



## Contact Information

# 2025 Upper Columbia Regional Project Pre-Application

\* Pre-applications (SRFB & Monitoring) due March 12, 2025 (COB)

\*Complete SRFB applications due in PRISM April 18, 2025 (COB)

\*Complete Monitoring applications due in PRISM May 1, 2025 (COB)

\*Revised SRFB proposals due in PRISM May 27, 2025 (COB)

\*Final revised SRFB & Monitoring applications due in PRISM June 23, 2025 (noon)

<b>Project Title</b>	Mainstem Columbia assessment
<b>Sponsor</b>	Cascade Fisheries
<b>Primary Contact</b>	Kristen Kirkby
<b>E-Mail Address</b>	kristen@ccfeg.org

## Project Summary

**Please provide a description or summary of the proposed project, including project goals. The goal of the project should be to solve identified problems by addressing the root causes. Then clearly state the desired future condition.**

The goal of this assessment is to take steps toward a better understanding of subyearling spring chinook habitat availability in reservoirs of the mainstem Columbia. Despite compelling data documenting the use of reservoirs for subyearling spring chinook rearing there is a substantial gap in our understanding of what habitat exists in these reservoir pools and whether habitat actions could be taken to improve the quantity, quality, and/or connectivity of that habitat. All our anadromous salmonids must pass through these reaches during outmigration and upon return for spawning, but data from WDFW shows a substantial proportion of our spring chinook juveniles are rearing in the mainstem Columbia as subyearlings, with documentation that this life history strategy can be successful. While continued habitat restoration work is necessary in our subbasins to restore function and improve conditions in support of increased survival, the mainstem Columbia is a major habitat (both spatially and temporally in our fishes' life cycles) and should be assessed for a better understanding of current conditions and the possibility of restoration or enhancement actions to improve survival of our listed fish. With this project, we propose to assess existing spring chinook rearing habitat quantity, quality, location, and connectivity within the Rock Island and Wells reservoirs; where possible assess pre-dam habitat through historical references to improve our understanding of past conditions; and identify potential restoration/enhancement actions to improve quantity and quality of juvenile rearing habitat while limiting predator use.

**What are the project objectives? Objectives support and refine biological goals, breaking them down into small steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound).**

**Note: This exact question is included in the PRISM application. Example format: The project seeks to address [specify limiting factor(s)] for [limiting life stage(s)] by [specific actions proposed] to create an estimated [include specific target metrics, as described below] upon implementation in [estimated year].**

Use existing bathymetric data from Chelan (Rock Island) and Douglas (Wells) PUDs to map current habitat availability at 12 representative flow/pool scenarios. A 2D hydraulic model will be developed and used to run a Habitat Suitability Index for both juvenile chinook and predator species of interest to develop a habitat duration assessment to help identify limiting factors. This work will occur in partnership with the US Bureau of Reclamation and Rio Applied Science and Engineering (Rio ASE) in 2026. Findings will help inform the development of potential restoration actions.

Cascade Fisheries will also review historical data, aerial imagery, and ground photography for a discussion on pre-dam habitat types and availability. This will take place in 2026 and be included in a final report.

Based on the findings from modeling and HSI, as well as findings from other related work and studies, CF will work with Rio ASE in late 2026 and 2027 to develop habitat enhancement concepts. These will be general concepts with some spatially explicit example actions.

## Budget Request

Values MAY be duplicative and do not have to equal TOTAL anticipated budget in pre-application.

**Anticipated Request - SRFB (standard round)** 64200

**Tributary Committee - Anticipated or Actual** 64200

**Anticipated TOTAL Budget** 128400

## Project Location

**Briefly describe the location of the project** This project will occur in the Rock Island (RM 453-473) and Wells (RM 515-545) reservoirs of the mainstem Columbia River.

**Latitude (decimal degrees)** 48.049760

**Longitude (decimal degrees)** -119.897245

**Project subbasin**

Multiple Subbasins

**Please explain why there are multiple subbasins**

This project takes place in the mainstem of the Columbia River and includes the mouths of the Wenatchee and Methow.

