NORTH FORK JOHN DAY RIVER BASIN ANADROMOUS FISH HABITAT

ENHANCEMENT PROJECT

Annual Report for February 2011 – January 2012

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ABSTRACT

The Confederated Tribes of the Umatilla Indian Reservation North Fork John Day Anadromous Fish Enhancement Project continued to develop and implement habitat improvements during 2011 using guidance from the John Day Subbasin Plan, Mid-Columbia Steelhead Recovery plan, and other plans or management documents which prioritized restoration efforts. Cooperative efforts between private landowners and public entities such as the North Fork John Day Watershed Council, Umatilla National Forest, and Wallowa-Whitman National Forest prioritized, designed, and implemented specific habitat restoration efforts. During 2011 the project worked with cooperators to replace one passage barriers, eradiate noxious weeds and conduct presence/absence surveys, stabilize a streambank, and certify a water right. Noxious weeds were also controlled and monitoring data collected on sites where Riparian Conservation Agreements exist. Additionally, contributions to outyear efforts included input and coordination for several potential efforts within the North Fork John Day River Basin.

ACKNOWLEDGMENTS

The Confederated Tribes of the Umatilla Indian Reservation wish to thank the Bonneville Power Administration for funding the project and its personnel Jamie Swan, Jenna Peterson, and others for their assistance. We would also like to give thanks to the North Fork John Day Watershed Council for providing a forum for tribal input and promoting the Confederated Tribes of the Umatilla Indian Reservation's habitat recovery efforts; the Umatilla National Forest and its employees (Fishery Biologists Kathy Ramsey and Allison Johnson, Hydrologists Caty Clifton and Ed Farren, Range Managers Tom Thompson and Brad Lathrop) and the Wallowa Whitman National Forest and its employees (Hydrologist Suzanne Fouty, Range Manager Teena Ballard) for assistance with cooperative restoration efforts and providing information, the Natural Resources Conservation Service's Lorraine Vogt, and Oregon Department of Fish and Wildlife's Jeff Neal, and Josh McCormick. Thanks also to Confederated Tribes of the Umatilla Indian Reservation staff, whose cooperation and contributions are evident in this report. Special thanks to Delbert Jones in assisting with monitoring efforts and implementing and maintaining improvements, to Julie Burke Celeste Reeves, and Michelle Thompson for administrative support, and Gary James and Jim Webster for support and guidance. We would like to acknowledge cooperating landowners, Steve Berry, Gene and Julia Engblom, Richard and Dorothy Allstott, Brian Prater, Bill Neal, Sheri Helms, Robin, Mary Lou, Andy and Bill Fletcher, and Forrest Rhinehart who supported our efforts by cooperating in habitat enhancements on their property.

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INTRODUCTION

The Confederated Tribes of the Umatilla Indian Reservation's North Fork John Day River Habitat project (the Project) has undertaken the task of protecting and enhancing habitat in the North Fork John Day (NFJD) basin to improve natural production of indigenous species in support of the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) First Foods. Our efforts are expected to increase juvenile and adult freshwater survival resulting in greater numbers of Endangered Species Act listed Mid-Columbia River Summer Steelhead trout (*Oncorhynchus mykiss*) and Bull trout (*Salvelinus confluentus*) in addition to Spring Chinook salmon (*Oncorhynchus tshawytscha*) and redband trout (*Oncorhynchus mykiss gairdnerii)*. Progress toward this goal can be difficult to ascertain due to existing habitat conditions across the basin, depressed aquatic populations relative to historic conditions, and habitat use at specific locations relative to population dynamics across the basin NFJD and Columbia River basins. In place of a baseline representing historic conditions or the particular state of a depressed population the relative productivity of less disturbed areas can be useful. Significant portions of the NFJD Mid-Columbia Steelhead trout (Carmichael, R.W., 2006), spring Chinook salmon, and Bull trout populations reside in the NFJD Wilderness area and other protected areas that are relatively unaltered or minimally altered; thus, habitat conditions throughout these populations could provide a suitable surrogate for identifying changes in life history strategies in other parts of the basin. Restoring degraded habitats and monitoring subsequent changes in habitat use and species should provide an estimate of our effect upon these species.

Restoration efforts benefiting these species and habitats primarily occur outside undisturbed or minimally disturbed areas, that is, lands managed by private or public entities. As such, cooperative partners are necessary to develop and implement effective restoration efforts within in-stream, riparian, and floodplain habitats. These efforts not only benefit threatened and non-threatened wildlife but protect or restore larger scale natural processes with sufficiently large processes and prioritize efforts according to needs, available funding and technical feasibility. Collaborative efforts reduce the burden upon a single entity and improve restoration efforts by providing additional scrutiny, cost share opportunities, and educational opportunities about the value of singular and cooperative habitat restoration efforts. Deficits in habitat are identified through review of priority area strategies outlined in the Columbia BM RC&DA (2005), Carmichael, R.W., 2006, forest and basin plans, and other documents created to direct program implementation or recovery efforts. From these designations, specific restoration efforts are developed during discussions with landowners.

To date, the Project has constructed approximately 34.7.4 Km of riparian fencing, 29 off-stream water developments, and reactivated two wells; enhanced approximately 20 Km stream, 850 acres of riparian and floodplain habitat, and 850 acres of upland habitat on private and public properties. Appendix I & II show sites where maintenance or restoration efforts have been completed since 2008 or in 2011 on both private and public lands. Private landowners who have entered into a Riparian Conservation Agreements with CTUIR include Forrest Rhinehart (Upper Camas Creek), Robin, Mary Lou, William, and Andy Fletcher (Lower Camas Creek), Gene and Julia Engblom (Owens Creek), Richard and Dorothy Allstott (Snipe Creek), Steve Berry (Deer Creek), and Billy Neal and Sheri Helms (NF John Day). Cooperative partners with whom CTUIR hasn't entered into a Riparian Conservation Agreement have included the North Fork John Day Watershed Council (NFJDWC), the Umatilla National Forest (UNF), Wallowa Whitman National Forest, Grant Soil and Water Conservation District, National Resource Conservation Service (NRCS), and the Farm Services Agency (FSA) among others. Conversations with these and other

groups or agencies are proving useful for identifying additional restoration opportunities and dispersing information regarding the benefits of cooperative restoration efforts to develop trust with small rural communities within the NFJD Basin. For example, the NFJDWC has proven invaluable for reaching out to the 1200 people residing within the basin that would otherwise be reluctant to cooperate with a tribal or government entity.

