GRANDE RONDE MODEL WATERSHED
Watershed Enhancement Project Proposal
March 2010

1. **Project Name:** Dark Canyon/Meadow Creek (Cunha) Fish Habitat Enhancement Project

2. **Applicant:** Confederated Tribes of the Umatilla Indian Reservation, Grande Ronde Subbasin Fish Habitat Restoration Project

3. **Participating Landowner(s) and Agencies:**

   Joseph Cunha
   43530 Shetland Court, Pendleton, Oregon 97801
   pjcunha@q.com
   541-276-8031 (home)

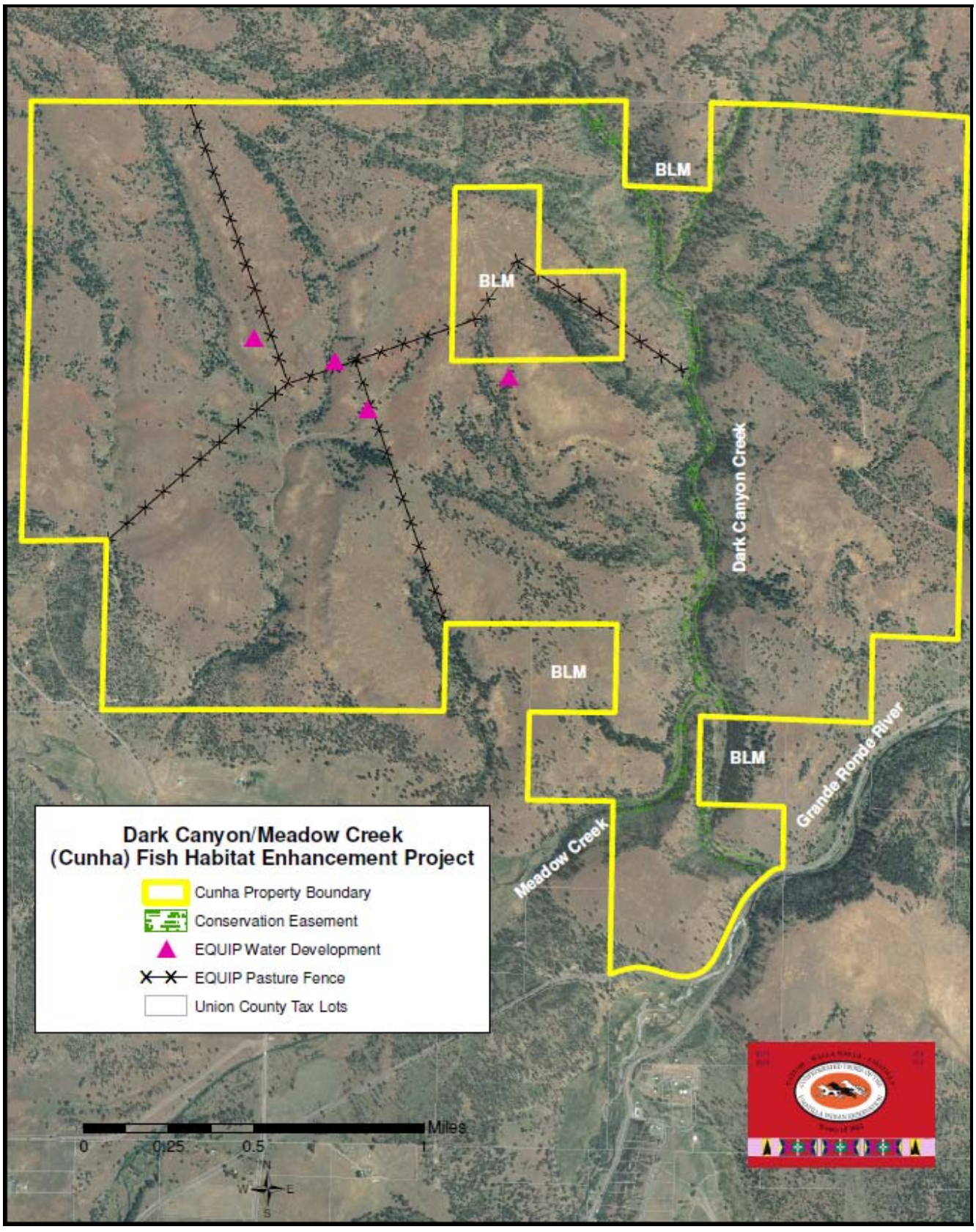
4. **Project Contact(s):**

   Technical Contact:
   Allen Childs, Project Leader
   LaGrande Field Office
   Ag Service Center, Rm. 4
   10507 North McAlister Road
   Island City, Oregon 97850
   allenchilds@ctuir.com
   541.429.7940 (office & fax)
   541.969.3142 (mobile)

   Administrative Contact:
   Julie Burke, DNR Administrative Manager
   PO Box 638
   Pendleton, Oregon 97801
   julieburke@ctuir.com
   541.429.7292 (office & fax)

5. **Project Location:**
   The proposed project is located near Starkey, Oregon in the Upper Grande Ronde Subbasin. The project legal description is: Township 3 South, Range 35 East, portions of Sections 24, 25, and 36, Willamette Meridian, Union County Tax Lot 500. The project encompasses approximately 3.5 miles of Dark Canyon Creek and 0.5 miles of Meadow Creek beginning at the confluence of Meadow Creek with the mainstem Grande Ronde River upstream along Meadow Creek to McCoy Meadows and along Dark Canyon to the Wallowa-Whitman National Forest Boundary. The project area includes private land and two BLM tracts, one along Dark Canyon at the upper reaches of the project area and along the lower reach of Meadow Creek. See Figure 1.

Figure 1 Project Vicinity Map



6. Project Objectives:

The following identifies project specific objectives and references to specific objectives identified in the Grande Ronde Subbasin Plan:

a. **Protect Habitat:** Develop riparian conservation easement along 3.5 miles of Dark Canyon and 0.5 miles of Meadow Creek. Conservation strategy includes CTUIR-BPA riparian conservation easement and NRCS/FSA CREP Easement. BLM tracts within the project area are currently fenced and excluded from grazing.

Subbasin Plan Reference: Habitat Protection. (page 258):
• Protect high quality habitat, restore degraded habitats, and provide connectivity between functioning habitats.
• Manage for healthy ecosystems to support aquatic resources and native species

b. **Enhance Instream Structural Diversity and Complexity:** Install/construct large wood complexes and limited rock structures to facilitate development of riffle, run, pool, glide habitat representation and provide instream diversity, mimicking natural recruitment of wood and rock, respective of channel types.

Subbasin Plan Reference: Channel Conditions (page 260):
•Maintain existing LWD by promoting BMP's for forestry practices. Add LWD where deficient and appropriate to meet identified short term deficiencies.
• Reconnect channels with floodplain or historic channels where appropriate and feasible. •Install in-channel structures (LWD, boulders).

c. **Enhance Floodplain Connectivity:** Remove and/or breach segments of old railroad grade currently confining floodplain function and riparian/wetland habitat along Meadow Creek.

Subbasin Plan Reference: Channel Conditions (page 260):
• Remove or relocate channel confinement structures such as draw-bottom roads and dikes where appropriate and feasible.

d. **Enhance Riparian Habitat Condition:** In conjunction with planned upland infrastructure developments through FSA-EQUIP and CTUIR-PCSRF funding (upland range pasture fence installation and water developments) and establishment of term riparian conservation easement, remove livestock utilization from riparian habitat along Dark Canyon Creek and Meadow Creek, enhance hydrologic connectivity where feasible, and increase riparian hydrophytic plant communities through artificial (planting/seeding) and natural recruitment.

