GRANDE RONDE MODEL WATERSHED

Watershed Enhancement Project Proposal

1. **Project Name:** Catherine Creek-44 Stream and Fish Habitat Restoration Phase I

2. **Applicant:** Union Soil and Water Conservation District
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5. **Project Location:**
The proposed project is located approximately 4 miles Southwest of Union, Oregon on Catherine Creek in the Upper Grande Ronde Subbasin. The project legal description is: Section 34 Township 4 South, Range 40 East WM, and Section 3, Township 5 South, Range 40 East WM, Section 34. The project is on private land.

Long Range Project Reach Overview:
This project's Phase I goals and objectives are the initial steps in an overall large scale local partnership effort between 8 private landowners and the USWCD, BOR, CTUIR, and ODFW. These partners are working to strategize, plan, and design a multi-faceted and phased project addressing critical Spring/Summer Chinook habitat limiting factors to promote increased capacity for spawning, summer rearing, and overwintering habitat within the Middle Catherine Creek Reach. Phase I's goal is to address the landowners immediate concerns of high water event bank erosion, fencing loss, occasional livestock loss, and potential outbuilding flooding while larger scale planning and design for Phase II is completed. Phase II and potential subsequent project phases include a variety of habitat enhancement and restoration strategies including:

- Re-meandering channel segments
- Re-activation of historic channel segments
- Construction/re-activation of side channels and alcove habitat
- Reclamation of channelized reaches into complex side channel and wetland habitat
- Removal of dykes to promote floodplain connectivity
- Installation of Large Wood Material (LWM) structures and riffle complexes
- Riparian plantings and seeding
- Irrigation POD's consolidations, seasonal push-up dam removals, and water conservation measures such as irrigation delivery pipelines, off channel watering systems, and riparian exclosure easement fences.

- Project goals such as easements and exclosure riparian fencing is not included with Phase I. However, all landowners have agreed to enter into conservation easement agreements once Phase II, scheduled for 2014, is completed.
- Phase I actions are a subset of the overall multi-phase project.

6. Project Objectives:

Primary habitat limiting factors identified within the project area have been developed through literature review, field visits by basin biologists, and field investigations and reference of the NOAA Fisheries NE Oregon Snake River Recovery Plan and BiOp Expert Panel Process commissioned by BOR and BPA. Key habitat limiting factors to be addressed include:

CCC3 and UGS10A - Middle Catherine Creek (Pyles Creek To North and South Forks of Catherine Creek)
4.1: Riparian Condition: Degraded riparian conditions.
4.2: Riparian Condition: Large wood Recruitment.
5.2: Peripheral and Transitional Habitats: Floodplain condition.
7.2: Sediment Conditions: Increased sediment quantity/excess fine sediment.
8.1: Water Quality: Temperature, elevated summer stream temperatures, low DO levels.
9.2: Water Quantity: Decreased water quantity, lower summer flows.

Project Goal Statement:

The overall project goal is to restore natural channel functions and processes that provide for increased capacity to spawn and rear ESA listed Salmon and Steelhead while protecting and maintaining the utility and economic viability of a working ranch. The project objectives are to protect habitat, enhance floodplain connectivity, in-stream structural diversity and complexity, and riparian habitat conditions assisting Salmon/Steelhead recovery. The project potentially reduces excessive bank erosion, heavy sediment loads, and high water temperatures, while creating and or enhancing complex fish habitat, especially large wood structures, and increasing riparian vegetation. Consequently, limiting factors for Spring/Summer Chinook, Steelhead, and Bull trout in the Upper Grande Ronde/Catherine Creek Subbasin will be addressed. Stabilizing stream banks at 5 high priority targeted sites with large wood material structures and riparian plantings benefits these ESA fish populations and habitat.

