Data Collection Contract

Request for Proposals
April 24, 2018

Columbia River
Honor. Protect. Restore.

OFFICE
PO Box 151
Toppenish, WA 98948

PHONE
(509) 949-4109

EMAIL
rogb@yakamafish-nsn.gov

WEB
Yakamafish-nsn.gov

The Yakama Nation in coordination with the Upper Columbia Regional Technical Team is seeking proposals from qualified companies to award a contract in support of a data collection contract. The winning bidder (herein referred to as "contractor") shall perform the following Work Tasks under this contract.

Based upon the proposals received under this solicitation, the Confederated Tribes and Bands of the Yakama Nation will award an up to one year contract to the best quality bidder from the Scope of Work listed below.

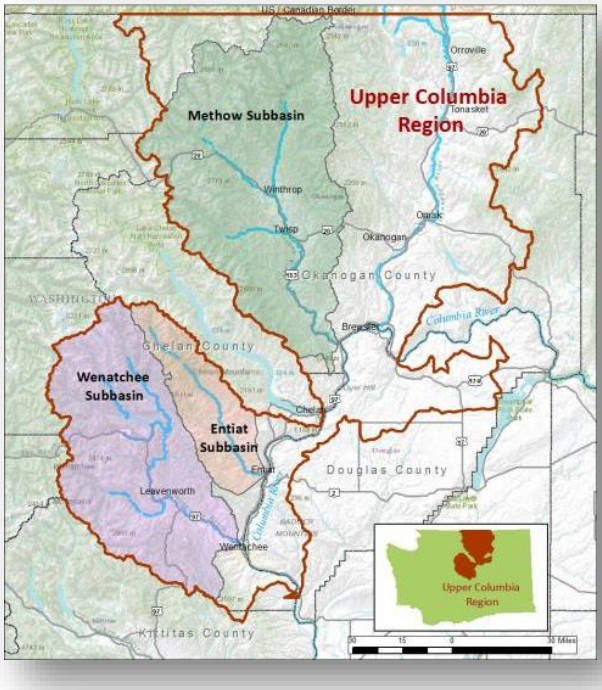
Project Background

The Upper Columbia Regional Technical Team (RTT) has developed a strategy that will help them prioritize restoration and protection actions within the Upper Columbia basin, specifically within the Wenatchee, Entiat, Methow, and Okanogan subbasins (*see map below*).

The prioritization strategy consists of three steps: 1. Prioritization of assessment units (AUs) for restoration and protection, 2. Identification and prioritization of reaches within AUs including; identification and ranking of limiting factors, threats that cause factors to be limiting, identification of limiting life stages, and identification and prioritization of action types to address limiting factors, and 3. Prioritization and determining the feasibility of implementing the prioritized list of actions within high priority areas.

In order to gain a full understanding of the entire prioritization process, please review the attached Assessment Unit Maps (Exhibit E) and Habitat Action Prioritization Strategy (Exhibit F.) The draft prioritization strategy describes in more detail the prioritization process, metrics, and data needed to populate the prioritization tool.

Project Location Map



Proposed Scope of Work

The RTT is looking for a contractor who will identify and compile all the available information that will help the RTT prioritize AUs within each subbasin; identify limiting factors and threats at the Reach and AU scales; identify limiting spring Chinook, steelhead, and bull trout life stages; and identify and prioritize actions to address limiting factors.

Task 1. At the AU scale, the RTT needs information that will help them estimate the following indicators for spring Chinook, steelhead, and bull trout:

- Amount of intrinsic potential currently occupied
- Location of major and minor spawning areas
- Number of life-history forms present
- Abundance of natural-origin spawners
- Seasonal presence and absence of juveniles
- Area of high quality habitat as percent or gradation of properly functioning condition
- Area of AU altered or degraded by land use
- Area of protected habitat
- Areas sensitive to climate change (e.g., changes in hydrologic regimes, changes in flood events, and increases in mean August temperatures; see Crozier 2016)[1] Suggest focusing on 2015 temperature data as a baseline for future water-quality conditions.
- Presence of non-native fish species
- Life stages of each species present within each AU
- Identification of limiting factors and their importance.

Task 2. At the Reach scale, the RTT needs information that will help them estimate the following indicators for spring Chinook, steelhead, and bull trout:

- Species present within each reach
- Identification of limiting life stages
- Habitat condition as a percent or gradation of properly functioning condition
- Valley confinement (e.g., confined, unconfined, or moderately confined)
- Identification of threats (activities or processes that cause certain habitat conditions to be limiting to fish; e.g., roads, mining, landslides, etc.)

Task 3. Compile all of the data collected under tasks 1 and 2 and list them in an Assessment Unit Spreadsheet (Exhibit G.)

Task 4. Produce an electronic compilation of all information by AU. Compilation should include all reports, data, and weblinks identified in tasks 1 and 2.

Task 5. Provide analysis consisting of a summary table or maps detailing the findings by Task 1 and 2 indicators, per Assessment Unit and Reach

Task 6. Provide two electronic copies of all compiled data, reports, and web-links to the YN and RTT in a neat and precise format.

[1] Crozier, L. 2016. Salmon-specific freshwater exposure attributes. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, WA.

Bid Directions

Each company seeking to be eligible for a contract award under this Request for Proposals must submit two hardcopies of their proposal in writing to:

Yakama Nation Fisheries
Attn: Jackie Olney
RE: RTT Data Collection RFP
PO Box 151
401 Fort Road (if using a shipping service)
Toppenish, WA 98948

Proposals must be received by Close of Business, May 21st, 2018. Only hand deliveries and/or mail or parcel delivery service submittals will be accepted. Please clearly state "RTT Data Collection Proposal" on the shipping envelope and the cover letter of the proposal. It is recommended that all shipping and/or delivery confirmation receipts are retained past the proposal due date to ensure proof of submission.

Each proposal must include a Statement of Qualifications detailing the company's experience and ability to complete the work described in the Scope of Work. Include a detailed company fee schedule detailing all billing rates for all personnel required to complete the Scope of Work. Please certify by signature the fee schedule as being valid for at least 150 days. Please also provide a description of how responsive your company can be to new work requests that may be issued during the contract period.

Please review the included Consultant Services Agreement template for typical Yakama Nation contracting terms and conditions including reporting/invoicing requirements.

Questions for this RFP should be directed to:

Brandon Rogers
Email rogb@yakamafish-nsn.gov
Phone (509) 949-4109

Limitations

The Yakama Nation reserves the right to accept or reject any and all of the proposals received as a result of this request or to cancel in part or entirely this request if it is in the best interest of the Yakama Nation to do so. This request does not commit the Yakama Nation to pay costs incurred in the preparation of a proposal.

CONSULTANT SERVICES AGREEMENT

This consultant services agreement is between the CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION, a sovereign native nation with its governmental headquarters located at P.O. Box 151 / 401 Fort Road, Toppenish, WA 98948 on the Yakama Reservation ("**Yakama Nation**"), and [CONSULTANT'S NAME], EIN Number _____, with its primary place of business located at [address] ("**Consultant**").

The Yakama Nation wants to obtain technical assistance to accomplish the project, task, study, or other work described in Exhibit A (Scope of Work) to this agreement.

Consultant states that it has the necessary technical expertise, skill, and capability to complete the Work for the Yakama Nation.

The parties therefore agree as follows:

ARTICLE 1. STATEMENT OF SERVICES

1.01 **Work & Standard of Performance**. Consultant shall perform the work described in Exhibit A (Scope of Work) to this agreement (the "**Work**"). Consultant shall, at its sole expense, provide all labor, services, and equipment necessary to complete the Work timely and to the Yakama Nation's satisfaction, except as expressly provided otherwise in this agreement. Consultant's performance shall comply with applicable tribal, federal, state, and local law and policy, and be consistent with generally accepted professional best practices, both of which Consultant states it has knowledge of.

1.02 **Term**. This agreement will be effective on the date when both parties have signed it, and will terminate as set forth below, unless terminated earlier in accordance with Article 9 of this agreement (if neither option is selected, Option B shall be the default):

☒ *Option A:* On _____, 20__

☐ *Option B:* Upon Consultant's satisfactory performance of the Work.

1.03 **Prior Performance.** If the Consultant has performed any Work prior to the start date of this agreement, then this agreement will govern such prior performance. Except that the Consultant's invoicing obligations, and the Yakama Nation's associated payment obligations, as set forth in Exhibit C (Payment Terms), will not arise until the start date of this agreement.

1.04 **Key Personnel**. If any of Consultant's employees or agents are specifically identified in Exhibit A (Scope of Work) as the employee(s) or agent(s) expected to perform the Work, they will be considered "**Key Personnel**" for purposes of this agreement. Consultant shall ensure that Key Personnel continue to be assigned to the Work until its completion, unless Consultant obtains the Yakama Nation Project Manager's written consent to a staff substitution.

ARTICLE 2. COMPENSATION

2.01 **Maximum Compensation**. The maximum total compensation approved by the Yakama Nation and payable to Consultant for Work under this agreement is $_____. The Yakama Nation shall not pay Consultant more than this maximum amount for the Work. Consultant acknowledges that this maximum amount

(a) is sufficient to perform the Work and (b) includes all eligible expenses associated with Consultant's performance of the Work.

2.02 **Rates/Fees/Payments**. The Yakama Nation shall make payments to Consultant according to the billing rate(s) and/or fee schedule(s) and the invoicing and payment terms described in Exhibit B (Budget) and Exhibit C (Payment Terms) to this agreement.

2.03 **Expenses**. The Yakama Nation shall only compensate Consultant for eligible expenses directly associated with the performance of the Work. Consultant acknowledges that eligible expenses are limited to those reasonable expenses incurred with the prior written approval of the Yakama Nation, for which the Consultant provides a reasonably detailed receipt or other proper proof. The Yakama Nation shall pay eligible expenses, including any authorized travel expenses, consistent with applicable tribal and federal law and policy.

2.04 **Federal or Grant Funds**. Consultant acknowledges that federal or grant funds utilized to compensate Consultant may be subject to certain requirements and restrictions, which may include, but are not limited to 2 C.F.R. Part 200. Consultant shall utilize funds in accordance with applicable funding requirements and restrictions, and shall reimburse the Yakama Nation for any expenses that are paid by the Yakama Nation but subsequently disallowed by the federal agency or other grantor.

ARTICLE 3. PROJECT MANAGEMENT

3.01 **Project Managers.** Each party will designate an internal project manager to facilitate the completion of the Work. Being designated as a party's project manager does *not* endow the representative with any legal authority to bind that party. Either party may change their project manager by giving notice to the other party.

(a) The Yakama Nation's Project Manager is [Name]. S/he may be reached at [Phone], or [email].

(b) The Consultant's Project Manager is [Name]. S/he may be reached at [Phone], or [email].

ARTICLE 4. LEGAL NOTICE

4.01 **Valid Notice.** For a notice under this agreement to be valid, it must be in writing, properly addressed to the party's current legal contact, and delivered (a) by a national transportation company with all fees prepaid and receipt signature required, or (b) by USPS certified mail, return receipt requested, postage prepaid. Notice will be effective upon the date of receipt. Either party may change its designated address or recipient for legal notice by giving the other party reasonable notice of such change.

4.02 **Notice to the Yakama Nation.** Notice to the Yakama Nation must be sent to the Tribal Council Chairman at P.O. Box 151 / 401 Fort Road, Toppenish, WA 98948, with courtesy copies to the Yakama Nation's Project Manager electronically at their email address listed above in section 3.01(a), and to the Yakama Nation Office of Legal Counsel at P.O. Box 150 / 401 Fort Road, Toppenish, WA 98948.

4.03 **Notice to Consultant.** Notice to Consultant must be sent to _____ at _____ _____.

ARTICLE 5. RECORDS, ACCOUNTING & AUDITS

5.01 **Recordkeeping.** Consultant shall maintain auditable records during the term of this Agreement and for a period of at least three (3) years following the termination of this Agreement. Consultant shall comply with

the Audit Act of 1984, P.L. 98-502 (31 U.S.C. § 7501 et. seq.), as amended, and the Office of Management and Budget's Uniform Guidance requirements set forth at, 2 C.F.R. Part 200, Subpart F, as amended, in maintaining its records.

5.02 **Accounting.** Consultant shall adhere to a systematic accounting method in performing the Work to ensure timely and appropriate resolution of audit findings and recommendations, and compliance with the Office of Management and Budget's Uniform Guidance requirements set forth at, 2 C.F.R. Part 200, Subpart F, as amended.

5.03 **Audits.** Except as prohibited by law, the Yakama Nation, the United States (if applicable), and any grantor agency (if applicable), or their duly authorized representative(s), may audit, examine, request, or make copies of Consultant's records that concern or are relevant to the subject matter of this agreement or to Consultant's performance of its obligations under this agreement. Consultant shall provide such authorized auditors with timely access to its records.

5.04 **Access to Yakama Nation Records, Personnel & Facilities.** Except as prohibited by law, the Yakama Nation shall provide Consultant with reasonable access to its personnel, facilities, and records necessary for Consultant's performance of this agreement.

5.05 **Confidential Information.** If the Yakama Nation provides Consultant with documents or information typically maintained as confidential by the Yakama Nation ("**Confidential Information**"), Consultant shall make all reasonable efforts, and take all reasonable precautions, to prevent the disclosure of that Confidential Information to non-parties, except as may be required by law or court order. Consultant shall not use Confidential Information for any purpose except the performance of this agreement.

5.06 **Continuing Obligation.** Consultant's obligations under Article 5 of this agreement are intended to survive the termination of this agreement.

ARTICLE 6. WORK PRODUCT

6.01 **Definition**. "**Work Product**" includes, but is not limited to, all papers, reports, information, drawings, internal memoranda, files, proposals, papers, copyrights, patents, photographs, data, and all written or graphic material, or any other material or property, whether stored electronically or in hard copy, in any format including native formats, and however produced, prepared, collected, generated, or created by the Consultant in connection with this agreement.

6.02 **Ownership.** Consultant acknowledges that all Work Product it produces pursuant to this agreement will be works for hire, which the Yakama Nation will own, and which Consultant will not retain any interest in or rights to. Consultant shall give all its Work Product to the Yakama Nation promptly upon the termination of this agreement or upon request.

ARTICLE 7. RISK MANAGEMENT

7.01 **Insurance Requirement.** Consultant shall be required to purchase and maintain insurance during the term of this agreement, as set forth in Section 7.02 below: ☒ YES ☐ NO. (If neither box is checked, insurance is required.)

7.02 **Insurance Coverage.** If insurance is required under Section 7.01, Consultant shall, at its own expense, maintain the following minimum insurance coverage during the term of this agreement and for a period of three years following the completion of the Work:

(a) Either Commercial General Liability Insurance OR Professional Liability Insurance, including errors and omissions insurance, in the amount of at least one million dollars per occurrence and two million dollars aggregate.

(b) If the performance of the Work requires Consultant to use one or more automobiles, Commercial Automobile Insurance coverage for all vehicles used in performance of the Work in an amount equal to the greater of either (i) one million dollars, or (ii) any other amount specified by applicable law.

(c) Any other insurance coverage required by applicable law, which may include (but may not be limited to) workers compensation insurance or disability benefits insurance.

7.03 **Additional Insured.** Consultant shall name the Yakama Nation as an additional insured on its applicable insurance policies, and at the Yakama Nation's request shall provide the Yakama Nation with certificates of insurance and copies of the relevant policies.

7.04 **No Subrogation.** Consultant hereby waives for insurance purposes all subrogation rights it may have against the Yakama Nation and any of the Yakama Nation's officers, agents, employees, governmental entities, contractors, or subcontractors.

7.05 **Indemnification.** Consultant shall, at its expense, indemnify and (at the Yakama Nation's discretion, and with counsel acceptable to the Yakama Nation) defend the Yakama Nation and its officers, agents, employees, and assigns (each and all considered the "Yakama Nation" for purposes of this Section 7.02) against *any* claim, demand, judgment, loss, cost, damage, expense or other liability whatsoever, including legal fees and expenses, which are incurred by or claimed against the Yakama Nation and arise, either directly or indirectly, from any error, action, omission, or breach of contract by Consultant or its officers, agents, employees, or subcontractors. The requirements of this Section 7.05 are intended to survive the termination of this agreement.

7.06 **Injunctive Relief.** Consultant acknowledges that its breach or threatened breach of Article 5 or Article 6 of this agreement would cause irreparable injury to the Yakama Nation, which could not be adequately compensated by money damages. Consultant further acknowledges that injunctive relief to enforce Articles 5 & 6 of this agreement would be proper.

ARTICLE 8. DISPUTE RESOLUTION

8.01 **Negotiation.** If the parties disagree about the performance, interpretation, or enforcement of this agreement, they shall first attempt to resolve their disagreement informally through (a) dialogue between their project managers, and then (b) face-to-face negotiations between their leaders, which must be held in Toppenish, WA. If the parties cannot resolve their disagreement after taking these steps, it will be deemed a 'dispute'.

8.02 **Mediation.** The parties shall endeavor to resolve any disputes through non-binding mediation before resorting to any other dispute resolution procedure. Such mediation must be held at a mutually agreeable location in Yakima, Washington. Any demand for mediation must be made in writing and delivered to the other party in accordance with the provisions of Article 4 (Notice) of this agreement. The parties shall share equally the costs of hiring a mediator and securing a suitable location for the mediation proceedings. The requirements of this Section 8.02 are intended to survive the termination of this agreement.

ARTICLE 9. TERMINATION

9.01 **For Convenience.** Either party may terminate this agreement by giving to the other party at least 90 days prior written notice. The notice must specify the effective date of termination.

9.02 **For Breach.** Either party may immediately terminate this agreement by written notice following a material breach by the other party. The parties acknowledge that the terms of Article 5 (Records, Accounting & Audits), Article 7 (Risk Management), Section 1.04 (Key Personnel), and Section 2.02 (Rates/Fees/Payment) are material terms. Consultant acknowledges that time is of the essence for performance of the Work.

9.03 **By Tribal Council Executive Committee.** The Yakama Nation Tribal Council Executive Committee may immediately terminate this agreement upon written notice to Consultant.

9.04 **Effect.** Termination of this agreement will not relieve either party of any liabilities or claims against it that arise under this agreement before the agreement is terminated. Termination will not limit the Yakama Nation's rights or remedies at law or equity, including, but not limited to, the right to contract with other qualified persons to complete the Work.

ARTICLE 10. GENERAL TERMS

10.01 **Independent Contractor.** Consultant acknowledges that it is an independent contractor and not an agent or employee of the Yakama Nation for purposes of this agreement. The parties state that they are not engaged in a joint venture or partnership.

10.02 **Conflicts**. During the term of this agreement, Consultant shall not accept work from any non-party, which would create a real or apparent conflict of interest with Consultant's performance of the Work for the Yakama Nation.

10.03 **Subcontractors.** Consultant shall not hire a subcontractor to perform any portion of the Work for this Agreement, except as expressly authorized in writing by the Yakama Nation. Where the Yakama Nation has authorized Consultant's hiring of a subcontractor, Consultant shall require the subcontractor to comply with all relevant terms and conditions of this agreement in performing their portion of the Work. Any unauthorized attempt by Consultant to subcontract the Work must be null and void, and Consultant shall be responsible for all expenses, fees, and costs associated with the unauthorized subcontract(s).

10.04 **Fair Employment Practices.** Consultant shall not discriminate against any employee or applicant for employment because of handicap, race, age, religion, sex, gender, or sexual orientation. Consultant shall take affirmative steps to ensure that applicants and employees are treated fairly during hiring and employment.

10.05 **Indian Preference Employment.** When Consultant performs Work within the boundaries of the Yakama Reservation, or on Yakama property outside the boundaries of the Yakama Reservation, Consultant acknowledges that it is subject to and shall comply with applicable Indian preference employment laws of the Yakama Nation, including its Tribal Employment Rights Ordinance (Yakama Revised Law & Order Code, Title 71, as amended) ("**TERO**"). Consultant further acknowledges that under Section 703(i) of the 1964 Civil Rights Act, it may implement an Indian Preference hiring policy for all work performed near (within reasonable commuting distance from) an Indian reservation. Consultant hereby adopts the TERO and its associated policies as its Indian preference hiring policy for all Work it performs near the Yakama Reservation, and shall publicize the same.

10.06 **Permits and Approvals; Taxes and Fees.** The Consultant shall, at its expense, obtain any and all permits, approvals, or authorizations from local, state, federal or tribal authorities necessary or required for the completion of the Work. Unless the parties have expressly agreed otherwise in this agreement, Consultant shall pay any taxes or fees applicable to or associated with its completion of the Work.

10.07 **Force Majeure.** The parties' obligations under this agreement are subject to force majeure. If acts of God, severe weather conditions, fire, or unforeseen catastrophic events caused by nonparties which are beyond

the control of the parties, prevent the parties from performance, such non-performance must not be considered a breach of this agreement.

10.08 **Entire Agreement.** This agreement constitutes the entire understanding between the parties with respect to the subject of this agreement, and supersedes all prior or contemporaneous agreements, whether written or oral, between the parties. The parties acknowledge that they each participated in negotiating this agreement, and that they have read, understood, and approved its terms. Headings are provided in this agreement for convenience, and are not intended to affect the meaning of the provisions to which they are affixed.

10.09 **Exhibits Incorporated by Reference**. This agreement includes any terms or documents incorporated by reference, as well as those exhibits listed below. If the terms of an exhibit or incorporated document conflict with the terms of the body of this agreement, the terms in the body of this agreement must prevail.

(i) Exhibit A – Scope of Work

(ii) Exhibit B – Budget

(iii) Exhibit C – Payment Terms

(iv) Exhibit D - Intergovernmental Master Agreement 56662 ("IG-MA 56662")

IG-MA 56662 can be accessed using a web browser at the following address: http://yakamafish-nsn.gov/restore/projects/bpa-master-agreement-terms-and-conditions

When prompted, enter "YN Fish1855" as the webpage password to access the Master Agreement.

(v) ____n/a_____ [n/a if blank]

10.10 **Change Orders.** Change orders must be in writing and authorized by an appropriate representative of the Yakama Nation as follows:

(a) **Material Changes.** Any material changes to this agreement or the Work to be performed must be authorized in writing and signed by the Yakama Nation Tribal Council Chair as modifications or addendums to this agreement. Material changes are (i) any changes which require an increase in the maximum 'not to exceed' contract amount set forth in Section 2.01 of this agreement, or (ii) any changes to *what* Work is to be performed.

(b) **Immaterial Changes.** The Yakama Nation's Project Manager may authorize immaterial changes in writing. Immaterial changes are those that concern *how* the Work will be accomplished, but do not change the scope of what Work will be performed, or the overall contract payment amount.

10.11 **Amendments; Waiver.** The parties may amend this agreement by a written instrument signed by the authorized representatives of both parties. No waiver under this agreement will be effective unless it is in writing and signed by an authorized representative of the party granting the waiver. A waiver granted on one occasion will not operate as a waiver on other occasions.

10.12 **Execution.** If the parties sign this agreement in several counterparts, each will be deemed an original, but all counterparts together will constitute one instrument. The parties may sign and deliver this agreement (and any ancillary documents) to each other electronically, and the receiving party may rely on the electronic document as if it was a hard-copy original. The parties each state that they have the necessary legal authority to enter into and sign this agreement, and to perform their obligations under this agreement.

10.13 **Choice of Law and Venue.** Yakama law governs the validity and interpretation of this agreement, and any adversarial proceedings brought by one party against the other party arising out of this agreement. Any court action filed to enforce or interpret this agreement must be in the Yakama Tribal Courts. Consultant acknowledges that this agreement will be considered to have been executed at the Yakama Nation governmental headquarters in Toppenish, WA, and that this agreement establishes a consensual business relationship between the parties for purposes of Yakama Tribal Court jurisdiction. Consultant shall not raise any personal jurisdiction objections to Tribal Court jurisdiction.

10.14 **Sovereign Immunity.** In entering into this agreement, the Yakama Nation is not waiving its sovereign immunity from suit, and is not waiving, altering, or otherwise diminishing its rights, privileges, remedies, or services guaranteed by the U.S. Treaty with the Yakamas of June 9, 1855 (12 Stat. 951).

10.15 **Special Terms & Conditions.** In addition to the forgoing terms and conditions, the following requirements will apply to this Agreement:

(a) Compensation under this contract is dependent upon the availability of funds to the Yakama Nation under Intergovernmental Master Agreement 56662 ("IG-MA 56662") between the Bonneville Power Administration and the Yakama Nation.

(b) In addition to compliance with the other terms of this contract, Consultant shall comply with any and all requirements set forth in the IG-MA 56662 applicable to subcontractors. If Consultant is authorized under this Agreement to hire any subcontractors, Consultant shall ensure that their contracts also include requirements for compliance with the terms of the IG-MA 56662 applicable to subcontractors.

Each party is signing this agreement on the date stated opposite that party's signature:

THE CONFEDERATED TRIBES AND BANDS OF THE YAKAMA NATION:

By: JoDe Goudy — Date

Title: Tribal Council Chairman

[CONSULTANT]:

EIN #:

By: — Date

Title:

EXHIBIT B – BUDGET

1. Project Budget:

2. Applicable Rate Schedule. Consultant shall invoice, and the Yakama Nation shall pay, according to the following billing rates: _____.

EXHIBIT C – PAYMENT TERMS

1. Schedule. The Consultant shall invoice for work performed in accordance with the following schedule [if no schedule is selected, invoicing shall occur per Option A – Monthly Time & Materials]:

☒ *A. Monthly Time & Materials:* The Consultant shall invoice monthly on a time and materials basis for actual Work completed during the invoice period. Unless the parties agree in writing to different terms, invoice periods shall begin on the first day of each month and end on the last day of each month.

☐ *B. Progress:* The Consultant shall invoice following the completion of each major Work task identified in Exhibit A (Scope of Work). A Work task will not be considered complete until it has been reviewed and accepted by Yakama Nation's Project Manager.

☐ *C. Alternative Schedule:* The Consultant shall invoice as follows: _____.

2. Invoicing Requirements. Invoices must include appropriate supporting documentation, which may include, but is not limited to, expense receipts and a brief summary of activities associated with the Work performed by Consultant. Consultant shall submit invoices to the Yakama Nation's designated Project Manager within 15 days after the end of the invoice period in which the Work was performed and/or expenses were incurred. Consultant hereby waives the right to receive full payment on invoices submitted more than 60 days following the end of the invoice period. (The 'end' of the invoice period for progress payments will be considered the last day of the calendar month in which the Work task was completed.)

If a question or concern arises regarding an invoice, Yakama Nation shall promptly notify Consultant of the question or concern. Within 15 business days following such notification, Consultant shall take action to sufficiently explain or correct the issue, or Consultant will be deemed to have waived their right to demand payment for the associated Work or expense.