Bonneville Power Administration (BPA) initially approved the Project in 2000 with on-the-ground actions following in 2001 to provide partial mitigation for the loss of native salmon and steelhead resulting from the construction of dams on the Columbia River. Additional habitat restoration funds are secured through entities such as the FSA, NRCS, Oregon Watershed Enhancement Board (OWEB), Oregon Department of Fish and Wildlife (ODFW), U.S. Bureau of Reclamation (BOR), the U.S. Army Corps of Engineer (Corps) and other private or public. In an effort to reduce costs associated with overhead the UNF's North Fork John Day Ranger District provides office and storage space while vehicles and equipment are shared with:

(1) BPA Project #198710001 – CTUIR's Umatilla River Basin Anadromous Fish Habitat Enhancement Project
(2) BPA Project #199604601 – CTUIR's Walla Walla Basin Habitat Enhancement Project
(3) BPA Project #199608300 – CTUIR's Grande Ronde Basin Habitat Enhancement Project
(4) BPA Project #200820100 – CTUIR's Protect and Restore the Tucannon Watershed

This annual report covers efforts conducted from 1 February 2011 through 31 January 2012.

SITE DESCRIPTION

The NFJD River (Figure 1.) is the largest tributary to the John Day River flowing westerly for 180 kilometers to join the mainstem John Day River near Kimberly, Oregon. The NFJD River's basin covers 47,885 square kilometers consisting of 37% private, 62% federal, and 1% state lands. The NFJD has been designated as a Wild and Scenic River from Camas Creek upstream to the head waters including one portion classified as "Wild," two as "Scenic," and two as "Recreational." These segments are primarily managed by the UNF and WNF. State Scenic Waterways designated by the State of Oregon, stretch from Monument, OR upstream to the NFJD Wilderness boundary and from the confluence with the North Fork John Day River upstream to the Crawford Creek Bridge on the Middle Fork John Day River. The Middle Fork John Day River (MFJD) (Figure I) flowing into the NFJD is generally considered and primarily managed as a separate system by ODFW, the Confederated Tribes of the Warm Springs Reservation of Oregon, and The Nature Conservancy.

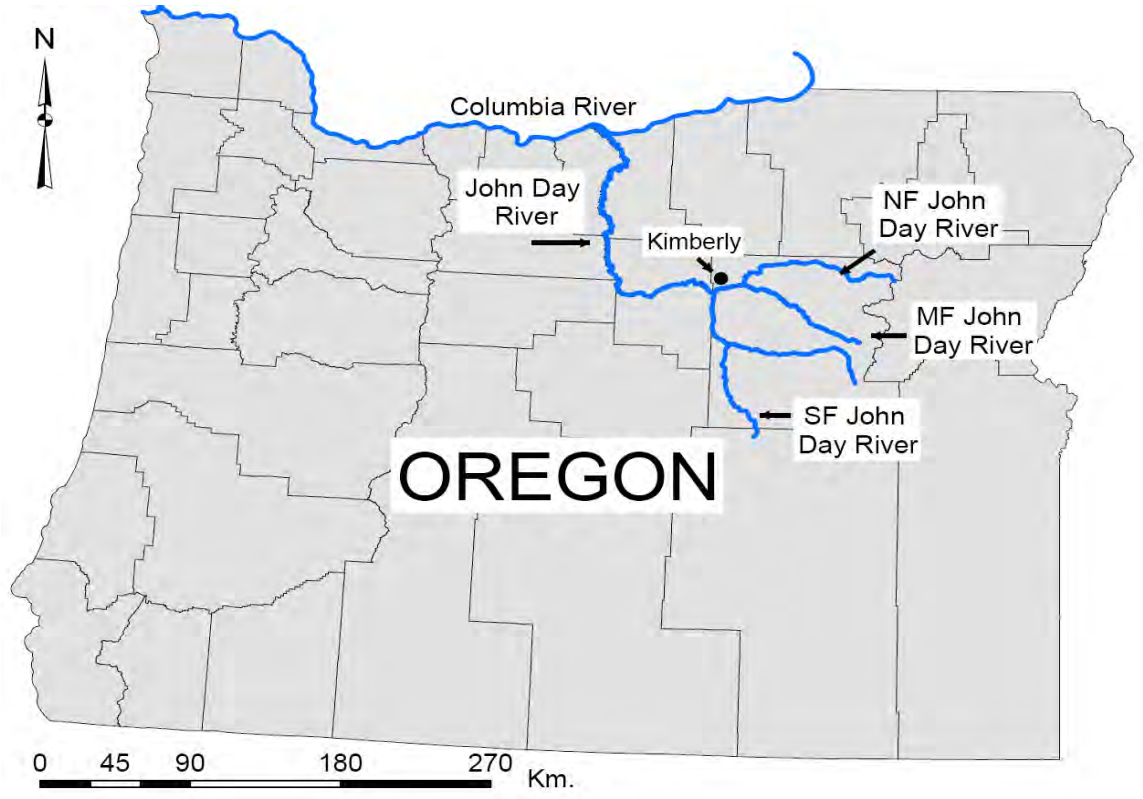

Figure I. Regional map showing the John Day Basin.

The NFJD contains fifteen 5th Field HUC's (Figure II) of which four, the Upper and Lower Camas Creek, Desolation Creek, and Granite Creek units are considered 'priority' areas for the purpose of concentrating the Project's restoration efforts. The CTUIR currently maintains six Riparian Conservation Agreements with landowners on the NFJD, Deer, Camas, Owens, and Snipe Creeks (Figure III, Appendix I).