**Does the proposed project span multiple assessment units?**

Yes

**List the additional assessment units directly impacted by this proposal.**

Methow River - Alta Coulee, Wenatchee River - Nahahum Canyon, mainstem Columbia

## Reach(es) Name

Wenatchee River Nahahum 01; lowest, inundated reach of the Methow, Columbia River mainstem reaches RM 453-473 and 515-545

Identify the reach(es) priority/ reach ranking. Note: If the project involves work in multiple reaches, select "Multiple" and include details in the text box that will appear below. Please reference the Prioritization Web Map: <https://prioritization.ucsrb.org/>.

Multiple reaches (provide details below)

## Please detail the reach-ranking of the reaches below

Wenatchee River - Nahahum Canyon 01 is the only described and ranked reach in this project. The lowest reach of the Methow River is not identified or ranked. The Columbia River reaches are not identified or ranked, despite playing a major role in the life history of anadromous salmonids.

## Project Information

1. What species will the project benefit?

Spring Chinook

Summer Chinook

2. Select the project's objectives and the associated tracking metrics

Design, Monitoring or Assessment

4. Does this project already exist in Salmon Recovery Portal or PRISM?

No

5. Has this project been submitted previously for funding through the SRFB and/or other process(es)?

No

6. What category is the project?

Assessment

If applicable, what is the secondary project category?

Design

Is the project eligible for Riparian Funding?

No

## Design and Restoration Proposals

7. What project phase(s) are proposed for completion?

Conceptual Design

8. Is your project within a completed (or soon-to-be completed) Reach Assessment or other type of assessment (e.g., Rapid Site Assessment, other)?

No

9. Which limiting factors does the project propose to address?

Cover - Wood

Predators - Juveniles

**10. Which life stages will the proposed project address?**

Fry

Smolt Outmigration

Summer Rearing

Winter Rearing

**11. Freshwater Benefits - Describe how your project will improve survival, capacity and/or distribution for target species at the reach scale?**

This assessment will provide information on habitat quantity, quality, and connectivity in the mainstem Columbia, critical information to improve our understanding of rearing habitat capacity and so potential fish use. The identification of appropriate habitat restoration or enhancement actions will also allow for the development of projects to increase habitat for juvenile rearing in future, a next step of this project. We know subyearling and yearling spring chinook and subyearling summer chinook are using mainstem habitat for rearing, and we know that this can be a successful life history strategy; however, our understanding of the availability of habitat is very limited, and this limits our ability to work toward restoring some of the function of these significant river reaches that must support all Upper Columbia fish at several life stages and which would have historically provided substantial, and likely high-quality, habitat for rearing and outmigrating juveniles.

**12. Temporal Effect - Briefly describe how and to what extent the project would promote natural stream/watershed process consistent with the geomorphology of the stream?**

This project would identify and describe existing habitat availability and condition, investigate historical habitat availability, and recommend actions to enhance mainstem habitat to benefit juvenile salmonids. These are heavily modified reaches of river whose ecosystem roles have been limited by historical and current land use practices. Restoring process in these reaches may not be possible, but habitat enhancement and an increase in juvenile rearing habitat could benefit populations.

**13. Temporal Effect - How long will it take for the project to achieve its intended response?**

1-10 years

**14. Temporal Effect - How long will the restoration action and its benefits persist?**

Less than 10 years

10-50 years

**15. Temporal Effect - What level and/or interval of maintenance is anticipated? What is the plan for any anticipated maintenance?**

Not applicable in this assessment and design project.

