

July 1999

**CTUIR GRANDE RONDE RIVER BASIN
WATERSHED RESTORATION PROGRAM
MCCOY CREEK/MCINTYRE CREEK ROAD CROSSING**

Annual Report July 1997 - June 1998



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**ANNUAL REPORT
July 1997 – June 1998**

CTUIR Grande Ronde River Basin Watershed Restoration Program

McCoy Creek/McIntyre Creek Road Crossing

**Confederated Tribes of the Umatilla Indian Reservation
and
Bonneville Power Administration**

**Contract Project Number 199609300
BPA IGA #97 BI 35164**

**Prepared by: Allen Childs, Project Biologist
July 1999**

ABSTRACT

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Bonneville Power Administration (BPA) entered into a contract agreement on July 1, 1997 to conduct watershed restoration project activities in the Upper Grande Ronde River Basin. Contract work activities were focused on the McCoy Meadows Restoration Project, McIntyre Creek Road Relocation and Obliteration Project, Upper Mainstem Grande Ronde River Large Wood Addition Project, and Middle Mainstem Grande Ronde River Habitat Enhancement Project.

The McCoy Meadows Restoration Project effort was initiated in 1995 under a Clean Water Act grant. Clean Water Act funds were focused on development of baseline conditions, development of a restoration analysis and strategy, and initiation of phase 1 construction of the project involving relocation of an approximate 1 mile segment McCoy Creek out of its current channelized section into a Pre-1977 meander channel. BPA funds under this contract were directed by the CTUIR to cost share and coordinate project efforts.

As part of the McCoy Creek subbasin restoration effort the CTUIR secured Early Action BPA funds for the design and construction of an improved stream crossing on McCoy Creek to increase capacity, reduce icing, and contribute to both upstream and downstream meadow restoration efforts. In addition to the McCoy Meadows Restoration Project and the bridge project, the CTUIR directed BPA funding under this contract to the U.S. Forest Service Forest Road 2137 Road Relocation and Obliteration Project which entails obliteration and relocation of approximately 2 miles of existing drawbottom road to improve water quality and instream habitat conditions in the McIntyre Creek subwatershed, upstream from the McCoy Meadows restoration project.

The CTUIR also participated as a project sponsor on a habitat restoration project with the U.S. Forest Service in the Upper Grande Ronde River Basin. The project (Upper Grande Ronde River Large Wood Addition Project) involved large woody debris additions to the mainstem Grande Ronde on an approximate 2 mile reach located upstream of Starkey, Oregon adjacent to Forest Road 51. Large wood placement objectives included enhancing instream structural diversity and large pool habitat quality.

An additional objective of this contact included identification and development of additional restoration opportunities in the mainstem Grande Ronde River on both federal and private lands. The Tribal focus area for near-term restoration project development includes the mainstem Grande Ronde River and major tributaries from Hilgard State Park adjacent to Interstate 84 upstream to the Wallowa-Whitman National Forest Boundary near Starkey, Oregon. This river section is one of several considered high priority for improving water quality, particularly during summer low flow and winter periods, enhancing large pool habitat, and increasing structural complexity for juvenile rearing habitat.

Development and continuation of cooperative efforts with the Grande Ronde Model Watershed Program, other agencies, and landowners are key elements in addressing limiting factors in the Grande Ronde River Basin. Under this contract, the CTUIR proposed to build on past efforts and focus restoration project development over the next few years in several key areas.

Specific tasks accomplished under the McCoy Meadows Restoration component of the contract included: 1) pre-construction preparation involving interagency project coordination, development of project engineering designs, development of a biological assessment and Division of State Lands 401 Permit Application, preparation of requests for proposals and subcontracts for project construction, collection and propagation of riparian tree and shrub stock for use in restoration efforts, and acquisition of materials and supplies; 2) restoration project construction involving equipment rental contracts and revegetation activities; 3) ongoing monitoring and evaluation to assess project effectiveness; and 4) initiation of phase 2 project designs and preparation for additional project construction and implementation.

Planning and design for the McIntyre Creek Road Relocation and Obliteration Project and the McCoy Creek Bridge Replacement Project was ongoing at the closure of this contract period. To date, engineering designs for both project activities have been completed. The U.S. Forest Service is proceeding with contracting on the road relocation effort. The CTUIR are preparing to contract the McCoy Bridge Construction effort. Both project efforts are scheduled for implementation beginning in July 1999.

The Upper Grande Ronde Large Wood Addition project was designed and implemented by the USFS in July 1997 and included helicopter transport of approximately 120 whole trees/rootwads from adjacent National Forest System lands to the project site and placement with tracked excavators. Project activities included installation of instream rock structures and large woody debris, and anchoring large woody to minimize off-project transport.

Project activities under the Mainstem Grande Ronde River Restoration component of the project was initiated in late 1997 and involved coordination with landowners and interagency project partners on project development and site-specific project designs. Pre-project planning included development of site-specific project objectives, development of conceptual and detailed project designs, pre-construction preparation including development of requests for proposals, biological assessments and permits, identification of large woody debris and other construction materials and layout of project designs, and initial collection and propagation of suitable vegetative material for use in revegetation efforts. Project activities also included coordination and development of project proposals to solicit project partnerships and matching funds including a proposal submitted to the Grande Ronde Model Watershed Program.

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INTRODUCTION

This Annual Report provides a detailed overview of watershed restoration accomplishments achieved by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and project partners in the Upper Grande Ronde River Basin under contract with the Bonneville Power Administration (BPA) during the period July 1, 1997 through June 30, 1998. The Contract Agreement entitled McCoy Meadows Watershed Restoration Project (Project #96-83-01) includes habitat restoration planning, design, and implementation in two project areas—the McCoy Meadows Ranch located in the Meadow, McCoy, and McIntyre Creek subbasins on private land and the Mainstem Grande Ronde River Habitat Enhancement Project located on private and National Forest System lands near Bird Tract Springs along the Grande Ronde River.

