Submitted in partnership by:

Wolf Water Resources, Ecosystem Sciences, Mount Hood Environmental, and Resource Specialists, Inc.

Proposal for CTUIR RFP 2023/05-418

Tucannon River PA 5-15 Assessment and Conceptual Design

March 28, 2023

WOLF WATER RESOURCES

Contact:

Nick Legg, PG

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WOLF WATER RESOURCES

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March 28, 2023

Kris Fischer and Julie Burke
Confederated Tribes of the Umatilla Indian Reservation (CTUIR)

Subject: Proposal - Tucannon River PA 5-15 Assessment and Conceptual Design

Dear Ms. Burke and Mr. Fischer:

The vitality of natural systems and communities have long depended on their relationship and reciprocity to one another. This relationship is on display in the Tucannon River headwaters, where infrastructure and lakes have proven unsustainable to river energy while at the same time degrading floodplain function, First Foods, and salmon abundance. The situation is untenable. The current state of reciprocity is bringing mutual harm. As such, we have a clear opportunity to reestablish and restore riverscape connections that bring mutual benefit to the diversity of communities (biota and people) that rely on this landscape.

The Tucannon River PA 5-15 Assessment and Conceptual Design Project is an opportunity to expand the vision of what is possible and collectively build vitality through an integrated effort that brings together the perspectives of Tribes, agencies, community members, and multi-disciplinary experts. Wolf Water Resources (W2r), in partnership with Ecosystem Sciences, Mount Hood Environmental, and Resource Specialists Inc, is a team built specifically with the multi-disciplinary, technical, and engagement expertise to support the co-managers in realizing the full potential of this opportunity.

Just as the Tucannon River is dynamic and requires a comprehensive view, our integrated project strategy sets the conditions for our team to adaptively address and respond to the technical, timeline, and engagement needs that may arise over the course of the project. Key elements in that approach include:

- A ***collaboration-focused*** project approach founded on active participation and regular touch-ins to leverage previous efforts and knowledge, while working to distill technical information with practical application in mind.
- An emphasis on creating ***simple, accessible, and illustrative end products*** that will become a resource for Tribes, river managers, and agencies for years to come.
- A technical approach that recognizes the ***central importance of floodplains*** in re-establishing function in all categories of the River Vision Touchstones, while also reducing infrastructure risk and increasing recreational opportunities.

Together with you our objective is to create a vision and actionable plan for the future of the Tucannon River that co-managers and the community can get behind. With win-win opportunities abound, we are excited to submit this proposal and work through the process with you.

W2r accepts all terms and conditions outlined in the RFP.

Sincerely,

Nick Legg, LG
Watershed Sciences Director, Wolf Water Resources

Marjorie Wolfe, Authorized Representative
President, Wolf Water Resources

REVERSE SIDE, COVER LETTER

SECTION 2

Firm Summary

Team Introduction

The science and practice of watershed management has been evolving in the Pacific Northwest, and collectively, we have learned better ways to design and implement projects. The Tucannon River 5-15 Assessment and Conceptual Design project is an is an opportunity to plan comprehensive restoration actions that benefit critical fish species, Tribal members, multiple user groups, and infrastructure resilience. Wolf Water Resources (W2r), in partnership with Ecosystem Sciences, Mount Hood Environmental, and Resource Specialists, Inc. shares a passion for the restoration of watershed health and multi-species uplift, and each of our key team members will bring expertise catered to this project.

Wolf Water Resources | Managing Firm

Connected by a passion for finding integrated solutions for the natural environment, Wolf Water Resources (W2r) is an active partner to our region's salmon recovery organizations. Our integrated team of watershed scientists and river systems engineers specialize exclusively in salmon habitat restoration. We work across broad scales to find workable and resilient solutions for our region's most pressing aquatic habitat restoration needs, and our team members are familiar with the issues, datasets, histories, and actions influencing salmon populations in eastern Washington and Oregon.

Wolf Water Resources

29 staff: hydraulic engineers geomorphologists, hydrologists, biologists, riparian scientists, and landscape ecologists.

Location: Portland, OR

Through whole-system thinking and a partnering approach to working with our clients, W2r is continually striving to elevate restoration science and methods for project implementation. Our creative and objective-oriented methods for analyses, coupled with our experienced perspectives on how to present information, helps extract, organize, and translate large datasets and studies into ways that benefit decision making and help our clients achieve their restoration goals.

W2r has led complex ecosystem restoration projects spanning multiple river miles, managed extensive consultant teams on expert witness cases on the nation's largest rivers, an advised on important restoration planning frameworks to multi-group partnerships. We are actively working in the Lower Snake River, Grande Ronde, Wallowa, and John Day Basins, and our project work for CTUIR includes the Lookingglass Creek Fish Habitat Enhancement, Desolation Creek Reach 3 Floodplain Restoration, and Tucannon River Project Area 27/28 projects. Our efforts on each of these projects demonstrate our manner of balancing scientific and creative approaches to optimize species recovery, philosophy of partnering with our clients, and diligence in managing tasks and project budgets.

Ecosystem Sciences | Facilitation and Visual Communications Lead

Ecosystem Sciences is an environmental design and planning firm with more than 30 years of experience creating balanced approaches for natural resource management. Their services include watershed and river systems planning and design, riparian habitat assessments, technical analysis and reporting, data visualization, and stakeholder engagement/communication. To this project they will develop a communications plan with the co-managers, facilitate technical and public meetings, and serve a lead role in organizing the assessment and conceptual design plan document.

Ecosystem Sciences has provided communications planning, meeting facilitation, analysis, and data/graphic visualization services to several key regional projects, including the Birch Creek Watershed Assessment and Action Plan (for CTUIR) and the John Day River Watershed Restoration Strategy. They are currently working on CTUIR's Upper Walla Walla River Assessment and Action Plan.

Mount Hood Environmental | Fisheries Management and Aquatic Science

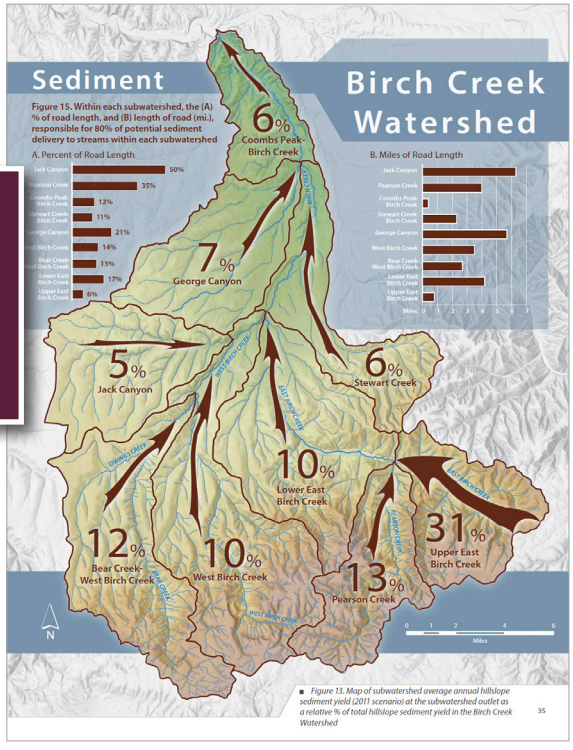
Mount Hood Environmental (MHE) scientists bring extensive experience participating in collaborative watershed assessments and providing expertise in fish habitat modeling and analysis to estimate habitat capacity and suitability relative to existing and restored conditions, and future climate change scenarios. MHE has developed and implemented robust hatchery and wild fish interaction studies, providing published data to guide fishery management plans. MHE has provided critical information to fisheries managers on a multitude of projects, helping prioritize and design rehabilitation actions and inform policy decisions. Additionally, their scientists are adept at distilling technical information to project stakeholders, including the public.

MHE is currently working on the Upper Walla Walla Watershed Assessment and Action Plan for CTUIR with Ecosystem Sciences which includes capacity, suitability, and climate change forecast modeling for Chinook salmon, steelhead and bull trout, and recommendations for a comprehensive rehabilitation strategy.

Resource Specialists, Inc. | Dam Safety and Water Control Structures

Resource Specialists, Inc. (RSI) is available to provide expertise in dam safety and water control structures to this project. RSI was founded in 2007 and their staff has been involved in water resource and environmental engineering over the past 25 years. They bring a long history of work in eastern Washington and Oregon. As a water resources engineering firm as well, their team provides stream restoration and dam design and construction services, and they recognize the needs and challenges of salmon habitat recovery in Pacific Northwest ecosystems. RSI has worked with W2r on the Chewuch Skyline Fish Screen and Upper Beaver Creek projects.

Information rich visuals convey data in various formats and scales to give users the context they seek. Ecosystem Sciences has worked on multiple such efforts with CTUIR and other partners to create illustrative plans centered around rivers and watersheds.



SECTION 3

Organization Structure

FOCUS, REFINE, ADVANCE

Just as the Tucannon River is dynamic and requires a comprehensive view, our integrated project strategy sets the conditions for our team to adaptively address and respond to the technical, timeline, and engagement needs that may arise over the course of the project. Our proposed team leaders are shown at right; a representation of each firm's role is shown below.

- *Wolf Water Resources*
- *Ecosystem Sciences*
- *Mount Hood Environmental*
- *Resource Specialists, Inc.*

CTUIR AND CO-MANAGERS

Project Manager
Nick Legg, PG

Meeting Facilitation
Zach Hill

Team Leads

Sr. Geomorphologist
Nick Legg, PG

Fish Biologist/ Fisheries Management
Bryce Oldemeyer
Mark Roes
Tulley Mackey

Policy Specialist
Zach Hill
Derek Risso

Dam Safety, Reservoir Specialist
Gabe Williams, PE
Benn Eilers

GIS Analyst/ Geomorphologist/
Luke Russell, GIT
Jeremiah Green

Engineering Feasibility/Cost Estimation
Allen Dysart, PE
AJ Jones, PE

Riparian Ecologist/ Wetland Scientist
Joe Rudolph

Communications/ Documentation Support
Zack Herzfeld
Derek Risso

Comprehensive Team Expertise

WATERSHED POLICY/ PLANNING | ECOLOGICAL & RIVER FUNCTION | RIVER/ FLOODPLAIN DESIGN

Firm Roles:

- ● Primary expertise and role on project
- ● Support role on project

		Group Facilitation	Technical Facilitation/ Presentation	Landscape Pattern/ Land Use	Reach-Scale Planning	Policy	Prioritization Methodologies	Mapping/ Cartography	Presentation Graphics, Exhibits	Quantitative Analysis, Metrics	Climate Change Analysis	Data Analysis/ Interpretation	Geomorphic Function	Hydrologic Function	Riparian Function	Habitat Limiting Factors	Focal Species Trends	Fisheries Productivity Modeling	Site Recreational Design	Water Rights	Wetland Mitigation	River/ Floodplain Design	Cost Estimation, Funding Estimates	Dam Safety	Reservoirs/ Water Intakes
W2R	Nick Legg, PG	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●				●	●	●		
	Luke Russell, GIT		●	●	●		●	●	●	●	●	●	●	●		●	●					●	●		
	AJ Jones, PE		●		●		●							●		●	●				●	●	●		
	Allen Dysart, PE		●		●		●							●		●	●				●	●	●		
	Joe Rudolph		●					●	●		●	●			●	●	●				●				
	Jeremiah Green							●	●			●			●	●	●				●	●			
ECOSYSTEM SCIENCES	Zach Hill	●	●	●		●	●	●	●	●	●	●					●	●	●				●		
	Zack Herzfeld	●	●	●		●		●	●	●		●	●						●				●		
	Derek Risso	●	●	●		●		●	●	●	●	●							●				●		
MT HOOD ENVIRO.	Bryce Oldemeyer		●			●				●		●			●	●	●	●					●		
	Mark Roes		●			●				●		●			●	●	●	●					●		
	Tulley Mackey		●			●				●		●			●	●	●	●					●		
RSI	Gabe Williams, PE					●				●										●		●	●	●	●
	Benn Eilers					●				●										●		●	●	●	●

Key Team Member Qualifications

PROJECT MANAGER

Nick Legg, PG *W2r Watershed Sciences Director*

Licensed Geologist OR, WA; MS Geology, BS Geology and Economics.

Nick has worked throughout the country on large river systems helping to create policies for watershed health and novel approaches for reach-scale restoration. With work spanning detailed analytical studies and watershed-scale plans, he has developed refined ways to look at and distill complex scientific datasets while recognizing the intersecting variables of stakeholder interests and land use. By focusing on the right scale and level of detail, Nick has honed his skill in communicating technical information, recognizing the critical role that it serves in achieving clarity and stakeholder alignment. He presents information in meaningful ways and frames conversations so clients, landowners, and agencies can integrate their interests and collaboratively achieve their restoration priorities.

In addition to skill in communication, Nick's experience leading both planning-level and site-scale restoration projects will benefit his leadership on our team. As a geomorphologist Nick recognizes landscape processes at play and understands and guides our project teams on how those processes will influence reach-scale behavior and must factor into site design efforts. As a project manager he sees the bigger picture while also understanding all of the project's facets that must align. He mindfully keeps his clients and project team up to date with progress, fee status, and technical needs as they evolve.

Shown below are recent projects that demonstrate Nick's skill in leading multi-consultant/ stakeholder projects that required integrated decision making for habitat prioritization.

HELPING YOUR DECISION MAKING:

Nick is skilled in organizing information and presenting it in ways so it is clear and targeted toward practical questions and resilient outcomes.

Restoration Planning, Strategy, and Prioritization Experience:

South Fork Toutle River Headwaters Prioritization and Preliminary Design Lower Columbia Fish Enhancement Group, 2020-2022	· Managed W2r's services and served a lead role on the consultant team to collate information and prioritize restoration sites along a 9-mile reach. · Developed a quantitative ranking of reach-scale restoration, addressing the magnitude of uplift for focal species. · Informed site design elements for select concepts. · Strategic efforts supported acquisition of over $5+ million in grant funding for the first phase of the project.
Upper Grande Ronde Sediment Study Grande Ronde Model Watershed, 2020-2022	· Managed the project and led technical services to inform a strategy for sediment in the context of salmon recovery and watershed restoration. · Tailored analytical methods to understand conditions of the watershed and in the presentation of findings. The approach integrated field data and hydraulic modeling to inform watershed scale patterns of coarse sediment sources, transfer, and sinks.
Geomorphic and Flooding Impacts of Large River Levee System Federal Client (Confidential), 2020-present	· Managed a multidisciplinary team on a $1.9M fast-tracked project to prepare an assessment of 900 river miles of one of the largest rivers in the U.S. · Liaised with an external expert team to translate large data sets and analyses into clearly understandable reports; forecasted potential outcomes under different management scenarios while accounting for climate and hydrologic change.
Tryon Creek Integrated Watershed Plan City of Portland, 2021-present	· Leading an effort to develop an integrated watershed management strategy accounting for stream geomorphology, floodplains, development impacts, and community needs. · Facilitated a series of external work group meetings and worked with multiple project consultants to create a strategy aligned with the interests of a consortium--efforts will help groups prioritize future spending, planning, and design efforts.

Columbia River Basin Expert Panel Process USBR, 2015-2016	· Facilitated workshops, coordinated a multi-consultant team, analyzed data, and managed large datasets to evaluate habitat improvements in seven priority sub-basins of the Columbia River including the Grande Ronde, Wallowa, Upper Salmon, and Lower Snake sub-basins.
Molalla River Watershed Restoration Program Molalla River Watch, 2019-2022	· Guided development of a watershed-scale restoration program; spear-headed multi-scale, innovative temperature and vegetation mapping approaches to enable project partners and land owners to identify restoration opportunities and work on a larger scale. · Key aspects included remote sensing, temperature monitoring, invasive species management, prioritization, and restoration program development.
Mill Creek Floodplain Corridor and Erosion Assessment Walla Walla Conservation District, 2021-present	· Managed W2r's services to support a planning study in the reach. · Used hydraulic modeling and geomorphic analyses to inform decision making around increasing floodplain width and resilience for land owner/ stakeholder needs and ecosystems.
Vance Creek Watershed Assessment Mason Conservation District, 2019-2022	· Collaborated with the client, USGS, and a team of consultant firms to prioritize solutions to degraded instream conditions over a 4-mile reach of critical salmonid habitat. · Used innovative sediment transport and hydrologic approaches to assess potential restoration solutions in the context of sedimentation and groundwater processes.

