12c. Beaver Creek Passage Program Evaluation Proposal
In-Stream Passage

Applicants must respond to the following items. The local citizen and technical advisory groups will use the evaluation proposal to evaluate your project. Applicants should contact their lead entity for additional information that may be required.

Up to eight pages may be submitted for each project evaluation proposal.

(SUBMIT INFORMATION VIA PRISM ATTACHMENT PROCESS OR ON PAPER)

For prioritization questions or technical assistance, contact Dave Caudill at Department of Fish and Wildlife (WDFW) at (360) 902-2486 or at caudidsc@dfw.wa.gov. For engineering design questions or technical assistance, contact Pat Klavas at WDFW at (360) 902-2606 or at Klavajpk@dfw.wa.gov

NOTE: This information, along with information provided in Section 12d-WDFW Fish Passage Data Forms will be evaluated by WDFW and comments forwarded to the Review Panel for consideration.

For more details on the Beaver Creek Passage Program, please review the attached Beaver Creek Passage Program Project Report.

I. BACKGROUND

Describe the fish resources (number of species or unique populations), the current habitat conditions, and other current and historic factors important to understanding this project. Be specific—avoid general statements. When possible, document your sources of information by citing specific studies and reports.

The Upper Wenatchee Passage Program (UWPP) is a collaborative effort between Chelan County, the U.S. Forest Service (USFS) and the Bureau of Reclamation (Reclamation) to acquire funds to replace nine barrier culverts that interrupt adult and juvenile salmonid passage in the Chiwawa and Middle Wenatchee subwatersheds (Figure 3). The biological goal of the UWPP is to increase fish passage into Alder Creek, Clear Creek, Beaver Creek and Skinney Creek. The objectives include replacing 9 barrier culverts with fish-friendly structures to provide over 11 additional river miles (RM) of spawning and rearing habitat for Upper Columbia steelhead, spring Chinook and bull trout. Culverts were selected in groups or complexes to be replaced concurrently in order to increase the potential increment of habitat gain with each barrier correction. Beaver Creek is a tributary to the Middle Wenatchee, which has a known occurrence of all three ESA listed species (Table 2) and is listed as a Category 1 (UCRTT 2003). This application is proposing to replace 3 barrier culverts in Beaver Creek located in the Middle Wenatchee watershed to provide 2.99 RM of habitat.

Beaver Creek is a tributary of the Wenatchee River at RM 46.2, a few miles below the junction of the Wenatchee and Chiwawa River. This drainage is 6,310 acres in size and is primarily within U.S. Forest Service (USFS) ownership in the mid and upper reaches with much of the federal portion designated Late-Successional Reserve (LSR). The lower portions are within private ownership. Three culverts are being proposed for replacement; Beaver Creek barrier #1 at RM 1.9, Beaver Creek barrier #2 at RM 2.0, and Beaver Creek barrier #3 at RM 2.5. All of these culverts are off of the Chiwawa Loop Road under private crossings.

The Chelan County Natural Resources Department (CCNRD) in coordination with the U.S. Forest Service and Bureau of Reclamation (Reclamation) will implement the Beaver Creek Passage Project to remove one wooden dam and replace three barrier culverts with fish-friendly bridge structures to provide year-round fish passage to all species at all life stages. All sites are located on private property and are similar with respect to topography and proposed solution. The second barrier is in close proximity to a wooden dam that is to be removed at the same time as the existing culvert. The Chelan County Public Works Department is also scheduled to replace a barrier culvert at RM 0.3 during the 2007 construction season. Successful completion of the Beaver Creek Passage Program will provide 2.99 miles of habitat for spawning, rearing and high-water refugia. This will expand the spatial diversity for Upper Columbia steelhead and support salmon recovery in the Wenatchee subbasin.

Upper Columbia River Spring-Run Evolutionarily Significant Unit (ESU) of Wenatchee River Summer steelhead, *Oncorhynchus mykiss*, (endangered) and Columbia River Distinct Population Segment (DPS) bull trout, *Salvelinus confluentus*, (threatened) are present in Beaver Creek (Table 4 in Beaver Creek Passage Program Project Report). In addition, coho are known to use Beaver Creek.

