

**NORTH FORK JOHN DAY RIVER BASIN ANADROMOUS FISH HABITAT
ENHANCEMENT PROJECT Progress Report for 1 May 2020 through 31 August
2021**

BPA Contracting Officer:

Jesse Wilson

Prepared by:

John Zakrajsek, Fisheries Habitat Biologist; Mitchell Daniel, Fisheries Biologist; Project Lead

John Clark, Fisheries Technician

Confederated Tribes of the Umatilla Indian Reservation

Department of Natural Resources

Fisheries Program

Prepared for:

U.S. Department of Energy

Bonneville Power Administration

Environment, Fish and Wildlife

P.O. Box 3621

Portland, OR 97208-3621

Project No. 2000-031-00

Contract Number 73982

August 2021

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 the 1 May 2020 to 31 August 2021 performance period using guidance from the Umatilla River Vision, 2008 Accords, John Day Subbasin Plan, Mid-Columbia Steelhead Recovery plan, John Day Basin Partnership's ATLAS based prioritization, and other plans and management documents. 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. Efforts included collaboration with Trout Unlimited and the Umatilla National Forest to complete low tech wood placements, implementation of the Granite Creek RM 7.5 design, collaboration with Grant County SWCD and Oregon Department of Fish and Wildlife to construct riparian exclusion fencing along Starveout Creek, furthering the Bull Run Creek design in cooperation with the Wallow-Whitman National Forest and North Fork John Day Watershed Council, completion an addendum for the Desolation Creek Reach 3 design, finalization of the Hidaway Creek design, and collaboration with the Umatilla National Forest and Grant County SWCD to move the Desolation Creek 10 Road Relocation forward. Noxious weeds were controlled and monitoring data collected on sites where riparian conservation agreements exist or where the CTUIR's Bio-Monitoring Project (BPA Project #2009-014-00) established monitoring sites.

ACKNOWLEDGMENTS

The Confederated Tribes of the Umatilla Indian Reservation wish to thank the Bonneville Power Administration for funding the project and its personnel Jesse Wilson, Israel Duran, Sean Welch, and others for their assistance. We would also like to give thanks to the John Day Basin Partnership and 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 Steve Boe, Hydrologist Richard Cissel, Range Manager Brad Lathrop, District Ranger Paula Guenther) and the Wallowa Whitman National Forest and its employees (Hydrologist Bob Hassmiller and District Ranger Kendall Cikanek) for assistance with cooperative restoration efforts and providing information, the North Fork John Day Watershed Council's staff for collaborating on restoration actions and coordination, and Oregon Department of Fish and Wildlife's Stephan Charette, Brent Smith, Mike Jensen, and Russell Powell Charette. Thanks also to Confederated Tribes of the Umatilla Indian Reservation staff, whose cooperation and contributions are evident in this report. Special thanks to Julie Burke, Celeste Reeves, and Michelle Thompson for administrative support, and Gary James and Mike Lambert for program support and guidance. We would like to acknowledge cooperating landowners, Ecotrust Forest Management, Mary Lou, Andy and Bill Fletcher, Robert Pedracini, Cody and Bob McConnell, Karen Flagg, and Don Hartley who supported our efforts through conservation agreements and actions implemented on their property.

TABLE OF CONTENTS

| | |
|-----------------------------------|-----------|
| <i>ABSTRACT</i> | <i>I</i> |
| <i>ACKNOWLEDGMENTS</i> | <i>II</i> |
| <i>INTRODUCTION</i> | <i>1</i> |
| <i>SITE DESCRIPTION</i> | <i>6</i> |
| <i>2016 ACCOMPLISHMENTS</i> | <i>8</i> |
| <i>DISCUSSION</i> | <i>15</i> |
| <i>REFERENCES</i> | <i>17</i> |
| <i>APPENDIX I</i> | <i>19</i> |

INTRODUCTION

Funding approved in 2000 by the Bonneville Power Administration charged the Confederated Tribes of the Umatilla Indian Reservation's North Fork John Day River Habitat project (The Project) with enhancing terrestrial and aquatic habitat. While the tools and strategies have evolved over time restoration has and will continue to be implemented through direct action or modifying land management strategies in the North Fork John Day (NFJD) basin (Figure 1).

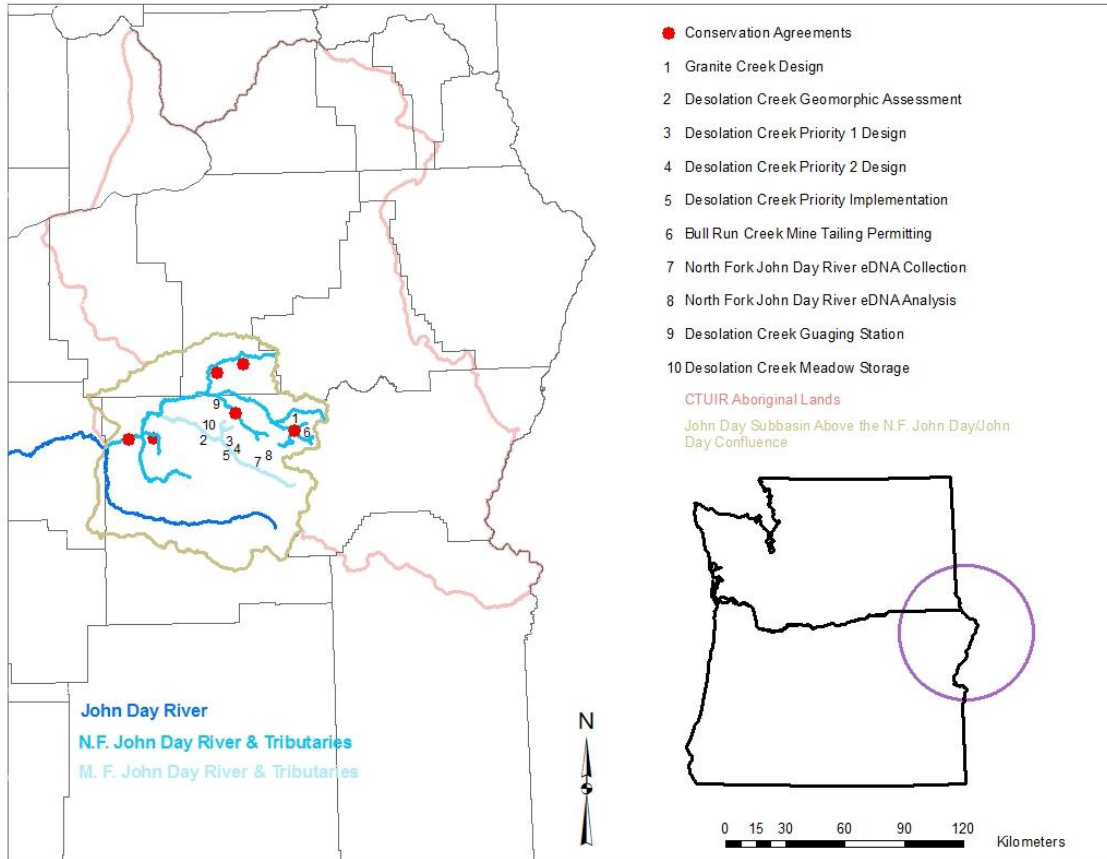


Figure 1. Map of the CTUIR ceded lands and focus basins for The Project.

Since 2000 subbasin plans and recovery documents have been used as a basis for establishing The Project's strategy as they became available. However, the development of the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) First Foods (Figure 2) have more recently formed the basis for all of The Project's efforts. The First Foods are integral to native culture and religion and their perpetuation in effect provides for the continuation of CTUIR's society. In other words, they constitute the minimum ecological products necessary to sustain the CTUIR's culture. The mechanism by which the First Foods management or enhancement occurs within the CTUIR's Department of Natural Resources was developed in 2008 and published as the Umatilla River Vision (Jones, 2008). More recently an upland vision was developed to guide management and restoration of terrestrial resources (Entress et al, 2019). These strategies identified a holistic process driven approach enveloping five touchstones (hydrology, connectivity, geomorphology, aquatic biota, and riparian vegetation). Incorporating these touchstones into development, design, monitoring, and reporting efforts holistically perpetuates the First Foods.

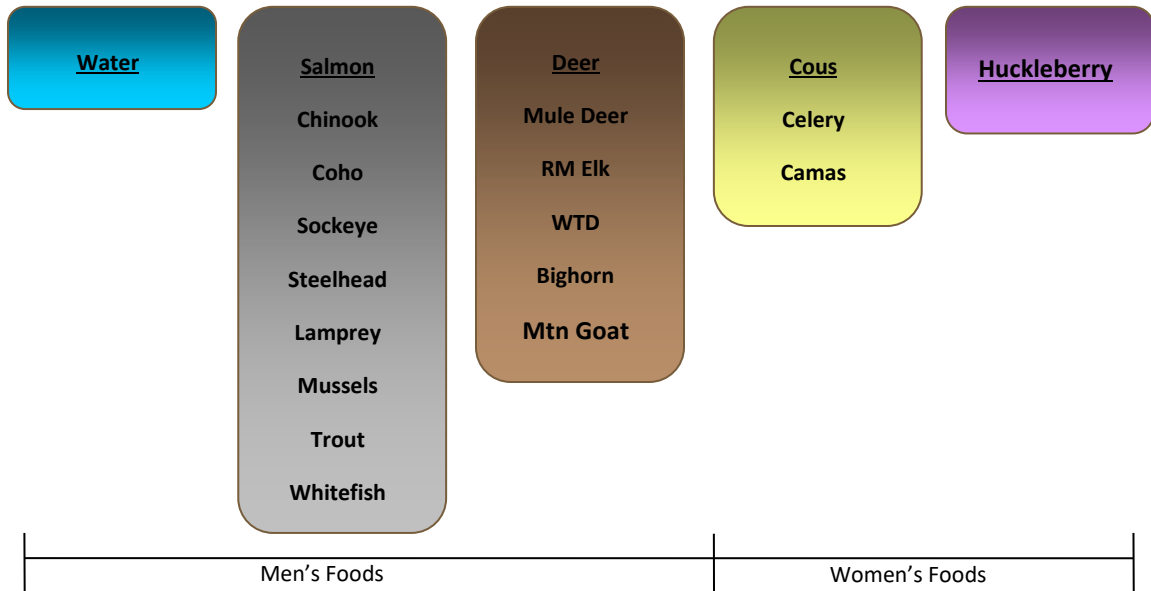


Figure 2. Characterization of the First Foods by grouping and cultural significance with respect to men's and women's foods. First Foods are listed in order of importance from left to right.