During the contract period, the CTUIR and partners (Mark and Lorna Tipperman, landowners), Oregon Department of Environmental Quality (ODEQ), U.S. Environmental Protection Agency (EPA), Oregon Department of Fish and Wildlife (ODFW), and Natural Resource Conservation Service (NRCS) initiated phase 1 construction of the McCoy Meadows Restoration Project. Phase I involved reintroduction of a segment of McCoy Creek from its existing channelized configuration into a historic meander channel.

Project efforts included bioengineering and tree/shrub planting and protection, transporting salvaged cottonwood tree boles and limbs from offsite source to the project area for utilization by resident beaver populations for forage and dam construction materials, relocation of existing BPA/ODFW riparian corridor fencing to outer edges of meadow floodplain, establishment of pre-project photo points, and coordination of other monitoring and evaluation efforts being led by other project partners including groundwater monitoring wells, channel cross sections, water quality monitoring stations, juvenile population sampling index sites, redd surveys, and habitat surveys. Project activities also included coordination with the U.S. Forest Service, Wallowa-Whitman National Forest, LaGrande Ranger District (USFS(on the Forest Road 2137 (McIntyre Road) Relocation and Obliteration Project and the McCoy Creek crossing. The USFS completed engineering designs under the cooperative effort for the McCoy Creek crossing.

Project activities accomplished on the Upper Mainstem Large Wood Addition Project included placement of approximately 120 whole trees to enhance instream structural diversity, pool habitat quality, streambank stability, and improved floodplain morphology.

Project activities accomplished on the Mainstem Grande Ronde Habitat Enhancement Project included coordination with landowners (Shauna Musgrove of Cuhna Ranches, Dean Stone, and the Wallowa-Whitman National Forest, LaGrande Ranger District) to develop a habitat enhancement/restoration project opportunity along a 3 mile section of the mainstem Grande Ronde River and major tributaries including the lower reaches of Bear Creek and Jordan Creek. Upon securing an agreement with the landowners, project partners including the CTUIR, ODFW, NRCS, and USFS initiated development of project

objectives and site-specific designs. By June 1998, project designs were completed and preparations nearly complete to initiate onsite project construction.

DESCRIPTION OF PROJECT AREAS

McCoy Meadows Restoration Project Area

The McCoy Meadows Restoration Project is located on the approximate 2,500 acre McCoy Meadows Ranch in the lower reaches of the Meadow, McCoy, and McIntyre Creek subbasins of the Upper Grande Ronde River Basin. The ranch encompasses about 2 miles of McCoy Creek, 1 mile of McIntyre Creek, and 4 miles of Meadow Creek. McIntyre Creek is a tributary to McCoy Creek which is a tributary to Meadow Creek. Meadow Creek flows into the Grande Ronde River approximately 2 miles downstream from Starkey. Meadow Creek contains historic Snake River spring chinook habitat. All three streams provide critical habitat for threatened Snake River summer steelhead trout. Threatened north bald eagles winter in the Upper Grande Ronde Basin including the Meadow and McCoy Creek subbasins and the project area contains the largest beaver wetland complex in the Upper Grande Ronde along Meadow Creek. McCoy Meadows supports the highest concentration of nesting neotropical migrant yellow warblers in the Grande Ronde Basin and supports sensitive species such as the spotted frog. In addition, the project contains native tufted hairgrass plant communities, which are currently limited to remnant wetland areas throughout the basin.

Impaired water quality and severely reduced quality and quantity juvenile salmonid rearing habitat are currently limiting anadromous fish production in McCoy Creek, Meadow Creek, and in the Grande Ronde River downstream of the project area. An ODFW Stream Report (1992) describes the project area reach, “[t]here is a high proportion of units with actively eroding stream banks. Stream shading is very low.” The report further indicates little to no large wood interacting with the channel, that 73.4 percent of the banks are actively eroding and the average open sky is 90 percent.

Stream surveys conducted by CTUIR fisheries staff in the fall of 1995 documented similar conditions with about 40 percent glide habitat, 35 percent riffle habitat, and 25 percent pool habitat. Ground cover in the riparian area was estimated at about 2 percent shrubs and included 13 percent bare soil. Canopy closure ranged from 1-3 percent and open sky averaged 91 percent. Large wood averaged 0.8 pieces per 100 meters (about 12 pieces per mile).

Water quality and biological resource monitoring in the project area was initiated by ODFW in 1988 and by ODEQ in 1993. Examination of ODFW data collected between 1988 and 1994 reveals that mean weekly maximum temperatures exceeded the new Oregon Stream Temperature standard (64° F/17.8° C: salmonid rearing) from the start of monitoring each year (about May 15) through the end of October.

Hourly temperature data from thermographs showed that summer mean weekly maximum temperatures were consistently higher in the lower portions of the meadow compared to the upper meadow where McCoy Creek enters the meadow floodplain. This demonstrates that, though summer stream temperatures consistently exceed state water quality standards as a result of upstream activities and conditions, additional thermal loading occurs within the project area.

In addition, data collected by the Oregon Department of Environmental Quality in 1992 and 1993 illustrate that in 1993 the highest seven-day average of daily maximum temperatures were 25.8, 24.9, and 26.1 degrees Celsius for Upper McCoy, Middle McCoy, and Lower McCoy, respectively. It is notable that there is little difference in water temperatures between the three sites, which suggests that water temperatures in this reach are in equilibrium with air temperature during this time of year.