**16. Methods - Briefly describe the potential (for design) or proposed restoration methods and how they will achieve project objectives.**

Use existing bathymetric data to create a 2D hydraulic model for the Wells pool and Rock Island pool. This will be run at 12 representative flow scenarios. The model will be used to map current habitat availability using Habitat Suitability Index (HSI), considering metrics that have been identified in related scientific literature (e.g. depth, slope, bank protection, etc) (Chipps et al. 1997; Garland et al. 2002; Tiffan et al. 2006, 2016; Beecher and Caldwell 2022). HSI may also be run for predator species, such as smallmouth bass (White et al. 2024). This work will identify the quantity, quality, and connectivity of existing juvenile chinook rearing habitat, and consider overlaps with predator species to provide a basic habitat duration assessment.

Review historical data, aerial imagery, and ground photography for a discussion on pre-dam habitat types and availability (Stanford et al. 2006). This work will improve our understanding of habitat loss and inform the development of restoration or enhancement concepts to restore some of the functions of lost habitats and support juvenile rearing.

Develop general and spatially-explicit habitat enhancement concepts. This work would consider existing conditions, historical information, and information from the literature to develop several potential generalized restoration or enhancement actions to recommend for implementation, as well as identify

potential locations for these action types.

Beecher, H., and Caldwell, B. 2022. Instream Flow Study Guidelines: Technical and Habitat Suitability Issues including fish preference curves. Washington Department of Fish and Wildlife.

Chipps, S.R., Bennett, D.H., and Dresser, T.J. 1997. Patterns of Fish Abundance Associated with a Dredge Disposal Island: Implications for Fish Habitat Enhancement in a Large Reservoir. *North American Journal of Fisheries Management* 17(2): 378–386. doi:10.1577/1548-8675(1997)0172.3.CO;2.

Garland, R.D., Tiffan, K.F., Rondorf, D.W., and Clark, L.O. 2002. Comparison of Subyearling Fall Chinook Salmon's Use of Riprap Revetments and Unaltered Habitats in Lake Wallula of the Columbia River. *North American Journal of Fisheries Management* 22(4): 1283–1289. doi:10.1577/1548-8675(2002)0222.0.CO;2.

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Tiffan, K.F., Hatten, J.R., and Trachtenberg, D.A. 2016. Assessing Juvenile Salmon Rearing Habitat and Associated Predation Risk in a Lower Snake River Reservoir. *River Research & Apps* 32(5): 1030–1038. doi:10.1002/rra.2934.

White, J.S., Kock, T.J., Penaluna, B.E., Gregory, S., Williams, J., and Wildman, R. 2024. Expansion of smallmouth bass distribution and habitat overlap with juvenile Chinook salmon in the Willamette River, Oregon. *River Research & Apps* 40(2): 251–263. doi:10.1002/rra.4228.

## Assessment Proposals

### 7. What type of assessment are you proposing?

This will be a habitat assessment. Cascade Fisheries will continue working with WDFW to identify next steps to directly study fish use in future, work that will be informed by this habitat assessment.

### 8. Is the assessment identified on the MaDMC monitoring and data gaps list?

Yes

### 9. Describe how the assessment fills a regional priority and where that priority is identified.

This assessment provides a critical foundation from which to address a data gap identified by the UCSRB Monitoring and Data Management Committee: Juvenile fish use and survival in the reservoirs and timing and extent of use (Tier 1). The mainstem Columbia has been left out of all regional planning documents and prioritization, despite the critical role it plays in multiple life stages for all of our ESA-listed fish species. With decades of work put into our tributaries and continued uncertainty about the persistence of our listed species, CF believes that the region should look also to these mainstem habitats which, historically, were important feeding and rearing grounds for subyearling and yearling juvenile salmonids and which still play a very influential role in the survival of our fish.

### 10. Methods - What methods will you use in your assessment and how will they achieve your stated objective(s)?

Use existing bathymetric data to map current habitat availability using Habitat Suitability Index (HSI) and metrics that have been identified in related scientific literature (e.g. depth, slope, bank protection, etc) (Chipps et al. 1997; Garland et al. 2002; Tiffan et al. 2006, 2016; Beecher and Caldwell 2022). HSI may also be run for predator species, such as smallmouth bass (White et al. 2024). This work will identify the quantity, quality, and connectivity of existing juvenile chinook rearing habitat, and consider overlaps with predator species. Modeling would take place in 2026.

