

Project Proposal

1. **Project Name:** Ladd Creek/Ladd Marsh Wildlife Area Channel Reconstruction and Wetland Restoration

2. **Applicants:**

Grande Ronde Model Watershed Foundation
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3. **Participating Landowner(s) and Agencies:**

Grande Ronde Model Watershed Foundation (GRMWF)
Oregon Dept. of Fish & Wildlife (ODFW)
Union County
Confederated Tribes of the Umatilla Indian Reservation (CTUIR)
Oregon Department of Transportation (ODOT)

4. **Project Contact(s):**

Oregon Department of Fish and Wildlife (technical)

- Vance McGowan, 541.963.2138, Vance.R.McGowan@state.or.us
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Grande Ronde Model Watershed Foundation (administrative)

- Lyle Kuchenbecker, 541.663.0570, lyle@grmw.org
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5. **Project Location:**

All of the channel reconstruction will occur on the Ladd Marsh Wildlife Area on the West Fork, Middle Fork and East Forks of Ladd Creek. Ladd Creek is a tributary of Catherine Creek. Legal description is: T.3S.R.38E, portions of sections 25, 35, 36; T.3S.R.39E. portion of section 31.

6. **Project Objectives:**

The project objectives are:

- promote natural, stable stream channels and in-stream habitat diversity
- Improve water quality (sediment, nutrient, water temperatures)
- Increase groundwater recharge
- Improve wetland habitats for riparian/wetland dependent species

- Increase suitable rearing habitat for anadromous and resident salmonids

7. Project Description

Introduction

The forks of Ladd Creek were channelized to drain wetlands for agricultural use in the late 1800's or early 1900's. This project proposes to restore near-historic channel configuration and hydrology by constructing approximately 6.1 miles of new channel to replace 3.3 miles of ditches. Approximately 1.9 miles of the new channel reconstruction (funded by the Federal Aviation Administration through Union County) is mitigation for impacts to Gekeler Slough resulting from a Union County Airport runway extension.

The project will implement a variety of restoration activities including channel restoration and re-establishment of hydrology capable of supporting hydrophytic riparian and wetland vegetation. Artificial and natural native/native-like tree, shrub, and grassland communities will be established. The approximate size of the affected landscape is 900 acres.

Data collection, channel design, ESA consultation, permitting, cultural resource work, and staging of some materials will occur in 2006. Construction will occur in 2007 with revegetation complete in 2008. In addition to FAA cost share, funding will be requested from OWEB, the Pacific Coast Salmon Recovery Fund, the Blue Mountain Union Pacific Railroad Trust and ODOT. In-kind cost share (design, construction supervision and inspection) will be provided by ODFW and CTUIR.

This project compliments the following past, on-going or planned projects:

- Lower Ladd Rechannel and Wetland Restoration, 2002, ODFW, Ducks Unlimited, City of La Grande
- Middle Fork Ladd Rechannel, 2005, ODFW, COE
- Middle Fork Ladd Passage (Glory Hole), Proposed 2007, ODOT
- Shaw Creek Fish Passage & Sediment Reduction, Proposed 2006, GRMWF, Forest Capital
- Smutz Draw Fish Passage & Sediment Reduction, 2002, ODF, Boise Cascade
- Smutz Draw Fish Passage, Proposed 2006, USFS

This project addresses the following elements of the Grande Ronde Subbasin Plan, May 28, 2004 and the Grande Ronde Subbasin Plan Supplement (Management Plan), December 31, 2004:

Grande Ronde Subbasin Plan Supplement (Management Plan)

- p. 15 Table 3-1, mid-Catherine Crk (Ladd Creek) high restoration priority to address habitat diversity, habitat quantity
- p. 47 Table 5-5, Strategy "Restore watershed processes impacting the aquatic system", Sub-strategies - "Restore hydrology to reestablish wetlands", "Reconstruct channelized stream reaches to historic or near-historic form", "Reconnect channels with floodplain or historic channels...", Improve the density, condition and species composition of riparian vegetation..."

Existing condition

The Ladd Creek system is a major tributary of Catherine Creek. Historically Ladd Creek was likely a significant steelhead producer and possibly had limited chinook production. Channelization, irrigation withdrawals, agricultural land conversion and construction of I-84 have dramatically reduced steelhead production. Current steelhead spawning numbers are unknown. There are resident rainbows above the I-84 drop structure in Ladd Creek, Shaw Creek and Smutz Draw. The lower approximately two miles of Ladd Creek above the confluence with Catherine Creek are used by over-wintering steelhead and Chinook juveniles. Salmonid use in the project area is limited due to the channelization and limited habitat diversity.

All of the forks of Ladd Creek in the project area are channelized. Approximately one half mile of the main Ladd Creek Channel runs between the railroad and Hwy 203. The ditches are unusually deep with steep banks that increase erosion and have lowered the water table by several feet. Predominant vegetative cover along the ditches is non-native reed canary grass. Native vegetation is limited due to the lowered water table and agricultural land use.