Diverse land forms and geology range from 558 meters at the mouth to 2530 meters in elevation in the headwaters and consist of Columbia River Basalts, oceanic crust, volcanic materials, historic river and lake deposits, and recent river and landslide deposits. The North Fork John Day basin has a continental climate influenced by maritime weather patterns in the higher elevation areas which are characterized by low winter and high summer temperatures, low to moderate average annual precipitation and dry summers. Climate ranges from sub-humid in the upper elevations to semi-arid in the lower elevations with 0.33 to 0.5 meters annually contributing 60% of the flow in the lower John Day River, primarily through November and March. Mean annual temperatures are 3° C in the upper sub-basin and 14° C in the lower sub-basin and range from <-18^{o} C in the winter to over 38° C during the summer. The average frost-free period is 50 days in the upper sub-basin and 200 days in the lower sub-basin. The Blue Mountains in the basin's higher elevations produce a range of microclimates unlike the lower basins typical warmer and more stable patterns.

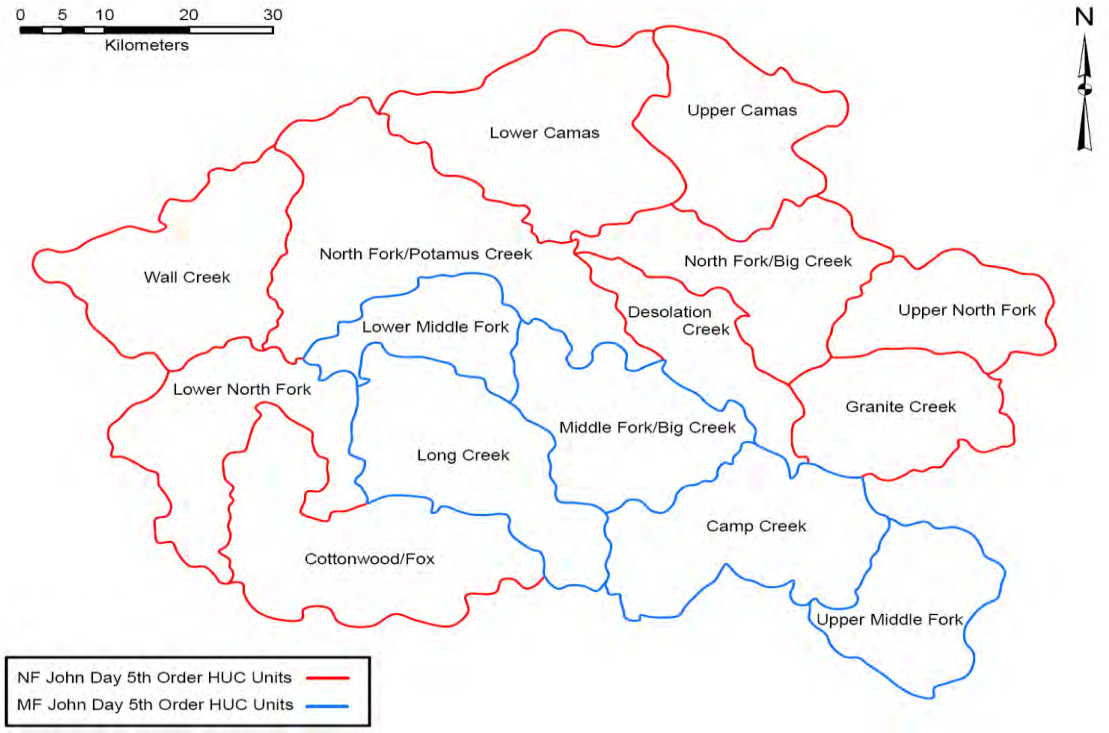

Figure II. NFJD 5th field HUC's

Historically, the John Day River was one of the most significant anadromous fish producers in the Columbia River Basin (CRITFC 1995) due to its stability, strong summer stream flows, high water quality, and heavy riparian cover. Riparian areas were densely populated with aspen, poplar, willow, and cottonwood and beaver were abundant. Large spring and fall Chinook salmon migrations and numerous beaver sightings indicated the John Day River contained extensive in-stream habitat diversity. Resident trout species including westslope cutthroat (*Oncorhynchus clarki lewisi*), interior redband and bull trout gave way as habitat changed in response to land management objectives. These changes favored introduced species such as

brook trout (*Salvelinus fontinalis*), smallmouth bass (*Micropterus dolomieui*), and redside shiner (*Richardsonius balteatus*) in places historically dominated by native resident salmonids. The NFJD currently supports strong native runs of spring Chinook salmon and summer steelhead in the Columbia River Basin with minimal influence from hatchery stocks. Narum et al. 2008 confirmed the John Day River's status as a viable refuge for wild stocks with limited anthropogenic influence.

