Wallowa River McDaniel Habitat Restoration Project

FINAL REPORT

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1. Project Description:

Introduction

The Wallowa River channel was greatly simplified through channelization in the first half of the 1900's, which decreased habitat diversity on the McDaniel property. The project was designed to restore wetland meadow hydrology with associated palustrine emergent wetlands, water storage capacity, and instream aquatic habitat including critical backwater rearing areas. The project involved survey, design and implementation of a new 0.5-mile channel for the Wallowa River. The establishment of conservation easements on the property through the NRCS CREP program will ensure restoration investments. All planning and implementation for this project was coordinated between the landowner, Wallowa Resources, ODFW and NRCS. The project addressed many of the factors limiting salmonid production in this reach through a combination of active and passive restoration techniques.

Site History

This project is within the area surveyed for US government landlines in the 1860's. Notes for this area, section 11 of the township, report river flows in a bed more than 100 feet wide under a dense gallery forest composed of cottonwood and birch, with willow and alder thickets at least 50 feet wide on each shore of the river. The corner of section 11 closest to the river was referenced to 3 to 5 foot diameter Aspen trees. From the corner the surveyors went less than 800 feet east to the thickets at the edge of the river. Today the river channel is more than a mile from this spot. Events leading to current river configuration:

1. Beaver trapping in the 1800's.
2. Unrestricted livestock grazing.
3. Wallowa River channel moved east in 1908 to accommodate railroad.
4. Post WWII berm/dike development to protect farm facilities.
5. Field leveling in the 1970's.

Existing Condition

The project site is near the town of Lostine in Wallowa County. In this vicinity the river was channelized into a steep, narrow course at the east edge of its flood plain. Since the early 1900's the river has been straightened and put into a channel 20 to 30 feet wide with a gradient of 5% in this reach. Other parameters at risk for the Wallowa River include:

1. Water quality including temperature, chemistry and nutrients;
2. Habitat elements including pool quality, off-channel habitat, and refugia;
3. Channel width to depth ratio; and
4. Altered peak and base flow characteristics.

Project Location

- Township 1 N., Range 43 E., Section 11.
- 1.3 miles East of Lostine, Oregon on the Wallowa River near river mile 32.
- Wallowa River sub watershed, a tributary to the Grande Ronde River.

Project Purpose, Goals, and Objectives

The primary purposes of the project include restoring degraded riparian and floodplain habitat, improving instream habitat diversity, and improving water quality for adult and juvenile summer steelhead and spring Chinook salmon. This purpose contributes to the missions of the Wallowa County Nez Perce Tribe Salmon Habitat Recovery Plan and the Grande Ronde Model Watershed Operations.

Goals

1. Enhance instream aquatic habitat for spring Chinook salmon, steelhead and resident species.
2. Restore and enhance meadow/riparian hydrology and associated instream and wetland habitat along the Wallowa River.
3. Improve water quality.
4. Develop and implement conservation easements with private landowner to protect habitat and compliment efforts initiated under this project.

Objectives

1. Increase base flow depth in the Wallowa River channel, increase flooding frequency and depth on the meadow, and create pool and riffle sequences that increase the consistency of bedload transport and deposition on the floodplain.
2. Increase stream channel sinuosity, channel length, and geomorphic stability, and decrease channel gradient, capacity and cross-sectional area.
3. Improve instream, riparian, floodplain/meadow conditions and functions, including improved quality and use of riparian and meadow areas for native plant communities and wildlife.
4. Improve/increase vegetative cover/shade to moderate stream temperatures.
5. Improve/increase streambank stability.
6. Improve surface water and ground water interaction with resultant lowering of summertime stream temperature and increase wintertime stream temperature.
7. Improve properties of coldwater fish habitat and terrestrial and aquatic macroinvertebrate community composition.
8. Improve/restore use of restored stream channel segments by anadromous fish.

2. Project modifications:

There were no substantive changes to the project design. The implementation team lead by Vance McGowan, ODFW, Allen Childs, CTUIR, and Nils Christoffersen, Wallowa

Resources, took advantage of donated boulder material from USFS road sides to insert additional rock habitat and stream bank protective features in the summer's of 2004 and 2005.