Since 2000 The Project has focused upon improving habitat for aquatic species on private lands. To that end early restoration actions were passive in nature and occurred as opportunities arose reflecting limited funding and capacity. Actions typically included removing grazing cattle from sensitive stream channel and riparian habitats. Early efforts were in part hampered by the public's unfamiliarity with the CTUIR or habitat restoration in general. As The Project provided educational opportunities and as more restoration actions were undertaken this changed to some extent. The Project has thus far implemented a variety of actions (Appendix 1) influencing 515 stream kilometers and 8138 acres through a mix of riparian fencing construction and maintenance, stock water development, passage barrier removal, native plantings, mine effluent efficiency improvements, and stream channel improvement efforts as well as several surveys and assessments. During 2020 and 2021 we continued implementing measures to protect sensitive riparian, floodplain, and wetland habitats, continued design efforts, and made progress in strategic planning through the development of assessments. The cumulative effect of these actions are expected 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*).

The Project originally focus upon private landowners proved difficult for a variety of reasons and as such, we began cooperating with public land management agencies as well. This approach was accepted by the Independent Scientific Review Panel (ISRP) during their 2006 and 2013 Geographic Review processes, the proposals for which, identified four 5th field HUCS (#1707020206, #1707020205, #1707020202, and #1707020204) in three tributaries to the North Fork John Day River including upper and lower Camas, Granite, and Desolation Creeks as focus basins (Figure 1). Designations were based upon restoration and protection potentials contained within the John Day Subbasin Plan and other guidance documents such as the 2005 John Day Subbasin Plan (NPPC, 2005), 2008 Mid-Columbia Steelhead Recovery Plan (NMFS, 2008), 2002 Bull Trout Recovery Plan (USFWS, 2002), and CTUIR's adoption of the First Foods policy and Umatilla River Vision (Jones, 2008), and more recently the CTUIR's Upland Vision (Endress et al, 2019).

Development of the John Day basin Partnership (JDBP) over the past several years has improved The Project's ability to coordinate with other restoration practitioners throughout the John Day River Basin. Additionally, products developed by the JDBP not limited to a Strategic Action Plan, outreach and funding opportunities, aquatic prioritization throughout the John Day River Basin, and an upland prioritization (in progress) greatly enhance our ability to prioritize, develop, implement, and adaptively manage restoration actions. The JDBP's ATLAS based aquatic prioritization has become The Project's primary tool for ranking potential actions although this does not replace previously CTUIR and collaborator derived inputs.

Within Granite Creek focus area the Granite Creek Action Plan (USFS, 2008) and the Bull Run Creek Action Plan (USFS, 2012) contribute to the development of collaborative restoration actions on public lands. The Project continues to work toward developing actions on private lands and will, where possible, implement restoration actions adjacent to previously developed actions to extend and improve the cumulative effect of actions undertaken.

Within Desolation Creek, The Project developed an ATLAS based prioritization for the entire basin which was adopted, in whole, into the JDBP's aquatic prioritization.

Within Upper and Lower Camas Creek The Project coordinates with the Umatilla National Forest (UNF) and Wallowa-Whitman National Forest (WWNF) in the basin's headwater areas and private landowners in the balance of the basin. The Camas Creek Geomorphic Assessment developed to understand and address sediment deposition near Ukiah, Oregon contains information and potential treatments applicable to the entire basin. As such, the document will be used in developing and implementing future restoration actions in the Camas Creek basin.

Appendix I show sites where maintenance or restoration efforts have been completed since the Projects inception on private and public lands. On private lands the CTUIR currently maintains three conservation agreements with private landowners. Cooperative partners with whom CTUIR hasn't entered into a Riparian Conservation Agreement have included the North Fork John Day Watershed Council (NFJDWC), the UNF, WWNF, 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 1,200 people residing within the basin that may otherwise be reluctant to cooperate with a tribal or government entity.

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 has provided office and storage space while vehicles and equipment are shared with:

Within the DNR Program The Project consults with other staff during the development and implementation of restoration actions and shares resources and knowledge to benefit management and restoration efforts. In the past, consultation with the DNR's Range and Forestry and Water Resources Programs has occurred. While there may not be a direct working relationship between all actions there are active collaborative efforts between The Project and the CTUIR's Bio-Monitoring Project, Instream

Flow Acquisition and Protection Project, Grande Ronde River Fisheries Enhancement and Monitoring and Evaluation Projects, Instream Flow Restoration Project, and the DNR's Cultural Resource Program. The Project's staff interact with other DNR staff as needed and during annual all staff meeting. We also contribute to DNR Fisheries Habitat Program meetings held twice a year. CTUIR's BPA funded actions we work with include but are not limited to;

- BPA Project #1987-100-01; CTUIR's Umatilla River Basin Fish Habitat Enhancement Project
- BPA Project #1996-046-01; CTUIR's Walla Walla Basin Habitat Enhancement Project
- BPA Project #1996-083-00; CTUIR's Grande Ronde Basin Habitat Enhancement Project
- BPA Project #1996-083-00; CTUIR's Protect and Restore Tucannon Watershed Project
- BPA Project #2009-014-00; CTUIR's Bio-Monitoring of Fish Habitat Enhancement Project
- BPA Project #1994-026-00; CTUIR's Pacific Lamprey Research and Restoration Project
- BPA Project #2002-037-00; CTUIR's Freshwater Mussel Research and Restoration Project
- BPA Project #2007-252-00; CTUIR's Hyporheic Flow Assessment in Columbia River Tributaries Project
- BPA Project #2008-206-00; CTUIR's Instream Flow Restoration Project
- BPA Project #2008-207-00; CTUIR's Acquisition and Protection Project
- BPA Project #2008-201-00; CTUIR's Ceded Area Juvenile and Adult Passage

John Day Geographic Region – The primary tool for basin wide organizing and collaboration has become the JDBP. While the JDBP does not receive funding from BPA it makes available opportunities for members to regularly meet to discuss and strategize restoration efforts across the John Day River basin. Because of these opportunities, JDBP members and its related operational committees are better able to develop educational resources (Outreach Committee), identify available funding opportunities (Finance Committee), and communally secure funding for the larger John Day River basin (OWEB FIP funding) than a single organization could alone. Byproducts of the JDBP's efforts also increase member resources and improve the effects of restoration actions such as the development of a Memorandum of Understanding, the SAP (JDBP, 2018), aquatic Atlas prioritization, terrestrial Atlas prioritization now under development, and Project Tracker repository (JDBP 2021). That said, the JDBP will not become a basin wide coordination entity in the form of the Grande Ronde Model Watershed as it will enhance rather than replace member coordination. Nor has the JDBP replaced The Project's adherence to CTUIR derived policy and guidance through which the JDBP's products and large scale planning and recovery guidance is filtered. Collaborators funded by BPA include;

- BPA Project #1984-021-00; ODFW John Day Habitat Enhancement
- BPA Project #1993-066-00; ODFW Oregon Fish Screens Project
- BPA Project #1998-016-00; ODFW Escape and Productivity of Spring Chinook and Steelhead
- BPA Project #2000-015-00; CTWS Upper John Day Conservation Lands Program
- BPA Project #2002-034-00; Wheeler SWCD Riparian Buffers in Wheeler County
- BPA Project #2002-035-00; Gilliam SWCD Riparian Buffers in Gilliam County
- BPA Project #2007-397-00; CTWS John Day Watershed Restoration Program

North Fork John Day River Basin - The Project developed subbasin specific guidance documents that complement regional planning or recovery documents. These include the CCGA and DCGAAP which the CTUIR and collaborators use to develop and implement effective restoration actions. Guidance provided by these documents and those developed by other collaborators such as the WWNF's Bull Run Creek Assessment (USDA 2012) provides a stable and consistent foundation that all collaborators have access to. More recent establishment of the JDBP and development of products such as the Atlas prioritization tool incorporated the DCGAAP's findings in their entirety. While the JDBP's Atlas tool have become the primary prioritization tool for the JDB it will not supplant other previously developed planning documents. Rather, it will complement those documents and provide a mechanism for periodic review

of existing conditions and progress toward meeting goals and objectives.

The Project will continue to work with NFJD cooperators beyond private landowners and citizens when the opportunities arise. This has and will continue to include collaborators not limited to the UNF, WWNF, Malheur National Forest, NFJDWC, Grant SWCD, Monument SWCD, ODFW, and City of Ukiah. Relationships are also maintained and built through the CTUIR's participation in the local community as a member of the NFJDWC's board.

The Project has developed and implemented several large scale restoration actions, the scale of which is enhanced by the JDBP's involvement. For instance of the five reach scale restoration actions currently in development or being implemented (Hidaway Creek RM 1.3, Desolation Creek Reach 3, Desolation Creek 10 Road Relocation, Granite Creek RM 7.5 and the Bull Run Creek Tailing Restoration) all have three or more collaborators and three (Hidaway Creek RM 1.3, Desolation Creek 10 Road Relocation, and Granite Creek RM 7.5) received OWEB FIP funding from the Partnership. Funding will also be sought for the Desolation Creek Reach 3 and Bull Run Creek Tailing Restoration from the JDBP as well.

This annual report covers efforts conducted from 1 May 2020 through 31 August 2021.

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 WWNF. 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. The NFJD contains fifteen 5th Field HUC's (Figure 3) 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.

