# 14. Evaluation Proposal
# In-Stream Habitat

**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)**

## I. BACKGROUND

Describe the fish resources, 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 White Creek watershed as a whole is likely the most important spawning and rearing tributary watershed within the Klickitat subbasin. In recent years, the White Creek watershed has accounted for up to 40% of the observed steelhead spawning in the entire Klickitat subbasin (Sampson and Evenson 2003, YN Fisheries Program 2002-2004 spawner survey data).**

**The White Creek watershed is 138 square miles in area. Elevations range from 1140 to 5100 ft.; most of the watershed lies between 2500 and 3300 ft. in elevation. Average annual precipitation is between 20 and 29 in., with roughly half falling as snow. Current habitat conditions in Tepee Creek and White Creek reflect past riparian timber harvest and road construction throughout the watershed; instream large woody debris (LWD) levels are low in some reaches and base flows are very low to non-existent in many reaches. Changes in channel morphology are related to livestock grazing, road interactions, and in some locations, historic removal of LWD. The watershed lies within the Yakama Reservation forest; commercial timber harvest has occurred since the 1950's in this area. Current and future land uses also include timber harvest, although riparian management areas (as laid out in the Yakama Nation/Bureau of Indian Affairs Forest Management Plan) will limit timber harvest in streamside areas.**

**Currently, most of the incised reaches in the White Creek watershed (upstream of the project reach) dry up from July through October. Anecdotal accounts from the 1960s suggest that at least some of these reaches were historically perennial. Many of the same reaches showing signs of bed armoring are also characterized by a simplified morphology with low pool frequencies, rectangular, canal-like cross sections, and an absence of large woody debris (LWD). Impacts from grazing (in the form of altered riparian vegetation, bank erosion, and channel incision) are also evident in several meadow reaches within the watershed. Anecdotal evidence, along with watershed size, elevation, and precipitation, suggest that more reaches had perennial flow historically.**

**The project reach encompasses the upper 3 miles of the perennial portion of lower White Creek. Dewatering of upstream reaches makes this are particularly important for juvenile rearing. However, poor habitat conditions limit capacity in this area.**

**One critical factor associated with the project is access difficulty. There is road access at RM 3.2 and 9.6. In between White Creek flows through a fairly rugged canyon bordered by steep slopes with walls as much as 700' high.**

**There are no artificial or natural barriers to steelhead downstream of the project reach.**

## II. PROBLEM STATEMENT

State the nature, source, and extent of the problem that this project will address and help solve. Address the primary causes of the problem, not just the symptoms. When possible, document your sources of information by citing specific studies and reports.

**Much of the mainstem of White Creek has a very simplified, plane-bed channel form and physical habitat conditions are correspondingly poor as evidenced by low pool and LWD frequency as well as low pool quality.**

**A 6.4 mile long reach (RM 9.6 to RM 3.2) that includes the project reach was assessed for summer refugia habitat in early September 2004 (Conley 2005). This reach was selected because it has clearly experienced simplification and it straddles the transitional zone of perennial water presence. Fish stranding in the summer is common upstream of the Brush Creek confluence (RM 5.0). Given the coarse nature of valley bottom sediments throughout the reach (i.e. low potential for long-term floodplain storage) and generally close proximity of bedrock, it seems most likely that baseflow hydrology is currently governed by groundwater inputs from the flood basalts. In the assessed reach pools only account for 14% (by length) of the channel. Pool quality is poor to marginal residual depths averaging 1.7' (n = 55) and 67% of the pools have less than the average depth. Bed armoring is particularly evident through the project reach where bed materials typically consists of a packed lag of cobbles and boulders. LWD frequency is also poor and averages 6.3 large logs and jams (cumulative) per mile.**

**The condition of the project reach is a function of both local and watershed-scale factors including:**

1) **<u>Historic riparian harvest</u> - The presence of riparian stumps and yarding corridors throughout the reach suggest historic riparian clearcutting as a probable cause of low cover and in-channel LWD frequency (Conley 2005).**
2) **<u>Increased peak flows associated with forest road drainage and density</u> - Increased peak flows associated with road development in the headwaters have likely had negative consequences on stream channel morphology and habitat. Hydrologic modeling (HEC-HMS) of upstream subwatersheds indicated road density has increased peak flows for a 2.5-year recurrence storm from 5.5 to 31.8% (nhc 2003). The model suggested runoff associated with 100-year recurrence storm has increased 0.6 to 16.0%. The proposed project area is located roughly 10 miles downstream of the modeled subwatersheds, and the intermediate topography is of considerably lower relief than the modeled subwatersheds, thus, peaks would be expected to be attenuated somewhat before reaching the project reach. Priority road segments were identified for treatment in 2004 and treatments were prescribed in 2005 (nhc 2005). Phase 1 of road maintenance and modifications to restore drainage patterns is anticipated to occur this fall (2005).**