The most significant improvements to the project design came from on-site and opportunistic decisions to expand the revegetation activities. Vance McGowan instructed the contractors to salvage trees from the pre-existing riparian canopy for planting during the summer of 2005. These trees would otherwise have been lost when the new channel was punched through to the existing river channel at its lowest, downriver point. Wallowa Resources secured additional planting material through the involvement of school youth and donated live willow plants for cuttings from the Wallowa Union Railroad Authority. Vance McGowan also greatly enhanced the sedge transplant effort by experimenting with sedge mat excavation and replacement along the banks, rather than relying on transplanted plugs alone.

Operationally, the project benefited from the donated temporary use of 6,000 lb highway barriers from the Oregon Department of Transportation during the actual diversion of water from the existing river channel to the newly constructed channel.

Financially, there were modifications to the budget due to higher than anticipated costs for structural materials – in particular the rootwad logs and cross-vane boulders. Furthermore, there were adjustments in cost-share allocations due to the project work initiating before the final OWEB approval was secured. This allowed project implementation to take advantage of the 2004 field season, but it created the need for Wallowa Resources to cover certain operational costs from its own general funds. Collectively, these changes resulted in additional budget contributions from BPA, Wallowa Resources, ODFW and others, and a no-cost budget amendment under the OWEB grant.

3. Project Accomplishments:

Specific Actions

1. Reestablished approximately 0.5 miles of meandering stream channel.
    - Increased main channel length from 1,800 feet to 2,570 feet, and created over 250 feet of backwater channel by leaving the lower end of the old channel in place.
    - Increased sinuosity from 1.05 to 1.50.
    - Reduced gradient from approximately 0.9 to 0.64.

2. Streambank and wetland revegetation (30.8 acres).
    - Collection and propagation of 400 native trees (cottonwood, alder, ponderosa pine)
    - Cutting, seeding or planting of riparian and wetland trees, shrubs, sedges and grasses - including 7680 sedge plugs, 3000 sq ft pf sedge mats, 5000 willow cuttings, 400 planted stock, and 224 trees and shrubs translocated from within the existing riparian canopy to the new channel banks, and 120 lbs of riparian seed.

- Seed bed preparation and protection.
- Irrigation during plant establishment.

3. Fence Construction/conservation easement:
   The landowner currently signed a conservation plan written with NRCS. This Conservation Reserve Enhancement Program (CREP) plan includes tracts 293 and 294. Elements of the existing plan include:
   - 9817 feet of fence.
   - 30.8 acres of riparian buffer.

   These numbers are rough measurements of work completed in summer of 2006. The CREP plan for this project is on file at the Enterprise, Oregon NRCS office.

4. Operation and maintenance.
   - Weed monitoring and control on 30.8 acres.
   - Caging, weeding, mating, and continued irrigation of planted stock
   - Fence maintenance.
   - Channel stabilization and supplemental revegetation as necessary – still being discussed following very high spring flows of 2006 season.

4. Benefits and Lessons Learned:

The project is generating habitat improvement and local economic benefits.

- The riparian floodplain benefits through natural vegetative recovery. Riparian fencing and adaptive management will protect approximately 30 acres of instream, riparian and upland habitats.

- The instream habitat benefits from the redevelopment of meanders and the restoration of complex pool habitat. These improvements should restore historic spawning and rearing habitat, increase water storage capacity of adjacent meadows, and improve water quality.

- Adult and juvenile summer steelhead and juvenile spring chinook are the targeted species of concern, but many species of wildlife such as neotropical birds, and big game will benefit as well. Steelhead was observed spawning in the newly constructed channel in the spring of 2006.

- Local contractors, businesses and landowners benefited from the job and material supply opportunities provided by this project. The community gained by the involvement of student and youth groups in the planting, maintenance and monitoring of this project.

- This project is a model for future river restoration projects in Wallowa County – already upstream and downstream landowners are exploring opportunities for similar projects along the Wallowa River within their property boundaries.

The principal lessons learned during the course of this project were:

- Due to overlapping jurisdictions and permitting requirements, it is essential to have a lead agency well versed in the laws, regulations and permitting processes required for river restoration, particular where the river provides habitat to threatened and endangered species. Private landowners cannot be expected to pursue this process without guidance, support and leadership from an experienced and skilled lead agency. The support provided by ODFW, CTUIR, and BPA was invaluable in this particular project.