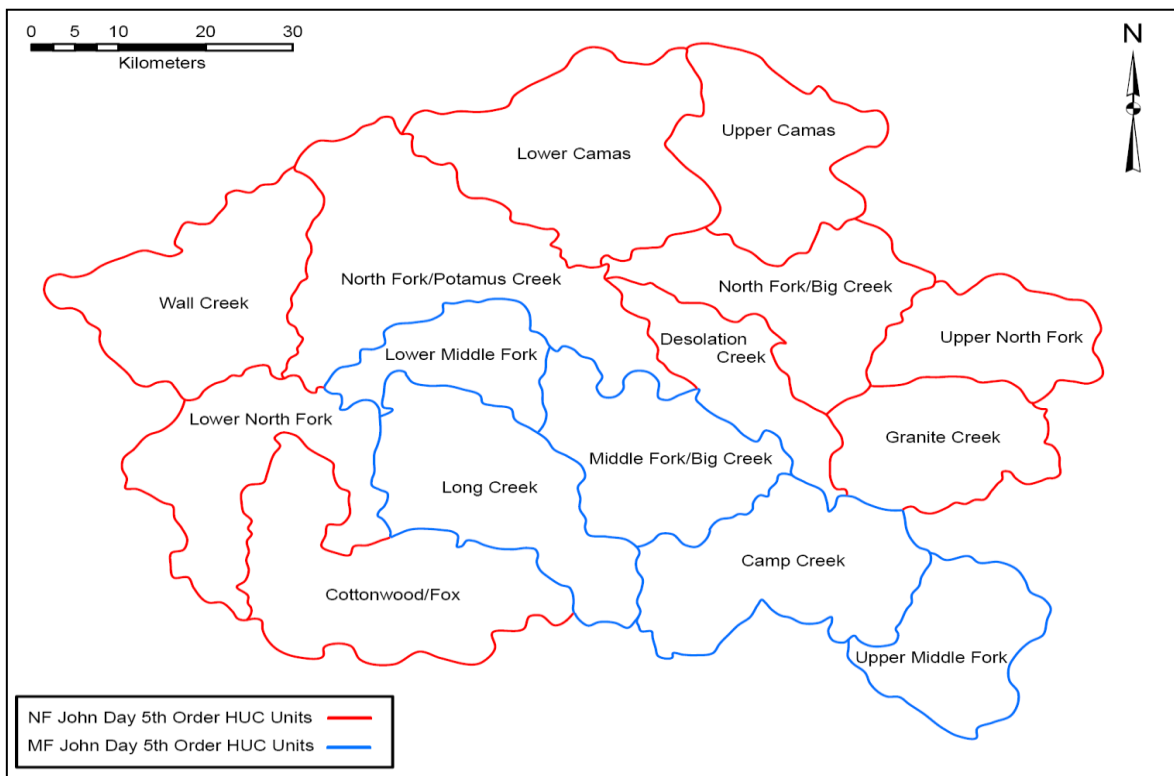


Figure 3. NFJD 5th field HUC's

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 less than -18° 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.

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 dolomieu*), and redband 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.

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 down-cutting) 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.

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”.

2020 ACCOMPLISHMENTS

A description of individual Work Elements to which efforts were directed during 2014 (Figure 4) include;

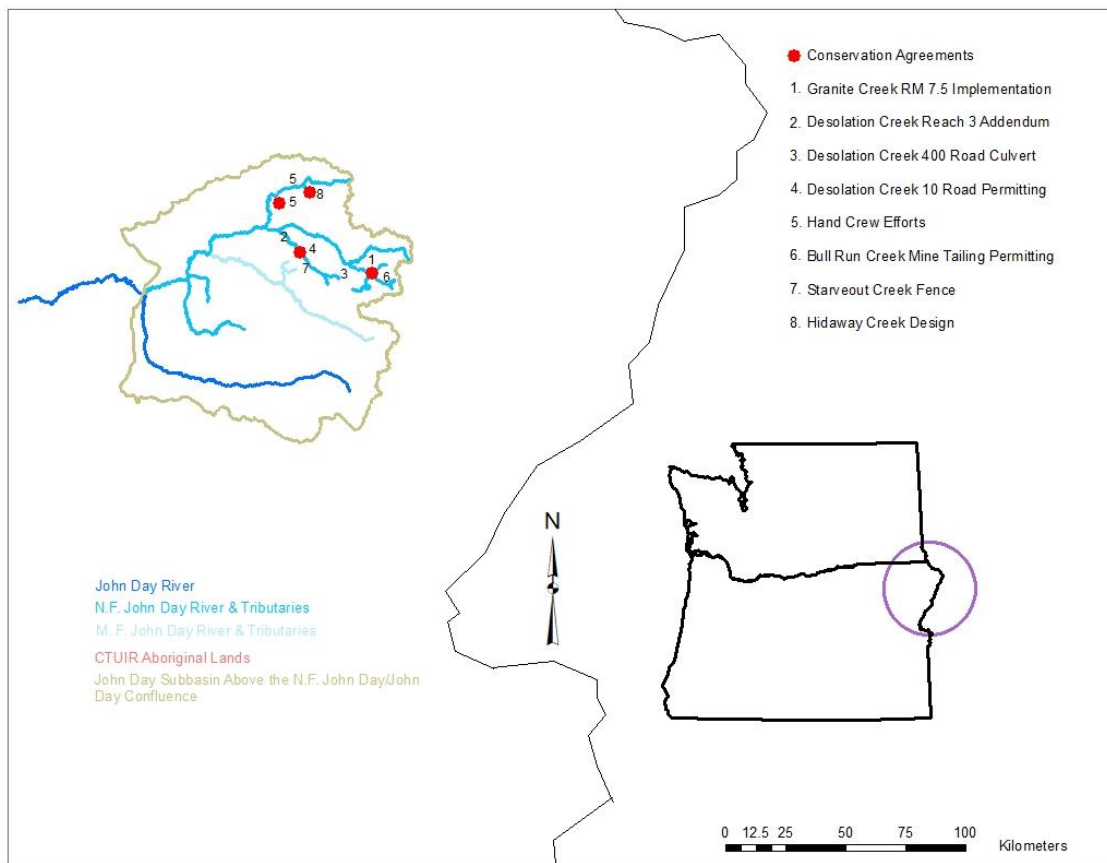


Figure 4. Restoration and Protection Site Locations.

WE A – Manage and Produce Deliverables

Staff focused on administration associated with restoration budgets, contracting, and associated duties of the CTUIR's North Fork John Day River Fisheries Enhancement Project. Specifically this entailed tasks associated with implementing restoration actions for 2020 performance period and outlining actions for the 2021 performance period. Actions in development or under consideration for future development are centered on the CTUIR's focus basins and increasing coordination through participation in the JDBP. The NFJD Fisheries Habitat Project lead contributed to the Steering Committees monthly meetings and associated tasks and those of the finance committee. Fisheries Biologist Mitchell Daniel actively participated as a member of the outreach committee during 2020 and will be contributing to developments of the JDBP's upland ATLAS prioritization.

A proposal was developed and submitted in early March for the 2021 Independent Scientific Review Panel (ISRP) process for the 2023 – 2027 period. The proposal included a review of past efforts, justification of processes developed to support ongoing and future work, and a list of proposed actions and can be found at [Reports & Data – John Day River Basin](#). The CTUIR's NFJD Project Lead then gave a presentation on 15 June 2021 as required via video conferencing. The preliminary ISRP response is due in September of 2021 for which The Project's staff will respond

as required after conferring with BPA and CTUIR staff.

WE B - Produce Environmental Compliance Documentation

All permits and/or requisite information were secured by CTUIR or passed on to BPA as available. This includes but is not limited to herbicide tracking, lamprey tracking, invasive species considerations, and permitting compliance. Environmental compliance efforts were associated with;

- HIP design permitting for the Bull Run Creek Mine tailing design effort.
- HIP design permitting associated with the 10 Road Relocation.
- HIP and Fill/Removal permit consultation related to the Desolation Creek Reach 3 design addendum.
- Fill/Removal permit consultation related to the Desolation Creek Reach 3 design addendum.
- Implementation of the Granite Creek RM 7.5 design.

WE C - Cultural Resource Surveys

- Cultural resource surveys for the Bull Run Creek Mine tailing design effort.
- Cultural resource survey determinations associated with the 10 Road Relocation.
- HIP consultation related to the Desolation Creek Reach 3 design addendum.
- Cultural resource surveys for the Hidaway Creek RM 1.3 restoration effort.

WE D – Provide Outreach and Education

Outreach during this performance period primarily consisted of attendance at NFJDWC meetings held remotely due to the pandemic. In June of 2021 the CTUIR presented the CTUIR's First Foods policy during the NFJDWC's staff training.

The CTUIR's Information Technology and Geographic Information System program further developed the Central Data Management System (CDMS) per BPA specs and project websites for CTUIR projects. The Project's staff spent time confirming information contained within the CDMS and ensuring appropriate content is linked between the CDMS and project website. The Project's website can be viewed at [John Day River Basin – CTUIR Fish Habitat Restoration Efforts in the John Day River Basin](#) and is the primary portal for remote information sharing regarding project activities. We will continue to use the CDMS as our primary repository for data and populating the project's website. Additionally the CTUIR's geographic information group created web pages for all fisheries habitat programs to be used as an outreach and information sharing tool. Both of these tools were outlined and referred to in The Project's 2021 ISRP proposal.

Due to the Covid 19 pandemic events such as the Ukiah Fishing Derby were not held in 2020 or 2021.

WE E – Identify, Prioritize, and Select Habitat Restoration Areas

The Project worked to continue ongoing action development and implementation. This included coordination with the JDBP and NFJDWC to facilitate active and passive habitat restoration within the Lower and Lower Camas Creek and Desolation and Granite Creek focal areas. Projects are identified and ranked according to priorities identified in the JDBP's ATLAS prioritization framework and reconciled with assessments and plans developed by The Project and its collaborators to maximize available opportunities, collaboration, and funding. In all basins, concerted efforts are made to develop larger reach scale actions in key locations to improve our ability to influence natural processes and track progress toward meeting objectives.

Actions outlined for 2021 statement of work submitted in late 2020 focused upon actions

already in development or implementation. That said, outreach efforts during 2020 included discussions of a potential suite of actions on private land along Owens Creek near Ukiah, Oregon and near Granite, Oregon. Unfortunately the landowner decided near Ukiah, Oregon chose not to participate at this time. At this point in time staff need to move several ongoing actions through implementation to make room for new efforts

WE F- Riparian Conservation Agreements – Investigate for Livestock Trespass

Issues of trespass were addressed during regular facility monitoring efforts.

WE G – Riparian Conservation Agreements – Maintain Fences and Associated Water Developments

Facilities to include stock water developments and fence lines were set-up for the season in May of 2020 and winterized in October. No inordinate maintenance issues were identified. Regular weekly monitoring while cattle were present occurred during which time minor maintenance occurred and trespass was addressed.

WE H – Riparian Conservation Agreements – Noxious Weed Control

A contract for noxious weed control efforts awarded in April of 2020 used herbicides on Granite Creek RM 7.5, Mud Creek, and NF John Day conservation agreement sites. The CTUIR collaborated with the City of Ukiah for weed control on the Camas Creek RM 12 site and adjacent properties within and around the city. Species treated included but weren't limited to Scotch thistle, Cutleaf teasel, Houndstoung, Dalmation Toadflax, Bull thistle, St. Johnswort, and Poison hemlock. Treatment records were submitted to BPA in fulfillment of HIP III requirements.