Restoration Design Leadership:

Desolation Creek Reach 3 Floodplain Restoration CTUIR, 2019-present ***construction in process***	· Led a design process using targeted analyses to benefit decision making and gain alignment among stakeholders for a novel floodplain restoration approach (the first Stage 0 project to be reviewed under BPA's HIP process). · Design was geared toward long-term channel-floodplain response and optimizing habitat uplift; habitat suitability modeling showed ~1,000% increase in habitat area at key conditions for salmonids.
Sugar Channels Reconnection Methow Salmon Recovery Foundation, current project (in 60% design phase)	· Leading the design a major floodplain reconnection (1.75 miles, 150 acres) along the Methow River in collaboration with subconsultant partners and USBR. · Proposed project actions include side channel reconnections, engineered logjams, and levee removal and setback.
Upper Beaver Creek Assessment and Design Methow Salmon Recovery Foundation, 2019-2022 ***constructed***	· Guided a large stakeholder group to alignment on a site design that considered a unique set of solutions surrounding land use, road, and other infrastructure needs. · Restoration elements offer multiple benefits for fish and infrastructure including enhancing subsurface connections to improve thermal refugia.

Additional Relevant Projects:

- Tucannon River Project Area 27/28 (CTUIR)
- Swale Creek Canyon Restoration Prioritization (Yakama Nation)
- Middle Fork Hood River Flood Risk Analysis at the Parkdale Fish Hatchery (Confederated Tribe of the Warms Springs of Oregon)
- Twisp River Devany Side Channel Reconnection (Methow Salmon Recovery Foundation)

"I am very impressed by Nick's ability to analyze complex environmental conditions and **identify solutions** to complicated problems. I am even more impressed by his **ability to communicate and present** complex scientific information to broad audiences in both writing and presentations."

Evan Bauder, Mason Conservation District

FACILITATION LEAD

Zach Hill ● *Ecosystem Sciences*

Licensed Architect, ASLA Afl; M Arch. Environmental Design and Planning, MSc Ecological Design, B Arch.

Zach brings 25 years of experience integrating environmental management goals with the needs of local communities and land owners and brings expertise in environmental design and policy, communications planning, and stakeholder engagement. Having worked throughout the Pacific Northwest, including in eastern Washington and Oregon on multi-faceted watershed planning and reach-scale prioritization projects, Zach is particularly effective at organizing engagement strategies and synthesizing stakeholder feedback on projects with multiple land use and resource interests. Through his ability to distill complicated information into a comprehensible and compelling formats, his work has won many awards and accolades, including the American Society of Landscape Architects National Honor Awards.

Facilitation and Communications Experience:

Upper Walla Walla Watershed Assessment and Action Plan CTUIR, 2021-present	· Facilitated efficient and effective communication with stakeholders. · Continued communication and collaboration with the other project contributors, including private landowners, the public, and each of the stakeholder groups. · Worked closely with the CTUIR to understand the technical needs for data collection, data analysis, assessment output, and action plan development while coordinating directly to provide information for stakeholder outreach.
Big Wood River Assessment and Atlas Blaine County Planning and Flood Control, 2019-2021	· Provided project collaboration, coordination, meeting facilitation and management through refining project vision, goals, and objectives. · Produced a design concept layout through storyboard and graphical content creation. · Produced the final technical atlas document, including individual reach segmentation and characterization, and prioritized treatments.
Birch Creek Geomorphic Assessment and Action Plan CTUIR, 2016-2019	· Compiled existing data and conducted technical analyses to provide a summary of the geomorphic setting including historic and current conditions. · Identified and prioritized potential habitat protection and restoration opportunities based on habitat limiting factors. · Facilitated meetings and incorporated stakeholder priorities to ensure beneficial outcomes for landowners and fish habitat. · Produced the final assessment and action plan using rich data visualizations.

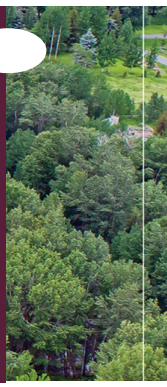
ALIGNED SOLUTIONS FOR RIVER SYSTEM HEALTH:

Working a the intersection of community and the environment, Zach is skilled in stakeholder and community facilitation for projects with various land use and resource interests.

BIG WOOD RIVER ATLAS

"I think this is a really important resource that very few communities have. The design team did **an incredible job of bringing everyone together** and creating a document that communicates."

Dick Fosbury, Blaine County Commissioner



John Day Watershed Assessment and Restoration Strategy

Confederated Tribes of Warm Springs Oregon, 2014-2017

- Developed a strategic watershed restoration action plan and an implementation atlas through a transparent process that prioritized projects based on habitat limiting factors, fish use, and targeted restoration actions.
- Incorporated stakeholder priorities to ensure beneficial outcomes for landowners and fish habitat.
- Focused on communicating the mutual "common ground" benefits of restoration work.

Snake River, Tributary Streams, Watershed Enhancement Strategy

Shoshone-Bannock Tribes, 2014-2022

- Conducted geomorphic assessment on tributaries to the Snake River; evaluated physical and ecological processes occurring on a reach scale.
- Identified strategies for stream restoration, habitat improvements, and management solutions to benefit native salmonids.
- Incorporated stakeholder priorities to ensure beneficial outcomes for fish habitat.
- Developed restoration guide based on illustrations and visuals.

Additional Relevant Projects:

- Baker Harvey Restoration (Walla Walla Basin WC)
- Smith Bales Restoration (Walla Walla Basin WC)
- Upper Rio Grande Watershed Report (US International Boundary and Water Commission; Texas Commission on Environmental Quality)
- Silver Creek Geomorphic Assessment/ Stream Restoration Design and Planning – Idaho (The Nature Conservancy)
- Snake R. Hydrologic and Geomorphic Assessment, County Line Hydroelectric Projects (Idaho Irrigation District; New Sweden Irrigation District)

Big Wood River Atlas

KEY W2R TEAM MEMBERS

Luke Russell, GIT

MS Applied Geosciences, BS Geology, Minor in Environmental Sciences and Resource Management

FLUENCY IN: ESRI products, Python, SQL, R, PHREEQ-C, MODFLOW, River-FLO2D, and HEC-RAS 2D, HEC-RAS SIAM

Luke is a geomorphologist skilled in technical modeling, software customization, and illustrative mapping. As a geomorphologist Luke interprets technical information through a system-lens, enabling useful approaches for tailoring and communicating data for stakeholder and public understanding.

Luke has supported a number of restoration prioritization projects as well as site design projects including the ***South Fork Toutle River Headwaters Prioritization and Preliminary Design, Upper Grande Ronde Sediment Study,*** and ***Tryon Creek Integrated Watershed Plan***. He has also supported W2r's efforts on the ***Tucannon River Project Area 27/28*** for CTUIR.

Role

Data organization, presentation

GIS analyses, mapping

Allen Dysart, PE

Professional Engineer, OR; Certified Remote Pilot FAA Part 107; BSc Ecological Engineering

TRAININGS: HEC-RAS 1D, 2D

Allen has been a team lead for the design of key process-based floodplain and instream restoration projects, seeing them from concept to construction. He understands design principles for working with river processes and that support stream shading, large wood recruitment, complexity, flood attenuation, and aquifer recharge. Allen is currently a key team member on the ***Lookingglass Creek*** project for CTUIR and he assisted in the design and led planset development, cost estimation, and construction oversight on the ***Tucannon River (Area 27/28)*** project for CTUIR. His additional recent relevant projects include the ***Sheep Creek Restoration Design*** (Grande Ronde Model Watershed) and ***Gobar Creek Restoration*** (Cowlitz Indian Tribe).

Role

Engineering input for restoration feasibility (design considerations, cost)

Meeting attendance to record comments and to maintain a connection with the design process

Jeremiah Green

BS Environmental Science; Certified Remote Pilot FAA Part 107

TRAINING: Wetland delineation

Jeremiah is a natural resource scientist who combines his passion for ecosystem processes with analytical and problem-solving skills. He supports a variety of reach-scale and site-level design projects with GIS analysis and mapping and the presentation of ecological/biological data. His recent projects include the ***Upper Grande Ronde Sediment Study, Methow 3R Floodplain Restoration, Vance Creek Watershed Assessment, Molalla River Confluence Floodplain Restoration*** projects. He also supported the ***Tucannon River (Area 27/28)*** project.

Role

Scientific/GIS analysis, mapping

Communication of ecological/biotic function

Concept drafting/visualization

AJ Jones, PE

Professional Engineer, OR, WA; RiverRAT certification; BS Civil Engineering

TRAININGS: HEC-RAS 1D, 2D

AJ has led key design tasks or managed some of W2r's most innovative process-based floodplain restoration projects, including CTUIR's ***Tucannon River (Area 27/28)*** and ***Desolation Creek Reach 3 Floodplain Restoration*** projects. She is currently managing the ***Lookingglass Creek*** project. AJ brings a keen understanding of the factors to consider when evaluation restoration treatments. Her construction oversight experience adds direct benefit during concept development for restoration projects by providing a practical understanding of treatment effectiveness and constructibility (key to evaluating alternatives), which directly informs designs, specifications, and cost estimates.

Role

Input on restoration feasibility (design considerations, cost)

Joe Rudolph

MA Geography, BS Geospatial Science; Certified Remote Pilot FAA Part 107

TRAININGS: HEC-RAS 2D, River Hydraulics; Guidance for using ORWAP v.3.1; Stream Functional Assessment Method (SFAM); Western Washington Wetland Rating System (v2014); topographic surveying; stream assessment

Joe develops streamlined, desktop-based approaches for wetland mapping, providing design teams an important, planning-level understanding of site features at a resolution and accuracy greater than what the NWI provides. Joe has also provided GIS-based analyses to inform reach-scale planning efforts and site-specific design treatments on the ***SF Toutle R. Headwaters Prioritization and Preliminary Design, Upper Deschutes Conceptual Restoration Plan and Design, Tryon Creek Integrated Watershed Plan,*** and ***Middle Fork and Willamette River - Elijah Bristow State Park Floodplain Restoration*** projects.

Joe has previously informed wetland enhancement and preservation opportunities or other design elements on the ***Desolation Creek Reach 3*** and ***Tucannon River (Area 27/28)*** projects for CTUIR. Recently he has provided site assessment, wetland determination, and design input on the ***Lookingglass Creek*** project.

Role

Riparian ecology, wetland function, mitigation

GIS analysis, mapping, data visualization support

KEY ECOSYSTEM SCIENCES TEAM MEMBERS

Zack Herzfeld

MSc Geography, BA International Business

Zack brings 10 years of experience analyzing watershed assessment and planning. Zack specializes in GIS analysis and geomorphology as well as organizational communication, data analysis and visualization, and river ecology. Zack has supported the ***Birch Creek Geomorphic Assessment and Action Plan*** and the ***Big Wood River Assessment and Atlas***.

Role

Communications, data visualization, document layout

Derek Risso

MSc Fisheries and Wildlife Science, BA Environmental Studies

Derek has over 25 years of experience as an ecologist working in watersheds throughout the western U.S. His skill sets include vegetation science, wetland science, fisheries ecology, land use and watershed assessments, and technical policy guidance. Derek has worked in project management and technical support roles on the ***Upper Walla Walla Watershed Assessment and Action Plan*** and the ***John Day Watershed Assessment and Restoration Strategy.***

Role

Communications, data visualization, document layout

Policy guidance

KEY MOUNT HOOD ENVIRONMENTAL TEAM MEMBERS

Bryce Oldemeyer

MS Natural Resources, Academic Certificate of Statistics, BS Environmental Science

Bryce is a quantitative fisheries scientist with over 15 years of experience implementing statistical methods to answer intricate ecological questions. In particular, he has extensive experience with habitat assessments and restoration; water quality and macroinvertebrate monitoring; data reduction, analysis, visualization, and automation; and water rights and water management in Idaho and Oregon. He has been involved in anadromous research throughout the Columbia River Basin and over the last several years, Bryce has collaborated with clients to crosscut biological and geomorphic aspects of watershed assessments to develop watershed rehabilitation strategies.

Role

Fish biology and productivity
Model quality oversight and guidance

Mark Roes

BS Wildlife Biology, Graduate Certificate, Applied Statistics

Mark is a quantitative ecologist with experience developing salmon and steelhead life cycle models, carrying capacity analyses, productivity analysis of hatchery effects, and forestry compliance study designs. Recently, Mark conducted a steelhead recruitment analysis to examine hatchery and environmental influences on productivity in the Hood River, analyzed recreational catch-and-release mortality with survival analyses in coordination with the WDFW, and provided study design and analysis recommendations for Oregon Department of Forestry's compliance monitoring program.

Role

Fish habitat requirements, stream flow and fish capacity relationships, analysis of hatchery effects

Tulley Mackey

BS Natural Resources

Tulley is a fisheries biologist with 10 years of experience conducting fish habitat assessments and density and abundance surveys. He has worked with multiple agencies and project collaborators to understand limiting factors for sensitive species and develop holistic approaches to habitat rehabilitation.

Role

Hydraulic habitat suitability analysis

KEY RSI TEAM MEMBERS

Gabe Williams, PE, CWRE

Professional Engineer, OR; Certified Water Rights Examiner; BS Mechanical Engineering

Gabe brings 20 years of experience in natural resources enhancement with a focus on stream restoration, irrigation efficiency, and reservoir and dam design primarily in Eastern Oregon and Washington. Gabe has worked on many projects in the Umatilla and Walla Wall Basin and has been involved with many projects for CTUIR including Taylor Bridge, Birch RM 2.8, and Ilsquulkpte Creek.

Role

Diversion and water control assessment

Dam safety

Benn Eilers

Professional Engineer, OR; BS Mechanical Engineering, MS Mechanical Engineering

Benn brings 25 years of experience including significant advanced modeling experience pertaining to lakes and reservoirs, as well as multi-platform data acquisition and integration. Benn has worked on many projects in the Umatilla and Walla Walla Basin and has been involved with many projects for CTUIR including Taylor Bridge, Birch RM 2.8, and Ilsquulkpte Creek.

Role

Diversion and water control assessment

Dam safety

SECTION 4

Firm Qualifications & Experience

W2r, in partnership with Ecosystem Sciences, Mount Hood Environmental, and Resource Specialists, Inc., brings project experience with the key technical and engagement roles that will be needed to support the co-managers on the Tucannon River PA 5-15 project. A few of these examples are below and select project narratives are provided on the following pages.

Prior Project	Multi-use planning	Multi-stakeholder facilitation	Community meetings	Geomorphic assessment	Restoration prioritization	Fisheries management/ fish biology	Water intakes and artificial lakes	Stream temperature	Graphic communication	Conceptual design
SF Toutle River Planning/Design ●		●		●	●	●	●	●		●
Upper Walla Walla Watershed Assessment and Action Plan ●	●	●	●	●					●	
Upper Deschutes Conceptual Restoration Plan and Design ●	●	●	●		●	●		●		●
Tryon Creek Integrated Watershed Plan ●	●	●			●			●		
Birch Creek Geomorphic Assessment and Action Plan ●		●	●	●	●				●	
Big Wood River Flood Assessment Atlas ●		●		●	●				●	
Upper Grande Ronde Sediment Study ●		●		●	●			●	●	
Upper Beaver Creek Assessment and Design ●	●	●	●	●	●	●	●	●		●
Molalla River Watershed Restoration Program ●	●	●				●		●	●	●
Mill Creek Floodplain Corridor and Erosion Assessment	●	●		●		●				
Snake River, Tributary Streams, Watershed Enhancement Strategy ●	●	●		●	●	●		●	●	
Vance Creek Watershed Assessment ●		●		●	●	●				●
Rock Lake Reservoir Expansion ●	●	●		●		●	●			●
Sarvis Reservoir Reservoir Expansion ●		●		●			●			●
North Fork Salmon River Watershed Assessment ●					●	●				

● *Wolf Water Resources*
● *Ecosystem Sciences*
● *Mount Hood Environmental*
● *Resource Specialists, Inc.*

SELECT PROJECT EXAMPLES

South Fork Toutle River Headwaters Prioritization and Preliminary Design W2r

Lower Columbia Fish Enhancement Group, 2020-2022. Contact: Brice Crayne, 360-904-7922.

Key staff:

Nick Legg
Joe Rudolph
Nora Boylan
Luke Russell

W2r supported a broad consultant team in the development of multiple conceptual restoration designs over a nine-mile reach of the South Fork Toutle River and 10 of its tributaries in southwest Washington (a restoration project of unprecedented scale likely to be implemented over the next 10 years). W2r's geomorphic assessment guided prioritization and conceptual design of project elements in this highly remote and extensive reach. Specifically, we developed quantitative rankings of reach-scale restoration priorities, addressing magnitude of uplift for focal species. Our geomorphic work specifically assessed where and which restoration approaches are most likely to most benefit the river's recovery (for instance, where, what type, and the size of logjams that are likely to be relatively stable to influence habitat). This information will ultimately be overlain with other critical considerations of LWD delivery (helicopter v. truck in this remote environment) and size/sourcing on nearby timber lands to better understand the most feasible, beneficial, and cost-effective approaches over the a large project reach. Our geomorphic change analysis informed reach-scale trajectories in incision and widening, aligning with Cluer and Thorne models. Our team also developed conceptual design maps in GIS with standard symbology and display to cover multiple reaches and tributaries. The proposed restoration treatments were tied to watershed position, slope, fish use, limiting factors, and climate change impacts to hydrology (with reductions in snowpacks).