Subbasin Plan Reference: Riparian Conditions (page 262):
• Improve the density, condition and species composition of riparian vegetation through planting, seeding, improved grazing and forest management practices.
Subbasin Plan Reference: Sediment Conditions (page 261):
• Manage grazing in riparian areas following grazing plans designed to improve riparian condition; could include exclusion, partial season use, development of off-site water, herding.
• Reestablish riparian vegetation by planting trees, shrubs, sedges (native species preferred)
• Stabilize active erosion sites, where appropriate, through integrated use of wood structures (limited use of rock if necessary) and vegetation reestablishment.
• Encourage landowner participation in riparian management incentive programs, e.g. CREP, WRP, EQIP.
• Promote/implement development of grazing plans to improve upland vegetative condition.

7. Project Description

Introduction - The project proposes a coordinated approach to address management challenges on a private cattle ranch and habitat limiting factors associated with priority ESA fish habitat in the Upper Grande Ronde Subbasin for Threatened Snake River ESU summer steelhead and spring-summer Chinook. The project includes assisting the private landowner with upland infrastructure development to offset a reduction in access to pastures and water resources for habitat conservation purposes along Meadow Creek and Dark Canyon Creek. The upland portion of the project, consisting of 3.4 miles of pasture cross fence and four spring developments, has been funded through non-BPA sources which are currently underway and planned for completion in late 2010.

This proposal focuses on securing BPA funding for instream habitat enhancement activities, including instream structural additions (large wood and rock) and removal/breaching portions of an old railroad grade adjacent to Meadow Creek. Following completion of "active" instream habitat actions, riparian habitat along Dark Canyon and Meadow Creek will be enrolled in the FSA CREP program which will provide funding for planting, seeding, and riparian conservation easement boundary fencing.

Funding secured for instream habitat implementation through this proposal will be administered by the CTUIR under its' existing BPA-Accord contract. BPA-Remand funds will be entirely "pass through expenses" and be applied directly to on the ground actions.

Habitat Limiting Factors and Existing Conditions

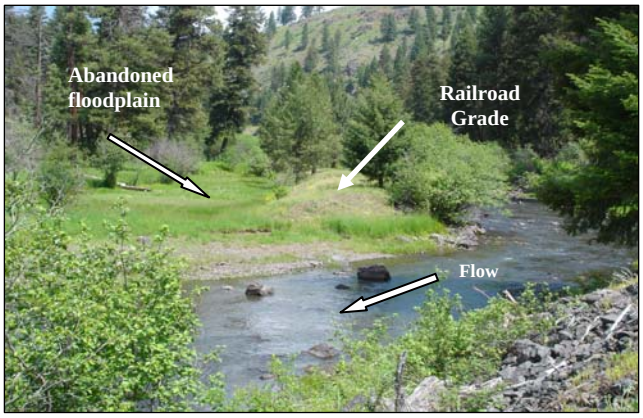
Habitat assessments and field surveys were initiated by CTUIR staff in June 2009 and consisted of a walk through survey along the Dark Canyon and Meadow Creek project reach to inventory large wood and qualitatively assess riparian, instream, and morphological condition. Baseline channel morphology and habitat surveys are currently underway with channel cross sections, longitudinal profile, and channel substrate survey scheduled for completed by early spring 2010. Following is a summary of habitat limiting factors identified during our initial project assessment and survey effort.

Generally, the upper reaches of Dark Canyon Creek are in fair condition compared with the lower reaches of both Dark Canyon and Meadow Creek with a more intact and mature riparian plant community, higher occurrence of large woody debris, and generally greater habitat complexity. The lower 2 miles of Dark Canyon Creek illustrates a long history of riparian logging, extensive livestock grazing, and a general lack of large wood within the floodplain. Instream habitat conditions degrade from upstream to downstream reaches with poor habitat complexity, lack of large pool habitat, and excessive streambank erosion. Meadow Creek within the project area provides limited habitat complexity with poor availability of large pool habitat and a constrained floodplain created by an old railroad grade. Following is a summary of specific habitat limiting factors with additional discussion.