Existing wildlife habitat conditions in the McCoy Meadows area are significantly different than historic conditions. The area is described in the Stuart Journals as a sinuous wetland meadow that contained such a high level of sinuosity, early explorers commonly became confused as to which streams they were following. Records maintained by early explorers and trappers also record the abundance of beaver commonly observed in the Grande Ronde River basin.

In current times, many streams in the upper basin contain primarily riffles and shallow glides, poor riparian habitat conditions with minimal overstory riparian tree and understory riparian shrub, very little structural diversity, and a notable absence of beaver, except for small, isolated colonies. Historic land uses have significantly reduced the extent and quality of wetland and riparian habitat resources in the McCoy Meadows area.

Channelization and agriculture in the area resulted in alteration of groundwater and surface water regimes, loss of riparian/wetland vegetation, and decreased suitability for beaver. The meadow area, portions of which historically contained a large, montane wetland complex, is currently grassland pasture with limited riparian/wetland complexity. The following photo illustrates historic McCoy Meadows (Channel and Land-Use Alterations between 1937 and 1980).

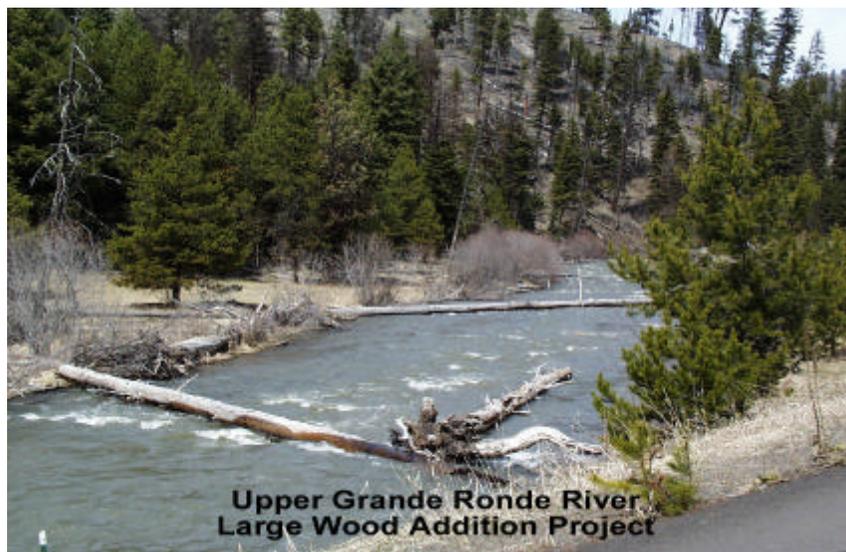


Key objectives of the McCoy Meadows Restoration Project include:

- Increase stream channel sinuosity
- Improve instream, riparian, floodplain/meadow conditions and functions, including improved quality and utilization of riparian and meadow areas for native plant communities and wildlife, including beaver and other riparian dependent native species
- Improve/increase vegetative cover/shade to decrease summer stream temperatures and increase winter temperatures
- Improve/increase streambank stability
- Improve water chemistry
- Improve surface water and groundwater interaction
- Improve properties of coldwater fish habitat and terrestrial and aquatic macroinvertebrate community composition
- Improve utilization of new stream channel segments by steelhead
- Provide watershed restoration educational opportunities

Upper Mainstem Grande Ronde Large Wood Addition Project

This project is located upstream from Starkey, Oregon along the upper Mainstem Grande Ronde River on National Forest System lands. The CTUIR directed BPA funds to assist in funding helicopter transport of large wood to project site and installation large wood debris and instream rock structures to restore instream structural diversity, large pool habitat availability, and improved stream stability and floodplain morphology. Project implementation occurred during the instream work window beginning in July 1997. Approximately 120 whole trees with rootwads were flown in by helicopter and installed with ground-based equipment. Instream rock structures (vortex weirs and rock clusters) were also installed to improve instream structure. Tribal and USFS crews anchored whole trees with cable to minimize off-project transport of whole trees.



Middle Mainstem Grande Ronde Habitat Enhancement Project

This project area is located in the middle Upper Grande Ronde River Basin approximately 4 miles upstream from Hilgard State Park on Longley Meadows near Bird Tract Springs. The project includes National Forest system lands and private lands. Two private ranches, including the Stone Ranch and Cunha Ranch, are part of the project. The middle Upper Grande Ronde River provides critical adult salmon and steelhead holding and juvenile winter and summer rearing habitat. Major tributaries in the project area include Bear Creek and Jordan Creek which provide important backwater habitats for juvenile salmonids and critical spawning and rearing habitat for summer steelhead.



