

Yakima River mile 89.5 side channel and floodplain restoration project

Proposal for: WaterSMART Environmental Water Resources Projects for Fiscal Year 2023

Yakama Nation, PO Box 151, Toppenish, WA 98948

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Yakima River project site in May 2011 under 25 year recurrence flooding. Project goals are to safely re-water the side channel and floodplain semi-annually at lower flood recurrence intervals.



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1. EXECUTIVE SUMMARY

Date: March 20, 2023

Applicant: Yakama Nation

City, County, State: Toppenish, Yakima County, Washington State

The Yakima River mile 89.5 side channel and floodplain restoration project will reconnect approximately 9.89 miles of side channels along the Yakima River, and thereby restore natural floodplain processes on more than 946 acres of riparian forest, grassland, and wetland habitat. The project is located within the Yakama Reservation near the town of Toppenish, Washington (46.379738 N, -120.243392 E). It addresses long-standing reductions in the abundance and quality of fish habitat and degradation of riparian and wetland zones caused by river flow regulation through the USBR Yakima Project. Other issues causing ecosystem impairment are floodplain constriction by levees and bridges, and land conversion to irrigated agriculture. The project will re-connect the river and floodplain through two constructed inlet structures to existing side channels so that water can access historical pathways during high and moderate flows, rather than only during large flood events. Project actions include the following: excavating side channel sections; removing blockages within the existing side channel; constructing outlets stabilized with engineered logjams (ELJs) to ensure fish can return to the mainstem river; and enhancing beaver dams at the farthest downstream end of the side channel to help retain additional water within the floodplain. Disturbed areas will be revegetated with native species. The goals are to improve off-channel habitat for salmon, steelhead, and Pacific lamprey, provide longer periods of open-water for migrating and breeding waterfowl, enhance culturally important riparian and wetlands plants, improve and expand wetland habitats, and to increase the health and regenerative capacity of the riparian black cottonwood forest. The project will also improve local water quality and alluvial aquifer recharge, as well as helping sustain long-term large woody debris recruitment on the Wapato Reach of the Yakima River. The project is supported by the 2012 Wapato Reach Assessment Report, the 2019 Basis of Design Report, and by full engineering designs. The project is planned for construction from July 1st 2024 through October 15th, 2026. It is focused on effects of the USBR Yakima Project.

2. PROJECT LOCATION

The Yakima River mile 89.5 side channel and floodplain restoration project is located within the Yakama Reservation, in Yakima County, near the town of Toppenish, Washington (46.379738 N, -120.243392 E). It lies approximately 3 miles east of Toppenish in the Yakima River floodplain.

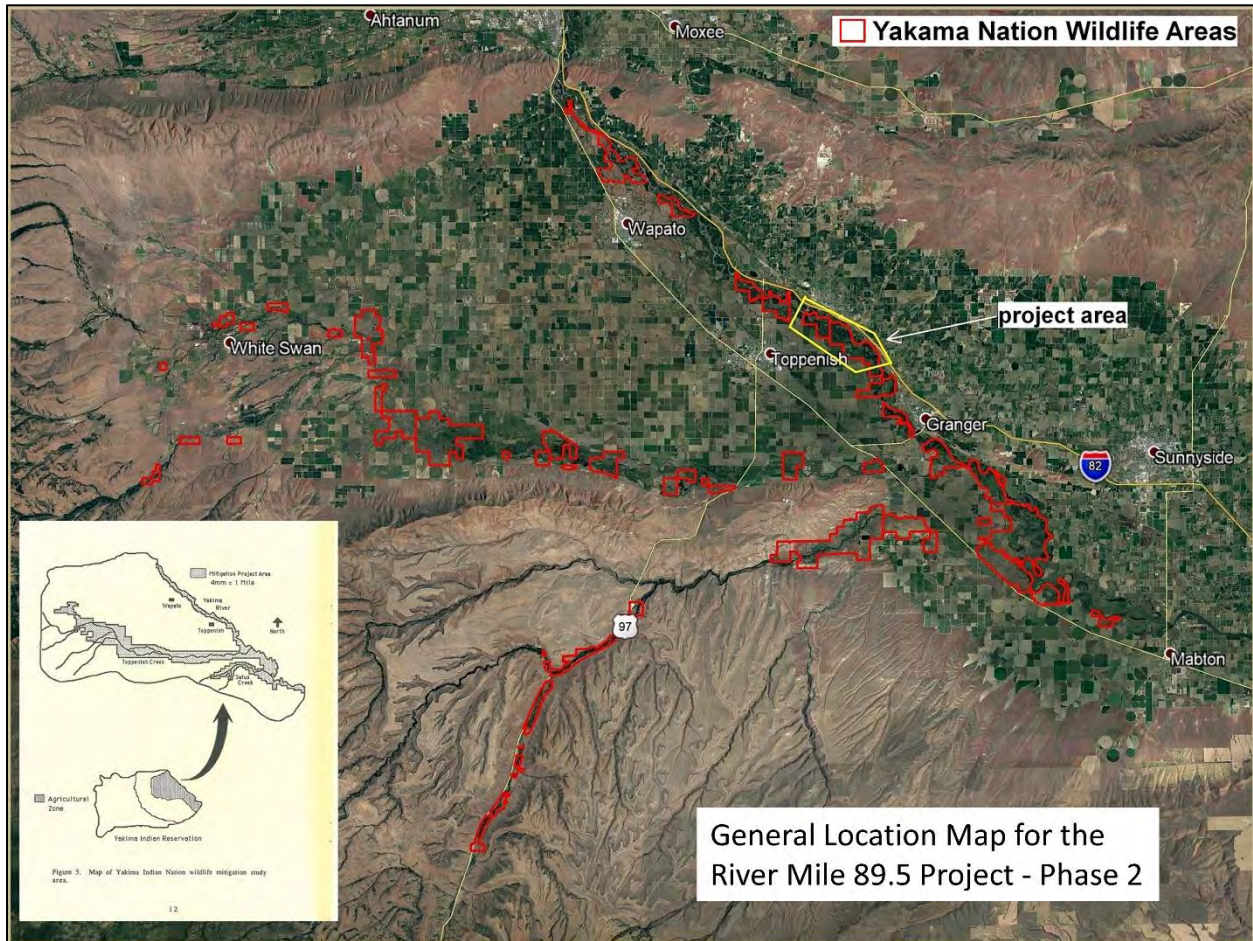


Figure 1. Location map of project showing the eastern portion of the Yakama Reservation in the lower Yakima Valley. The town of Yakima is located immediately off the map to the north.

3. TECHNICAL PROJECT DESCRIPTION

Background and Site Description

The Yakima River RM 89.5 Floodplain Restoration Project area includes approximately 900 acres of historical floodplain along the river right (west) side of approximately 4 miles of the mainstem Yakima River (RM 8-91). The Yakima River is 214 miles long and is a major tributary in the Columbia River basin (Figure 1). The modern active floodplain within the project area is very low gradient (0.19%) and ranges from 0.8 miles to 0.1 miles wide relative to the modern location of the mainstem Yakima River. Irrigation ditching, roads, bridges, gravel mining, and agriculture have encroached on what was historically an active floodplain that was at least 2 miles wide, less than a hundred years ago (according to aerial photos and subtle topographic scarring). The ungraded portions of the modern floodplain have irregular surface topography with multiple historical channel pathways and meander scars (Figure 2). Pockets of active floodplain exist on the east side (river left) of the Yakima River between the channel and a partially confining natural terrace. A 3,400-foot long levee constructed in the late 1970's on river-right along the mid-section of the mainstem river near RM 89.5 halted local lateral migration and disconnected the mainstem channel from its adjacent and downstream floodplain. Upstream from the project area, irrigation infrastructure that includes dams and irrigation diversions impose notable alterations to the site's natural seasonal flow regimes. The two diversions immediately upstream from the project area (Wapato and Sunnyside) are

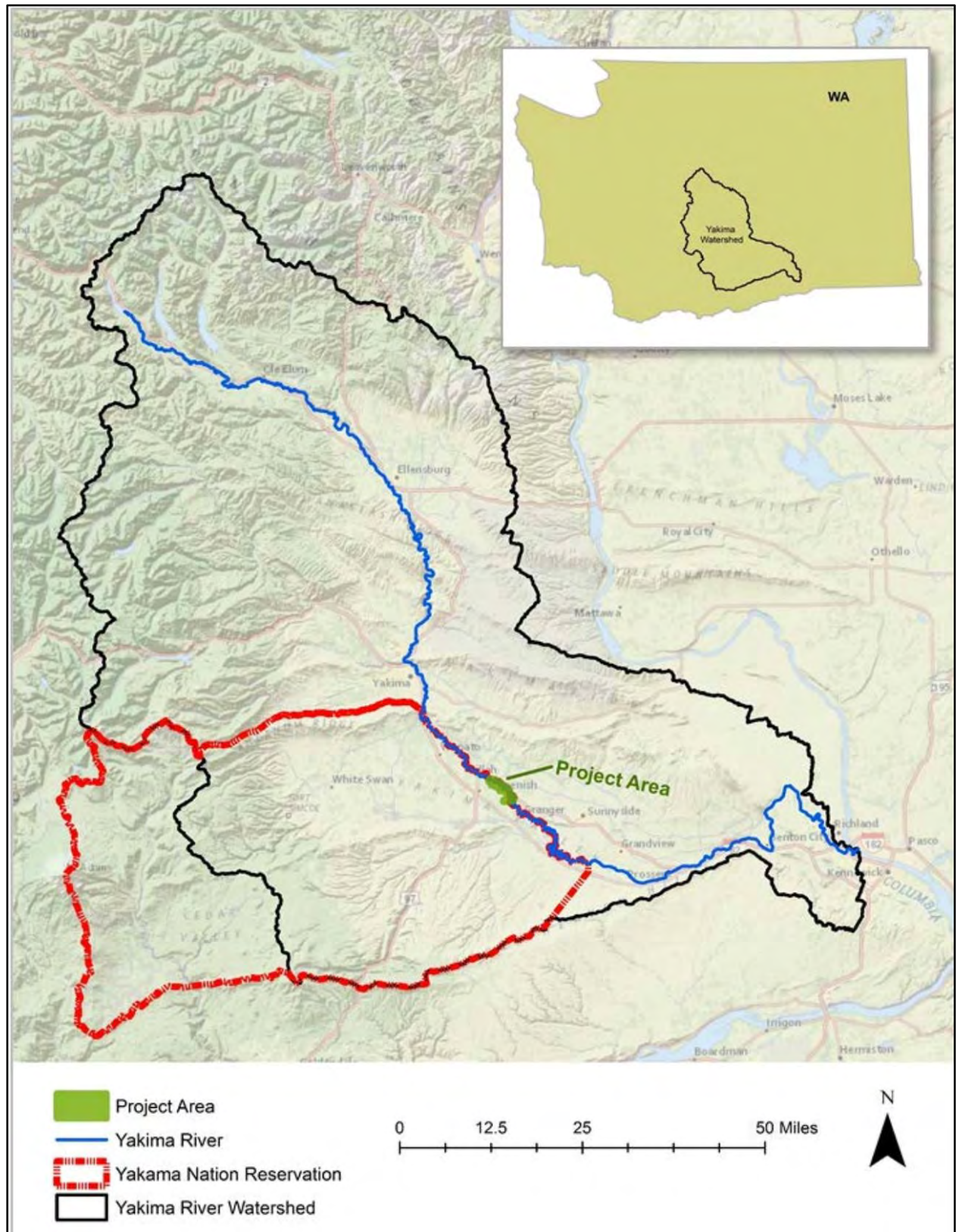


Figure 1. Project location in the Yakima Basin.