Providing access in Beaver Creek will directly benefit ESA listed summer steelhead for at a least one life stage and will add 2.99 linear miles of habitat. Summer steelhead are known to be present to the first barrier (Jackie Haskins, personal communication, 2006, WDFW 2005); in 2004 during steelhead surveys, 15 steelhead redds were found in Beaver Creek near the mouth (USFS 2004). Beaver Creek also has a known presence of coho and bull trout (WDFW 2005). Summer steelhead are the target species; however, some life stages of spring Chinook, bull trout and coho will likely derive some benefit from this program.

II. PROBLEM STATEMENT

Concisely describe the passage problem (outfall, velocity, slope, etc). Describe the current barrier (age, material, shape, and condition). Is the structure a complete or partial barrier? Describe the amount and quality of habitat to be opened if the barrier is corrected.

When possible, document your sources of information by citing specific studies, reports, or personal communication.

Providing access in Alder Creek will directly benefit ESA listed summer steelhead. Steelhead have been found spawning and rearing in sections of Alder Creek (ISEMP 2005, In Press; Harza/BioAnalysts 2000; WDFW 2005). Replacing Alder #1 will provide 0.4 miles of stream habitat and, in combination with Alder #2 replacement, will provide approximately 0.9 linear miles of stream habitat. Six steelhead redds were located below the county Chiwawa road in spring 2005 (USFS 2006 Cameron Thomas, personal communication). There is also a known occurrence of ESA listed threatened bull trout. In the summer of 2005, a juvenile bull trout was captured during night snorkeling downstream of the Chiwawa Road crossing (ISEMP 2005, In Press). Spring Chinook juveniles are known to use the mouth of Alder Creek for rearing (Harza/BioAnalysts 2000, WDFW 2005) (Figure 3 in the Beaver Creek Passage Program Project Report).

Beaver Creek Barrier #1
The second barrier traveling upstream is the first barrier in this proposal and is located at RM 1.9 beneath a private drive off of the Chiwawa Loop Road and is identified in UWPP as Beaver Creek Culvert #1. This 36" round CMP (corrugated metal pipe) culvert is a barrier due to an outfall drop of 10", a 1.3% slope, and no substrate in the culvert.

Beaver Creek Barriers #2a and 2b
A culvert and a timber dam at RM 2.0 at a private crossing off of Chiwawa Loop are identified as fish passage barriers, Beaver Creek Barriers #2a and 2b. The culvert is a round smooth steel 46" pipe that has an outfall drop of 12" and velocity of 7.6 ft./sec. There is no substrate in the pipe. The timber dam is approximately 100 feet upstream from the culvert.

Beaver Creek Barrier #3
The uppermost barrier culvert is at a private crossing off of Chiwawa Loop Road at RM 2.5, Beaver Creek Culvert #3. This culvert is a round corrugated steel 44" pipe with a slope of 9% a velocity of 46 ft/sec and there is no substrate in the pipe.

Successful completion of the Beaver Creek Passage Program will provide 2.99 miles of habitat for spawning, rearing and high-water refugia

III. PROJECT OBJECTIVES

List the project's objectives. Objectives are statements of specific outcomes that typically can be measured or quantified over time. Objectives are more specific than goals (visions of the desired future condition) and less specific than tasks (the specific steps that would be taken to accomplish each of the objectives). For example, the objectives of a barrier removal project might be to provide fish passage, restore natural stream function, and riparian revegetation in the treated area. Explain how achieving the objectives will address and help solve the problem identified in II above.

The primary objective of this project is to remove three (3) fish passage barriers in Beaver Creek within the Middle Wenatchee Assessment Unit and replace them with modular bridges. This project will provide a total of 2.99 linear miles of tributary habitat for salmonid passage. The project sites have a high potential for supporting the Wenatchee River Watershed tributary habitat, as identified in the Chelan County Fish Barrier Inventory and the Forest Service Inventory.

IV. PROJECT APPROACH

- Has the project received a Priority Index (PI) Number? If yes, provide the PI number and indicate the method used: Physical Survey, Reduced Sample Full Survey, Expanded Threshold Determination, or WDFW Generated PI (list source, such as a study or inventory).