Specific Actions

The project includes the following activities:

- Planning, design, construction inspection
 - Topographic GPS survey (ODFW)
 - ESA consultation, permitting (CTUIR)
 - Cultural Resource survey (contract)
 - Final design (ODFW Habitat Biologist)
 - Construction inspection (ODFW/CTUIR)
- Reestablish a meandering stream channel system (see attached map) consisting of:
 - 6.1 miles of channel reconstruction
 - Log and root wad revetments (200) as necessary to stabilize meander bends (exact locations to be determined in final design)
 - Rock grade control structures, preventative measure (15) to minimize risk of channel downcutting (locations determined by final design)
 - 3.3 miles of channel reclamation (ditch filling)

Stream channel morphology:

A previous portion of Ladd Creek that was re-constructed in 2002 is very similar in topography and grade to the proposed project. Figure 1 shows the location of the current project and 2002 reconstructed portion of Ladd Creek - Reach 1. Cross sections of Reach 1 are similar to the channel design for the proposed project (Figure2). The cross sections of the pool and riffle are representative of a Rosgen's C-type stream that would be the initial channel type for the project. Figure 3 shows two cross sections of the channelized ditch in Reach 1 before construction. Actual cross sectional surface area at bankfull and low water stages for a C-type stream

would be similar to existing ditch conditions. The main differences include increased sinuosity and length of the stream, and subsequent rising of the water table, allowing vegetation to establish and stabilize the bank.

A Rosgen's C-type stream is very sinuous, with a moderate width/depth ratio (Figure 4). The reconstructed C-type channel is designed to convert to an E-type channel in 4-5 years. The reasoning behind this strategy is to allow high flow relief until bank stabilizing vegetation is established. Once vegetation can stabilize the banks, the stream then becomes narrower and deeper to accommodate high flows without erosion, and thus becomes an E-type stream (Figure 4). In highly erosional systems, excess sediment is introduced and can cause aggradation which increases the width/depth ratio and causes more frequent out of bank flows. Once established, an E-type stream is generally very stable and has a very low width/depth ratio that can accommodate high velocities without causing erosion. Short duration out of bank flows occur only at high flow events, and in the Ladd Creek system, this would take place in pulses during the early spring (March-April).

- Streambank revegetation (6.1 miles)
 - Collect and propagate native plant materials
 - Seed wetland sedges and grasses
 - Plant trees, shrubs
 - Irrigate during plant establishment (est. 2 growing seasons)

The final artificial revegetation plan will be prepared prior to implementation and will identify planting density and species. The following species are candidates for use:

Tree species: native willow, cottonwood

Shrub species: dogwood, elderberry, hawthorne

Grass, sedge and forb species: basin wildrye, tufted hairgrass, western wheatgrass, Idaho fescue, clover, camus, and sedge plug transplants

The Lower Ladd Rechannel Project (2002) has experienced extensive natural willow and hydrophytic riparian and wetland vegetation establishment. Similar results are expected to supplement planted species.

- Weed monitoring/control (Ladd Marsh Wildlife Area personnel as part of regular vegetation management activities on the marsh)
- Relocate/replace Hwy 203 crossing (ODOT)
 - Hwy 203 bridge will be relocated approximately one half mile to the southeast to tie new channel to 2002 Lower Ladd reconstructed channel. Final design, e.g. bridge, concrete box structure, etc. has not been determined. Design flow will be 100 year event.

This array of activities, ie. channel reconstruction (Rosgen methodology), revegetation and ditch plugging has been used extensively on a variety of on-going and completed projects in the Grande Ronde Basin with good results.

- Operation and Maintenance (O & M)
 - Weed monitoring and control (Ladd Marsh Wildlife Area)
 - Channel stabilization and supplemental revegetation as necessary
- Monitoring
 - Channel and bank stability (ODFW/CTUIR) - post construction, annual (5 yrs +) – x-sections, longitudinal profiles, photo-points, habitat surveys
 - Vegetation survival/success, wetland habitats (ODFW/CTUIR) – vegetation surveys, photopoints
 - In-channel habitat and fish use/production (ODFW) – periodic habitat surveys, photo-points
 - Water quality monitoring (ODFW/CTUIR) – primarily temperature during warm season flow periods
 - Ground water levels (ODFW/CTUIR) – permanent ground water wells installed pre-project and monitored for several years.
 - Noxious weed management (survey and treatment) – Ladd Marsh Wildlife Area

Benefits

- Improved riparian and in-channel habitat for anadromous and resident salmonids. 6.1 miles of meandering channel will provide improved habitat by increasing channel complexity (pools, woody debris, structure), stream shade and aquatic species diversity. Substrate materials will provide increased spawning habitat.
- Improved water quality - Improved streambank stability, channel shade and functioning wetlands will reduce sediment inputs, reduce stream heating and reduce nutrient input and transport.
- Improved wetland habitat for riparian dependent species - Wetlands will provide habitat for riparian and wetland dependent species, where few previously existed.
- Increased ground water storage/recharge - Channel reconstruction and filling in of drainage ditches will create wetlands which will retain and slow surface water runoff allowing increased water infiltration into the soil profile. The stored water will be available for late season release and may improve late season stream flow in Catherine Creek.

Project Maintenance/Enhancement

The project and affected area are within the Ladd Marsh Wildlife Area. All maintenance activities will be included in on-going ODFW maintenance programs.

Permits

The project will require Oregon SHPO clearance, COE/DSL permits and ESA consultation with NOAA and USFWS. ODFW and CTUIR will facilitate these activities.

Monitoring Plan

- The ODFW & CTUIR will conduct the activities listed above.

Project Schedule/Work Dates

| Actions/Tasks | Timeline |
|---|-----------------|
| Topographic GPS Survey, Data collection | December 2005 |
| Design complete | April 2006 |
| Cultural Resource survey, Or SHPO concurrence | August 2006 |
| ESA Consultation/Permits completed/acquired | December 2006 |
| Construction contract awarded | December 2006 |
| Construction begin | July 2007 |
| Construction complete | November 2007 |
| Revegetation complete | November 2008 |