

# Umatilla River Anadromous Fish Habitat Project

## 2021 Annual Report

(January 1, 2021 – January 31, 2022)

BPA Project Number 1987-100-  
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## ACRONYMS

BA	biological assessment
BDSS	beaver dam support structure
BIA	Bureau of Indian Affairs
BPA	Bonneville Power Administration
cfs	cubic feet per second
COR	Contracting Officer Representative
CREP	Conservation Reserve Enhancement Program
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CY	Cubic Yards
dbh	diameter at breast height
EPA	United States Environmental Protection Agency
ESA	Federal Endangered Species Act
ft	foot/feet
FY	fiscal year
in	inch/inches
JPA	Joint Permit Application
km	kilometer/kilometers
LWD	large woody debris
m	meters
mi	mile/miles
MOA	Memorandum of Agreement
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NPPC	Northwest Power Planning Council
NPCC	Northwest Power and Conservation Council
NRCS	Natural Resource Conservation Service
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODSL	Oregon Department of State Lands
OWEB	Oregon Watershed Enhancement Board
OWRD	Oregon Water Resources Department
PCSRF	Pacific Coastal Salmon Recovery Fund
RM	river mile
SOW	Statement of Work
SE	Standard error
TMDL	total maximum daily load
UAFHP	Umatilla Anadromous Fisheries Habitat Project
UBNPME	Umatilla Basin Natural Production Monitoring and Evaluation Project
UBWC	Umatilla Basin Watershed Council
USACOE	United States Army Corps of Engineers
USDA-FS	United States Department of Agriculture Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UPRR	Union Pacific Railroad

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## INTRODUCTION

The CTUIR retain aboriginal and treaty rights related to fishing, hunting, pasturing of livestock, and gathering of traditional plants within the Umatilla River subbasin. The CTUIR Department of Natural Resources (DNR) has developed and accepted a First Foods organization and approach to ecosystem management based on the cultural traditions and practices of the Longhouse. The organization follows the serving order of food and conceptually “Extends the Table” to manage for sustainability within the Umatilla River subbasin. The First Foods are considered to be the minimum ecological products necessary to sustain CTUIR culture (Quaempts et al. 2018). The order is watershed-based beginning with water at the first and lowest point and progresses up to salmon, deer, cous, and huckleberry. This creates clear links to treaty rights and resources and sets direction and goals that relate to the community culture. In addition the CTUIR DNR developed the Umatilla River Vision that provides a description of the processes and conditions needed to protect and provide for First Foods (Jones et al. 2008). The River Vision describes physical and biological processes in support of 5 touchstones; hydrology, geomorphology, connectivity, riparian vegetation, and aquatic biota. The work accomplished through this project is directly related to the First Foods of water and salmon and the 5 touchstones, which incorporates goals of restoring high water quality and healthy and sustainable salmonid fish populations.

CTUIR’s right to fish in its historical fishing places was acknowledged in the Treaty of 1855 that stated: “the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations...” (Treaty of 1855, Articles of Agreement, Article 1, page 3). Decreased salmonid abundance has significantly impacted the livelihood of the Tribal community and altered their way of life.

Overfishing, sweeping changes to rivers and streams, and policies that changed the landscape have endangered salmon and created a “salmon crisis” (Montgomery 2003). It is the challenging duty of the CTUIR Umatilla Anadromous Fisheries Habitat Project (UAFHP) to restore and sustain healthy conditions of local watersheds to both assist in salmon recovery and ensure they provide adequate quantities of sustainable natural resources to satisfy the CTUIR’s needs and preserve opportunities for traditional ways of life.

As part of the Northwest Power Conservation Council’s Columbia Basin Fish and Wildlife Program, this project is one of Bonneville Power Administration’s (BPA) many efforts at off-site mitigation for damage to salmon and steelhead runs, their migration, and wildlife habitat caused by the construction and operation of FCRPS dams. The Umatilla Anadromous Fish Habitat Project (UAFHP; #1987-100-01) initiated by CTUIR in 1987 is an integral component of the Umatilla River Subbasin Salmon and Steelhead Production Plan (NPPC 1990), and project work is supported both locally and regionally by multiple planning documents: Umatilla/Willow Subbasin Plan (NPCC 2005), Umatilla River Basin TMDL and Water Quality Management Plan (2001), CTUIR TMDL (2005), Umatilla River Vision (Jones et al. 2008), Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment (NMFS 2009), Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*) (USFWS 2015), Meacham Creek Watershed Analysis and Action Plan (Andrus and Middel 2003), Umatilla and Meacham Watershed Assessment (UNF 2001), and the Birch Creek Watershed Action Plan (CTUIR 2016).

The Final Umatilla/Willow Subbasin Plan (NPCC 2005; Subbasin Plan) provided a systematic vision of a healthy ecosystem with abundant, productive, viable, and diverse populations of aquatic and terrestrial species with goals, objectives, and management strategies necessary to reach the subbasin vision. The vision entails several broad goals for habitat: 1) Protect existing high quality fish and wildlife habitat and strongholds, 2) restore and enhance degraded and diminished fish and wildlife habitats to support population restoration goals and to mitigate impacts from the construction and operation of the Columbia basin hydropower system and other anthropogenic impacts, and 3) restore the health and function of ecosystems in the Umatilla subbasin to ensure continued viability of their natural

resources (Management Plan, page 5-3). Specific aquatic qualitative objectives and strategies were developed to support the subbasin vision and goals. Quantitative management objectives relative to the UAFHP work activities include 1) maintain and enhance natural production, productivity, abundance, life history characteristics and genetic diversity of fish and mussels throughout the Umatilla subbasin using habitat protection and improvement and 2) maintain and enhance passage of adult and juvenile steelhead and Chinook throughout the Umatilla subbasin with passage protection and restoration (Management Plan, page 5-5). The Umatilla Subbasin Plan (NPCC 2005) determined that the limiting factors could be addressed through habitat restoration and implementation (“Phase III”) of the Umatilla Basin Project (pages 5-10). An identification and analysis of limiting factors/conditions and priority areas for action are fully described within the Subbasin Plan (Section 3.5) including passage barriers/entrainment, in-channel characteristics, habitat diversity (LWD), floodplain confinement, high water temperatures, high turbidity, inadequate flows, and poor riparian/floodplain vegetation. Priority management strategies are being conducted by the UAFHP in accordance with the Final Umatilla Willow Subbasin Plan (NPCC 2005; pages 5-8 & 5-9) to address limiting factors within the subbasin:

- Increase water conservation and irrigation efficiency
- Large Wood/Boulder Structure Placement
- Fence/Plant Riparian Zones
- Modify Channel Floodplain Function
- Construct Pool/Riffle – In-stream Modification
- Modify Detrimental Land use Activities
- Restore Upstream/Headwater Attributes to Improve Downstream Conditions
- Increase Passage Efficiency

The UAFHP continues to protect, enhance, and restore functional floodplain, channel, and watershed processes to provide sustainable and healthy habitat for aquatic species in the Umatilla River subbasin. Habitat restoration efforts fit within a holistic watershed approach supporting capacity building and long-term progress towards 1) achievement of the CTUIR DNR River Vision and First Foods mission statements, 2) Endangered Species Act delisting of Columbia River bull trout and middle Columbia River steelhead, and 3) addresses water quality limiting factors per the Clean Water Act 303d list.

During the 33-year project history, the CTUIR has helped administer and implement a number of fisheries habitat enhancement projects in the Umatilla River subbasin. The CTUIR maintains partnership habitat enhancement projects along Meacham Creek, Isquúktpe Creek, Birch Creek, Wildhorse Creek, East and West Birch Creek and the mainstem Umatilla River, among other sites. The CTUIR has developed effective interagency partnerships and is effectively working at the policy and project levels with various federal, state, and county agencies and private landowners.

The UAFHP is an integral component of the *Umatilla River Subbasin Salmon and Steelhead Production Plan* (1990) and is well integrated into the framework of the *Umatilla Subbasin Plan* (NPCC 2005) established by the NPCC to better coordinate habitat restoration work in the Umatilla River Basin. The CTUIR, ODFW, Natural Resource Conservation Service (NRCS), Umatilla National Forest, Umatilla Basin Watershed Council (UBWC), and other participating agencies and organizations have made significant progress towards restoring and protecting vital salmonid habitat in the basin.

The major project accomplishments during the 2021 contract periods are described in Table 1 below. This only includes the major implementation activities. The planning and design related activities for future implementation projects are contained in Table 2.

Project results are reported in various BPA formats including Pisces status reports, project completion reports, and annual reports. The CTUIR maintains a complete database on project planning, proposals, permitting, implementation, and results through the completion of required project deliverables. For a complete list of reports submitted by the CTUIR’s UAFHP since 1989, please consult the following website at URL:

**Table 1.** Summary of Implementation work accomplished in 2021.

Work Element	Stream Name	Description
Conservation Agreements	Wildhorse, Birch, EFK Birch, WFK Birch, Cottonwood, & Umatilla River	Maintain current conservation agreement terms and conditions on 16 agreements, including maintaining fencing.
Conservation Easement	Umatilla River	Continue working on finalizing a Conservation Easement on the UmaBirch Property
Weed Treatment	Meacham, Umatilla River	Controlled noxious weeds on 56 acres of conservation agreements and previously implemented habitat projects using chemical and mechanical treatments. Biological control treatments are ongoing. Assisted the Rangeland Department in monitoring and treating Japanese Knotweed on the Umatilla River and Imeques project location. Yellow flag iris has been identified on the Meacham RM 10 project area.
Planting	Meacham	4,029 plants
Meacham Creek - Bonifer Reach PA1-4 Punchlist	Meacham	Improved 3.80 habitat miles of stream with complexity, created 20 pools, and installed 300 log structures.
UmaBirch PA4	Birch Creek	Design has reached 100%, contractors have been selected. Implementation is expected to begin spring 2022

**Table 2.** Major designs and project planning for the 2021 field season.

Project	Description
<b>West Birch and Stanley Creek Fish Passage Project</b>	Continue the design process to produce an engineered design for a floodplain reconnection and in-stream habitat enhancement project on West Birch Creek. Design altered to account for cultural sites and changes due to flooding in the early spring.
<b>Umatilla River Assessment</b>	Collaborated with entities and engineers to draft the final Assessment document, technical appendices, spreadsheet tools, and geodatabases.
<b>UmaBirch Conservation Easement</b>	Collaborated with the landowner and continued tasks to complete a conservation easement on a part of the UmaBirch property. Conservation Easement anticipated to be completed in summer of 2022.
<b>UmaBirch Design</b>	Completed 60% designs for UmaBirch Project PA 1-3. The design for Birch Creek 2.3 (PA 4) was taken to 100% and implementation is planned for 2022
<b>UmaBirch NEPA Compliance</b>	An environmental assessment was initiated in 2020 and will be finalized in 2022.
<b>Meacham Creek RM 10-11 Design</b>	Coordinated with USFS and selected engineering firm to create 15% design.
<b>Imeques Reach Design</b>	Put out RFP for design, selected a contractor, and working toward 15% design by February 2022.

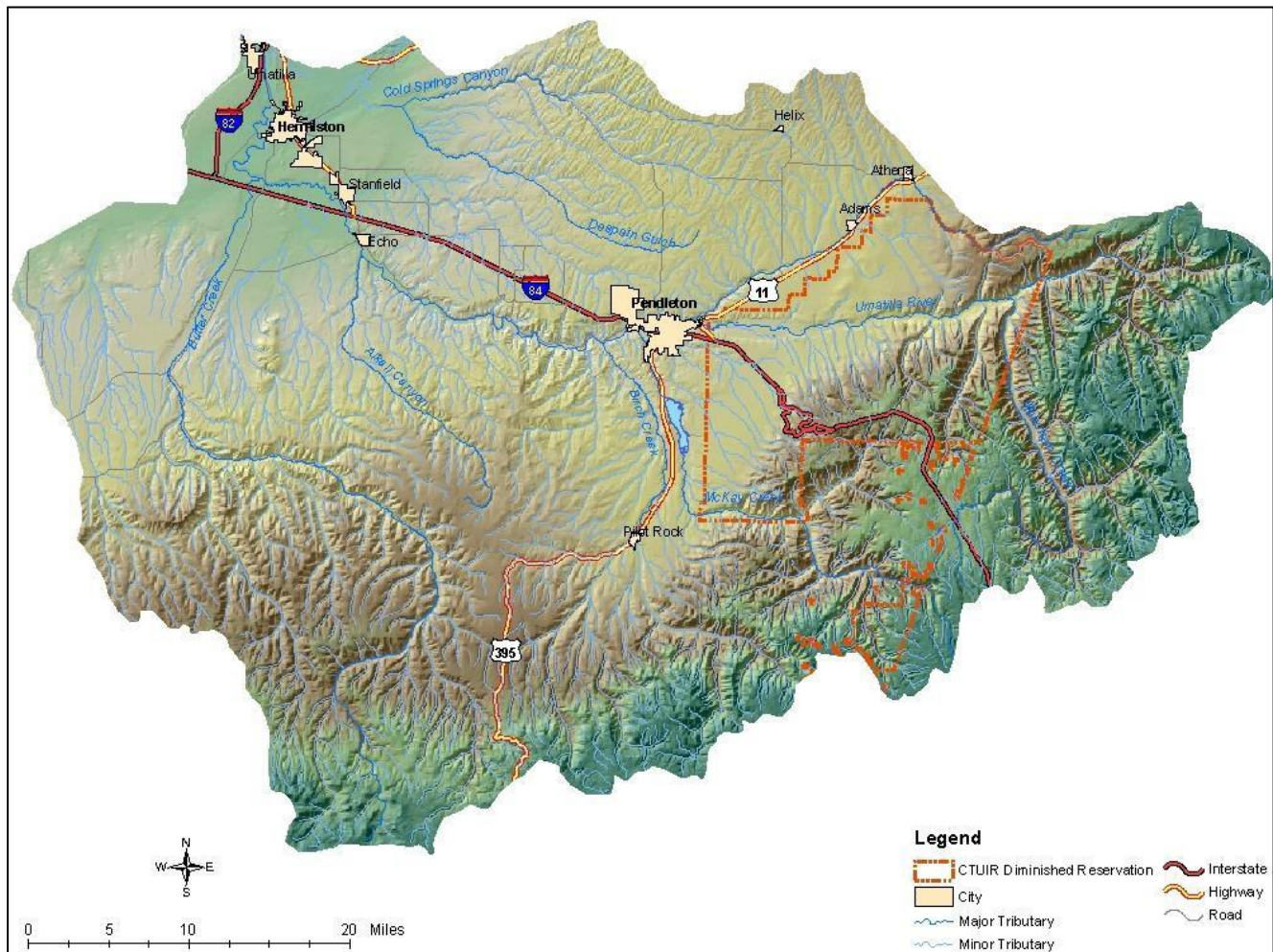
## Project Area

The UAFHP is defined by the boundaries of the Umatilla River subbasin, which is located in the northwest portion of the Blue Mountain Ecological Province in northeast Oregon. The Umatilla River subbasin comprises 1,465,600 acres of the 6,400,000 acres of ceded CTUIR land (CTUIR 1995) as identified by the Treaty of 1855. Figure 1 illustrates the vicinity of the Umatilla River subbasin within the Blue Mountain Province (Project map: <http://www.cbfish.org/Project.mvc/Map/1987-100-01>). The Umatilla River drains an area of approximately 2,540 square miles (mi.<sup>2</sup>) (6,579 square kilometers [km<sup>2</sup>]) and flows approximately 89 mi. (143 km) from where it branches into the north and south forks of the Umatilla River to the mouth at the confluence with the Columbia River. Each fork adds another approximately 10 mi. (16 km) of length. The Umatilla River originates at elevations up to 4,228 feet (ft.; 1,289 m), and flows west and north to its confluence with the Columbia River (USFWS 2002) at an elevation of about 269 ft. (82 m). Other major tributaries include Meacham Creek, Birch Creek, McKay Creek, Butter Creek, and Wildhorse Creek.

The Umatilla River subbasin historically supported viable and harvestable populations of spring/summer and fall

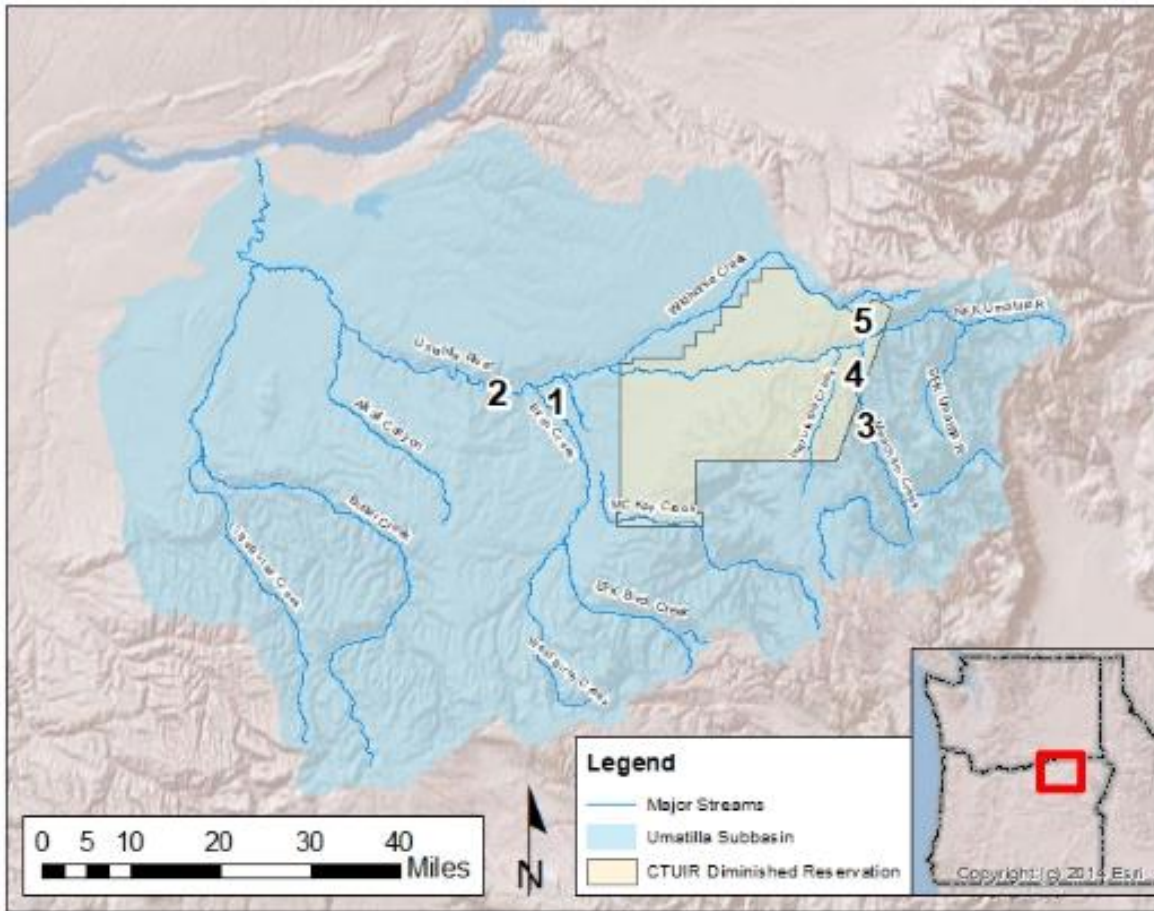
Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), sockeye salmon (*O. nerka*), summer steelhead (*O. mykiss*), Pacific lamprey (*Entosphenus tridentatus*), bull trout (*Salvelinus confluentus*), steelhead-rainbow trout (*O. mykiss sp.*), mountain whitefish (*Prosopium williamsoni*) and a variety of additional native species. Anthropomorphic alterations have negatively impacted the watershed and caused significant reductions of endemic salmonid populations. Beginning in the late 1800s, fish populations started to decline due to habitat degradation. In fact, Sockeye and Coho were extirpated by the early 1900s. Irrigation and agricultural development throughout the basin in the early 1900s is believed to be the primary cause of the decline of steelhead and the extinction of salmon. Since the signing of the Treaty of 1855, aquatic and riparian habitats have been degraded through irrigation diversions, water extractions, channelization, livestock grazing, logging, agriculture and urban development (NPCC 2004). Subsequently, the abundance of Chinook, steelhead, bull trout, and other fish species has also been dramatically reduced. The Umatilla River population of spring Chinook salmon was reported extinct in 1926 (Boyce 1986). With declining fish populations, Tribal governments, federal, state and international agencies were obligated to eliminate or significantly reduce subsistence and sport fisheries by the mid-1970s. The Federal government listed Middle Columbia River summer steelhead and Columbia River bull trout in the Umatilla subbasin as threatened species under the ESA in 2006 and 1999, respectively.

In the mid-1980s, a successful, hatchery-based salmonid reintroduction effort for the Umatilla River was instituted using neighboring strains of various salmonid species. Although hatchery programs currently support subsistence and restricted sport fishing opportunities for steelhead and Chinook and Coho salmon, there remains significant need to re- build viable, harvestable, and sustainable naturally-produced fish stocks throughout the basin.



**Figure 1.** Umatilla River Subbasin

Our primary area of focus for restoration and monitoring work in FY 2020 was Meacham Creek, Wildhorse Creek, Birch Creek and the mainstem Umatilla River (Figure 2).



**Figure 2.** Umatilla River Basin FY 2021 UAFHP Project Sites

**1: UmaBirch PA4 EC & Design:** Worked to complete the design and begin implementation of this project area

**2: UmaBirch CE/Design:** Completed conservation easement to protect over 360 acres of floodplain at the confluence of the Umatilla River and Birch Creek. Concurrently developing a restoration design.

**3: Meacham Creek RM 10-11:** Continued to work collaboratively with USFS and landowner neighboring project. A land owner agreement has been established. Design has been stalled at 15% due to the wildfires raging the surrounding basin.

**4: Meacham Creek (Bonifer Punchlist Project):** Restored 3.8 River miles of stream and floodplain habitat in Bonifer Reach.

**5: Imeques Reach Floodplain Enhancement Design:** Kleinschmidt- R2 Team selected as Technical design contractor. Working on reaching 100%. Assisted Tri-County in noxious weed spraying of Japanese Knotweed.

**Umatilla Basin Assessment:** Gathered data and selected contractor. This will cover the entire Umatilla Basin, as outlined in blue above.

## COMPLETED WORK BY WORK ELEMENT

This section highlights and describes completed work elements in an outline similar to our statement of work on CBFish.org. Each work element with associated identifier code and milestone are listed, followed by a comprehensive summary of completed work under each work element. In addition to a description of completed work elements specific to restoration activities, we briefly highlight habitat inventory results specific to UAFHP efforts outlined for this contract period.

### Contract 73982 REL 125 (CY 2021)

#### **Work Element A: 185. Produce Pisces Status Report**

**Work Element Title:** Periodic Status Reports for BPA

**Milestone Deliverable:** Complete Periodic Pisces Status Reports

CTUIR reported to BPA periodically during the contract period on the status of each statement of work element, and milestones and deliverables using the computer program Pisces:

February-June (2/1/2021-6/30/2021)

July-September (7/1/2021-  
9/30/2021)

October-December (10/1/2021 -  
12/31/2021) Final January (1/1/2022 -  
1/31/2022)

The BPA Contracting Officer Representative (COR) reviewed the Pisces status reports, recommended changes as necessary and accepted them electronically upon approval. Additionally, upon completion of each deliverable milestone, we provided metrics and final project location (latitude and longitude) when required. These Pisces status reports provide a tool for the BPA COTR and administrative staff to track project progress in meeting contract requirements.

#### **Work Element B: 132. Produce (Annual) Progress Report**

**Work Element Title:** Produce Annual Progress Report CY21 (Jan. 1, 2021, thru Jan. 31, 2022)

**Milestone Deliverable:** Completed annual progress report

- A. Review progress report format requirements
- B. Upload finalized RM&E technical report for BPA to publish
- C. Distribute progress report for BPA review and comment
- D. Upload non-technical progress report to Pisces
- E. Review progress report format requirements
- F. Draft CY2021 technical report
- G. Interagency/tribal review
- H. Confirm BPA posted received

The CY2021 BPA Annual Progress Report was completed and was uploaded to BPA through Pisces in April 2022.

#### **Work Element C: 119. Manage and Administer Projects**

**Work Element Title:** Manage and Administer Project

**Milestone Deliverable:** Effective implementation management and timely contract administration

- A. Evaluate current workload and monitor implementation progress.
- B. Develop work plan consistent with expected budget availability and potential tasks or projects.
- C. Integrate and manage the planning, permitting, environmental compliance, and coordinated implementation of contract actions.
- D. Implement actions consistent with CTUIR River Vision. Complete CTUIR and BPA review of the funding package (SOW, Budget, and Property Inventory) for the upcoming contract period.

This work element includes general administration of the CTUIR Umatilla Anadromous Fish Habitat Project (UAFHP). CTUIR staff managed and administered project activities in accomplishing work elements and milestones with associated costs.

## **Work Element D: 165. Produce Environmental Compliance Documentation**

**Work Element Title:** Produce Environmental Compliance Documentation

**Milestone Deliverable:** Compliance Documentation and Assistance for Environmental and Cultural Resource Clearances

The following milestones were completed for FY 2021 projects:

- Meacham Creek – Bonifer Reach Floodplain Reconnection
- Mainstem Umatilla River – UmaBirch 1000% design submittal, and contractors selected for both construction and pipeline relocation
- Submitted OWEB grant and presented a Virtual Site Tour for UmaBirch PA4

CTUIR successfully submitted many applicable documents to the appropriate federal, tribal, state, county entities for select implementation projects in a timely manner required under work elements related to producing environmental compliance documentation in FY2021. Secondary environmental compliance accomplishments during the reporting period included coordination with various compliance personnel to prepare supplemental documentation and reporting for ongoing and planned management actions. Environmental compliance methods include development of appropriate documentation under various federal, Tribal, state and county laws and regulations governing federally funded project work. Methods involve coordination with various federal and state entities agencies and development and submittal of permit applications, cultural clearances, biological assessments, National Environmental Policy Act checklists, etc., as necessary. Part of the environmental compliance work element includes planning and developing site-specific proposals tailored to accomplish fisheries goals and meet compliance standards. The details concerning the implementation of treatments and preparations for putting efforts on the ground, including preparations for subcontracting, and specifics in regarding the safeguarding of ESA-Listed species during the implementation process are outlined in the proposals.

- 1) UAFHP Environmental Compliance Documentation
- 2) ESA consultation with NMFS for FY 2021 project activities was covered under the Terms and Conditions of the HIP III Programmatic Biological Opinion (HIP III BO). Project activities covered under the HIP III BO included:
  - Operate and Maintain Habitat/Passage/Structure (WE I: 186; WE J: 186): CTUIR monitored and maintained existing easements and habitat improvement sites. Maintenance included vegetation watering and installing bioengineering treatments to stabilize habitat features.
  - Maintain Vegetation (WE K: 198): Project activities included maintaining plants on NRCS CREP tracts and treating noxious weeds.
  - Plant Vegetation (WE Q: 47): Project activities included planting in the newly constructed Meacham Creek Bonifer Reach Punchlist Project and in the previously constructed Meacham Creek Project Areas.

CTUIR submitted a letter and attachments with necessary project descriptions and geo-referenced maps for assisting BPA with Section 106 National Historic Protection Act consultations and environmental compliance. The

following projects were submitted for compliance:

1) UmaBirch Floodplain Restoration and In-stream Enhancement

Cultural Resources protection and preservation compliance was ongoing during this contract period. The CTUIR Cultural Resources Protection Program delivered a final report to BPA in early 2021. As well as the projects listed above, ongoing projects will all require Cultural Resource Protection and Preservation monitoring during construction in 2022. The UmaBirch Floodplain project and West Birch projects will be ongoing into the next CY.

### **Work Element E: 114. Identify and Select Projects**

**Work Element Title:** CTUIR Umatilla Subbasin Restoration Coordination

**Milestone Deliverable:** Develop or update prioritized Habitat Project list

CTUIR UAFHP staff developed and annually updated habitat restoration and enhancement projects through coordination and planning with State, Federal and local partners, and private landowners consistent with the Umatilla Willow Subbasin Plan (NPCC 2005). This included participation with the UBWC and the Umatilla County SWCD. CTUIR completed a prioritized list of potential and final developed projects to be implemented contractually with BPA and other funding sources for the upcoming fiscal year and future year planning. Project development and planning were incorporated into this WE to assist in development of future funding packages. The CTUIR also continued to assist in completing the mainstem Umatilla River Assessment and Action Plan during this contract period. It is anticipated that this document will tier to all of the documents listed below and build on those to focus on the mainstem habitat actions, prioritized by reach and fish species.

Final Umatilla Willow Subbasin Plan (NPCC 2005),  
Middle Columbia River Steelhead Recovery Plan (NMFS 2009),  
Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*) (USFWS 2015), Meacham Creek Watershed Analysis and Action Plan (Andrus & Middel, 2003), and  
Birch Creek Watershed Action Plan (CTUIR 2016).

### **Work Element F: 191. Watershed Coordination**

**Work Element Title:** Umatilla River Watershed Coordination Duties

**Milestone Deliverable:** Coordinate Watershed Association Activities

- A. Coordinate with Umatilla Basin Watershed Council
- B. Coordinate with NRCS and the Umatilla County Soil and Water Conservation District
- C. Network with professionals in the field of habitat restoration
- D. Coordinate with co-manager ODFW and other Federal agencies

CTUIR UAFHP staff participated and coordinated with multiple agencies and stakeholders in the Umatilla River subbasin through the Umatilla River Basin Restoration Team meetings, including ODFW, USDA-FS, NRCS, the Umatilla County SWCD, Umatilla Basin Watershed Council and local stakeholders to enhance natural resources, identify problems and solutions, coordinate efforts to prevent duplication, enhance communication and cooperation and identify funding and cost share opportunities within the Umatilla River subbasin. Staff further coordinated with other agencies (e.g. USFWS, NOAA, EPA, BPA and etc.) in planning and implementing partner habitat restoration and enhancement projects, ESA planning processes, and project prioritization and selection processes. CTUIR staff prepared agreements, if necessary, to assign duties and responsibilities to the appropriate entities. We also developed documents, press releases, web sites, and other communications to impart information to participating stakeholders and the public. This effort was made much more challenging because of the pandemic.

## Work Element G: 99. Outreach and Education

**Work Element Title:** Public Outreach and Education

**Milestone Deliverable:** Complete Outreach and Education Activities

CTUIR UAFHP staff educated the public on natural resource protection and restoration principles, and communicated on project activities throughout the year whenever possible. This work was much more limited in scope this year, due to COVID-19 pandemic. Most of the events that staff normally participate in were canceled. It was limited to giving presentations and participating in local and regional workshops, symposia, technical teams and/or conferences (training, project presentation, and memberships), and newspaper articles. The staff is tentatively planning on attending River Restoration Northwest Annual Conference in February '22. Additionally, the quarterly habitat team meetings have been re-initiated with local stakeholders and agencies in the Basin.

CTUIR UAFHP staff completed CTUIR semi-annual reports summarizing project objectives and outputs, expected outcomes, and resulting impacts of project restoration activities (Figure 3). These reports are used by the CTUIR Department of Natural Resources to inform CTUIR staff and government officials, other agencies and entities, and the public of project activities

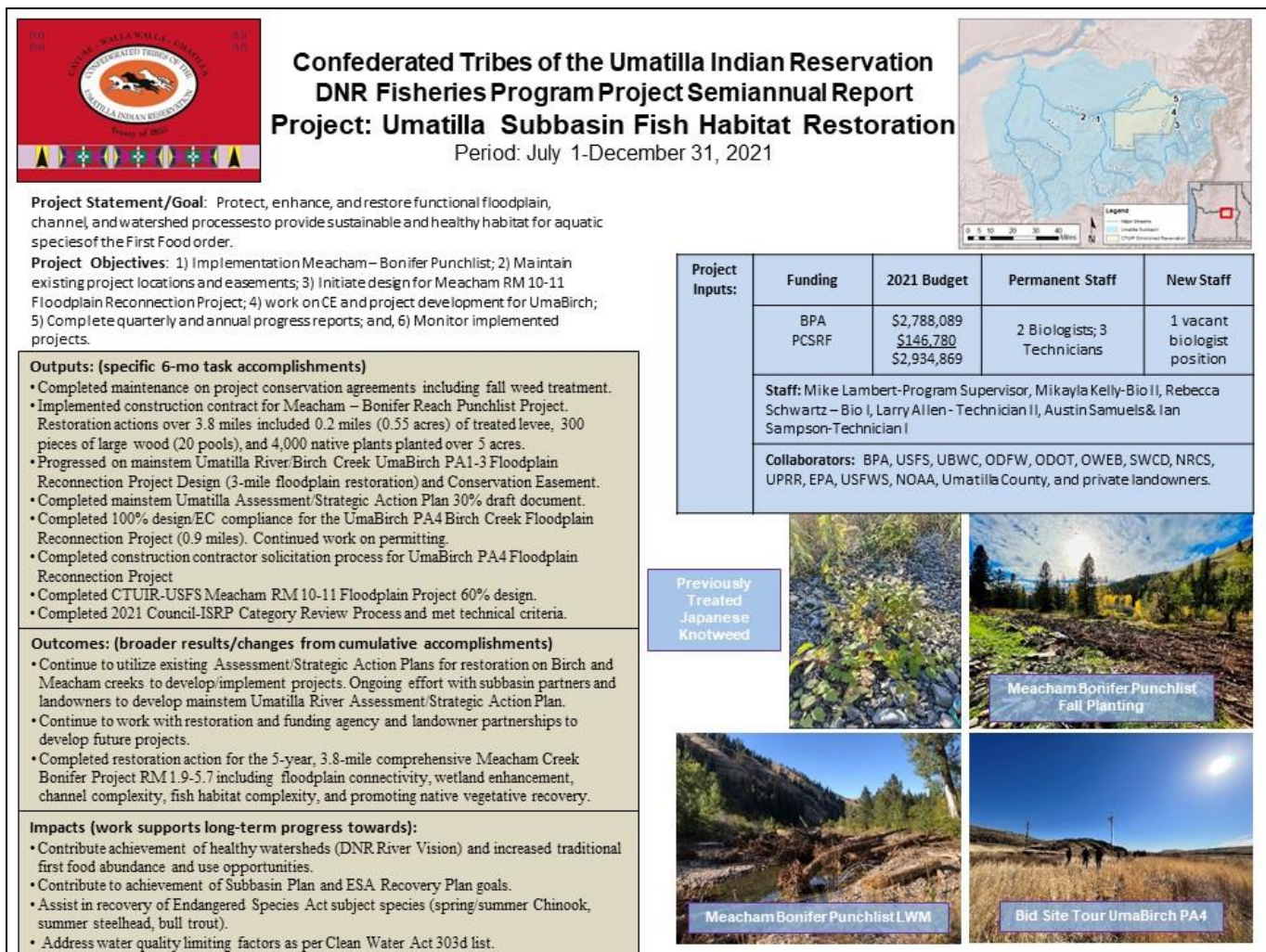


Figure 3. CTUIR semi-annual report for the CTUIRUAFHP, July 1– December 31, 2021.

## **Work Element H: 122. Provide Technical Review and Recommendation**

**Work Element Title:** Review and Provide Technical Input on Issues and Topics that Affect the Areas Natural Resources

**Milestone Deliverable:** Provide Technical Input and Summaries to Enhance or Protect Natural Resources in the Subbasin

- A. Conduct review and provide input as necessary on natural resource preservation issues.
- B. Review and provide technical input on issues that may adversely affect natural resources.

CTUIR UAFHP staff reviewed and provided technical input as applicable on plans and proposals by entities within the Umatilla River Basin that may adversely impact floodplain or riverine processes and biota productivity. Other projects that were reviewed included relevant public project planning, development and review of grant funding proposals, and proposed landowner projects. Project staff provided input to multiple CTUIR departments on annual activities relevant to work within the floodplain, rivers, and wetlands, US Army Corps of Engineers/Oregon Division of State Lands removal-fill permit applications, and CTUIR Stream Zone Alteration (SZA) Permit applications on work proposed within the floodplain on Reservation land.

## **Work Element I: 186. Operate and Maintain Habitat/Passage/Structure**

**Work Element Title:** Inspect and Maintain Function of In-stream Improvement Structures

**Milestone Deliverable:** Maintain Proper Operation of In-stream Habitat Structures

- A. Environmental compliance requirements complete.
- B. The inspection, replacement and/or maintenance of passage and habitat structures.
- C. Hire contractor to perform work.

CTUIR monitors 8 passage rectification projects to assure that treatments are effectively working and to insure that intrusive objects are not interfering with the designed function of the passage structures (Table 3). Routine quarterly scheduled site visits of individual projects are conducted either independently by the CTUIR or jointly with project partners such as ODFW. Site visits typically follow significant flow events or responses to landowner requests at project sites. Project maintenance included, but was not limited to, meeting specified conditional language in state and Federal permits, maintaining debris that is routinely captured or caught on in-stream structures, responses to landowner requests and concerns, and completion of post-treatment surveys to monitor and quantify changes to physical and ecological responses.

## **Work Element J: 186. Operate and Maintain Habitat/Passage/Structure**

**Work Element Title:** Maintenance of Habitat Features Associated with Project Conservation Agreements

**Milestone Deliverable:** Maintenance of Land or Structures Associated with Conservation Agreements

- A. Environmental compliance requirements complete.
- B. Adhere to details of existing easements and/or initiate additional agreements as feasible.

The purpose of these Conservation Agreements is to protect, enhance, and restore functional floodplain, channel, and watershed processes to provide sustainable and healthy habitat for aquatic species in the Umatilla River subbasin. The UAFHP have and will continue to maintain the individual projects to ensure that project structures and fencing are functioning and habitat recovery is progressing towards meeting projects goals and objectives. The CTUIR currently maintains 16 conservation agreements. Current agreements provide secured access and protection of resources for functional floodplain, channel watershed processes to provide sustainable and healthy habitat for aquatic species 26 miles of stream. CTUIR routinely conducts custodial maintenance on individual projects to ensure that project structures and fencing are functioning and habitat recovery is progressing towards meeting projects goals and objectives. Activities include, but are not limited to, installing and repairing riparian cattle exclusion fences,

**Table 3.** Habitat passage structures monitored and maintained by CTUIR to meet design specifications.

Year	Stream	Stream Location	Project Description
2007	Meacham Creek	RM 1.7	Passage rectified by removing large cabled boulders (improved adult passage)
2007	Meacham Creek	RM 20.2	Partial dam removed (juvenile and adult passage)
2007	Camp Creek	RM 0.3	Partial dam removal (juvenile and adult passage)
2007	Greasewood Creek	RM 0.4	Partial dam removal (juvenile and adult passage)
2007	West Birch Creek	RM 3.2	Roughened channel to restore proper gradient and reduce step height at road bridge crossing for adult passage
2008	West Birch Creek	RM 2.7	Hoelt Dam fish passage rectification (juvenile and adult passage)
2019	Umatilla River	RM 48.2	Partial dam removed (juvenile and adult passage)
2019	Wildhorse Creek	RM 18.8	Passage rectified by removing concrete grade control structure and replacing bridge (Juvenile and adult passage)

maintaining or installing water gaps, riparian and floodplain plantings and maintenance, noxious weed control, maintenance of fish habitat improvement structures, and landowner coordination and education. This fall and winter the UAFHP staff planted over 4,000 plants throughout the Meacham Bonifer Project Areas.

### **Work Element K: 198. Maintain Vegetation**

**Work Element Title:** Maintain Vegetation and Control Noxious Weeds in Project Areas within the Umatilla River Subbasin

**Milestone Deliverable:** Maximize Survival of Native Vegetation in Enhancement Project Areas

- A. Environmental compliance requirements complete.
- B. Physical removal of non-preferred species of vegetative growth from project area.
- C. Weed control in project areas by chemical means.
- D. Water vegetation and reduce weed competition to improve survival at CTUIR project areas.
- E. Till established weed areas as necessary for noxious weed control.

Project activities conducted in 2021 included the monitoring and maintenance of 16 conservation agreements on numerous individual landowner properties. Watering, weeding and maintenance methods for each Conservation Agreement and project area is important for enhanced native vegetation and project site but maintenance varies by site conditions. Strategies to address weeds are included in agreements that are either completed by the landowner, CTUIR, subcontractor, and/or through the County Weed Control Board. CTUIR staff provides assistance to landowners by coordinating and managing herbicide application, providing funding, and developing treatment strategies. Manual, biological and chemical treatment options are utilized by CTUIR and may be employed when consistent with existing standards. The project treated 78.5 acres of property within the Umatilla subbasin in 2020 (Table 4). Weed control is essential in establishing native grass and plant species. The UAFHP partnered with Umatilla County and the Forest service to spray/control noxious weeds on sites where chemical application is necessary. The team identified problem weeds, determined the appropriate herbicide and selected the most effective application methods and rates in accordance with the National Oceanic and Atmospheric Administration's (NOAA) Biological Opinion under BPA's Habitat Improvement Program. The UAFHP utilizes backpack spraying applications to treat perennial, annual and

biennial weed species. All herbicide applications are consistent with Oregon Revised Statute (ORS).570.505 and Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Regulations. CTUIR complies with BPA standards and supplies a report to BPA detailing the types and quantities of herbicides applied to specified locations.

Additionally, Habitat Department Staff assisted the Rangeland Management Department in monitoring invasive Japanese Knotweed at the Imeques Project and various locations along the Umatilla River. The Habitat Department also assisted Tri-County CWMA in Japanese knotweed control found in project and conservation agreement areas after the 2020 flood events. The department staff will be retaking the Pesticide Applicators exam in 2022 as well.

**Table 4.** Noxious weed treatments completed by location within the Umatilla River Basin, 2021

Stream Name	Latitude	Longitude	Acres Treated	Method	Species Targeted
Meacham Creek	45.63673	-118.35686	12	Mechanical, Chemical	<i>Potentilla recta</i> , <i>Centaurea</i> spp., <i>Echium vulgare</i> , <i>Rubus</i> spp.
Wildhorse Creek	45.80863	-118.49055	1	Mechanical	<i>Conium maculatum</i>
Umatilla River	45.66254	-118.99011	37.5	Mechanical	<i>Lepidium</i> spp., <i>Centaurea</i> spp.
Umatilla River	45.66254	-118.99011	28	Chemical	<i>Polygonum cuspidatum</i> , <i>Fallopia japonica</i>
<b>Total Acres Treated</b>			<b>78.5</b>		

### Work Element L: 172. Conduct Pre-Acquisition Activities

**Work Element Title:** Conduct pre-acquisition activities for Birch Creek-Umatilla River confluence and East Birch Properties

**Milestone Deliverable:** Produce the necessary documents necessary to move forward with purchasing a conservation easement.

Significant coordination and planning efforts were accomplished in the 2021 contract year to advance the UmaBirch project to the potential purchase of most of the floodplain property and the execution of a conservation easement on the remaining floodplain portion of the property. The UAFHP has been working closely with the landowner, other CTUIR projects, the Blue Mountain Land Trust, and Western Rivers Conservancy and BPA to determine the scope and terms of the land and water conservation easement, conservation measures and value. Over the course of this contract year, all parties have met intently to coordinate all activities necessary for completion of the agreement. An appraisal was completed during this CY. The deliverable for the work element of producing documents and surveys necessary for the conservation easement has been met. CTUIR, landowner, and other partners will continue progress in 2022.

### Work Element M: 115. Produce Inventory or Assessment

**Work Element Title:** Produce Umatilla River Subbasin Assessment

**Milestone Deliverable:** Deliver Subbasin Assessment and Assessment Action Plan

The UAFHP awarded a contract for the Assessment and Action Plan to Tetra Tech Inc. in 2020. The CTUIR worked with Tetra Tech Inc. in identifying data gaps and collating the necessary data and identification of data gaps in 2021. In 2021, CTUIR UAFHP staff field collected reach based large wood density counts and pebble count data for the assessment. The draft assessment document was completed in 2021 for review by the subbasin technical team. The UAFHP worked closely with the CTUIR GIS department to transfer this data into new maps in the CTUIR repositories and in public databases as well as determining where critical data gaps still exist. In contract year 2021 the UAFHP also continued coordinating with stakeholders including various CTUIR departments, federal and state agencies, local

governments, and local nonprofits to begin assembling a core technical team and several smaller teams to work on specific components of the assessment.

### **Work Element N: 175. Produce Design and/or Specifications**

**Work Element Title:** Meacham RM 10 Habitat Enhancement Project Design

**Milestone Deliverable:** Complete Meacham Creek RM 10 Habitat Enhancement Design

CTUIR continued to work collaboratively with the USDA USFS Walla Walla Ranger District to develop the work plan for RFP proposal for engineering design. The RFP was advertised through a formal competitive bid process, and Tetra Tech Inc. was the selected contractor. The 60% design and basis for design report has been completed. The design will include, EC compliance and construction oversight. Part of the delay in being able to implement this project was a result of the increase in fires and the demand needed by partner U.S. Forest Service personnel. A draft USFS agreement for the project was completed. Yellow Flag Iris was identified at the project location is an invasive species that needs to be addressed.

### **Work Element O: 175. Produce Design and/or Specifications**

**Work Element Title:** UmaBirch Properties – Floodplain Restoration and Habitat Enhancement Design

**Milestone Deliverable:** 100% UmaBirch Floodplain Restoration and habitat Enhancement Design

In 2021, UAFHP staff continued towards finalizing the conservation easement for restoration work on the UmaBirch project established in 2017. The 100% design for the first phase (PA4) was completed in July of 2021. The design indicates a phased construction approach into four distinct project areas (PAs). Included in the 100% design is an implementation plan, design drawing, construction specifications, and Habitat Improvement Program Conservation Measures for PA4. Phasing designs allows the CTUIR to be flexible in its restoration strategy at the site and plan projects for out years more easily.

The project was subsequently broken into 4 distinct project areas. The decision was made to carry Project Area 4 (PA4) forward first, as it was deemed to be the least complex. The designs for PA4 have reached 100%. Lindley is the selected contractor for harvest of logs and construction. Irrigation Specialists is the selected contractor for the relocation of the irrigation pipeline. Communications with the various stakeholders has been reinitiated in order to continue collaborative design progress for Project Areas 1-3. PA 1-3 has reached 30% design. PA 1-3 will progress to 60% design over contract year 2022 including a U.S. Army Corps of Engineers levee, feedlot and old gravel mining ponds that need considered in the design process.

### **Work Element P: 29. Increase Aquatic and/or Floodplain Complexity**

**Work Element Title:** Construction – Meacham Creek Bonifer Punchlist

**Milestone Deliverable:** Create Floodplain Complexity.

During this contract year the UAFHP completed all construction activities in the Bonifer Reach Project Areas 1-4 (RM 1.9-5.7). Large wood structures were placed and levees that no longer served the purpose of protecting the UPRR tracks due to channel migration after the large flood events were removed to allow greater floodplain connection and complexity (Tables 5&6).

An As-Built Survey Monitoring Analysis of the Bonifer Reach of the Meacham Creek Floodplain Restoration and In-Stream Enhancement project including project areas (PA 1-4) was done in 2020 highlighting changes in channel characteristics post-construction (Tetra Tech 2020).

**Table 5.** Meacham Creek Punchlist Implementation Pictures.



**Table 6.** Meacham Creek Bonifer Reach implementation schedule.

Implementation Year	Project Areas	Stream Location	Project Description
2017-18	3 & 4	RM 4.05 – 5.7	Removed levees/dikes, created primary and secondary channel, enhanced pool/alcove habitat, constructed large woody jams, added large wood, constructed embankments
2019	2	RM 3.25 – 4.05	Created primary and secondary channel, added large wood
2020	1	RM 1.9 – 3.25	Removed levees/dikes, created side channel, added large wood
2021	1-4	RM 1.9 – 5.7	Implemented punch list items over entire project. Removed and modified spur dikes and levee, channel realignment, reactivation of historic channels, and adding LWM

### **Work Element Q: 47. Plant Vegetation**

**Work Element Title:** Planting within Umatilla River Subbasin Project Areas

**Milestone Deliverable:** Complete Scheduled Tree and Shrub Plantings in Project Areas

- A. Environmental compliance requirements complete.
- B. Agreement with the Native Plant Nursery for Growing Plants and Developing Plant Protocol.
- C. Establish Planting Locations in Existing Project Areas for Increased Recovery.

UAFHP staff annually plant vegetation and distribute native grass seed in areas we have implemented existing and new habitat enhancement projects or have identified a need in maintained riparian Conservation Agreement areas. In 2021, the UAFHP completed a fall planting effort within the previously implemented Meacham Creek Floodplain Restoration and In-stream Enhancement Project. The fall planting effort included installing 4,097 containerized, native plants in Meacham Creek (Figure 4).

Planting tasks include site planning and development of planting strategies, collection and preparation of materials (pruning and conditioning of live willow material), pre-order coordination with the CTUIR Tribal Native Plant Nursery, and installation. Planting techniques are customized for conditions within each project area. Planting location, species, age, form (cuttings, saplings, bare-roots, potted, plugs), and soil/substrate conditions were considered and addressed during the implementation planning phase. The CTUIR UAFHP staff work closely with the Tribal Native Plant Nursery to collect local seed and plant stock to provide native plants for particular project areas by elevation and planting zones.

### **Work Element R: 180. Enhance Floodplain/Remove, Modify, Breach Dike**

**Work Element Title:** Construction - Meacham Creek Punchlist

**Milestone Deliverable:** Remove Levees and Spur Dikes

CTUIR subcontracted construction services to complete the construction of floodplain reconnection in the Meacham Creek Bonifer Reach Project Area 4 as part of the Bonifer Reach Floodplain Reconnection and In-Stream Enhancement Project. A total of 8 confining features were removed or modified, totaling 9,100 cubic yards of material, to allow historic river flow paths and enhanced channel function.



**Figure 4.** CTUIR planting native vegetation at the Meacham Creek Project Site

**Work Element S: 184. Install Fish Passage Structure**

**Work Element Title:** West Birch Creek and Stanley Creek Fish Passage Project Implementation

**Milestone Deliverable:** Completed Final Design and EC

CTUIR collaborated with the ODFW and UBWC to design the replacement of two fish passage barriers with 1) an open-bottom arch bridge on Stanley Creek and 2) complete removal of another current abandoned irrigation diversion structure entirely on West Birch Creek. The UBWC have secured match funds to complete this work through an OWEB grant. An environmental engineering firm was solicited and contracted to complete topographic surveys, coordinating with the county and city by the UBWC in 2020. This firm will also be responsible for the development of the surface layer, habitat analysis, hydraulic model development and report, geomorphic assessment, development of the restoration design alternatives analysis, development of the implementation plan and schedule, and permitting. We worked with UBWC and engineering firm Tetra Tech Inc. to complete the 15% design, identify the action area, and started cultural resource consultation. This construction work plan was delayed until 2023 due to delay of engineering design.

**Work Element T: 175. Produce Design and/or Specifications**

**Work Element Title:** Imeques Project Design

**Milestone Deliverable:** Imeques Reach habitat Enhancement Final Design

CTUIR developed a work plan and advertise for solicitation of engineering services for design. Kleinschmidt-R2 was selected for development of design. The contract for engineering was implemented in 2021 and completed the initial 15% conceptual designs and draft basis for design report. The UAFHP staff are working closely with our Fisheries Program Artificial Production and Monitoring and Evaluation departments on design with intent to improve acclimation facility operations and maintenance, trap site and fish habitat improvements.

**Work Element U: 175. Produce Design and/or Specifications**

**Work Element Title:** West Birch Creek Fish Passage Project Design

**Milestone Deliverable:** Final Design

CTUIR collaborated with the ODFW and UBWC to design the replacement of two fish passage barriers with 1) an

open-bottom arch bridge on Stanley Creek and 2) complete removal of another current abandoned irrigation diversion structure entirely on West Birch Creek. The UBWC have secured match funds to complete this work through an OWEB grant. An environmental engineering firm was solicited and contracted to complete topographic surveys, coordinating with the county and city by the UBWC in 2020. This firm will also be responsible for the development of the surface layer, habitat analysis, hydraulic model development and report, geomorphic assessment, development of the restoration design alternatives analysis, development of the implementation plan and schedule, and permitting. We worked with UBWC and engineering firm Tetra Tech Inc. to complete the 15% design, identify the action area, and started cultural resource consultation.

## **Discussion**

The projects implemented in this reporting period were carefully designed in previous years to mitigate for the identified ecological concerns and align with local assessments. The CTUIR approaches restoration utilizing the Umatilla River Vision, previously described (Jones et al. 2008). The process-based philosophy of the River Vision encourages development of projects that address multiple River Vision Touchstones, limiting factors, and ecological concerns (Table 7).

Habitat protection and restoration actions, like those completed during this review period, were identified in numerous local assessments and planning documents. The Umatilla River Basin TMDL and WQMP (ODEQ and CTUIR 2001), Umatilla/Willow Subbasin Plan (NPCC 2005), Middle Columbia Steelhead DPS ESA Recovery Plan (2009), and the Recovery Plan for the Coterminous United States Population of Bull Trout (USFWS 2015) all identify one or more habitat restoration or protection actions implemented by the UAFHP in this reporting period as a way to address issues facing ESA-listed fish species and/or water quality concerns. In addition to the subbasin-scale planning documents, the restoration activities completed by the UAFHP in this reporting period are also supported by several smaller scale watershed assessments. The Meacham Creek Watershed Analysis and Action Plan (Andrus and Middel 2003) and the Birch Creek Watershed Action Plan (CTUIR 2016) both specifically support the restoration actions completed in those watersheds.

## **OBSTACLES AND LESSONS LEARNED**

One of the largest obstacles to implementation during almost this entire reporting period was the worldwide COVID-19 pandemic health restrictions and extreme drought and fire season over 2021. These obstacles created multiple challenges to communication, implementation and staff daily activities. Throughout this period, project staff have adapted and become much more adept at communicating via virtual means (e.g. Microsoft Teams, Zoom, and etc.). This has resulted in increased efficiencies in some cases and a decrease in other cases.

Overcoming these constraints as best as possible, the UAFHP completed work in areas with multiple jurisdictions, subcontracted several large design and construction contracts, and maintained complex partnerships with landowners and local action agencies. The wide variety of work presented a number of unique challenges. As a result of working through these challenges, the UAFHP has learned several lessons that will inform future project work.

**Table 7.** The Umatilla Anadromous Fish Habitat Project objectives relative to the Umatilla River Vision touchstones (Jones et al. 2008), BPA 2008 Fish Accords primary limiting factors (Fish Accords 2008) and NOAA’s ecological concerns (NMFS 2009).

Umatilla Habitat Program Objectives	Umatilla River Vision 2008 Touchstones Addressed	BPA 2008 Fish Accords Primary Limiting Factor's Addressed	NOAA Ecological Concerns	NOAA Ecological Concerns Subcategories
Protect and conserve natural ecological processes that support the viability of fish populations and their primary life history strategies	Biota Connectivity Geomorphology Hydrology Riparian Vegetation	In-channel Characteristics Floodplain/Riparian Sediment	Multiple(Habitat Quantity, Injury and Mortality, Peripheral and Transitional Habitats, Channel Structure and Form, Sediment Conditions, Water Quality, Water Quantity, Population Level Effects)	Multiple
Restore passage and connectivity to habitats blocked or impaired by artificial barriers and maintain properly function passage and connectivity	Geomorphology Connectivity	Passage/Entrainment	Habitat Quantity	Anthropogenic Barriers
Maintain and restore floodplain connectivity and function	Aquatic Biota, Connectivity, Riparian Vegetation, Geomorphology, Hydrology	Water Quality-Temperature Riparian/Floodplain	Food, Peripheral and Transitional habitats, Riparian Condition, Channel Structure and Form, Water Quantity	Altered Primary Productivity, Altered Prey Species Composition and Diversity, Riparian Condition, LWD Recruitment, Floodplain Condition, Bed and Channel Form, Instream Complexity, Decreased Water Quantity, Altered Flow Timing
Restore degraded and maintain properly function channel structure and complexity	Connectivity, Riparian Vegetation, Geomorphology	In-channel Characteristics	Riparian Condition, Peripheral and Transitional Habitats, Channel Structure and Form	Riparian Condition, LWD Recruitment, Side Channel Conditions, Floodplain Condition, Bed and Channel Form, Instream Structural Complexity
Restore riparian condition and LWD recruitment and maintain properly functioning conditions	Aquatic Biota, Riparian Vegetation, Hydrology	In-channel Characteristics Riparian/Floodplain	Food, Riparian Condition	Riparian Condition, LWD Recruitment, Altered Primary Productivity, Food-Competition, Altered Prey Species Composition and Diversity
Restore natural hydrograph to provide sufficient flow during critical periods	Connectivity, Aquatic Biota, Hydrology,	Floodplain/Riparian Water Quality-Temperature	Habitat Quantity, Water Quality, Water Quantity	HQ-Competition, Oxygen, Increased Water , Alter Flow Timing
Improve degraded water quality and maintain unimpaired water quality	Hydrology, Aquatic Biota	Floodplain/Riparian Water Quality-Temperature	Riparian Condition, Sediment Conditions, Water Quality	Riparian Condition, Decreased Sediment Quantity, Temperature, Oxygen Turbidity, Toxic Contaminants

The rampant fires earlier this summer and fall caused issues for construction and partners. The extreme temperatures and dryness prevented construction from being completed when the contractor had hoped due to having to shut down equipment at 1 PM and having to start earlier in the morning. Additionally, the fires became a priority for the USFS, the CTUIR’s partner in the Meacham RM 10 – 11 project. Due to the attention and resources being focused on fire control, this slowed communications and progression on project design. Additionally, an invasive Yellow Flag Iris plant was discovered in the project area, and discussions are ongoing how to handle this outside of the USFS ARBO.

## ADAPTIVE MANAGEMENT

The UAFHP places a heavy weight on adaptive management, applying lessons learned in past years, and using research and action effectiveness monitoring data to support project decision making.

This contract year the UAFHP brought on a new Fisheries Habitat Biologist I while also losing the Project Lead. The Biologist I has assisted in collecting field data and project implementation. This fall the team continued to assist in collect data critical to completing the Umatilla River Basin Assessment. This data includes pebble and LWM density counts, which have been utilized with the CTUIR's GIS department. Additional field work completed this CY includes assisting the Rangeland Management Department with spraying and surveying invasive Japanese Knotweed. Successful removal will allow progression for project implementation at the Imeqes site.

This CY include being adaptable to rapid changes in department staffing and learning how to adapt to multiple roles in order to ensure projects are completed and met on time. Additionally, reflecting on how to improve, plan, and coordinate planting will be critical when construction is completed at UmaBirch PA 4 in the next CY. The UAFHP continues to improve the species mix based on ecological suitability and enhancement of First Foods species. Methods for planting more efficiently, like hydro-seeding riparian species in addition to plugs has been researched to incorporate into the UmaBirch wetlands that will be constructed next CY.

At the start of this contract year the UAFHP completed the ISRP review with no further questions asked, a tremendous accomplishment for the department. The UAFHP was recognized for their proposal and met scientific criteria through the [Council-ISRP Geographic Review](#) process (Christian et al. 2021).

One of the lessons learns this CY was how to effectively treat and monitor invasive Japanese Knotweed. This was particularly challenging to accomplish as it grows along the stream bank the UAFHP is restricted to HIIP protocols. The Rangeland Management contracted Tri-County CWMA to spray herbicide in the fall. The UAFHP Technician crew assisted Tri County with spraying. Several months later the crew also assisted in post spraying monitoring. During that time an additional ±130 plants were identified that were not previously treated. One of the lessons learned from this is that due to Japanese Knotweed being a newly identified invasive to the subbasin, the UAFHP will have to continue to work with other departments to make sure Japanese Knotweed continues to be managed and monitored in the future.

Utilizing a River Vision (Jones et al 2008) approach, the staff have developed an implementation approach to allow the water to do as much work for us as possible. Not only does this align perfectly with a process-based approach, it also minimizes impacts to the resources in the short term. This approach, specific to constructing new side channels or main channels, relies on the premise that they are constructed in the fall and allowed to overwinter. These channels are roughly excavated, to allow the water to activate the newly constructed section at a designed flow elevation (e.g. typically about 1.2 year flow return interval). Channel dimensions are not constructed to exact widths or depths, as the water will be allowed to scour the channel to the appropriate dimensions. Also the project strives to only excavate the minimum amount necessary to reconnect relic channels. This accomplishes the following ecological/biological benefits:

- There is less excavation, as the water is allowed to more clearly define its own channel geomorphology, which reduces overall project costs;
- Allowing the water to define its own course more directly also likely contributes to longer term stability, as the water is creating its own channel;
- This allows the newly disturbed soil to gain weathering, which reduces the amount of turbidity produced;
- The newly disturbed soil is washed into place by hand. This turbid water is pumped into the floodplain and allowed to slowly re-infiltrate slowly, which further reduces future turbidity;
- When the turbidity is realized in the system, it is at a time of the year when there is substantially less stress to the fish that are present:

- Water temperatures are lower (i.e. there's less oxygen requirements on the fish);
- The turbidity presumably settles out along the length of newly reconnected channel prior to reaching areas occupied by fish;
- This occurs at a time of the year when there's more water, which allows fish more refugia areas to avoid any potential turbidity stressors; and,
- This approach minimizes the need for fish salvage, and thus, reduces the incidental take of listed and resident fish.

A gap in our current feedback loop stems from the simple truth that not many of these large-scale, full floodplain projects have been implemented and monitored in a manner that provides clear, concise answers. This is particularly true for certain project elements, like hyporheic exchange and long-term ecological improvements. Another flaw is the lack of resources available that allows project sponsors to clearly articulate findings of monitoring that is completed to colleagues.

Of course, COVID-19 created a situation that forced project staff to adapt to a changed work environment. Staff that were able embraced technology and began working from home, had all meetings virtually and gave pre-bid tours virtually. This created several logistical challenges, as well as increased efficiencies in some instances. CTUIR staff have adapted to this via new software, added flexibility in utilizing work computers at home and more flexible work schedules. COVID-19 continues to present challenges that staff will continue to overcome.

## **SUMMARY AND CONCLUSIONS**

The CTUIR Habitat Program utilizes a process based approach to restoration activities, following the CTUIR River Vision (Jones et al 2008), Upland Vision (Endress et al 2019) and First Foods policies (Quaempts et al 2018). These guiding documents provide the framework in which our program develops, designs, implements and monitors restoration activities and projects. Following this approach, project staff have developed a more holistic way to meet project objectives, provide the system with tools to place it on a recovery trajectory and allow the water to do some of the work for us.

In accordance with the 2006 NPCC solicitation outline, the CTUIR UAFHP has focused its restoration activities primarily on Meacham Creek, Birch Creek, and mainstem Umatilla River. However, project restoration activities occur in other areas of the basin where floodplain and riverine processes are treated with outcomes that are beneficial to ecological processes, water quality and fish production. The Meacham Creek Watershed has long been a primary focal point of the CTUIR effort to improve habitat conditions in the Umatilla Basin because of its location, size, historical significance, and recovery potential. Table 8 highlights the CTUIR Umatilla Anadromous Fish Habitat Project restoration accomplishments since 2007.

Proposed restoration actions have focused on protection, enhancement, and restoration of functional floodplain, channel and watershed processes at multiple scales using passive and active restoration techniques. Over the past decade, the CTUIR Department of Natural Resources and UAFHP have transitioned from restoration toward a fixed endpoint to address symptoms to a restoration of processes. Restoration of process is more likely to address causes of river ecosystem degradation, whereas restoration toward a fixed endpoint addresses only symptoms. Specific restoration actions proposed for completion by CTUIR include levee removal and or modification, floodplain and channel construction, in-stream and floodplain large wood additions, in-stream structure placement, wetland enhancement, floodplain and riparian plantings, noxious weed removal, riparian management through fencing, and removal of physical migration barriers. Threats from climate change, invasive non-native species, and chemical/fuel spills are becoming increasingly relevant within the Umatilla Watershed. The negative effects associated with these emerging dangers have the potential to severely compromise ongoing restoration efforts. The obvious and most direct potential threat to restoration efforts in the long-term is the increase in stream and river temperatures to an uninhabitable level for salmon and trout in the near future. The UAFHP have and will continue to maintain project areas

under secured conservation agreements, or conservation easements/land acquisition, on private properties for protection and enhancement of floodplain and riparian habitat investments. Completed project activities are described below in more detail in the context of the watershed with reference to annual progress reports.

During this reporting period, the UAFHP continued to implement habitat improvement projects through a debilitating pandemic. The CTUIR UAFHP completed the final punchlist of floodplain reconnection and in-stream enhancement in the Meacham Creek Bonifer Reach. In addition to project implementation, UAFHP staff completed maintenance of ongoing riparian enhancement and passage projects at properties where the CTUIR has pre-existing riparian conservation agreements like Athena Bridge. This maintenance included noxious weed treatment, maintenance of built structures, and riparian planting.

The CTUIR UAFHP made progress as well as completion on several design documents that will serve to inform projects in the long and near term future of the UAFHP. The UAFHP began the design process for a floodplain reconnection and in-stream enhancement project on Meacham Creek RM 10-11. UAFHP made great strides on the Umatilla Basin Assessment and Action Plan, with the hope of beginning implementation early 2022. Design of the UmaBirch PA 4 has reached completion, while the remaining PAs remain at 30% with expected progression to come.

A principal strength and focus of the CTUIR UAFHP project is the ability to work cooperatively with the various entities throughout the restoration process. Staff participated and cooperated with multiple agencies and stakeholders in the Umatilla Basin Watershed including ODFW, USDA-FS, Natural Resource Conservation Service, Umatilla Basin Watershed Council, Umatilla County Soil and Water Conservation District, and local stakeholders to enhance or protect natural resources, identify problems and solutions, coordinate efforts to prevent duplication, enhance communication and cooperation and identify funding and cost share opportunities within the Umatilla River subbasin.

The UAFHP is an ongoing effort to protect, enhance and restore functional floodplain, channel and watershed processes to provide sustainable and healthy habitat for aquatic species in the Umatilla River subbasin, including Threatened Middle Columbia River Steelhead. Project work further supports the CTUIR Department of Natural Resource River Vision and First Foods mission statements to sustain production. The River Vision principles have been successfully applied in effort to reestablish the salmonids to self-sustaining levels. We expect a substantial positive response of salmonid populations once habitat floodplain and channel function is addressed and improved. We believe a positive correlation between habitat improvement, salmonid density, and fitness levels will shift the status of ESA-Listed species towards a safer level of sustainability in the Umatilla River Basin.

**Table 8.** The CTUIR UAFHP restoration project descriptions by location, treated primary limiting factors (NMFS 2009) by CTUIR River Vision touchstones (Jones et al. 2008) and accomplishments; 2007-2021.

Subbasin, Stream and Years	Project Description	Species	CTUIR River Vision Touchstones/ Habitat Limiting Factors (PLF's shaded in yellow-NOAA BiOP)								Comment/ Accomplishments	
			Biota- Connectivity	Geomorphology	Connectivity		Hydrology			Riparian Vegetation		
			Passage Barriers/ Entrainment	In-channel Characteristics	Habitat Diversit y (LWD)	Floodplain Confinement	High Temps	High Turbidity	Low Flows	Riparian/ Floodplain		
Meacham Creek and Camp Creek, Tributary of Meacham Creek (2007)	Fish passage rectifications, pool development with rock structures, and plantings	STS	X				X				X	Rectified two diversion dams and one in-stream structure providing unimpeded access to the entire watershed, development of pools with boulder cross vanes, 335 ft of streambank stabilization with added wood complexity, 0.3 miles livestock exclusion fence, and 500 riparian plantings.
West Birch Creek (2007- 2008)	Fish passage rectification, riparian protection fencing and plantings	STS	X		X		X				X	Rectification of the Cunningham and Hoeft Dams providing 2.4 miles unimpeded habitat, 335 ft of streambank stabilization with added wood complexity, 0.3 miles livestock exclusion fence, and 5,000 riparian plants.

Mainstem Umatilla River (Initiated 2008-2012)	Treated and maintained 3.5 miles of floodplain and channel; riparian and uplands	CHS, CHF, STS, Coho			X		X	X	X	X	Conservation Agreement on B&G Property to maintain 355 (61 riparian and 294 upland acres; installation of 60.7 acres of CREP tract's), 2 off-channel water wells, 13,400 seedling trees planted, 1,335 lbs of native grass seed and noxious weed control; Installation of an access restriction fence (3 additional riparian acres protected).
Meacham Creek (2009)	Floodplain improvement with levee setback, initiation of off-channel rearing habitat, large wood placement, and riparian plantings	CHS, STS,BT, Pacific Lamprey	X	X	X	X	X		X	X	Restored 40 acres of floodplain connectivity over 1-mile of stream by removal or modification of 3 levees and 1 dike (3,200 linear ft, 24,000 cubic yards); distribution of large wood on floodplain; 15,000 planted hardwood and conifer seedlings (30acres).
Meacham Creek (Initiated 2008-2012)	Riparian protection fencing and plantings	CHS, STS,BT, Pacific Lamprey		X	X		X		X	X	Built 9.8 miles of livestock exclusion fence between RM 2.0-8.5 (~350 acres protected).
Birch Creek (2010-2016)	Bank stabilization and large wood habitat complexity and riparian plantings	STS		X	X	X	X	X		X	Restoration of 335 ft of streambank stabilization with large wood and boulders over 0.1 miles of stream, 2 large wood in-channel habitat structures, and planted 5,000 riparian plantings over the 1-mile property.

Meacham Creek Floodplain Restoration and In-Stream Enhancement Phase I Project RM 6-7.1 (2011-2012)	Floodplain and channel improvement with levee setback, large wood placement, side-channel connectivity, wetland enhancement, and riparian plantings.	STS, CHS, BT, Pacific Lamprey		X	X	X	X	X	X	X	Reconnected 67 acres of floodplain over 1-mile of stream by removing a 2,800 foot levee and modification of two spur dikes (600 ft removed), realigned historic channel with meanders in the floodplain, developed 3 secondary channels and 3,568 ft of off-channel habitat, 12 large pool structures, 10 major and 286 medium rock and log features, and installed 38,290 plantings.
Birch Creek (2012)	Fish passage rectification and habitat restoration project.	STS, Coho	X	X		X	X	X		X	Removed two abandoned irrigation diversions (Taylor Property-ODFW lead agency) providing unimpeded access to 2.7 river miles of stream. Included channel reshaping, setback of leveed road adjacent to the channel; and reshaping of the channel and banks, two j-hook rock structure placements and riparian plantings over 0.6 miles of stream.
West Birch Creek (2012)	Fish passage rectification and habitat	STS	X	X	X		X	X		X	Removed one abandoned irrigation diversion (Low Property-ODFW lead

	restoration project.										agency) providing unimpeded access to 5.0 river miles of stream, installation of rock and large wood structures, channel re-shaping and plantings over 1-mile of stream.
Dillon Diversion Dam Removal (2017)	Fish passage rectification	STS, CHS, CHF, Coho, BT, Pacific Lamprey	X	X							Removed a longstanding partial barrier to upstream migration and opened an additional 3.65 miles of river to unimpeded travel for anadromous salmonids.
Meacham Creek Bonifer Reach Floodplain Reconnection and In-stream Enhancement – Project Areas 3 & 4 (2017-2018)	Floodplain and channel improvement with levee removal, channel reconnection, large wood placement, and riparian plantings	STS, CHS, BT, Pacific Lamprey		X	X	X	X	X	X	X	Treated over 1.6 miles of Meacham Creek by removing 3,385 linear feet of levees and dikes, reconnecting 3,766 linear feet of primary and secondary channel habitat, and installing 69 engineered log jams with more than 537 logs with rootwads attached.
Basin-wide Agreements O&M (2008-2018)	Ongoing maintenance of 17 riparian conservation agreements including livestock exclusion fencing, tree planting and weed control	CHS, CHF, STS, Coho, BT, Pacific Lamprey	X	X	X	X	X	X	X	X	552 acres protected and maintained, 15.15 miles of riparian fence protection (184 ac.), 7,300 planted hardwood seedling trees.
Meacham Creek Bonifer Reach Floodplain Reconnection and In-stream Enhancement –	Floodplain and channel improvement with channel creation and reconnection,	STS, CHS, BT, Pacific Lamprey		X	X	X	X	X	X	X	Treated 0.95 miles of Meacham Creek by creating and reconnecting 7,656 feet of primary and secondary channel

Project Area 2 (2019)	large wood placement, and riparian plantings										habitat, and installing 14 engineered logjams, 45 individual log structures, and 130 boulders
Reith Dam Removal (2019)	Fish passage rectification	STS, CHS, CHF, Coho, BT, Pacific Lamprey	X	X							Removed a longstanding partial barrier to upstream migration and opened miles of river to unimpeded travel for anadromous salmonids.
Athena Bridge Fish Passage Project (2019)	Fish passage rectification	STS, BT, Pacific Lamprey	X	X						X	Removed fish passage barrier, replaced bridge, placed rock structures and planted native riparian vegetation.
Meacham Creek Bonifer Reach Floodplain Reconnection and In-stream Enhancement – Project Area 1 (2020)	Floodplain and channel improvement with channel creation and reconnection, large wood placement, and riparian plantings	STS, CHS, BT, Pacific Lamprey		X	X	X	X	X	X	X	Treated 0.8 miles of Meacham Creek by creating and reconnecting 7,656 feet of primary and secondary channel habitat, and installing 13 engineered logjams, and 22 additional log structures
Meacham Creek Punchlist – Bonifer Project 2021	removing and modifying levees and spur dikes and adding LWM to improve habitat complexity	STS, CHS, BT		X	X	X	X	X	X	X	Treated 2 acres of habitat by full dike removal in the riparian zone and treated 0.55 acres of riparian non-wetland habitat

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