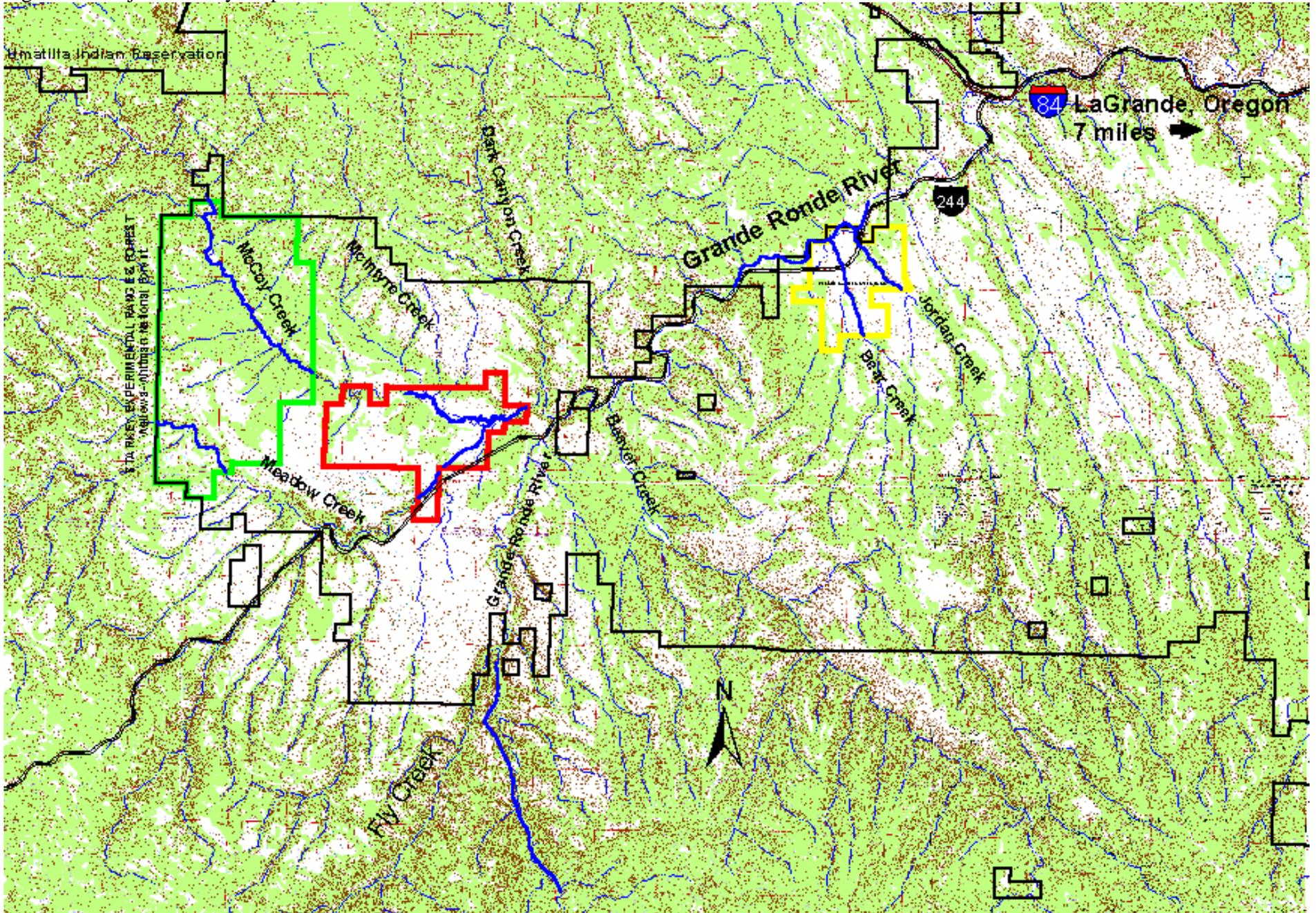
Past land uses such as railroad grade construction, channelization, removal of instream structure for waterway log transport (log fluming) and livestock grazing have altered and constrained floodplain morphology, de-stabilized streambanks, removed instream habitat structural diversity, and degraded riparian/floodplain conditions along the mainstem Grande Ronde and tributaries. Severe icing, high summer and low winter water temperatures, and poor instream structural diversity including a lack of high quality large pool habitat currently limits habitat suitability for threatened Snake River salmon and steelhead populations.

Project objectives for the Mainstem Grande Ronde Habitat Enhancement Project include:

- Increase instream structural diversity and quantity and quantity of large pool habitat
- Improve adult holding and juvenile summer and rearing habitat complexity
- Improve water quality (decrease summer water temperatures and increase winter water temperatures)
- Improve streambank stability
- Improve/enhancement ability of private landowner (Cunha Ranch) to improve livestock distribution and eliminate streambank degradation caused by livestock

Figure 1 illustrates the vicinity of individual watershed restoration projects discussed above.

Figure 1 – Project Vicinity Map



METHODS AND MATERIALS

McCoy Meadows Restoration Project

Project development and implementation on the McCoy Meadows Project included coordination of project assessment and design, engineering and biological surveys, consultation and permitting with federal and state agencies, purchasing materials and supplies, collection and propagation of vegetation for use in restoration, planting and bioengineering, project contracting preparations, project construction, monitoring and evaluation, and maintenance.

Task 1 Pre-Construction Preparation

Coordination

The CTUIR is performing as project coordinator on the McCoy Meadows Restoration Project. Coordination activities include scheduling, organizing, and conducting design team meetings with multiple project partners including ODFW, NRCS, and GRMWP, maintaining communications with the landowner, and coordination and oversight of various project components such as surveys, designs, consultations with federal agencies under the Endangered Species Act and permitting, purchasing materials and supplies, preparing contract requests for proposals, contracting, and contract administration.

Engineering designs for McCoy Bridge

Work performed under this contract included maintaining coordination with the USFS on the McIntyre Creek Road Relocation and Obliteration Project. Under this project, the CTUIR directed BPA funding to cost-share the first phase of this project effort involving drawbottom road relocation. Future restoration efforts will be directed at restoring the McIntyre Creek floodplain currently constrained by the drawbottom road. As part of this cost-share effort, the USFS prepared engineering designs for the planned bridge crossing on McCoy Creek which is part of the McCoy Meadows Restoration Project. Engineering designs and specifications have been completed. Work is progressing on soliciting contract bids. Union County Public works is a project partner on the bridge replacement effort and is scheduled to contribute in-kind services including hauling fill material, removal of existing culverts, and constructing a temporary route to accommodate traffic during the bridge construction effort. Construction on the new bridge is scheduled to begin in late July 1999.

Subcontracting

Project construction efforts involved subcontracting for heavy equipment. Work performed under this contract included planning and development of contract scopes of work, drafting requests for proposals, advertising and solicitation for bids, review of bid proposals and contractor selection, contract awarding and coordination, and

administration of contract (maintaining daily logs, negotiation with contractors, and billings/payments).

