Granite Creek Restoration Design

Project Intent, Vision, Goals, and Objectives, and Design Objectives for Developing a Restoration Design

June 2016

1. Introduction

This document describes the Vision, Project Goal and Objectives, and Design Objectives identified for the Granite Creek Restoration Design (The Project). This document was developed by the CTUIR with input from Robert and Jodi Pedracini and Robert and Cody McConnell (the Landowners), and GeoEngineers. These efforts will occur under a Riparian Conservation Agreement entered into by Rose Pedracinni and the CTUIR in 2013. In Mrs. Pedracinni's absence her heirs, the Landowners, will provide guidance throughout the design and implementation process. The Project will incorporate physical and biological data into extensive discussions with all cooperators including the landowner to produce an implementable and permitted design. At this time implementation is scheduled for 2017.

The Desolation Creek watershed has primarily been impacted by historic placer mining and associated activities. 'Doodlebugs' were the chosen tool and mining is believed to have occurred twice with tailings left in place after mining activities stopped. These activities cumulatively decreased water quality, along with valuable terrestrial and aquatic habitat used by listed and non-listed species, altered sediment supply and sorting, reduced frequency of large wood and its entrainment and habitat features such as high-quality pools, and poor connectivity of adjacent floodplains, springs, and wetlands. Since mining stopped the Oregon Department of Fish and Wildlife worked with Mrs. Pedracinni to level tailing piles and install wood revetments to improve terrestrial and aquatic habitats. More recently the CTUIR worked with Mrs. Pedracinni to improve streambank stability through the placement of large wood. The CTUIR seeks to implement restoration for the benefit of focal fish species including steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), spring Chinook salmon (*O. tshawytscha*), and Pacific lamprey (*Entosphenus tridentatus*). Through this Project, the CTUIR intends to identify opportunities to increase spawning, rearing, and migration habitat for these species by increasing habitat quantity and qualityand restoring processes that sustainably maintain high-quality habitat.

The CTUIR's Biomonitoring Project has begun monitoring the project site using protocols associated with the Columbia River Habitat Monitoring Program supplemented with biological monitoring protocols. These efforts will be incorporated into documentation for the design in support of HIP III permitting documentation.

2. Intent

To better address and understand limiting factor/ecological concerns in the Granite Creek Watershed the CTUIR has been working through a coordinated effort on public lands with the United States Forest Service and on private lands where opportunities arise. The Landowner's property represents an example of the latter approach. To address these limiting factors/ecological concerns as implement the Project, the CTUIR intends to implement the Project for the following purposes;

1. Incorporate the Landowner's management strategies through open and effective communication,
2. Use existing and new information to develop scientific and process based approach to develop designs for a restoration project that address factors limiting/ecological concerns, the CTUIR's First Foods and in turn effective habitat complexity and suitability for focal species,
3. Implement the final permitted design,
4. Ensure the design has been appropriately implemented.

3. Vision

As contract administrator and technical lead the CTUIR will accomplish the Project to protect and enhance their culturally significant First Foods under the Department of Natural Resources' Mission Statement "To protect, restore and enhance the First Foods - water, salmon, deer, cous and huckleberry - for the perpetual cultural, economic and sovereign benefit of the CTUIR. We will accomplish this using traditional ecological and cultural knowledge and science to inform: 1) population and habitat management goals and actions; and 2) natural resource policies and regulatory mechanisms." Management and restoration actions in support of the First Foods are in part implemented through Umatilla River Vison (Jones et al, 2008). The Umatilla River Vision identifies a process based approach founded upon five primary touchstones: (1) hydrology, (2) geomorphology, (3) connectivity, (4) native riparian vegetation, and (5) native aquatic biota.

This inherently includes incorporating landowner priorities and management strategies when working on properties not owned or managed by the tribe. We will therefore work closely with the landowners to incorporate their goals, objectives, and land management strategies that will improve their ability to enjoy and manage the property.

4. PROJECT GOAL

The goal of the project is to undertake a rigorous, data-driven, and process based approach to quantifiably improve terrestrial and aquatic processes and habitats used by listed and non-listed species during all life stages. This inherently addresses Primary Limiting Factors/Ecological Concerns identified for The Watershed in the 2008 Fish Accords and is consistent with the Mid-Columbia Steelhead Recovery Plan NMFS, 2008) and Draft Columbia River Bull Trout Recovery Plan. This goal also falls in-line with established planning documents including:

- CTUIR's North Fork John Day Fisheries Enhancement Strategy, approved by the Independent Scientific Review Panel during the 2013 Geographic Review
- John Day River Subbasin Plan (NPCC 2005)
- Umatilla River Vision (Jones et al. 2008)
- John Day River Basin Watershed Restoration Strategy (CTWSRO 2014)

5. PROJECT OBJECTIVES

The objectives established for this Project are connected to discrete actions that can be clearly defined and the results measured over time to evaluate progress toward meeting each objective. To address the goal of the Project, the following objectives and associated tasks were developed;

5.1 Identify the factors negatively influencing physical and biological processes and habitat stability/complexity resulting in degraded physical conditions and limiting biological productivity. This objective will be met through the development of a permitted design that considers:

- Background information and data analysis – Descriptions of historical and current watershed processes, including land use, geology, geomorphology, water quality, hydrology, and hydraulics.
- Geomorphic description and analysis – The identification and quantification of physical processes influencing the channels morphology, hydraulic properties, and sediment transport processes affecting channel function within the reach, the effects of proposed

restoration strategies on channel morphology, and integration of results into restoration design to foster effective an outcome.

- Hydrologic and hydraulic analysis – Identification of current and future hydrologic conditions for the project site that will create and maintain dynamically stable habitat complexity for terrestrial and aquatic wildlife.
- Riparian plant community – Develop an understanding of the existing riparian communities and their potential to inform the design's planting plan and develop planting strategies and plans to meet future native vegetation population seral states.
- Habitat inventory – Existing aquatic and terrestrial habitat composition and extent and an estimate of how the Project will improve habitat complexity, composition, extent, quality, and its influence upon biologic populations.
- Meetings – Effective communication through meetings at key stages during the design development and implementation efforts.

5.2 Describe and develop desired future conditions complementing Landowner and cooperator needs by;

- Ensuring the Landowner and cooperators are actively involved through frequent and open communication,
- Incorporating management strategies and objectives identified by the landowners,
- Defining cooperator roles and responsibilities as related to terrestrial and aquatic ESA-listed and focal species,
- Determining areas of common ground and cooperation.

5.3 Ensure the permitted and construction ready design is implemented to the appropriate standards through;

- Approval of implemented actions by the Landowner and all cooperators.
- Oversight by technically qualified staff during implementation,
- Confirmation through documentation of the implemented design,

6. DESIGN OBJECTIVES

The Design Objectives are based upon the intent, Vision, Project Goals, and Project Objectives above lead directly into actionable treatments and metrics developed to determine treatment effectiveness in addressing limiting factors and ecological concerns (Table 1). The Design Objectives selected for this effort developed relative to geomorphic and biological processes and function include;

- Increased **channel complexity**, with **channel morphology** closer to historical and natural form.
- Increased quantity and quality of **habitat diversity**, especially wood and pools. Specific to pools create and maintain deeper pools capable of providing resting areas for returning salmon.
- Improved **sediment mobilization, deposition, sorting,** and **routing**.
- Increased **stream velocity diversity** at both low and high flows.
- Increased in-stream **thermal diversity** throughout the year.
- Increased **floodplain connectivity** and frequency of inundation.
- Increased **riparian function** with site-appropriate native vegetation.
- Increased area suitable for **adult spawning.**
- Increased area suitable for **juvenile rearing.**

Table 1. Ties between Limiting Factors, Umatilla River Vision, CTUIR First Foods, NOAA Ecological Concerns, Restoration Objectives, and Metrics.					
Limiting Factors	**CTUIR River Vision Touchstones**	**CTUIR First Foods**	**NOAA Ecological Concerns**	**Granite Creek Restoration Design Objectives**	**Metrics**
In-channel Characteristics	Primary: Geomorphology Secondary: Connectivity	Water Geomorphology	6.1 Bed and Channel Form	Increase channel complexity with channel morphology Increase quantity and quality of habitat diversity (wood, pools) Increase stream velocity diversity at all flows Increase area for adult spawning Increase area for juvenile rearing	Primary Channel Length Secondary Channel Lengths Bankfull and Wetted Width Bankfull Depth Bankfull Cross-Sectional Area Width/Depth Ratio Gradient Channel Incision Entrenchment Ratio
			6.2 Instream Structural Complexity	Increase channel complexity with channel morphology Increase quantity and quality of habitat diversity (wood, pools) Increase stream velocity diversity at all flows Increase area for adult spawning Increase area for juvenile rearing	Channel Morphology Braided-Channel Ratio Pool Frequency or Spacing Pool Depths Habitat Unit Composition LWD Counts
Passage/Entrainment	Primary: Connectivity Secondary: Aquatic Biota	Water Fish	1.1 Anthropogenic Barriers	Not Applicable to this site	Not Applicable to this site

Limiting Factors	CTUIR River Vision Touchstones	CTUIR First Foods	NOAA Ecological Concerns	Granite Creek Restoration Design Objectives	Metrics
Riparian/Floodplain	Primary: Geomorphology Secondary: Riparian Vegetation Tertiary: Connectivity	Water Salmon Cous	4.1 Riparian Vegetation	Increase floodplain connectivity and inundation frequency Increase riparian function with appropriate native vegetation	Riparian Characteristics
			4.2 LWD Recruitment		Floodplain Inundation
			5.1 Side Channel and Wetland Condition		River Complexity Index
					Channel Sinuosity
					Channel Migration Rate
			5.2 Floodplain Condition		Meander Belt Width
					Confinement Width
					Off-Channel Habitat Length
Sediment	Primary: Geomorphology Secondary: Aquatic Biota	Water Salmon	7.2 Increased Sediment Quantity	Improve sediment sorting and routing	Sediment Size Distribution: Channel
					Sediment Size Distribution: Bars
					Percent Fine Sediment in Bed
					Erosion/Deposition
					Bank Stability
Water Quality	Primary: Hydrology Secondary: Connectivity	Water Riparian Vegetation	8.1 Temperature	Increase in-stream thermal diversity	Stream Temperature Average/Range
			9.2 Decreased Water Quantity (Climate change)		Stream Discharge Distribution
			9.3 Altered Flow Timing (Climate change)		Stream Discharge