7. Project Description:

The project area is located within Reach UGS10A (Summer Steelhead) and Reach CCC3 (Spring-Summer Chinook) (Northeast Oregon Snake River Recovery Plan, Draft (NOAA, March 2012) and BiOp Expert Panel Draft Reach Delineations (BPA/BOR, April 2012). Geographically, these reaches encompass Middle Catherine Creek from the confluence of Pyles Creek upstream to the North and South Forks of Catherine Creek. The Project Area is also located within Reach 4 of the Bureau of Reclamation Tributary Assessment (BOR, February 2012) and has been identified as one of the highest priority reaches for restoration actions. BOR and ODFW assessments found Catherine Creek within this project area to include stream bank instability, high channel width/depth ratios, poor riparian vegetation, lack of side channel habitat and floodplain connectivity, and poor in-channel diversity and

complexity within individual reaches. Additionally, the project reach is affected by winter icing, high summer water temperatures, and low summer base flow.

Phase I proposes installation of 18 engineered large wood material structures at 5 targeted critical project reach sites and 2.32 acres of riparian plantings. In addition to the large wood material installation and plantings, several abandoned car bodies will be removed from stream banks. Large boulder and rock materials will also be placed to enhance in-channel complexity. All temporary impact areas will be re-seeded, planted, and restored following construction. Upon completing Phase I project partners and landowners will move forward with a proposed Phase II. Phase II, currently being developed and scheduled for construction in 2014 includes: consolidation of 4 irrigation points of diversion into a single point of diversion, construction of an irrigation delivery pipeline network from the consolidated diversion, and riparian corridor enhancement through side channel construction, floodplain connectivity, in-stream complexity, and riparian vegetation plantings.

Existing Conditions:
Environmental baseline conditions were derived from various sources including baseline field surveys, site aerial photography, LiDAR imagery, habitat characterization reports, and communication with the landowners and partnership agency staff with knowledge of the action area. Project partners have worked together to compile datasets and develop baseline assessment data with an accompanying hydraulic model and a 100-year flood event model. Additional limiting factors and existing conditions data were compiled from ODFW habitat surveys and from the BOR Catherine Creek Tributary Assessment and BiOp expert panel draft recovery plan. Anderson Perry completed a Wetland Delineation Report in the Spring of 2013.

The existing channel is relatively homogenous with minimal habitat availability and complexity. Current ODFW fish monitoring and BOR assessment confirms this project site is a high priority critical area for juvenile Chinook Salmon over-wintering habitat, spawning, and summer rearing. During the winters of 2009-2012 the ODFW fish tracking study of over-wintering juveniles in the area showed a preference for deeper pools with cover habitat (overhanging vegetation and/or submerged LWM). There is a lack of LWM which has reduced the available cover habitat and ability to sustain deep pools. In addition, high summer water temperatures are common during the irrigation season.

Generally, the project Reach is in poor to fair condition with stream segments exhibiting a lack of deep pools, little complex cover, channel incision, and poor riparian vegetation communities with some large trees and little overhanging vegetation. Prior channelization has removed the meander bends and point bars that are essential to create and maintain deep pools. Sediment storage in the channel has caused severe localized bank erosion and over-widening. The channel is becoming shallower which further exacerbates many of the problems already present in the area. Stream bank erosion is prominent along many portions of the project area which actively erode stream banks and contribute excessive sediment into Catherine Creek. Channelization and past intensive streamside grazing practices have led to high channel width/depth ratios, loss and suppression of riparian vegetation, subsequent

loss of future channel complexity, and stream bank erosion leading to excessive fine sediment loads in the channel. The project complements completed and on-going fish habitat enhancement activities in the Catherine Creek watershed. Overall project goals, objectives, and limiting factors include:

Project Name	Streams	Year	Assessment Unit steelhead	Assessment Unit Chinook	River Vision Touchstones	BiOP Limiting Factor ID	Snake River Basin Draft Recovery Plan/BiOP Identified Limiting Factors	Eco Concern Sub-Cat ID	Ecological Concern-Sub Category	Project Goals	Project Objectives	Implementation Actions/Metrics	Monitoring Metrics
Catherine Creek RM44 Fish Habitat Enhancement Project (Project in planning stage)	Catherine Creek	2014 2017	UGS10B	CCC3B	Biota-Connectivity	1	Habitat Quantity	1.1	Anthropogenic Barriers	Improve diversion structures. Subbasin Plan Reference: Channel Conditions. (page 260)	**Protect Habitat:** Develop riparian easement with 8 landowners (CTUIR/BPA/ODFW easement and/or CREP). **Enhance riparian habitat conditions:** Increase riparian plant communities through planting and seeding and natural recruitment. **Enhance Floodplain Connectivity:** Remove channel confinement structures. **Enhance in-stream structural diversity and complexity:** Re-activate historic channel meanders to increase sinuosity and place large wood within active channel. **Reduce excessive sediment:** Manage riparian grazing with exclusion fences, stabilize existing erosion sites with wood structures and re-establishment of vegetation. **Decrease summer peak temperatures:** Improve/increase vegetative cover/shade to decrease summer stream temperatures and increase winter temperatures. **Decreased Water Quantity;** Consolidate points of diversion. Purchase water rights.	Conceptually includes: 2 miles restoration channel, 3-4 miles of side channel habitat, 5.5 miles habitat complexity. Removal of irrigation push up dams (4) Planting within riparian area. Seeding disturbed ground. Construct riparian fence. Off-channel water to be developed	**Enhance Floodplain Connectivity:** Topographical GPS points collected pre project using Trimble R8 GPS. **Enhance in-stream structural diversity and complexity:** Longitudinal profile and cross-sections pre project surveyed using Trimble R8 GPS. **Reduce excessive sediment:** Pebble counts at permanent cross-sections pre project. **Decrease summer peak temperatures:** Water temperature - hourly data - Hobo Pendant loggers - April to November starting 2012.
					Riparian Vegetation	4	Riparian Condition	4.1	Riparian Condition	Protect Habitat. Subbasin Plan Reference: Habitat Protection (page 258).			
										Enhance riparian habitat conditions. Subbasin Plan Reference: Riparian Conditions (page 262).			
								4.2	LWD Recruitment				
					Connectivity	5	Peripheral and Transitional Habitats	5.1	Side Channel and Wetland Conditions	Enhance Floodplain Connectivity. Subbasin Plan Reference: Channel Conditions (page 260).			
								5.2	Floodplain Condition				
					Geomorphology	6	Channel Structure and Form	6.1	Bed and Channel Form	Enhance in-stream structural diversity and complexity. Subbasin Plan Reference: Channel Conditions (page 260).			
								6.2	Instream Structural Complexity				
						7	Sediment Conditions	7.2	Increased Sediment Quantity	Reduce excessive sediment. Subbasin Plan Reference: Sediment Conditions (page 261).			
					Hydrology	8	Water Quality	8.1	Temperature	Decrease summer peak temperatures. Subbasin Plan Reference: Riparian Conditions (page 262).			
						9	Water Quantity	9.2	Decreased Water Quantity	Increase summer water quantity. Subbasin Plan Reference: Low Flow Conditions (page 263).			

Specific Actions

1. Install Engineered Large Wood Material Structures.

- Large Wood Material Structures, with logs approximately 18-30" diameter by 20-60' long, will be installed at 5 targeted critical project sites. Logs with and without 5-6' attached root wads will be installed. Surrounding and among the structures' key logs, will be placement of wood racking materials consisting of 4–12" diameter by 6-20' long wood pieces including large branches and tree tops. These materials create voids and spaces within log jams which increases habitat complexity. All key materials will be buried or partially buried into the channel bank with native backfill to provide stability. Key structure logs will also be stabilized and connected by rebar pins.

Site 1. This project habitat structure area consists of 2 wood placement sites; a proposed structure along the left bank and an upstream grouping of structures along the right bank. The left bank site is located downstream on the outside of a channel meander bend. This site has been historically protected by car bodies placed in and adjacent to the channel to aid in bank stabilization. Proposed actions at this location include the removal of car bodies, installation of an engineered large wood material structure to reform the bank, and enhancement of the existing pool by concentrating scour around the proposed structure, providing cover and habitat complexity. The large wood associated with this site will include approximately 67 key logs and 54 racking members.

Site 1's second upstream right bank habitat structure area includes the placement of a flow through log jam at the upstream end of the meander, and 4 flow deflector jams located downstream, providing habitat complexity during high flows when the side channel is activated. The large wood associated with this site will include approximately 46 key logs and 87 racking members.

