance, age class. Plant stocking survival.	Surveys at completion, 5th, and 10th years following project implementation.	Survival estimate of revegetation effort.	GRMW staff, partner, or contractor.
All inclusive	Photo points	Provides qualitative data to quantitative measures.	Annual for 10 years following completion.	Oregon Plan photo point monitoring guide.	GRMW staff.
Improved fish habitat.	Juvenile fish population. Steelhead Redd counts.	Fish use of restored channel.	Annual redd counts and juvenile fish population surveys every third year.	ODFW	ODFW research Enterprise.
Reduced noxious weed population.	Noxious weed surveys	Control noxious weeds.	Annual.	Walk through	Landowners.

Work Dates

Implementation Schedule	
Item	Anticipated Completion Date
Complete Project Design	Fall/Winter 2012
Acquire Permits	Spring 2013
Bid and Award Project	Spring 2013
Project Construction Phase I. Construction out of pre-project channel.	Summer/Fall 2013
Project Construction Phase II. Connection phase and in water work.	Summer 2014 during the in-water work window. For this section of the Wallowa River the instream work window is from July 15 to August 15.

9. Attachments:

Project Budget

Preliminary Engineering Report including:

1. Data Collection.
2. Site Information.
3. Proposed Improvements.
4. Maps.
5. Photos.
6. Calculations.