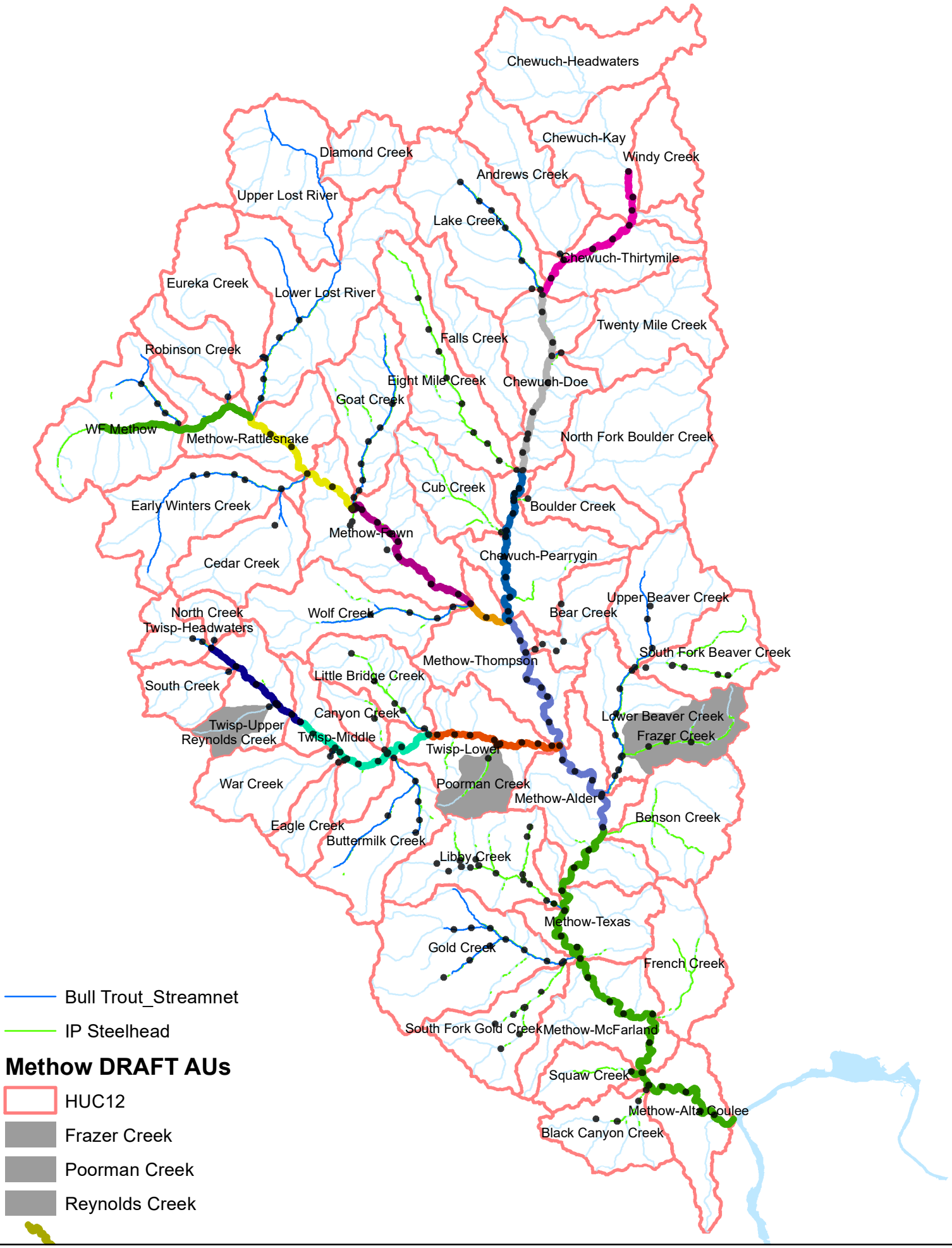
3. Payment. The Yakama Nation shall pay all approved invoices within 60 days following the date of invoice.

Exhibit E

Entiat DRAFT AUs

2/6/2018 - Upper Columbia Salmon Recovery Board

Methow DRAFT AUs



Wenatchee DRAFT AUs

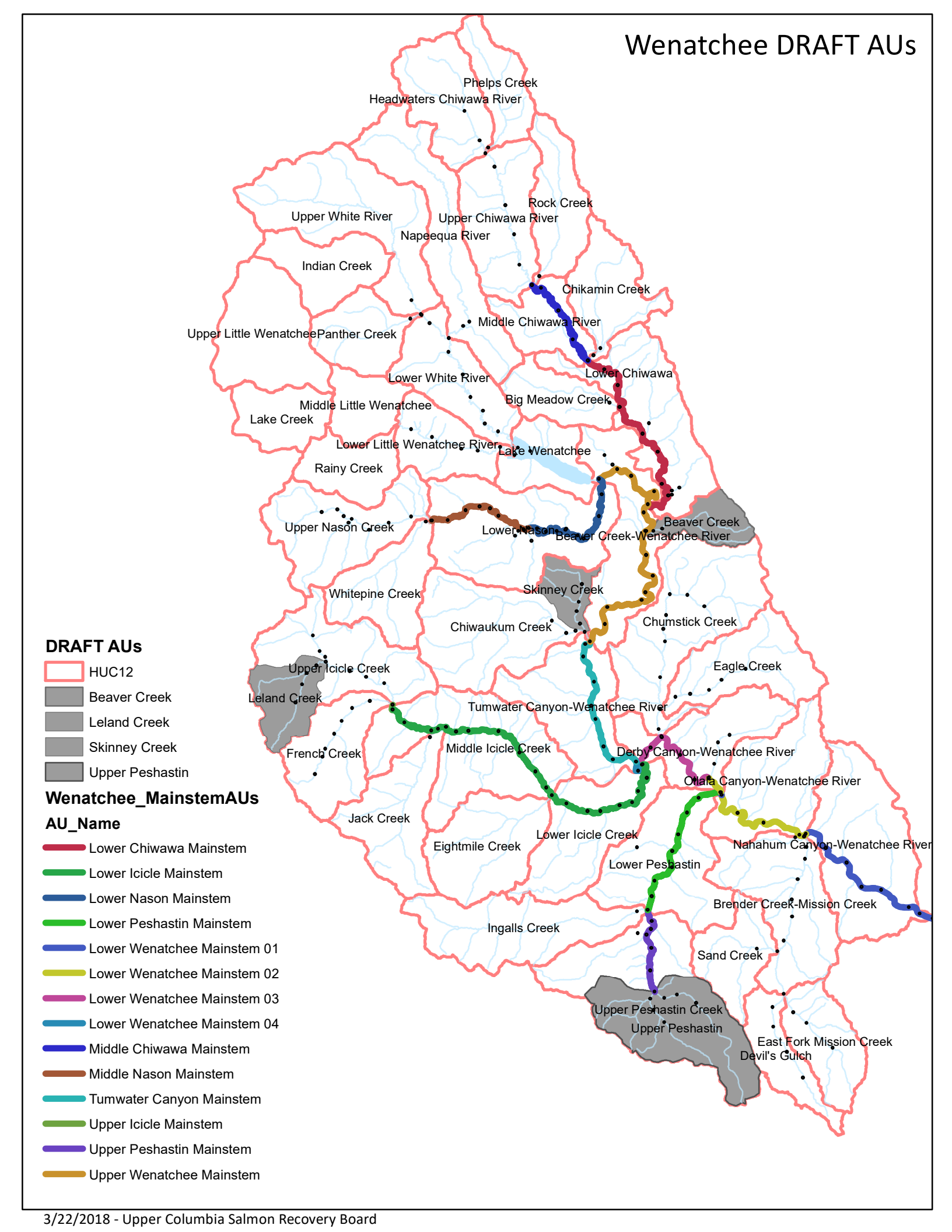


Exhibit F

HABITAT ACTION PRIORITIZATION WITHIN THE UPPER COLUMBIA RIVER BASIN

UCRTT

UPPER COLUMBIA REGIONAL TECHNICAL TEAM

March 2018

Table of Contents

Introduction

In this document, we describe a strategy for prioritizing protection and restoration[1] actions within the Upper Columbia River basin. We define prioritization as the process of ranking assessment units (AU),[2] reaches, limiting factors, and habitat action types[3] (for both restoration and protection) to determine their relative biological priority for funding and implementation. The reason for prioritization stems from the need to have the largest biological effects as soon as possible, to make the best use of limited resources, and to protect or restore areas before further degradation occurs. Prioritization is a critical component of the *Biological Strategy to Protect and Restore Salmonid Habitat in the Upper Columbia Region*, which was last updated in 2014. The objective of this strategy is to provide a consistent, repeatable, systematic, and well-documented approach for prioritizing restoration and protection actions and locations for restoration and protection. This strategy will provide a transparent prioritization process that will assist restoration practitioners and managers with making decisions. We will revise this strategy periodically as new information becomes available, projects are completed, funding levels change, or new restoration and protection opportunities are identified.

In developing this strategy, we reviewed several programs including the BPA Atlas Process and other published studies (e.g., Williams et al. 2007 and Roni et al. 2013). Our approach consists of three important steps, each step representing a "hurdle" in the prioritization process (Figure 1). The first step is prioritization of assessment units for restoration and protection. To do this, we used a standardized procedure to identify assessment units within each subbasin and identified metrics and scoring rules for prioritizing areas for restoration and protection. Completion of this hurdle provides a list of high priority areas for restoration and protection within each subbasin. The next step is identification and prioritization of reaches within AUs, identification and ranking of limiting factors and the threats that cause factors to be limiting, identification of limiting life stages, and identification and prioritization of action types to address limiting factors. This step involves compiling and evaluating all available information and working with our partners (biologists and researchers) to identify and prioritize information within each element of this step. We developed scoring rules for each element and also created a tool that calculates an overall combined score. These scores are used to rank habitat action

[1] A wide variety of terms are used in the literature, including restoration, rehabilitation, mitigation, creation, improvement, and enhancement (NRC 1996; Roni and Beechie 2013). Although strictly speaking, restoration is defined as returning an ecosystem to its original, pre-disturbance state, in this document we use it synonymously with enhancement, rehabilitation, mitigation, creation, or improvement.

[2] An assessment unit (AU) is a portion of a watershed that consists of a similar ecoregion, geomorphology, and stream type.

[3] Action type refers to a classification of restoration actions such as pool development, riparian fencing, barrier removal, boulder placement, etc. Action types are classified under restoration categories such as protection, floodplain reconnection, riparian restoration, nutrient supplementation, etc. Table 6 identifies restoration categories and action types.

types based entirely on biological benefit. The final step in the prioritization process is to work with the WATs, IT, and others to determine the feasibility of implementing the prioritized list of actions within high priority areas. The final product will be a list of reach-specific, high-priority actions (restoration and protection) that if implemented should provide the greatest benefits to listed species. Information will also be contained on geospatial maps, hosted by the Upper Columbia Salmon Recovery Board, that will be available to funders and sponsors.

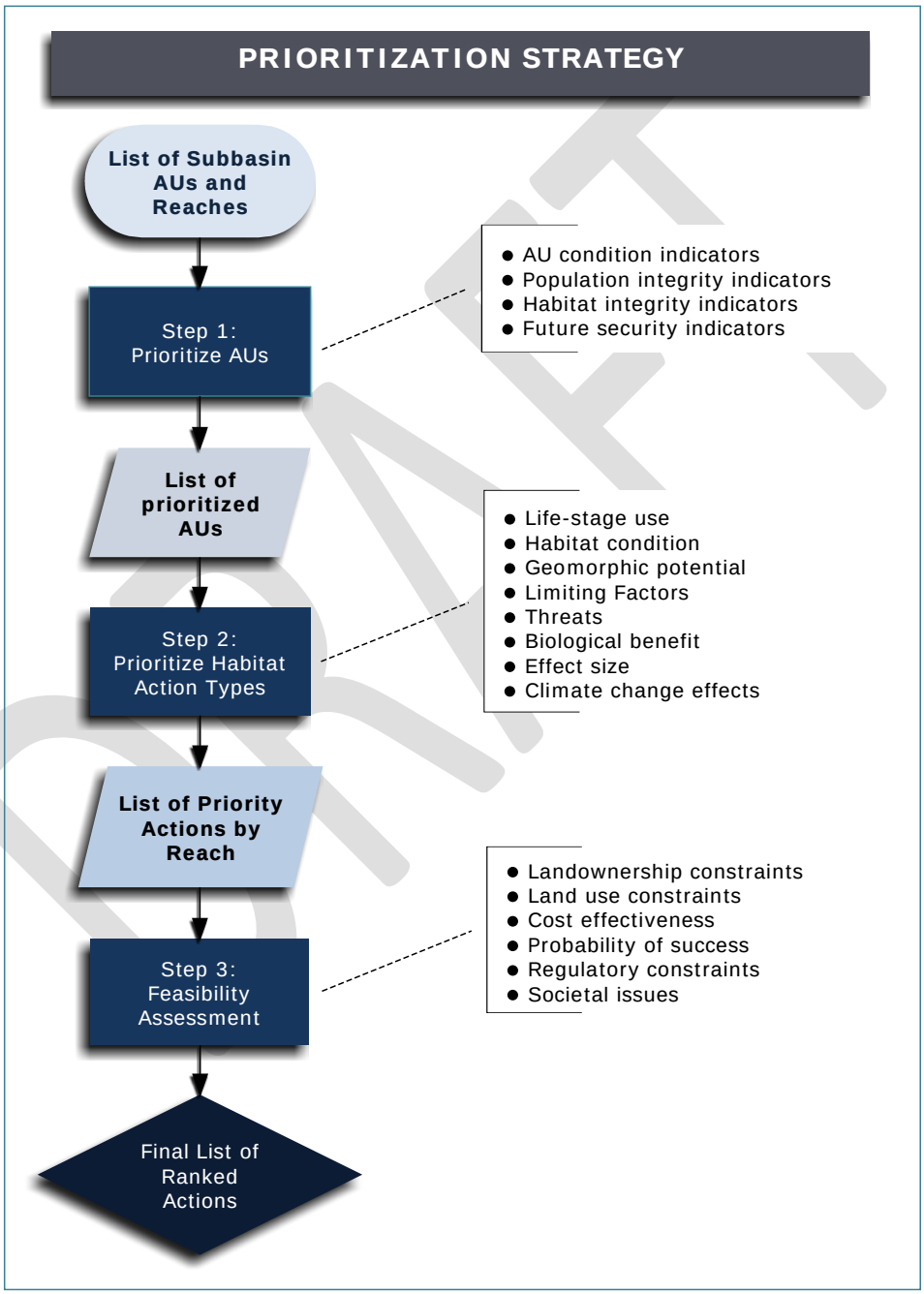


Figure 1. Three-step process for selecting habitat actions for restoration and protection.