WE I – Riparian Conservation Agreements – Collect Water Temperature and Photo Point Data

Data loggers recording water and air temperatures were deployed in late May and recovered in October while photo points were collected in September per our usual data monitoring activities. Permanent data loggers are now being used where conservation agreements exist while seasonal loggers are used elsewhere.

All data was proofed and uploaded to the CDMS.

WE J & K – Hand Crew LWD Placement - North Fork Cable Creek & Camas Creek

During 2020 The Project coordinated with Trout Unlimited and UNF to implement low tech hand crew work in higher elevation meadow habitats. Such efforts, separate from more intensively designed and implemented actions, complement them through their ability to effectively use local materials and less impactful techniques to introduce complexity to sensitive habitats. In these areas often upstream of ongoing or planned work heavy equipment entrance and movement would create significant harm. Hand crew work occurs in seasonally very wet meadows about small stream channels. Table 2 contains information reflecting the extent of work completed with a narrative of the work in Appendix 2.

| Table 2: Project 2020 Hand Crew Implementation Metrics | | | |
|--|-------------|----------------|--------------|
| | Camas Creek | NF Cable Creek | Totals: |
| Stream Miles Surveyed (mi) | 1.2 | 1.8 | 3 miles |
| Stream Miles Treated (mi) | 0.7 | 1.8 | 2.5 miles |
| Floodplain Treated (Acres) | 14 | 17.5 | 31.4 acres |
| Wood Jams Built | 10 | 29 | 39 wood jams |
| Loose Whole Trees Placed | 30+ | 0 | 30+ trees |
| Channel Racking (mi) | 0 | 0.27 | 0.27 mi |

WEs L, M, N O, & P – Granite Creek

During 2020 and 2021 The Project worked to implement the Granite Creek RM 7.5 restoration action. Originally scheduled for completion in 2020 the effort took 4 weeks during 2020 and six weeks during 2021. The selected 2020 implementation contractor was unable to adequately staff their crew during 2020 at least in part due to the Covid 19 pandemic. Additionally, the site contained soft areas that weren't recognized prior to equipment movement through the site and as a result design components were evaluated individually for their feasibility and modified accordingly. The most disrupting item was our inability to track equipment along river right between Stations 8+50 to 26+50 which created issues with backfilling the existing channel between Stations 8+50 to 11+50. Because of this the lower meander and riffle were not developed and the existing channel not filled. During 2020 all large wood was secured and delivered through a materials contract and the design contractor completed work between Stations 8+50 and 21+50. Completed features included two meander bends, three side channels, three riffles, and all wood structures. Grass seed and native vegetation in addition to the willow cuttings planted during implementation were placed in November of 2020.

The largest confounding factor outside of sensitive areas and its influence upon access in 2020 was water management. Although side channels were used to bypass flows the amount of groundwater in the site was difficult to manage in both its volume and turbidity. This was largely due to the small floodplain, tight working conditions, and extremely dirty tailings. It did force consideration of alternative measures for 2021.

During early 2021 a variance was secured by the Project which allowed for in-stream work to begin on 1 July. Prior to this and outside of the ordinary high water mark a side channel was developed with wood placed between Stations 28+50 and 42+00. On July 15 flows were turned into the side channel and work began on the main channel between Stations 31+00 and 42+00. Conditions reflected individual sites such as where a meander bend placed in a soft area where equipment could not fully access at Station 35+00 was not fully developed, instead, relying upon channel evolution through natural process. Additionally one riffle was located in deep fine sediments and took extra work and time to stabilize, large sand deposits were found in two locations, one of which, was located beneath a riffle, and another riffle was located atop material floating on fines clays. These areas became more unstable as equipment worked and stabilized once equipment was removed. Additional large wood was used in side channel 7 to increase complexity and use extra wood.

Below Station 35+00 all riffles, side channels and large wood structures riffles were developed as designed save wood structures at Station 23+50 where existing trees created an opportunity to lace wood into the trees without creating significant disturbance of existing features. Water management became an issue at times primarily as a result of groundwater entry into work areas.

Work above Station 42+00 progressed smoothly although one buried rootwad structure was changed to a sweeper to take advantage of an existing pool. The designed structure was located where equipment access and developing the structure would have created significant damage to the pool and compromised structure stability. The Sweeper was developed with wood placed down into the pool to enhance scour and cover for aquatic species.

WE Q – Desolation Creek 400 Rd Culvert Replacement Geophysical Study

Collaborators were unable to secure cultural resource clearance and funding went away with

the 2020 fiscal year. Because of this and collaborator's inability to secure replacement funding the effort has been put on hold. The action will be reconsidered as the associated Desolation Meadows restoration effort led by Trout Unlimited continues and as the Umatilla National Forest brings on fisheries and hydrology staff capable of providing salient input.

WE R – Starveout Creek Riparian Fence

Starveout Creek is an ESA listed, summer steelhead bearing tributary of Desolation Creek; the downstream portion and subject project is located on the conservation property owned by the Desolation Creek LLC. A collaborative effort involving the landowner, Grant County SWCD, ODFW, and The Project was developed to install three miles of fence funded by ODFW and another 1.1 miles funded by the CTUIR enclosing approximately 44 acres of riparian and floodplain in total (Appendix 3). The fence now excludes livestock access to 1.65 miles of spawning and rearing habitat in total. The project tied into existing fence along Desolation Creek on the downstream end of the project and a property boundary fence with the Umatilla National Forest on the upstream end; three water gaps were installed to provide stockwater for livestock using the adjacent pastures. Fire restrictions impeded construction efforts through the summer and into the fall; the project was completed and inspected by 20 October 2020.

ODFW provided \$22,280.00 of financial support for services related to the fence construction. Department staff also provided construction management and project design services including landowner coordination, project layout, attendance at the bid tour, contractor oversight and project inspection.

Grant SWCD performed administrative tasks associated with the ODFW fencing program such as bidding the work, contracting and fiscal management.

Desolation Creek LLC: Staff representing the property owner aided in the project design and performed brush clearing of the fence route.

The CTUIR provided \$19,747 of funding support for the monies were used for the purchase of fencing materials and to support the fence construction. Additionally, the tribes provided staff to review the final fence construction.

WE S – Bull Run Creek Design

During 2020 The Project worked with WWNF staff to advance the 50% Conceptual Design to the 80% design level. Given that the WWNF had recently filled open positions selection of specific treatments to be carried forward were discussed and approved during a field visit of the site in early summer of 2020. Options included a high flow channel in the sites lowest extent, an alternative channel meander upstream of that, and potential use of bio-char, bio-solids, and/or a wood based soil amendment. Separately, collaborators discussed cultural resource permitting and NEPA analysis and how individual collaborators could help move the design forward. The meeting left the WWNF responsible for providing cultural resource material to a CTUIR survey subcontractor and obligated the forest to NEPA consultation for their aspects of the larger action. BPA became responsible to SHPO consultation once a cultural resource survey was completed and undertaking NEPA to satisfy their needs. The CTUIR agreed to fund a cultural resource survey and deliver it to BPA for SHPO consultation.

The culture resource survey could not be completed until the spring of 2021 and the report did not arrive until the after the 80% design report and plan set was received. Survey report findings will be incorporated into the 100% design report and plan set.

WWNF and The Project's staff also met with the mining claim operator to explain our intent, better understand how restoration may or may not conflict with mine operations, how we may avoid complications later on through proactive means, and if restoration efforts may enhance the mine's operation plan. The operator was generally supportive of the work and provided input on how restoration may complement his efforts. That said, it is incumbent upon the WWNF to regularly communicate with the operator and ensure mine operation plans and on the ground activities sync with mine oversight.

A component of the 80% design which had not been considered during or prior to 50% design level efforts were complete was the use of bio-solids, bio-char, or a wood based soil additive. The design engineer developed a memo discussing their use and potential permitting and application concerns which was passed on to all collaborators for review. The intent of including such material was to increase soil/tailing water retention and organic matter which was lost as mining occurred. Discussions regarding the 80% design in late 2021 will determine the path forward.

WE T – Hidaway Creek Design

The Hidaway Creek RM 1.3 design was created, reviewed, and approved through a collaborative process involving the landowner, BPA, ODFW, NFJWC, and The Project with implementation planned for 2021. However, delays and confounding factors which prohibited completion of the Granite Creek RM 7.5 effort required that we delay implementation of the Hidaway Creek R 1.3 design to 2022.

Once the final design was accepted by collaborators The Project worked with the CTUIR's cultural resource program to complete cultural resource surveys with the resulting report passed to BPA for their use in SHPO consultation. The Project also secured fill/removal permits from Oregon Department of State Lands and the U.S. Army Corps of Engineers, and identified a suitable implementation contractor through a competitive bid process. A request for variance of the 15 July to 15 August instream work window has been submitted to ODFW, National Marine Fisheries Service, and U. S. Fish and Wildlife Service to allow wood gathering and staging from October 2021 through February 2022 for placement in 2022.

WE U – Submit Progress Report for the February 1, 2018 to January 31 2019 Performance Period

Submitted on 11 January 2021.

WE V - Submit Progress Report for the February 1, 2019 to January 31 2020 Performance Period

Submitted on 11 January 2021.

WE W – Periodic Status Reports

Completed as required.

WE X – Desolation Creek Reach 6 10 Road Relocation Permitting and Design (by others)

The highest priority for habitat restoration resulting from the Desolation Creek Geomorphic Assessment and Action Plan was Reach 6 between RM 9.5 and 12. At the 15% conceptual design step habitat design phase collaborators began discussing relocating a portion of the 10 Road from the floodplain to adjacent hillslopes primarily along old logging haul roads. By the 30% design step collaborators agreed this was an appropriate approach to reduce long term road

stability issues and improve aquatic and terrestrial process and habitat across the floodplain. A road alignment was agreed upon by BPA and CTUIR, the UNF secured topographic data to support road design, and completed culvert designs across Kelsay and Spring Creeks. CTUIR completed cultural resource surveys while Grant SWCD has secured funding to complete design work for the road. Thus far, Grant SWCD has produced 15% conceptual designs with 80% or greater designs expected by late 2021 or early 2022.

During 2021 and separate from Grant SCWD's design efforts the CTIR's staff and that of BPA discussed culverts designed under ARBO and potential vehicles for ESA permitting. Culverts for Kelsay and Spring Creek were developed by the UNF's contractor who also secured topographic data upon which the road design will be based. Discussions resulted in the CTUIR's requesting additional information from the UNF and in turn the design contractor which was subsequently passed to BPA. Information exchange was tracked on HIP tracking forms. Designs have been approved.

Additionally, the BPA's and CTUIR's staff have participated in discussions to determine the most effective vehicle for ESA consultation. BPA is considering the road relocation project to be covered under the Endangered Species Act Section 7 Consultation Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for BPA's Habitat Improvement Program (HIP4 BO) for Middle Columbia River (MCR) steelhead and bull trout (*Salvelinus confluentus*) and their designated critical habitat. Because of this and the project's inclusion of set-back or removal of existing, berms, dikes, and levees, culvert replacements, and road decommissioning it contains high risk components. Thus, BPA has initiated the HIP Review Process to determine if the project meets the requirements under the HIP4 BO, provide a technical review, and to solicit feedback and early involvement from the Services on project design.

WE Y – Desolation Creek Reach 3 - Design Addendum

Reach 3 between Desolation Creek's RM 2.6 and 4.5 was ranked as the second highest area for restoration in the Desolation Creek Geomorphic Assessment and Action Plan. After the completion of half the highest priority Reach 6 the CTUIR move to design work in Reach 3 while efforts to design the 10 Rd relocation continued. During 2018/19 a design contractor was selected and design work finalized the design save a 0.3 mile road relocation and associated culvert replacement. While the original contract's scope contained the road relocation changes requested by the CTUIR to improve physical process and ecologic function of Moonshine Creek and an associated wetland prevented the addendum's inclusion in the design accepted in April of 2020. The addendum was received in February of 2021 and subsequently passed to BPA for review. Implementation contracting will occur in August/September of 2021 followed by Fill/Removal application submission before the end of the year. We also expect to submit an application for funding to the JDBP in an effort to secure Oregon Watershed Enhancement Board Focused Investment Partnership support for this effort. Implementation will begin or occur in its entirety during 2022 and depend upon funding availability.

DISCUSSION

Since the Independent Scientific Review Panel’s 2013 Geographic we have made significant strides in establishing guidance specific to each of our focus basins. The Project’s development of the Camas Creek Geomorphic Assessment (NSD, 2016) and Desolation Creek Geomorphic Assessment and Action Plan (Tetra Tech, 2017) complement more recent JDBP products such as their aquatic prioritization based on BPA’s ATLAS tool, upland prioritization in development, strategic action plan, and improved outreach and funding capacity for all members. Combined, these resources dramatically improved restoration planning and The Project’s ability to meet objectives. Monitoring data collection, management, and sharing also improved with the development of the Physical Habitat Monitoring Strategy (PHaMS) (USGS 2015) in collaboration with CTUIR, NOAA, and U.S. Geologic Survey. Statements of Goals and Objectives related to specific restoration actions and action specific MAMPs required under HIP improved our ability to tie objectives to measurable outcomes. For example, in 2020 and 2021 The Project developed a robust [MAMP](#) for the Desolation Reach 3 100% design submittal. BPA HIP review staff have approved the document and subsequently created a template from it as an exemplary document for our future actions and other actions within our organization. Continued development of the CTUIR’s CDMS, The Project’s website, development of the JDBP Project Tracker, and BPA’s switch to a web based data management system improved staff capacity for reporting the outcomes of implemented actions and increased data sharing capacity to provide information to interested parties.

These improvements in restoration guidance and capacity allowed for significant strides in completing the admittedly aggressive list of proposed actions included in The Project’s 2013 ISRP Geographic Review proposal. Completing all proposed actions required close coordination amongst cooperators without regard or need for our sponsorship and strong lead in all actions undertaken. Rather, we believe that progress includes coordination among multiple parties and shifting roles according to relative capacity and restoration priorities such as that shown in Table 3.

Table 3. Future fisheries restoration actions proposed in The Project’s 2013 ISRP Geographic Review proposal. (* = Actions identified in the Bull Run Creek Action Plan (USDA, 2012).

| Deliverables | Status |
|---|--|
| Manage and Administer Project | Ongoing |
| Outreach and Education | Ongoing through participation in NFJWC meetings, JDBP organization and maintenance, participation in annual Ukiah Fishing derby, and presenting information at the CTUIR’s DNR annual open house. |
| Maintain Structures and Native Vegetation | As of March 2021 six conservation agreements have ended. Three are currently being maintained. |
| Collect/Generate/ Validate Field Data | Ongoing |
| Fox Creek | NFJWC and CTUIR instream and riparian fencing efforts are complete with 1.4 Km of riparian fence, 25 large wood features, and 20 plugs developed. The CTWSRO sponsored a large scale suite of actions after The Project entered into a conservation agreement with Desolation Creek LLC on Desolation Creek. |
| Bull Run Creek Mine Tailing Removal | Joint WWNF, NFJWC, and CTUIR effort in progress. The Project has been successful in keeping multiple entities involved in the face of changing collaborator staff and shifting collaborator directives and progressing toward a holistic design acceptable to all. As of March 2021 the 50% design has been completed with cultural resource surveys and the 80% design expected by August of 2021. The 50% design includes 1.4Km of ~33 m wide inset floodplain containing a meandered channel and 165 large wood structures. |
| Granite Creek Instream Restoration | Streambank stabilization in 2013. An expanded effort over 0.8 miles of private and federally managed lands, including the 2013 work area, has been developed and implemented. The final design includes four meanders, 0.6 Km of side channel, 189 large wood structures, four pools, two alcoves, 1 constructed riffles, and four wetland improvements. |
| Mud Creek Grazing Plan | The landowner developed in cooperation with a local resources. |

| | |
|---|--|
| Junkins Creek Culvert | In progress with implementation expected in 2022. Delayed due to UNF staffing issues and shifting priorities. |
| Desolation Creek Instream | A geomorphic assessment and prioritization using BPA's ATLAS tool was developed for the entire Desolation Creek basin and incorporated into the JDBP's prioritization based upon BPA's ATLAS framework. Thus far the upper half of the Tier 1 Reach 6 has been designed and implemented. A potential road relocation, currently in design, delayed design efforts on lower Reach 6. The next Tier 1 reach, Reach 3, has been designed and with implementation planned for 2022. Upper reach 6 includes 1.5 Km of side channel improvements, 0.8 Km of road obliteration, and 47 large wood structures. |
| Bull Run Creek Culvert | Collaborative WWNF, NFJDWC, CTUIR effort which realigned a portion of Deep Creek to facilitate physical and biologic process and culvert realignments on Deep and Bull Run Creeks as a single action. Returned full access to 16 Km of habitat. |
| Camas Creek Instream Adjustment | The 2012 CTUIR brief, NFJDWC and CTUIR outreach culminated in community acceptance of the CCGA (NSD, 2016). The document will guide future restoration in the Camas Creek basin and has been made available to the community. |
| Bull Run Creek Wood Placement | The NFJDWC and WWNF placed large wood in 2.0 Km of Bull Run Creek in coordination with the CTUIR. |
| Junkins Creek Culvert II | No progress. Awaiting development of the lower Junkins Creek culvert. |
| Sponge Creek Culvert | ODFW and UNF collaborated to improve access to 2.7 Km of habitat. |
| Desolation and Clear Creek Wood Placement | Incomplete due to staffing difficulties and other priorities of the UNF and CTUIR. |
| Deep Creek Culvert I | Collaborative WWNF, NFJDWC, CTUIR effort which realigned a portion of Deep Creek to facilitate physical and biologic process and culvert realignments on Deep and Bull Run Creeks as a single action. Returned full access to 3.6 Km of Deep Creek. |
| Deep Creek Culvert II | Completed as a joint WWNF and NFJDWC effort in coordination with the CTUIR. Returned full access to 0.9 Km of Deep Creek. |
| Deep Creek Wood Placement | The NFJDWC and WWNF placed large wood in 3.6 Km of Deep Creek in coordination with the CTUIR. |
| UNF Fence Maintenance | Completed through a joint UNF and CTUIR effort whereby the UNF supplied materials and the CTUIR provided funding for UNF staff and contractors. In total, 71.5 Km of riparian fence was improved protecting 2,985 acres. |

Objective refinement also contributed to The Project's incorporation of floodplain restoration treatments that more effectively enhance floodplain connectivity, channel complexity, and stream channel morphology with consideration of climate change effects. Improving groundwater storage and hyporheic complexity through these enhancements are more likely to support species of interest in the face of climate change. Our use of the best available science and up to date restoration techniques blend more traditional 'engineered' treatments with 'stage zero' techniques (Behan et al 2021) to encourage use of locally derived materials, natural process, and geomorphic evolution within the same treatment reach. The Project began incorporating this approach for the Desolation Creek Reach 3 effort to be implemented in 2022 and will continue to adapt our restoration strategy with lessons learned from previous and future actions.

Given that the JDBP is now the primary coordination forum amongst John Day River Basin restoration collaborators we expect to continue contributing to the partnership's maintenance and development. This will not preclude extracurricular efforts to improve restoration development and implementation efforts moving forward including the development of new guidance, acceptance of improved techniques, and refinements in implementation, monitoring, and reporting.

REFERENCES

- Accords, 2008, 2008 Columbia Basin Fish Accords Memorandum of Agreement between the Three Treaty Tribes and FCRPS Action Agencies
- Arismendi, I., Johnson, S.L., Dunham, J.B., and Haggerty, R., 2013, Descriptors of Natural Thermal regimes in Streams and their Responsiveness to Change in the Pacific Northwest of North America, *Freshwater Biology*, 58, pp880-894
- Arrigoni, A.S., Poole, G.C., Mertes, L.A., O'Daniel, S.J., Woessner, W.W., and Thomas, S.A., 2008, Buffered, Lagged, or Cooled? Disentangling Hyporheic Influences on Temperature Cycles in Stream Channels, *Water Resources Research*, 44W09418)
- Bjornn, T.C., and Reiser, D.W., 1991, Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitat. *American Fisheries Society Special Publication 19*
- Carmichael, R.W., 2006, DRAFT Recovery Plan for Oregon's Middle Columbia River Steelhead Progress Report, Oregon Department of Fish and Wildlife.
- Columbia BM RC&DA (Columbia-Blue Mountain Resource Conservation & Development Area). March 15, 2005. John Day Subbasin Revised Draft Plan. Prepared for Northwest Power and Conservation Council.
- CRITFC (Columbia River Inter-Tribal Fish Commission). 1995. Wy-Kan-Ush-Mi-Wa- Kish-Wit Spirit of the Salmon. Columbia River Anadromous Fish Plan of the Nez Perce, Umatilla, Warm Springs and Yakima Tribes. Portland, Oregon.
- CTUIR (Confederated Tribes of the Umatilla Indian Reservation), 2016, Fish Habitat Enhancement Biological Effectiveness Monitoring 2016 Annual Progress Report, CTUIR Biomonitoring Project (Bonneville Power Administration Project # 2009-014-00).
- Endress, B., A., Quaempts, E., J., Steinmetz, S., 2019, Confederated Tribes of the Umatilla Indian Reservation, Upland River Vision, [CTUIR DNR Upland Vision April 2019.pdf](#).
- ICBEMP (Interior Columbia Basin Ecosystem Management Project), 2000, Final Environmental Impact Statement, Department of Agriculture Forest Service and the United States Department of Interior Bureau of Land Management.
- Jones, K. L., G. C. Poole, E. J. Quaempts, S. O'Daniel, T. Beechie, 2008. Umatilla River Vision. Prepared for the Confederated Tribes of the Umatilla Indian Reservation, 31 pp.
<http://www.umatilla.nsn.us/DNRUmatillaRiverVision.pdf>
- McCullough, D. A. 1999. A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids with Special Reference to Chinook Salmon, U. S. Environmental Agency, Seattle WA, Document #910-R-99-010.
- Narum, S. L., Schultz, T. L., Van Doornik, D. M., and Teel, D., 2008, Localized Genetic Structure Persists in Wild Populations of Chinook Salmon in the John Day River Despite Gene Flow from Outside Sources, *Transactions of the American Fisheries Society* 137:1650–1656.
- NMFS, 2008. Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment. National Marine Fisheries Service (NMFS) Northwest Region.
- NPPC. 2005. Revised draft John Day Subbasin Plan. Prepared by Columbia-Blue Mountain Resource Conservation And Development Area, Available from: <http://www.nwcouncil.org/fw/subbasinplanning/johnday/plan>.

- NSD, (Natural Systems Design), 2016, Final Camas Creek Oregon Geomorphic Assessment, Developed for the Confederated Tribes of the Umatilla Indian Reservation.
- ODEQ, 2010, John Day River Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP), Oregon Department of Environmental Quality, Portland, Oregon, 177pp
- OWRD (Oregon Department of Water Resources), 2017, <http://www.oregon.gov/OWRD>.
- Rosgen, D., 1996 Applied river morphology. Wildlands Hydrology, Pagosa Springs, Colorado.
- RMS -1, 2001, ferns, M.L., Madin, I.P., and Taubeneck, W.H., Reconnaissance Geologic Map of the La Grande 30 x 60 Minute Quadrangle, Baker, Grant, Umatilla, and Union Counties, Oregon, Oregon DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES, Salem, Oregon.
- Tetra Tech, 2017, Desolation Creek Geomorphic Assessment and Action Plan, Developed for the Confederated Tribes of the Umatilla Indian Reservation.
- USFS, 2008. Watershed Action Plan to remove barriers and improve stream function on National Forest System Lands within the Granite Creek Watershed. September 22, 2008.
- USFS, 2012. FY 2012 Watershed Restoration Action Plan, Bull Run Creek Watershed; HUC 170702020202 September 24, 2012
- USFWS, 2002. Chapter 9, John Day River Recovery Unit, Oregon. 82 p. In: U.S. Fish and Wildlife Service, Bull Trout (*Salvelinus confluentus*) Draft Recovery Plan, Portland, Oregon.

APPENDIX I

| Limiting Factors | Code | Objectives | Code |
|------------------------------|------|--|------|
| Channel Characteristics | CC | Improve stream channel complexity and morphology | 1 |
| Habitat Diversity | HD | Preserve desirable or improve degraded aquatic habitat | 2 |
| Floodplain Confinement | FC | Improve floodplain connectivity | 3 |
| Riparian & Floodplain | RF | Improve riparian and floodplain complexity | 4 |
| Water Quality (non-sediment) | WNS | Improve or preserve temperatures and chemistry | 5 |
| Water Quality (sediment) | WS | Improve sediment routing and sorting | 6 |
| Stream Discharge | SD | Improve streamflow during base flow periods | 7 |
| Passage Barriers/Entrainment | P | Improve passage to existing high quality habitats | 8 |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|---|--------------------------|------------------|------------|------------|--------------|---|---|---|
| Owens Creek Conserv Agreemt 2001 - 16 | CC, HD, WS, WNS | 1, 2, 7 | 2001 | 0.5 | 5.2 | <ul style="list-style-type: none"> - 481 meters of 4-strand barbed wire riparian fence constructed. - One stock well developed and with associated troughs. - Structure maintenance and noxious weed treatments for the life of agreement. | 2 cross sections, 1 Photo Point | none |
| Upper Snipe Creek Conserv Agreemt 2001 - 16 | CC, HD, RF, WNS, WS | 1, 2, 3, 4, 5, 6 | 2001 | 1.3 | 34 | <ul style="list-style-type: none"> - 2,218 meters of 4-strand barbed wire riparian fence constructed. - Two spring developments constructed. - Structure maintenance for the life of the agreement. | 2 cross sections, 2 longitudinal profiles, 1 photo point | 2 cross sections |
| Lower Snipe Creek Conserv Agreemt 2001 - 16 | CC, HD, RF, RFC, WNS, WS | 1, 2, 3, 4, 5, 6 | 2001 | 1.3 | 54 | <ul style="list-style-type: none"> - 4,237 meters 4-strand barbed wire riparian fence constructed. - Three stock wells developed. - 7,000 native hardwoods planted. - Structure maintenance and noxious weed treatments for the life of agreement. | 2 cross sections, 2 longitudinal profiles, 2 thermistors, 1 photo point | 2 cross sections, vegetative survival count |
| Deer Creek Conserv Agreemt 2003-18 | CC, HD, RF, RFC, WNS, WS | 1, 2, 3, 4, 5, 6 | 2003 | 3.8 | 219 | <ul style="list-style-type: none"> - 2,736 meters of 4-strand barbed wire fence constructed and 2,889 meters of fence refurbished. - 11 spring developments constructed. - Approximately 7,500 native hardwoods planted. - Structure maintenance and noxious weed treatments for the life of agreement. | 2 cross sections, 2 longitudinal profiles, 2 thermistors, 1 photo point | 2 cross sections |
| Lower Camas Creek Conserv Agreemt 2006-2021 | CC, HD, RF, RFC, WNS, WS | 1, 2, 3, 4, 5, 6 | 2006 | 1.6 | 40 | <ul style="list-style-type: none"> - 335 meters of levee removed - 1.6 Km of riparian fence constructed - Three stock water ponds constructed - One stock water pond improved - One spring developments created - Approximately 5,500 native hardwoods planted - Structure maintenance and noxious weed treatments for the life of agreement | 3 cross sections, 1 longitudinal profile, 2 thermistors, 3 pebble count | Three cross sections |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|-----------------------------------|--------------------------|------------------|------------|------------|--------------|---|--|--|
| | | | | | | | sites, 1 photo point | |
| Upper Camas Creek Conserv Agreemt | CC, HD, RF, RFC, WNS, WS | 1, 2, 3, 4, 5, 6 | 2009 | 1.3 | 256 | <ul style="list-style-type: none"> - 2,450 meters of 4-strand barbed wire riparian fence and 3 water gaps constructed. - 3,090 meters of upland 4-strand barbed wire fence constructed. - One upland well developed. - Structure maintenance and noxious weed treatments for the life of agreement. | 12 cross-sections, 1 longitudinal profile, 2 thermistors | 3 cross sections |
| NFJD Conserv Agreemt 2005 - 2020 | RF, WS | 3, 6 | 2005 | 1.6 | 6 | <ul style="list-style-type: none"> - 1.6 Kilometers of four strand barbed wire fence constructed to remove cattle from riparian areas. - One well installed to replace watering them the NFJD. - 250 native vegetative pilings | Photo points | none |
| NFJD Wildernes Survey 2010 | HD | 2 | 2010 | 0 | 0 | <ul style="list-style-type: none"> - Surveyed of noxious weeds along 217 Kilometers of trail within the NFJD Wilderness area. | none | none |
| Battle Creek Culvert Replacmt | WS, P | 6, 8 | 2010 | 13.7 | 0 | <ul style="list-style-type: none"> - Removed complete barrier to high quality summer steelhead trout habitat. | UNF road inspections | Redd surveys for 2 years after replacemt |
| Granite Creek Culvert Replacmt | WS, P | 6, 8 | 2010 | 4.3 | 0 | <ul style="list-style-type: none"> - Removed partial barrier to high quality summer steelhead trout habitat. | UNF road inspections | Redd surveys for 2 years after replacemt |
| Bruin Creek Culvert Replacmt | WS, P | 6, 8 | 2011 | 8.5 | 0 | <ul style="list-style-type: none"> - Removed partial barrier to high quality summer steelhead trout habitat. | UNF road inspections | Redd surveys for 2 years after replacemt |
| Beaver Creek Connect | P | 8 | 2010 | 0.18 | 1 | <ul style="list-style-type: none"> - Removed 5 log drops, sealed the stream channel with bentonite, and reshaped the stream channel. | 3 cross sections, 1 longitudinal profile | ODFW annual spring spawner |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|------------------------------------|---------------------|---------------|------------|------------|--------------|--|--|--|
| | | | | | | | | surveys |
| Ten Cent Creek Culvert Replacmt | WS, P | 6, 8 | 2011 | 9.6 | 0 | - Removed partial barrier to high quality summer steelhead trout habitat. | UNF PIBO & road inspections | Redd surveys for 2 years after replacemt |
| Clear Creek Mine Tailing Distribut | HD, RF, RFC, WS | 2, 3, 4, 5 | 2006 | 3.8 | 45 | - Recontoured approximately 276,000 cubic meters of mine tailings. - Reestablished an inset floodplain to promote floodplain connectivity and sediment / debris deposition. | none | none |
| Kelsay Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2008 | 1.6 | 100 | - 4,425 meters 'New Zealand' and one water gap along constructed. | 4 photo points, 2 thermistors, USFS permittiee maintenance | none |
| Taylor Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2010 | 1.6 | 46 | - 3,200 meters of 4-strand barbed wire fence constructed. | Photo point, USFS permittiee maintenance | none |
| Sugarbowl Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2010 | 0.8 | 18 | - 1,600 meters of 4-strand barbed wire fence constructed. | Photo point, USFS permittiee maintenance | none |
| Morsay Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2010 | 3.2 | 100 | - 11,747 meters of 4-strand barbed wire fence constructed. | Photo point, USFS permittiee maintenance | none |
| Bruin Creek Riparian Fence | CC, HD, RF, | 1, 2, 3, 5, 6 | 2010 | 0.8 | 19 | - 695 meters of three strand 'New Zealand' fence constructed. | Photo point, | none |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|--|---------------------------------|---------------------|------------|------------|--------------|---|--|---|
| | WNS, WS | | | | | | | |
| Butcherknife Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2012 | 1.5 | 1200 | - 3,621 meters of four strand barbed wire fence constructed. | UNF PIBO | none |
| Five Mile Creek Fence Maintnce | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2012 | 2.5 | 90 | - Heavy maintenance on 8 Kilometers of riparian exclusion fencing. | Photo point, USFS permittie maintenance | none |
| Fox Creek Leafy Spurge Control | HD, RF | 2, 3 | 2010 | 65 | 260 | - Approximately 215 acres treated with herbicide and biological controls. - 45 acres survey for infestations and tracking the progress of previous treatment. - 45 acres survey for infestations and tracking the progress of previous treatment. | none | visual surveys of selected areas, 2 transects |
| Granite Creek Native Veg Plantings | HD, RF | 2, 3 | 2010 | 0 | 24.5 | - Planted 8,400 native hardwoods in floodplain and riparian areas. | none | visual surveys of selected areas |
| Clear Creek Native Vegetation Plantings | HD, RF | 2, 3 | 2010 | 2 | 4 | - Planted 5,040 native hardwoods in floodplain and riparian areas. | none | visual surveys of selected areas |
| Granite Creek Noxious Weed Control | HD, RF | 2, 3 | 2010 | 4.8 | 40 | - 40 acres of riparian and floodplain habitats surveyed for noxious weeds. - 28.5 acres of riparian and floodplain areas treated with herbicides | none | visual surveys of selected areas |
| NFJD River Push-up Dam Removal and Water | WS | 6 | 2009 | 145 | 80 | - One irrigation point of diversion moved approximately 152 meters to a permanent scour hole. - One water gap removed. - Water right POD change completed. | 4 cross sections, 4 pebble counts | Greenline survey |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|--------------------------------------|------------------------------|---------------------|------------|------------|--------------|---|--|--|
| Right Cert | | | | | | | | |
| Lower Camas Creek Coord | CC, HD, RF, RFC, WNS, WS, SD | 1, 2, 3, 4, 5, 6, 7 | 2012 | 9 | 1,000 | - Completed brief detailing past and existing conditions, possible influences of existing geomorphology, and a strategy for developing appropriate treatments. | cross-sections and pebble count data collected as baseline information | none |
| Fox Creek Channel Enhancmt & Fencing | CC, HD, RF, WNS | 1, 2, 3, 5 | 2013 | 0.6 | 8 | - Placed 25 pieces of large wood in the original stream channel. - 20 plugs restricting flow through 700 meters of the Corps channel. - 600 meters of riparian fence constructed | Photo point | none |
| Corrigal Springs Culvert Replacmt | WS, P | 6, 8 | 2013 | 5.8 | 0 | - Removed partial barrier to high quality summer steelhead and bull trout habitat. | UNF road inspections | Redd surveys for 2 years after replacemt |
| Mud Creek Conserv Agreemt 2013 - 27 | CC, HD, RF | 1, 2, 3 | 2013 | 1.6 | 100 | - 2,407 meters of six strand high tension wire fence constructed. - One water gap installed - One stock water well developed with associated solar pump, panels, and water trough. | Photo points | none |
| Red Boy Pipeline Replacmt & Signs | WS | 6 | 2013 | 0.25 | 0.5 | - Six inch PVC drain pipe between the mine audit and settling ponds was replaced with 250 meters of 12" HDPE pipe and the number of cleanouts increased from two cleanouts to five manholes and two cleanouts. - 2 information signs developed and installed | Pipeline and settling pond maintenance by landowner | none |
| Taylor Creek | CC, HD, | 1, 2, 3, 5, | 2013 | 1.6 | 10 | - Heavy maintenance completed on 1.6 Kilometers of riparian fence constructed | Photo points, USFS | none |

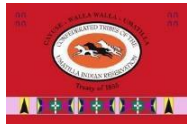
| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|---|---------------------------------|------------------------|------------|------------|--------------|--|--|---|
| Fence Mainten | RF, WNS, WS | 6 | | | | in the 1980s. | permttiee maintenance | |
| Little Indian Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2013 | 1 | 25 | - 2,103 meters of four strand barbed wire fence constructed. | Photo points, USFS permttiee maintenance | none |
| Smith Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2013 | 4 | 90 | - 1,219 meters of four stand barbed wire fence constructed. | Photo points, USFS permttiee maintenance | none |
| Granite Creek Conservati on Agreemt 2013 - 23 | CC, HD, RF, RFC, WNS, WS | 1, 2, 3, 4, 5, 6 | 2013 | 0.6 | 10 | - Four large wood structures and one rock weir installed to reduce sediment entrainment in Granite Creek. | CTUIR Bio-Monitoring Project | CTUIR Bio-Monitoring Project |
| CTUIR Monitor Plan Develop | CC, HD, RF, RFC, WNS, WS, SD, P | 1, 2, 3, 4, 5, 6, 7, 8 | 2013 | 0 | 0 | - Developed a reached scale monitoring plan to standardize the CTUIR's Fishery Habitat Program's monitoring efforts. | none | none |
| Deep Creek Culvert Replacmt | WS, P | 6, 8 | 2014 | 3.2 | 1 | - Removed partial barrier to high quality summer steelhead and bull trout habitat. | UNF road inspections | Redd surveys for 2 years after replacmt |
| Bull Run Creek Culvert Replacmt | WS, P | 6, 8 | 2014 | 16.2 | 0 | - Removed partial barrier to high quality summer steelhead and bull trout habitat. | UNF road inspections | Redd surveys for 2 years after |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|--|---------------------------------|------------------------|------------|------------|--------------|---|--|---|
| | | | | | | | | replacem |
| Little Indian Creek Culvert Removal | WS, P | 6, 8 | 2014 | 0.5 | 0 | - Removed partial barrier to high quality summer steelhead trout habitat. | photo points | Redd surveys for 2 years after replacem |
| Camas Creek Fence Maintain | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2014 | 35 | 230 | - Heavy maintenance of riparian fence constructed in the 1980/90s protecting 35 Kilometers of stream channel and floodplain habitats | UNF PIBO, USFS permittie maintenance | none |
| Camas Creek Geomorp Assessmt and Action Plan | CC, HD, RF, RFC, WNS, WS, SD, P | 1, 2, 3, 4, 5, 6, 7, 8 | 2015 | 9 | 1000 | - Geomorphic Assessment concentrating on the primary assessment area extending from river mile 12.0 to 17.8 A secondary assessment area included all portions of the watershed above river mile 17.8. | LiDAR, River Form Metrics, 1D & 2D Hydrologic Modeling, Aerial Photographs | none |
| Desolation Creek Fence Maintain | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2015 | 18.9 | 33.7 | - Heavy maintenance on 39 Kilometers of riparian fence constructed in the 1980/90s protecting 18.7 Kilometers of stream channel and floodplain habitats | USFS permittie maintenance | none |
| Desolation Creek Stock Water Develop | CC, RF, WS | 1, 2, 3, 6 | 2015 | 0 | 1 | - One spring developed to include spring box, trough, and spring fenced off | none | none |
| Fox Creek Riparian Fence | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2015 | 0.8 | 1.7 | - 800 meters of four strand barbed wire fence constructed to protect summer steelhead trout habitat from cattle. | None, Landowner maintenance | none |
| Battle Creek Refit | WS, P | 6, 8 | 2016 | 13.7 | 0 | - Restored passage through the baggier through washing in fine material and creation of an inset low flow channel | none | none |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|--|----------------------------|------------------------|------------|------------|--------------|--|---|------------------------------|
| Five Mile Creek Fence Maintain | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2016 | 9.6 | 2693 | - 26.5 Km of fence received heavy or general maintenance | UNF PIBO, USFS permittiee maintenance, | none |
| Camas Creek Fence and Stock Water Develop | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2016 | 8 | 1 | - 1.2 Km of four strand barbed wire fence constructed - One stock water pond created and one existing stock water pond deepened | none | none |
| Camas Creek Fence and Stock Water Develops | CC, HD, RF, WNS, WS | 1, 2, 3, 5, 6 | 2016 | 8 | 1 | - 1.2 Km of four strand barbed wire fence constructed - one stock water pond created and one existing stock water pond deepened | none | none |
| Desolation Creek Geomorp Assessmt and Action Plan (GAAP) | CC, HD, RF, WNS, WS, SD, P | 1, 2, 3, 4, 5, 6, 7, 8 | 2015 | 11 | 135 | - Geomorphic assessment concentrating on the primary assessment area extending from river mile 1.2 to 11.8 with the balance of the basin considered the secondary assessment area - Desolation Creek basin wide Action Plan to guide restoration efforts | LiDAR, River Form Metrics, 1D Hydrologic Modeling, Aerial Photographs | none |
| NFJD eDNA | I | 9 | 2017 | 58 | 0 | - Understand distribution of bull trout, brook trout, and Pacific Lamprey in the Desolation, Camas, and Granite basins | none | eDNA |
| Desolation Creek Gauging Station | SD | 7 | 2017 | 0.1 | 0 | - Installation and monitoring of a gauging station on lower Desolation Creek at RM 1.0 | Flow curve development | none |
| Desolation Creek Upper Reach 6 Design & Implemt | CC, HD, RF, WS | 1, 2, 3, 4, 5 | 2016 | 0.4 | 6 | - 45 large wood structures developed - 1.6 Km of side channel reactivated - Decommissioned 0.5 miles of unused road - Planted 50 Mountain Alder, 96 Red Osier dogwood, 100 Mock Orange, Black cottonwood, Chokecherry, and willow, and 75 Blue elderberry | CTUIR Bio-Monitoring Project | CTUIR Bio-Monitoring Project |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|---|---------------------|------------------|-------------------|------------|--------------|--|---|------------------------------|
| Granite Creek RM 7.5 Restore | CC, HD, RF, WS, WNS | 1, 2, 3, 4, 5, 6 | 2017 - 2020 | 0.8 | 0 | <ul style="list-style-type: none"> - 168 large wood structures developed - 11 BDAs constructed - 9 side channels created - 4 alcoves created - 4 meander bends created - 10 riffles constructed - 3,000 willow plantings - 100 alder plantings | CTUIR Bio-Monitoring Project | CTUIR Bio-Monitoring Project |
| Bull Run Creek Mine Tailing Design | CC, HD, RF, WS, WNS | 1, 2, 3, 4, 5, 6 | 2017 - 2020 | 2 | 22 | <ul style="list-style-type: none"> - Developed design to address the effects of historic placer mining in floodplain and stream channel habitats | CTUIR Bio-Monitoring Project | CTUIR Bio-Monitoring Project |
| Desolation Creek Meadow Study | SD | 7 | 2018 | 0 | 13 | <ul style="list-style-type: none"> - CTUIR technical input for a study providing information regarding wet meadow storage in an area excluded from cattle grazing | 6 piezometers instrumented with level-loggers and one baro-logger | none |
| Hidaway Creek Design | CC, HD, RF | 1, 2, 3, 4, 5, 6 | 2018 - 2020 | 2.9 | 12 | <ul style="list-style-type: none"> - 198 large wood structures to be developed using wood sourced from adjacent hillslopes | Photo points | none |
| Camas Creek Hand Crew | CC, HD, RF | 1, 2, 3, 4, 5, 6 | 2020 | 1.1 | 14 | <ul style="list-style-type: none"> - 20 large wood jams constructed - 40 whole trees placed | none | none |
| N. Fk. Cable Creek Hand Crew | CC, HD, RF | 1, 2, 3, 4, 5, 6 | 2020 | 2.9 | 17.5 | <ul style="list-style-type: none"> - 29 large wood jams constructed - 0.27 miles of channel racking | none | none |
| Starveout Creek Riparian Fence | CC, HD, FC, RF | 1, 2, 3, 4, 5, 6 | 2020 | 1.75 | 11 | <ul style="list-style-type: none"> - 2.2 Km of four strand barbed wire fence constructed - 1 water gap constructed - Maintenance by ODFW and grazing permittees | none | none |
| Hidaway Creek RM 1.3 Large Wood Placemt | CC, HD, RF | 1, 2, 3, 4, 6 | 2019 - 2020 | 2.96 | 0 | <ul style="list-style-type: none"> - 198 large wood structures developed | Photo points | none |

| Site | Limit Fact | Obj | Start Year | Km. Affect | Acres Affect | Metrics | Phys. Monitor | Bio. Monitor |
|---------------------------------|-------------------------|---------------|-------------|------------|--------------|--|--|--------------|
| Design | | | | | | | | |
| Desolation Creek Reach 3 Design | CC, HD, FC, RF, WS, WNS | 1, 2, 3, 4, 6 | 2019 - 2020 | 3.6 | 60 | <ul style="list-style-type: none"> - 2 culverts replaced - 205 large wood structures constructed - 8 BDAs constructed - 10,000 native plantings - 20 floodplain acres opened for inundation | Photo points, longitudinal profiles, cross sections, aerial imagery, pebble counts | none |



North Fork John Day Headwaters Resilience Project Engaging Hand Crews to Restore the Headwaters

Cooperative Agreement Final Report



Photo 1 - North Fork Cable Creek Post Implementation

Project Executive Summary

In the 2020 field season, the project team implemented restoration work in two North Fork of the John Day (NFJD) headwater tributaries. The team constructed 45 wood structures and numerous other wood additions across 3 stream miles, and 31.5 floodplain acres.

Many of the NFJD tributaries and their floodplain habitats are not in proper functioning ecological condition (hydrologic, geomorphic, biological), due to historic anthropogenic influences including beaver trapping, overgrazing, logging, road building, wood removal from streams, and an altered fire regime. The NFJD headwater tributaries are a top priority in numerous regional plans and assessments. Trout Unlimited (TU) in partnership with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the Umatilla National Forest (UNF) lifted this new initiative off the ground in the John Day. TU hired, trained and worked with hand crews on the ground to implement the project including a Forestry Crew, and the John Day Basin Conservation Corps.

The project goal is to build climate resilience and restore hydrologic form and function in stream, riparian, and wetland habitats to protect and conserve native fish (ESA-listed Steelhead, Bull Trout, and Chinook salmon) and wildlife. We are implementing cost-effective, high impact approaches to increase floodplain connectivity, and thereby restore the ecosystem's natural groundwater storage capacity. We are using site specific prescriptions to hand place High Density Woody Debris (HDWD) in several NFJD tributaries – Camas Creek, and North Fork (NF) of Cable Creek. The objectives of the HDWD approach include, restore stream grade, reduce hydraulic efficiencies, increase channel-floodplain connectivity-hyporheic exchange and inundation time, and enhance habitat complexity. The funds have supported the project team in leading youth crews, contractors, and U.S. Veterans to complete in-stream work.

Engaging a diversity of individuals in public land stewardship improves civic engagement in our public lands now and into the future.

Narrative Summary

Our project team completed field assessments and design plans for Camas Creek in 2019, and for NF Cable Creek in 2020. We began implementation at both project sites during the 2020 field season. TU contracted a forestry group for one week of implementation work on Camas Creek. On the NF Cable Creek, TU worked for 2 weeks with the John Day Basin Conservation Corps which is made up of young adults and US War Veterans. In those three weeks, the teams treated 3 stream miles and 31.5 floodplain acres. They built a total of 39 wood jams, placed 30+ whole trees instream and side channels, racked 0.27 miles of stream with woody debris, and added significant amounts of floodplain wood to 6 regions (see Figure 1 below for a breakdown of metrics).



Photo 2: Crew building lateral deflector LWD structure on Camas Creek.

Figure 1: Project 2020 Implementation Metrics

| | Camas Creek | NF Cable Creek | Totals: |
|----------------------------|--------------------|-----------------------|----------------|
| Stream Miles Surveyed (mi) | 1.2 | 1.8 | 3 miles |
| Stream Miles Treated (mi) | 0.7 | 1.8 | 2.5 miles |
| Floodplain Treated (Acres) | 14 | 17.5 | 31.4 acres |
| Wood Jams Built | 10 | 29 | 39 wood jams |
| Loose Whole Trees Placed | 30+ | 0 | 30+ trees |
| Channel Racking (mi) | 0 | 0.27 | 0.27 mi |

This project has benefited from the work of many project partners including CTUIR (assisted with project planning, initiative development, and funding support), UNF (funder, planning and compliance), and NFJDWC (provided crews).

TU and partners are fulfilling our goals of engaging hand crew workers in aquatic stewardship work. We strive to both complete our restoration objectives as well as educate our workers on the ecological benefits of this type of restoration work, and train them for careers in natural resources. Covid-19 created added challenges during the 2020 field season. However, we have worked hard this year to manage risk while still engaging a diverse group of people. The project team was able to accomplish our restoration goals, and we engaged 14 people on the N. Fork of the John Day, and 30+ people in our larger cross basin initiative. All the crews camped for 2-5 weeks at the project sites, which provided a unique opportunity for them to engage with the landscape.

Cost Share and Match: TU contributed a variety of cost-share and match to this effort. TU contributed approximately \$18,000 for staff time and crews from a mix of OWEB, and other funds. TU partnered with BOR for the use of approximately \$10,000 worth of hand crew equipment. The USFS contributed approximately \$15,000 on in-kind staff time, and \$20,000 worth of large woody material. TU committed \$2,415 in match which is listed in the invoice. If you include the larger cross-basin hand crew there is additional \$50,000+ contributed to this effort from a variety of sources.

Please let us know if you have any questions and thank you for your support!



Photo 3: Example of a placement of a loose whole tree on Camas Creek. Before (left), after (right).



Photo 4: NF Cable Creek Post Implementation.



Photo 5: Setting up the grip hoist cable to build a large woody debris jam on Camas Creek.



Photo 6: Before (left), and after (right) of channel racking to treat incised channel on N. Fork of Cable Creek.



Photo 7: Before (left), and after (right) of large woody debris jam/channel racking on N. Fork Cable Creek.

STARVEOUT CREEK RIPARIAN IMPROVEMENT PROJECT

Summer/Fall 2020

Project Description:

Starveout Creek is an ESA listed, summer steelhead bearing tributary of Desolation Creek; the downstream portion and subject project is located on the conservation property owned by the Desolation Creek LLC. The project involved the construction of 4.14 miles of wire fence enclosing approximately 44 acres of riparian and excluding livestock access to 1.65 miles of spawning and rearing habitat. The fence project ties into existing fence along Desolation Creek on the downstream end of the project and a property boundary fence with the Umatilla National Forest on the upstream end; three water gaps were installed to provide stockwater for livestock using the adjacent pastures.

The project was bid during the summer, 2020 and the contract was awarded to Timber Basin Contractors LLC. Fire restrictions impeded construction efforts through the summer and into the fall; the project was completed and inspected by October 20th, 2020.

Collaborator roles:

Confederated Tribes of the Umatilla Indian Reservation (CTUIR): The tribes provided \$19,747 of funding support for one mile of the project; the monies were used for the purchase of fencing materials as well as to support the fence construction. Additionally, the tribes provided staff to review the final fence construction.

Oregon Department of Fish and Wildlife (ODFW): The John Day Basin Fish Habitat Enhancement Program is one of the longest running habitat programs sponsored by BPA. ODFW provided \$22,280.00 of financial support for services related to the fence construction. Department staff also provided construction management and project design services including landowner coordination, project layout, attendance at the bid tour, contractor oversight and project inspection.

Desolation Creek LLC: Staff representing the property owner aided in the project design and performed brush clearing of the fence route. A fifteen-year agreement with ODFW will allow the Department access to maintain and repair the fence as needed.

Grant Soil and Water Conservation District (SWCD): The District performs administrative tasks associated with the ODFW fencing program such as bidding the work, contracting and fiscal management.

| Starveout Creek Riparian Improvement Project <i>Cost Share Distribution and Amounts</i> | | | | |
|---|------------------------|---------------------------|-----------------------|--------------|
| Collaborator | Fence Materials | Fence Construction | Administration | Total |
| CTUIR | \$13,411.00 | \$6,336.00 | \$0 | \$19,747.00 |
| ODFW | \$4,700.00 | \$17,388.80 | \$191.20 | \$22,280.00 |
| Grant SWCD | \$0 | \$0 | \$838.99 | \$838.99 |

Starveout Creek Riparian Fence

Desolation Creek LLC

Project Photos