- Pre-design consultation with landowners, contractors and companies that may have an interest in the riparian aggregate removed may allow for lower costs in channel construction. If the values of the materials to be removed (top soil, gravel, aggregate, etc.) are known in advance, along with the specifications for such material in local markets, the project may generate considerable income from the sale of such material, which could offset construction costs. This may result in slightly higher excavation costs due to the processing requirements to meet market specifications for any product, but this may be justified if the revenue exceeds such costs. Opportunities in this area should be explored further in future projects.

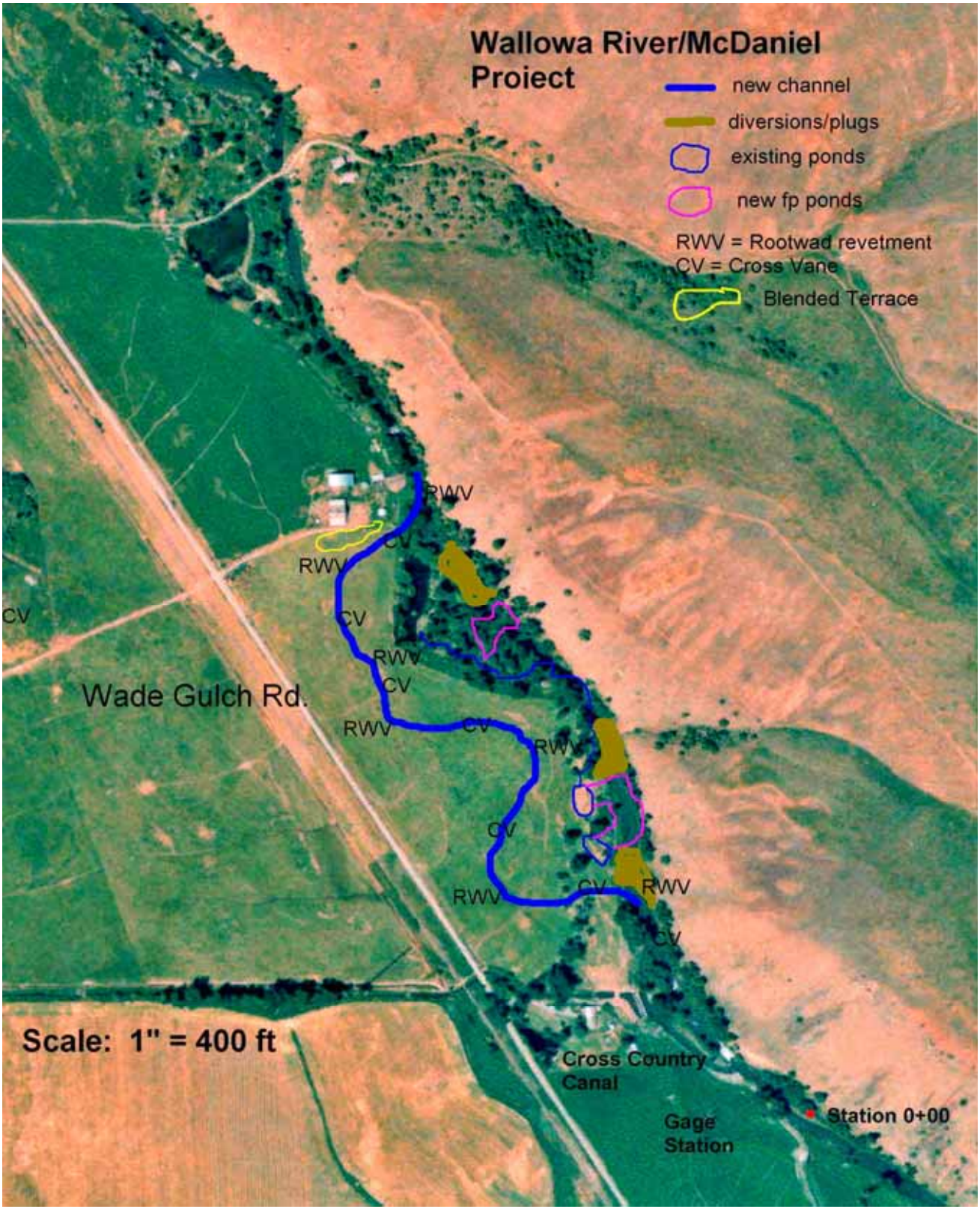
- To the extent possible, flexibility for on-site design modifications should be built into the regulatory review and permitting process. This process is still fairly rigid and risk averse and may result in missed opportunities to improve end results or reduce project implementation costs.