Collection and Propagation of Plant Materials

Project work involved collection and propagation of approximately 10,000 cuttings of primarily willow (*salix* spp.) which were conditioned and grown in the CTUIR Native Plant Nursery as containerized stock. An additional 6,000 riparian tree and shrub tublings were purchased from an outside vender. Additional material is planned for collection and propagation to support vegetative restoration needs on the McCoy Meadows Project Area. The CTUIR Nursery is currently storing 10,000 containerized shrubs for use in the 1999 spring planting period.

Propagation material collection methods included pruning onsite source stock during the winter dormancy period and conditioning at the CTUIR nursery in bark and soil to stimulate root nodule development. Following conditioning, cuttings were then hand planted into containers to grow out as containerized stocked.

In addition to collection of material for propagation, CTUIR staff also collected several thousand whips for use in livestaking and bundle/fascine installation to help stabilize streambanks and encourage accelerated shade development.

During the July 1997 construction period, 24 whole willow rootwads were transplanted into an approximate 200 linear foot outside meander along McCoy Creek. The source material willow clumps were topped to minimize shock and to salvage whip material. The rootwads were excavated using a backhoe, loaded into a dumptruck, hauled to the transplant location, and installed using a tracked excavator. In addition, approximately 40 other tree and shrub clumps were salvaged and transplanted during the construction period.

Between April and May 1998, approximately 8,000 riparian shrub and tree tublings (primarily willow, red osier dogwood, mock orange, and black cottonwood), 1,000 conifer, 120 black cottonwood poles, and 800 linear feet of fascines were installed in the phase 1 project area. Methods included site preparation (scalping and excavation), planting, and installation of protection devices and shade cards. Bundles and fascines were installed by hand or with the use of equipment (small backhoe). Cottonwood livestakes were installed using a backhoe mounted stinger.

Task 2 Restoration Project Construction

In July 1997, the CTUIR and partners initiated phase 1 of the McCoy Meadows Project. Designs included relocation of a channelized segment of McCoy Creek into a historic meander channel segment. Methods involved heavy equipment to move and rearrange (cut and fill) approximately 3,000 cubic yards of cut and fill material. See Figure 2 for phase 1 construction.

In addition to the cut and fill activities associated with constructing and reconnecting historic meander channels, project work also involved filling drainage ditches developed in the early 1900's that were designed to drain the meadow floodplain and removal of culverts and dikes. Activities were directed primarily to alleviate concentrated water flow in ditched configurations and spread out water in sheet flow to reduce erosive energy and increase water storage in the upper meadow floodplain.

Task 3 Post construction activities and monitoring

Post construction activities included inspecting contracted work and determination of project completion. Contractor was then released from project site upon successful completion of contract requirements.

Monitoring and evaluation activities on the McCoy Meadows Restoration Project is ongoing. M&E includes water quality, groundwater, instream habitat, fish populations, photo points, aerial photography, permanent vegetation plots, and stocking survey plots.

CTUIR staff are responsible for photo points, vegetation plots, and stocking survey plots. ODEQ is conducting extensive water quality monitoring including water temperature and chemistry, macroinvertebrates, and channel cross sections. NRCS is monitoring groundwater. ODFW is monitoring instream habitat conditions and fish populations. Monitoring reports available at this time are included as appendices in this annual report.

Tasks 4 Phase 2 McCoy Meadows Project Designs

Phase 2 project design development is currently ongoing. Survey work has been completed under CTUIR contract by an engineering firm. The design team has completed development of channel design criteria and is currently developing channel alignment strategies. Activities include reviewing survey data, assessing historic channel locations and physical dimensions, and analysis of suitable channel configurations. Additional survey data including additional channel cross section data is currently being collected by NRCS and CTUIR staff to assist in development of phase 2 designs. Phase 2 designs are being closely integrated with the bridge construction effort described earlier. The new bridge will be located approximately 200 feet south of the current crossing due to concerns associated with the lack of grade control in the channelized configuration. Phase 2 channel design alignment integrates this features into the channel location and configuration. Designs also include provision for maintaining continuity of overflow in the meadow by integrating additional culverts (and meadow flood capacity) in the existing road prism, which currently acts like a dam or dike. Final phase 2 engineering designs are anticipated to be completed by early to mid August. Initial construction activities are expected to begin by early to mid September.

In conjunction with phase 2 project design development, the design team is currently assessing and developing additional work elements in the upper meadow, phase 1 project area. Project construction activities planned in the upper meadow include for the July

1999 work window include construction of an engineered debris jam at the 97' channel entrance location and filling the portions of the channelized reach to direct additional flow into the restoration channel.

CTUIR staff in conjunction with project partners are currently preparing biological assessments, permits, and NEPA compliance reports for the bridge, ongoing phase 1 project activities, and phase 2 channel restoration work.

Upper Grande Ronde Large Woody Debris Addition Project

Methods employed under this project included identification of suitable whole trees from adjacent National Forest System lands, contracting helicopter flight services, flying whole trees to pre-determined locations along the Grande Ronde River floodplain, and instream placement of whole trees and rock structures with a tracked excavator. Whole trees were then anchored to large rocks using stainless steel cable and epoxy by tribal and USFS staff. All woody debris installed under the project was mapped and counted as part of the monitoring program to assess wood transport through the system. Contracting and project administration was provided by USFS staff.

Middle Mainstem Grande Ronde River Habitat Enhancement Project

Task 1 Project Development and Designs

Project proposal and conceptual designs have been developed cooperatively with Grande Ronde Model Watershed Program, NRCS, ODFW, USFS, and CTUIR. Designs consisted of plan views, design drawings, and engineering specifications for individual project reaches. Project designs were completed by the design team with NRCS taking the lead on engineering specifications. Project designs were completed in July 1998 with contracting, permitting, NEPA compliance, and field preparations being completed by August 1998.