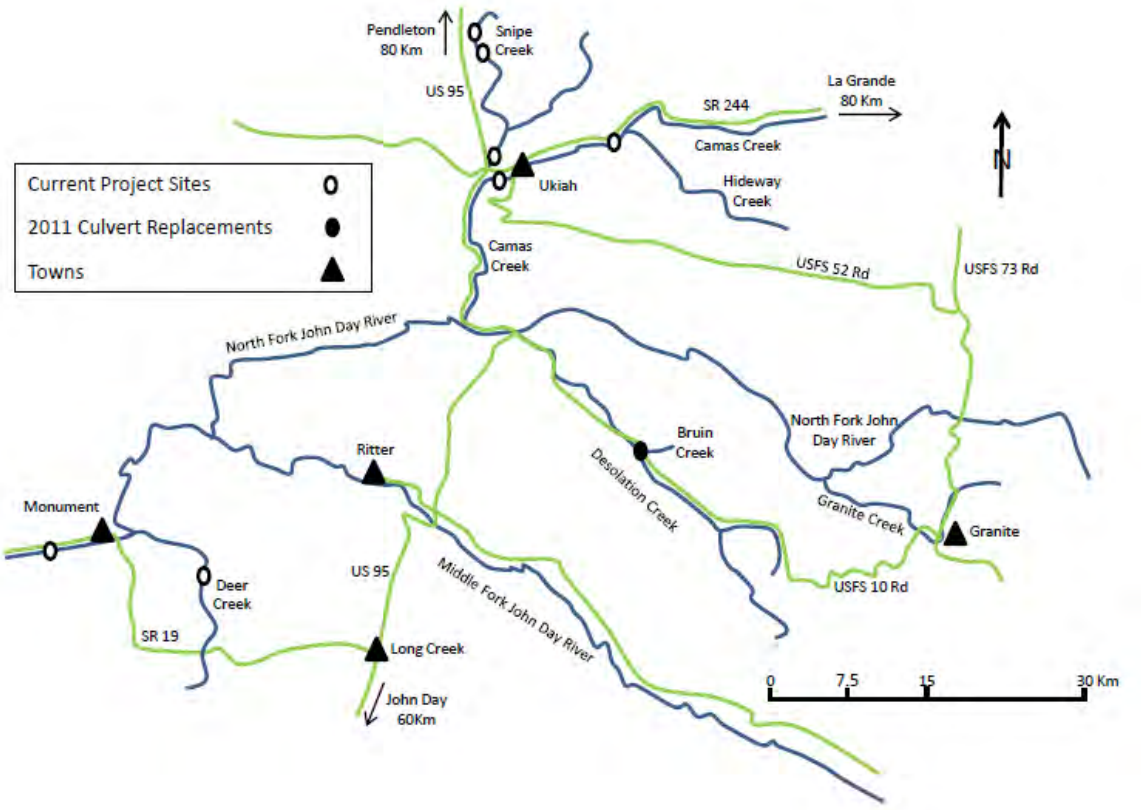

Figure III. Restoration and Protection Site Locations.

The NFJD steelhead population currently occupies ten major spawning areas (including Upper and Lower Camas, Owens, Granite, and Desolation Creek) and five Minor Spawning areas distributed throughout the basin (Carmichael, R.W., 2006). Surveys indicate approximately 1,400 kilometers of the NFJD (StreamNet, 2008) and its tributaries are currently used for spawning and rearing, with index surveys showing consistent use over time. Index area spawning surveys from 1965 to 2005 on NFJD tributaries indicate returning adult steelhead in natural production areas ranged between 369 spawners in 1990 to 10,235 spawners in 1965 (Carmichael, R.W., 2006). While these numbers are somewhat variable over time, current populations appear to be substantially less productive then historic populations (Columbia BM RC&DA 2005) and show a long term decreasing trend. Declines in the basin's summer steelhead population warranted a threatened listing under the ESA in 1999 (The North and Middle Forks John Day River Local Advisory Committee 2002).

Surveys indicate approximately 300 kilometers (approximately 57% of total stream

kilometers; (StreamNet, 2008) of the NFJD and its tributaries provide spawning and rearing habitat for Spring Chinook salmon with relatively consistent use over time. However, due to run and spawn timing specific areas may not be used consistently in response to limiting factors. For instance, Granite Creek has shown a long term decline in use for unknown reasons, habitat use in Camas Creek is opportunistic and responds to available flows and water temperatures, and returning adults of the MFJD population died prematurely during 2007; likely due to elevated water temperatures (Unterwagner 2007).

Limiting habitat factors identified in the NFJD basin (Table 1) and designated in Carmichael (2006), Columbia BM RC&DA (2005), and various management plans include water quality (temperature, modified flows, nutrient input), in-stream habitat (structure, cover, sediment loading, channel morphology and processes,), and riparian health. Most streams in the NFJD basin are considered to be in relatively good condition, with the exception of elevated late summer water temperatures that exceed Oregon Department of Environmental Quality standards. In general, most indicators of channel condition within the NFJD suggest the basin is "functioning at risk".

Historic and current land use practices or threats (Table I) within the have reduced river stability, decreased high quality summer stream flows and water quality, reduced heavy riparian and floodplain cover, and compromised physical and biological processes related to these associations and structures. The loss of abundant riparian and flood plain vegetation, once robust beaver populations, and large spring and fall Chinook salmon migrations suggest the NFJD has lost a significant amount of in-stream habitat diversity and may now have an altered hydrologic cycle. Changes in the hydrologic cycle attributed to altered riparian and floodplain areas and stream morphology and processes can be indicated by increased runoff, altered peak flow regimes, reduced ground water recharge and soil moisture storage, and low late-season flow and elevated water temperatures. Historic and current land management strategies, in combination with possible changes in the hydrologic cycle, have contributed to stream channel instability (i.e., channel widening and downcutting) in some portions of the NFJD. Additionally, wildlife habitat has become increasingly fragmented, simplified in structure, and infringed upon or dominated by non-native plants (ICBEMP 2000).

Major Limiting Factors	Threats
Floodplain & Channel Structure In-Stream Habitat Sediment Routing Water quality	Riparian Disturbance Stream Channelization & Relocation Grazing Forest practices Roads Irrigation Withdrawals Mining & Dredging

Table I. Limiting factors and threats within the North Fork John Day Basin.

Changes in habitat have also resulted from a century of fire suppression activities and fire exclusion from the forest ecosystem resulting in greater forest stand densities than historic natural conditions. Dense stands are more susceptible to insect infestation, disease, and catastrophic stand replacement fires. Juniper encroachment into native grasslands resulting from altered an altered fire regime have served to increases evapotranspiration and reduce stream flows. Roads created to facilitate logging operations and fire suppression have increased

in-stream sedimentation from road erosion and disturbed areas during logging operations. Culverts and other structures associated with road construction have fragmented existing in-stream and riparian, floodplain, and wetland habitats.

Altered native habitat conditions also facilitate the spread of non-native and highly adaptable species. Nonetheless, habitat conditions on public lands and some private lands are generally considered to be improving through cooperative efforts between public and private landowners, tribal programs, federal, and state agencies, and groups such as Soil and Water Conservation Districts and Watershed Councils.

2011 ACCOMPLISHMENTS

A description of individual Work Elements to which efforts were directed during 2011 include;

WE A – Produce Pisces Status Report

Completed and submitted as required.