Figure 2. Project area showing levee and floodplain meander scars and side channels.

estimated to reduce average summer flow by two thirds, and the median spring peak flow by a similar amount. (USBR, 2017; Yakama Nation, 2017), figure 3. Using another metric to assess the extent of flow regulation, the 2 year recurrence peak at the site, as measured at the USBR Yakima River gage at Parker, has been reduced from 23,500 cfs unregulated to 12,500 cfs regulated. (Unregulated flow is an estimate produced by the USBR Yakima Project hydrologist, Chris Lynch). An extensive assessment of the existing conditions at the site is provided in the Yakima RM 89.5 – Floodplain Restoration Site Assessment (Inter-Fluve, 2018), which is included in the proposal as supporting documentation.

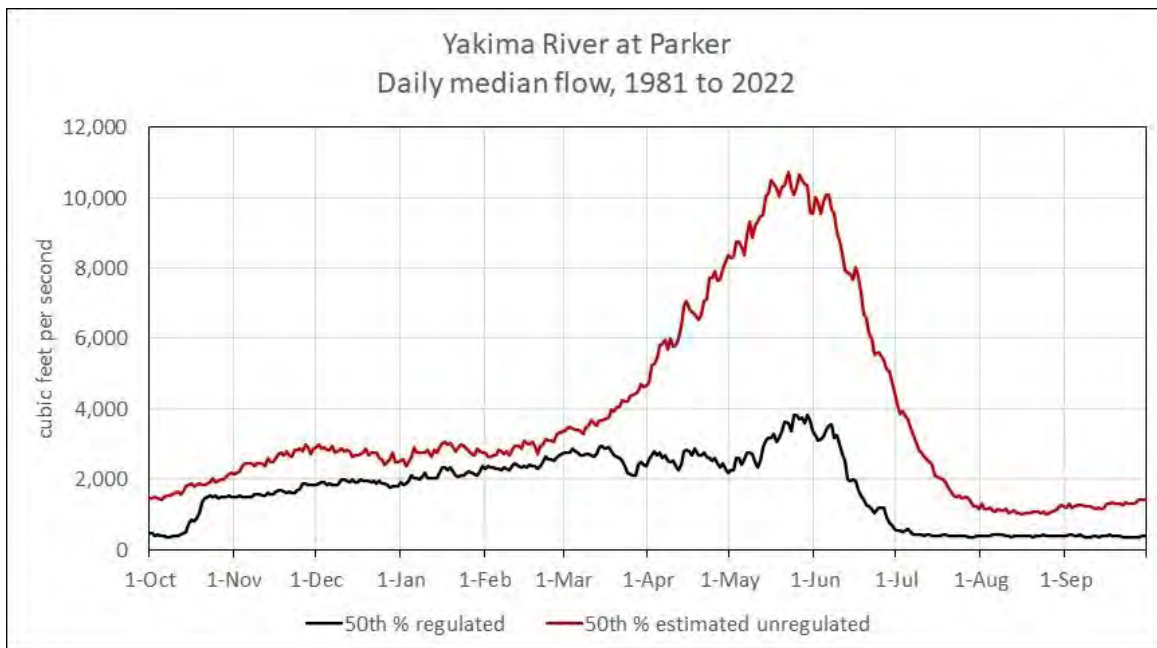


Figure 3. Regulated vs. unregulated flow at the Parker gage, upstream of the project site. The spring peak, which would normally inundate floodplains annually, has been drastically reduced.

Thus, the project floodplain area is doubly disconnected, hydrologically by flow regulation and physically by the levee. Historical evidence of this disconnection is provided by General Land Office maps from 1875 (pre-regulation) that show perennially flowing side channels in the project area. Furthermore, reduced flow has caused increased sedimentation in previously perennial side channels and in wetlands, plugging them with fine sediment deposited in floods. These conditions have significantly reduced fish and wildlife habitat, and reduced water supply to floodplain wetlands and riparian zones. Science and Yakama traditional knowledge agree that well-functioning floodplain ecosystems are dependent on the frequency and duration of wetting by surface and groundwater resources (Opperman et al 2010). Therefore, reconnecting floodplain processes and side channel habitat at this site have significant potential to improve a complex and dynamic floodplain ecosystem that will yield important habitat benefits for aquatic, terrestrial and avian species.

Goals and Objectives

The overarching goal of this project is to improve floodplain and side-channel connectivity to the mainstem river to restore high-quality habitat for native fish and wildlife, and to enhance wetland and riparian floodplain ecosystems. Objectives are:

1. to the extent possible, increase inundation of floodplain, wetland, and side-channels
2. enhance fish and wildlife habitat in the floodplain, side channels, and mainstem Yakima River.
3. reduce or not increase flood hazard for properties adjacent to the project area.

Project Design

Criteria:

A list of design criteria developed for the project area incorporates site conditions, project area objectives, construction impacts, infrastructure constraints, property owner concerns, and feasibility. Design criteria serve three primary purposes: 1) to clearly document and communicate specific project objectives and constraints, 2) to help inform and guide the design process so that objectives are met, and 3) provide a basis for future performance monitoring. The following criteria have been developed:

Habitat

- Increase the quality and quantity of habitat within the riparian floodplain corridor for avian and terrestrial species.
- Increase the quality and quantity of off-channel habitat for ESA listed native salmonids.
- Consider off-channel habitat improvements for native lamprey.
- Minimize fish stranding in side- or off-channel habitat features.

- Create/enhance improved habitats and stream function.

Geomorphology and Hydrology

- Support sustainable geomorphic conditions and processes.
- Support improved and sustainable hydrologic connectivity of the floodplain with an understanding that natural processes, over time, include sedimentation, debris accumulation, and system evolution.
- Consider existing active geomorphic processes of the mainstem channel (lateral migration, braiding, sediment and woody material transport, and floodplain development).
- Reconnect floodplain by increasing frequency and magnitude of inundation
- Increase frequency of floodplain connectivity by activating/connecting side-channels.
- Activate multiple flow inputs for side-channel activation to build redundancy that supports long-term functionality and maximizes floodplain connectivity into the design.
- Avoid increased flood risk to existing infrastructure and properties.
- Maintain active geomorphic processes of the mainstem channel.
- Maintain connectivity of existing side/off channel features to the mainstem channel.
- Consider existing risks and future restoration potential of the gravel pit mines located on the river-left floodplain at the upstream end of the project area.

Groundwater Recharge and Irrigation Inputs

- Consider groundwater recharge and exchange with side channel and off-channel floodplain features.
- Based on limited available data of existing groundwater conditions, design side and off-channel features to receive groundwater inputs.
- Consider irrigation return locations and inputs (surface and potential groundwater).

Engineering and Risk

- Document flood flows and model with HEC-RAS changes in water surface elevations.
- Model flood inundation and changes in flood flow pathways. Design to minimize risk.
- Designs will minimize impacts to existing groundwater elevations.
- Design large wood (LW) jam structures and/or ballasting considering natural LW processes and risk of potential wood movement downstream.
- Design LW structures to use natural materials and avoid/minimize use of ballast boulders or cabling.
- Minimize risk of levee failure or main-stem channel pathway changes at the levee.

Construction Impacts

- Design to minimize disturbance during construction.
- Use locally sourced materials, to the degree possible.
- Excavated material to be exported to an appropriate site (to be determined by YN).
- Disturbed areas (areas of excavation, access routes, etc.) will be included in replanting plan (reseeding, etc.). Seed types and application to be developed in coordination with Yakama Nation staff will emphasize native species.

Hydrology:

Surface water discharge at the project area is characterized for this assessment using the stream gage at Parker, WA – which is located 17 miles upstream. The modern mean daily discharge hydrograph (1935- 2017), is provided in Figure 3. The highest average discharge values usually occur in the spring when snow melt and rain-on-snow events occur in the headwater tributaries. Surface water in the mainstem Yakima River is diverted for irrigation upstream of the project at the Sunnyside Canal diversion located immediately upstream of the Parker discharge gage. This diversion notably reduces flow in the mainstem to supply water to the Yakima Valley from late spring through mid-October. The irrigation usage results in a muted hydrograph at the project site. The Bureau of Reclamation estimates that current summer base-level flows are one third of the historical, pre-dam discharge. According to USBR discharge data cited by the Yakama Nation, mean annual discharge at the Parker diversion has been reduced from an unregulated average of 4,765 cubic feet per second to 2,390 cubic feet per second (USBR, 2017; Yakama Nation, 2017).

Peak flow data available at the Parker, WA gage from 1935 to present were used to estimate the discharge and recurrence frequency for the 2, 10, 25, 50, and 100-year flood events using the Log- Pearson type III flood analysis technique. Those flood recurrence intervals are:

Recurrence Interval (years)	Discharge (cfs)
2	11,440
10	27,450
25	35,367
50	43,463
100	50,359

Hydrologic Design Analysis

In addition to reviewing the annual hydrograph and estimating peak flow events at the Parker gage on the mainstem Yakima River (Inter-Fluve, 2018), two basic hydrologic analyses were completed. These analyses were used to identify the frequency at which the mainstem channel conveys certain high-flows. This was done to aid in the process of identifying the preferred discharge at which restoration treatments will aim to activate the floodplain. Under existing conditions, the upstream portion of the project area begins to experience floodplain and oxbow connectivity with the mainstem channel at approximately 7000 cfs. Connectivity and activation of the oxbows at and downstream of the levee require flows ≥ 7000 cfs for a period of time (hours to days depending on discharge as well as groundwater and floodplain saturation status).