Site 2. This project habitat structure area consists of 2 large wood placement sites; a grouping of structures along a left bank gravel bar, and a grouping of structures along a left bank meander bend. The left bank is located downstream along the inside of a channel meander bend. This section is located immediately upstream and across from a proposed consolidated diversion location (CC-44 Phase II). Proposed actions include installation of 4 log jam structures to promote deposition along the left bar, concentrate scour and flow along the right bank, enhance the existing pool, and provide cover and habitat complexity throughout the bend. The large wood associated with this site includes approximately 36 key logs and 62 racking members.

The upstream site is located along the left bank around the outside of a channel meander bend. The proposed actions include the placement of a flow through log jam at the upstream end of the meander and 5 flow deflector jams at the downstream end, providing habitat complexity when the side channel is activated. In addition, 4 sweeper logs will provide more complexity and reduce erosion during high flow

events. The large wood associated with this site includes approximately 46 key logs and 87 racking members.

Site 3. This project habitat structure area consists of one large wood material structure placement site along a portion of right bank eroding rapidly. Proposed actions include the installation of a large wood material structure along the right bank to reduce near bank velocities, providing cover and creating habitat complexity. Wood placement will allow the fence to be set back to create a riparian buffer, promote natural vegetation establishment, and reduce the near bank impact from livestock activity. The large wood material associated with this site will include approximately 29 key logs and 31 racking members.

Site 4. This project habitat structure area consists of large wood material structure placement along the right bank upstream and downstream of the bridge, in addition to some boulder placement within the channel. This area includes a portion of right bank eroding immediately upstream and downstream of an existing bridge crossing. The wood placement along this bank will create diversity in velocity distribution across the channel section and provide an area for juvenile fish refuge within the main channel. The wood placement will also protect the banks from further erosion and aid in creating/maintaining a pool underneath the existing bridge. The large wood associated with this site will include approximately 43 key logs, and 43 racking members.

Site 5. This project habitat structure area consists of large wood placement along the right bank upstream and downstream of an existing point of diversion, with some boulder placement within the channel, and de-activation of a historic currently unused diversion ditch. This area includes the immediate area around the landowner's irrigation diversion, as well as the right bank immediately downstream of the diversion location and the historic diversion ditch. The right bank downstream of the diversion is eroding releasing fine sediment into the channel. Protecting this bank with large wood material will create diversity in velocity and provide refuge cover for juvenile Salmonids. The landowner currently accesses the channel at this location to maintain an irrigation pool. The placement of wood and rock upstream will help maintain the diversion pool, and provide an increase in habitat and depth of cover for adult Salmonids. The large wood associated with this site will include approximately 7 key logs and 7 racking members.

2. **Re-seed and Re-plant Disturbed Areas.**
   - Using a combination of live stakes, plugs, and container plants all areas disturbed during construction will be re-seeded using native seed mixes and plants. The establishment of a healthy, self-sustaining native vegetative community throughout the project site is vital to the success of a stream enhancement project. Re-vegetation immediately after grading provides key initial site stabilization and energy dissipation. Such communities promote short-term and long-term bank stabilization; shade for cooler water; protective cover for fish; habitat for terrestrial wildlife (birds, mammals, amphibians, and macro invertebrates); and future wood material recruitment.

Approximately 11 acres of the project area are currently enrolled in a Conservation Reserve Enhancement Program (CREP) program and have been fenced to exclude livestock. The areas currently fenced include the area around Site 1. Although not enrolled in any easement programs, currently there is fencing along Catherine Creek throughout the entire project reach. This will ensure Phase I project sites will be excluded from livestock access. There will not be additional fencing installed as part of Phase I. However, Phase II of this project will establish additional exclusion fencing and conservation easements which will encompass the entire project area.

3. **Trap and haul (salvage) fish and other aquatic species from construction areas to avoid any unintentional take or injury.**
   - All fish capture, handling, and relocation would be directed by qualified and experienced fish biologists in accordance with NMFS, USFWS, and ODFW fish removal protocol with guidelines.