Habitat Conditions/Habitat Complexity – Channel instability associated with removal of streamside cover, logging in riparian areas, historic splash dam logging, and railroad grade construction has resulted in modification of natural channel processes, altered width/depth ratio's, elevated erosion, and simplified habitat. Field surveys along Dark Canyon Creek indicated an average of 13 pieces of large wood/per mile with the upper 1.5 miles providing higher quality riparian habitat and wood recruitment compared to the lower 1.5 miles which contained only 3 pieces of wood greater than 12 inches in diameter. Future wood recruitment potential in the upper and middle reaches of Dark Canyon is generally good with mid-seral stands of Douglas-fir, spruce, and ponderosa pine compared to the lower. Riparian shrub and tree cover is notably lacking, though the upper reaches of the Dark Canyon Creek contain scattered, mature cottonwoods.

Dark Canyon Creek illustrating channel incision, streambank erosion, and poor riparian conditions

Meadow Creek within the project area provides poor habitat with a distinct lack of pool habitat and structure. Additionally, the entire length of Meadow Creek within the project area is constrained by the railroad grade located along its length on the left bank and along an approximate 800 foot segment along the right bank. The lower 0.4 miles of Meadow Creek has a wider, historic floodplain while the upper 0.5 miles are located within a confined valley form with limited potential for meander development. Channel classification transitions from a Rosgen "B" channel form to a "C" form but is largely constrained and disconnected from its historic floodplain by the railroad grade.



Meadow Creek at RM 0.2 upstream from confluence with Dark Canyon Creek.

• Sediment – Loss of upland and streamside vegetative cover has increased the rates of erosion. Soils lost from upland areas has overwhelmed hydraulic processes resulting in decreased availability of large pool habitat, spawning areas, riffle food production, and hiding cover. Field observations of Dark Canyon Creek and Meadow Creek within the project indicate locations with chronic streambank erosion and sediment transport to fish bearing streams. Road segments and portions of the historic railroad grade are actively eroding and streambank stability along lower Dark Canyon Creek is generally poor due to unstable channel morphology, lateral channel migration, and poor riparian conditions.

• Riparian Function – Riparian habitat degradation is the most serious habitat problem in the subbasin for fish (McIntosh 1994, ICBEMP 2000). Loss of floodplain connectivity by roads, dikes, and channel incision, and in many streams reduced habitat suitability for beaver, has

altered dynamically stable floodplain environments, which has contributed to degradation and limited habitat recovery. This loss leads to secondary effects that are equally harmful and limiting, including increased water temperature, low summer flows, excessive winter runoff, and sedimentation.

• Low Flow – Water resources in many streams have been over-appropriated resulting in limited summer and fall base flow, development of fish passage barriers, and increased summer water temperatures. Water temperature monitoring initiated by the CTUIR in 2009 on Dark Canyon Creek documented 7 day summer maximum temperatures exceeding 23 ºC near the confluence with Meadow Creek 22 ºC at the upstream property boundary (Figure 1). Ongoing monitoring along Meadow Creek at McCoy Meadows reveals summer maximum temperatures exceeding 28 ºC.