Inter-Fluve performed a basic flow duration analysis on the reported daily average discharge values for 35 years of complete records (1981-2016) at the Parker gage (USBR, 2017) and the estimated pre-dam/irrigation discharge at the same gage located approximately 17 river miles upstream of the project area. This identifies the number of days per year on average over this time period, that the mainstem discharge is expected to equal or exceed a particular discharge (includes all the months of the year) (Table 1). According to this analysis the side channel and floodplain will be connected over 200 days a year post-project, in the winter and spring, compared to about 20 days a year under current conditions.

Table 1. Average number of days per year that discharge at the Parker gage will experience a range of discharges -- modern hydrology and estimated pre-dam/irrigation hydrology. Based on 1981-2016 reported daily discharge values and USBR natural flow estimates.

Discharge (cfs):	>7000	≥ 6000	≥ 5000	≥ 4000	≥ 3000	≥ 1500	≥ 1000
Modern hydrology Probable days/year	21	28	39	58	86	181	225
Estimated pre-dam/irrigation hydrology Probable days/year	75	92	114	141	180	287	335

Hydraulic Modeling

To evaluate the project area hydrological response to restoration actions, the Yakima River and floodplain project site hydraulics were modeled using HEC-RAS (Hydraulic Engineering Center River Analysis System) version 5.0.3 (September 2016). An existing conditions model was developed and run using two-dimensional, unsteady state simulation mode to perform

hydraulic computations for a representative discharge hydrograph. Model results depict hydraulic parameters such as depth, velocity, water surface elevations, and lateral inundation extents throughout the complex flow regions in the project area due to surface flow. Model results were compared to aerial photos taken by YN staff during flood events as well as photo sets available on Google Earth. Model roughness coefficients were adjusted to calibrate the model to observed conditions. The existing conditions model was then modified to represent design conditions to evaluate probable flow hydraulics under proposed conditions. Several iterations of the model were undertaken for multiple proposed conditions to evaluate and identify the designs that meet project goals and objectives (improved floodplain and habitat conditions as well as not increasing flood hazards for nearby private properties). Details about the model design and results are provided in the Evaluation Criteria section of the proposal.

Design Components

The *Yakima River RM 89.5 – Floodplain Restoration Design Plans* are included in the proposal as an attachment. Design plans are construction ready, with the exception of a potential redesign of inlet structure 1A based on river observations since the designs were completed in 2018. summary description of the design component is provided below. “The Owner” of the project refers to Yakama Nation Wildlife Management Program delegated staff and “the Engineer” refers to Inter-Fluve staff. This project incorporates a few simple elements and action to attain goals and objectives, as listed below. Side channels are labeled 1A, 1B, etc, for convenience as shown below in figure 5 and table 2.

- Construct of inlet structures with engineered wood structures
- Excavation and grading at selected locations in existing side channels
- Construction of two hardened fords for Wildlife Area site maintenance
- Construction of temporary access roads
- Temporary material staging
- Remediation and revegetation

Inlets with Large Wood Structures

Large Wood (LW) jam structures will be constructed at the excavated side-channel inlet mouth of Align 1a and Align 4 on the mainstem Yakima River. The LW installations are designed as an apex jam located on the channel-left side of the inlet mouth and a bank jam located upstream from the excavated inlet. The intended purpose of the LW jams is to promote hydraulic maintenance of the side-channel inlet while also providing in-stream habitat features. The LW jams include approximately 21 18”dbh x 40’ long logs with rootwads that have their trunks buried into the bank and 21 12-15” diameter by 30’ long log snag ballasts installed vertically and

driven into the ground 15-20' by vibratory pile driving equipment and bolted to the horizontal logs. The upstream end of the jam will have a matrix of six 15-18" dbh x 35-40' long logs and slash (~75 CY) placed horizontally in the rootwads. A photo of an example of an inlet jam is provided in (4).



Figure 4. Example of inlet jam. Installed by Inter-Fluve 2013, photo taken in 2016 (Inter-Fluve).

In addition to back-fill burial, the horizontal LW trunks with rootwads will be further stabilized to resist buoyancy with placed boulders and backfill contained by biodegradable fabric encapsulated soil lifts that will support the maturation of vegetation on the bank. Boulders (~36" diameter) will be integrated into the backfill material and placed on the horizontal LW trunks. These elements are shown in the Plans on sheets 14-18.

Floodplain and Side-Channel Activation

To increase floodplain connectivity, a set of side-channel alignments that re-connect the mainstem channel and perennial side-channel to existing oxbow ponds and flood-event flow pathways are designed. Alignment of inlet locations and side-channel activation pathways are based on existing floodplain topography, hydraulic model analysis, and probability for geomorphic sustainability. The selected alignments are illustrated in (3). Activation flows for the alignment inlets are provided in Table 2. Alignments 1a and 1b activate the designed

side-channels at the upstream end. Alignment 4 contributes discharge to the downstream portion of the same side-channel. Alignments 3a and 3b contribute additional flows along the middle portion. Having more than one activation inlet increases the complexity of floodplain reconnection and the ecologic benefits that supports. In addition, multiple activation inlets provide secondary and ancillary activation routes to the side-channel that increase the probability of long-term sustainable side-channel connectivity.

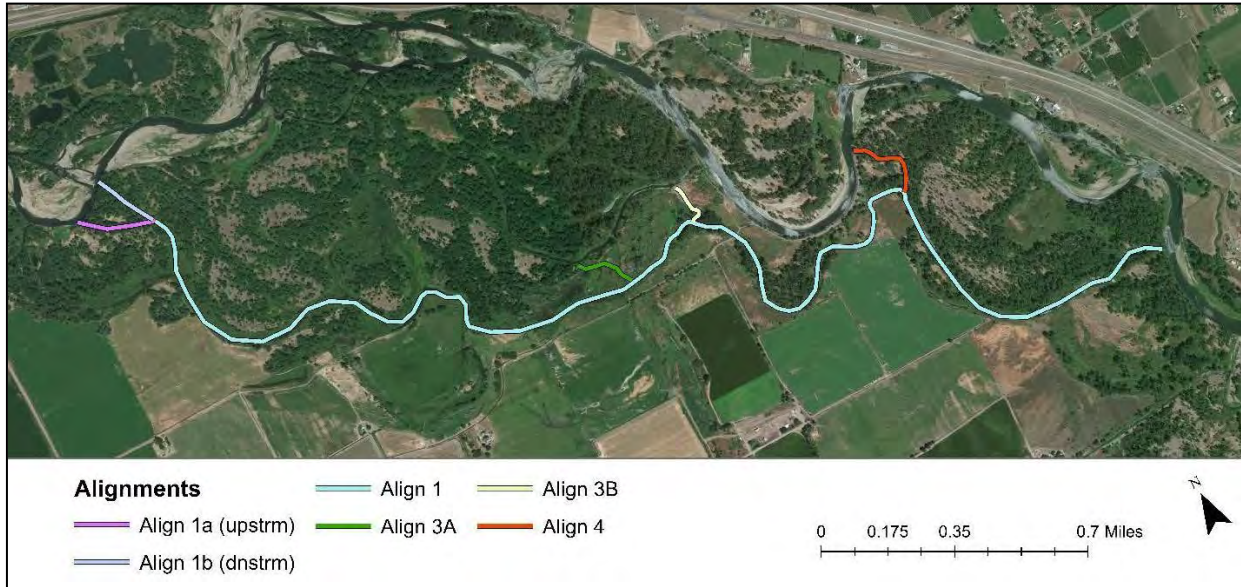


Figure 5. Basic orientation of selected activation alignments.

Table 2. Activation discharges for the inlets of the selected alignments.

Alignment	Align 1a (upstrm)	Align 1b (dnstrm)	Align 3A	Align 3B	Align 4
Activation Discharge	1000 cfs	1000 cfs	3000 cfs	1500 cfs	1000 cfs

Activation of the side-channel alignments requires excavation of inlet channels and connector flow paths through the floodplain at identified locations to create and maintain connectivity. Areas of excavation are designed to increase the frequency of through-flow by connecting existing oxbow ponds and abandoned side-channel scars. Routing side-channel alignments through existing floodplain features minimizes excavation requirements and takes advantage of existing established riparian vegetation along already wetted or seasonally wetted features within the floodplain. The orientations of the alignments are designed to activate wetland and floodplain feature more frequently than existing conditions.

Channel geometry (width and depth) and slope for each inlet and connector flow paths are designed to convey water through the alignments at the desired activation discharge while also increasing the frequency of floodplain inundation within the project area. Each inlet channel geometry is designed for its specific location and activation discharge. Hydraulic modeling of the inlets and connector flow paths was used to refine channel geometry through the design process. Channel geometry considers existing oxbow and side-channel dimensions as well as long-term hydraulic maintenance of the activated side-channel alignments. The banks of excavated channels will be seeded and planted with native species. Similar to natural channel dynamics, no additional armoring of the channel is proposed.

See the attached Design Plans for specification on the alignment orientations, channel geometry, and slope for each designed inlet and side-channel connector excavation area.

Fords

Two access routes through the site will be maintained by construction of three stream ford crossings. The surface of the ford is flush with the new channel finished grade profile to not disturb flow. Twelve inches of granular material will be placed to allow a driving surface for four-wheel drive pickups and tractors. The crossings will be wetted more frequently with the proposed fords than under existing conditions.

Access Routes and Material Storage Areas

Access routes for the project were identified in collaboration with Yakama Nation staff. Where possible, existing routes are utilized. Elsewhere, temporary access routes have been identified to minimize impacts to vegetation and maximize equipment routing. Access into excavated areas is expected along the centerline of the area being excavated. This uses the construction footprint for access by applying an 'inside-out' construction sequencing (excavating from within the channel) to limit disturbance to existing vegetation along the banks. If and where necessary, the access routes will be improved by the contractor for construction purposes. Remediation guidelines of designated access routes are included in the Plans.

Two material storage areas will be used to store the excavated material outside of the active floodplain. Excavated materials will be stored in two general sorting piles: 1) fines – small gravels, and 2) gravel-boulders. The owner will be responsible for coordinating the removal of the excess excavated material as needed in the future for other habitat restoration projects in the area. The location of these areas and guidelines on volumes and contouring of the material is provided in the Plans. In addition, two temporary staging areas are designated for staging equipment and LW jam materials during construction. These areas will be remediated

immediately after construction is complete. Where identified, the Material Storage Areas will be replanted with appropriate native seed mixes. All vegetation remediation will follow the planting guidelines provided in the Plans.

Remediation and Revegetation

Areas disturbed during construction, including existing access routes, will be remediated after construction to similar or improved conditions. Temporary access routes, storage areas, newly constructed channel, and any additional disturbed areas will be replanted with appropriate native seed mixes to support site recover and reduce erosion risks. Plant lists, seed mixes, quantities, locations, and planting guidelines are included in the Plans (sheets 19-22). The contractor is responsible for procuring the seed and re-seeding all disturbed areas, except areas of the Material Storage Area holding stockpiled materials. The Owner will place seed in the Material Storage Areas after the material has been hauled off site. All woody plants (live cuttings, bare root, and container) will be procured and installed by the owner in autumn, after construction is complete and planting conditions are more optimal for survival.