Review historical data, aerial imagery, and ground photography for a discussion on pre-dam habitat types and availability (Stanford et al. 2006). This work will improve our understanding of habitat loss and inform the development of restoration or enhancement concepts to restore some of the functions of lost habitats and support juvenile rearing. This work would take place in 2026.

Develop general and spatially-explicit habitat enhancement concepts. This work would consider existing conditions, historical information, and information from the literature to develop several potential

generalized restoration or enhancement actions to recommend for implementation, as well as identify potential locations for these action types. Concept development would take place in late 2026 and early 2027.

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**11. Will a design result from the project?**

**12. If yes, what level of design (e.g. conceptual, preliminary, final)? What proportion of your budget will support design?** Conceptual

**13. Briefly describe why SRFB funds are necessary, rather than other sources of funding.**

SRFB funding is appropriate for this project as it meets an identified regional data gap and allows for two years of funding in support of both an assessment and a design. Cascade Fisheries is requesting 50% of the funding from a second source, either the Tributary Committees or the Priest Rapids Coordinating Committee.

## Protection Proposals

## Monitoring Proposals

## Project Risk and Economic Benefits

**1. What is the landownership?** Mixed, but the river is State Owned Aquatic Lands.

**2. Have you secured landowner participation in or acceptance for this project?**

**Please explain**

Not required for this assessment

**3. Describe any land owner requirements (e.g., design elements, right-of-ways, access agreements, liability waivers, etc.) and if/how they could affect the project**

None

**4. Will the project raise potential concerns for interest groups (e.g., recreational users) or the community at large (including upstream/ downstream/ adjacent landowners)?**

No

**5. Who will have the responsibility to manage and maintain the project? What is the responsibility of current or future landowners?**

NA until a conceptual design developed in this project is taken to implementation.

**6. Are other projects being proposed immediately upstream or downstream of worksite?**

No

**7. Please describe the risk of failure associated with this project.**

Failure is unlikely for this project. Bathymetric data already exist for two reservoirs and our partners, USBR and Rio ASE, have extensive experience in modeling and concept development. CF has effectively and efficiently managed many and various assessments in our region.

**8. Is there any public outreach planned during and/or after implementation? Does the project build community support for salmon recovery efforts?**

The project requires collaboration with various agency and organizational partners for data sharing and future project development. Public outreach won't be a major component of the project, but findings from the project will be written into a report that will be publicly available on CF's website and will also be synthesized and simplified to share with our social media and website audiences. CF will share findings at WATs, as well.

**9. Does the project represent an opportunity for economic benefit? How much benefit does the project create for the dollars invested?**

If a conceptual design developed in this project is moved forward to implementation, it will bring substantial economic benefit to local contractors and suppliers. The assessment work will be carried out mainly by CF staff and contractors.

**10. Describe any partnerships, their experience, and types of contributions supporting the project.**

WDFW has been a major partner in the development of this project, sharing data on subyearling work and committing to providing technical support for this assessment as well as partnership in the development of future assessments that may look more directly at fish use. Cascade Fisheries will be working with Rio ASE, who have extensive experience working on 2D hydraulic modelign and the development of thoughtful, process-based restoration designs across the Upper Columbia. The USBR is interested in and supportive of this assessment, and, depending on an uncertain future, would provide technical support.

**Optional Section - Preparation for PRISM (SRFB applications only)**

The following questions are identical to the questions RCO requires in the PRISM application for SRFB projects. If desired, sponsors can complete associated questions early and copy responses into PRISM during the "Complete Application" phase due on April 18, 2025.