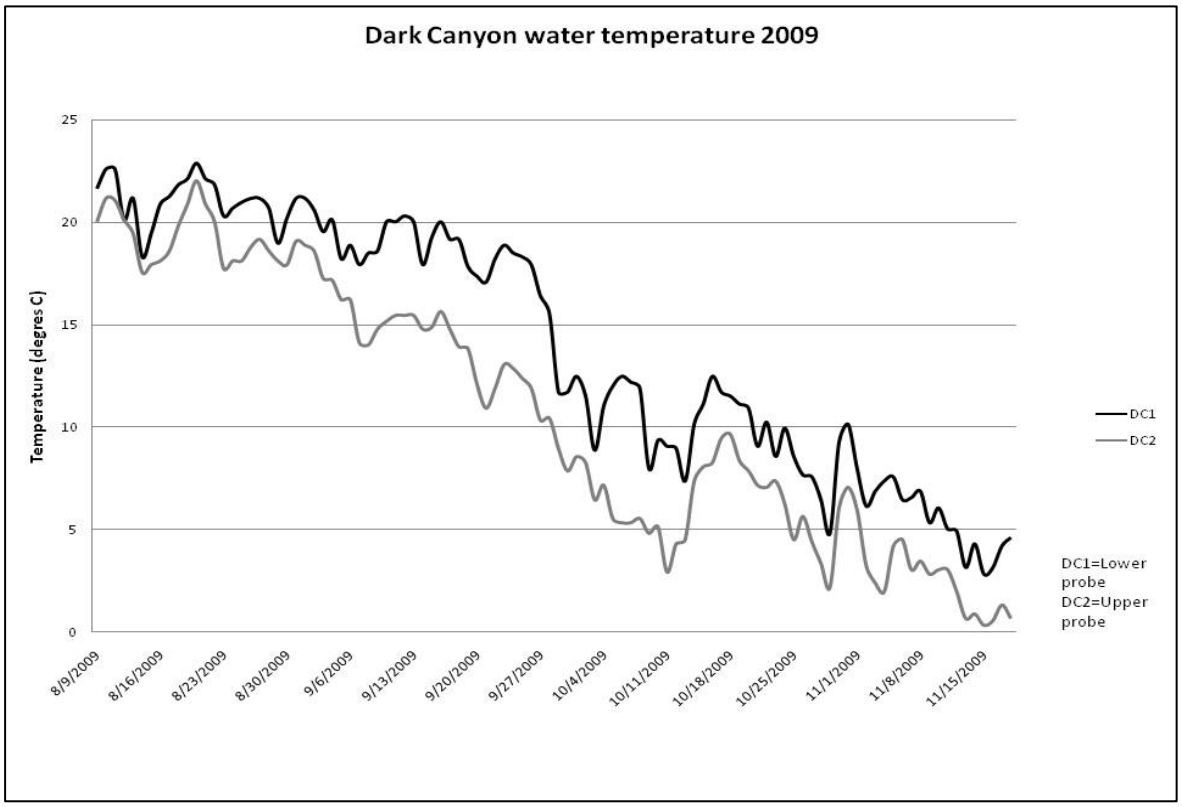
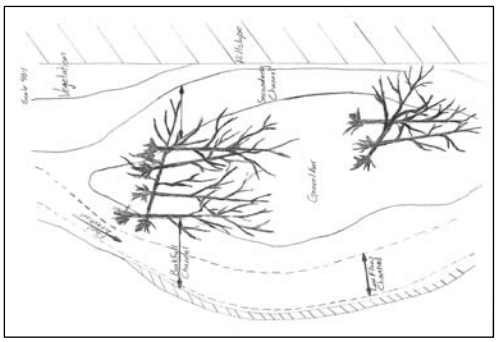


Figure 2: Water temperature (ºC) for Dark Canyon Cr at the upper property boundary (DC2) compared to the lower property boundary (DC1) for the same dates/times during 2009.

Specific Actions – Project activities funded under this BPA-Biop Remand proposal include: Instream habitat enhancement (installation of large wood and rock) and floodplain improvements associated with breaching and/or removal of railroad grade segments along Meadow Creek. Figure 3 illustrates locations of planned actions. Following is a description of planned treatments.

1. **Large Wood Additions** – Approximately 18 sites along Dark Canyon Creek and 9 sites along Meadow Creek have been identified for wood placement. An estimated 150 pieces of large wood will be added to existing pools, or placed in a manner to create pool habitat and provide habitat complexity. Wood material utilized in the Dark Canyon portion of the project will be collected from adjacent uplands, focusing primarily on dead and down material that is available onsite. Previous logging activities and difficult access to the area limits our ability to haul wood material from off-site areas. The largest material available will be utilized but will generally be limited to 12-16 inch dbh and greater than 20 feet in length. Individual trees with rootwads (where available) and dead/down logs will be placed in log jam configurations or in clusters to mimic natural recruitment and log jam formation, similar to the natural log jam illustrated to the left located in Dark Canyon Creek. The plan view to to the left illustrates application of log jams on center channel gravel bars and side channels to trap sediment, facilitate riparian vegetation establishment and provide complexity.