Initial project construction activities were implemented during August-September 1998. Project planning and preparations included: 1) contract preparation (USFS); 2) coordination with landowners on access routes and staging areas; 3) field reconnaissance to locate large wood planned to be flown to project area via helicopters; and 4) planning for range improvements and riparian conservation easement. Biological Assessment/Evaluations completed by USFS. ODFW has completed Section 404 permit application. NEPA and cultural review also completed by USFS.

Task 2 Project Implementation

Implementation activities included purchase and delivery of materials including approximately 1,500 cubic yards of 36 to 48 inch angular basalt and delivery of approximately 100 whole trees by helicopter and self loading log truck. Existing rock vortex weirs on National Forest System lands initially constructed in 1992 were repaired

and whole trees with rootwads were installed to improve instream structural diversity associated with the large pool habitat formed by the rock weirs. Approximately 700 feet of streambank repair was accomplished through the installation of rootwad revetments. Gravel bars were stabilized by the additional of large whole trees.

RESULTS AND DISCUSSION

McCoy Meadows Restoration Project

In July, 1997 the McCoy Meadows design team initiated the first step in restoring the natural character and function of McCoy Meadows by reintroducing McCoy Creek into a pre-1977 stream channel, planting thousands of riparian shrubs and trees, and filling old drainage ditches in order to allow spring runoff to flood the meadow and restore groundwater storage.

In 1997 alone, over 1,200 linear feet of stream channel was restored above pre-project, channelized conditions. An additional 1,800 linear feet of existing stream channel (utilized by McIntyre Creek following 1977 channelization efforts) was enhanced by increased summer baseflow provided by McCoy Creek. In dryer years, this stream segment provided intermittent stream flow. Post project conditions included perennial flow throughout the season. Prior to project implementation, this reach contained a single beaver dam and associated lodge structure. During 1997 and through 1998 following phase 1 project implementation, approximately 12 new beaver dams were established. To facilitate beaver dam development and their beneficial effects in the meadow complex, approximately 120 pieces of 4-8 inch diameter (up to 8 feet lengths) cottonwood limbs and boles salvaged from off-site were deposited near the existing beaver lodge by tribal staff. Depositing this material was intended to provide a forage resource and larger diameter material to re-enforce existing dam structures and potentially reduce depredation on both existing and planted shrubs. Without exception, all wood was utilized for foraging and incorporated into dam structures. Although carrying capacities for beaver in this reach has not been determined, forage and dam construction resources of relatively abundant supply are nearby and beaver control has not been identified as a project need. Monitoring efforts are ongoing.

Channel gradient in the phase 1 project reach decreased from approximately .7 feet/100 feet to .5 feet/100 feet along the main McCoy Creek segment with a corresponding increase in channel sinuosity from 1.08 to 1.33. Channel gradient in the restored channel of .3 feet/100 feet compares favorably to the channelized section which has a gradient of .8 feet/100 feet. Sinuosity of the restored channel is also much greater--1.52 compared to 1.01 in the channelized segment. Physical habitat conditions in the restored channel segments also compare favorably with channelized segments. Pool habitat availability has increased to over 50 percent compared to less than 12 percent in channelized segments, average pool depth is greater in the restored channel (by up to 40 percent), the width to depth ratio has decreased by an estimated 45 percent, and streambank stability is roughly

60 percent greater in the restored channel compared to channelized segments (ODFW Aquatic Habitat Inventory, July 1998, Appendix B). Stream shade provided by vegetation on restored stream segments is currently similar to channelized segments. However, we anticipate stream shade to increase dramatically over the next decade over pre-project conditions due to decreased stream gradient, greater streambank stability, improved hydrologic conditions, and the aggressive revegetation program currently underway.

This aerial photo of upper McCoy Meadows, taken in June, 1998 illustrates restored meander channel and channelized section.



Water quality in the restored channel reach has been positively influenced by project activities. During the summer of 1997 following channel relocation, water quality monitoring data illustrates that water temperatures decreased by an average of 6⁰F (Fahrenheit) compared with the channelized stream segments located upstream from the project area. Water temperature cooled down as it traveled through the restoration reach and increased in downstream channelized segments. In addition, data illustrates that diurnal temperature fluctuations were moderated in the project reach compared to channelized reaches.

Grab samples of water temperature in the restored channel also demonstrated 10⁰F degree cooler water in both pools and backwater areas along the restoration reach compared to channelized segments. During the summer of 1998, water temperature data was similar to 1997 data. Maximum water temperatures in the restored channel segments reached 78.8⁰F (26⁰C) during July compared to maximum temperatures of 84.2⁰F (29⁰C) in the channelized segments downstream from the phase 1 project area which illustrates a 5.4⁰F temperature difference.