\*please note, this section is not applicable for Monitoring proposals

**Do you want to review and/or pre-populate PRISM questions?**

Yes

**1. Problem Statement: What are the problems your project seeks to address? Include the source and scale of each problem. Describe the site, reach, and watershed conditions. Describe how those conditions impact salmon populations. Include current and historical factors important to understand the problems.**

The mainstem Columbia River is thought to have provided important and productive juvenile rearing habitat for both rearing and outmigrating juvenile salmonids before dams and their associated reservoirs changed the landscape (Stanford et al. 2006). High-quality rearing habitat would have been found in the shallow, low-velocity shoreline areas of the river, as well as connected floodplain and off-channel habitats. Productivity was likely high in these areas seasonally, with productive aquatic and terrestrial insect sources. These shorelines have been greatly modified by land use practices and reservoir inundation, with the development of a varial zone along the river's edge where the short-term, out-of-season base-flow fluctuations in water elevations no longer allow for some of the life cycles of insects that would have once provided a significant source of food for juveniles (Stanford et al. 2006). These modified habitats have also invited more and different predators. Flow regulation and dams have also led to bedload storage and an armoring of the channel bottom, as well as siltation and vegetation of backwater habitats. Temperature regimes have changed, as well. Despite these changes to hydrograph, temperature, foodweb, and physical habitat, salmonids must continue to spend a significant amount of time in the mainstem Columbia, particularly as rearing juveniles, and little is known about their habitat use or the potential to enhance these degraded conditions.

The Upper Columbia River (UCR) spring chinook ESU is listed under the Endangered Species Act (ESA) as endangered and the natural-origin abundance of this ESU continues to decline for all populations. Life cycle modeling undertaken through WDFW Monitoring and Evaluation data collection for adaptive management of the hatchery program points to losses outside of the subbasin tributaries. WDFW research has shown significant subyearling spring chinook movement into the mainstem Columbia River through data collected at the Wenatchee PIT barge and Entiat, Methow, and Wenatchee screw traps (T. Desgroseillier, personal communication). Data specific to the Entiat show that both spring and summer chinook subyearlings are overwintering in the mainstem Columbia. Although some proportion of summer subyearlings outmigrate to the estuary during summer and fall, this hasn't been observed with spring chinook subyearlings, which seem to be overwintering in the mainstem Columbia, mainly above McNary dam. Returned adult otolith microchemistry has documented that this life history strategy can be successful, and mainstem overwintered subyearlings appear to have significant adult returns in some years compared to tributary-reared fish. More winter freshets with climate change may increase the number of subyearlings moving into the mainstem in future.

Despite some of these compelling findings, data collection on juvenile spring chinook rearing in the mainstem is limited in space and time, and passage survival is only documented for yearling chinook. Rocky Reach juvenile detection shuts down from September through mid-March with the closure of the juvenile bypass system and Wells does not have regular juvenile data collection. Although the Entiat and Wenatchee Rivers have a smolt trap close to their mouths, and the Wenatchee now also has a PIT barge to facilitate juvenile detection, the Methow River is lacking monitoring in the lower river. WDFW continues to collect data on subyearlings and the PIT barge should facilitate this effort in the Wenatchee basin. Chelan PUD is also undertaking a study of subyearling use in the mainstem Columbia as part of the Rock Island relicensing effort. However, currently we have a very limited understanding of existing habitat availability and conditions in the mainstem. Habitat Suitability Indices are available for juvenile chinook and predators and related research outside of the Upper Columbia (Chipps et al. 1997; Garland et al. 2002; Tiffan et al. 2006) has identified relevant, verified habitat metrics for determining high-quality fall chinook subyearling habitat. These resources provide a foundation from which to assess habitat availability in the Upper Columbia and so better understand the current conditions, limiting factors, and potential for future restoration in these very important, influential reaches of our regional river system, which have been largely ignored in restoration and recovery planning and efforts.

Chipps, S.R., Bennett, D.H., and Dresser, T.J. 1997. Patterns of Fish Abundance Associated with a Dredge Disposal Island: Implications for Fish Habitat Enhancement in a Large Reservoir. *North American Journal of Fisheries Management* 17(2): 378–386. doi:10.1577/1548-8675(1997)0172.3.CO;2.

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## **2. Describe the limiting factors, and/or ecological concerns, and limiting life stages (by fish species) that your project expects to address.**

This is a data gap for our region. These reaches of the Columbia have not been assessed and are not included as reaches within prioritization. Although there is a MaDMC data gap on fish use in the Columbia, an understanding of which is dependent on knowledge of habitat, there's no discussion of ecological concerns for the mainstem Columbia in the Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan nor the Biological Strategy outside of a discussion of impacts from and recommendations for actions related to hydropower.

These reaches of the Columbia must support subyearling and yearling rearing, smolt outmigration, and adult holding and migration. All of our anadromous populations must move through and use these reaches several times in their lifecycles.

## **3. What are the project goals? The goal of the project should be to solve identified problems by addressing the root causes. Then clearly state the desired and future condition. Include which species and life stages will benefit from the outcome, and the time of year the benefits will be realized.**

The goal of this assessment is to take steps toward a better understanding of subyearling spring chinook habitat availability in reservoirs of the mainstem Columbia. Despite compelling data documenting the use of reservoirs for subyearling spring chinook rearing there is a substantial gap in our understanding of what habitat exists in these reservoir pools and whether habitat actions could be taken to improve the quantity, quality, and/or connectivity of that habitat. All our anadromous salmonids must pass through these reaches during outmigration and upon return for spawning, but data from WDFW shows a substantial proportion of our spring chinook juveniles are rearing in the mainstem Columbia as subyearlings, with documentation that this life history strategy can be successful. While continued habitat restoration work is necessary in our subbasins to restore function and improve conditions in support of increased survival, the mainstem Columbia is a major habitat (both spatially and temporally in our fishes' life cycles) and should be assessed for a better understanding of current conditions and the possibility of restoration or enhancement actions to improve survival of our listed fish. With this project, we propose to assess existing spring chinook rearing habitat quantity, quality, location, and connectivity within the Rock Island and Wells reservoirs; where possible assess pre-dam habitat through historical references to improve our understanding of past conditions; and identify potential restoration/enhancement actions to improve quantity and quality of juvenile rearing habitat while limiting predator use.

## **4. What are the project objectives? Objectives support and refine biological goals, breaking them down into smaller steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound).**

Create a 2D hydraulic model to assess habitat conditions based on depth, velocity, and connectivity from existing bathymetric data. Map current habitat availability at 12 representative flow scenarios using modeling and Habitat Suitability Index (HSI). Consider metrics that have been identified in related scientific literature (e.g. depth, slope, bank protection, etc) (Chippis et al. 1997; Garland et al. 2002; Tiffan et al. 2006, 2016; Beecher and Caldwell 2022). HSI may also be run for predator species, such as smallmouth bass (White et al. 2024). This work will identify the quantity, quality, and connectivity of

existing juvenile chinook rearing habitat, and consider overlaps with predator species. A basic habitat duration assessment will be created. Modeling would take place in 2026.

Review historical data, aerial imagery, and ground photography for a discussion on pre-dam habitat types and availability (Stanford et al. 2006). This work will improve our understanding of habitat loss and inform the development of restoration or enhancement concepts to restore some of the functions of lost habitats and support juvenile rearing. This work would take place in 2026.

Develop general habitat enhancement concepts and identify potential areas for implementation. This work would consider existing conditions, historical information, and information from the literature to develop several potential generalized restoration or enhancement actions to recommend for implementation, as well as identify potential locations for these action types. Concept development would take place in late 2026 and early 2027.

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**5. Scope of work and deliverables. Provide a detailed description of each project task/element. With each task/element, identify who will be responsible for each, what the deliverables will be, and the schedule for completion.**

A 2D hydraulic model for the Rock Island and Wells reaches, to be run at 12 representative flow scenarios, and output from running HSI and additional habitat queries on this model. Rio ASE will develop the model and run the analyses with guidance from Cascade Fisheries. The work will be done in 2026.