Under Nick Legg's project management and strategic efforts W2r supported the client's acquisition of over $5+ million in grant funding for the first phase of the project. Nick worked closely with project partners through monthly planning and design meetings. He also attended several meetings with funders.

SIZE: 9 miles. FEE: $58,000.

HIGHLIGHTS

- ✔ **9 mile reach.**
- ✔ **Analyses targeted toward practical outcomes and questions.**
- ✔ **Pairing of restoration strategies with the trajectory of natural recovery processes.**

W2r creates visually appealing GIS mapping, data frameworks, graphic diagrams, and photo-realistic renderings to facilitate stakeholder understanding and help them "see" project concepts.

The rendering at left was produced to represent restoration treatments along a reach of the South Fork Toutle River.

SELECT PROJECT EXAMPLES

Birch Creek Geomorphic Assessment and Action Plan

Ecosystem Sciences

CTUIR, 2019. Contact: Mike Lambert, 541-429-7240.

Key staff:

Zach Hill

Derek Risso

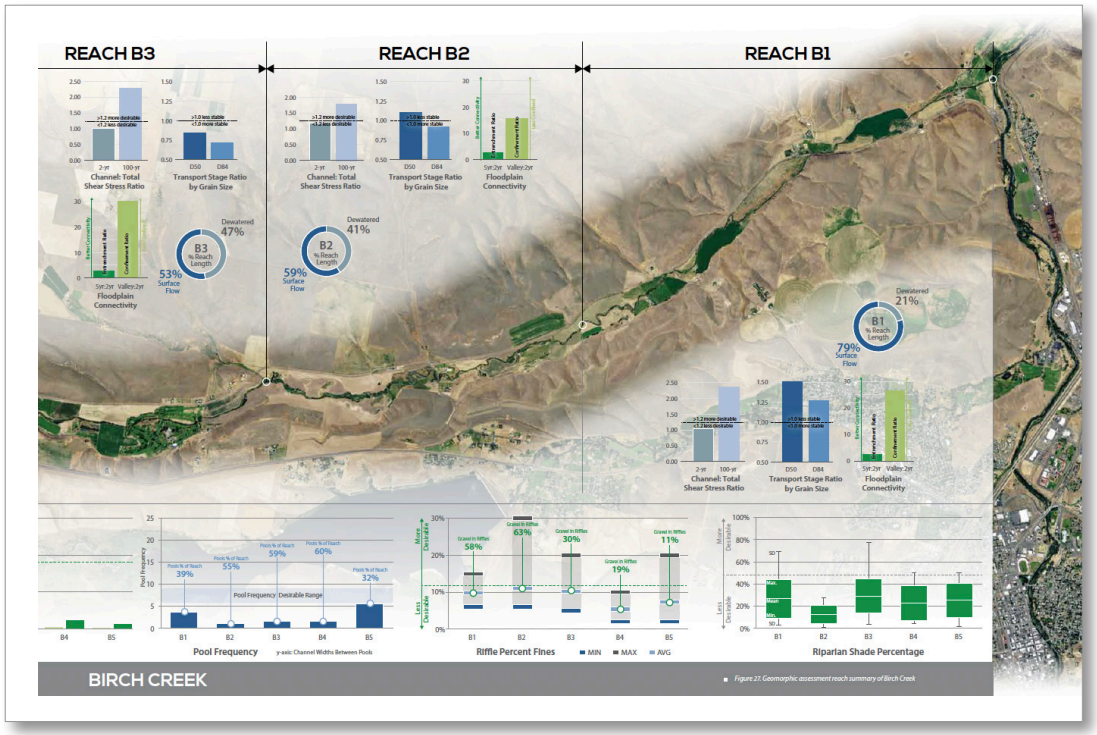
Ecosystem Sciences supported CTUIR and a Technical Partnership in the development of a strategic action plan and identification of areas for instream and floodplain restoration within the Birch Creek Watershed. Fisheries, flood control, and agriculture play a central role in river and floodplain habitat management in the Birch Creek watershed and were key stakeholder interests integrated into the restoration planning process. Our team completed watershed and reach-scale geomorphic analyses to support identification and prioritization of stream, floodplain, and fish habitat restoration alternatives. The analyses facilitated the understanding of expected riverine and floodplain processes and identified restoration projects that are consistent and compatible with natural, reach-scale hydraulic and sediment transport processes. This work supported the vision and strategy of the CTUIR Umatilla River Vision.

HIGHLIGHTS

- ✔ **Action Plan effectively communicates the stakeholders' shared vision.**

Ecosystem Sciences provided communications planning, meeting facilitation, riparian conditions assessment, GIS analyses and mapping, data and statistical analyses; and design, illustration, and production of the Action Plan. In our role, we communicated the team's assessment outputs, a systematic compilation of potential projects, creation of potential new solutions, an evaluation of restoration alternatives, and documentation of the preferred path to monitor physical and ecological function from implemented habitat and stream improvements.

SIZE: 284 Square Miles / 110 stream miles. FEE: $450,000.



SELECT PROJECT EXAMPLES

Upper Deschutes Conceptual Restoration Plan and Design W2r

South Puget Sound Salmon Enhancement Group, 2022-present. Contact: Cole Baldino, 360-412-0808.

Key staff:

Glen Leverich

Luke Russell

Joe Rudolph

Nora Boylan

The South Puget Sound Salmon Enhancement Group (SPSSEG) recently hired W2r to build upon scientific reports and assessments and develop conceptual designs for restoration treatments along 10 miles of the upper Deschutes River and eight miles of its four major tributaries. The project addresses known salmonid habitat limiting factors with particular focus on coho and water quality impairments (e.g., fine sediment, temperature), and marks a collaborative effort between SPSSEG, the Squaxin Island Tribe, Thurston County, and the principal landowner Weyerhaeuser.

Efforts of W2r coupled existing data review and extensive partner/ stakeholder coordination to determine an evaluation and prioritization framework to identify the most feasible restoration projects for the upper watershed. During the evaluation of project reports and assessments, our team recognized that instream restoration efforts may not be able to adequately address the many sources of fine sediment in the reach, and restoration approaches should therefore enhance sediment-transport dynamics and gravel sorting processes through strategic and economical placement of large wood in the river corridor. With this in mind, W2r's team members assessed geomorphic conditions and locally-sourced wood resources throughout the project area via field survey and desktop analysis (e.g., river migration assessment and hydraulic modeling).

We presented the framework in a comprehensive and stakeholder friendly mapbook which includes restoration treatments along the reach and which will be used by project sponsors to present identified projects to new landowners, further design on identified projects, and pursue funding for project implementation. W2r is currently advancing the selected project unit involving a combination of ELJs and tipped trees to a permit-ready design package.

SIZE: 10 miles. FEE: $115,000.

HIGHLIGHTS

- ✔ **Understanding the right restoration treatments benefited from our recognition of broader watershed processes.**
- ✔ **Development of a graphically-driven concept design mapbook and prioritization matrix tool.**

Big Wood River Flood Assessment Atlas Ecosystem Sciences

Blaine County, Idaho, 2021. Contact: Kristine Hilt, 208-788-5570.

Key staff:

Zach Hill

Derek Risso

Zack Herzfeld

Areas along the Big Wood River saw major flooding and channel erosion during the summer of 2017. The 2017 flood was extreme in magnitude and duration, and the channel's response was exacerbated by high sediment load contributions from large nearby fires that occurred in 2007 and 2013. In response to these events, as well as regional climatic and hydrologic trends, Blaine County initiated the Big Wood River Atlas planning process.

The Big Wood River Atlas will serve as a resource for city and county officials, government agencies, nonprofits, engineers, and other stakeholders that have an interest in potential flooding along the Big Wood River. It will be a tool for property owners and the general public, especially those who may submit and/or review future stream alteration permit applications, and it provides information about the river's history—including its changes in course—and sets forth recommendations for river corridor management and habitat restoration.

Ecosystem Sciences provided communications leadership, meeting facilitation, stakeholder engagement, as well as floodplain conditions assessment, GIS analyses, mapping, data analyses services on this project. We also provided design, illustration, and production of the Atlas.

SIZE: 75 river miles. FEE: $272,000.

HIGHLIGHTS

- ✔ **Skilled facilitation helped the team respond to stakeholder interests and reflect them in the Atlas.**

SELECT PROJECT EXAMPLES

Tryon Creek Integrated Watershed Plan W2r

Portland Bureau of Environmental Services, 2019-present. Contact: Fred McGregor, 503-823-4981.

Key staff:

Nick Legg
Luke Russell
Joe Rudolph
Allen Dysart
Nora Boylan

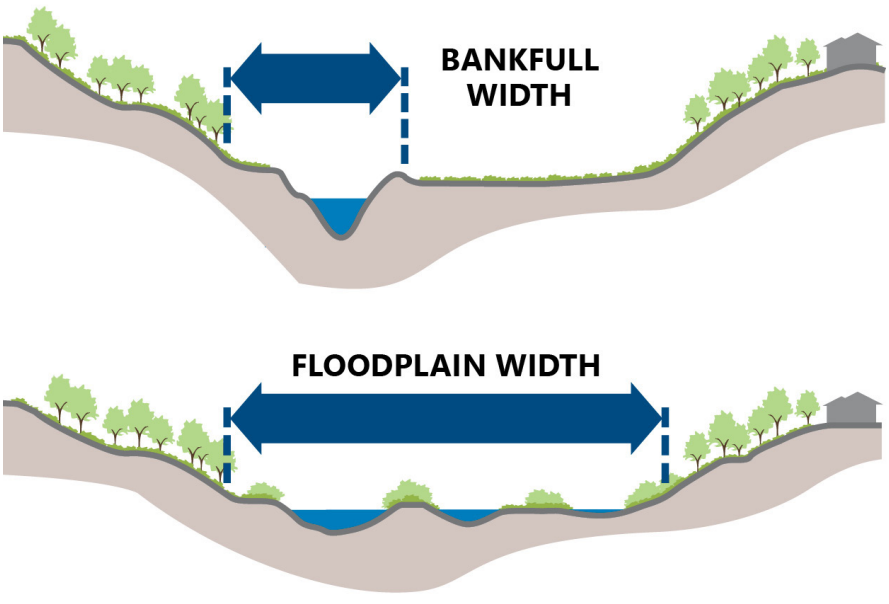
W2r is convening and working with a group of subject matter experts from various City departments to develop an over-arching strategy for watershed management and restoration, considering watershed-scale impacts from development. The project explicitly considers the whole watershed from uplands to stream corridors, and to inform integrated solutions, W2r is using multi-scale geospatial analyses of stream conditions, stream susceptibility, runoff patterns, stream power, development patterns, infiltration potential, and landslide risks. Our efforts will identify projects to reconnect floodplains, reduce stream power, increase connectivity, and address limiting factors.

W2r's role on this project has involved facilitation of a collaborative workgroup, including agenda development, inter-meeting communication, meeting facilitation, and comments and notes documentation. The collaborative group has multiple levels that address technical and policy questions separately. We have engaged partners by leading technical discussions, presenting technical analyses to broad and multi-perspective groups, and engaging with members for their own expertise and knowledge. Our team has distilled large field, GIS, geomorphic, and modeling datasets (from other consultants, agencies, and City departments), making it more accessible and transparent for the group. This work was completed using a Learning Action Alliance modeled on the success of Colin Thorne's (W2r river scientist) work with the UK Urban Flood Resilience Project. We paired that effort with recognition of objectives and priorities from each City department and guided the workgroup of subject matters experts in the development of work products that aid in the City's shared/aligned decision making processes. This work will help departments efficiently prioritize spending, planning, and design efforts related to resource management, flood protection, monitoring, infrastructure resilience, fish habitat, and reporting. It also identifies and describes stream enhancement options that are most appropriate for specific geomorphic conditions along each stream reach in ways that are easily understood by the public.

SIZE: 15 square miles. FEE: $249,475.

HIGHLIGHTS

- **Distillation of data into formats that best inform decision making.**
- **Management of a project to result in the prioritization of future spending, planning, and design efforts.**



Graphics that identify stream enhancement options were developed to be easily understood by the public.

SELECT PROJECT EXAMPLES

Upper Grande Ronde Sediment Study W2r

Grande Ronde Model Watershed, 2020-present. Contact: Jesse Steele, 541-663-0570.

W2r recently delivered a watershed-scale, model-based sediment study to inform a strategy for salmon recovery and restoration priorities in the 525-square mile Upper Grande Ronde basin in northeast Oregon. W2r's services, managed and led by Nick Legg, involved tailored analytical methods for sediment budgeting and floodplain analysis to inform watershed-scale production and connectivity of coarse sediment (a key limiter on fish habitat and stream recovery in incised systems). The team presented findings to multiple co-manager groups within the UGR, including the Atlas Team and the State of the Science Meeting. W2r also published a short paper for the SEDHYD conference coming to St. Louis this May.

To work within budget constraints, W2r collaborated with GRMW and the Bonneville Power Administration to assemble large existing datasets, collect additional sediment data in the field, and to develop hydraulic models needed for the study. W2r then adapted and applied the planning-level sediment budget model called the Sediment Impact Analysis Methods (originally developed by USACE) to inform and map the reach-scale sediment transport, supply, and storage dynamics over 100+ stream miles. The results were used to inform the sediment-related connections between reach-scale restoration projects planned for implementation at various watershed positions, ultimately to inform watershed-scale restoration priorities and strategies.

SIZE: 525 square miles. FEE: $99,900.

Key staff:

Nick Legg

Luke Russell

Jeremiah Green

Allen Dysart

HIGHLIGHTS

- ✔ **525 square mile area.**
- ✔ **Translation of data and metrics to prioritize restoration priorities and strategies.**

Upper Walla Walla Watershed Assessment & Action Plan Ecosystem Sciences

CTUIR, current project (subconsultant to Rio ASE). Contact: Ethan Green, 541- 429-7555.

The Upper Walla Walla Watershed Assessment and Strategic Action plan is a comprehensive effort to develop a scientifically defensible and strategic habitat restoration plan founded on a watershed-scale geomorphic, hydrologic, and biological data. The project is using a scientifically robust and efficient approach to assess the watershed, identify target conditions for restoration, and recommend a suite of potential actions to achieve those targets. The team is evaluating historical, current, and desired conditions in the upper Walla Walla River in collaboration with state co-managers, federal and local agencies, and other stakeholders.

Ecosystem Sciences is serving as the project's communications liaison and developed the project's communications plan, as well as provided meeting facilitation, characterization of riparian conditions, shade modeling, design and illustration services, and the Action Plan document. Our team capitalized on frequent and open communication with stakeholders to generate a framework specific to the history and needs of the watershed and its interested parties.

SIZE: 70 stream miles and associated floodplain. FEE: $350,000.

Key staff:

Zach Hill

Derek Risso

Zack Herzfeld

HIGHLIGHTS

- ✔ **Collaboration with CTUIR ensured effective communication with stakeholders and the understanding of complexities associated with the large assemblage of stakeholders, planning partners, and project proponents.**

North Fork Salmon River Watershed Assessment Mount Hood Environmental

Sub to Rio Applied Science and Engineering, current project. Contact: Mike Edmonson, Idaho Governor's Office of Species Conservation, 208-332-1551.

Recently, Mount Hood Environmental (MHE) completed the North Fork Salmon River (NFSR) watershed assessment, a collaborative effort to characterize existing NFSR biologic and geomorphic conditions and develop a rehabilitation strategy to meet recovery goals for Chinook salmon and steelhead. In coordination with Rio Applied Science and Engineering, Idaho Department of Fish and Game, and Idaho Governor's Office of Species Conservation, MHE provided assessment support through quantile random forest (QRF) and climate change forecast modeling, identifying habitat variables limiting habitat capacity. Through this modeling effort, MHE quantified a 41% deficit in Chinook salmon spawning capacity, a 58% deficit in steelhead spawning capacity, and 40% deficit in summer parr rearing capacity for steelhead. Quantifying habitat capacity deficit by species and life stage provided clearly defined targets for rehabilitation actions to achieve population recovery goals. MHE analyses also included impaired and restored sites, elucidating capacity improvements from rehabilitation actions already implemented and providing baseline capacity estimates for candidate rehabilitation sites. As part of the project, MHE participated in numerous stakeholder meetings to develop the scope of work, identify assessment sites, and disseminate modeling results

SIZE: 211 square miles. FEE: $60,000.