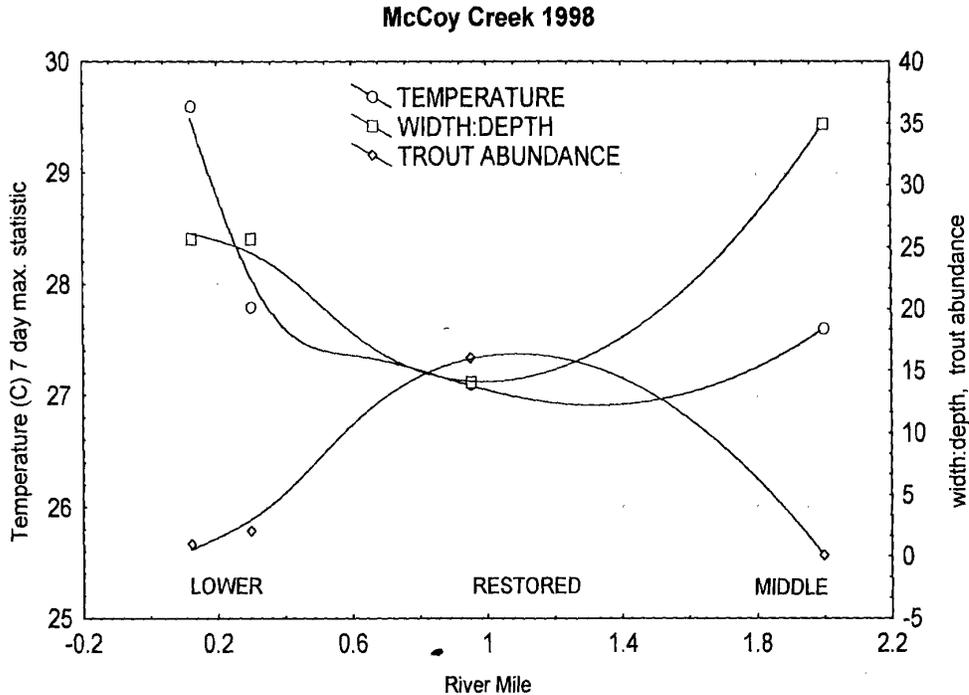
The following figure illustrates streambank stabilization and large woody debris additions on the upper reach of the phase 1 project area.



This photo illustrates a segment in the phase 1 restoration project reach. The segment is part of the historic (pre-1977) McCoy Creek, which flowed intermittently prior to the 1997 restoration effort.



Figure 2 – This figure illustrates parameters of water temperature, width:depth ratio, and trout abundance in the restoration reach along Upper McCoy Creek compared to segments upstream and downstream of the 1997 and 1998 restoration project area.



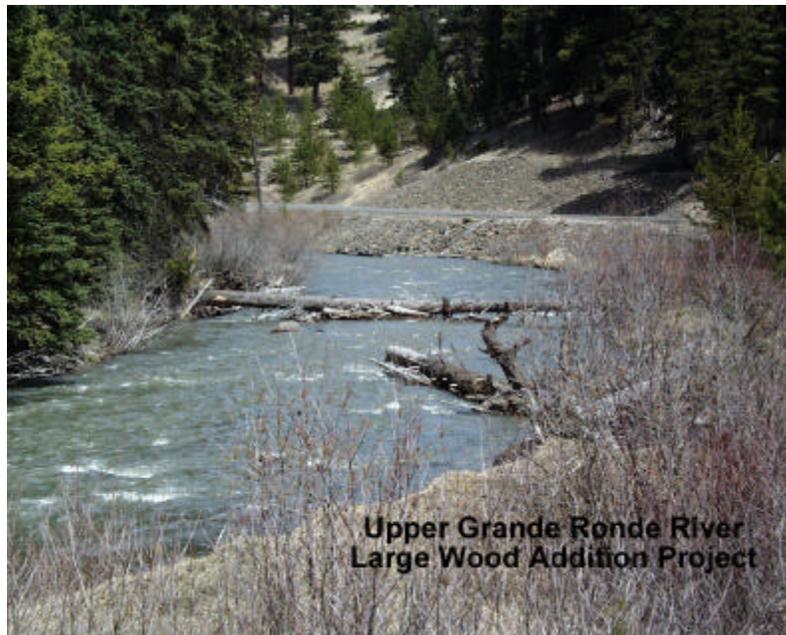
Overall, reintroduction of McCoy Creek into the pre-1977 channel segments under phase 1 of the project has initiated improvement in water quality and fish habitat compared to pre-project conditions. The influence of increased groundwater storage in conjunction with a significant decrease in the width to depth ratio and an increase in average depth has initiated an improving trend in water quality and initiated the first major step towards achieving the goals and objectives of the McCoy Meadows Restoration Project. Project staff speculate these conditions will continue on an improving trend in the restoration reach with additional groundwater storage (as more meadow floodplain is reactivated), increased shade provided by restored native riparian and wetland plant communities, and an increase in average depth resulting from continued beaver activity.

Current monitoring and evaluation efforts for water quality and groundwater is not sufficient to accurately portray the interaction of groundwater-surface water interactions and the microhabitat effects provided by groundwater discharge throughout the project reach. Efforts are currently underway to increase water quality and groundwater data collection to better assess project effectiveness and to increase our understanding of the importance of wet meadows in watershed restoration and recovery of endangered salmonids. Increased M&E may include installation of additional water temperature probes, installation of continuously recording temperature probes in existing groundwater wells, and development of a groundwater map.

Upper Mainstem Grande Ronde River Large Wood Addition Project

Under this project approximately 3 miles of instream habitat work was accomplished during the 1998 instream work window. Approximately 140 whole trees and 35 instream rock structures were installed. Whole trees with intact rootwads were flown to the project site by helicopter and temporarily placed in the floodplain for placement by tracked excavator.

Whole tree placement was focused on existing gravel bars to assist in stabilization and to promote natural geomorphic channel migration and development and increasing instream structural diversity for rearing juvenile salmonids. Additional structural installation included placement of individual and clusters of large boulders to enhance instream structural diversity.



Middle Mainstem Grande Ronde Habitat Enhancement Project

Project development accomplished during the contract period consisted of working with private landowners and developing consensus on project designs, establishment of an inter-agency design team, development of project designs (including engineering survey and development of design drawings and specifications), securing cost share funding for the project (including Grande Ronde Model Watershed Program), and completion of pre-construction preparations. Pre-construction preparation included development and solicitation of equipment rental contract bids, purchasing materials and supplies, location and mapping of whole trees, on-site project layout, and initial delivery of materials to the project site. Project materials included whole trees and approximately 1,500 cubic yards of angular basalt. Whole trees were identified on adjacent National Forest System Lands,

and on private lands. Prior to initiation of helicopter flights, individual trees were dislodged using tracked excavators in order to ensure the helicopter could lift the structure. Rock was secured by a contractor and hauled and stocked-piled at pre-designated locations. Initial project implementation was completed during the instream work window between August through September 1999. A complete assessment of the initial phases of project implementation will be presented in the 1999 Annual Report for this project. Project efforts are currently ongoing with bioengineering and extensive tree and shrub planting scheduled to begin in May 1999. Monitoring and evaluation including photo points, channel cross sections, habitat surveys, and juvenile population surveys are ongoing. Additional monitoring efforts will include survival monitoring of bioengineering and planting sites to determine stocking survival.

The following photos illustrate streambank stabilization efforts and backwater habitat development.





Additional project implementation activities include development of off-channel livestock water sites and installation of riparian corridor and pasture cross fences. These activities are scheduled to be completed during summer 1999.

SUMMARY AND CONCLUSIONS

The goals and objectives of this contract have been achieved through implementation of the initial phase of the of the McCoy Meadows project, project development, designs, and initial implementation of the mainstem Grande Ronde Habitat Enhancement Project, and implementation of the Upper Mainstem Grande Ronde River Large Wood Addition Project. Biological objectives of improving water quality, instream habitat diversity, floodplain function, and channel morphology are being achieved as planned. However, additional monitoring and evaluation will help us assess and track project benefits over time Project designs and implementation efforts on both the McCoy and Mainstem Grande Ronde project are ongoing efforts involving several miles of key salmonid spawning and rearing habitat in the Upper Grande Ronde River Basin.

McCoy Meadows Project

Our initial assessment of the McCoy Meadows Project is that the project has demonstrated significant habitat and water quality restoration in McCoy Creek. Habitat quantity has been nearly doubled by reintroducing channelized segments into historic meander segments, multiple instream and floodplain habitat variable are showing increasing trends (width:depth ratio, pool depth, % streambank stability), groundwater storage has increased, and water temperatures have been reduced over pre-project

conditions. An overall water temperature reduction of 5⁰F during the summer low flow period is an important indicator of the beneficial effects of enhanced groundwater storage in wetland meadow complexes. It is important to note that the temperature reduction has been accomplished without the benefit of a significant amount of vegetative shade. Over time, we expect these benefits to increase throughout the entire wetland meadow complex as additional channel reintroduction efforts are completed, beaver recolonization and dam construction, and as native vegetation becomes established and matures.

Future restoration work planned on the McCoy Meadows project area includes initiation of reclamation activities associated with the channelized segments located in the upper meadow into the historic floodplain. Techniques will involve construction of a debris jam on the channel structure located at the 97' McCoy channel diversion, backfilling at least a portion of the upper channelized section, and contouring areas along the channelized section to create floodplain complexity and to encourage palustrine emergent wetland development.

Additional planned restoration work during the 1999-2000 contracting periods includes: construction of a replacement bridge on McCoy Creek to improve fish passage, increase capacity, and provide greater continuity of overland flow; channel construction and reintroduction activities in the lower meadow complex to expand the benefits described above throughout the lower meadow complex (over 3,000 linear feet of reclaimed channel over existing channelized condition); relocation of existing BPA/ODFW riparian corridor fencing to outer edges of floodplain meadow, and planting and bioengineering to facilitate vegetative recovery.

In addition, the 2137 Road Relocation and Obliteration project is planned to begin the construction phase during the summer of 1999. Relocation of approximately 2.5 miles of existing drawbottom to a ridgetop system will assist in restoring floodplain and riparian conditions in the McIntyre Creek subbasin. In conjunction with the road relocation effort, planning will be initiated to determine appropriate strategies to restore the existing road prism and riparian habitat features. Coordination with a private landowner needs to begin to develop opportunities to restore floodplain conditions between the McCoy Meadows Project and the upstream National Forest System lands effort.

Upper Mainstem Grande Ronde Large Woody Debris Addition Project

Implementation of this project increased stability of gravel bars and will assist in improving long-term geomorphic function. The project was designed to replace system components (large wood and structure) removed during the last century by logging and road development and restore instream structural diversity and stability. The project is considered highly successful in achieving the short term objectives. Longer term objectives will be achieved over time by natural processes (i.e., hydrologic and geomorphic processes) to develop a naturally stable stream reach that provides abundant high quality pool habitat for rearing juvenile salmonids.

Middle Mainstem Grande Ronde Habitat Enhancement Project

Initial project implementation was completed in September 1999. Current activities include preparations for spring planting, additional floodplain restoration (railroad grade removal), and installation of range developments including riparian fencing and off-channel water developments. Instream structural additions, including streambank stabilization using rootwad revetments are performing well. Spring run-off is currently providing an opportunity to visually assess the function of these structures. We anticipate significant benefits in terms of stabilization of actively eroding streambanks, improve geomorphic function, and enhanced instream structural diversity and complexity, and increased pool habitat quality and quantity.

APPENDIX A - Expenditures

APPENDIX B – Supplemental Technical Documents

- Appendix B.1 McCoy Meadows Restoration Analysis
- Appendix B.2 Phase 1 Project Implementation Map
- Appendix B.3 McCoy Meadows Photo Point Monitoring Album (97'-98')
- Appendix B.4 McCoy Meadows Habitat and Population Monitoring Data (ODFW)
- Appendix B.5 Water Quality Monitoring Data
- Appendix B.6 McCoy Bridge Designs
- Appendix B.7 Phase 2 McCoy Meadows Conceptual Designs
- Appendix B.8 Mainstem Grande Ronde Habitat Enhancement Project Designs and Grande Ronde Model Watershed Project Proposal