Harza/BioAnalysts (2000) completed a habitat survey in the reach directly upstream of the Beaver Creek barrier culvert #2. Two hundred meters of stream habitat were measured in terms of pool and riffle habitat dimensions, riparian and instream cover conditions, dominant substrate, and qualitative rating of spawning and rearing potential. Channel conditions for reaches further upstream were taken from USGS topographic maps and included drainage area and channel gradient. These data were analyzed using the WDFW Habitat Priority Index (PI) (1998). The Fish Passage Priority Index (PI) model consolidates variables which affect a project's potential resource benefit, (species utilization, passage improvement, production potential, habitat gain, project cost, and fish stock mobility and health) resulting in a numeric indicator of relative priority. Results from this analysis showed spring Chinook with a Priority Index (PI) of 6.5, steelhead with a PI of 3.5, cutthroat trout with a PI of 6.1, rainbow with a PI of 3.1, and bull trout with a PI of 2.5 for a total Priority Index for Beaver Creek at 21.7.

- ω Identify if there are additional fish passage barriers downstream or upstream of this project.

There were two fish passage barriers downstream from the Beaver Creek Passage Program (Culverts 1-3). The first barrier was corrected by the landowner. The Chelan County Public Works Department is scheduled to replace the second barrier culvert at RM 0.3 during the 2007 construction season.

- ω Briefly describe the location of the project within the context of the watershed (estuary, main stem, tributary, etc) and the life cycle stage(s) affected.

Beaver Creek is a tributary of the Wenatchee River at RM 46.2, a few miles below the junction of the Wenatchee and Chiwawa River. Beaver Creek is just off the Chiwawa Loop Road near Plain, Washington in T 26, R 18, Sec 5. This drainage is 6,310 acres in size and is primarily within U.S. Forest Service (USFS) ownership in the mid and upper reaches with much of the federal portion designated Late-Successional Reserve (LSR). The lower portions are within private ownership. All of these culverts are off of the Chiwawa Loop Road under private crossings. Beaver Creek provides rearing habitat and high water refugia for juvenile steelhead, spring Chinook, bull trout and coho. In addition, it provides spawning habitat for adult steelhead (see Table 1 in Beaver Creek Passage Program Project Report).

- ω List the individuals and methods used to identify the project and its location.

Both Chelan County and the Forest Service have completed fish barrier inventories within the Wenatchee and Stemilt/Squilchuck watersheds to identify priority barriers for correction. The barriers identified in these inventories along with other indicators described below were used to prioritize passage barriers that, if corrected, have a high likelihood of providing benefits to salmonids. Chelan County contracted Harza/BioAnalysts to produce the "Chelan County Fish Barrier Inventory" in 2000. The Beaver Creek culverts were identified in the Harza/BioAnalysts inventory.

In 2000 and 2001, the Forest Service completed a culvert survey on fish bearing streams in the Wenatchee Watershed on National Forest Lands. Results from this survey identified a total of 104 culvert crossings that blocked passage for at least one fish life stage. An additional 15 culverts were identified as potentially blocking at least one fish life stage. Since that survey, 7 culverts on National Forest lands in the Wenatchee watershed have been replaced by the Forest Service to meet Washington State standards for fish passage. Two more culverts were re-surveyed and found not to require fish passage. Another 2 culverts were replaced by a Forest Service Cost-share partner.

Prioritization of limiting factors is occurring within the State Salmon Recovery and local 2514 Watershed Planning processes for the Wenatchee River. The barrier prioritization was determined using multiple indicators as described below and was based heavily on priorities set in the Subbasin Plan and the presence of ESA-listed species within a sub-watershed and priorities set in the Subbasin Plan. Indicators used to prioritize barriers included:

1. Chelan County and Forest Service Fish Barrier Inventories
2. Subbasin and regional plans
3. Location in high priority Category 1 watersheds
4. Major and minor spawning areas
5. WDFW Priority Index Score
6. County or USFS road maintenance schedules
7. "Small stream prioritization index" which considers; a) the number of listed species affected; b) life history stage affected; c) spread of exotic species (e.g. brook trout; d) the linear

distance of potential stream above the culvert (metric goals); and e) condition of habitat upstream of the barrier

8. Upper Columbia Regional Technical Team Barrier Prioritization Draft Report (UCRTT 2006)

Of the USFS and County culvert barriers analyzed, 9 culverts in two Category I watersheds (Middle Wenatchee and Chiwawa) were identified to be replaced for this program. Culverts were selected in groups or complexes to be replaced concurrently in order to increase the potential increment of habitat gain with each barrier correction. The 4 complexes are termed the Alder Creek, Beaver Creek, Clear Creek and Skinney Creek Complexes.