WE B - Produce Environmental Compliance Documentation

Permits and requisite information was either secured by CTUIR or passed on to BPA for all efforts save WE M which will be discussed later.

WE C – Identify and Select Projects

In an effort to identify and prioritize new habitat restoration efforts, we obtained background information from numerous sources (county records, previous contacts, sub-basin and recovery plans, and consultation with landowners) and coordinated with basin shareholders. This resulted in coordination meetings with five landowners for proposed 2011 and out year efforts.

Restoration opportunities were identified in cooperation with the UNF, WNF, and NFJDWC during 2011 and beyond when funding becomes available with planning beginning for efforts in 2014 and beyond. The Project agreed to provide additional cost share towards a grant application submitted by the NFJDWC supporting cooperative restoration efforts from 2011 through 2013 addressing mine runoff and passage barrier replacements within the Granite Creek basin. Longer range planning to streamline future cooperative effort development and implementation will allow for the efforts proposed in the NFJDWC grant application and several others currently under consideration.

WE D – Outreach and Education

During 2011, outreach included participation in the Monument Resource Fair and communication with and through the North Fork John Day Watershed council

WE E – Maintain Water Developments

Water developments were maintained throughout 2011 and we will continue to coordinate with landowners regarding maintenance. The Upper Camas Creek well developed issues and was replaced in early 2011. Conversations with the landowner regarding the solar pumps ability to provide ice free water during the winter led to a request for specific information indicating the landowner's thoughts on how to modify the existing setup. At this point specific information has not been secured and discussions continue related to cost share and the feasibility of additional efforts.

WE F – Investigate for Livestock Trespass

Livestock trespass was investigated and rectified throughout the grazing season. Trespass occurred only on the Upper Camas Creek site due to the failure of a boundary fence. The adjacent landowner was contacted and the fence repaired.

WE G – Maintain Fences

Fence inspections throughout 2011 did not identify damage that wasn't repaired in short order. On Upper Camas Creek a boundary fence failed and was repaired by the adjacent landowner and on Deer Creek fallen trees were removed from water gaps and pulled off the fence.

WE H – Maintain Vegetation

A contract for noxious weed control efforts awarded in February 2011 used herbicides on Upper Camas, Owens, Snipe, and Deer Creeks and the NF John Day sites. Significant progress has been made on the Deer Creek and NF John Day River sites however, seed sources from within the site and neighboring properties continue to demand more efforts than those properties in and around Ukiah, Oregon. Efforts outside these areas shall continue through cooperative efforts with partners, for instance, a cooperative agreement with the City of Ukiah successfully provided weed control on Lower Camas Creek site and adjacent properties within and around Ukiah.

In an effort to protect native vegetation CTUIR continues to place and maintain wire fencing around select plantings on Lower Camas Creek and although the shifting channel has consumed some protected trees the fencing has significantly reduced mortality by deer and elk bourse. The cost of wire does not allow similar protection on all trees.

WE I – Collect Monitoring Data

Monitoring efforts during 2011 were undertaken to provide a baseline for future efforts since little information exists prior to cooperative efforts. Sampling efforts included longitudinal transects in the channel along with cross section transects reaching 10m on either side of the stream, and photopoints. A summary of the collected data (Appendix III) represents post-implementation data upon which we will elaborate during 2011. Sites on which data was collected included only the Upper and Lower Camas Creek sites. A result of the 2010 analysis and the individual projects duration all sites save these two appear to have stabilized and therefore annual monitoring efforts are unwarranted at this time. Lower Camas Creek continues to seek a stable channel form and the on the Upper Camas Creek site pre-implementation data is being collected.

Those sites on whish data was not collected during 2011 will monitored every third year unless an analysis of flow reoccurrence intervals dictates otherwise. While we have been unable to investigate this approach due to time constraints the potential for this approach is extremely appealing.

WE J – Acquire Stream Temperature Data

Temperature loggers were installed in May 2011 and removed at the end of September 2011. Recovered files were subsequently passed on to NOAA for uploaded into their database. Descriptive values for the data are included in Appendix III.

WE K – Bruin Creek Culvert Replacement

Over the past three years the road prism about the Bruin Creek culvert (Figure IV) had been eroding causing the old culvert to split at the first upstream seam. During spring runoff the culvert plugged resulting in a significant loss of prism material; fortunately,

implementation had been planned for 2011. Increased estimated costs resulted in diverting funding from the Sponge Creek culvert replacement to this one which was taken care of in early 2011. Implementation began and ended within the in-stream work window resulting in a smaller road prism in part due to the loss of eroded material. There were no complications or cost overruns and cost share included $17,000 (UNF) and $82,086 (NFJDWC/Ecotrust Grant Funding) ($91,047 (CTUIR). The UNF secured and administered a contract for this effort, the NFJDWC provided funding though and EcoTrust Grant, and CTUIR provided funds for implementation.

Figure IV. The Bruin Creek culvert before (left) and after (right) replacement. Note erosion above and around the old culvert and streamflows entering the culvert at the first seam.

WE L – Sponge Creek Culvert Replacement

Due to an increase in estimated costs and the failure of the road prism about the Bruin Creek culvert funds were diverted from this WE to support the Bruin Creek culvert replacement. The design is partially complete and replacement will occur in the future as funding becomes available.

WE M – Upper Camas In-stream Restoration

During this performance period all permits were secured in time for in-stream implementation save a Biological Opinion from NOAA. A Biological Opinion was submitted and consultation requested by BPA in February with the Biological Opinion arriving in early 2012. The Biological Opinion precipitated additional consultation with NOAA to secure addition clearance regarding language in the Biological Opinion which did not allow for Duckbill anchors outlined in the Biological Assessment and design plans. As such CTUIR was unable to implement the project during 2011.