What follows is a description of the prioritization process. We first identify the spatial scale of the prioritization process and then describe each of the prioritization steps in detail. It is important to note that although this is an UCRTT product, prioritization is a collaborative process and its success is based on working closely with those involved with developing and implementing restoration and protection projects.

Spatial Scale

For the purposes of this strategy, the Upper Columbia River basin includes all tributaries between Priest Rapids and Chief Joseph dams (Figure 2). The basin consists of six, major "subbasins" (Crab, Wenatchee, Entiat, Chelan, Methow, and Okanogan basins) and several smaller watersheds. This area captures the distribution of the Upper Columbia River Basin Summer Steelhead (listed as endangered in 1997, reclassified as threatened in 2009, and updated again in 2014). It also captures the Upper Columbia River Spring Chinook Salmon Evolutionarily Significant Unit (ESU) (listed as endangered in 1999, updated in 2005, and then again in 2014) and the Upper Columbia Recovery Unit for the Columbia River Bull Trout Distinct Population (listed in 1998). The Interior Columbia Basin Technical Recovery Team identified independent populations of summer steelhead and spring Chinook within the Upper Columbia ESUs (ICBTRT 2003). They identified three independent populations of spring Chinook within the Upper Columbia ESU; Wenatchee, Entiat, and Methow populations. For summer steelhead, they identified five independent populations within the ESU; Wenatchee, Entiat, Methow, Okanogan, and Crab Creek populations. Although they identified five geographic areas for the independent populations of steelhead within the ESU, steelhead may also exist within smaller tributaries to the Columbia River, such as Squilchuck, Stemilt, Colockum, Tarpiscan, Tekison, Quilomene/Brushy, Palisade, Douglas, Foster, and Swakane creeks, and the Chelan River and tailrace.

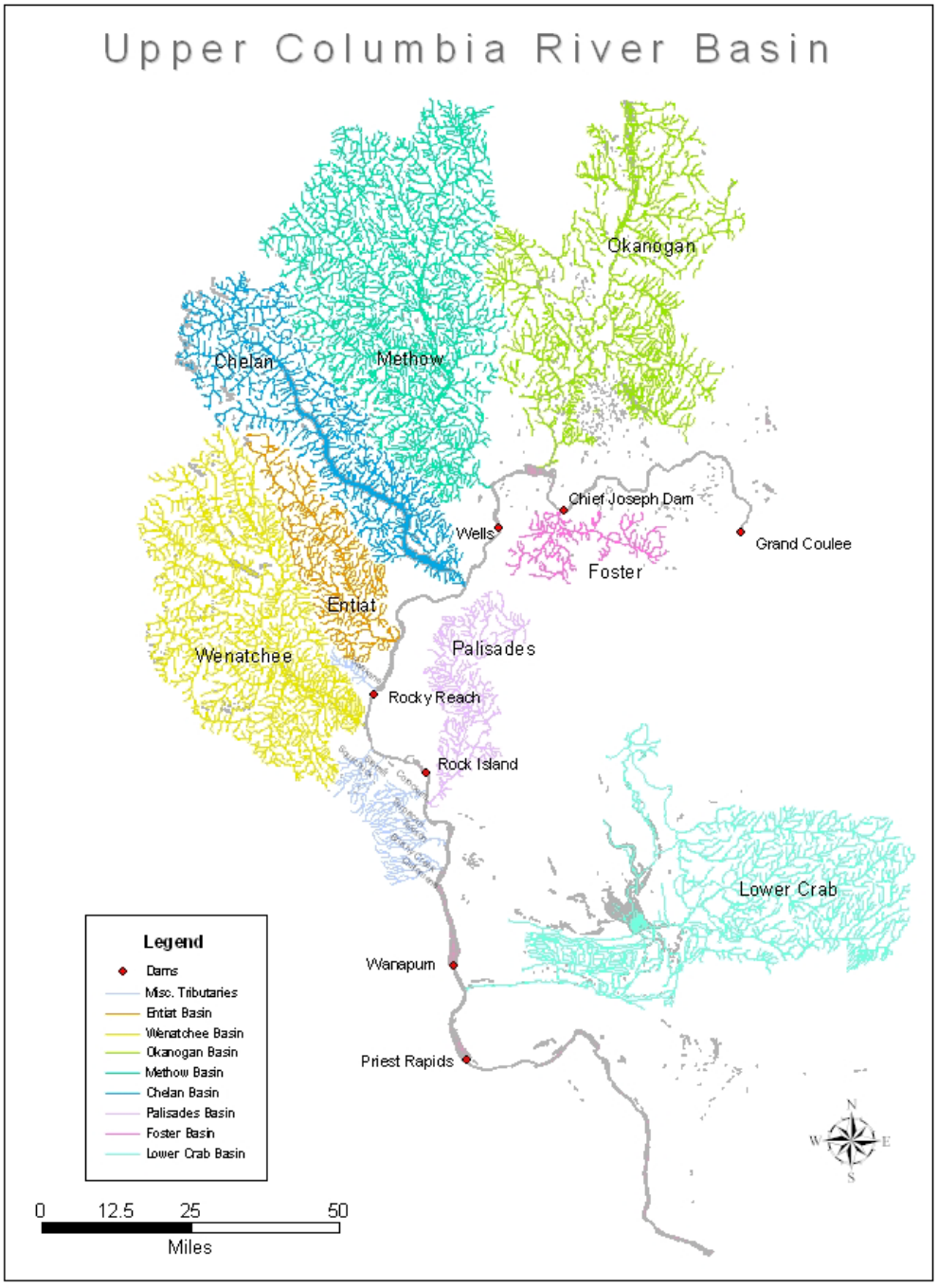


Figure 2. Tributaries in the Upper Columbia River Basin.

For prioritization, we will focus on the Wenatchee, Entiat, Methow, and Okanogan subbasins. Because of a lack of information, several of the smaller tributaries and Crab Creek will receive less attention in the prioritization process. In addition, because of the large amount of restoration work conducted by Chelan PUD in the Chelan River and Tailrace, this area will not be evaluated for prioritization at this time.

Importantly, this prioritization process does not rank populations or subbasins against each other for restoration or protection, because the four steelhead and the three spring Chinook populations must each reach recovery levels for delisting under the ESA.[4] Rather, this process prioritizes assessment units and reaches within each population or subbasin. That is, the process will rank assessment units and reaches within the Wenatchee subbasin independently of assessment units and reaches within the Methow subbasin. Thus, each subbasin will have its own list of priority areas for protection and restoration.

Prioritization Approach

As noted above, we identified a three-step process for prioritizing restoration and protection actions. The first step involves ranking assessment units within each subbasin (i.e., Wenatchee, Entiat, Methow, and Okanogan) for restoration and protection. The second step involves ranking reaches within AUs and identifying limiting factors, threats, limiting life stages, and geomorphic potential. From this, we identify and rank habitat action types that will address the threats, limiting factors, and limiting life stages, and fit within the geomorphic processes that shape the stream channel. The final step involves refining the ranking of restoration and protection actions within each reach based on feasibility. At this step, factors such as landowner willingness, cost, complexity, and societal issues[5] come into play. In sum, the three-step process includes biological, physical, economic, and sociopolitical criteria.

We understand there are several different approaches that can be used to prioritize restoration and protection actions in the Upper Columbia River basin. We selected the three-step approach because it is simple, repeatable, systematic, and transparent, and can be used throughout the Upper Columbia region. However, we acknowledge the extensive development and use of the Ecosystem Diagnosis and Treatment (EDT) model in the Okanogan River subbasin (and soon within the Methow River basin), where prioritization was developed around EDT. It is not our desire to replace the EDT work with the prioritization approach described in this document. Rather, we encourage the use of the EDT model to prioritize restoration and protection actions and assessment units where the model has been extensively developed and used. However, where EDT is not up-to-date or well developed (e.g., Wenatchee and Entiat subbasins), we need a prioritization strategy that will accommodate the best available information, whether it comes from EDT or other sources. Thus, this strategy is designed to use EDT results if they are available, but it does not require EDT. Below we describe the three-step process in more detail.

[4] If a given population moves closer to extinction, we will then prioritize among populations.

[5] Examples of societal issues include conflicts between enhancement opportunities and recreational, political, and economic issues. The latter may include, for example, conflicts between beaver reintroduction and agricultural practices.

Step 1: Assessment Unit Prioritization

Modeling efforts indicate that to produce measurable increases in salmon and trout abundance at a watershed or population scale, a large amount of habitat within a watershed needs to be enhanced, suggesting the need to focus limited resources on watersheds or assessment units with the largest potential for fish recovery and restoration (Roni et al. 2010). Thus, the first step in the prioritization process is to rank assessment units within each subbasin for restoration and prioritization. This will be accomplished by using a multi-criteria decision analysis (MCDA) framework, similar to that used by Williams et al. (2007) to rank watersheds for protection of endangered trout. The MCDA includes specific indicators for Assessment Unit Condition, Population Integrity, Habitat Integrity, and Future Security (see Attachment 1). Based on an evaluation of the literature and input from the IT, WATs, project implementers, and others, we identified the following indicators for each category:

- Assessment Unit Condition Indicators
    - Intrinsic Potential – Percent of intrinsic potential currently occupied within an assessment unit.
    - Major and Minor Spawning Areas – Presence of major (MSA) or minor (mSA) spawning areas within an assessment unit.
- Population Integrity Indicators
    - Life-History Diversity – Number of life-history forms present compared to historical (or reference) conditions within an assessment unit.
    - Spawner Abundance – Abundance of natural-origin spawning adult salmon or trout within an assessment unit.
    - Juvenile Presence – Presence of natural-origin, summer and winter rearing, juvenile salmon or trout within an assessment unit.
- Habitat Integrity Indicators
    - Habitat Quality – Habitat quality for adult holding, spawning/incubation, summer rearing, and winter rearing compared to historical (or reference) conditions within an assessment unit.
    - Degraded Habitat – Percent of the assessment unit with degraded habitat.
    - Land Stewardship – Percent of the assessment unit with protected habitat.
- Future Security Indicators
    - Climate Change – Area of assessment unit sensitive to climate change (Crozier 2016).
    - Non-native Fish Species – Presence of non-native fish species within an assessment unit.

These indicators will be used to score and rank assessment units for spring Chinook salmon, steelhead, and bull trout for both restoration and protection.

Based on the literature, Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan, monitoring data, and our scoring criteria for evaluating proposed projects, we identified a consistent range of scores for each indicator (see Attachment 1). For each indicator, scores range from 1 to 5, with 5 being the preferred condition. The definition of each score depends on the species and whether we are prioritizing for restoration or protection. That is, the definition for, say, "Spawner Abundance" differs among spring Chinook, steelhead, and bull trout. In addition, the definition of scores for a given species differs between restoration and protection. The scores are defined such that overall scores rank assessment units from highest to lowest for both restoration and protection. Because some indicators may be more important than others in ranking assessment units, those important indicators will be given greater weight than others. A different set of weights will be assigned to indicators for different species and for restoration and protection.

The final step is to summarize the scores for each assessment unit, each species, and for protection and restoration. This is accomplished by summing the product of each indicator score by its weight. Total scores are then sorted from highest to lowest for each species and for protection and restoration. This is a simple and transparent way to rank assessment units for protection and restoration.

EDT Modeling

The current EDT model in the Okanogan River basin and the forthcoming model run for the Methow River basin will provide output that accounts for most of the indicators identified in Step 1. For areas with EDT, we will:

1. Rank each Assessment Unit based on observed adult and juvenile abundance.
2. Calculate an EDT protection and restoration priority rank for each Assessment Unit using EDT capacity, productivity, and life-history diversity metrics.
3. Sum ranks to produce an integrated habitat protection and restoration priority score for each assessment unit.