Wood placement sites identified along Meadow Creek were strategically located in areas containing the highest potential to form large, complex pool habitat (existing pools with gravel substrate) and in areas that can potentially provide thermal refuge in association with complex pool habitat (confluence of Dark Canyon Creek and side channels associated with existing abandoned floodplain caused by the railroad grade). The project will focus on creating large pool habitat in 5 primary areas (two in the upper project reach, the segment at the confluence of Dark Canyon, and two sites in the lower project reach, including a backwater habitat area associated within an existing side channel at the lower section of the railroad grade and along an outside meander pool downstream from the BLM parcel. Wood placement in Meadow Creek will require construction of engineered log jams (12 structures) that include large diameter materials (>24 inch dbh and 35 feet in length), racking and/or anchor logs that are excavated and back-filled into the floodplain, and rock ballast. No steel pins or cable will be utilized. The objective of these structures is to provide a hardened structure to direct thalweg and energy to scour and maintain pool depth and provide in channel diversity. Large wood additions will contribute to floodplain stability by increasing roughness, slowing water velocities, and trapping sediment. Also, large wood will increase pool habitat quality and provide thermal and predatory refuge for aquatic species.

2. Rock Placement Along Meadow Creek – Historic splash dam logging and likely clearing of in-channel obstructions (log jams and rock) has reduced the availability diverse habitat. The majority of the reach provides riffle habitat with limited pools and pocket water that lacks depth. In conjunction with installation of log jams at selected pool sections, sponsors propose re-installing large boulders that have are available along the 0.5 mile project reach in clusters and individually in riffles and existing pools to increase complexity and enhance availability of pocket and step-pool habitat. Includes approximately 20 sites. With the availability of rock material within reach of Meadow Creek, the costs of installing rock material would be minimal.