Benefits

The project complements completed and on-going fish habitat enhancement activities in the Catherine Creek watershed. The project site is within historic ESA listed Salmonid spawning, rearing and over-wintering habitat. ODFW fish monitoring and BOR Tributary Assessment studies indicate a lack of in-stream complexity and fish habitat, particularly in the Middle Catherine Creek Reach area from the confluence of Pyles Creek upstream to the North and South Forks of Catherine Creek. Project benefits address these issues by developing an enhanced more stable and diverse riverine reach with higher ecosystem value, particularly with respect to anadromous Salmonids. The completed project area will further sustain Steelhead, Chinook and Bull trout, as well as other species. Benefits from the proposed improvements to in-stream habitat increase the rearing capacity for these species. In addition, the Phase I project area after Phase II completion will be protected under 10-15 year conservation easements. Specific project benefits include:

- Engineered LWM structures will maintain the desired channel configuration and increase in-stream habitat complexity.
- Creation of scour pools, runs, and riffles of various sizes and complexity.
- Potential increase for sediment storage at controlled locations.
- Increase LWM recruitment from near non-existent conditions through re-vegetation of native Willow, Cottonwood, Alder, shrubs and grass plantings. The additional vegetation will also add stability to stream banks and decrease erosion and sediment loads into the creek.
- Phase II plantings and exclosure riparian fencing will increase wildlife habitat created within the project area.
- Phase II conservation easements will protect the project and allow it to mature.

Project Maintenance

USWCD, CTUIR, ODFW staff, and the landowners will maintain the project. Extensive maintenance of in-stream habitat enhancement structures and exclosure fencing is not anticipated. Maintenance associated with the conservation easements includes annual fence inspection, repair and maintenance of planted materials consisting of managing competing

vegetation to increase plant survival rates. A weed management plan will be developed and implemented once Phase II of the project is completed.

Permits

Project partner staffs are completing all environmental compliance requirements in cooperation with BPA staff. These requirements include ESA Section 106 consultations, and Oregon DSL and USCOE Fill Remove and Wetland Mitigation permit authorizations. BOR conducted a cultural resources survey in the summer/winter of 2012. Currently, the Section 106 consultation is near completion and the permitting process has begun with all permit applications submitted.

Monitoring Plan

Photo points will be established in 2013 by the USWCD and partnership agency staff to provide comparative progress of implementation success and habitat complexity. A final report will be submitted by the USWCD to document the actual project implementation and will include the established photo points featuring pre and post construction implementation. All required monitoring reports will be submitted to the appropriate funding and permitting agencies. A monitoring plan has been developed to evaluate project objectives which include periodic visits to photo points and surveys of monumented cross-sections to monitor channel processes.

Work Dates

Project in-stream construction will coincide with the in-water work window, July 1 to August 15, as recommended in Oregon Guidelines for Timing of In-Water Work To Protect Fish and Wildlife Resources, published by ODFW June, 2008. All other Phase I construction activities will be completed during the Summer/Fall of 2013. Specific dates for various project aspects include:

- Habitat, Hydrologic, Geomorphic Survey/Analysis: Fall/Winter 2012/13.
- Pre-design completed: Fall/Winter 2012/13.
- Permitting/Consultations: Winter/Spring 2012/2013.
- Final design completed: Spring 2013.
- Construction: Summer/Fall 2013.
- Monitoring: Initiated in 2013 and will continue through 2022.

8. Project Budget

A detailed budget with information for materials, labor costs, work units, and cost share by funding source is provided. BPA funds will be utilized for construction, materials, and project management to manage and inspect construction, schedules, solicit bids, develop and award contracts, monitor project post construction, obtain all necessary invoices, and produce all required forms and reports. The budget estimate was developed using costs from previous stream restoration projects as well as current R.S. Mean's costs. Unless otherwise noted the unit costs reflect the costs to purchase, transport, and place materials.

Multiple Union SWCD past project budgets, experience, and conversations with contractors, suppliers, and partnership agency's staff provided information to develop an accurate project budget. Project management and administration were based on the District's experience with other projects and the amount of staff time it takes to

complete large wood structure restoration projects.

A special budget note: This budget reflects the $96,235 which BPA approved to include from a previous District project CC-37 to be used to purchase some of the wood materials for this project.

9. **Attachments: Please see attachments including project maps, design, photos.**