Three different native seed mixes will be applied to three identified planting zones, delineated by surface elevation and expected days of wetting after construction. The three zones are Wet Fringe, Riparian, and Transitional. If surface elevations within the allowed areas of disturbance are different than existing conditions on access routes and along the border of the constructed channels after construction, then planting zones in those areas will need to be adjusted accordingly. All disturbed areas will be reseeded with QuickGuard Sterile Triticale at a rate of 15 lbs/acre to promote germination of the native seed mix and reduce weed-seed propagation.

4. MONITORING PLAN

The monitoring plan is intended to assure that the project is built to design, and that the major project elements function as intended. The plan is intended to be simple but informative. The design and engineering consultant will develop a 5 year monitoring plan and implement the first 6 months; other Yakama Nation funds will be used to complete the plan. The plan elements are:

- Before and after drone video flights to document that all project elements have been completed as designed.
- As-built construction plans to document that all project elements have been completed as designed.
- Surface flow measurement at 2 to 3 easy to access and representative locations, 2 times each year during the winter. This action will document increased flow volume and frequency in the side channel network caused by project actions.

- Fish presence/absence monitoring, 2 times per year, at 2 to 3 representative locations through electro-fishing or snorkeling. This action will document fish use of the side channels.
- Ground level and drone repeat photography of revegetation areas, taken 1 time per year in the late spring at peak phenology. This will enable us to track the recovery of the project area from project disturbance.
- Drone video flights 1 to 2 times per year during high water, to document how the side channel and wetland complex is responding to project actions.

5. APPLICANT CATEGORY AND ELIGIBILITY OF APPLICANT

This project is proposed for Category C: Restoration projects benefitting ecological values or watershed health that have a nexus to water resources or water resources management; includes the following activities:

- *Improving stream channel structure and complexity.*
- *Improving channel/flood plain connectivity.*
- *Restoration projects influencing water temperature or improving the timing or volume of available flows at particular locations to improve aquatic conditions.*
- *Stream restoration to improve groundwater recharge and riparian habitat.*
- *Restoring backwater/flood plain areas (for larval and juvenile fish and other wildlife species) to enhance and maintain rearing as well as feeding and foraging habitats.*
- *Restoring a natural feature or use of a nature-based feature to reduce water supply and demand imbalances or the risk of drought or flood, including restoring natural wetlands, construction or improving wetlands for treatment of irrigation water or stormwater flows, or otherwise using or restoring natural features to address water management issues.*
- *Restoration projects that enhance commercial, recreational, subsistence, or Tribal ceremonial fishing and river-based recreation.*

6. PERFORMANCE MEASURES

Included in the Evaluation Criteria section.

7. EVALUATION CRITERIA

E.1.1 Evaluation Criterion A: Project Benefits (25 Points)

E.1.1.1 Subcriterion A.1: Project Benefits

E.1.1.1.1 General Project Benefits

- Explain how the project will *benefit ecological values that have a nexus to water resources or water resources management*, including benefits to plant and animal species, fish and wildlife habitat, riparian areas, and ecosystems that are supported by rivers,

streams, and/or other water sources, or that are directly influenced by water resources management.

○ In your response, identify the specific ecological values benefitted and how those ecological values depend on, or are influenced by, water resources or water resources management.

This project benefits specific ecological values that are supported by floodplain wetlands, side channels, and riparian forests. The fundamental issue that the project addresses is insufficient water in side channels and wetlands, caused by upstream flow regulation by USBR storage dams that reduces winter and spring flows. This hydrological disconnection of side channel and floodplain habitats severely impairs fish, wildlife, and wetland habitats and plant communities. By using engineered inlets to connect the side channels at lower water surface elevations, the project will restore hydrologic connectivity to a 6 mile long (9+ total channel miles) and 135 acre (of delineated wetlands) side channel and wetland complex. It will increase annual days of connection from approximately 25 currently to over 200 after the project is completed. This dramatically increased connectivity will: restore winter and spring off-channel fish habitat in the side channel complex, resulting in increased rearing and wintering habitat abundance and quality, 2) restore winter and spring hydrology to wetlands, increasing waterfowl wintering and breeding habitat, 3) mimic natural hydrology for wetlands plants, increasing the growth and vigor of important traditionally used plants such as Wapato and Tule, and 4) raise the riparian water table during winter and spring, supporting increased growth and vigor for the cottonwood riparian forest, 5) improve habitat for riparian and wetland wildlife such as beavers, mink, and otters. Figure 6 below illustrates the gain in side channel connectivity.

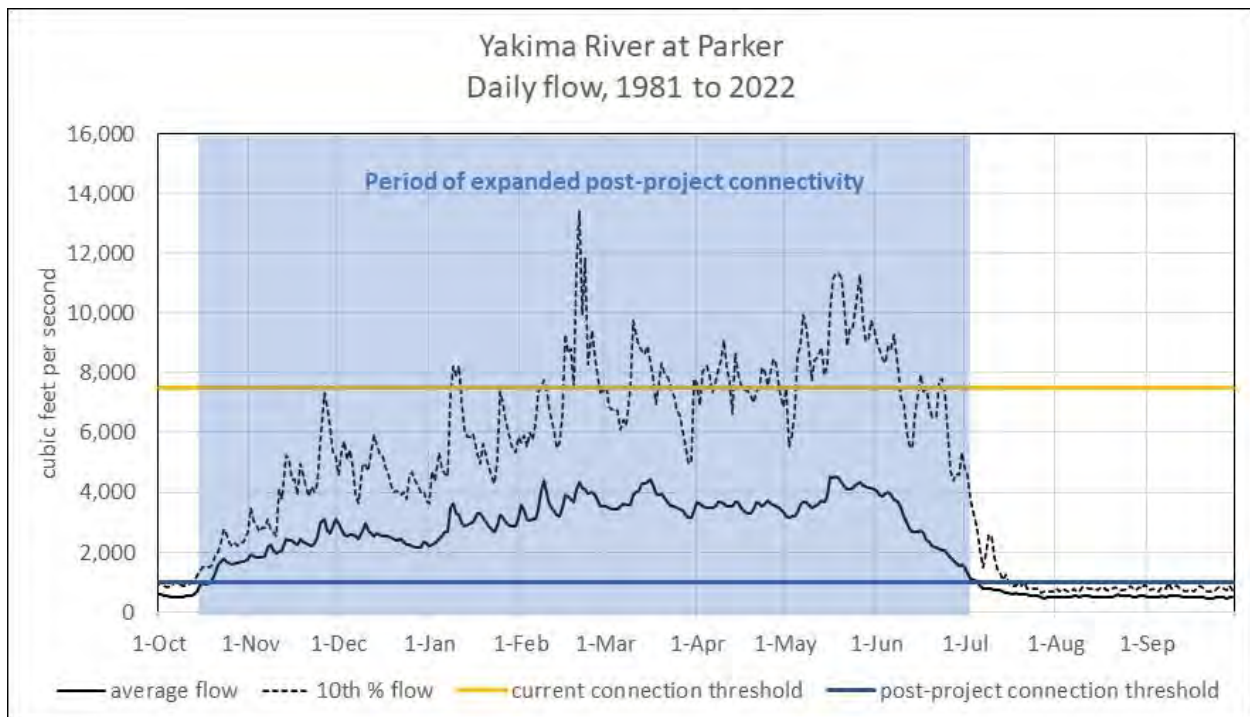


Figure 6. Yakima River hydrograph, showing regulated flow, for the project reach showing increased side channel connectivity under post-project conditions. The blue shaded area corresponds to the period when flows typically exceed 1,000 cfs (heavy blue line), which is the design connection flow that happens on average 220 days per year. Currently flows must exceed 7,500 cfs (heavy orange line), which rarely happens in average regulated flow conditions (solid black line), and only for parts of the winter even in high flow years (10th % exceedance flows-dotted black line).

- Explain whether the project will increase water supply reliability for ecological values by improving the timing or quantity of water available; improving water quality and temperature; or improving stream or riparian conditions for the benefit of plant and animal species, fish and wildlife habitat, riparian areas, and ecosystems; or through similar approaches.

This project will improve both the timing and quality of available water to the project area (see figures 5 and 6), by increasing frequency and duration of inundation and flow, and by doing so during the winter and spring which under natural flow conditions are the high flow periods of the year. Water flowing slowly through the extensive side channel wetlands will have higher water quality through the trapping and removal of fine sediment and associated contaminants. The large scale of the project is expected to have downstream watershed health improvements for the Yakima River, where USBR facilities and operations impair natural ecosystem function. In addition, some of the water flowing in the side channel complex is expected to increase recharge to the alluvial aquifer over current dry conditions, likely increasing cool groundwater

inflow back to the river during warmer months. This project will increase the winter spring water supply for riparian areas and fish and wildlife habitat and in wetland ecosystems. It is important that the project area is Yakama Nation land permanently protected for fish and wildlife through the Bonneville Power Funded Lower Yakima Valley Riparian and Wetland Project; thus, fish and wildlife and their habitat will realize the full potential of hydrologic restoration. Hydraulic modeling indicates that at 3,000 cfs, a flow that occurs approximately 30 days per year, the project will increase the area of inundation by 52 acres, an approximately 25% increase over current inundation area, as shown below in figure 7. Similarly, at 15,000 cfs, which is approximately the bankfull flow in the project area and occurs 1 or 2 days per year, the inundated area will increase by 85%, or over 90 acres, as compared to current conditions (figure 8). The much greater area of inundation will have positive water quality effects, and help to recharge the riparian water table.

- Will the project *improve watershed health* in a river basin that is adversely impacted by a Reclamation water project?

This project extends over 2.8 floodplain miles, 5 mainstem river miles, and 950 floodplain acres. It reconnects over 9.5 miles of side channels to regular flow and inundation. As such, it impacts hydrological function and water quality over a large area and is expected to improve water quality and flood peak levels in downstream river reaches. See figure 8 for a map of project effects during overbank flows.

- Is the project for the purpose of meeting *existing environmental mitigation or compliance obligations* under Federal or State law? No

- If the project will benefit *aquatic or riparian ecosystems* within the watershed (e.g., by reducing flood risk, reducing bank erosion, increasing biodiversity, or preserving native species), explain the extent of those benefits (i.e., magnitude and geographic extent). Estimate expected project benefits to ecosystems and provide documentation and support for this estimate, including a detailed explanation of how the estimate was determined.