3) **<u>Incisement of upstream reaches</u> - Site indicators and aerial photo interpretation suggest that many upstream reaches have become incised. Detailed topographic survey and hydraulic (HEC-RAS) modeling have been performed on one of these reach (along Tepee Creek). Results indicated entrenchment of 3 to 4 vertical feet, a 5-year flood is contained within the channel margins, and an 1100' sub-reach where even the 10-year flood is within banks (Interfluve 2004). This loss of floodplain connectivity prevents energy dissipation and conveys more water to downstream reaches. The YNFP is currently pursuing funding to restore floodplain connectivity and improve habitat within incised reaches.**
4) **<u>Historic debris torrent(s)</u> - Scour marks on trees and deposits in the upper mile of the reach suggest one or more debris torrents have occurred (Conley 2005). Torrents may have been associated with one or more historic road crossing failures as evidenced by chunks of concrete within the channel at 3/4 mile of the current 207 Road crossing. The 207 Road crossing appears to have been relocated (downstream) from its former alignment and is a well-sized bridge. Future failure risk of the crossing is considered very low.**

**The extent of the proposed project is RM 3 to RM 6. It will improve LWD frequency and pool quality. Other projects are currently in the planning and design stages to address the upstream factors mentioned above.**

**Despite its degraded condition, the White Creek watershed as a whole is likely the most important steelhead spawning tributary watershed within the Klickitat subbasin. In recent years, the White Creek watershed has accounted for up to 40% of the observed steelhead spawning in the entire Klickitat subbasin.**

## 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 an in-stream habitat project might be to increase channel complexity, to provide cover, to capture sediment, to reduce erosion, to create pools, and to reconnect side-channels or floodplain. Explain how achieving the objectives will address and help solve the problem identified in II above.

**The overall project goal is to improve habitat conditions by increasing LWD frequency and pool quality along 3 miles of White Creek. Treatments will specifically target juvenile rearing conditions, though increased sediment sorting is anticipated as a by-product which should improve spawning conditions as well. The LWD treatments will increased active channel roughness and should increase overbank flow frequency.**

## IV. PROJECT APPROACH

- Briefly describe the geographic setting of the project (marine nearshore, estuary, main stem, tributary, etc) and the life cycle stage(s) affected.

**The project location is on the mainstem of White Creek, a 3rd order tributary of the Klickitat River. White Creek provides critical spawning and rearing habitat for ESA-listed Middle Columbia River steelhead. The project area comprises 3 mile long reach of White Creek which is primarily forested and moderately incised. The reach is**

**located between 1690' and 2050' above sea level. The contributing drainage area is roughly 116 $mi^2$ (at the downstream end of the reach) which is predominantly forested by ponderosa pine and has scattered meadows in valley bottoms. The study reach was identified as an assessment priority by YNFP specialists based on observed steelhead use and departure from historic condition.**

**During winter and spring portions of the year, high numbers of adult Mid-Columbia River steelhead are regularly observed in the vicinity of the project reach. Juvenile *O. mykiss* are observed in the area year-round. Juvenile and adult steelhead and resident rainbow trout will be the primary beneficiaries of this project, as it will improve spawning and rearing habitat.**

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

**The project reach was identified by YNFP specialists in 2002. Monitoring conducted from 2003-2005 have indicated the importance of the area to mid-Columbia Steelhead.**

**A 6.4 mile long reach (RM 9.6 to RM 3.2) that includes the project reach was assessed for summer refugia habitat in early September 2004 (Conley 2005). This assessment reach was selected because it has clearly experienced simplification and it straddles the transitional zone of perennial water presence. Fish stranding in the summer is common upstream of Brush Creek and pool quality and frequency is poor throughout. Given the coarse nature of valley bottom sediments throughout the reach (i.e. low potential for long-term floodplain storage) and generally close proximity of bedrock, it seems most likely that baseflow hydrology is currently governed by groundwater inputs from flood basalts. Two representatives from InterFluve, Inc walked the reach with KWEP specialists to provide input on selection of project sites and constructability given the degree of apparent change in channel conditions and difficult access. It was agreed that initial restoration activities should focus on enhancing areas with current late-summer water. Twenty-six sites were identified, 18 of which are downstream of the Brush Creek confluence. Treatments will all involve LWD placement and will likely involve excavation of existing pools to improve pool quality.**

**Harvest and staging areas were visited in June 2005 with a representative of Columbia Helicopter to assess feasibility and duration of aerial operations that would likely be required.**

- ω Describe the consequences of not conducting this project at this time. For acquisition projects, also describe the current level and imminence of risk to habitat.