A review of existing historical data (e.g. historical aerial imagery) to identify and describe pre-dam conditions in these reaches, to be completed by Cascade Fisheries in 2026.

A report discussing potential restoration or enhancement actions and identifying some specific locations for future projects. To be developed by Cascade Fisheries and Rio ASE in late 2026 and early 2027.

**6. What are the assumptions and physical constraints that could impact whether you achieve your objectives? Assumptions and constraints are external conditions that are not under the direct control of the project, but directly impact the outcome of the project. These may include ecological and geomorphic factors, land use constraints, public acceptance of the project, delays, or other factors. How will you address these issues if they arise?**

We don't anticipate any constraints outside of the current uncertainties with federal budgets and agency availability. With increased stability in that realm, we may receive more technical support from the USBR. Modeling efforts may uncover additional data needs, but on first review of the existing data, we do not believe this is necessary.

## **7. How have lessons learned from completed projects or monitoring studies informed this projects?**

There's literature that discusses similar juvenile chinook habitat assessments in the Snake River and in the Hanford Reach of the Columbia (Chipps et al. 1997; Garland et al. 2002; Tiffan et al. 2006). Although both studies focused on fall chinook, they did look at subyearlings and also at smallmouth bass. These studies will directly inform an approach for this assessment, as will Habitat Suitability Index work.

## **8. Describe the alternatives considered and why the preferred was chosen.**

CF has had several meetings with WDFW to discuss an appropriate approach for this phase of the project to better understand habitat availability and fish use in the mainstem Columbia. While we initially discussed looking directly at fish use, the scale and logistics of that effort were too substantial and required too much assistance from WDFW. This habitat assessment, as well as additional data that will be collected by the Wenatchee River PIT barge and through Chelan PUD's study of fish use for the Rock Island relicensing, will provide valuable insight to inform next steps of a direct fish-use assessment.

## **9. How were stakeholders consulted in the development of this project? Identify the stakeholders, their concerns or feedback, and how the concerns were addressed.**

CF has reached out to WDFW, members of the RTT, and Bureau of Reclamation staff for assistance considering the best approach for this project. All have offered guidance and assisted with project development, and the USBR and WDFW have expressed an intention to provide technical assistance when and where they are able.

## **10. Does your project address or accommodate the anticipated effects of climate change? How will your project be climate resilient given future conditions? How will your project increase species and habitat adaptability?**

This work is likely to become even more relevant with climate change. More winter freshets with climate change may increase the number of subyearlings moving into the mainstem in future, and temperature limitations are likely to become more of a factor during the warm months for rearing juveniles in the lower mainstems of our tributaries, as well as in some areas of the Columbia River. All the more reason to better understand and identify methods to increase habitat quantity and quality in this important habitat through which all of our fish must pass and in which many will spend extended time. Proposed restoration and enhancement actions would be informed by these anticipated changes to best meet the needs of our region in future.

## **11. Describe the sponsor's experience managing this type of project. Describe other projects where the sponsors has successfully used a similar approach.**

Kristen Kirkby, project manager, has over a decade of experience in fisheries ecology and 9 years of experience managing small and large restoration and design projects including side channel and creek restoration and enhancement, habitat surveys, barrier assessments and replacements, and riparian restoration. Kristen is supported in all aspects of project management by CF's experienced team. Jason Lundgren, the Director of CF, has over a decade of project management experience in salmon recovery including assessments, design, and construction projects. CF has implemented habitat surveys extensively throughout the Upper Columbia and regularly works with contractors developing 2D hydraulic models and conceptual and later designs.

## **12. Will veterans (including the veterans conservation corps) be involved in the project? If yes, please describe.**

No.

# **Supporting Documents**

[Upper Columbia Process Guide 2025](#)

[SRFB Manual 18 \(2025\)](#)

[RCO Application Resources \(2025\)](#)