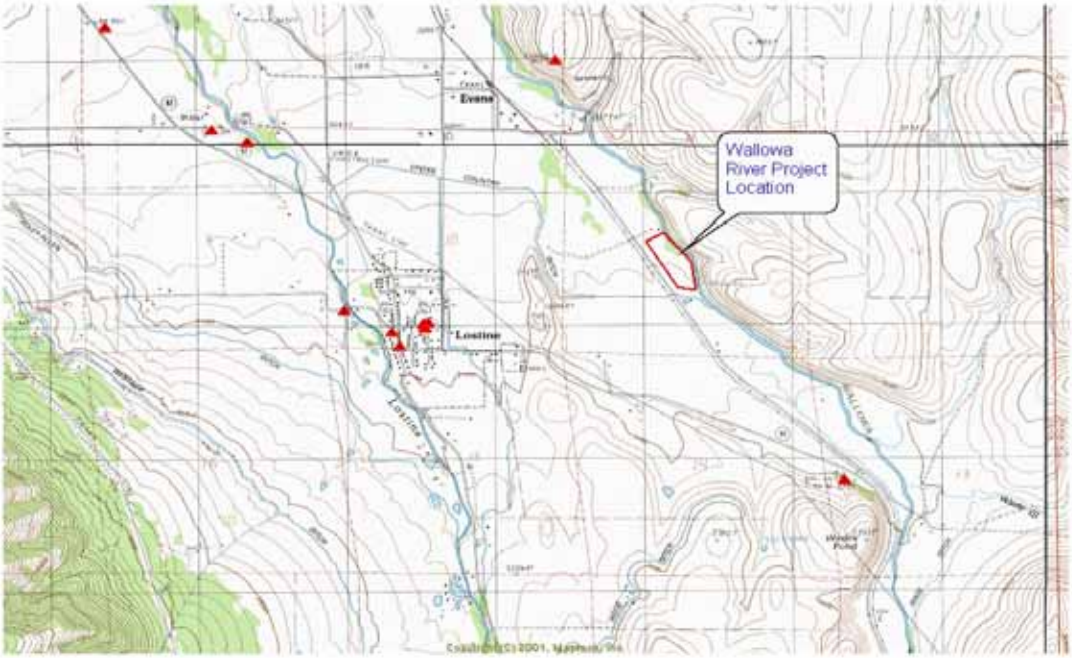
- Funding agencies should be prepared to support maintenance and modification of these projects in response to lessons learned from continued monitoring and from short-term disturbances (i.e. spring flooding) that reveal weaknesses in the original design. This project's weakest point was the initial meander coming out of the pre-existing channel into the newly constructed channel. The design resulted in a significant drop in water velocity and therefore significant deposition of fines, which significantly altered the intended channel profile (a deep pool within the meander) at this point. Consideration is currently being given to some type of remediation within this stretch of the project.

- Otherwise, the project appears to be well staged for success. It withstood the third highest flood event on record shortly after its completion (spring of 2006). This event appears to have enhanced the actual habitat restoration impacts by creating a number of new and well-developed point bars with good fish spawning rock. Emerging river science suggests these point bars also play a positive role in maintaining cooler water temperatures.

- The total cost for channel construction and revegetation was approximately $81 per linear foot, or $4.25 per square yard of material. This includes plants, grade control, revetments, filling in of the old channel, etc. This compares well to alternative river restoration approaches using hard structural work along only one stream bank that typically ranges from $75 to $100 per linear foot.

5. Project Map





5. Participating Landowners and Agencies:

This project is a partnership between a number of interested parties including the landowner, Doug McDaniel, Wallowa Resources, Oregon Department of Fish and Wildlife (ODFW), USDA Natural Resource Conservation Service (NRCS), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Oregon Watershed Enhancement Board (OWEB), and Grande Ronde Model Watershed Program (GRMWP). The ODFW is the lead technical agency. Primary project funding was provided by Bonneville Power Administration (BPA) and OWEB.