Key staff:

Bryce Oldemeyer

Mark Roes

Tulley Mackey

HIGHLIGHTS

- ✔ **Distillation of data to inform a rehabilitation strategy for Chinook salmon and steelhead.**
- ✔ **Stakeholder meeting participation.**

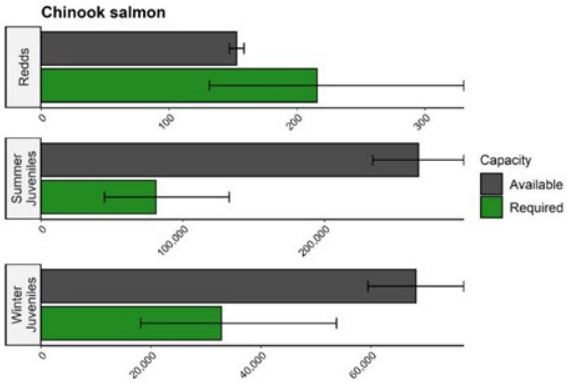


Figure 1. Estimated available capacity given current habitat conditions for Chinook salmon at three life stages in the North Fork Salmon River watershed. Available capacity was calculated using a Quantile Random Forest (QRF) approach, and required capacity was calculated using a generalized capacity model (GCM) with adult escapement goals. Error bars represent 90% confidence intervals.

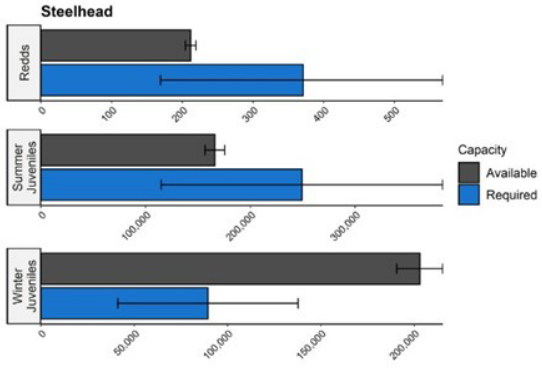


Figure 2. Estimated available capacity given current habitat conditions for steelhead at three life stages in the North Fork Salmon River watershed. Available capacity was calculated using a Quantile Random Forest (QRF) approach, and required capacity was calculated using a generalized capacity model (GCM) with adult escapement goals. Error bars represent 90% confidence intervals.

SECTION 5

Proposed Approach & Scope of Work

Understanding

The Project Area (PA) 5-15 Assessment and Conceptual Design project is an opportunity to find a new course for the Tucannon River headwaters that uplifts ecosystems, elevates First Foods, and adds quality recreational opportunities. While the demands on the river are multi-faceted and seemingly in conflict, win-wins exist that can bring collective benefits for all, including Tribal members, recreational users, managers of the Wooten Wildlife Area, and future generations.

The Tucannon River floodplain, its series of artificial lakes, and the connecting infrastructure are central to envisioning a future of ecosystem uplift and quality recreational opportunity. Where artificial lakes constrict the floodplain, habitat for Chinook salmon, steelhead, bull trout, lamprey, and mussels have all suffered. Confinement of the river and its energy has also threatened the longevity and function of these lakes for fishing use. With eroding levees, malfunctioning water intakes, sedimentation, and dam safety issues, many of these lakes provide diminishing recreational value, a growing maintenance backlog, and, in some cases, limited options for repair. Recognizing the alignment in diminished recreational values, increased costs, and ecosystem impacts, this project is an opportunity to build a future where reconnected floodplains support thriving ecosystems for aquatic and upland species, recreational users have access to functioning and well-maintained lakes (that are feasibly managed), ecosystems and infrastructure are buffered to the impacts of climate change, and communities maintain access to the beautiful Tucannon headwaters and its full suite of natural and cultural values.

While the project's potential solutions may be complex, the process to develop them needs not be complicated. Past data and studies provide a foundation. Collaborative partnership exists. Re-inventing the wheel is not required. What is required is an integrated and comprehensive effort to assemble and distill information into a format that can be visualized and digested for clear decision making and action. Analysis will be needed but is not an end point. The key will be to use data and analysis to build understanding quickly and transparently amongst co-managers to support an agreed-upon plan that moves to much-needed action.

FOCUS, REFINE, ADVANCE

Focusing and distilling information through clear visuals and skilled communication will lead to effective decision making on project priorities and actions.

Building understanding of the issues and opportunities requires a team that can hear the challenges, identify the key questions, distill the landscape's story (through data and visuals), and facilitate a conversation around priorities and actions. Through work on community floodplain and ecosystem challenges regionally to nationally, our multi-disciplinary team brings an approach that is rooted in these fundamentals:

- **Partnering with people:** Hearing all perspectives is critical. We enjoy and value co-developing solutions with partners to create a vision.
- **Keeping it simple:** We emphasize simple methods and data first. We analyze to distill, not complicate.
- **Showing over telling:** We use visuals to build understanding and support decision making.
- **Working with nature:** Rivers are dynamic. By giving them space, we allow ecosystems to self-heal while safeguarding infrastructure and people.

Floodplains and Co-Benefits to the River Vision and People

Floodplains are core to our approach for this project because they address and support all River Vision Touchstones. For example, wide and connected floodplains support:

- Connectivity in three dimensions (longitudinally, laterally, and vertically), not only within the river and floodplain, but also within uplands.
- Dynamic geomorphology with reduced stream power, sediment erosion and deposition, and interaction with upland sediment sources and processes.
- Integrated stream hydrology and water quality where floods attenuate, aquifers recharge, and hyporheic processes maintain diverse temperature profiles.
- Robust and diverse riparian vegetation communities that dynamically evolve with river processes and support stream shading, large wood recruitment, and complexity.
- Aquatic biota that thrive with the floodplain space and the processes described above.

With this centrality of floodplains in mind, we can simplify our analysis and clearly tell the story of the restoration priorities in the Tucannon River.

Wide floodplains also support reduced risks for people and infrastructure, such as the lakes and roads in this project area. By giving rivers room, we provide more space for flooding and reducing risks on floodplain margins. Wide floodplains also reduce erosive stresses and promote resilience of adjacent infrastructure.

The co-benefits of floodplains to ecosystems and people who live on and manage the land speak to the obvious and basic need for this project. From our perspective, floodplains will be the primary touchpoint as we progress through this project with you. While we work through diverse and complex issues with you, we will fall back to floodplains to tell the story and identify and execute integrated actions with broad benefits for all.

Scope of Work

We have reviewed the scope of work outlined in the RFP and agree on the overall workflow. Below we describe our detailed approach, assumptions, and deliverables for each of the seven (7) major tasks identified. In some cases, we have identified "add-on" tasks for your consideration. These tasks could either be initiated at the outset of the contract or later when the need is identified.

Scope Overview and Schedule

Our proposed schedule is built according to the start and end dates listed in the RFP. Because the project flows through a collaborative process, we have also provided an estimated schedule of meetings and topics. We fully recognize that these topics and meeting schedule will evolve, but it nonetheless helps to visualize the approximate sequencing of information and discussion.

Task 1. Project Kick-off Meeting

Field-based project kickoff meetings are highly effective for developing team connections and building understanding at the outset. We plan on a day-long tour with co-managers, followed by an additional field day as follow-up for our team to observe key project areas in greater detail. The scientific and data exchange meeting

(assumed remote) will serve to build data exchange processes, connections, and sharing protocols in advance of the data review exercise in Task 3.

Deliverables:

- *Notes on action items and priorities from field tour*
- *Notes on action items from scientific and data exchange meeting*

Task 2. Project Management and Communication

With major collaborative efforts, intentional and flexible project management and communication protocols are essential to project success. Task 2 includes the management and communication efforts to promote delivery of the assessment and conceptual design, while ensuring the views and input of project partners are integrated and heard throughout the process.

Project Management

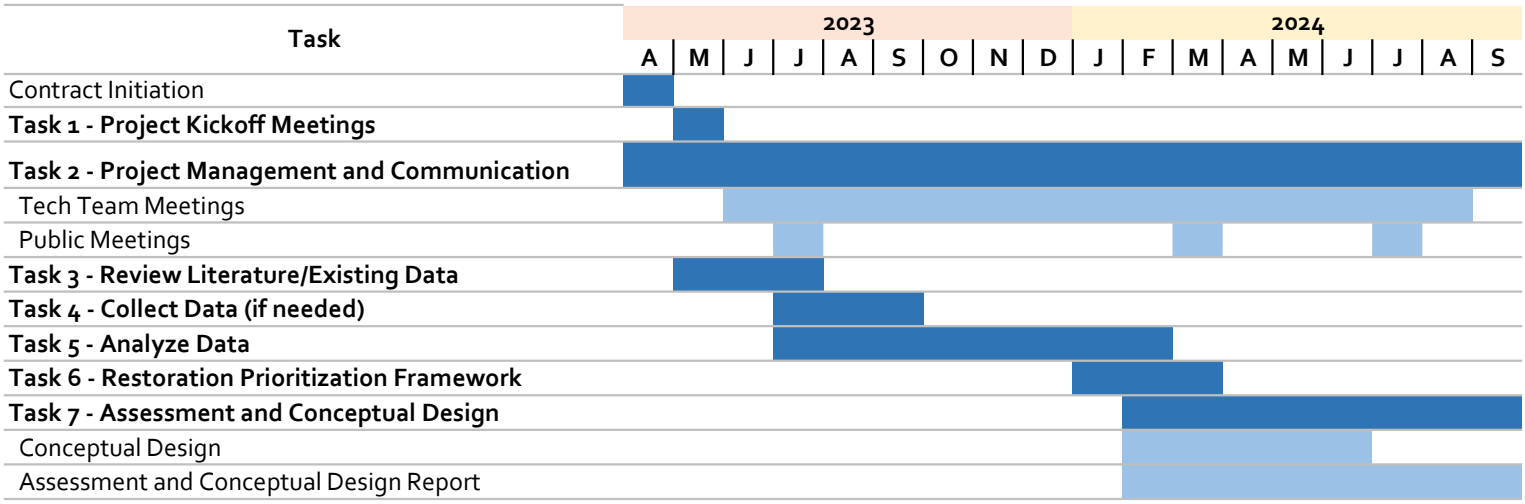
Effective project management has been integrated into our approach, recognizing the need to meet schedule, budget, and objectives and move expeditiously toward watershed action. Nick Legg will manage all aspects of this project. Nick has managed many projects for tribal, government, private, and non-profit sectors over his career, coordinating between large and small teams. This project requires a collaborative process between several key co-managers, including CTUIR, Nez Perce Tribe, Washington state agencies, federal agencies, local non-governmental organizations, and private landowners. Frequent and open communication will be critical. We plan to report progress on our efforts at regular meetings, while accepting guidance and feedback from co-managers.

The contents of this proposal represent our preliminary proposed Project Management Plan (PMP), which summarizes our approach, budget, and schedule. Throughout the project, Nick will work with CTUIR to refine the PMP to meet project objectives, address any changes that arise, and keep CTUIR aware of our progress. The careful preparation of the PMP, its review by CTUIR, and any potential future refinements will provide quality assurance that the project will have successful outcomes.

Communications Plan

Our team will collaboratively develop a communications plan with the co-managers to ensure efficient and effective communication with co-managers and stakeholders prior to commencement of project work. We will work closely with CTUIR to understand the technical needs for data exchange and analysis, assessment output, and plan development while coordinating directly to provide information for stakeholder outreach. With the diversity of parties involved, it will be important to communicate and collaborate with other key contributors to this process, including private landowners, the public, and each of the stakeholder groups. In addition to our project manager, we have identified a Communications and Lead Facilitator on our team, Zach Hill, to ensure the PMP is executed successfully, engage with and manage stakeholder comments and concerns, facilitate technical and public engagement meetings, and effectively communicate outcomes. Zach will bring lessons learned from working in this role for multiple reach-scale and watershed plans, including CTUIR's Birch Creek and Walla Walla Action Plans. Nick will support Zach in this role, also bringing experience leading collaborative watershed

Overall Project Schedule



planning efforts throughout the region and bringing technical expertise in river systems and floodplain science.

In its simplest form, the communications plan outlines what will be communicated, who it will be communicated with, how communication will be facilitated, and how often formal meetings will occur. A key measure of successful communication is acquiring timely feedback from each stakeholder group to understand their specific context and expectations, knowledge/expertise, or challenges. The communications plan is designed to support the project in achieving its stated goals and objectives and support or improve relationships with stakeholders who are important to the project's success. At a high level, the communications plan will include:

(1) Purpose and Need;

(2) Communications Approach and Overview;

(3) Internal and External Communication Protocols;

(4) Public Communication; and

(4) Meetings, Organization, and Schedule.

Facilitation of Technical and Public Meetings

We are experienced working with large groups of cooperating agencies, local communities, landowners, and interested community members. We are aware of many specific concerns that will likely be focal points of discussion and debate on this project. The variety of knowledge, experience, and land use interests within the community has the potential for contentious relationships and disagreement about solutions. We believe that open dialogue and consistent, understandable communication is paramount to solving community issues and concerns while providing for desired ecological outcomes. Also, openly discussing our approach and giving periodic project updates will move potential conflict to an earlier stage in the project timeline when it can be more efficiently and effectively managed. We will not advance a project component without upfront agreement on the plan/approach, and we will not finalize a project component on the backend until stakeholders are reasonably satisfied with the outcome.

Creating opportunities for open dialogue with the community also supports the theme of restoring floodplain processes, fisheries and habitat, and improving stream conditions through stewardship. It is important the technical assessment information and the plan are presented in an understandable form to the community stakeholders, giving them an opportunity to participate in an exchange of ideas. We have proposed a final product that will be a useful and relevant communication tool with a graphic-rich, visual display of technical information in a very understandable format for an audience of technical and non-technical stakeholders.

We will collaborate with and assist CTUIR in reaching out and engaging the community in the process of planning. We will facilitate formal technical meetings with the key stakeholders and cooperating agencies, landowners, local community members, and interest groups. We will also facilitate three public meetings by presenting the project and participating in discussions, and providing relevant answers, work products and project outputs. As further support to CTUIR, members of our team will also be available at a local community level to meet with landowners, community decision makers, and stakeholders to discuss the findings of the investigative studies, listen to local knowledge and experience, and incorporate that information into the plan. Our team members are excited about sharing knowledge in their fields of expertise and gaining knowledge from local community members.

We have a real desire for a collaborative process in which all members are actively participating in technical team and public meetings. We facilitate active participation by asking co-managers to present and share their knowledge along with consultants. We also seek balance in discussions so quieter voices are given full opportunity to participate.

"Nick has a quiet and deliberative style of communicating, which allows him to listen to input from a range of stakeholders and then provide constructive critique that they can hear."

Chris Johnson, Methow Salmon Recovery Foundation

Detailed Project Vision, Goals, and Objectives

The statement of goals and objectives is an essential early component for guiding restoration plans. Our team brings extensive experience working on restoration projects throughout the Columbia River Basin, and in many cases, directly with CTUIR. These experiences allow us to integrate the broader agency and fish recovery priorities, as well as Tribal priorities such as ties to First Foods and CTUIR's River and Upland Visions. We understand that all co-managers and interested parties have their own priorities, which also have their own alignment. We envision goals and objectives that address key life stages, limiting factors/ecological concerns, the River Vision and First Foods reciprocity-based management approaches (Quaempts et al. 2018), and those of co-managers and the public.

A key with developing visioning and objective documents is to set priorities that clearly articulate the intended outcomes of the various partners, while avoiding overly prescriptive objectives that can be burdensome later in the process. Brief and accessible guiding documents can become a touchstone of co-managers for years to come, whereas lengthy and dense documents tend to be put on the shelf. We will work with the co-managers to strike a balance between the needed accessibility while also including sufficient detail and specificity to be useful. The detailed Project Vision, Goals, and Objectives will be developed collaboratively with CTUIR and co-managers during the first technical team meeting.

Assumptions:

- Fifteen (15) technical meetings and three (3) public meetings will be held either remotely or in the vicinity of the project area. Each technical and public meeting will not exceed two hours. We propose one technical meeting take place in person, and fourteen remotely via video conferencing. We propose two public meetings in person, and one remote.
- Our Project Manager (Nick Legg) and Communications and Lead Facilitator (Zach Hill) will attend all technical meetings and three public meetings. Zach will facilitate the meetings and will be assisted by staff to help organize and document the meetings, agenda, and comments. W2r engineer, Allen Dysart, will attend meetings to record comments and to maintain a connection with the design process. Other technical staff will also be available to attend meetings via phone or video conference, depending on the meeting needs.
- CTUIR will assist the team with schedule and coordinate logistics associated with face-to-face meetings including location, projector, attendees, dates, and times. We will provide web-meeting details and instructions to all participants as needed.