The project will benefit aquatic and riparian ecosystems. For aquatic ecosystems, it will 1) reduce downstream flood risk, 2) preserve native species. It reduces downstream flood risk by increasing flood storage in the project area during floods. This was calculated by comparing pre- and post-project hydraulic modeling results at different flows levels. The results show that floodplain flood storage increases greatly in post-project conditions. In addition, modeling shows that post-project conditions will create more areas of off-channel and slow flowing water, and in side channels that have increased riparian and woody cover. These features are known to be preferentially used by juvenile salmon and steelhead. These species have been documented in the project area by previous fish studies. The hydraulic model used for the analysis was

calibrated using direct water level measurements and using high-quality aerial photos of flood conditions.

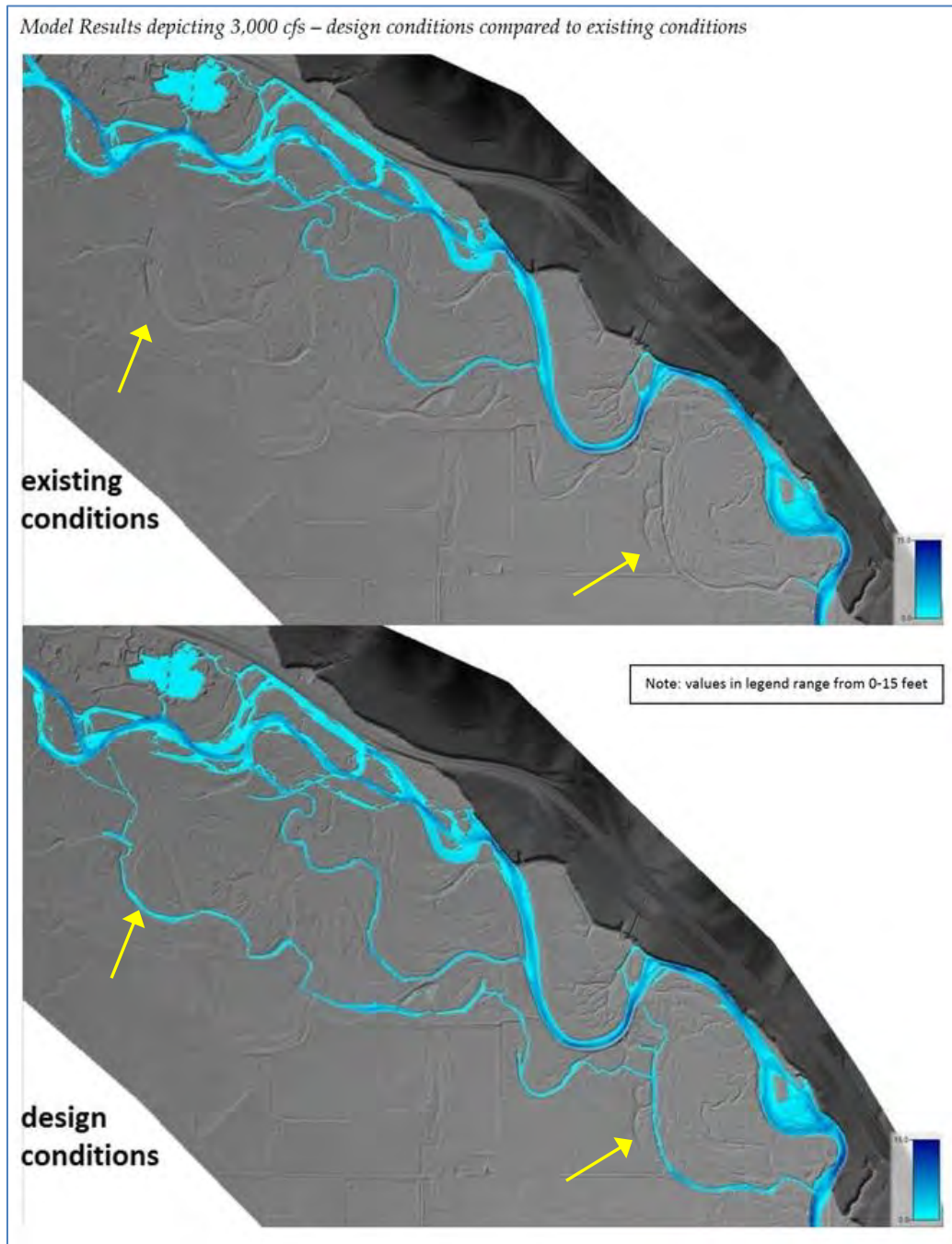


Figure 7. Calibrated hydraulic model results showing pre- and post-project conditions at 3,000 cfs. The yellow arrows show side channels that will be activated by the project, but are currently dry during 3,000 cfs flows.

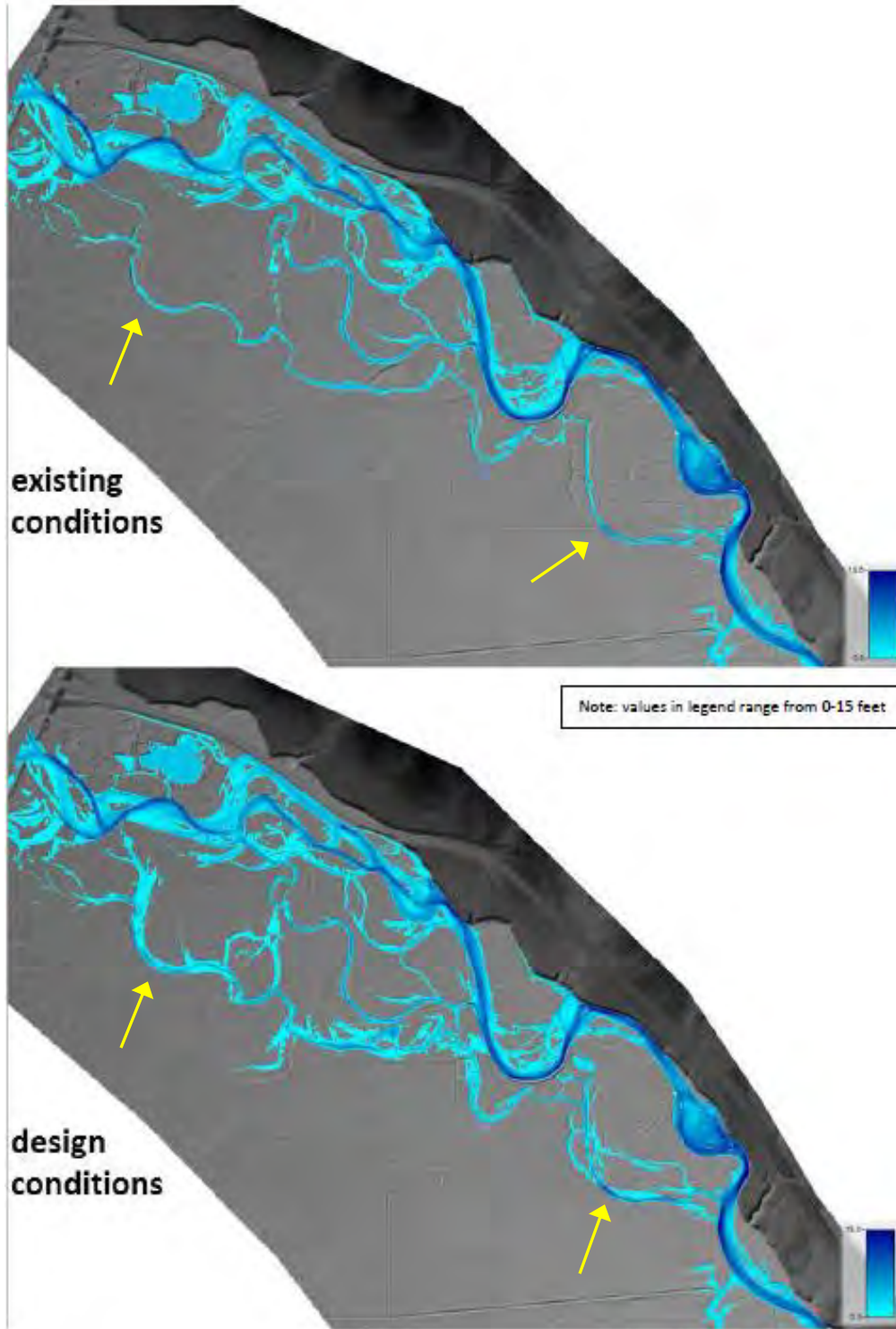


Figure 8. Calibrated hydraulic model results showing pre- and post-project conditions at 15,000 cfs. The yellow arrows show side channels that will be strongly activated by the project, but currently only take minor flow volumes during 15,000 cfs flows.

- If the project will benefit specific *species and habitats*, describe the species and/or type of habitat that will benefit and the status of the species or habitat (e.g., native species, game species, federally threatened or endangered, State listed, or designated critical habitat). Describe the extent (i.e., magnitude and geographic extent) to which the project will benefit the species or habitat, including an estimate of expected project benefits and documentation and support for the estimate.

The project will benefit spring Chinook salmon, Pacific lamprey, many types of migratory waterfowl species, black cottonwood riparian forest, and freshwater riverine wetlands. 9.5 miles of side channel habitat for salmon and lamprey will be dramatically more frequently connected and inundated. Over 130 acres of wetlands will have improved hydrology.

- If the proposed project will benefit *federally listed threatened or endangered species*, address the following:

- Is the species subject to a recovery plan or conservation plan under the ESA?

Middle Columbia River steelhead uses the project area and is ESA Threatened. This species is covered by the Yakima River Basin 2009 Steelhead Recovery Plan.

- What is the relationship of the species to water supply?

Middle Columbia steelhead has been strongly affected by river regulation. Side channel and off-channel habitat utilized by juveniles for rearing and during high water periods has been disconnected hydrologically by lower river flows. In addition lower flows have reduced the formation of instream habitat features through geomorphic action.

- What is the extent of the proposed project that would reduce the likelihood of listing or would otherwise improve the status of the species?

The project increases average wetted area by 85% during bankfull flows which increases habitat for middle Columbia steelhead. It also increases off-channel and side-channel habitat, actions that are called for as recovery strategies by the 2009 Yakima River Basin Steelhead Recovery Plan. These areas are shown in figures 7 and 8, and in the Basis of Design Report that is attached.

- Is the species adversely affected by a Reclamation project?

Yes, it is adversely affected by flow regulation and irrigation diversions of the Yakima River Project. See Kock et al 2021 for the results of an ongoing USGS study showing detrimental effects on juvenile survival by the USBR Yakima Project.

- Will the project address drought conditions or drought-related impacts on water supplies, habitat, species, or the ecosystem as a whole? If yes, describe past and current drought conditions and impacts and forecasted drought conditions and anticipated impacts. How will this project help build resilience to drought?

Yes. Even during drought years the project will function to increase side channel connectivity and improve wetland hydrology.

- If the project will result in long-term improvements to water quality (e.g., decrease sediment or nutrient pollution, improve water temperature, or mitigate impacts from floods or drought), explain the extent of those benefits (i.e., magnitude and geographic extent). Estimate the expected project benefits to water quality and provide documentation and support for this estimate, including a detailed explanation of how the estimate was determined.

The project will have long-term benefits to downstream turbidity and nutrient levels through increased trapping of fine sediments in floodplain and wetlands.

- Are there project benefits not addressed in the preceding questions? If so, what are these benefits?

The project will increase the abundance and health of wetland and riparian plant species used traditionally by the Yakama people.

E.1.1.1.4 Restoration Project Benefits

If the proposed project includes a restoration project component, address the following questions, as applicable to your project, in addition to addressing the general questions above. Proposals containing a well-supported description and quantification of benefits will receive more points.

- Invasive Species – Project does not include removal of invasive plant species.
- Invasive Species – Other Taxa: Project does not remove non-plant invasive species.

E.1.1.2 Subcriterion A.2: Multiple Benefits

Explain how and to what extent the project will benefit multiple water uses. Address the following:

- If the project will benefit multiple water uses (e.g., benefits to ecological values AND benefits to other water uses, including municipal; agricultural; Tribal; commercial, recreational, subsistence, or Tribal ceremonial fishing; and river-based recreation), explain how and to what extent the project will benefit multiple water uses.

The project benefits ecological values as described above, AND benefits multiple aspects of Tribal treaty rights and traditional life-ways. Specifically, it restores habitat for Treaty fisheries resources, increasing the ability for Tribal members to harvest fish for subsistence and ceremonial use. It also will increase the abundance of cultural plants, which should increase the ability of Tribal members to utilize them.

The project will also benefit recreational waterfowl hunting through dramatically increasing wetted acres in wetlands. This will increase winter and breeding waterfowl habitat, and provide increased hunting opportunities for the public through the Yakama Nation Public Hunting program.

- If the project will provide multiple restoration benefits (e.g., benefits to ecological values or watershed health; fish and wildlife habitat; protection against invasive species; enhancement to commercial, recreational, subsistence, or Tribal ceremonial fishing; enhancement of river-based recreation), explain how.

As described above, the project will increase ecological values, watershed health, fish and wildlife habitat, and enhancement to recreational and Tribal hunting and plant harvest opportunities.

- Will the project reduce water conflicts within the watershed? If so, explain how. **N/A**

E.1.2 Evaluation Criterion B: Collaborative Planning (20 Points)

- **Strategy or Plan:** Is your proposed project supported by a specific strategy or planning document? If so, identify the strategy or planning document by name and address the following questions:

Supported by the 2009 Yakima Basin Steelhead Recovery Plan, 2012 Wapato Reach Assessment Report and the 2019 Wapato Reach Action Plan, and the 2022 Yakima Basin Integrated Plan 10 year action plan. Please see the letter of support from the Yakima Integrated Plan (<https://www.usbr.gov/pn/programs/yrbwep/reports/FPEIS/fpeis.pdf>)

- When was the plan or strategy prepared and for what purpose?

These multiple strategies and plans were developed over 13 years from 2009 to 2022 for the purpose of increasing aquatic habitat and increasing or maintaining fish populations in the Yakima River basin.

- What types of issues are addressed in the plan? For example, does the plan address water quantity issues, water quality issues, and/or issues related to ecosystem and watershed health or the health of species and habitat within the watershed?

These plans largely address the ecosystem and watershed health, and the health of species and habitat within the watershed. Specifically they address water supply for agriculture, and fish passage and habitat improvements for Treaty and ESA listed fish species.

- Is one of the purposes of the strategy or plan to increase the reliability of a water supply for ecological values?

The 2022 Integrated Plan 10 year action plan aims to increase ecological flows for fish population health in the Yakima River basin.

• **Strategy or Plan Development:** Was the strategy or plan developed through a collaborative process?

Yes.

- Was the strategy or plan developed as part of a collaborative process by:
 - ♣ A watershed group, as defined in Section 6001(6) of the Cooperative Watershed Management Act?

Yes, these plans (except for the steelhead recovery plan), were developed and funded through the Yakima Basin Integrated Plan, a watershed coordination group.

OR

- ♣ A water user and one or more stakeholders with diverse interests (e.g., stakeholders representing different water use sectors such as agriculture, municipal, Tribal, recreational, or environmental)?

The Steelhead Recovery Plan was developed through the coordination of the Yakama Nation, the Yakima Basin Fish and Wildlife Recovery Board, Yakima County, and the Bureau of Reclamation.

- Describe who was involved in preparing the plan and whether the plan was prepared with input from stakeholders with diverse interests (e.g., water, land, or forest management interests; and agricultural, municipal, Tribal, environmental, and recreation uses)? The Yakima Basin Integrated Plan involves the cooperation of almost all water and land management stakeholders in the Yakima Basin (over 40?). The plan was developed in 2010 and 2011 as a long-term strategy to improve water supply for farmers, increase fish populations, and conserve land.

- If the strategy or plan was prepared by an entity other than the applicant, explain why it is applicable to the proposed project. Describe whether and how the applicant was involved in the development of the strategy or plan. If the applicant was not involved in the development, explain why.

The Integrated Plan is a multi-stakeholder group that the Yakama Nation actively participates in.

- Does the proposed project implement a goal or need identified in the plan?

The project occurs in a priority reach of the YBIP 10 year plan, and addressed needs for priority species (Steelhead and Salmon.)

- Describe how the proposed project is prioritized in the referenced plan or strategy.

Priority reaches were selected based in areas where the impact of restoration would be greatest. For example, all fish runs in the basin use the project reach. Anadromous fish population restoration is one of the major 4 goals of the Integrated Plan.

E.1.3 Evaluation Criterion C: Stakeholder Support for Proposed Project (15 Points)

- Describe the level of stakeholder support for the proposed project. Are letters of support from stakeholders provided? Are any stakeholders providing support for the project through cost-share contributions or through other types of contributions to the project?

A letter of support from YBIP is included. The Washington State Department of Ecology is providing \$200,000 in state funding, and the Yakima Basin Fish and Wildlife Recovery Board is providing \$960,000 towards construction of the project.

- Explain whether the project is supported by a diverse set of stakeholders, as appropriate, given the types of interested stakeholders within the project area and the scale, type, and complexity of the proposed project. For example, is the project supported by entities representing agricultural, municipal, Tribal, environmental, or recreation uses?

Through YBIP, the project is supported by all of the above listed stakeholder types.

- Is the project supported by entities responsible for the management of land, water, fish and wildlife, recreation, or forestry within the project area? Is the project consistent with the policies of those agencies?

Yes, the project takes place on land controlled by the project proponent, the Yakama Nation.

- Is there opposition to the proposed project? If so, describe the opposition and explain how it will be addressed. Opposition will not necessarily result in fewer points.

No known opposition.

E.1.4 Evaluation Criterion D: Readiness to Proceed (20 Points)

Milestone	Target Date	Comments Description
Project Start	Sept. 22 nd , 2022	
Progress Report Submitted	2/22/23	Will be extremely brief as not major work has taken place yet.
Progress Report Submitted	9/29/23	General report on state of permitting and plans for implementation – project will not have been implemented at this point.
Preliminary Design	NA	NA – See below
Final Design	7/21/23	Pre-construction design deliverables described in Application Project Proposal. Target date is for any design changes that may need to occur due to flooding

		damage to Phase 1 structure in 2022.
Cultural Resources Complete	2/15/24	Must occur prior to beginning ground disturbance. YN Cultural Resources Program will handle survey work and a full report will not be made available to RCO, only the relevant permissions from Yakama Nation Tribal Council and the Tribal Historic Preservation Officer.
Applied for Permits	8/4/23	Target date is for ALL permits – most permitting paperwork should be submitted substantially before this.
Permits Complete	2/15/24	As above, this is for ALL permitting to be completed, most permitting should be completed well in advance of target date.
Bid Awarded / Contractor Hired	5/3/24	Contractor may be hired substantially sooner than this date, since all preparation work should be completed by the start of 2024. However, no construction activities are expected prior to June 2024, so this target date gives ample time to complete a full bidding process.
Restoration Started (if restoration or planting will occur in phases, please enter start dates for each phase)	Site preparation: 6/3/24 Side channel cleaning, etc.: 7/8/24 Structure installation: 9/2/24 Restoration Plantings: 11/4/24	Activities will initially be mostly access route improvements and materials staging, true construction activities will begin somewhat later after side channel water levels have dropped further. Inlet/outlet structures immediately adjacent to the river will take place during fall low flows. Restoration plantings will take place after all construction work has been completed.
Restoration Complete (if restoration or planting will occur in phases, please enter completion dates for each phase)	Site preparation: 7/5/24 Side channel cleaning, etc.: 10/11/24 Structure installation: 11/1/24 Restoration Plantings: 2/28/25	See above.
As-built drawings	4/25/25	Will note where completed project differs from final design. Will be provided as soon as possible, ideally before the end of 2024.

Stewardship Plan	10/31/24	Stewardship plan may be adjusted as needed to account for performance of both project features and plantings over the winter of 2024-25. But, a full plan will be submitted by this date.
Final Inspection	3/5/25	Tentative date, but all project elements should be implemented by this point and side channel should be activated.
Final Report	4/25/25	Could be submitted later if more time to assess side channel activation and plantings success is required.

- Proposals with a budget and budget narrative that provide a reasonable explanation of project costs will be prioritized under this criterion.
- Describe any permits and agency approvals that will be required along with the process and timeframe for obtaining such permits or approvals.

- Clean Water Act permit-Washington State JARPA, 1 year, June 2023 to June 2024
- Yakama Nation Water Code Permit-6 months, January 2024 to June 2024
- National Historic Preservation Act Section 106, 1 year, June 2023 to June 2024
- NEPA, 1 year, June 2023 to June 2024
- ESA permitting, 1 year, June 2023 to June 2024

- Identify and describe any engineering or design work performed specifically in support of the proposed project. If additional design is required, describe the planned process and timeline for completing the design. Priority will be given to projects that are further along in the design process and ready for implementation.

Full design plans will be included in the proposal. A limited amount of engineering and design may be needed to install a second inlet structure, to be determined in the coming months. If needed, this design will be conducted under an existing design and technical support contract with the consulting engineering firm that designed the full project.

- Does the applicant have access to the land or water source where the project is located? Has the applicant obtained any easements that are required for the project? If so, provide documentation. If the applicant does not yet have permission to access the project location, describe the process and timeframe for obtaining such permission.

The Yakama Nation has access and control over the land where the project is located. It is on Tribal land. 1 year, June 2023 to June 2024

- Identify whether the applicant has contacted the local Reclamation office to discuss the potential environmental and cultural resource compliance requirements for the project and the associated costs. Has a line item been included in the budget for costs associated with compliance? If a contractor will need to complete some of the compliance activities, separate line items should be included in the budget for Reclamation's costs and the contractor's costs.

Reclamation personnel Richard Visser, Dan Church, and Candace McKinley have been contacted by email. There will be a line item in the budget for the contractor to handle Clean Water Act and NEPA permitting.

- Is the project completely or partially located on Federal land or at a Federal facility? If so, explain whether the agency supports the project and has granted access to the Federal land or facility, whether the agency will contribute toward the project, and why the Federal agency is not completing the project. Not located on Federal land.

E.1.5 Evaluation Criterion E: Performance Measures (5 Points)

- Describe the performance measures that will be used to quantitatively or qualitatively define actual project benefits upon completion of the project. Include support for why the specific performance measures were chosen.

Performance measures:

Performance measures for this project are intended to be meaningful and relative easy to monitor. The primary measure is increased volume and frequency of flows in the floodplain side channel network. This will be measured by establishing 2 to 3 flow measurement sites and monitoring flow in the winter and spring 2 to 3 times a year (or continuously if that proves feasible) to document increased hydrologic performance. Another measure is the extent of inundation area, which will be tracked using repeat drone videography. A third performance measure is fish use of the project area; this will be monitored through annual sampling, 1 to 2 times per year, of fish presence/absence. Finally, recovery from project disturbance and growth of revegetation areas will be tracked through drone and ground level repeat photography.

1. Increased flow and frequency of inundation in side channel and wetlands.
2. Increased flood storage during high flow.
3. Increased wetland hydroperiod.
4. Increased use of side-channels by native fish species.

- All applicants are required to include information about plans to monitor improved streamflows, aquatic habit, or other expected project benefits. Describe the plan to monitor the benefits over a 5-year period once the project has been completed. Provide details on the steps to be taken to carry out the plan.

1. Hydraulic modeling using the as-built survey-increased flow and frequency of inundation.
2. Pre- and post-project flow measurements at 2 to 3 selected locations. Flow measurements will either be conducted by wading with a flow meter or by installing continuously recording loggers.
3. Pre- and post-project drone imagery during high flow.

4. Post-project fish sampling once or twice per year, funded from other sources.

E.1.6 Evaluation Criterion F: Presidential and DOI Priorities (15 points)

E.1.6.1 Subcriterion No. E1: Climate Change

- How will the project build long-term resilience to drought? How many years will the project continue to provide benefits? Estimate the extent to which the project will build resilience to drought and provide support for your estimate.

Project will increase surface water and groundwater levels over 950 acres. This will increase off-channel and side-channel habitat even during drought years, and increase growth, vigor, and reproduction of the riparian forest. It will also buffer wetlands from drying out by dramatically expanding the hydroperiod.

- In addition to drought resiliency measures, does the proposed project include other natural hazard risk reductions for hazards such as wildfires or floods?

Project reduces flood risk by slowing and spreading waters. Project reduces fire risk by increasing floodplain moisture levels.

- Will the proposed project establish and use a renewable energy source?

No

- Will the proposed project reduce greenhouse gas emissions by sequestering carbon in soils, grasses, trees, and other vegetation?

Increased growth of riparian forests from increased water supply may increase carbon uptake by the forest.

- Does the proposed project include green or sustainable infrastructure to improve community climate resilience, such as reducing the urban heat island effect, lowering building energy demands, or reducing the energy needed to manage water? Does this infrastructure complement other green solutions being implemented throughout the region or watershed? No

- Does the proposed project seek to reduce or mitigate climate pollutions such as air or water pollution?

Increased floodplain inundation should increase water quality by increasing sediment trapping and deposition, along with associated contaminants.

- Does the proposed project have a conservation or management component that will promote healthy lands and soils or serve to protect water supplies and its associated uses?
- Does the proposed project contribute to climate change resiliency in other ways not described above?

E.1.6.2 Subcriterion No. E2: Disadvantaged or Underserved Communities

- Will the proposed project serve or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to, public health and safety by addressing water quality, new water supplies, or economic growth opportunities.

Increases water quality in the Yakima River. Increased jobs created by the construction phase.

- Describe, in detail, how the community is disadvantaged based on a combination of variables that may include the following:
 - Low income, high and/or persistent poverty Yes
 - High unemployment and underemployment Yes
 - Racial and ethnic residential segregation, particularly where the segregation stems from discrimination by government entities Yes, creation of Tribal Reservation.
 - Linguistic isolation Yes, large numbers of Spanish speaking migrants, majority-minority county.
 - High housing cost burden and substandard housing. Unknown.
 - Distressed neighborhoods. Yes, Yakima town has many poor and underserved neighborhoods.
 - High transportation cost burden and/or low transportation access. Unknown.
 - Disproportionate environmental stressor burden and high cumulative impacts. Yes, agricultural impacts of dust and contaminants create high asthma rates.
 - Limited water and sanitation access and affordability. Yes, near the project area many rural residents have wells contaminated with excess nitrates.
 - Disproportionate impacts from climate change. Unknown.
 - High energy cost burden and low energy access. Unknown.
 - Jobs lost through energy transition. Unknown.
 - Access to healthcare. Yes, health care corporations in Yakima County are consolidating and shuttering services. One of two hospitals has closed and recently a maternity center was closed in Toppenish, near the project area.

Yakima County is a underserved community according to Washington state guidelines.

- If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

The demography of the Yakama Reservation is available through US Census Bureau (<https://www.census.gov/tribal/?st=53&aianhh=4690>) and Federal Reserve Bank (<https://www.minneapolisfed.org/indiancountry/resources/reservation-profiles/yakama-nation-reservation>) information. The reservation area is area covered by the demographic information below.

The Yakama Nation has approximately 11,000 enrolled members, approximately 6,000 of whom live in or near the Yakama Reservation. The Reservation contains 30,647 people in all, making Yakama citizens a minority in their own homeland. The population of the Reservation in general, and Yakama citizens in specific, tend to be less wealthy and less well educated than the Washington State average. Indeed, Yakima County, which partially contains the Reservation, is an underserved and low income County in Washington State.

Inside the Reservation, including in incorporated towns, the total population in the 2020 census was 30,647. Of those, 20% were American Indian, 60% Latino, and 20% white or of another ethnicity. Median per capita income and household income are less than those of the United States, and educational attainment is also less than the US average. Conversely, the youth and adult poverty rates, at 48% and 37% respectively, are substantially higher than the U.S. averages.

E.1.6.3 Subcriterion No. E.3: Tribal Benefits

Points will be awarded based on the extent to which the project will honor the Federal Government's commitments to Tribal Nations.

- Does the proposed project directly serve and/or benefit a Tribe? Will the project improve water management for an Indian Tribe? Yes, seeks to restore Tribal fisheries, wetlands, and riparian resources, which are natural and cultural resources to the Yakama Nation. Improves water management by increasing flood storage and reducing flood risk.
- Does the proposed project support Reclamation's Tribal trust responsibilities or a Reclamation activity with a Tribe? Yes, helps to redress natural and cultural resources damages caused by the USBR Yakima Project.
- Does the proposed project support Tribal resilience to climate change and drought impacts or provide other Tribal benefits, such as improved public health and safety, by addressing water quality, new water supplies, or economic growth opportunities?

Yes, improves drought resilience and addresses water quality.

8. PROJECT BUDGET

Please see the attached budget spreadsheet.

9. FUNDING PLAN AND LETTERS OF COMMITMENT

\$200,000 is being provided as match by the Washington State Department of Ecology, through the Yakima Basin Integrated Plan. It will be available to us by Jan 1, 2024. A letter of commitment are being sought at the time of submittal, and will be submitted within 30 days (April 28th).

10. BUDGET PROPOSAL

Funding sources	Amount
Non-Federal entities	
1.Washington State Department of Ecology	\$200,000
Non-Federal subtotal	\$200,000
REQUESTED Reclamation funding	\$600,000

Source	Amount
Costs to be reimbursed with the requested Federal funding	\$600,000
Costs to be paid by the applicant-grant. Please note that the Washington State Recreation and Conservation office has awarded \$960,000 to the project. The source for this funding is IJJA funds from NOAA, therefore we have not listed it as match. It is not included in the budget spreadsheet, however it will pay for other project elements not described in this application.	\$1,160,000
Value of third-party contributions	\$
TOTAL project cost (including non-match NOAA funding through the Washington RCO). Total costs described in the proposal are \$800,000.	\$1,760,000

11. BUDGET NARRATIVE

Please see attached budget in the Budget Detail and Narrative spreadsheet.

12. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

H.1 Environmental and Cultural Resource Considerations

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

Earth disturbing work includes excavating selected portions of side channels that have become plugged due to regulated flows not providing sufficient sediment mobilizing flow in side channels. This work will produce dust and equipment will release diesel exhaust and noise. This

work will temporarily disturb nearby wildlife. All work will be conducted during dry conditions or in water bodies isolated from fish use by screens or cofferdams. Best management practices will be used to minimize water quality degradation. A

- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

- Middle Columbia Steelhead, ESA Threatened
- Bull Trout, ESA endangered

These species will not be affected by project activities because work areas will be isolated from fish use during the project.

- Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States”? If so, describe and estimate any impacts the proposed project may have.

Yes, there are approximately 135 acres of jurisdictional wetlands (WOTUS). Project will have temporary disturbances of blocking selected areas, and small amounts of sediment may be released into the waters. The primary permanent project affect will be to enhance the hydrology of wetlands and side channels by increasing the water supply and the frequency and extent of hydrologic connectivity.

- When was the water delivery system constructed? N/A, water system work is not a part of this project.

- Will the proposed project result in any modification of, or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously. N/A, irrigation system work is not a part of this project.

- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question. No, not to our knowledge.

- Are there any known archeological sites in the proposed project area? To be determined during the cultural survey.

- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations? No, restoring side channels and wetlands is unlikely to have a disproportionately high adverse effect on minority populations.

- Will the proposed project limit access to, and ceremonial use of, Indian sacred sites or result in other impacts on Tribal lands?

No, project will not impede access or use of sacred sites. Otherwise it will have positive impacts on Tribal natural and cultural resources such as fish, wildlife, and traditionally used plants.

- Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

No, best management practices will be used to ensure that equipment used for the project does not bring in invasive species propagules.