Step 2: Habitat Action Type Prioritization

The second step of the prioritization process is to rank habitat restoration and protection actions within high-priority assessment units and reaches. This will be accomplished by first identifying and ranking reaches within AUs. We then identify and rank limiting factors (factors that limit the abundance, survival, and/or distribution of fish), threats (activities or processes that cause certain habitat conditions to be limiting to fish, e.g., roads, logging, mining, landslides, etc.), and limiting life stages within each reach. Working with our partners, we will use available watershed assessments, reach assessments, habitat modeling (e.g., EDT), life-cycle modeling, riparian assessments, remote sensing information (e.g., Light Detection and Ranging, aerial photos, etc.), status and trend monitoring data, Expert Panel information, and professional judgment to inform this step. These tools will be used to identify spatially explicit degraded and properly functioning habitat conditions. These conditions, including limiting

factors and threats will be mapped using geographic information system (GIS) technology. Specifically, they will be included on the GIS maps showing the standardized assessment units and reaches. All this information will then be evaluated to identify appropriate restoration actions, which will also be mapped in GIS. With this information, we then rank restoration actions for each priority reach and rank reaches for protection. Below we describe each element of this step.

Prioritization of Reaches

Reaches will be prioritized for both restoration and protection based on fish periodicity (temporal presence/absence) and life-stage use, habitat condition, and geomorphic potential. Fish presence will be described for each focal species (Chinook salmon, steelhead, and bull trout) at seven life stages (adult migration, adult holding, adult spawning, incubation/emergence, juvenile summer rearing, juvenile winter rearing, and juvenile emigration). For each reach, we will prepare presence/absence tables and then count the number of life stages and species present within each reach (Table 1). The length of time a given life stage is present within a reach is not a factor in determining periodicity. Chinook salmon will be given more weight than steelhead and bull trout, because Chinook are listed as Endangered, while steelhead and bull trout are listed as Threatened. Reaches that have more life stages and multiple species receive the highest scores.

Table 1. Example of a fish periodicity (presence/absence) table. Colored cells indicate presence; lighter shades indicate limited use.

Pucker Brush Creek in Assessment Unit PB1; Reach PBR1																											
Species	Life Stage	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
		1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31
Chinook salmon	Adult migration																								
	Adult holding																								
	Adult spawning																								
	Incubation/emergence																								
	Juvenile summer rearing																								
	Juvenile winter rearing																								
	Juvenile emigration																								
Steelhead	Adult migration																								
	Adult holding																								
	Adult spawning																								
	Incubation/emergence																								
	Juvenile summer rearing																								
	Juvenile winter rearing																								
	Juvenile emigration																								
Bull trout	Adult migration																								
	Adult holding																								
	Adult spawning																								
	Incubation/emergence																								
	Juvenile summer rearing																								
	Juvenile winter rearing																								
	Juvenile emigration																								

Fish use is based on the number of life stages present within a reach and their ranking as determined from fish-use scores. Using the best available information, we assign habitat-use scores based on how important a life stage is to population performance (abundance, productivity, and viability) within a given reach (Table 2). For restoration, reaches with the most life stages present and in need of immediate action for population performance receive the highest scores. For protection, reaches with the most life stages present and with the best habitat conditions receive the highest scores.

Table 2. Scores for current fish use for restoration and protection within each reach.

Habitat-use score	Definition
Restoration	
0	Life stage is not present.
1	Life stage use is minimally affected by current conditions.
3	Life stage use is important to *long-term* population performance.
5	Life stage use needs *immediate* action for population performance.
Protection	
0	Life stage is not present.
1	Life stage use needs action for population performance.
3	Life stage use is important to *long-term* population performance.
5	Life stage use is minimally affected by current conditions.

Habitat condition reflects the current condition of habitat within a reach and the potential for habitat improvement. For restoration, scores are based on the assumption that reaches with fair to good habitat conditions provide the most opportunity for improvement (thus, the highest scores), while areas with poor habitat would require larger resource investments for minimal improvement, and reaches with excellent habitat provide little opportunity for improvement (Table 3). For protection, reaches with good to excellent habitat conditions receive the highest scores.

Table 3. Scores for habitat condition for restoration and protection within each reach. Properly functioning condition can be estimated using habitat models or from the Expert Panel process.

Habitat condition score	Definition
Restoration	
1	Habitat condition is at ≤10% properly functioning condition.
2	Habitat condition is at >90% properly functioning condition.
3	Habitat condition is at 11-40% properly functioning condition.
4	Habitat condition is at 61-90 properly functioning condition.
5	Habitat condition is at 41-60% properly functioning condition.
Protection	
1	Habitat condition is at ≤10% properly functioning condition.
2	Habitat condition is at 11-40% properly functioning condition.
3	Habitat condition is at 41-60% properly functioning condition.
4	Habitat condition is at 61-90 properly functioning condition.
5	Habitat condition is at >90% properly functioning condition.

Geomorphic potential reflects the ability of actions to affect habitat conditions based on valley confinement. Scoring is based on the assumption that moderately confined or unconfined reaches offer more process-based enhancement opportunities than confined reaches (Table 4). Intrinsic potential maps, Beechie Classification, and other data inform this metric.

Table 4. Scores for geomorphic potential within each reach.

Geomorphic score	Definition
1	Little to no floodplain available for enhancement (confined reach).
3	Moderate amount of floodplain available for enhancement (moderately confined).
5	Large amount of floodplain available for enhancement (unconfined reach).

Each of the metrics used to prioritize reaches (fish periodicity, habitat use, habitat condition, and geomorphic potential) are weighted equally; i.e., each metric constitutes 25% of the composite score. A composite score for each reach is generated by summing the score of each metric. Total scores are then sorted from highest to lowest, reflecting the ranking of reaches within AUs for enhancement work and protection.

Prioritization of Limiting Factors

Once reaches are prioritized for enhancement and protection, we identify and prioritize limiting factors and threats for each reach. Here, we use available information from the Biological Strategy, reach assessments, watershed assessments, limiting factors analysis, monitoring programs, modeling work, Expert Panel process, and other sources to identify factors and threats that limit population performance. Limiting factors are then scored based on their effect on critical life stages (from habitat-use analysis described above) and salmonid performance (Table 5).

Table 5. Scores for ranking limiting factors within each reach.

Limiting factor score	Definition
1	Factors that may be beneficial to address but will have limited effects on critical life stages or population performance.
3	Factors that are important but not critical to address important life stages and population performance.
5	Factors that are necessary to address critical life stages and population performance.

Importantly, factors that are lethal (e.g., lethal temperatures and other water quality issues, no flow, etc.) must be addressed before other factors are evaluated. Thus, lethal factors serve as an "on/off" switch for restoration. If lethal factors are present ("on"), only those are evaluated; if lethal factors are not present ("off"), all limiting factors are evaluated.

After limiting factors are identified and ranked, threats that cause factors to be limiting will be identified. Both limiting factors and threats will be mapped using GIS technology for each reach. This information will be used to help identify appropriate enhancement actions for each reach.

Prioritization of Habitat Action Types

With the prioritization of reaches for restoration and protection, and the identification and ranking of limiting factors and threats, we will work with our partners to identify and prioritize appropriate restoration and protection actions for each priority reach. Restoration actions will be grouped into ten broad categories with specific action types identified under each category (Table 6). The specific action types are intended to provide a comprehensive list of potential activities that might be implemented to address limiting factors, threats, salmonid life stages, and geomorphic conditions. They include both passive and active restoration approaches, and include activities that range from site-specific actions to watershed-scale actions.

Table 6. List of restoration categories and action types.

Category	Action types
Protection	Acquisition
	Easement
Channel modification	Channel reconstruction or construction
	Pool development
	Riffle construction
	Meander (oxbow) reconnection or construction
	Spawning gravel cleaning or placement
Floodplain Reconnection	Levee modification: removal, setback, breach
	Remove or relocate floodplain infrastructure
	Restoration of floodplain topography and vegetation
	Floodplain construction
Side Channel/Off-Channel Restoration	Perennial side channel
	Secondary (non-perennial) channel
	Floodplain pond – wetland
	Alcoves
	Hyporheic off-channel habitat (groundwater)
	Beaver restoration management
Riparian Restoration and Management	Riparian fencing
	Riparian buffer strip, planting
	Thinning or removal of understory
	Removal of non-native plant species
Fish Passage Restoration	Dam removal or breaching
	Barrier or culvert replacement or removal
	Structural passage (diversions)
Nutrient Supplementation	Addition of organic or inorganic nutrients
Instream Structures	Rock weirs
	Boulder placement
	LWD placement and engineered log jams
Bank Restoration, Modification, and Removal	Modification or removal of bank armoring
	Restore banklines with LWD - bioengineering

Category	Action types
Water Quality and Quantity	Acquire instream flows (lease or purchase)
	Improve thermal refugia
	Irrigation system upgrades – water management
	Reduce or mitigate point-source effects
	Upland vegetation treatment – management
	Road decommissioning or abandonment
	Road grading and drainage improvements

Once appropriate action types are identified for priority reaches, we will then rank the action types. Below we describe the process of ranking restoration action types and reaches for protection.

Restoration Actions: Based on our scoring criteria for evaluating restoration project proposals, we identified four indicators for ranking habitat actions within priority reaches (Table 7).

Table 7. Indicators and scores for prioritizing restoration actions within each reach. Benefits refer to fish.

Indicators	Score	Definition
Benefit	1	Action will provide no immediate or long-term benefit.
	3	Action will provide some immediate benefit but no long-term benefit.
	5	Action will provide immediate and long-term benefit.
Improves natural processes	1	Action does little to promote natural processes within the reach.
	3	Action partially improves natural processes within the reach.
	5	Action fully restores natural processes within the reach.
Size of action effect	1	Action addresses <30% of the limiting factor within the reach.
	3	Action addresses 30-70% of the limiting factor within the reach.
	5	Action address >70% of the limiting factor within the reach.
Ameliorates climate change effects	1	Action will not ameliorate the effects of climate change.
	3	Action will partially ameliorate the effects of climate change.
	5	Action will ameliorate the effects of climate change.

Indicators will be weighted based on their overall importance. Total scores will be calculated by summing the product of each indicator score by its weight. These scores will then be sorted from highest to lowest, with the highest scores indicating highest priority projects.

Protection Actions: Based on our scoring criteria for evaluating protection project proposals, we identified six indicators for ranking reaches for protection (Table 8). This level of ranking further refines the prioritization of reaches described above.

Table 8. Indicators and scores for prioritizing reaches for protection.

Indicators	Score	Definition
Ownership	1	Reach is entirely on public lands.
	3	Reach is a mix of private and public lands.
	5	Reach is entirely on private lands.
Size of area to be protected	1	Area to be protected makes up <30% of the reach.
	3	Area to be protected makes up 30-70% of the reach.
	5	Area to be protected makes up >70% of the reach.
Connection with other protected areas	1	Area to be protected is disconnected with other protected parcels.
	3	Area to be protected is partially connected with other protected parcels.
	5	Area to be protected is completely connected with other protected parcels.
Risk of degradation	1	There is no risk that the area will be degraded.
	3	There is an intermediate or unknown risk that the area will be degraded.
	5	There is a high risk that the area will be degraded.
Presence of upstream degradation	1	Extensive degradation upstream will degrade the area to be protected.
	3	Degradation upstream will have intermediate effects on the area to be protected.
	5	There is no degradation upstream that will degrade the area to be protected.
Sustains natural processes	1	Area to be protected does not sustain natural processes.
	3	Area to be protected partially sustains natural processes.
	5	Area to be protected sustains natural processes.

Indicators will be weighted based on their overall importance. Total scores will be calculated by summing the product of each indicator score by its weight. These scores will then be sorted from highest to lowest, with the highest scores indicating highest priority projects.

EDT Modeling

The current EDT model in the Okanogan River basin and the forthcoming model run for the Methow River basin will provide output that accounts for most of the indicators identified in Step 2. For areas with EDT, we will use:

1. Percent of template function: Current limiting factor performance relative to the EDT template in the Assessment Unit.
2. Relative weight: The proportion of negative productivity impacts relative to the EDT template that are attributable to the limiting factor in the Assessment Unit.
3. Template abundance: Adult abundance potential in the Assessment Unit under template conditions.

These parameters are combined to produce a limiting factor priority score using the following equation:

$$Priority\ Score = \frac{pT}{W} * TNeq$$

Where: pT = Percent of template function

W = Relative weight

$TNeq$ = Template adult abundance

This formula produces an individual priority score for each limiting factor by Assessment Unit that reflects its importance relative to all other limiting factors across Assessment Units. It considers the current condition of each limiting factor, the potential improvements in habitat performance with restoration, and the overall restoration potential of each assessment unit. The priority scores can range across three to four orders of magnitude, allowing the user to easily differentiate which limiting factors are most important.

Step 3: Feasibility Assessment

Results from Steps 1 and 2 provide high priority action types within high priority reaches and AUs based on biological benefit. To this point, feasibility of implementing projects has not been considered. In the final step in the prioritization process, we will work with the IT, WATs, and others to assess the feasibility of implementing the ranked restoration and protection actions. Using the prioritized list of restoration and protection actions for each priority reach, we will evaluate feasibility using the following possible indicators:

- Landowner Willingness – Landowner willingness may preclude the implementation of certain action types within an assessment unit. This criterion applies to private lands within the assessment unit.
- Public Willingness – Members of the community may object to proposed actions on public lands if the proposed actions interfere with other public activities (e.g., members of the community may object to road decommissioning if it reduces motorized recreational opportunities).
- Land-use Constraints – Current infrastructure such as roads/railways, businesses, homes, etc. may preclude implementation of certain action types.
- Cost Effectiveness – The cost of an action relative to its benefit may reduce the ranking of an action type (Box 4.1 on pages 113-114 in ISAB (2018) provides a simplified framework for evaluating cost effectiveness).
- Probability of Success – The complexity of an action type may preclude its implementation.
- Partnership Capacity – Without partners, a project sponsor may lack the ability (e.g., quantity and quality of professionals) to design, implement, and adaptively manage the proposed actions.
- Regulatory Constraints – Regulatory issues such as permitting may make some actions more difficult to implement than others.

- Societal Issues – Some action types may be more difficult to implement because of societal issues such as conflicts with recreational activities or reintroduction of beavers into agricultural areas.

We will then develop a scoring and weighting system that can be used to sequence restoration and protection actions within priority reaches. As before, total scores will be calculated by summing the product of each indicator score by its weight. These scores will then be sorted from highest to lowest, with the highest scores indicating highest priority. Because feasibility can change rapidly, a reevaluation of actions should occur at least annually.

Final Product

The result of the prioritization process will be a list of high priority actions to be implemented within high priority areas (priority reaches within priority assessment units) for each subbasin. Importantly, the prioritization process will not describe how specific actions are to be implemented. For example, within a specific reach, we may identify a levee as the cause of a disconnected floodplain that currently limits abundance or survival for a critical salmonid life stage. In this case, we will not state where or how the levee should be breached or removed. Rather, we will note that the levee needs to be addressed in order to restore off-channel connectivity and to improve habitat conditions for a critical life stage. Thus, project sponsors and their engineers will identify the best way to implement the priority action. The results of the prioritization process will be in GIS and housed on the Upper Columbia Salmon Recovery Board website.

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Attachment 1: Assessment Unit Prioritization Tables

Spring Chinook Salmon

Indicators, definitions, scoring rules, relevance to prioritizing areas, and data sources for protection.

Indicator	Definition	Scoring Rules	Relevance	Data Source
Assessment Unit Condition Indicators				
Intrinsic potential *(weight = 0.10)*	Percent of intrinsic potential currently occupied within an assessment unit.	5 = >80% of IP occupied 4 = 61-80% 3 = 41-60% 2 = 21-40% 1 = 1-20%	Chinook that occupy a larger proportion of their intrinsic potential will have an increased likelihood of persistence.	Intrinsic Potential Maps, Current Distribution Maps (StreamNet)
Major and minor spawning areas *(weight = 0.10)*	Assessment unit includes major (MSA) or minor (mSA) spawning areas identified in the recovery plan.	5 = AU includes MSA 3 = AU includes mSA 1 = AU includes no MSA or mSA	Chinook that occupy the major and minor spawning areas identified in the recovery plan will have an increased likelihood of persistence.	Maps of mSA and MSA
Population Integrity Indicators				
Life-history diversity *(weight = 0.10)*	Number of life history forms present as compared to presumed historical conditions.	5 = All life histories present 3 = Two or more life histories present but at least one absent 1 = One life history present; others absent	Loss of life-history forms (e.g., summer and winter rearing in natal areas, fall migrants, and late-spring/early-summer migrants) increases risk of extirpation and may reduce genetic diversity.	Fish Monitoring Data (ISEMP, Hatchery M&E, OBMEP)
Spawner abundance *(weight = 0.10)*	Number of natural-origin spawning adult Chinook salmon per stream length.	5 = >16 spawners/km 4 = 13-16 spawners/km 3 = 9-12 spawners/km	AUs with low densities of spawning Chinook are more vulnerable to extirpation.	Spawning Ground Surveys (Hatchery M&E, ISEMP, OBMEP)

Indicator	Definition	Scoring Rules	Relevance	Data Source
		2 = 5-8 spawners/km 1 = 0-4 spawners/km		
Juvenile presence *(weight = 0.10)*	The presence of natural-origin juvenile Chinook salmon during summer, winter, or both.	5 = Presence of juveniles during summer and winter 3 = Presence of juveniles during summer or winter 1 = Juveniles absent during summer and winter	AUs supporting juvenile Chinook salmon during summer and winter increases spatial structure and diversity.	Juvenile surveys (Hatchery M&E, ISEMP, OBMEP)
Habitat Integrity Indicators				
Habitat quality *(weight = 0.10)*	Habitat quality for adult holding, spawning/incubation, summer rearing, and/or winter rearing is similar to historical habitat conditions. Given the lack of information on historical conditions, potential or template habitat conditions can be used.	5 = ≤20% of potential habitat quality has been lost 4 = 21-40% of potential habitat quality has been lost 3 = 41-60% of potential habitat quality has been lost 2 = 61-80% of potential habitat quality has been lost 1 = >80% of potential habitat quality has been lost	Loss of habitat quality increases risk of extirpation and loss of life-history diversity.	HSI, Life-Cycle Models, ISEMP, EDT, CHaMP, Expert Panel, PFC
Area of assessment unit degraded *(weight = 0.10)*	Amount of AU that has been altered by land use activities.	5 = Amount of land converted <20% 4 = 20-40% 3 = 41-60% 2 = 61-80% 1 = >80%	Conversion of lands from natural habitats reduces habitat quality and availability.	National Land Cover Database (1:100k), USGS Landsat Imagery, National Agriculture Imagery Program (NAIP), USFS Watershed Condition Framework
Land stewardship *(weight = 0.10)*	Area of federal or state lands with regulatory or congressionally-established habitat protections and	5 = >75% of AU in protected status 4 = 50-75% protected 3 = 26-50% protected 2 = 1-25% protected 1 = no protected habitat	AUs with higher proportions of protected lands typically support higher quality habitat than do other lands.	County Ownership Maps

Indicator	Definition	Scoring Rules	Relevance	Data Source
	conservation acquisitions and easements.			
Future Security Indicators				
Climate change *(weight = 0.10)*	Areas sensitive to climate change will experience changes in hydrologic regimes (snow-dominated to transitional or transitional to rain-dominated), increased exposure to flood events, increased mean August temperatures, and reduced summer water availability.	5 = No hydrologic regime shift within or upstream from AU; small change in flood events; increase in mean August temperature Z-score <0.5; decrease in mean summer low flow Z-score <0.5 3 = Hydrologic regime shift within but not upstream from AU; moderate change in flood events; increase in mean August temperature Z-score 0.5-1.5; decrease in mean summer low flow Z-score 0.5-1.5 1 = Hydrologic regime shift within and upstream of AU; large change in flood events; increase in mean August temperature Z-score >1.5; decrease in mean summer low flow Z-score >1.5	Climate change is likely to threaten Chinook because of warmer water temperatures, changes in peak flows, and increased frequency and intensity of disturbances such as flood and wildfires.	NorWeST Database, EPA Layers; USGS Models
Non-native fish species *(weight = 0.10)*	Future vulnerability to introduced fish species (including Chinook salmon from other ESUs) determined as a function of occurrences of introduced species.	5 = Threats minor or nonexistent 4 = Non-native species present downstream or upstream of AU but chance of spread is low 3 = Non-native species present downstream or upstream of AU but chance of spread is moderate 2 = Non-native species present downstream or upstream of AU and change of spread is high 1 = Non-native species in AU and their chance of spreading is high	Introduced fish species are likely to reduce native populations through predation, competition, hybridization, and the introduction of non-native parasites and pathogens	Hatchery M&E, ISEMP, OBMEP, Angler/Creel Surveys

Spring Chinook Salmon

Indicators, definitions, scoring rules, relevance to prioritizing areas, and data sources for restoration.

Indicator	Definition	Scoring Rules	Relevance	Data Source
Assessment Unit Condition Indicators				
Intrinsic potential *(weight = 0.10)*	Percent of intrinsic potential currently occupied within an assessment unit.	5 = 1-20% of IP occupied 4 = 21-40% 3 = 41-60% 2 = 61-80% 1 = >80%	Chinook that occupy a larger proportion of their intrinsic potential will have an increased likelihood of persistence.	Intrinsic Potential Maps, Current Distribution Maps (StreamNet)
Major and minor spawning areas *(weight = 0.10)*	Assessment unit includes major (MSA) or minor (mSA) spawning areas identified in the recovery plan.	5 = AU includes MSA 3 = AU includes mSA 1 = AU includes no MSA or mSA	Chinook that occupy the major and minor spawning areas identified in the recovery plan will have an increased likelihood of persistence.	Maps of mSA and MSA
Population Integrity Indicators				
Life-history diversity *(weight = 0.10)*	Number of life history forms present as compared to presumed historical conditions.	5 = One life history present; others absent 3 = Two or more life histories present but at least one absent 1 = All life histories present	Loss of life-history forms (e.g., summer and winter rearing in natal areas, fall migrants, and late-spring/early-summer migrants) increases risk of extirpation and may reduce genetic diversity.	Fish Monitoring Data (ISEMP, Hatchery M&E, OBMEP)
Spawner abundance *(weight = 0.10)*	Number of natural-origin spawning adult Chinook salmon per stream length.	5 = 0-4 spawners/km 4 = 5-8 spawners/km 3 = 9-12 spawners/km 2 = 13-16 spawners/km 1 = >16 spawners/km	AUs with low densities of spawning Chinook are more vulnerable to extirpation.	Spawning Ground Surveys (Hatchery M&E, ISEMP, OBMEP)

Indicator	Definition	Scoring Rules	Relevance	Data Source
Juvenile presence *(weight = 0.10)*	The presence of natural-origin juvenile Chinook salmon during summer, winter, or both.	5 = IP but no summer or winter rearing 3 = IP with summer or winter rearing but not both 1 = IP with both summer and winter rearing	AUs supporting juvenile Chinook salmon during summer and winter increases spatial structure and diversity.	Juvenile surveys (Hatchery M&E, ISEMP, OBMEP)
Habitat Integrity Indicators				
Habitat quality *(weight = 0.10)*	Habitat quality for adult holding, spawning/incubation, summer rearing, and/or winter rearing is similar to historical habitat conditions. Given the lack of information on historical conditions, potential or template habitat conditions can be used.	5 = 41-60% of potential habitat quality has been lost 4 = 21-40% of potential habitat quality has been lost 3 = 61-80% of potential habitat quality has been lost 2 = >80% of potential habitat quality has been lost 1 = ≤20% of potential habitat quality has been lost	Loss of habitat quality increases risk of extirpation and loss of life-history diversity.	HSI, Life-Cycle Models, ISEMP, EDT, CHaMP, Expert Panel, PFC
Area of assessment unit degraded *(weight = 0.10)*	Amount of AU that has been altered by land use activities.	5 = 41-60% of land converted 4 = 20-40% 3 = 61-80% 2 = >80% 1 = <20%	Conversion of lands from natural habitats reduces habitat quality and availability.	National Land Cover Database (1:100k), USGS Landsat Imagery, National Agriculture Imagery Program (NAIP), USFS Watershed Condition Framework
Land stewardship *(weight = 0.10)*	Area of federal or state lands with regulatory or congressionally-established habitat protections and conservation acquisitions and easements.	5 = ≥75% of AU in protected status 4 = 51-75% protected 3 = 26-50% protected 2 = 1-25% protected 1 = no protected habitat	AUs with higher proportions of protected lands typically support higher quality habitat than do other lands.	County Ownership Maps

Indicator	Definition	Scoring Rules	Relevance	Data Source
Future Security Indicators				
Climate change *(weight = 0.10)*	Areas sensitive to climate change will experience changes in hydrologic regimes (snow-dominated to transitional or transitional to rain-dominated), increased exposure to flood events, increased mean August temperatures, and reduced summer water availability.	5 = Hydrologic regime shift within but not upstream from AU; moderate change in flood events; increase in mean August temperature Z-score 0.5-1.5; decrease in mean summer low flow Z-score 0.5-1.5 3 = No hydrologic regime shift within or upstream from AU; small change in flood events; increase in mean August temperature Z-score <0.5; decrease in mean summer low flow Z-score <0.5 1 = Hydrologic regime shift within and upstream of AU; large change in flood events; increase in mean August temperature Z-score >1.5; decrease in mean summer low flow Z-score >1.5	Climate change is likely to threaten Chinook because of warmer water temperatures, changes in peak flows, and increased frequency and intensity of disturbances such as flood and wildfires.	NorWeST Database, EPA Layers; USGS Models
Non-native fish species *(weight = 0.10)*	Future vulnerability to introduced fish species (including Chinook salmon from other ESUs) determined as a function of occurrences of introduced species.	5 = Threats minor or nonexistent 4 = Non-native species present downstream or upstream of AU but chance of spread is low 3 = Non-native species present downstream or upstream of AU but chance of spread is moderate 2 = Non-native species present downstream or upstream of AU and change of spread is high 1 = Non-native species in AU and their chance of spreading is high	Introduced fish species are likely to reduce native populations through predation, competition, hybridization, and the introduction of non-native parasites and pathogens	Hatchery M&E, ISEMP, OBMEP, Angler/Creel Surveys

Steelhead

Indicators, definitions, scoring rules, relevance to prioritizing areas, and data sources for protection.

Indicator	Definition	Scoring Rules	Relevance	Data Source
Assessment Unit Condition Indicators				
Intrinsic potential *(weight = 0.10)*	Percent of intrinsic potential currently occupied within an assessment unit.	5 = >80% of IP occupied 4 = 61-80% 3 = 41-60% 2 = 21-40% 1 = 1-20%	*O. mykiss* (anadromous and resident) that occupy a larger proportion of their intrinsic potential will have an increased likelihood of persistence.	Intrinsic Potential Maps, Current Distribution Maps (StreamNet)
Major and minor spawning areas *(weight = 0.10)*	Assessment unit includes major (MSA) or minor (mSA) spawning areas identified in the recovery plan.	5 = AU includes MSA 3 = AU includes mSA 1 = AU includes no MSA or mSA	Anadromous *O. mykiss* that occupy the major and minor spawning areas identified in the recovery plan will have an increased likelihood of persistence.	Maps of mSA and MSA
Population Integrity Indicators				
Life-history diversity *(weight = 0.10)*	Number of life history forms present as compared to presumed historical conditions.	5 = All life histories present 3 = Two or more life histories present but at least one absent 1 = One life history present; others absent	Loss of life-history forms (e.g., anadromous, resident, and ages-at-migration) increases risk of extirpation and may reduce genetic diversity.	Fish Monitoring Data (ISEMP, Hatchery M&E, OBMEP)
Spawner abundance *(weight = 0.10)*	Number of natural-origin spawning adult steelhead per stream length.	5 = >16 spawners/km 4 = 13-16 spawners/km 3 = 9-12 spawners/km 2 = 5-8 spawners/km 1 = 0-4 spawners/km	AUs with low densities of spawning anadromous *O. mykiss* are more vulnerable to extirpation.	Spawning Ground Surveys (Hatchery M&E, ISEMP, OBMEP)
Juvenile presence *(weight = 0.10)*	The presence of natural-origin juvenile steelhead	5 = Presence of juveniles during summer and winter	AUs supporting juvenile steelhead during summer	Juvenile surveys (Hatchery M&E, ISEMP, OBMEP)

Indicator	Definition	Scoring Rules	Relevance	Data Source
	during summer, winter, or both.	3 = Presence of juveniles during summer or winter 1 = Juveniles absent during summer and winter	and winter increases spatial structure and diversity.	
Habitat Integrity Indicators				
Habitat quality *(weight = 0.10)*	Habitat quality for adult holding, spawning/incubation, summer rearing, and/or winter rearing is similar to historical habitat conditions. Given the lack of information on historical conditions, potential or template habitat conditions can be used.	5 = ≤20% of potential habitat quality has been lost 4 = 21-40% of potential habitat quality has been lost 3 = 41-60% of potential habitat quality has been lost 2 = 61-80% of potential habitat quality has been lost 1 = >80% of potential habitat quality has been lost	Loss of habitat quality increases risk of extirpation and loss of life-history diversity.	HSI, Life-Cycle Models, ISEMP, EDT, CHaMP, Expert Panel, PFC
Area of assessment unit degraded *(weight = 0.10)*	Amount of AU that has been altered by land use activities.	5 = Amount of land converted <20% 4 = 20-40% 3 = 41-60% 2 = 61-80% 1 = >80%	Conversion of lands from natural habitats reduces habitat quality and availability.	National Land Cover Database (1:100k), USGS Landsat Imagery, National Agriculture Imagery Program (NAIP), USFS Watershed Condition Framework
Land stewardship *(weight = 0.10)*	Area of federal or state lands with regulatory or congressionally-established habitat protections and conservation acquisitions and easements.	5 = >75% of AU in protected status 4 = 50-75% protected 3 = 26-50% protected 2 = 1-25% protected 1 = no protected habitat	AUs with higher proportions of protected lands typically support higher quality habitat than do other lands.	County Ownership Maps
Future Security Indicators				

Indicator	Definition	Scoring Rules	Relevance	Data Source
Climate change *(weight = 0.10)*	Areas sensitive to climate change will experience changes in hydrologic regimes (snow-dominated to transitional or transitional to rain-dominated), increased exposure to flood events, increased mean August temperatures, and reduced summer water availability.	5 = No hydrologic regime shift within or upstream from AU; small change in flood events; increase in mean August temperature Z-score <0.5; decrease in mean summer low flow Z-score <0.5 3 = Hydrologic regime shift within but not upstream from AU; moderate change in flood events; increase in mean August temperature Z-score 0.5-1.5; decrease in mean summer low flow Z-score 0.5-1.5 1 = Hydrologic regime shift within and upstream of AU; large change in flood events; increase in mean August temperature Z-score >1.5; decrease in mean summer low flow Z-score >1.5	Climate change is likely to threaten *O. mykiss* because of warmer water temperatures, changes in peak flows, and increased frequency and intensity of disturbances such as flood and wildfires.	NorWeST Database, EPA Layers; USGS Models
Non-native fish species *(weight = 0.10)*	Future vulnerability to introduced fish species (including steelhead from other DPSs) determined as a function of occurrences of introduced species.	5 = Threats minor or nonexistent 4 = Non-native species present downstream or upstream of AU but chance of spread is low 3 = Non-native species present downstream or upstream of AU but chance of spread is moderate 2 = Non-native species present downstream or upstream of AU and change of spread is high 1 = Non-native species in AU and their chance of spreading is high	Introduced fish species are likely to reduce native populations through predation, competition, hybridization, and the introduction of non-native parasites and pathogens	Hatchery M&E, ISEMP, OBMEP, Angler/Creel Surveys

Steelhead

Indicators, definitions, scoring rules, relevance to prioritizing areas, and data sources for restoration.

Indicator	Definition	Scoring Rules	Relevance	Data Source
Assessment Unit Condition Indicators				
Intrinsic potential *(weight = 0.10)*	Percent of intrinsic potential currently occupied within an assessment unit.	5 = 1-20% of IP occupied 4 = 21-40% 3 = 41-60% 2 = 61-80% 1 = >80%	*O. mykiss* (anadromous and resident) that occupy a larger proportion of their intrinsic potential will have an increased likelihood of persistence.	Intrinsic Potential Maps, Current Distribution Maps (StreamNet)
Major and minor spawning areas *(weight = 0.10)*	Assessment unit includes major (MSA) or minor (mSA) spawning areas identified in the recovery plan.	5 = AU includes MSA 3 = AU includes mSA 1 = AU includes no MSA or mSA	Anadromous *O. mykiss* that occupy the major and minor spawning areas identified in the recovery plan will have an increased likelihood of persistence.	Maps of mSA and MSA
Population Integrity Indicators				
Life-history diversity *(weight = 0.10)*	Number of life history forms present as compared to presumed historical conditions.	5 = One life history present; others absent 3 = Two or more life histories present but at least one absent 1 = All life histories present	Loss of life-history forms (e.g., anadromous, resident, ages-at-migration) increases risk of extirpation and may reduce genetic diversity.	Fish Monitoring Data (ISEMP, Hatchery M&E, OBMEP)
Spawner abundance *(weight = 0.10)*	Number of natural-origin spawning adult Chinook salmon per stream length.	5 = 0-4 spawners/km 4 = 5-8 spawners/km 3 = 9-12 spawners/km 2 = 13-16 spawners/km 1 = >16 spawners/km	AUs with low densities of spawning anadromous *O. mykiss* are more vulnerable to extirpation.	Spawning Ground Surveys (Hatchery M&E, ISEMP, OBMEP)
Juvenile presence *(weight = 0.10)*	The presence of natural-origin juvenile steelhead	5 = IP but no summer or winter rearing	AUs supporting juvenile steelhead during summer	Juvenile surveys (Hatchery M&E, ISEMP, OBMEP)

Indicator	Definition	Scoring Rules	Relevance	Data Source
	during summer, winter, or both.	3 = IP with summer or winter rearing but not both 1 = IP with both summer and winter rearing	and winter increases spatial structure and diversity.	
Habitat Integrity Indicators				
Habitat quality *(weight = 0.10)*	Habitat quality for adult holding, spawning/incubation, summer rearing, and/or winter rearing is similar to historical habitat conditions. Given the lack of information on historical conditions, potential or template habitat conditions can be used.	5 = 41-60% of historical habitat quality has been lost 4 = 21-40% of historical habitat quality has been lost 3 = 61-80% of historical habitat quality has been lost 2 = >80% of historical habitat quality has been lost 1 = ≤20% of historical habitat quality has been lost	Loss of habitat quality increases risk of extirpation and loss of life-history diversity.	HSI, Life-Cycle Models, ISEMP, EDT, CHaMP, Expert Panel, PFC
Area of assessment unit degraded *(weight = 0.10)*	Amount of AU that has been altered by land use activities.	5 = 41-60% of land converted 4 = 20-40% 3 = 61-80% 2 = >80% 1 = <20%	Conversion of lands from natural habitats reduces habitat quality and availability.	National Land Cover Database (1:100k), USGS Landsat Imagery, National Agriculture Imagery Program (NAIP), USFS Watershed Condition Framework
Land stewardship *(weight = 0.10)*	Area of federal or state lands with regulatory or congressionally-established habitat protections and conservation acquisitions and easements.	5 = ≥75% of AU in protected status 4 = 51-75% protected 3 = 26-50% protected 2 = 1-25% protected 1 = no protected habitat	AUs with higher proportions of protected lands typically support higher quality habitat than do other lands.	County Ownership Maps
Future Security Indicators				

Indicator	Definition	Scoring Rules	Relevance	Data Source
Climate change *(weight = 0.10)*	Areas sensitive to climate change will experience changes in hydrologic regimes (snow-dominated to transitional or transitional to rain-dominated), increased exposure to flood events, increased mean August temperatures, and reduced summer water availability.	5 = Hydrologic regime shift within but not upstream from AU; moderate change in flood events; increase in mean August temperature Z-score 0.5-1.5; decrease in mean summer low flow Z-score 0.5-1.5 3 = No hydrologic regime shift within or upstream from AU; small change in flood events; increase in mean August temperature Z-score <0.5; decrease in mean summer low flow Z-score <0.5 1 = Hydrologic regime shift within and upstream of AU; large change in flood events; increase in mean August temperature Z-score >1.5; decrease in mean summer low flow Z-score >1.5	Climate change is likely to threaten *O. mykiss* because of warmer water temperatures, changes in peak flows, and increased frequency and intensity of disturbances such as flood and wildfires.	NorWeST Database, EPA Layers; USGS Models
Non-native fish species *(weight = 0.10)*	Future vulnerability to introduced fish species (including steelhead from other DPSs) determined as a function of occurrences of introduced species.	5 = Threats minor or nonexistent 4 = Non-native species present downstream or upstream of AU but chance of spread is low 3 = Non-native species present downstream or upstream of AU but chance of spread is moderate 2 = Non-native species present downstream or upstream of AU and change of spread is high 1 = Non-native species in AU and their chance of spreading is high	Introduced fish species are likely to reduce native populations through predation, competition, hybridization, and the introduction of non-native parasites and pathogens	Hatchery M&E, ISEMP, OBMEP, Angler/Creel Surveys

Bull Trout

Indicators, definitions, scoring rules, relevance to prioritizing areas, and data sources for <u>protection</u>.

Indicator	Definition	Scoring Rules	Relevance	Data Source
Assessment Unit Condition Indicators				
Percent of historical range occupied *(weight = 0.10)*	Percent of historical range within an AU currently occupied.	5 = >80% of historical range occupied 4 = 61-80% 3 = 41-60% 2 = 21-40% 1 = 1-20%	Bull trout that occupy a larger proportion of their historical range will have an increased likelihood of persistence.	
Important spawning areas *(weight = 0.10)*	Assessment unit includes important spawning areas identified in the recovery plan.	5 = 3 = 1 =	Bull trout that occupy important spawning areas identified in the recovery plan will have an increased likelihood of persistence.	
Population Integrity Indicators				
Life-history diversity *(weight = 0.10)*	Number of life history forms present as compared to presumed historical conditions.	5 = All life histories present 3 = One life history present; others absent 1 = Bull trout are locally extirpated	Loss of life-history forms (e.g., resident, fluvial, and adfluvial) increases risk of extirpation and may reduce genetic diversity.	
Spawner abundance *(weight = 0.10)*	Number of natural-origin spawning bull trout per stream length.	5 = >? spawners/km 4 = ?-? spawners/km 3 = ?-? spawners/km 2 = ?-? spawners/km 1 = 0-? spawners/km	AUs with low densities of spawning bull trout are more vulnerable to extirpation.	
Juvenile presence *(weight = 0.10)*	The presence of natural-origin juvenile bull trout during summer, winter, or both.	5 = Presence of juveniles during summer and winter 3 = Presence of juveniles during summer or winter	AUs supporting juvenile bull trout during summer and winter increases spatial structure and diversity.	Juvenile surveys (Hatchery M&E, ISEMP, OBMEP)

Indicator	Definition	Scoring Rules	Relevance	Data Source
		1 = Juveniles absent during summer and winter		
Habitat Integrity Indicators				
Habitat quality *(weight = 0.10)*	Habitat quality for adult holding, spawning/incubation, summer rearing, and/or winter rearing is similar to historical habitat conditions.	5 = ≤20% of historical habitat quality has been lost 4 = 21-40% of historical habitat quality has been lost 3 = 41-60% of historical habitat quality has been lost 2 = 61-80% of historical habitat quality has been lost 1 = >80% of historical habitat quality has been lost	Loss of habitat quality increases risk of extirpation and loss of life-history diversity.	
Area of assessment unit degraded *(weight = 0.10)*	Amount of AU that has been altered by land use activities.	5 = Amount of land converted <20% 4 = 20-40% 3 = 41-60% 2 = 61-80% 1 = >80%	Conversion of lands from natural habitats reduces habitat quality and availability.	
Land stewardship *(weight = 0.10)*	Area of federal or state lands with regulatory or congressionally-established habitat protections and conservation acquisitions and easements.	5 = >75% of AU in protected status 4 = 50-75% protected 3 = 26-50% protected 2 = 1-25% protected 1 = no protected habitat	AUs with higher proportions of protected lands typically support higher quality habitat than do other lands.	
Future Security Indicators				
Climate change *(weight = 0.10)*	Areas sensitive to climate change will experience changes in hydrologic regimes (snow-dominated to transitional or transitional to rain-	5 = No hydrologic regime shift within or upstream from AU; small change in flood events; increase in mean August temperature Z-score <0.5; decrease in mean summer low flow Z-score <0.5	Climate change is likely to threaten bull trout because of warmer water temperatures, changes in peak flows, and increased frequency and intensity of	

Indicator	Definition	Scoring Rules	Relevance	Data Source
	dominated), increased exposure to flood events, increased mean August temperatures, and reduced summer water availability.	3 = Hydrologic regime shift within but not upstream from AU; moderate change in flood events; increase in mean August temperature Z-score 0.5-1.5; decrease in mean summer low flow Z-score 0.5-1.5 1 = Hydrologic regime shift within and upstream of AU; large change in flood events; increase in mean August temperature Z-score >1.5; decrease in mean summer low flow Z-score >1.5	disturbances such as flood and wildfires.	
Non-native fish species *(weight = 0.10)*	Future vulnerability to introduced fish species (e.g., brook trout) determined as a function of occurrences of introduced species.	5 = Threats minor or nonexistent 4 = Non-native species present downstream or upstream of AU but chance of spread is low 3 = Non-native species present downstream or upstream of AU but chance of spread is moderate 2 = Non-native species present downstream or upstream of AU and change of spread is high 1 = Non-native species in AU and their chance of spreading is high	Introduced fish species are likely to reduce bull trout populations through predation, competition, hybridization, and the introduction of non-native parasites and pathogens	

Bull Trout

Indicators, definitions, scoring rules, relevance to prioritizing areas, and data sources for restoration.