WE N – Fox/Cottonwood Leafy Spurge Control

During 2011 targeted areas along 41 miles of Fox Creek were mapped. These efforts indicated that leafy spurge remained widely distributed in the areas where targeted mapping was conducted. The 2011 survey suggested that infestations are likely due to remote sites infestations and not a lack of treatment efficacy as 2010 herbicide treatments showed substantial improvement (Figure V). A total of 59 acres were treated with herbicides. Funding for this effort included $4,660 from the NFJDWC and $14,065 from CTUIR. The NFJDWC secured and administered a contract with a certified sprayer and CTUIR provided funding for labor.

Figure V. Treated area in 2010 (upper left), the same area during 2011 (upper right), and successful biological controls from 2010 noted in 2012 (lower left).

WE O – Rudio Creek Guzzlers

A shift in ranch management prevented the implementation of this effort. The landowner was not prepared to begin construction until the 2011 performance period had ended and did not show an interest beyond that point.

WE P –Red Boy Pipeline Replacement

During 2011 delays related to cost share and contracting prevented the pipeline replacement with implementation scheduled for 2012. The expected pipeline replacement in 2012 was push out to 2013 so that an assessment of the mine audit, pipeline, ponds, and contributing factors could be completed to confirm pipeline sizing.

WE Q – Beaver Creek Streambank Stabilization

The 2010 effort to return late summer flows to Beaver creeks channel was successful although scour in one location needed attention in 2011 to provide for long term stability. While most of the stream channel stabilized during high flows scour along a meander bend exposed a small portion of the Bentonite blanket used to prevent flows from leaving the channel through the substrate. In cooperation with the contractor who completed the 2010 effort and a local resident with appropriate equipment larger rock was placed to protect the streambank and create localized turbulence to decrease water velocities (Figure VI). The treatment proved effective in 2012 and CTUIR will continue to monitor site stability.

Figure VI. Scoured streambank in June of 2011 (left) and larger material placed during August of 2011 (right).

WE R – Prater Water Right Certification

During 2011 a certified water rights examiner completed the appropriate steps to certify an effort by the landowner to switch from wheel line to central pivot irrigation. This effort completed one which began in 2010 to move two irrigation diversions to a permanent scour hole thereby eliminating the need for push-up dam maintenance. Total costs and contributors for this effort included the NFJDWC with grant funding from Ecotrust ($425) and CTUIR ($2,376).

WE S – Produce Annual Report

See North Fork John Day River Anadromous Fish Habitat Enhancement Project, 2011 Annual Report.

WE T – Produce Project Deliverables

The 2011 Statement of Work and budget were submitted for approval in November of 2012 with subsequent changes in response to requests from CTUIR and BPA personnel.

DISCUSSION

Four properties (Lower Camas, Snipe, Owens, and Deer Creeks) did not require any effort beyond regular communications with the landowner and monitoring efforts. Progress on other sites has been outlined in the 2011 Accomplishments section of this report; however, several aspects of the 2011 SOW require additional comment.

Monitoring data (WE 157) has been collected according using standard techniques to define and track changes in channel morphology, stream temperatures, and vegetation to date, however, CTUIR's Fishery Habitat program will begin defining specific methods depending upon the type of effort undertaken in a monitoring plan currently being developed. While project leaders will still maintain a certain amount of latitude in describing and prescribing treatments the plan shall define standard set of tools for all projects. The extent of this document has not yet been fully defined and as such specifics such as the frequency of sampling frequency of sampling may not be identified. The project will modify sampling protocols as the plan dictates. Perhaps the greatest change with respect to monitoring data and its management will be CTUIR's hiring a Data Coordinator who will work with individual projects to better manage collected data. This will include improving data storage and query capabilities improving time and resource management.

During 2012 BPA identified a new reporting system which will begin replacing the 'traditional' reports of previous years. Classes to introduce this new format were held in November 2012 and not attended by this project due to scheduling conflicts. Given the upcoming Geographic Review, need to submit permit application for restoration projects, coordinate restoration projects, and submit an annual report among other tasks the proposed reporting format will not be used for the 2011-12 performance period

The Project will continue to develop and implement restoration efforts in our 'priority' basins (Camas, Desolation, and Granite Creek) and on the NFJD and Deer Creek near Monument, Oregon. Cooperative efforts outside these areas shall be considered on a case by case basis and depend on benefit to wildlife and available cost-share funds. Our approach shall continue to stress 'whole system or ridge to ridge' recovery practices, to address in-stream, riparian, floodplain, and upland components in a single effort or in cooperation with agencies or groups addressing basin-wide restoration. This approach will provide a greater long term benefit then singular efforts over a broad area.

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APPENDIX I

Sites maintained (Riparian Conservation Agreement exists) during 2010 by the CTUIR's NFJD Habitat Project. (Modified from Shaw, 2007)

Stream	Location	Stream (Km)	Riparian (Acres)	Upland (Acres)	Riparian Fence (Km)	Upland Fence (Km)	Water Gaps	Water Developments	Native Plantings
Camas Creek (Upper Camas Creek GA)	T5S R32E, Section 2 S1/2,	1.3	40	-	2.6	-	3	-	-
Camas Creek (Upper Camas Creek GA)	T5S R32E, Section 11 S1/2, Section 14	-	-	250	-	2	-	1	-
Camas Creek (Lower Camas Creek GA)	T5S R31E, Section 15 S½, Section 14 SW¼, SW¼	1.6	388	-	3.2	-	-	-	Approx. 16,000
Camas Creek (Lower Camas Creek GA)	T5S R31E, Section 15 S½, Section 14 SW¼, SW¼, Section 22 N½, Section 23 N1/2	-	-	600	-	-	-	5	-
Owens Creek (Lower Camas Creek GA)	T5S R31E, Section 10, Section 15	0.5	5.2	-	1.0	-	1	1	1800
Snipe Creek (Lower Camas Creek GA)	T4S R31E, Section 3, Section 4, T3S R31E, Section 32	1.3	34.4	-	2.3	-	2	2	Approx. 7,500
Snipe Creek (Lower Camas Creek GA)	T4S R31E, Section 3, Section 10	2.2	54	-	4.4	-	5	4	-
Deer Creek (Cottonwood Creek GA)	T8S R28E, Section 33, Section 34	0.8	22	-	8.4	-	5	4	-
	T9S R28E, Section 3, Section 4	3.4	90.2	-	-				
Deer Creek (Cottonwood Creek GA)	T8S, R28E, Sec. 32, Section 33	0.3	9	-	7.6	-	6	11	7500
	T9S, R28E, Sec. 3	3.5	98						
Lower NFJD (LNF John Day GA)	T9, R27E, Section 7	0.8	7.3	-	0.8	-	-	1	Approx. 4880

APPENDIX II

Restoration efforts undertaken by the Project and cooperative partners during 2011 where a Riparian Conservation Agreement did not exist.