Deliverables and Outcomes:

- *Communications Plan (< 10 pg).*
- *Project Vision, Goals, and Objectives document (< 10 pg).*
- *Monthly invoices.*
- *Meeting notes, recorded major comments, and action items.*
- *Facilitate and attend 15 tech team meetings (1 in person, 14 remote). Meeting materials provided in native format.*
- *Facilitate and attend 3 public meetings (2 in-person, 1 remote).*

Project Meeting Schedule

Meeting	Months from Project Initiation	Estimated Month based on April 17 Start Date	Format	Possible Topic/Goal	General Phase
Project Initiation	0	April 17, 2023			
Project Kickoff and Field Tour	1	May, 2023	In-Person		Project Planning and Visioning
Data Exchange and Orientation	1	May, 2023	Remote	Summary of Data and Exchange Protocols	
TechTeam Meeting 1	2	June, 2023	Remote	Vision, Goals, Objectives (Task 2)	
Public Meeting 1	3	July, 2023	In-Person	Gather Input on Community Concerns and Goals (feeds into Vision, Goals,	
TechTeam Meeting 2	3	July, 2023	Remote	Data Gaps and Analysis Plan (Task 3)	
TechTeam Meeting 3	4	Aug, 2023	Remote	Restoration Experience and Lessons Learned in the Tucannon	
TechTeam Meeting 4	5	Sept, 2023	Remote	Lakes and Recreation Uses	
TechTeam Meeting 5	6	Oct, 2023	In-Person	Floodplain (Geomorphic/Connectivity/Riparian) 1	Analysis and Distillation
TechTeam Meeting 6	7	Nov, 2023	Remote	Climate Change Impacts	
TechTeam Meeting 7	8	Dec, 2023	Remote	Floodplain (Geomorphic/Connectivity/Riparian) 2	
TechTeam Meeting 8	9	Jan, 2024	Remote	Fisheries Analysis	
TechTeam Meeting 9	10	Feb, 2024	Remote	Lake Infrastructure and Dam Safety	
Public Meeting 2	11	March, 2024	Remote	Share high-level summary of technical analysis with community	
TechTeam Meeting 10	11	March, 2024	Remote	Report Outline and Storyboard, Restoration Prioritization Framework	Report and Conceptual Design
TechTeam Meeting 11	12	April, 2024	Remote	Conceptual Design Drafts, Priority PAs	
TechTeam Meeting 12	13	May, 2024	Remote	30% Report Draft	
TechTeam Meeting 13	14	June, 2024	Remote	Conceptual Design Drafts, Second Priority PAs	
Public Meeting 3	15	July, 2024	In-Person	Share and Receive Input on Design/Restoration Strategy	
TechTeam Meeting 14	15	July, 2024	Remote	60% Report Draft	
TechTeam Meeting 15	16	Aug, 2024	Remote	90% Report Draft	
Project Completion		September 30, 2024			

Task 3. Review Literature and Existing Data

The Tucannon River is a data-rich watershed. This task will involve review and project planning relative to that existing data resources, augmenting our existing knowledge of the available data. Our objectives with this task include:

- Aligning available data with our technical project plan, recognizing that our data analyses will focus on planning-level decision making and restoration prioritization.
- Avoiding additional data collection, where possible, while identifying critical data gaps and priorities.
- Ensuring we have the full dataset available to avoid streamlined analysis effort in subsequent tasks.

To accomplish these objectives, we will develop an annotated data review document that also outlines a preliminary plan for how these data will be analyzed and used. This document will be delivered in a tabular format with limited narrative. Data gaps and the general data analysis plan will be presented to co-managers, likely in the second or third technical team meeting.

Assumptions:

The estimated timeline depends on CTUIR and co-managers providing data within three weeks of project initiation.

Deliverables and Outcomes:

- *Data review, gaps, and analysis plan memo (< 10 pages, tabular format)*
- *Presentation to technical team (slides provided in native format)*

Task 4. Collect Data

With the level and diversity of data available in the project area, our objective is to minimize additional data collection within the scope of this project. Based on our initial review of available data lists provided in the RFP, as well as the geomorphic change study and remote sensing acquisitions in progress, we do not see obvious gaps at this point, with exception of wetland mapping. Accordingly, our current scope as proposed includes one add-on task for your consideration, which is a planning-level wetland mapping assessment.

Planning-Level Wetland Mapping

In our experience floodplain restoration projects are facilitated with an early and planning-level assessment of wetland extents and types. Our streamlined, desktop-based approach makes use of available LiDAR and aerial imagery to improve mapping relative to the publicly available National Wetland Inventory dataset. A planning-level assessment of wetland distribution, classification (hydrogeomorphic and Cowardin), and artificial nature benefit the project two-fold. First, a planning-level understanding of wetlands at a resolution and accuracy greater than what the NWI provides serves as a baseline for identifying wetland enhancement and preservation opportunities. In addition, an understanding of wetland presence and quality in a potential project action area allows the project team to make important decisions early in the planning process.

As the project's conceptual design progresses and potential wetland impacts are identified, an inventory of wetlands allows the team to engage with USACE to develop a cost-effective and the most ecologically beneficial mitigation strategy. For example, an infrastructure modification may have impacts on an adja-

cent wetland. With an understanding of other mapped wetlands in the surrounding area, a simple and cost-effective mitigation strategy could be to complete an on-site wetland enhancement to address mitigation requirements. The planning-level wetland assessment will also identify artificial wetland features, such as the artificial lakes. The project team may engage with USACE to share our understanding of these features and gain evidence to support restoration actions based on historic ecological function.

We would employ a tested method for identifying wetlands on the landscape, which would also differentiate them from the artificial lakes. Utilizing CTUIR's existing data, the mapping process would rely on the best available aerial imagery and a LiDAR-derived relative-elevation model. The two datasets will be manipulated through spatial analyses and visual interpretation through a wetland science lens to identify the same indicators one would observe while conducting a wetland delineation on the ground. These include a geomorphic position on the landscape, indicative wetland vegetation communities, and persistent hydrology indicators. Once wetlands are preliminarily mapped and classified, specific locations which overlap with important project actions may be visited to further validate the desktop findings. The desktop mapping process can also be modified to evaluate future wetland conditions based on alternative restoration options by providing the GIS model with future condition terrain.

We have used this workflow to develop wetland restoration and on-site mitigation plans on other CTUIR projects including Desolation Creek Reach 3, Tucannon River (Area 27/28), and Lookingglass Creek. It has proven to be cost effective and accurate for planning-level assessments and in working with regulators. On each of these projects this process of mapping wetlands and addressing potential project impacts has been well received by USACE, Ecology, and the Oregon Department of State Lands.

Deliverables and Outcomes:

- *Wetland mapping memorandum with wetland maps and shapefiles. The memorandum will summarize the extent and type of mapped wetlands by PA.*
- *Presentation to technical team (slides provided in native format).*

Task 5. Analyze Data

Practical data analysis has a throughline to project planning, prioritization, and decision-making. We have structured our data analysis approach with that connection in mind and on a few key questions:

- What analysis is needed?

  Pursue the simplest level of analysis to inform the key questions.

- For what will the analysis be used?

  Consider the effort involved not only in the analysis, but also in communicating results and conveying understanding from that analysis.

- How can analysis be presented to promote broad understanding and impactful decision making?

  Understand the application to decision making before undertaking the analysis, and organize the data analyses by River Vision and Upland Vision touchstones.

By keeping these principles in mind, we can streamline the analysis effort and provide accessible—visual, meaningful, and brief—end products that serve as resources for the co-managers going forward.

Our analysis falls into the three categories identified in the RFP (geomorphology/hydrology/riparian, fisheries, and climate change), plus an additional "add-on" category for your consideration (each is described below). We will document the analysis results for each category in a technical memo with associated maps and figures. These technical memos will be attached as appendices to the final Assessment and Conceptual Design document.

MAKING INFORMATION USEFUL:

"The analysis stays **high-level where it makes sense** and has **additional detail in some areas** that will build confidence in our conclusions. It has given me a lot to think about in terms of **what the watershed planning process will look like**. We had a PM coordination meeting last week and I put in a 5-star review for Wolf Water Resources."

Carrie Sanneman, Multnomah Country Drainage District, in reference to Nick Legg's project management and information communication on a recent project.

Each analysis and summary will address key questions on meaningful scales (watershed-reach-PA) for planning and prioritization of restoration strategies from PA 5-15. The watershed scale will highlight general context and landscape scale connectivity to uplands, upstream and downstream reaches, and watershed history. On reach scales we will highlight broad patterns that connect and distinguish the project areas. The reach scale provides a critical comparative view of project areas, enabling prioritization and decision making. At the project area level, our analyses will analyze the minimum scales necessary to inform planning and some more detailed conceptual-level decision making in the early stages of design.

Geomorphology, Riparian Vegetation, and Connectivity

Aligning with the River Vision Touchstones, this area of analysis and summary will cover geomorphology, riparian vegetation, and riparian vegetation. For each of these categories, our analysis will inform: (1) the degree and causes for degradation, and (2) the processes and rates of recovery. Together, this combination informs the need for active versus passive restoration projects, as our geomorphologist, Nick Legg, recently presented at the Upper Columbia Floodplain Science Conference.

Wherever possible, our analysis will synthesize previous and ongoing analyses by partners and conducted for the Anchor (2021) study. Our analyses will prioritize root cause issues first, such as those which relate to and drive degradation, and relate to multiple River Vision Touchstones, such as disconnectivity and stream incision. Specific analyses may include but will not be limited to:

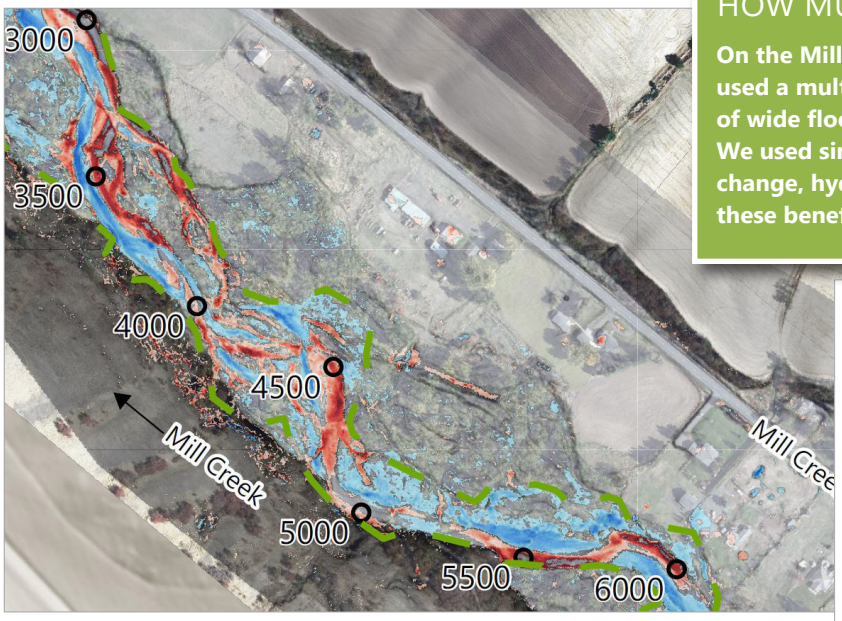
- **Connectivity and Floodplain Conditions -** Characterization of floodplain encroachment (by how much and which structures), channel incision (e.g., SEM stage), and stream power per unit width (using hydraulic model results).
- **Geomorphology -** Using the ongoing geomorphic change detection study we can evaluate sediment budgets (longitudinally and by PA) to evaluate recent erosion versus deposition trajectories and patterns of sediment supply and transport. Excess transport capacity estimates from the Anchor (2021) study will inform deposition potential in the current condition, as well as opportunities for reduced shear stress.
- **Riparian Vegetation -** Using the forthcoming FLIR and multispectral imagery coupled with LiDAR canopy heights, our team will classify vegetation canopy classes and types to inform vegetation composition. Additionally, previous observations of invasive species presence and their distribution are critical for informing vegetation health and restoration opportunities.

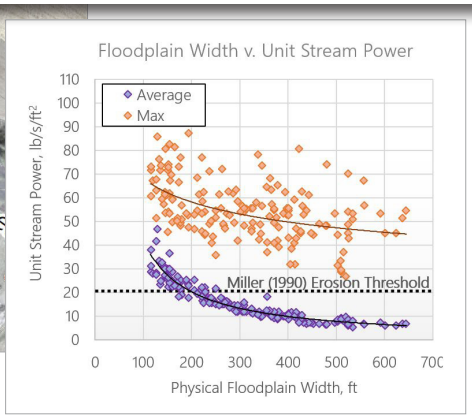
One goal with each of these categories is to distill results into a series of metrics that allow for comparative visualization of PA conditions and opportunities along the project area, thereby supporting the prioritization effort in Task 6.

We also use results to inform potential targets and trends to benefit from restoration actions. Recently on Mill Creek W2r developed relationships between floodplain width and unit stream power, which allowed us to evaluate erosion potential and risk under varying restoration scenarios. We plan to use similar (simple) approaches to

HOW MUCH FLOODPLAIN DOES A RIVER NEED?

On the Mill Creek project (Walla Walla watershed), W2r used a multi-measure analysis to inform the benefits of wide floodplains to both ecosystems and people. We used simple analyses of stream power, geomorphic change, hydraulic modeling, and floods to illustrate these benefits and inform management targets.





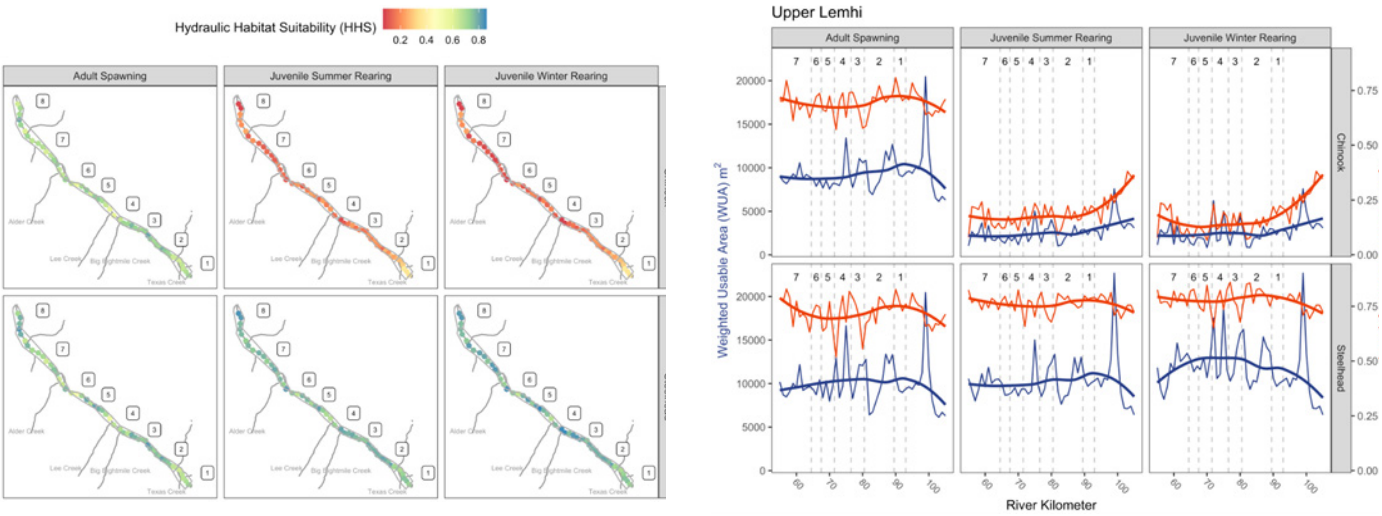


Figure 1. Example hydraulic habitat suitability results from the upper Lemhi River, Idaho. Left and right panels show composite suitability results summarized by river kilometer and geomorphic reach for Chinook salmon and steelhead and three life stages (spawning, summer rearing, winter rearing) as maps and line plots, respectively.

inform relative benefits of partial and full floodplain reconnection, recognizing these opportunities may vary along the reach, the nature of confining infrastructure (e.g., road, lake, powerline, campground), and by project area. These types of analyses also help to inform minimum targets for floodplain width that meet ecosystem and infrastructure needs.

Fish Biology and Productivity Models

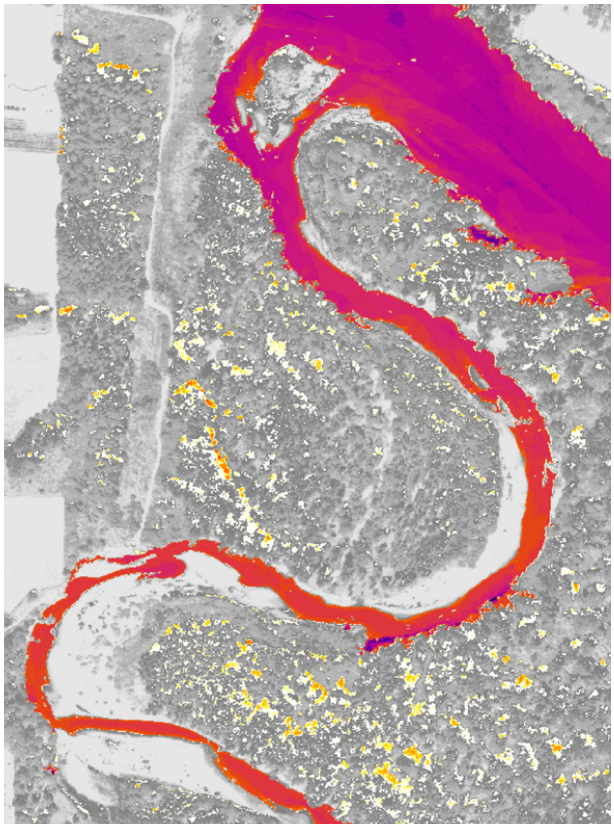
In addition to knowledge of limiting factors, our fish biology team with Mount Hood Environmental will apply their expertise in quantitative fisheries analysis to inform current limiters on fish productivity. We propose a planning-level approach that makes use of existing data and hydraulic models to develop relationships between potential fish productivity using a hydraulic habitat suitability (HHS, a version of HSI) analysis. The team will apply the analysis to connected and restored PAs, as well as encroached upon and incised PAs to develop general relationships between floodplain connectivity, width, and habitat availability (as measured using HHS) for key species. These relationships will inform potential productivity uplift from restoration actions that reconnect floodplains either through addressing incision or removing encroachments. The analysis will quantify potential increases in relative habitat suitability for Chinook salmon and steelhead at life stages identified to be limiting.

The hydraulic suitability analyses will also provide temporal (seasonal) and spatial descriptions of the ability of stream depths and velocities in the study area to support Chinook salmon and steelhead. Here, we will compare depth and velocity curves to incrementally modeled depths and velocities (supported by bathymetric LiDAR) for PAs. Such information can help identify areas where existing conditions may be limiting for each species and life stage, which has proven useful for project prioritization. These HHS results will be generally linked to readily available escapement data to inform estimates of increased population potential from the restoration plan. Figure 1 shows example results from an HHS analysis performed in the Lemhi River, Idaho.

Additionally, a review of literature for bull trout, lamprey, and freshwater mussel hydraulic habitat preferences will also be conducted. This information will provide insight into the potential impact proposed hydraulic habitat conditions targeted for Chinook salmon and steelhead may have on habitat suitability other focal species in the reach. We will work with you to develop quantitative productivity estimates for these other species, if more effort is desired.

Climate Change Effects Analysis on Hydrology and Water Quality

Our team will analyze the potential effects of climate change at the watershed scale which are anticipated to mostly affect runoff quantity and timing, and water temperature. We will synthesize key findings from previous watershed-scale assessments, such as the Tucannon Subbasin Plan (CCD 2004) and Geomorphic Assessment and Restoration Prioritization (CCD 2021), with our analysis of hydrological changes documented in the watershed to construct a conceptual model of water quantity and quality trends. We will analyze the historical and contemporary hydrological changes through use of air temperature and precipitation data sources (e.g., NOAA's National Climatic Data Center), and runoff dynamics and temperature through use of streamflow monitoring data sources (e.g., USGS's National Water Information System). Our hydrologic



Stream temperature map, W2r Molalla River confluence project

forecasts of future conditions will draw upon available tools, such as the Climate Impact Group's Pacific Northwest Hydroclimate Scenarios Project, which provides future forecasts on numerous parameters through the current century. Another tool to be considered for use is the Northwest Climate Toolbox developed by the Applied Climate Science Lab at the University of Idaho, which provides forecasts of future monthly streamflow for watershed extents above USGS gaging stations. Taken all together, we will produce a science-forward understanding of the effects of likely climate change scenarios on hydrology in order to further project planning and prioritization.

Stream temperature directly affects fish growth, survival, and habitat connectivity. Warming climatic conditions are anticipated to become progressively more stressful for cold water fish species as stream temperatures increase with warming air temperatures, which is likely to shift and reduce suitable habitat for many species. In addition to summarizing the 2023 FLIR and multispectral mapping by PA, we will evaluate recent and historic projected summer stream temperature scenarios (e.g., NORWEST) for the Tucannon River watershed, compared to life stage specific temperature thresholds for focal species including Chinook salmon, steelhead, bull trout, and Pacific lamprey. Freshwater mussels will be included if appropriate temperature thresholds are available from the literature. For example, optimal, maximum, and acute (lethal) thresholds available for focal species will be compared to recent composite (2002–2011), mid-century (2030–2059), and late-century (2070–2099) climate projections to assess summer temperature suitability under each scenario.

The goal of the stream temperature analysis is to determine where and whether summer temperatures could be a potential limiting factor for fish population productivity, and to identify if and where restoration actions (e.g., riparian planting, improved grazing practices, increased hyporheic exchange) aimed at reducing stream temperatures could be considered to help mitigate future impacts of a warming climate. The figure provides an example result for Chinook salmon spawning in the Upper Walla Walla watershed depicting where summer stream temperatures exceed thresholds under recent and projected climate scenarios.

[ADD-ON] Lakes Management Assessment (Dam Safety, Maintenance, Spoils Management, and Intake/Outlets)

The series of eight artificial lakes along the reach are critical elements in developing a comprehensive multi-use plan. While these lakes are key recreational areas, they are also having potential maintenance, infrastructure (intake and outlet structures), sedimentation, and dam safety issues. Development of plans and priorities will therefore need to consider the costs and effort required in maintaining these lakes, where desired. Accordingly, we recommend a comprehensive and high-level assessment of these lakes to identify the maintenance and compliance needs that would be required to keep them in place.

RSI Rock Lake project

RSI will lead the assessment of the lakes. RSI brings experience throughout eastern Washington and Oregon working on dam safety assessments, irrigation and water intake designs, water resource engineering, and water rights. From this experience, they will develop a relative ranking of required lake maintenance (both immediacy and total need), dam safety compliance issues, and related costs. Their assessment will incorporate discussions with WDFW on the current lake operations and issues, an assessment of intake and outlet structures, and observation for dam safety and confining levee (erosion) issues. They will use the existing model to inform questions around sedimentation, potential lake overtopping, and spoils management. This assessment will be documented in a brief technical memorandum to be integrated as an appendix to the

final document. Results will also inform the prioritization (Task 6) and conceptual design phases (Task 7).

Assumptions:

- The above analyses are proposed based on planning-level objectives to inform subsequent prioritization and conceptual design. We assume the input data require no significant post-processing to be usable for the intended applications.

Deliverables and Outcomes:

- *Geomorphology, Riparian Vegetation, and Connectivity Summary Memo (~20 pages) and Outputs*
- *Fish Analysis and Productivity Modeling Summary Memo (~15 pages) and Outputs*
- *Climate Change Effects Analysis on Hydrology and Water Quality, Summary Memo and Outputs (~10 pages)*
- *ADD-ON: Lakes Assessment Summary Memo (~15 pages) and Outputs*
- *Presentation to technical team for each of the topic areas above (slides provided in native format)*

Task 6. Restoration Prioritization Framework

The restoration prioritization framework is a critical juncture bringing together the analyses and outcomes of previous tasks to develop an informed and agreed upon strategy for restoration ahead. The framework will balance the needs of ecosystems and fish, needs of multiple users, organizational priorities of the co-managers, realities of infrastructure maintenance and compliance, and cost-benefits of considered management actions.

We envision that the framework developed will be as simple as possible to capture and score the key considerations, ultimately resulting in a ranking or tiering of opportunities. We will work from and expand the existing framework developed by Anchor (2021), recognizing the framework will need to incorporate multi-use considerations. From our experience developing these frameworks, we have found that no scoring scheme, no matter how robust and quantitative, can fully or perfectly capture all the needs and desires of the interested parties. Therefore, the human element will always be part of the framework's application. This highlights the need to maintain simplicity in the framework as much as possible. With these objectives in mind we will work with you to identify metrics and criteria that address the critical path items in implementing a restoration plan, while avoiding redundancy in criteria where possible. We anticipate these factors will include at a minimum:

- Limiting factors and processes for ecosystem recovery and restoration tied to River Vision touchstones (restoring floodplains and connectivity address multiple limiting factors).
- Connections to Upland Vision touchstones.
- Estimates of potential ecosystem and fish productivity uplift (relative to cost) for restoration actions.
- Potential scale of actions and benefits.
- Increases in safety/reductions in maintenance costs.
- Recreational use benefits.
- Watershed positioning relative to fish use, climate change impacts, and landscape-scale connection points.

In concert with this process we will develop lists of recommended actions by PA. This exercise will represent an initial step in the conceptual design process. We anticipate presenting these lists simply and comparatively as tables organized by PAs and standardized restoration activity types. This approach will allow reach-scale patterns of restoration strategies to be envisioned.

Deliverables and Outcomes:

Brief memorandum (~10 pages) outlining the:

- *Prioritization framework methodology and prioritized list of PAs; and*
- *Itemized list of restorations actions to address limiting factors in each PA.*

Task 7. Assessment and Conceptual Design

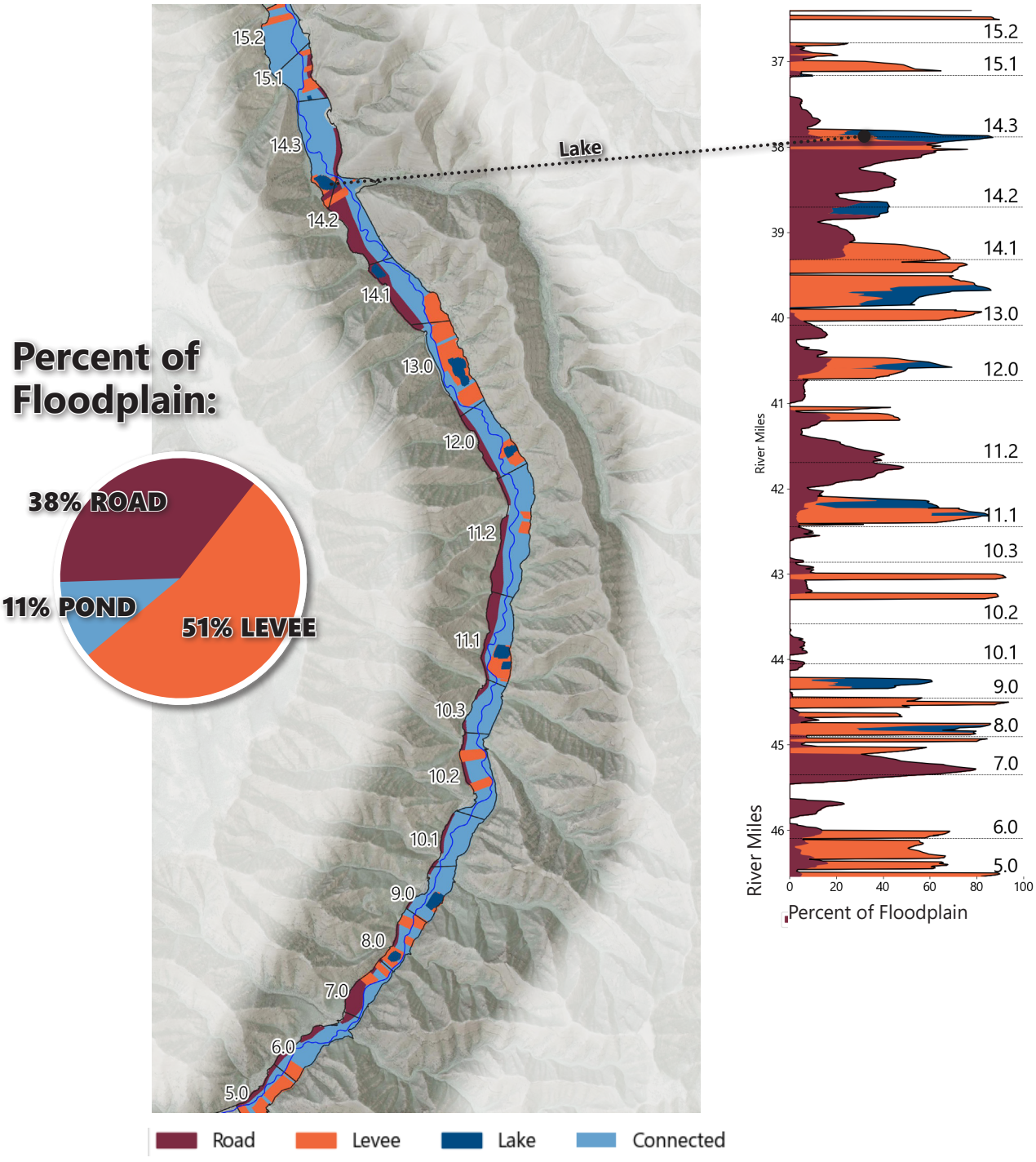
The Tucannon River Assessment and Conceptual Design is an opportunity to facilitate integrated and scientifically supported restoration and management of watershed processes to support recovery of ESA-listed species while creating a more resilient situation for reach-scale infrastructure (lakes, roads, utilities, hatcheries) and the multitude of users. The conceptual design of restoration and management actions, coupled with an illustrative and accessible document, will lay out a 10-year action plan for the co-managers.

Beyond simply laying out the plan, we intend to create a resource that co-managers enthusiastically reference for years to come. To achieve these desired outcomes, we will work with you to create documentation that is pithy, illustrative, and information-rich, with a layered presentation format for multiple learning styles and interests. Specific elements that will support these outcomes include:

- Careful consideration, with your input, on end uses of data, analysis, and restoration prioritization.
- Information flow that allows users to "peel back the layers" (organized by high-level summary to technical), rather than the typical organization of technical reports with lengthy methods up front and conclusions at the end.

Example of using geospatial and data visualization techniques to summarize floodplain encroachments:

The State of Floodplains in the Tucannon PA 5-15



- Visual maps, data, and analysis display. These visual elements will favor zoomed out (reach-scale) views to promote comparison and context, rather than viewing data points or PAs in isolation.
- Simple information favored over complex information.
- Fewer words, written in simple and accessible language.

Conceptual Design

Our conceptual design approach will build from the restoration action lists developed for Task 6, and will display the extent and nature of restoration plans by PA. Conceptual plans will be developed in GIS and will meet the Salmon Recovery Funding Board's Manual 18 requirements. Our work sequencing will include:

- Development of standardized visual format and symbology for consistent plan development across the 17 PAs. We will also develop standardized unit cost assumptions to inform consistent construction cost estimation at the PAs.
- Initial development of conceptual plans for a subset of three to five selected PAs with a range of landscape positions and restoration approaches to gather input from the co-managers on the format and displayed restoration approaches. We will present these plans and cost estimates for review and input by the co-managers. This initial subset could also be presented in a public meeting to gain broader input.
- With general agreement from the co-managers, our team will move forward developing the remainder of the PA conceptual designs and costs.
- A summary of restoration concepts and costs for reporting at high-level in the final document.

The intention of these designs is to create an initial estimate of actions, costs, and critical issues. We anticipate the conceptual design process may feed back into minor refinements of the prioritization framework and results, based on input and discussion amongst co-managers.

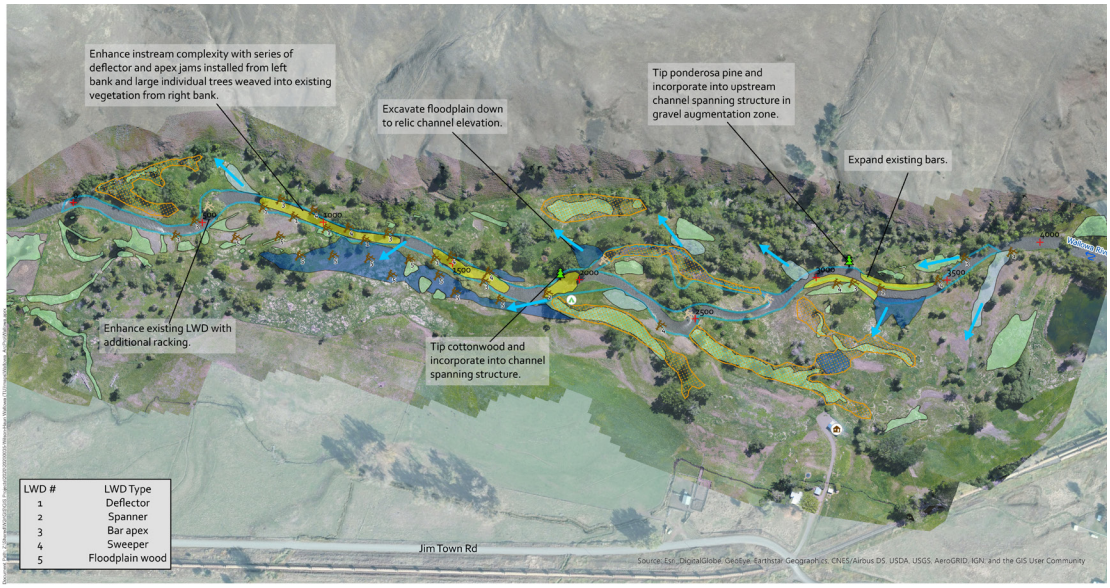
Assessment and Conceptual Design Document

The final document will establish a strategic co-manager plan for process-based floodplain restoration and multi-use management of the lakes and related infrastructure (roads, campgrounds, utilities). The document will include a summary of actions and treatments suitable to address identified restoration targets. The document will summarize technical analyses and the prioritization framework to provide a succinct record and rationale for the plan. In addition to reach-scale representations of the restoration plan displaying restoration approaches by PA, each PA will include a one-page summary to describe the concept map produced above.

The Assessment and Conceptual Design Plan will generally:

- Convey the vision, goals, and objectives.
- Document and display the multi-use restoration plan and conceptual approaches.
- Document and display the reach-scale conditions, aligning with River Vision Touchstones, that inform and provide rationale for the plan.

We will work with you to merge your detailed outline (provided in the RFP) with the general outline above to organize information flow and enhance the usability of the document for co-managers.



Concept design for the Wallowa River Wilson Haun Floodplain Reconnection project by W2r, constructed in 2022.

The document will be illustrated through an atlas format, featuring rich graphics that display spatial and temporal linkages for the project reach. Additionally, this document will serve as the manual for understanding monitoring methods and metrics, and a description of the framework attributes. Through our experience we have found the atlas format to be the easiest for interpretation by scientific and public communities alike, which justifies proposed projects to funding agencies and streamlines project implementation. Technical memos produced in prior tasks will be presented as appendices.

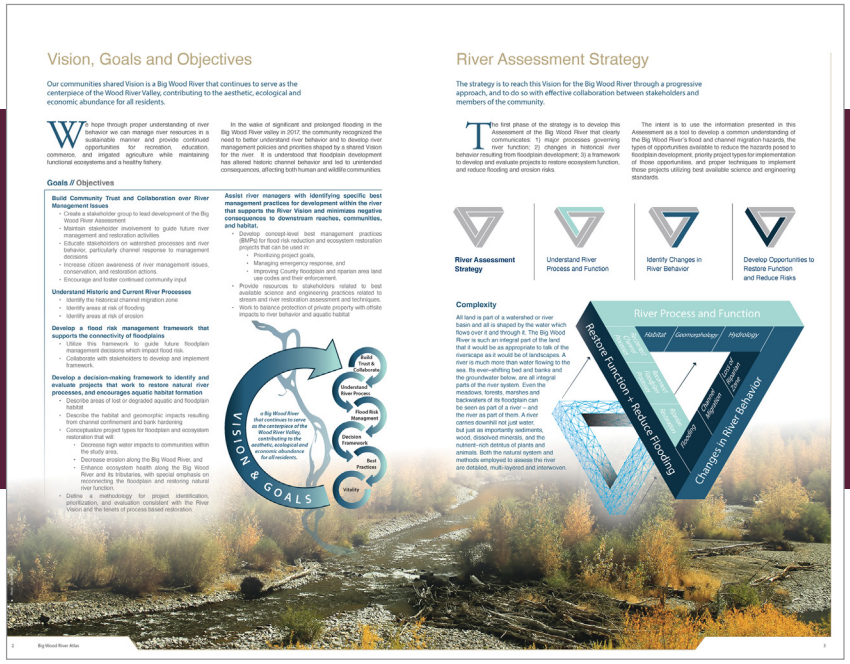
Assumptions:

- The final assessment and conceptual design plan documentation will incorporate pertinent information developed or gathered for the assessment, including methodologies, and clearly detail an effective approach to restoration.
- The final assessment and conceptual design plan will be a print-ready document. For planning and budgeting purposes, the document is to be 8.5x11 inches in landscape or portrait format and the total size is estimated to be between 50 and 75 pages (as concise as reasonably possible) with additional technical reports included as appendices as necessary to capture detailed methods, analyses, and maps. It will also be produced as an accompanying digital document in PDF format.
- Each of the three drafts will go through one round of review by the co-managers, and each subsequent draft will include an appendix summarizing the comments received and description of how they were addressed.
- Conceptual designs by PA will include one round of comments by co-managers.

Deliverables and Outcomes:

The assessment and conceptual design plan will be developed in an atlas-style format featuring graphics that display spatial and temporal linkages between river processes and opportunities to improve the project reach's habitat and fishery. We will develop illustrations, maps, tables, and graphics that properly support and document the action plan/atlas. The primary steps in its development will include:

- *Conceptual design plans (single-page GIS map) and planning cost estimates for each PA.*
- *Annotated layout design and storyboards.*
- *30% Draft Tucannon Assessment and Conceptual Design, as an update to the layout design including a summary of existing literature and data.*
- *60% Draft Tucannon Assessment and Conceptual Design, as an update to the 30% Draft including incorporation of additional stakeholder input and interim data analysis.*
- *90% Draft Tucannon Assessment and Conceptual Design, as an update to the 60% Draft.*
- *Final Tucannon Assessment and Conceptual Design including an ArcGIS geodatabase and map document with all pertinent spatial information collected or produced because of this project.*



ACTIONABLE SOLUTIONS FOR UPLIFT

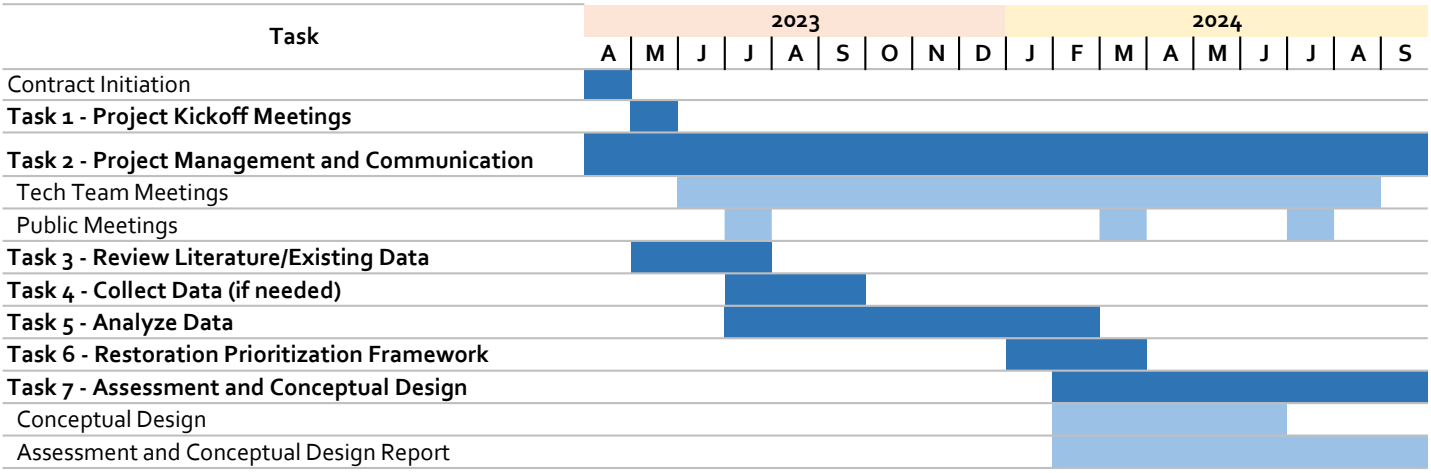
Ecosystem Sciences produced the final technical atlas document for the Big Wood River Flood Assessment, including individual reach segmentation and characterization and prioritized treatments.

SECTION 6

Project Schedule and Itemized Cost

Overall Project Schedule

An overall schedule for or services on this project is presented below; a detailed schedule showing project meetings is featured on page 23.



Team Member Availability

Throughout 2023 Nick Legg's major project commitments are the Sugar Channels Reconnection and Desolation Creek (construction phase) projects. On both of those projects, most of the tasks are being led by other staff and Nick's time needed to manage our task work and budget is projected to be under 15% each month through the summer. W2r's primary tasks on the Tryon Creek Integrated Watershed Plan are mostly complete, and it is expected that Nick will only need to spend 3% or less of his time managing our services on the project over the next few months. Nick is currently involved on several other projects providing occasional senior-level technical input that require between 5-10% of this time per month. These projects include the Gunter Levee, SF Toutle at Brownell Creek Restoration, Madsen Creek Tributary Conveyance System, and Molalla River Confluence projects. Even with Nick's other non project-related obligations as the firm's Watershed Sciences Director, we estimate he will have ample capacity (at 30%-40%) to manage our services on the Tucannon PA 5-15 project.

W2r's key team members with the greatest level of involvement on this project include Luke Russell, Allen Dysart, and Jeremiah Green (see roles on page 10). Similar to Nick, these team members have current project commitments that are coming to a close, opening up their increased availability by early summer. Luke has been a key team member on the Tryon Creek Integrated Watershed Plan, on which W2r's services are mostly complete, and his two other primary projects include the Clean Water Services Stormwater/ Stream Resiliency project and Madsen Creek Tributary Conveyance System. Each of these projects have typically involved 10-20% of his time per month and are not expected to exceed that over the next several months. Allen Dysart is a key team member on the Lookingglass Creek and Tucannon PA-27/28.1 projects; however, his project commitments on both of those projects are supported by other W2r staff and

we believe Allen has ample capacity to serve in a key role on this project. Jeremiah Green will be highly available to support this project, as well, since one of his major, multi-year projects comes to a close this May (and currently that project only requires about 25 hours of his time each month, or less than 15% of this time). Beyond May, and concurrent to our services on the Tucannon project, Jeremiah will have two other primary ongoing project commitments; however, both of those projects together will require only 30% of his time.

W2r team members AJ Jones and Joe Rudolph have minor roles on this project and we expect to manage our overall project workload in order to permit their availability when and where needed.

Proposed Project Budget

Unless expressly provided within the contract, rates are subject to increase annually on January 1 of each year.

		W2r								Ecosystem Science			RSI	MHE							
	Tucannon River PA5-15 Assessment and Conceptual Design CTUIR	Sr. Geomorphologist / PM	Project Engineer	Sr Engineer	Geomorphologist	Principal	Scientist/EIT	Sr. Riparian Ecologist	Project Administrator	Zach Hill Sr. Environmental Planner	Derek Risso Sr. Scientist	Zack Herzfeld Scientist	Dam Safety and Water Intake Engineer	Bryce Oldemeyer, Quantitative Fisheries Scientist	Mark Roes, Quantitative Ecologist	Tulley Mackey, Fisheries Biologist	Subtotal Labor Hours Per Task	Subtotal Labor Fee Per Task	Reimbursable Expenses	Total Cost	Add-on Tasks
Task	**Task Description**	$190	$150	$190	$145	$250	$130	$190	$125	$145	$145	$115	$125	$136	$90	$80					
1	**Project Kickoff Meetings**																**172**	**$24,894**	**$4,050**	**$28,944**	
	Field Tour and Kickoff	24	24		24		24			12		12	16	24			160	$23,144	$4,050	$27,194	
	Kickoff meeting (Orientation/Data Exchange)	2	2		2		2			2		2					12	$1,750	$0	$1,750	
2	**Project Management and Communication**																**616**	**$94,166**	**$5,363**	**$99,529**	
	Communication Plan	8								24		8					40	$5,920	$0	$5,920	
	Vision, Goals, Objectives	8					6			12		6					32	$4,730	$0	$4,730	
	Technical Team Meetings (15)	58	58	8	8	4	10	4		52		24	8	8			242	$37,848	$2,000	$39,848	
	Public Meetings (3)	28	28				16			24	8	24					128	$19,000	$3,363	$22,363	
	Record of Comments	8	36							3		9					56	$8,390	$0	$8,390	
	PM (Schedule, coordination, invoicing)	40				2			34	24				18			118	$18,278	$0	$18,278	
3	**Review Literature and Existing Data**																**78**	**$11,634**	**$0**	**$11,634**	
	Annotated List of Existing Data and Application	4	8	4	16		16	4		2		4	4	4			66	$9,674	$0	$9,674	
	Presentation of Conclusions and Critical Data Gaps	4	8														12	$1,960	$0	$1,960	
4	**Collect Data**																**150**	**$23,380**	**$1,744**	**$25,124**	
	Data Gaps - Collection (assumed 0)																0	$0	$0	$0	
	Wetland Mapping (ADD-ON)	2	8				80	60									150	$23,380	$1,744	$25,124	X
5	**Analyze Data**																**1054**	**$134,764**	**$2,225**	**$136,989**	
	Summary of Geomorphic/Riparian/Connectivity	40	40		160	2	160	40				6					448	$66,390	$1,338	$67,728	
	Summary of Focal Species Production Model	8	8		8		16					6		76	66	116	304	$32,206	$0	$32,206	
	Summary of Climate Change Analysis	4	8		8		16					6		48	20	76	186	$20,298	$0	$20,298	
	Summary of Lake Assessment - Infrastructure, Spoils, and O&M (ADD-ON)	8	16	4		2						6	80				116	$15,870	$888	$16,758	X
6	**Restoration Prioritization Framework**																**200**	**$31,558**	**$0**	**$31,558**	
	Methodology and Prioritized List by PA	16	24	8	16	2	16	4		8	4		4	8			110	$17,148	$0	$17,148	
	Itemized list of Restoration Actions	16	32	16	8		16			2							90	$14,410	$0	$14,410	
7	**Assessment and Conceptual Design**																**1359**	**$196,566**	**$0**	**$196,566**	
	Conceptual Design	17	136	68		8	272			4		8	32				545	$79,410	$0	$79,410	
	30% Draft	32	40	12	40	2	40	8		64	16	60		8			322	$46,968	$0	$46,968	
	60% Draft	24	30	8	30		30	4		40	12	48		4			230	$33,194	$0	$33,194	
	90% Draft	16	20	4	20		20	4		24	8	48		4			168	$23,764	$0	$23,764	
	Final Document (includes data exchange)	8	10	2	10	2	10			16	4	32					94	$13,230	$0	$13,230	
8	**Task 8 Title**																**0**	**$0**	**$0**	**$0**	
	Subtask 1																0	$0	$0	$0	
	Subtask 2																0	$0	$0	$0	
	Subtask 3																0	$0	$0	$0	
9	**Task 9 Title**																**0**	**$0**	**$0**	**$0**	
	Subtask 1																0	$0	$0	$0	
	Subtask 2																0	$0	$0	$0	
	Subtask 3																0	$0	$0	$0	
10	**Task 10 Title**																**0**	**$0**	**$0**	**$0**	
	Subtask 1																0	$0	$0	$0	
	Subtask 2																0	$0	$0	$0	
	Subtask 3																0	$0	$0	$0	
	Total - Base	**365**	**512**	**130**	**350**	**22**	**670**	**68**	**34**	**313**	**52**	**303**	**64**	**202**	**86**	**192**	**3363**	**$477,712**	**$10,750**	**$488,462**	
	Total - With Add-on Tasks	**375**	**536**	**134**	**350**	**24**	**750**	**128**	**34**	**313**	**52**	**309**	**144**	**202**	**86**	**192**	**3629**	**$516,962**	**$13,381**	**$530,343**	

SECTION 7

References & Past Performance

Reference for W2r

Brice Crayne

Project Manager, Lower Columbia Fish Enhancement Group

(360) 904-7922

12404 SE Evergreen Hwy
Vancouver, WA 98683

Brice has worked with project manager Nick Legg on the nine-mile South Fork Toutle River project (2020-2022). Brice can speak to Nick's and W2r's ability to shape a watershed-scale restoration strategy by contributing geomorphic understanding through objective-oriented analysis, making use of data and technology, and through graphic and communication techniques. W2r's restoration strategies on the SF Toutle project recognize the natural trajectory of the river. Joe Rudolph, Nora Boylan, and Luke Russell are some of the team members who have also supported our work for this client.

Reference for W2r

Chris Johnson

President, Methow Salmon Recovery Foundation

(509) 429-1232

50 Twisp River Rd
Twisp, WA 98856

W2r has worked with Chris on the multiple projects. Chris can speak to the partnering approach of Nick Legg and his knowledge of river systems science and ability to translate technical analysis in a way that is targeted toward practical questions and outcomes. Luke Russell, Jeremiah Green, Joe Rudolph, and Allen Dysart have also been involved as key staff on our work for MSRF. Projects have ranged from one to two miles in size and have been completed from 2019-present.

Reference for Ecosystem Sciences

Kristine Hilt, CFM

Senior Project Manager, Blaine County, Idaho

(208) 788-5570

219 1st Ave South,
Suite 208
Hailey, ID 83333

Kristine worked with Ecosystem Sciences team members, including Zach Hill, on the Big Wood River Flood Assessment and Atlas, completed in 2021. The Atlas provided stakeholders with ways to identify, evaluate, and prioritize opportunities to systematically protect the communities along the Big Wood River. Zach provided communications leadership, meeting facilitation, and stakeholder engagement on the project.

"Nick and his crew approached the Upper Beaver Creek project with a fresh perspective that cut through some very entrenched thinking and resulted in a creative approach that helped us balance a challenging set of expectations."

Chris Johnson, Methow Salmon Recovery Foundation

W2r Project List
Project Start Date 3/1/2020 To 3/31/2023

PROJECT	CLIENT	CONTRACT AMOUNT	START DATE
20220023 - Dreyer Residence CWS Standard Site Assessment	Adam Dreyer	$7,700.00	8/11/2022
20210001 - Little Creek (Union Co Soil and Water)	Anderson Perry	$11,658.00	1/29/2021
20210020 - Mill Creek Geomorph	Anderson Perry	$11,912.00	10/24/2021
20220031 - Nicholas Gap Instream Flow Study	Anderson Schultz LLC	$9,085.00	9/21/2022
20220032 - Stossel Right Bank Improvement Project	Aspect - Aspect Consulting, LLC	$20,580.00	9/23/2022
20210014 - Chehalis Basin Flood Risk Analysis	BerlinRosen Ltd., The Pew Charitable Trusts	$10,020.00	8/1/2021
20220034 - Estuary Bi-Op Technical Support	BPA - Bonneville Power Administration	$286,488.00	10/1/2022
20210004 - Confidential	Confidential	$972,280.00	4/5/2021
20220011 - Blue Lake Park (Metro, Cascade Enviro)	Cascade Environmental Solutions - Jennifer Levy	$19,301.00	4/25/2022
20220043 - Goodwin Side Channel	Cascade Fisheries	$36,220.00	11/21/2022
20220010 - City of Corvallis BEB Electrification (Elcon)	City of Corvallis - Elcon Associates (for City of Corvallis)	$17,060.00	3/29/2022
20170009.7 - Levee ARV (BES)	City of Portland- BES	$17,336.00	5/11/2020
20170009.8 - 20170009.8 BES Miller Creek Restoration E11267 (DPO 22281694)	City of Portland- BES	$50,113.00	10/15/2020
20170009.9 - West Lents Geomorphic Response and Engineering Review	City of Portland- BES	$46,765.00	6/29/2021
20190018.03 - Phase 1 Hydromodification Study	City of Portland- BES	$249,475.00	12/31/2021
20190018.04 - Tryon Creek Fish Passage E11427	City of Portland- BES	$240,936.70	11/10/2021
20190018.05 - Carolina Trunk Wetland Delineation	City of Portland- BES	$25,098.00	8/15/2022
20190018.1 - E11260 - Brookside Wetland Retrofit (DPO 22287111)	City of Portland- BES	$72,284.00	2/10/2021
20190018.2 - BES Hydromod Strategy (DPO 22283191)	City of Portland- BES	$20,898.00	10/5/2020
20220019 - Austin Hot Springs (CRBC)	Clackamas River Basin Council	$49,962.00	7/6/2022
20210012 - Watershed Protection Monitoring	Clackamas WES	$159,530.00	7/19/2021
20180001.1 - Pacific Highway Emergency Culvert	Clark County	$5,026.00	9/16/2020
2018001.2 - Clark County Culvert Monitoring - Pacific Highway	Clark County	$15,710.00	4/19/2022
2018001.3 - Clark County Culvert Monitoring - NE 10th Ave	Clark County	$15,722.00	5/4/2022
2018001.4 - Clark County Culvert Monitoring - NE Manley Rd.	Clark County	$26,639.00	5/4/2022
20170011.10 - CWS Stormwater Technical Services	Clean Water Services	$199,844.00	11/18/2021
20170011.6 - PM Training	Clean Water Services	$71,435.00	7/22/2020
20170011.8 - Construction Support Cedar Mill	Clean Water Services	$175,000.00	6/15/2021
20170011.9 - Baker-Heaton Permitting	Clean Water Services	$80,000.00	11/3/2021
20200028 - Grays River Confluence Monitoring Plan	Columbia Land Trust	$9,235.00	8/31/2020

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20200027 - Natures Acres	Columbia Soil Water Conservation District	$125,969.00	9/1/2020
20200012 - Little Bridge Crk (Colville Tribes)	Colville Tribes - Confederated Tribes of the Colville Reservation	$81,185.43	3/30/2020
20220046 - Antoine Creek (CTCR)	Colville Tribes - Confederated Tribes of the Colville Reservation	$164,315.00	3/14/2023
20200013 - Sandy River Outfall Siting Evaluation	Consor	$42,000.00	9/1/2020
20230001 - McMinnville Curbs and Ramps (Consor, ODOT)	Consor	$34,800.84	1/11/2023
20210023 - Beaver Hill Wetland Reserve	Coquille Watershed Association - Coquille Watershed Association	$113,968.00	12/17/2021
20200033 - Villines Wetland Grading Design	Cow Creek Band of Umpqua of Indians	$12,665.00	9/30/2020
20210002 - W. Fork Canyon Creek Culvert Replacement	Cow Creek Band of Umpqua of Indians	$13,500.00	1/11/2021
20220024 - Calf-Copeland Wetland Mitigation	Cow Creek Band of Umpqua of Indians	$9,951.00	8/5/2022
20160007.3 - 20160007.3 Palensky Hwy 30 Underpass	CREST	$178,731.00	12/31/2021
20160007.4 - Palensky Construction	CREST	$50,988.00	7/14/2021
20200034 - Dalton Lake	CREST	$56,095.00	11/13/2020
20200034.2 - Dalton Lake 60% - Final Design	CREST	$126,570.00	9/21/2021
20220025 - Lookingglass Creek	CTUIR - Confederated Tribes of the Umatilla Indian Reservation	$139,670.00	8/8/2022
20220042 - Tucannon PA-27/28.1 Design	CTUIR - Confederated Tribes of the Umatilla Indian Reservation	$99,475.00	11/15/2022
202000016 - Earth Ecology - Maplecrest	Earth Ecology - Nick Lake	$1,100.00	4/30/2020
20220003 - Econorthwest UFSWQD Revenue Needs	Econorthwest	$38,010.00	2/11/2022
20200022 - Skokomish River Confluence LWD	Environmental Science Associates	$97,164.00	11/19/2020
20210017 - Quartz, FRR Wetland Delin and Hydraulic Modeling	EWEB - Eugene Water and Electric Board	$350,724.00	10/20/2021
20220029 - Delta Ponds Berm	EWEB - Eugene Water and Electric Board	$46,384.00	9/8/2022
20200023 - UGR Sediment Study	Grande Ronde Model Watershed	$99,900.00	7/15/2020
20210019 - Sheep Creek	Grande Ronde Model Watershed	$83,500.00	10/24/2021
20210005 - KC000007 Gunter Levee (King Co)	HDR	$92,783.14	3/3/2021
20210011 - Madsen Creek 0306A Tributary Conveyance System	HDR	$92,006.81	12/15/2021
20220026.1 - Channel Migration Easement and Preliminary Planning	HDR	$85,135.00	11/8/2022
20190021.02 - Bear Creek – Final Design and Construction Oversite	Hix Snedeker Companies	$17,866.00	6/23/2022
20210018 - Lawson Natural Resources Assessment	Holly Lawson	$2,110.00	10/19/2021
20220028 - Tony Creek Fish Passage	HRWG - Hood River Watershed Group	$94,320.00	9/6/2022
20200019 - Interface Env - ACT	Interface Environmental Consulting - Carrie Caviness	$1,500.00	6/9/2020
20220001 - Necanicum River Floodway	Jackson Oil Co.	$8,680.00	6/21/2022
20180015.2 - CPRA Mississippi River Mid-Basin	Jacobs - Jacobs Engineering Group Inc.	$23,977.00	10/4/2021
20220013 - WSDOT DB Fish Passage (Jacobs)	Jacobs - Jacobs Engineering Group Inc.	$30,000.00	5/24/2022
20220013.1 - NW Fish Passage (WSDOT)	Jacobs - Jacobs Engineering Group Inc.	$1,109,521.00	1/17/2023
20220022 - Johnson Creek Confluence	JCWC - Johnson Creek Watershed Council	$59,950.00	7/28/2022

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20220017 - I205 1A Staging Area (Kiewit)	Keiwit - Kiewit	$14,093.00	6/16/2022
20200009 - Lane Co. Hayden Bridge Seismic Retrofit (kpff)	KPFF	$64,648.00	3/20/2020
20200011 - St. Johns Prairie Trail	KPFF	$90,750.33	3/27/2020
20200020 - Albers Mill Pier Inspection &Repair Functional Assessment	KPFF	$6,000.00	6/29/2020
20210008 - Whitaker Ponds Boardwalk	KPFF	$7,059.00	9/9/2021
20220004 - Wyland Rd (KPFF)	KPFF	$14,690.00	2/28/2022
20220021 - NE 15th Ave Clark County	KPFF	$131,850.00	7/27/2022
20220038 - Fowler Sewer Replace (KPFF)	KPFF	$38,715.00	1/23/2023
20220047 - PGE Memorial Substation	KPFF	$17,417.00	12/16/2022
20160015.02 - Steigerwald Construction Phase 2	Lower Columbia Estuary Partnership	$756,875.00	4/1/2020
20160015.03 - Steigerwald Construction Phase 3	Lower Columbia Estuary Partnership	$864,107.02	2/18/2021
20160015.04 - Steigerwald Construction Closeout	Lower Columbia Estuary Partnership	$386,539.00	4/1/2022
20200017 - EP Multnomah Channel Marsh Natural Area	Lower Columbia Estuary Partnership	$59,830.00	7/30/2020
20220014 - Campen Cr Feasibility (LCEP)	Lower Columbia Estuary Partnership	$35,695.00	5/1/2022
20220033 - Burnt Bridge Creek Restoration (LCEP)	Lower Columbia Estuary Partnership	$63,730.48	9/27/2022
20200001.01 - Brownell Reach Geomorph	Lower Columbia Fish Enhancement Group	$2,025.00	4/7/2020
20220009 - SF Toutle at Brownell Cr (LCFEG)	Lower Columbia Fish Enhancement Group	$81,225.00	5/24/2022
20210007 - Mason CD	Mason CD	$19,500.00	4/19/2021
20210007.05 - 20210007.05 Mason CD Front Street	Mason CD	$11,745.00	1/29/2022
2021007.02 - Mason CD KTP Express	Mason CD	$16,660.00	12/30/2021
2021007.03 - Mason CD Fredson House	Mason CD	$11,135.00	12/30/2021
2021007.04 - Mason CD Waste Storage Facilities –	Mason CD	$42,050.00	12/30/2021
2021007.06 - Mason CD Kikuchi	Mason CD	$45,070.00	4/22/2022
2021007.08 - Mason CD Culvert Removal	Mason CD	$6,985.00	8/12/2022
20230002 - Bull Run Dam Gate 1	McMillen, Inc.	$48,100.00	2/20/2023
20210024 - Methow 3R Floodplain	Methow Salmon Recovery Foundation	$39,500.00	1/7/2022
20220005 - Sugar Channels Reconnection	Methow Salmon Recovery Foundation	$329,040.00	3/7/2022
20230005 - Skyline Screen and Ditch Design (MSRF)	Methow Salmon Recovery Foundation	$61,579.00	2/7/2023
20170014.02 - Metro Eco Assessment - Sandy TA	Metro	$23,887.00	8/3/2020
20170014.04 - Metro Eco Assessments T105257 - Beaver Creek	Metro	$24,330.00	7/13/2021
20220008.1 - Metro Coffee Lake Creek Wetland	Metro	$7,195.00	3/29/2022
20220008.2 - Sandy River Site Conservation Plans	Metro	$20,000.00	5/1/2022
20220008.3 - Chinquapin Bluffs	Metro	$15,000.00	7/7/2022
20220008.4 - Metro CLCW Restoration of South Wetlands	Metro	$15,000.00	7/1/2022
20220008.5 - Metro Coffee Lake Creek Design	Metro	$60,945.00	10/1/2022

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20190005.1 - Big Creek Floodplain Restoration Implementation	MidCoast Watersheds Council	$22,696.00	3/12/2020
20200032 - Lower Drift Crk	MidCoast Watersheds Council	$82,913.00	9/29/2020
20180013.1 - Molalla Phase 2 OWEB-BPA Habitat	Molalla River Watch	$232,062.00	6/1/2022
20200015.3 - Gate Tower and Pipe Maintenance (MCDD)	Multnomah County Drainage District	$73,013.00	3/14/2023
20220037 - East Langell Environmental Services	NV5	$30,449.50	10/28/2022
20220016.1 - Silver Falls Wetland Delineation	OPRD - Oregon Parks and Recreation	$55,865.00	10/5/2022
20220016.2 - Beverly Beach SP Wetland Delineation (OPRD)	OPRD - Oregon Parks and Recreation	$43,888.00	12/27/2022
2019001.2 - Cadman-Ellis Reserve Permitting and Design	Parametrix	$589,705.00	7/15/2020
20210010 - Sandy NPDES Permitting Support	Parametrix	$169,119.00	7/23/2021
20210006.01 - Sea Scouts Marina Demolition Permitting	Port of Portland	$64,485.00	7/28/2021
20200008 - PSU Physical Processes Course	Portland State University	$1,750.00	3/6/2020
20220015 - OSU Ship Dock Operations and Design	Rowell Brokaw - Rowell Brokaw Architects, PC	$79,595.00	4/29/2022
20210015- - Lopez Village Hydrologic Analysis	San Juan County Dept. of Environmental Stewardship	$47,785.00	10/26/2021
20210016 - Orcas Island Fish Culverts	San Juan County Dept. of Environmental Stewardship	$169,713.00	11/3/2021
20200007 - Fivemile Bell	Siuslaw Watershed Council	$1,200.00	3/2/2020
20220006 - Wren Marsh (SWC)	Siuslaw Watershed Council	$57,237.00	3/29/2022
20220007 - Upper Deschutes Conceptual Design (SPSSEG)	SPSSEG - South Puget Sound Salmon Enhancement Group	$115,088.00	3/31/2022
20180006 - Kilchis Porter Tract	The Nature Conservancy	$20,000.00	12/17/2021
20220030 - Hosford South Riley St. Culvert	Toll Bros. - Toll Bros., Inc.	$26,430.00	9/21/2022
20200029 - Big Creek Construction Staking (Trask)	Trask Design & Construction - Grahm Trask	$6,045.00	8/26/2020
20200035 - Wilson-Haun Wallowa River Design	Trout Unlimited	$173,942.00	1/14/2021
20220020 - Ty Haberling Flood Risk at Spring Lane	Tyler Haberling	$2,000.00	7/8/2022
20180003 - Whychus Monitoring (UDWC)	Upper Deschutes Watershed Council - Mathias Perle	$20,035.00	6/7/2021
20200030 - Whychus Canyon Phase II (Rimrock Ranch)	Upper Deschutes Watershed Council - Mathias Perle	$171,467.00	9/25/2020
20180010.2 - Willapa Hills State Park Trail Improvements	WA State Parks & Recreation Commission	$305,615.00	11/5/2021
20220044 - Alaska Streamflow Analysis	Water Policy Consulting, LLC	$11,960.00	11/30/2022
20220002 - Fox Creek Culvert Feasibility	West Yost Associates, Inc. - Corie Moolenkamp	$52,936.00	3/10/2022
20220045 - Westport ERTG Support (Westervelt)	WESTERVELT ECOLOGICAL SERVICES, LLC	$15,544.00	11/30/2022
20220041 - Coho Creek (Whiting Environmental)	Whiting Environmental	$57,150.00	12/30/2022
20200024 - Interstate Bridge Replacement	WSP USA	$281,328.82	9/17/2020
20210021 - Carrols Creek Restoration	Yakama Nation	$78,191.00	11/15/2021

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