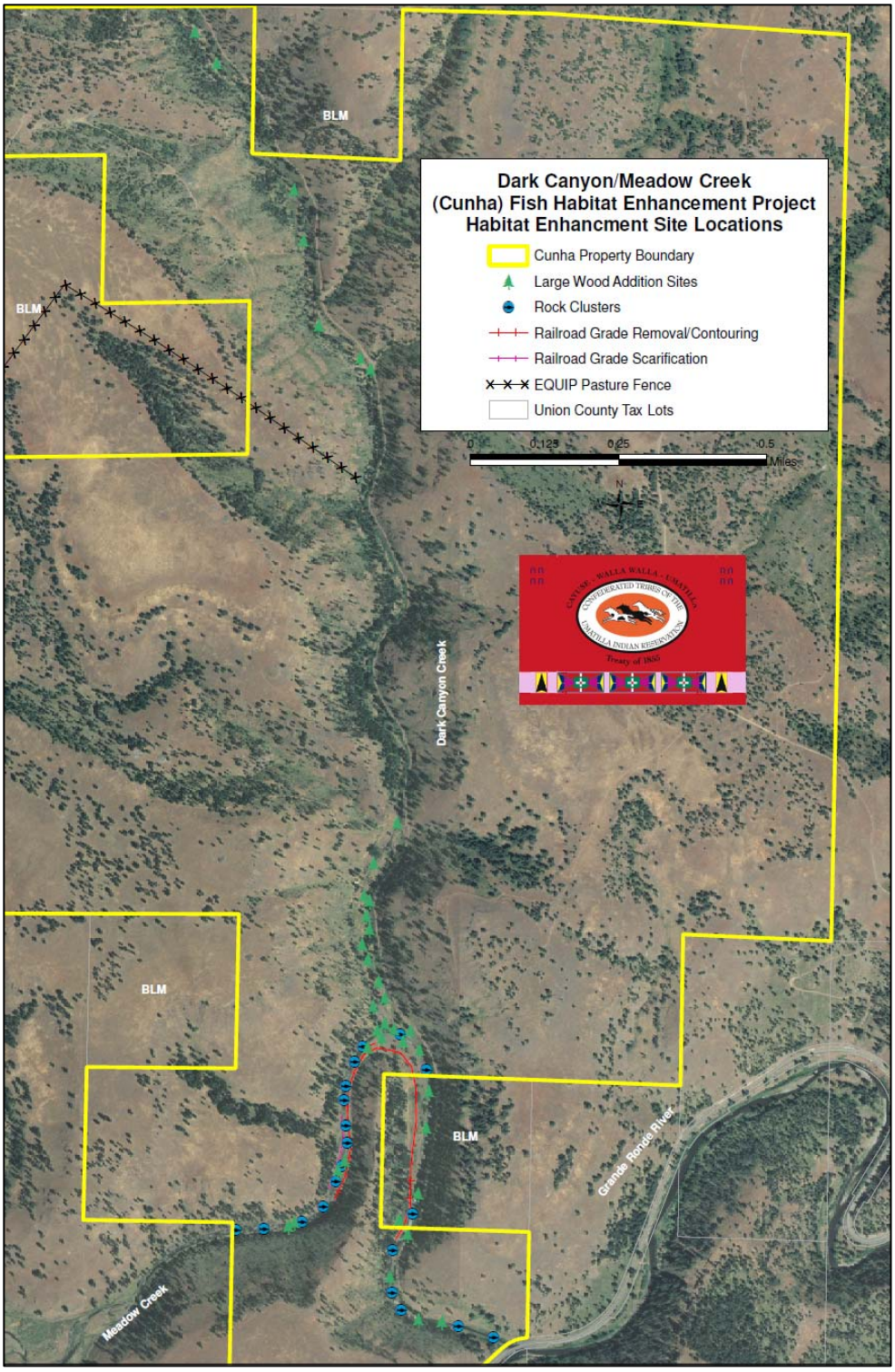
3. Railroad Grade Removal – Approximately 0.15 miles of railroad grade will be excavated and removed and an additional 0.10 miles contoured to the adjacent hillslope and/or scarified. Railroad grade segments located upstream from the confluence of Dark Canyon Creek on the right bank of Meadow Creek will be pulled back (excavated) approximately 30 feet from the bankfull channel of Meadow Creek and contoured into the adjacent hillside. An ATV route along the hillslope edge of the grade will be maintain for management purposes. Additionally, approximately 800 feet of grade located on the right bank of Meadow Creek will be bench-cut and scarified to facilitate seedbed preparation and planting

Upper Meadow Creek railroad grade along right bank.

The lower 0.15 miles of grade along Meadow Creek isolates floodplain habitat and limited development of meander pools and high quality habitat. Sponsors propose to excavate, haul, and contour this reach to restore floodplain connectivity and the associated morphological benefits that create complex instream habitat.

Lower Meadow Creek Railroad Grade. Segment planned from removal to activate abandoned floodplain along right bank

Figure 3 Habitat Enhancement Site Locations



Benefits – Approximately 4 miles of summer steelhead spawning and rearing habitat will be protected and enhanced under a 15 year conservation easement. Project benefits also extend to spring Chinook with suitable rearing habitat in both Meadow Creek and Dark Canyon. Expected project results include increased availability of large pool habitat associated with installation of large wood and rock complexes, recovery of riparian vegetation, including conifers, hydrophytic trees and shrubs, and macrophytes through a combination of active (planting) and passive (protection and elimination of livestock grazing), and improved floodplain connectivity along 0.25 miles of lower Meadow Creek by removing artificial channel confinement (railroad grade) and restoration of channel morphology processes that promote habitat complexity and function. Additionally, the project could potentially lead to improved trends in water quality (long-term) with a decrease in diurnal water temperature variations and decreased summer maximum water temperatures with improving trends in channel morphology (decreased width:depth) and riparian vegetation.

In addition to expected direct effects, the project will complement completed and ongoing habitat enhancement activities in the Meadow Creek watershed. For example, the project is located immediately downstream of the McCoy Meadows complex where restoration work has been ongoing since the 1980's and on National Forest system lands in Dark Canyon where the Forest Service has obliterated roads and completed instream habitat activities.