The Chelan County Natural Resources Department (CCNRD) in coordination with the U.S. Forest Service and Bureau of Reclamation (Reclamation) will implement the Beaver Creek Passage Project to remove one wooden dam and replace three barrier culverts with fish-friendly bridge structures to provide year-round fish passage to all species at all life stages. All sites are located on private property and are similar with respect to topography and proposed solution. The second barrier is in close proximity to a wooden dam that is to be removed at the same time as the existing culvert. The Chelan County Public Works Department is also scheduled to replace a barrier culvert at RM 0.3 during the 2007 construction season. Successful completion of the Beaver Creek Passage Program will provide 2.99 miles of habitat for spawning, rearing and high-water refugia (Table 1). This will expand the spatial diversity for Upper Columbia steelhead and support salmon recovery in the Wenatchee subbasin.

Harza/BioAnalysts (2000) completed a habitat survey in the reach directly upstream of the Beaver Creek barrier culvert #2. Two hundred meters of stream habitat were measured in terms of pool and riffle habitat dimensions, riparian and instream cover conditions, dominant substrate, and qualitative rating of spawning and rearing potential. Channel conditions for reaches further upstream were taken from USGS topographic maps and included drainage area and channel gradient. These data were analyzed using the WDFW Habitat Priority Index (PI) (1998). The Fish Passage Priority Index (PI) model consolidates variables which affect a project's potential resource benefit, (species utilization, passage improvement, production potential, habitat gain, project cost, and fish stock mobility and health) resulting in a numeric indicator of relative priority. Results from this analysis showed spring Chinook with a Priority Index (PI) of 6.5, steelhead with a PI of 3.5, cutthroat trout with a PI of 6.1, rainbow with a PI of 3.1, and bull trout with a PI of 2.5 for a total Priority Index for Beaver Creek at 21.7.

- ω Describe the project design and how it will be implemented.

The Beaver Creek Passage Program is a cooperative effort between the Chelan County Natural Resource Department (CCNRD), U.S. Forest Service (USFS) and the Bureau of Reclamation (Reclamation). Construction staking and inspection will be provided by CCNRD. CCNRD and the USFS will apply for all necessary permits. The construction, planting, and monitoring work will be accomplished through the combined efforts of the USFS, CCNRD and private contractor

The Washington Dept. of Fish and Wildlife "Design of Road Culverts for Fish Passage Manual" will be applied in designing the replacement structures. Engineering designs will reflect that most current research regarding replacement of barrier culverts and will be designed for the 100 year flow event. The proposed design concept for the Wenatchee Passage Program is to utilize modular steel bridge super structures set in place on pre-cast concrete abutments. This choice was based on discussions with Washington State Department of Fish and Wildlife personnel and WAC 220-110-070 which states in part "***In fish bearing waters, bridges are preferred as water crossing structures by the department in order to ensure free and unimpeded fish passage for adult and juvenile fishes and preserve spawning and rearing habitat."*** The manufacturers

claim low initial cost, prompt delivery, and fast easy installation. Furthermore, load ratings and normal maintenance practices are preserved.

It appears during initial cost estimating that stream crossing structures consisting of modular steel bridge components manufactured in pre-selected span lengths offer the most affordable natural tributary stream conditions at accepted road crossings. The Alder Creek Culvert #1 design concept contains commonly accepted designs with required materials and qualified construction contractors locally available. After requirements for all permitting and contracting documents have been secured, typical construction would proceed in accordance with the contract plans.

The Wenatchee Passage Program contains commonly accepted designs**,** materials and qualified construction contractors that are available locally. Typical construction after requirements for all permitting and contracting documents have been secured would proceed in accordance with the contract plans. Use of heavy construction equipment such as a track hoe, small dozer, road grader and dump truck can be assumed. Road closures of no more than three (3) days are expected. Construction staking and inspection would be provided by the Chelan County Natural Resources Department. Chelan County Natural Resources Department and the Forest Service will apply for all necessary permits.

Bridge abutments and steel superstructure are delivered by truck to the project site and are set in the dry. All components are off loaded and set in place with a track hoe, then are bolted together as per the manufacturer's instructions. The guardrail is included. New stream channel will be constructed in accordance with the approved Bureau of Reclamation design. Construction activities will be accomplished during low flow periods to reduce the potential impacts to juvenile fish. On-site sediment mitigation measures could include silt fencing where necessary, isolating and/or diverting the stream around the work site and using pre-cast footings. Native riparian vegetation will be planted in the disturbed sites to restore and enhance riparian habitat as well as minimize erosion and noxious weed establishment.