Stream	Location	Stream (Km)	Riparian Treatments (Acres)	Upland Treatments (Acres)	Riparian Fence (Km)	Upland Fence (Km)	Water Gaps	Water Develop-ments	Native Plantings	Passage Barriers Removed
Bruin Creek (Desolation Creek GA)	T8SR33E, Section 20	-	-	-	-	-	-	-	-	1
Fox Creek (Long Creek GA)	T10SR28-30E, T11SR28E, R10ST27-28E, R9ST27-28E		34*	25*						

* Estimates were made of both riparian and upland areas within the riparian enclosure due to the difficulty of parsing out specific habitats. Fences used existing temporary fence lines or topography to buffer riparian areas.

APPENDIX III

Results from cross section surveys extended 10 meters onto either bank and limited to fence line and hill slope on Upper Camas

Lower Camas Creek Treated							
39.6 Left	41% Rock	12% Grass	9% Rock/Willow	6% Sand	4% Mat	3% Rock/Sedge	
39.6 - Right	75% Grass	!6% Water	9% Hawthorn				
150 - Left	68% Grass	18% Water	13% Tree Mat	1% Dirt			
150 - Right	36% Grass/Rock	27% Rock	18% Grass	18% Water			
245 - Left	21% Grass	20% Grass/Dirt	14% Rock	13% Mat	6% Grass/Rock	5% Rock/Grass	
245 - Right	26% Mat	22% Grass	19% Grass/Rock	18% water	8% Spring Channel	4% Sedge	3% rock
Upper Camas Creek							
# 1 – Left	74% Water	17% Grass	9% Sedge				
# 1 – Right	39% Water	35% Snowberry/ Grass	10% Grass	7% Dirt	6% Dirt/ Rock/Grass	3% Hawthorn	
# 2 – Left	52% Water	28% Grass	21% Rock/Grass				
# 2 – Right	36% Water/Rock	22% Grass/ Snowberry	19% Rock/Grass	17% Water	7% Rock/Alder		
# 3 – Left	51% Water	42% Grass/ Snowberry	7% Rock				
# 3 Right	37% Grass/Rock	33% Water	23% Grass/ Snowberry	6% Rock			
# 4 – Left	40% Grass/Alder	37% Water	22% Grass				
# 4 – Right	27% Grass	26% Water	23% Rock/Alder	14% Dirt/ Grass/Alder	5% Cut Bank		
# 5 – Left	26% Water	32% Rock/Alder	12% Alder/Grass				
# 5 – Right	26% Water	21% Grass/Rock	21% Grass/ Sand/Rock	19% Grass/ Alder/ Snowberry	12% Grass/ Snowberry		
# 6 – Left	85% Water	15% Grass/Clay					
# 6 – Right	45% Water	42% Snowberry	7% Sedge	5% Rock/Sedge			
# 7 – Left	65% Water	27% Rock/Grass	8% Rock/Alder				
# 7 – Right	50% Grass/Snowberry	47% Water	3% Clay				
# 8 – Left	89% Water	11% Rock					
# 8 – Right	47% Snowberry/Grass	30% Water	8% Rock	4% Woody Debris	4% Snowberry/ Rock	2% Rose	
# 9 – Left	90% Water	10% Rock					
# 9 – Right	41% Water	41% Grass/ Snowberry	7% Sand	6% Grass	6% Grass/Rock		
# 10 – Left	93% Water	7% Woody Debris					
# 10 - Right	55% Grass/Snowberry	37% Water	8% Rock				
# 11 – Left	77% Water	13% Rock/ Grass/Current Snowberry	10% Rock				
# 11 – Right	54% Snowberry/Grass	42% Water	5% Rock				
# 12 – Left	59% Water	41% Sedge					
# 12 - Right	37% Water	20% Grass/Skunk Cabbage/Sedge	14% Hawthorn	8% Grass	6% Grass/Sedge		

2011 Photopoints

Upper Camas Creek Photo Point at Bank Pin Location between XS # 4 and XS # 5

Lower Camas Creek Photo Point at XS 150

NFJD at old Power Pole

Deer Creek at Road Crossing

Snipe Creek at Lower End

Owens Creek at Lower End

2011 Pebble Count Results

Lower Camas Creek

	$D_{50\ (cm)}$	$D_{84\ (cm)}$	Minimum Median Diameter (cm)	Maximum Median Diameter (cm)
Treated				
39.6	8	4	1.83	20.00
70	15	5	0.67	18.00
150	7	5	1.00	22.67
245	8	3	1.00	19.67
Untreated				
0	8	4	0.50	14.17
70.5	11	2	1.00	18.83

Upper Camas Creek

XS	$D_{50\ (cm)}$	$D_{84\ (cm)}$	Minimum Median Diameter (cm)	Maximum Median Diameter (cm)
1	12	3	0.50	34.67
2	4	2	1.00	28.67
3	3	2	0.50	28.00
4	4	2	2.00	28.00
5	9	3	1.75	32.00
6	5	4	0.75	27.33
7	7	2	1.00	37.67
8	5	3	1.00	25.00
9	2	5	1.00	23.67
10	7	3	1.25	26.33
11	6	2	0.75	30.00
12	4	2	0.75	29.00

Water Temperatures on Camas Creek from Highway 244 to Wayside approximately 15 Miles in Four Locations

Highway 244	2 June	Low - 5.244 @ 0800 hrs	High - 8.182 @ 1800 hrs
Highway 244	1 August	Low - 16.808 @ 0900 hrs	High - 25.805 @ 1600 hrs
Highway 244	27 September	Low - 8.481 @ 0800 hrs	High - 15.855 @ 1600hrs
Upper Rhinehart	2 June	Low – 5.037 @ 1100 hrs	High – 7.582 @ 1900 hrs
Upper Rhinehart	1 August	Low – 14.517 @ 0800 hrs	High – 25.61 @ 1600 hrs
Upper Rhinehart	27 September	Low – 6.674 @ 0700 hrs	High – 19.092 @ 1400 hrs
Lower Rhinehart	2 June	Low - 5.037 @ 1100 hrs	High - 7.481 @ 2000 hrs
Lower Rhinehart	1 August	Low -14.9 @ 0800 hrs	High - 26.39 @ 1600 hrs
Lower Rhinehart	27 September	Low - 8.978 @ 0800 hrs	High - 15.76 @ 1700 hrs
East Fletcher	2 June	Low - 7.481 @ 0700 hrs	High - 10.259 @ 1900 hrs
East Fletcher	1 August	Low - 12.98 @ 0700 hrs	High - 20.234 @ 1600 hrs
East Fletcher	27 September	Low - 9.965 @ 0800 hrs	High - 14.996 @ 1600 hrs
Wayside	2 June	Low - 6.978 @ 1000 hrs	High - 9.275 @ 2000 hrs
Wayside	1 August	Low - 14.9 @ 0900 hrs	High - 23.1 @ 1800 hrs
Wayside	27 September	Low - 11.041 @ 1000 hrs	High - 14.9 @ 1600 hrs

Codes/metrics used for longitudinal and cross sectional transects.

Bank Stability
No vegetation, stable, no erosion - 1
No vegetation, unstable, actively eroding - 2
Vegetation, stable, no erosion - 3
Vegetation, unstable, actively eroding - 4
Substrate
Organics
Silt
Sand
Gravel = 6mm - 6.4cm
Cobble = 6.4cm - 15.3cm
Rubble = 15.3cm - 30.6cm
Boulder = 30.6cm - 91.5cm
Bedrock = > 91.5cm
Wood Class
1 - Absent
2 - Wood present
3 - Wood present, some cover
4 - Wood present, med. To large, good cover
5 - Large wood, large jams

Results from longitudinal habitat survey results for restoration sites and averaged across all measured habitats in a transect.

	Depth (m)	Width (m)	Length (m)	% Slope	Flood Prone Width (m)	Bank Full Width (m)	Right Bank Stability	Left Bank Stability	% Organics	% Silt	% Sand	% Gravel	% Cobble	% Rubble	% Boulder	% Bedrock	% Shade Left	% Shade Center	% Shade Left	Wood Class	Species
Lower Camas Creek Untreated																					
Riffle	0.17	4.7	20.5	.004	> 100	16.4	3	4	10	-	-	4.	50				100	-	-	1	-
Run	0.19	5.3	38	.001	> 100	22.2	3	4	10	10	-	40	40	-	-	-	-	-	100	1	Z
Lower Camas Creek Treated																					
Riffle	0.14	2.4	11	.017	> 100	29.2	4	3	10	-	-	50	40	-	-	-	10	-	100	1	Z
Glide	0.22	7	35.5	.0003	> 100	24.2	4	3	10	-	-	45	45	-	-	-	-	-	100	1	Z
Scour Pool	0.40	5.5	7.8	.004	> 100	29.6	4	3	20	10	10	40	20	-	-	-	10	-	100	1	Z
Back Water	0.11	2.1	34.4	.005	> 100	18.2	4	3	40	50	-	10	-	-	-	-	-	-	100	2	-

Results from cross section habitat surveys for restoration sites. Data was averaged where multiple habitat types existed within a reach.

	Habitat Type	Land Use	Right Bank Stability	Left Bank Stability	Wet Width (m)	Bank Full Width (m)	Flood Prone Width (m)	% Organics	% Silt	% Sand	% Gravel	% Cobble	% Rubble	% Boulder	% Bedrock	% Shade Right	% Shade Center	% Shade Left	Wood Class
Upper Camas Creek																			
XS - 1	Run	Riparian	3	3	15.4	18.1	> 50	5	5	40	35	15	-	-	-	60	-	-	1
XS - 2	Riffle	Riparian	3	3	11	25.9	> 50	-	-	5	25	45	25	-	-	-	-	-	1
XS - 3	Riffle	Riparian	3	3	13.5	18.5	> 50	-	-	-	35	50	15	-	-	-	-	-	1
XS - 4	Riffle	Riparian	3	3	12.25	23.3	> 50	-	-	-	10	60	30	-	-	100	-	-	1
XS - 5	Riffle	Riparian	3	3	13.3	19.1	> 50	-	-	-	5	75	15	5	-	100	-	-	1
XS - 6	Riffle	Riparian	3	3	19.95	24.7	> 50	-	-	-	65	30	5	-	-	-	-	100	1
XS - 7	Riffle	Riparian	4	3	18.65	24	> 50	-	-	-	70	20	10	-	-	-	-	100	1
XS - 8	Glide	Riparian	3	3	13	16	> 50	-	-	-	15	35	30	20	-	-	-	100	1
XS - 9	Riffle	Riparian	3	3	16.4	20.1	> 50	-	-	-	25	60	10	5	-	-	100	100	1
XS - 10	Riffle	Riparian	2	3	18.5	21	> 50	-	-	-	20	60	15	5	-	-	100	100	1
XS - 11	Riffle	Riparian	4	3	18.3	21.7	> 50	-	-	-	10	50	30	10	-	-	-	100	1
XS - 12	Glide	Riparian	3	3	14.7	18.9	> 50	-	15	-	30	50	5	-	-	-	-	-	1
Lower Camas Creek Untreated + Treated XS # 150																			
XS - 0	Run	Riparian	3	4	3.1	34	> 100	10	-	-	70	20	-	-	-	40	-	100	1
XS - 150	Glide	Riparian	3	4	10.9	30.7	> 100	40	10	-	25	5	-	-	-	100	-	40	1