Project Maintenance – CTUIR staff will maintain the project. Extensive maintenance of instream habitat enhancement structures and railroad grade removal is not anticipated. Maintenance associated with the term conservation easement includes annual fence inspection and repair and maintenance of planted materials consisting of managing competing vegetation and protection devices to minimize depredation.

Permits – CTUIR staff will complete all environmental compliance needs in cooperation with BPA. ESA consultations with NOAA Fisheries and USFWS will be completed through BPA's environmental compliance program. A cultural resource survey, currently underway, will be completed by CTUIR cultural resource staff with SHPO consultation completed through BPA. A DSL/Corps permit application is under development by CTUIR staff. The WWNF LaGrande Ranger District will completed ESA consultation and NEPA requirements for the BLM portions of the project area.

Monitoring Plan – The following monitoring plan has been developed to evaluate project objectives:

a) **Protect Habitat:** Photo points have been established in 2009 to provide pre-implementation qualitative data on vegetation and channel conditions. These photo points will be repeated immediately post implementation then every 3 years thereafter until the riparian lease has expired.

b) **Enhance Instream Structural Diversity and Complexity:** A baseline assessment of existing conditions has been initiated by the CTUIR. A longitudinal profile and channel cross sections will provide an overview of morphological features and habitat complexity in associated with the large wood inventory completed in 2009. Channel

morphology surveys will be repeated in subsequent years post implementation to monitor changes in channel morphology and habitat complexity.

c) **Enhance Floodplain Connectivity:** This objective will be monitored through the establishment of photo points, as detailed in a) above.

d) **Enhance Riparian Habitat Condition:** Vegetation surveys (such as a shrub intercept or 'green-line' survey) will be undertaken during 2010 and repeated 3 and 5 years post project. In addition planting efforts implemented under the CREP program will be monitoring through stocking surveys.

e) **Water Quality** - In addition to the monitoring efforts listed above water quality (temperature) will be recorded for the duration of the riparian lease. Temperature data was collected during 2009 (Figure 1) and will be used in an EPT (extensive post treatment) monitoring design. It is anticipated that the analysis of these data would consist of summary statistics for each year/probe location with addition tests for differences in mean maximum weekly water temperatures between probe locations and between years done using either a paired t-test and/or a mixed model repeated measures analysis (providing these data meet the assumptions of these tests).

Work Dates – Project implementation is scheduled to be completed during summer 2010. Specific dates for various project aspects include:

- Permitting/ Consultation - February 15-July 1, 2010.
- Construction - July 1-31, 2010
- Monitoring – Initiated in 2009 and will continue through 2024.

8. Project Budget

Actions funded under CTUIR-BPA Accord Agreement include: planning/design, permitting, subcontracting, administration/inspection, and monitoring/evaluation. Additionally, CTUIR staff will assist the landowner in preparing for CREP enrollment, assist in the development of fencing and planting plans, and administer fencing and planting subcontracts on behalf of the landowner.

Dark Canyon-Meadow Creek (Cunha) Fish Habitat Enhancement Project			
Work Item	**Description**	**Detail**	**Cost Estimate**
Item 1	Mobilization	Lump Sum	$5,000.00
Item 2	Dark Canyon Wood Placement	18 sites, 5 pieces/site, 1.3 miles total, 200 series track-hoe: 120 hours @ $140/hr	$16,800.00
Item 3	Meadow Creek Log Structures	12 Engineered log jams: $3500 each	$42,000.00
Item 4	Meadow Creek Rock Placement	0.5 miles, 20 sites, 200 series track-hoe: 40 hours @ $140/hr)	$5,600.00
Item 5	Meadow Creek Railroad Grade (Contouring)	0.10 miles, 200 series track-hoe: 60 hours @$140/hour	$8,400.00
Item 6	Meadow Creek Railroad Grade (Removal)	0.15 miles, 3500 cubic yards @ $4/yard	$14,000.00
		TOTAL	**$91,800**

Attachments: