

Statement of Goals and Objectives

Desolation Creek Reach 3 Design

Background

In 2015 the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) entered into a conservation agreement with Desolation Creek LLC who had recently purchased a 13,000 acre parcel in the Desolation Creek basin between RM 1.8 and 12.3. Given that the Desolation Creek basin is predominantly owned and managed by two entities, the Umatilla National Forest and Desolation Creek LLC, both interested in ecologically sound resource management, collaborators determined that a basin wide action plan to guide restoration effort was useful. Subsequently the Desolation Creek Geomorphic Assessment and Action Plan (GAAP) (CTUIR, 2017) was developed and completed in 2017. The goal of which was to provide rigorous, data-driven, and science-based analyses leading to prioritized restoration and enhancement projects and designs that, when implemented over time, will accelerate process-based geomorphic function to rehabilitate Desolation Creek to the benefit of terrestrial and aquatic First Foods. The GAAP identified three Tier 1 reaches as priority for restoration based upon physical and biological process and ecological value relative to existing and proposed conditions. Thus far, a portion of the highest priority reach has been designed and implemented with the other half set aside until a relocation of the USFS 10 has been finalized. The CTUIR has therefore shifted its focus to RM 2.6 and 4.4 (Reach 3, The Project) the second highest ranked GAAP reach to develop and implement a design that supports the CTUIR's First Foods Policy using a process based approach as detailed in the Umatilla River Vision (Jones et. al., 2008).

The Project intends is to address ecological concerns originating from degraded physical and biologic process supporting steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), spring Chinook salmon (*O. tshawytscha*), Pacific lamprey (*Entosphenus tridentatus*), mussels, dace (*Rhinichthys sp.*) and sculpin (*Cottus sp.*) which are considered First Foods of the CTUIR. These First Foods represent and are an integral part of the tribe's culture.

The Desolation Creek watershed has been impacted by forest practices, sheep and cattle grazing and associated activities resulting from their development such as transportation infrastructure or as a result of their management such as altered fire regimes. These activities generally decreased water quality and available habitat thereby altering sediment supply and sorting, large wood presence and function, durability and frequency of pool/riffle/run habitats, connectivity of adjacent floodplains, springs, and wetlands, and hyporheic function. The CTUIR seeks develop a GAAP based design which incorporates the goals and objective of all collaborators and actively influence the restoration of physical and biologic process which will increase habitat quantity and quality.

Goals and Objectives

Goals and objectives are described at both the programmatic and project level. Programmatic goals and objectives are necessary to guide efforts such that progress is made toward meeting collaborator missions and ensuring individual actions fit within larger scale plans and recovery documents. Project level goals and objectives provide guidance as to why a particular action is being undertaken, identify appropriate ecological concerns that can be addressed as part of a design, and support the CTUIR's Fishery Habitat Program's Riverine Ecosystem Planning Approach (CTUIR 2016). Collaborator missions are described first, followed by Project goals and objectives.

Collaborator Programmatic Missions

Desolation Creek LLC

The mission, goals, and objectives of landowners as related to property management, the Project, and restoring watersheds for ESA-listed species are described in the following subsections. Each respective landowner retains final authority regarding decisions to implement any restoration actions advocated by co-managers or stakeholders.

The Confederated Tribes of the Umatilla Indian Reservation

As contract administrator, the CTUIR intends to accomplish the Project in accord develop treatments which align with their First Foods Policy to protect, restore, and enhance the tribal culture. The First Foods policy is based upon significant foods ritualistically served in a tribal meal including Water, Salmon, Deer, Cous, and Huckleberry in the order they are served. The First Foods Policy and Program establishes minimum ecological products necessary to sustain CTUIR culture are protected and sustained to meet treaty-reserved resources. In 2008 the Umatilla River Vision (Jones et al. 2008) was developed to implement the management and restoration of the First Foods and their habitats using five interrelated primary touchstones (Hydrology, Geomorphology, Native Aquatic Biota, Native Riparian Vegetation, and Connectivity) provide a process driven approach for natural resource management and restoration activities.

This design will also be undertaken in fulfillment of the DNR's mission 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." This will be accomplished 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" (CTUIR 2016).

The Confederated Tribes of the Warm Springs Reservation of Oregon

As one of three co-managers, the CTWSRO Fisheries Habitat Program mission is to protect, manage, and enhance habitat that supports culturally significant fish populations for the CTWSRO. Objectives supporting the Habitat Program mission include:

- Maintain and restore high-quality aquatic habitat to support harvestable fish populations.
- Ensure access to these populations for the Tribal membership.
- Foster partnerships to achieve holistic watershed-scale benefits.
- Demonstrate a conservation ethic that supports multiple use and harmony in rural communities with natural resource based economies.

Project Level Goals

Desolation Creek LLC

Return the Desolation Creek corridor to historic functioning capabilities. Not only to provide improved habitat for native fish species but also to provide suitable habitat to promote the return of wildlife and native plants.

CTUIR

The CTUIR's project level goal for the Project is to address the effects of historic timber harvest and grazing practices and associated ecologic concerns such that they improve and restore the system's ability to support the 'First Foods' using guidance provided by the Umatilla River Vision. The corresponding ecologic concerns affecting the River Vision touchstones that can be addressed specifically by this project include: High water temperatures; insufficient pools; shortage of LWD; loss of riparian vegetation; uncharacteristic

vegetation; lack of trees in riparian zone for shade, cover, and large wood recruitment; stream-valley floor hydrologic connection; channel form, stability, sinuosity, pool/riffle ratios and aquatic fish habitat complexity; substrate embeddedness; wetland state; and beaver habitat. An overarching goal is to address these ecologic concerns in a collective manner that acknowledges their interconnectedness and positive feedbacks. The types of actions and ways that these ecologic concerns can be addressed such that they restore the five touchstones are laid out more specifically as 'Project objectives' in the next section.

Through a process based approach, the Project and cumulative restoration actions within the Desolation Creek basin will also improve the Estimated Current Function of primary ecologic concerns of the Upper North Fork John Day River as well (cf. Three Treaty Tribes-Action Agencies 2008, Attachment G therein). With these changes the system's dynamic stability will be restored through a combination of active restoration measures and natural physical and bio/ecological processes.

Project Level Objectives

Objectives specific to this design effort were developed as part of the Request for Proposals and address site specific needs based upon Ecological Concerns of Reach 3 and will be used to guide development of the design. They include;

- Improve floodplain connectivity, frequency of inundation, and off-channel habitat to a condition closer to historical and natural form. Through re-engagement of the floodplain, flows will become less confined, stream power will decrease, gravel deposition will occur, groundwater tables will raise, and native riparian species will thrive.
- Reestablish riparian function with site-appropriate native vegetation and off-channel habitat.
- Increase and reestablish channel complexity, with channel morphology quantity and quality of habitat diversity, especially wood, pools, and a diversity of bed material sizes.
- Increase and reestablish stream velocity diversity at both low and high flows.
- Increase and reestablish area suitable for adult spawning.
- Increase and reestablish area suitable for juvenile rearing.
- Increase and reestablish geomorphically appropriate sediment sorting and routing.
- Increase and reestablish in-stream thermal diversity throughout the year.

Project's Relation to Larger Scale Plans and Recovery Documents

Through participation in the Project, collaborators will inherently undertake actions that cumulatively benefit the goals of entities working to improve management strategies, improve the fitness and distribution of native populations (listed and unlisted), and restore or improve process and in turn habitat supporting native species. Therefore, the Project's goals should complement appropriate land management strategies in accordance with established planning documents that include but are not limited to:

- Umatilla River Vision (Jones et al. 2008);
- CTUIR's North Fork John Day Fisheries Enhancement Strategy, approved by the Independent Scientific Review Panel during the 2013 Geographic Review (CTUIR 2013);
- Desolation Creek Geomorphic Assessment and Action Plan, (CTUIR 2017)
- John Day River Subbasin Plan (NPCC 2005);
- 2008 Columbia Basin Fish Accords (Three Treaty Tribes-Action Agencies 2008);
- John Day River Basin Watershed Restoration Strategy (CTWSRO 2014);

- Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan (NMFS 2009);
- Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment (Carmichael and Taylor 2010);
- ODFW (2016) Oregon Conservation Strategy;
- Revised Recovery Plan for the Coterminous United States Population of Bull Trout (USFWS 2015).

Monitoring Goals and Objectives

Although not a distinct component of this effort, the Collaborators all share the goal of developing a design which meets project objectives in tangible, measurable ways to demonstrate benefits for target species and the Desolation Creek ecosystem. Unfortunately for this effort the CTUIR's Bio-Monitoring Project will not be involved in monitoring the implemented design. Instead a combination of photo points, water temperatures, and easily measurable metrics will be used to inform the CTUIR's Riverine Ecosystem Planning Approach. To outline such an approach Table 1 was developed to specific and quantifiable candidate metrics with the CTUIR's First Foods, River Vision Touchstones, NOAA's Ecologic Concern Subcategories, and Project objectives. The proposed project metrics can be used to represent changes resulting from treatments and generally the CTUIR DNR's Physical Habitat Monitoring Strategy (PHAMS) restoration monitoring framework of Jones et al. (2015). Chosen metrics will align analysis and design efforts with the CTUIR's process driven approach to management and habitat restoration and future monitoring practices. Analyses and treatments incorporated into the final design will ideally produce measureable benefits for native aquatic and terrestrial species. The final part of this statement attempts to reconcile Table 2's metrics with resulting measurement numbers to identify progress toward satisfying objectives. To do this a monitoring program would need to address basic measurement questions and metrics as summarized below.

- Touchstone 1 – Hydrology Objectives and Basic Effectiveness Metric(s):
 - Reconnect surface and groundwaters to increase the diversity of water temperature, increase floodplain storage capacity, and increase summer baseflow;
 - Increase in floodplain inundation frequency and area for the 2 year flood event
 - Increase in deciduous canopy cover
 - Increase availability of off-channel habitat providing good thermal conditions;
 - Length/area of channel during summer w/ suitable water quality conditions
- Touchstone 2 – Geomorphology Objectives and Basic Effectiveness Metric(s):
 - Restore floodplain channels and channel migration;
 - Length and sinuosity of main and floodplain channels providing habitat
 - Changes in channel planform morphology
 - Increased LWD counts.
 - Increase in-channel habitat diversity;
 - Number and area of pool/riffle/run sequences and number of pools providing depth, object, and overhead cover
 - Increase spawning habitat availability;
 - Redd counts
- Touchstone 3 – Connectivity Objectives and Basic Effectiveness Metric(s):
 - Improve hydrologic connectivity and access to off channel habitats and floodplain/meadow vegetation ;
 - Length/area of channel during summer w/ suitable water quality conditions

- Area and type of deciduous vegetation cover
- Wetlands/meadow area
- Improve hyporheic and groundwater influence on stream channels;
 - Increases in permanent beaver residence
 - Number of localized streambed locations with reduced temperatures during baseflow
 - Relative number of before/after treatment pool/riffle/run sequences
- Touchstone 4 – Riparian Objectives and Basic Effectiveness Metric(s):
 - Improve future native riparian vegetation;
 - Increases in deciduous canopy area
 -
- Touchstone 5 – Aquatic Biota Objectives and Basic Effectiveness Metric(s):
 - Increasing habitat quantity and quality for native fish species;
 - Types of habitat created
 - How and when habitat is utilized

Table 1. Summary of CTUIR NFJD Habitat Project Objectives, CTUIR First Foods and Umatilla River Vision, NOAA Ecological Concerns, Restoration Objectives, and Relevant Bio-Monitoring Project Metrics.

CTUIR NFJD Habitat Project Objectives	CTUIR River Vision Touchstones	Primary CTUIR First Foods	NOAA Ecological Concern Sub-Category	Desolation Creek Restoration Project Objectives	Metrics identified by the CTUIR Bio-Monitoring Project and within the PHAMS Document	
Protect and conserve habitat and ecological processes supporting the First Foods	Primary: Geomorphology - Secondary: Aquatic Biota - Tertiary: Connectivity	Water & Salmon	6.1 Bed and Channel Form	Increase and reestablish channel morphology, complexity, and the quantity and quality of habitat diversity, especially the presence of wood and pool/riffle sequences Increase and reestablish stream velocity diversity at both low and high flows	Primary Channel Length - Secondary Channel Lengths - Bankfull & Wetted Width - Sinuosity - Bankfull Cross-section Area - Width/Depth Ratio, Entrenchment Ratio	
			6.2 Instream Structural Complexity	Increase and reestablish channel complexity and in turn habitat diversity, especially wood structures and pools		Habitat Frequency - Pool Depth - Pool Creator - Braided-Channel Ratio - Pieces of Wood/mile
				Increase and reestablish stream velocity diversity at both low and high flows		
				Increase and reestablish areas suitable for adult spawning		
				Increase and reestablish areas suitable for juvenile rearing		
				Increase and reestablish areas suitable for juvenile rearing		
Improve passage to existing high quality habitat	Primary: Connectivity - Secondary: Aquatic Biota - Tertiary: Geomorphology	Water & Salmon	1.1 Anthropogenic Barriers	Restore passage during baseflow periods through the entire reach	Stream Temperature Average/Range suitable for bull trout during baseflow periods	
				Improve Floodplain connectivity, frequency of inundation, and off-channel habitat to a condition closer to historical and natural form	Use of side and off-channel habitats	

CTUIR NFJD Habitat Project Objectives	CTUIR River Vision Touchstones	Primary CTUIR First Foods	NOAA Ecological Concern Sub-Category	Desolation Creek Restoration Project Objectives	Metrics identified by the CTUIR Bio-Monitoring Project and within the PHAMS Document
Improve riparian and floodplain complexity & floodplain connectivity	Primary: Riparian Vegetation - Secondary: Geomorphology - Tertiary: Connectivity	Water, Salmon, Deer, Cows	4.1 Riparian Vegetation	Improve floodplain connectivity, frequency of inundation, and off-channel habitat to a condition closer to historical and natural form	Hardwood - Survival & Change in Distribution - Softwood - Survival & Change in Distribution - Frequency of Floodplain Inundation
			4.2 LWD Recruitment	Reestablish riparian function with site-appropriate native vegetation and off-channel habitat	
			5.1 Side Channel and Wetland Condition	Increase and reestablish channel complexity and in turn habitat diversity, especially woody structures and pools	River Complexity Index - Sinuosity - Channel Migration Rate - Meander Belt Width - Confinement Width - Off Channel Habitat Length
			Increase and reestablish in-stream thermal diversity throughout the year	Increase and reestablish areas suitable for juvenile rearing	
Improve Sediment Routing and sorting	Primary: Geomorphology - Secondary: Hydrology	Water, Salmon	5.2 Floodplain Condition	Improve floodplain connectivity, frequency of inundation, and off-channel habitat to a condition closer to historical and natural form	Sediment Size Distribution: Channel - Sediment Size Distribution: Bars - Embeddedness - Bank Stability
			7.1 Decrease Sediment Quantity	Reestablish riparian function with site-appropriate native vegetation and off-channel habitat	

CTUIR NFJD Habitat Project Objectives	CTUIR River Vision Touchstones	Primary CTUIR First Foods	NOAA Ecological Concern Sub- Category	Desolation Creek Restoration Project Objectives	Metrics identified by the CTUIR Bio-Monitoring Project and within the PHAMS Document
Improve or preserve water quality	Primary: Hydrology - Secondary: Aquatic Biota - Tertiary: Connectivity	Water, Salmon	8.1 Temperature 9.2 Decreased Water Quantity (Climate change) 9.3 Altered Flow Timing (Climate change)	Increase and reestablish in-stream thermal diversity throughout the year Improve floodplain connectivity, frequency of inundation, and off-channel habitat to a condition closer to historic	Stream Temperature Average/Range Stream Discharge Distributions Piezometric Head/Inundation

References

- Carmichael, R.W., and B.J. Taylor. 2010. Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment. ODFW. Available: [http://www.dfw.state.or.us/fish/CRP/docs/mid_columbia_river/Oregon Mid-C Recovery Plan Feb2010.pdf](http://www.dfw.state.or.us/fish/CRP/docs/mid_columbia_river/Oregon_Mid-C_Recovery_Plan_Feb2010.pdf)
- CTUIR. 2013. CTUIR's North Fork John Day Fisheries Enhancement Strategy. Available: <https://www.cbfish.org/Project.mvc/Display/2000-031-00>
- CTUIR. 2016. CTUIR Fisheries Habitat Program Strategic Framework for Restoration Activities. Available: <http://www.critfc.org/wp-content/uploads/2016/09/Lambert-FisheriesHabitatProgramStrategy-Poster.pdf>
- CTUIR. 2017. Desolation Creek Geomorphic Assessment and Action Plan.
- Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO). 2015. John Day River Watershed Restoration Strategy. Available: <http://wsfish.org/jd-watershed-restoration/>
- Jones, K.L., G.C. Poole, E.J. Quaempts, S. O'Daniel, and T. Beechie. 2008. Umatilla River Vision. October. Available: <http://www.ykfp.org/par10/html/CTUIR%20DNR%20Umatilla%20River%20Vision%20100108.pdf>
- Jones, K.L, S.J. O'Daniel, T.J. Beechie, J. Zakrasjek, and J.G. Webster. 2015. Physical habitat monitoring strategy (PHAMS) for reach-scale restoration effectiveness monitoring. USGS Open File Report 2015-1069.
- NMFS (National Marine Fisheries Service). 2009. Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan. Northwest Region. November. Available: http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/middle_columbia/middle_columbia_river_steelhead_recovery_plan.html
- NMFS (National Marine Fisheries Service). 2013. Endangered Species Act – Section 7 Consultation, Programmatic Biological Opinion & Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Aquatic Restoration Activities in the States of Oregon, Washington, and Portions of California, Idaho and Nevada (ARBO II).
- North Fork John Day Watershed Council (NFJDWC). 2014. Letter to Oregon Watershed Enhancement Board, October 15. Available: https://www.oregon.gov/OWEB/docs/FIP/2014PrioritySubmissions/2014_Accelerated_Restoration_in_the_Upper_North_Fork_John_Day.pdf
- Northwest Power Planning Council (NPPC). 2005. John Day Subbasin Revised Draft Plan. March. Available: <http://www.nwcouncil.org/media/118963/PlanRevised.pdf>

Oregon Department of Fish and Wildlife. 2016. Oregon Conservation Strategy. Available:
<http://www.oregonconservationstrategy.org/conservation-opportunity-area/north-fork-john-day-river-2/>

Three Treaty Tribes-Action Agencies. 2008. Columbia Basin Fish Accords. Available:
<http://www.critfc.org/wp-content/uploads/2012/10/moa.pdf>.

USDA Forest Service, USDI Bureau of Land Management, Bureau of Indian Affairs (USFS et al.). 2013. Fish Habitat Restoration Activities Affecting ESA-Listed Animal and Plant Species and their Designated or Proposed Critical Habitat and Designated Essential Fish Habitat under MSA found in Oregon, Washington and parts of California, Idaho, and Nevada (ARBA II).

US Fish and Wildlife Service (USFWS). 2015. Recovery plan for the coterminous United States population of bull trout (*Salvelinus confluentus*). Portland, Oregon. xii + 179 pages.