**The primary consequence of not conducting the project at this time will be persistence of poor quality rearing and spawning habitat.**

- ω If project includes an acquisition element, then briefly describe the extent to which habitat to be acquired is currently fully functioning and/or needs restoration; the timeframe in which responses or improvements in habitat functioning are expected; and the continuity of the proposed acquisition with other protected or functioning habitat in the reach

**n/a**

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

**Harvesting and staging of LWD will occur along the canyon rim. LWD will be flown from staging areas to project sites. Ground-based equipment (spyder-hoe or similar) will excavate pools and place LWD. Labor crew will drill on-site boulders and epoxy-cable to LWD as well as cable log-to-log connections.**

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

**Assumes the use of a spyder-hoe (a.k.a. walking-excavator) with at least 120 hp. Assumes a 10 hour machine work day. Wood volume estimates are based on an average 14 mbf per site. Channel work production of 100 feet per day is an estimate based on field observations of the site location and internal discussions with InterFluve staff. Harvest and staging areas were visited in June 2005 with a representative of Columbia Helicopter to assess feasibility and duration of aerial operations that would likely be required.**

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

**The remote nature of the work area greatly limits alternatives. Alternatives considered include:**

**1) placement of LWD with the helicopter/no ground-based heavy equipment. This would require much more flight time and would not include pool excavation. Overall costs would probably be reduced. Roughly half of project sites would not be "constructable" because of canopy limitations. Time for maximum or optimal function of the structure would depend on the time to the next flow event capable of generating sufficient scour.**

**2) use of a tracked excavator instead of a spyder-hoe. The anticipated maintenance associated with using tracked equipment up and down a stream bottom as coarse as this portion of White Creek greatly diminishes desirability of this approach.**

- 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.)

**There will not be any project partners *per se*. Other YN Programs will be consulted via the Interdisciplinary Team process. Matching contributions will come in the form of materials donated in-kind by the Yakama Nation. Services provided in-kind by the YN Fisheries Program will be funded by the Bonneville Power Administration.**

- 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.)

**The Confederated Tribes and Bands of the Yakama Nation.**

- Describe the long-term stewardship and maintenance obligations of the project. Projects should be consistent with habitat forming processes in the watershed, requiring reduced up-keep and long-term maintenance over time.

**Fish use, channel conditions, and vegetation survival will be monitored by the Yakama Nation Fisheries Program, which has an active and ongoing monitoring and habitat enhancement program. Grazing-related monitoring will be coordinated with the BIA Range program.**

- 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.

**Will Conley, Watershed Restoration Specialist, will be responsible for project design oversight, implementation, and administration. Will has been assessing, designing, and supervising restoration projects for the YN Fisheries Program in the Klickitat subbasin for 5 years. He has a M.S. in Water Resources (Soil Science minor), a B.S. in Wildlife Ecology, and 9 years of prior field experience.**

**Joe Zendt, Fisheries Biologist, will be responsible for monitoring and fish relocation oversight. Joe has been assessing and supervising monitoring activities for the YN Fisheries Program for 5 years. He has a M.S. in Fisheries Biology, a B.S. in Biology, and 5 years of prior field experience.**

**Construction sub-contracts will be put out for bid either on a lump-sum or hourly basis and awarded based on experience and price.**

## V. TASKS AND TIME SCHEDULE

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

| Tasks | Date |
|---|---|
| **30% design complete** | **July 2006** |
| **Submit permit applications** | **December 2006** |
| **Permits received** | **April 2007** |
| **Bid and award harvesting sub-contract** | **April 2007** |
| **Harvesting started and completed** | **June 2007** |
| **Bid and award construction sub-contract** | **June 2007** |
| **Start construction** | **July 2007** |
| **Complete construction** | **August 2007** |

## 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.

**Based on assessment work, the primary implementation concern (and cost) is access. Though helicopter operations will be necessary for transport of materials, the primary cost is anticipated to be installation of LWD jams and pool excavation. If efficiencies are can be obtained, then additional sites will be implemented as the construction budget**