- ω Explain how the project's cost estimates were determined.

Alan Schmidt with the Chelan County Natural Resources Department developed the project's cost estimates. He listened to different options provided by agency personnel (USFS, WDFW, USFWS) and the Upper Columbia Regional Technical Team. Then he called several suppliers to obtain cost estimates. These estimates are included in the Beaver Creek Passage Program Barrier Form.

- ω Describe other approaches and opportunities that were considered to achieve the project's objectives.

Alternatives for Beaver Creek Passage Program are listed in the Beaver Creek Passage Program Barrier Forms. They include:

1. Replace the existing culvert with a modular steel bridge (preferred alternative)
2. Replace the existing culvert with a Super-Cor box culvert.
3. Retro-fit the existing culvert.

- List project partners. When appropriate, include a letter from each participating partner briefly outlining its role and contribution to the project. (See Section 15 for a sample format.)

The Beaver Creek Passage Program is a cooperative effort between the Chelan County Natural Resource Department (CCNRD), U.S. Forest Service (USFS) and the Bureau of Reclamation (Reclamation).

- List all landowner names. Include a signed form from each landowner acknowledging their property is proposed for SRFB funding consideration. (See Section 16 for a sample format.)

Youth Dynamics, Robert and Ruth Renberg, and Brian Webber. Signed Landowner Willingness Forms are included in the Beaver Creek Passage Program Project Report.

ω Describe your approach to the long-term stewardship of the facility.

Each landowner will enter into a landowner agreement that requires they maintain the structure on their property for fish passage function.

ω When known, identify the staff, consultants, and subcontractors that will be designing and implementing the project, including their names, qualifications, roles and responsibilities. If not yet known, describe the selection process.

Chelan County will be responsible for the administration of the project. Design, permitting, implementation and monitoring will be done in coordination with the Bureau of Reclamation. Chelan County Natural Resources director will obtain permits and put construction contracts out to bid. Bureau of Reclamation Engineers have provided designs for the modular steel bridge. The Habitat Project Manager will be coordinating and implementing all aspects of the project while our Natural Resource Specialist will be involved in fish removal and habitat restoration. A bidding process will be used to select a qualified contractor. See the "Staff Descriptions" in the Beaver Creek Passage Program Project Report for more details on the staff and their experience with managing this type of project.

V. TASKS AND TIME SCHEDULE

List and describe the major tasks and time schedule you will use to complete the project. Describe your experience with managing this type of project.

Item/Milestone	Outcome	Target Date (Month/Year)
Quarterly Reports		Quarterly
Surveys completed		7/2006 to 10/2006
Draft Project Design	~60% project design	10/2006 to 1/2007
Reclamation and USFS Meetings	Coordination and design input	2/2007
Landowner Access Agreements		4/2007 to 6/2007
Construction Access Agreements		4/2007 to 6/2007
Final Project Design	~75% project design will be submitted with permit (expect it will change during permitting process)	4/2007 to 7/2007
Permits submitted and obtained	HPA and other permits obtained	4/2007 to 7/2007
Pre-Construction Implementation Monitoring	Photograph and document barrier culvert	7/2007
Pre-Construction Effectiveness Monitoring	Determine baseline biological information using monitoring protocol developed by Hillman (2005)	7/2007
Develop bid package and award to contractor		8/2007
Remove culvert and install bridge	Fish-friendly structure installed	8/2007 to 9/2007
Riparian planting	Replant disturbed area around culvert to minimize erosion and eventually provide bank stability and shade	9/2007
Final Checklist		9/2007
Completion Report		9/2007
Turnover Agreement		10/2007
Post-Construction Implementation Monitoring	Ensure that work was completed	10/2007
Post-Construction Effectiveness Monitoring	Determine biological impacts of culvert replacement using monitoring protocol developed by Hillman (2005)	10/2007, then once a year for 5 years

VI. CONSTRAINTS AND UNCERTAINTIES

State any known constraints or uncertainties that may hinder successful completion of the project. Identify any possible problems, delays, or unanticipated expenses associated with project implementation. Explain how you will address these constraints.

Each of the Beaver Creek Culverts (1-3) are under private roads. We will coordinate with the appropriate landowner for each culvert. This will not add any additional costs to the project proposal.

Please find all references cited in this document in the Alde Creek Passage Program Project Report