13. REQUIRED PERMITS OR APPROVALS

14. OVERLAP OR DUPLICATION OF EFFORT STATEMENT

To our knowledge, this project does not overlap or duplicate other efforts in the Yakima River basin.

15. CONFLICT OF INTEREST DISCLOSURE AND NOTIFICATION

No conflict of interest is declared.

16. RESTRICTIONS ON LOBBYING

Lobbying form will be submitted.

17. UNIFORM AUDIT REPORTING STATEMENT

Audit will be submitted.

18. LETTERS OF SUPPORT AND LETTERS OF PARTNERSHIP

A letter of support from the Yakima Basin Integrated Plan partners will be submitted with the application.

19. REFERENCES

Opperman, J. J., R. Luster, B. A. McKenney, M. Roberts, and A. W. Meadows. 2010. Ecologically Functional Floodplains: Connectivity, Flow Regime, and Scale¹. JAWRA Journal of the American Water Resources Association 46:211-226.

Kock, T.J., Perry, R.W., Porter, M, and Monk, P., 2021, Outmigration Survival of Juvenile Salmonids in the Lower Yakima River, 2018–2020 (online resource):

https://dashboard.yakamafish-star.net/sites/default/files/2020-05/Master_Lower_River_Survival_Presentation.pdf?current=/DataQuery/Reports

20. OFFICIAL RESOLUTION

Attached.

21. OMB FORM 4040-0019: PROJECT ABSTRACT SUMMARY

Included in federal forms.

22. LETTER OF SUPPORT

Letter of support from Integrated Plan

23. COST ESCALATION REPORT

Cost escalation report by CBRE, and industry group. They document thoroughly that construction costs have escalated by 40% from 2018 to 2022. Available at:

(<https://www.cbre.com/insights/books/2022-us-construction-cost-trends/06-implications-for-construction-costs>),

24. APPENDIX A.

Basis of Design Report

25. APPENDIX B

Design Plans

26. APPENDIX C

Construction cost estimate. This estimate was prepared in 2018 and totaled \$1,030,000. According to the CBRE construction cost report, included as appendix D cost escalation from 2018 to 2022 was approximately 40%. Thus the best estimate for total project costs is now \$1,400,000 to \$1,500,000. In addition, some of the costs in the attached budget were estimated for in-house labor, but currently we plan to have all actions conducted by a contractor, increasing costs further. Items in the project covered by the USBR share of \$600,000 and the non-federal cost match of \$200,000 are highlighted in yellow in the attached budget. Other items will be funded by other funding provided through the Washington State Recreation and Conservation Office.

27. APPENDIX D

Large format project map.



This River Runs Forever Yakima Basin Integrated Plan

Urban Eberhart
Kittitas Reclamation District

March 23, 2023

Commissioner Cory Wright
Kittitas County

To: U.S. Bureau of Reclamation WaterSMART Environmental Water Resources Projects Program FY23 (R23AS00089) Reviewers

Commissioner Amanda McKinney
Yakima County

Re: Support for the River Mile 89.5 Side Channel Proposal on the Wapato Reach of the Lower Yakima River

Brandon Parsons
American Rivers

Lisa Pelly
Trout Unlimited

Dear Review Committee,

Scott Revell
Roza Irrigation District

As members of the Implementation Committee of the Yakima Basin Integrated Plan (Integrated Plan), we are writing to express support for the Yakama Nation's application under the U.S. Bureau of Reclamation WaterSMART Environmental Water Resources Projects Program for the *River Mile 89.5 Side Channel Proposal on the Wapato Reach of the Lower Yakima River*.

Mike Livingston
Washington Department of Fish and Wildlife

Tom Tebb
Washington State Department of Ecology

This project is a critical component of the Habitat Protection and Enhancement element identified in the Integrated Plan. The Integrated Plan is a unique integrated water resource management effort supported by a coalition of 23 members, including conservation groups, agricultural interests, irrigators, and local, state, and federal agencies. The U.S. Bureau of Reclamation, Washington State Department of Ecology, and the Yakama Nation are leading plan implementation through partnership with these and other organizations.

The Integrated Plan's Salmon and Steelhead 10-Year Restoration Strategy seeks to increase Yakima River Basin fish population recovery levels through the collaboration of Integrated Plan partners implementing fish and habitat restoration work. The Strategy focuses on three themes: (1) safe fish passage, (2) flow restoration, and (3) habitat restoration, and identifies key actions over the next 10 years to rebuild salmon and steelhead populations while improving their resilience to withstand climate change. The Strategy identifies safe passage projects in the Lower Yakima River, including floodplain connectivity restoration and off-channel habitat, as critical to the entire Integrated Plan salmon and steelhead restoration effort. The River Mile 89.5 Side Channel proposal, on the Wapato Reach of the Lower Yakima River, is part of a suite of Integrated Plan projects designed to improve the safety and reliability of fish passage and habitat that have been completed, are in process, or are in planning for the next 10 years. Wapato Reach is a priority geography within the Strategy as it supports migratory habitat for every fish run in the Yakima River Basin and provides prime winter rearing habitat for Chinook salmon.

"Restoring the natural health and economy in the Yakima Basin."

The Yakama Nation's proposal seeks funding to construct the 6-mile-long side channel reconnection project that will improve over 500 acres of riparian and wetland habitat for fish and wildlife. The project aims to reconnect off-channel and floodplain habitat for fall, spring, and winter use by anadromous fish species and to restore hydrologic function to the expansive wetlands that connect to the side channel and provide high quality migratory waterfowl habitat. The project's objectives include reconnecting the side channel at a flow threshold of 1,500 CFS, which would increase flow connection to the side channel by approximately 200 days per year on average; increasing flow volume, which would create and maintain off-channel habitats such as pools, bank, and low-velocity flood refuges; raising the groundwater level for 500 acres of riparian forest, which would support higher forest growth and vigor; and enhancing the hydrology for 100 acres of wetland, which would increase winter breeding habitat for migratory waterfowl and improve conditions for culturally important wetland plant species.

Thank you for considering this proposal for funding under the WaterSMART Environmental Water Resources Projects Program.

Sincerely,

Sincerely,



Urban Eberhart
Kittitas Reclamation District



Cory Wright
Kittitas County



Amanda McKinney
Yakima County



Brandon Parsons
American Rivers



Lisa Pelly
Trout Unlimited



Tom Tebb
WA State Dept. of Ecology



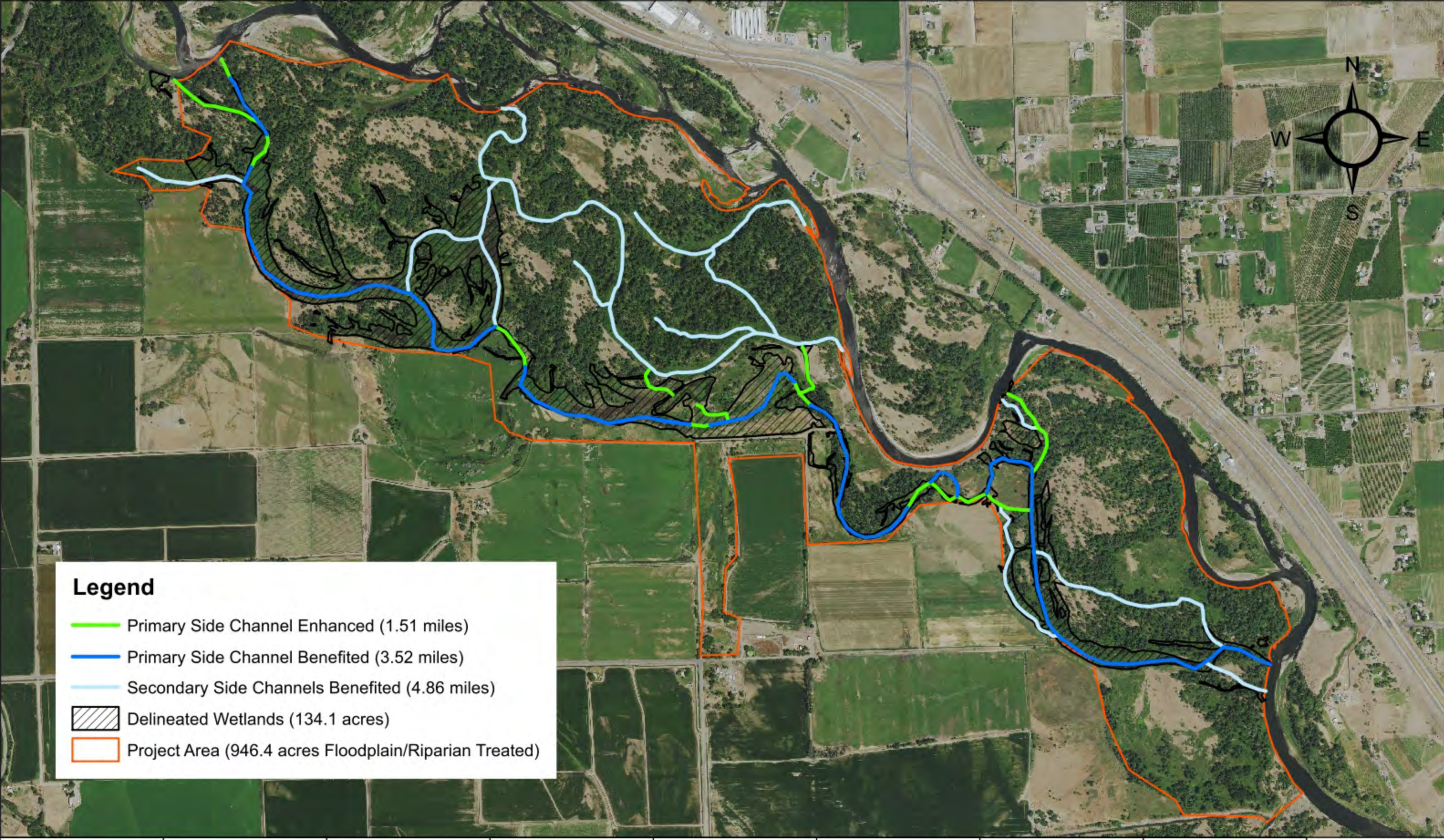
Scott Revell
Roza Irrigation District



Mike Livingston
WDFW

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River Mile 89.5 Phase 2 - Project Map



Legend

- Primary Side Channel Enhanced (1.51 miles)
- Primary Side Channel Benefited (3.52 miles)
- Secondary Side Channels Benefited (4.86 miles)
- Delineated Wetlands (134.1 acres)
- Project Area (946.4 acres Floodplain/Riparian Treated)

0 0.75 1.5 3 Miles