Indicator	Definition	Scoring Rules	Relevance	Data Source
Assessment Unit Condition Indicators				
Percent of historical range occupied *(weight = 0.10)*	Percent of historical range within an AU currently occupied.	5 = 1-20% of historical range occupied 4 = 21-40% 3 = 41-60% 2 = 61-80% 1 = >80%	Bull trout that occupy a larger proportion of their historical range will have an increased likelihood of persistence.	
Important spawning areas *(weight = 0.10)*	Assessment unit includes important spawning areas identified in the recovery plan.	5 = 3 = 1 =	Bull trout that occupy important spawning areas identified in the recovery plan will have an increased likelihood of persistence.	
Population Integrity Indicators				
Life-history diversity *(weight = 0.10)*	Number of life history forms present as compared to presumed historical conditions.	5 = One life history present; others absent 3 = All life histories present 1 = Bull trout are locally extirpated	Loss of life-history forms (e.g., resident, fluvial, and adfluvial) increases risk of extirpation and may reduce genetic diversity.	
Spawner abundance *(weight = 0.10)*	Number of natural-origin spawning bull trout per stream length.	5 = >? spawners/km 4 = ?-? spawners/km 3 = ?-? spawners/km 2 = ?-? spawners/km 1 = 0-? spawners/km	AUs with low densities of spawning bull trout are more vulnerable to extirpation.	
Juvenile presence *(weight = 0.10)*	The presence of natural-origin juvenile bull trout during summer, winter, or both.	5 = IP but no summer or winter rearing 3 = IP with summer or winter rearing but not both	AUs supporting juvenile bull trout during summer and winter increases spatial structure and diversity.	Juvenile surveys (Hatchery M&E, ISEMP, OBMEP)

Indicator	Definition	Scoring Rules	Relevance	Data Source
		1 = IP with both summer and winter rearing		
Habitat Integrity Indicators				
Habitat quality *(weight = 0.10)*	Habitat quality for adult holding, spawning/incubation, summer rearing, and/or winter rearing is similar to historical habitat conditions.	5 = 41-60% of historical habitat quality has been lost 4 = 21-40% of historical habitat quality has been lost 3 = 61-80% of historical habitat quality has been lost 2 = >80% of historical habitat quality has been lost 1 = ≤20% of historical habitat quality has been lost	Loss of habitat quality increases risk of extirpation and loss of life-history diversity.	
Area of assessment unit degraded *(weight = 0.10)*	Amount of AU that has been altered by land use activities.	5 = 41-60% of land converted 4 = 20-40% 3 = 61-80% 2 = >80% 1 = <20%	Conversion of lands from natural habitats reduces habitat quality and availability.	
Land stewardship *(weight = 0.10)*	Area of federal or state lands with regulatory or congressionally-established habitat protections and conservation acquisitions and easements.	5 = ≥75% of AU in protected status 4 = 51-75% protected 3 = 26-50% protected 2 = 1-25% protected 1 = no protected habitat	AUs with higher proportions of protected lands typically support higher quality habitat than do other lands.	
Future Security Indicators				
Climate change *(weight = 0.10)*	Areas sensitive to climate change will experience changes in hydrologic regimes (snow-dominated to transitional or transitional to rain-	5 = Hydrologic regime shift within but not upstream from AU; moderate change in flood events; increase in mean August temperature Z-score 0.5-1.5; decrease in mean summer low flow Z-score 0.5-1.5	Climate change is likely to threaten bull trout because of warmer water temperatures, changes in peak flows, and increased frequency and intensity of	

Indicator	Definition	Scoring Rules	Relevance	Data Source
	dominated), increased exposure to flood events, increased mean August temperatures, and reduced summer water availability.	3 = No hydrologic regime shift within or upstream from AU; small change in flood events; increase in mean August temperature Z-score <0.5; decrease in mean summer low flow Z-score <0.5 1 = Hydrologic regime shift within and upstream of AU; large change in flood events; increase in mean August temperature Z-score >1.5; decrease in mean summer low flow Z-score >1.5	disturbances such as flood and wildfires.	
Non-native fish species *(weight = 0.10)*	Future vulnerability to introduced fish species (e.g., brook trout) determined as a function of occurrences of introduced species.	5 = Threats minor or nonexistent 4 = Non-native species present downstream or upstream of AU but chance of spread is low 3 = Non-native species present downstream or upstream of AU but chance of spread is moderate 2 = Non-native species present downstream or upstream of AU and change of spread is high 1 = Non-native species in AU and their chance of spreading is high	Introduced fish species are likely to reduce bull trout populations through predation, competition, hybridization, and the introduction of non-native parasites and pathogens	

Exhibit G

Wenatchee Subbasin		
AU Name	**HUC12**	**Available Information**
Rainy Creek	170200110109	
Lake Creek	170200110107	
Middle Little Wenatchee	170200110108	
Indian Creek	170200110101	
Upper Little Wenatchee	170200110106	
Brender Creek-Mission Creek	170200110604	
East Fork Mission Creek	170200110601	
Devil's Gulch	170200110602	
Sand Creek	170200110603	
Upper Peshastin Creek	170200110501	
Ingalls Creek	170200110502	
Derby Canyon-Wenatchee River	170200110706	
Chumstick Creek	170200110705	
Eagle Creek	170200110704	
Lower Icicle Creek	170200110406	
Jack Creek	170200110403	
French Creek	170200110402	
Upper Icicle Creek	170200110401	
Eightmile Creek	170200110405	
Chiwaukum Creek	170200110702	
Beaver Creek-Wenatchee River	170200110701	
Middle Chiwawa River	170200110305	
Rock Creek	170200110304	
Headwaters Chiwawa River	170200110301	
Phelps Creek	170200110302	
Lake Wenatchee	170200110111	
Chikamin Creek	170200110306	
Big Meadow Creek	170200110307	
Lower Little Wenatchee River	170200110110	
Lower White River	170200110105	
Panther Creek	170200110103	
Napeequa River	170200110104	
Nahahum Canyon-Wenatchee River	170200110708	
Ollala Canyon-Wenatchee River	170200110707	
Middle Icicle Creek	170200110404	
Tumwater Canyon-Wenatchee River	170200110703	
Upper Chiwawa River	170200110303	
Upper Nason Creek	170200110201	
Upper White River	170200110102	
Whitepine Creek	170200110202	
Beaver Creek	170200110701	
Leland Creek	not a huc12	
Skinney Creek	not a huc12	
Lower Peshastin	not a huc12	
Lower Chiwawa	not a huc12	
Lower Nason	not a huc12	
Upper Peshastin	not a huc12	
MAINSTEM Aus		
Lower Chiwawa Mainstem	Up to HUC12 boundary	
Lower Icicle Mainstem	Up to Hatchery/Harriett's Bridge	
Lower Nason Mainstem	Up to Butcher Creek	
Lower Peshastin Mainstem	Up to Ingalls Creek/HUC12 boundary	
Lower Wenatchee Mainstem 01	Up to HUC12 boundary	
Lower Wenatchee Mainstem 02	Up to Peshastin Creek confluence/HUC boundary	
Lower Wenatchee Mainstem 03	Up to HUC12 boundary	
Middle Chiwawa Mainstem	Up to Rock Creek/HUC12 boundary	
Middle Nason Mainstem	Up to Whitepine Creek/HUC12 boundary	
Tumwater Canyon Mainstem	Up to Chiwaukum Creek/HUC12 boundary	
Upper Icicle Mainstem	Up to French Creek/HUC12 boundary	
Upper Peshastin Mainstem	Up to Tronsen Creek/AU boundary	
Upper Wenatchee Mainstem	Up to Lake Wenatchee	

Entiat Subbasin		
AU Name	**HUC12**	**Available Information**
Spencer Canyon-Columbia River	170200100306	
Roaring Creek	170200100208	
Eagle Creek	170200110704	
Mills Creek-Entiat River	170200100209	
Tillicum Creek	170200100102	
Chumstick Creek	170200110705	
Byrd Canyon-Columbia River	170200100303	
Lower Mad River	170200100103	
Beaver Creek-Wenatchee River	170200110701	
Mud Creek	170200100206	
Johnson Creek	170200100301	
Potato Creek-Entiat River	170200100207	
First Creek-Lake Chelan	170200090304	
Lower Chiwawa River	170200110308	
Preston Creek-Entiat River	170200100205	
Upper Mad River	170200100101	
Twentyfivemile Creek	170200090301	
Lake Creek-Entiat River	170200100204	

Chikamin Creek	170200110306
Big Creek-Lake Chelan	170200090209
Three Creek-Entiat River	170200100202
Rock Creek	170200110304
North Fork Entiat River	170200100203
Lone Fir Creek-Lake Chelan	170200090207
Headwaters Entiat River	170200100201
Phelps Creek	170200110302
Lower Railroad Creek	170200090204
Bear Creek-Lake Chelan	170200090206
Upper Railroad Creek	170200090203
Swakane Creek	170200100305
MAINSTEM AUs	
Lower Entiat Mainstem	Up to Potato Creek
Upper Entiat Mainstem	Up to Falls/HUC 12 boundary
Mad River Mainstem	Up to end of anadromy

Methow Subbasin

AU Name	HUC 12	Available Information
Squaw Creek	170200080707	
Gold Creek	170200080704	
French Creek	170200080705	
Libby Creek	170200080701	
Eagle Creek	170200080505	
Buttermilk Creek	170200080506	
War Creek	170200080504	
South Creek	170200080502	
Little Bridge Creek	170200080508	
South Fork Beaver Creek	170200080606	
Bear Creek	170200080604	
Wolf Creek	170200080603	
Upper Beaver Creek	170200080607	
Cedar Creek	170200080203	
Early Winters Creek	170200080204	
Boulder Creek	170200080406	
Cub Creek	170200080407	
North Fork Boulder Creek	170200080405	
Goat Creek	170200080601	
Robinson Creek	170200080202	
Methow-Alder	170200080610	
Methow-Thompson	170200080605	
Methow-Fawn	170200080602	
Methow-Rattlesnake	170200080205	
WF Methow	170200080201	
Chewuch-Pearrygin	170200080408	
Twisp-Lower	170200080509	
Twisp-Middle	170200080507	
Twisp-Upper	170200080503	
Twisp-Headwaters	170200080501	
Twenty Mile Creek	170200080401	
Falls Creek	170200080402	
Eight Mile Creek	170200080404	
Eureka Creek	170200080103	
Lower Lost River	170200080104	
Lake Creek	170200080305	
Diamond Creek	170200080101	
Upper Lost River	170200080102	
Windy Creek	170200080302	
Andrews Creek	170200080304	
Black Canyon Creek	170200080708	
South Fork Gold Creek	170200080703	
Benson Creek	170200080609	
Lower Beaver Creek	170200080608	
Methow-Alta Coulee	170200080709	
Methow-McFarland	170200080706	
Methow-Texas	170200080702	
Chewuch-Doe	170200080403	
Chewuch-Thirtymile	170200080306	
Chewuch-Kay	170200080303	
Chewuch-Headwaters	170200080301	
Poorman Creek	Not a HUC12	
Reynolds Creek	Not a HUC12	
Frazer Creek	Not a HUC12	
MAINSTEM AUs		
Upper Chewuch Mainstem		
Middle Chewuch Mainstem	HUC12 boundary	
Lower Chewuch Mainstem	HUC12 boundary	
Upper Twisp Mainstem		
Middle Twisp Mainstem		
Lower Twip Mainstem		
Lower Methow 01		
Lower Methow 02		
Upper Methow 01		
Upper Methow 02		
Upper Methow 03		
Upper Methow 04	West Fork Methow Mainstem	