2006 (7th Round) SRFB Cycle – Grant Application
Chelan County Natural Resource Department
Alder Creek Culvert #1
Project Report

PROJECT SPONSOR INFORMATION

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A. Project Description

The original Alder Creek Passage Program proposal requested funding for Alder #1 and #3. This modified (Alder Creek Culvert #1) proposal includes replacing one barrier culvert, Alder Creek barrier #1, with a modular steel bridge. Funding is not being requested for Alder Creek barrier #3 at this time. Based on the Upper Columbia Regional Technical Team (UCRTT) project proposal reviews that occurred on 18 August, the Chelan County Natural Resource Department (CCNRD) is removing **Alder Creek #3** from consideration because the RTT found a very low biological benefit from rectifying the third upstream barrier. The RTT found correcting **Alder Creek #1** would provide a high biological benefit to fish but there may be less expensive alternatives to correcting the barrier. We will complete an analysis with the Bureau of Reclamation to evaluate the possibility of retrofitting this culvert. If a retrofit alternative is feasible, it will be sent to the funding source for review prior to implementation. With the removal of Alder #1, the project costs will be reduced from $253,200 to **$148,536**. If retrofitting is a viable option, the project costs will be substantially less than to replace the culvert with a modular bridge.

One fish passage barrier culvert (Alder #1) will be replaced with a modular steel bridge to provide year-round fish passage to all species at all life stages. In addition to the barrier correction, the riparian area will be planted to restore and enhance habitat. Removing this barrier will provide unobstructed passage, which is an important step toward restoring ESA listed fish populations in this area. Activities undertaken in this project will increase available tributary habitat primarily for ESA listed summer steelhead, but may also benefit coho, endangered spring Chinook and threatened bull trout. Removing barriers to fish passage and enhancing habitat in the Chiwawa drainage is directly outlined in the strategies and recommendations of the major salmon recovery documents guiding restoration efforts within the Wenatchee subbasin.

B. Project Location

Alder Creek is located in the Chiwawa subwatershed of the Wenatchee watershed in North Central Washington. Alder Creek is a 2nd order stream that flows into the Chiwawa on the downstream left at RM 6.9 and drains about 7 square miles (Harza/BioAnalysts 2000). This tributary and the Alder Creek Passage Program is approximately 6 miles upstream from the town of Plain and are located within Sec. 12 T27N, R17E (Figure 1). The Alder Creek Passage Program includes 3 barrier culverts. Alder Creek barrier #1, is located at RM 0.5 beneath the double lane Chiwawa Road, a Chelan County easement. Alder Creek barrier #2 is located at RM 0.9 and is not included in this proposal because it has already been funded for replacement. Alder Creek barrier #3 is located at RM 1.4 and is located beneath Forest Service road 6102-200. (Figure 2).

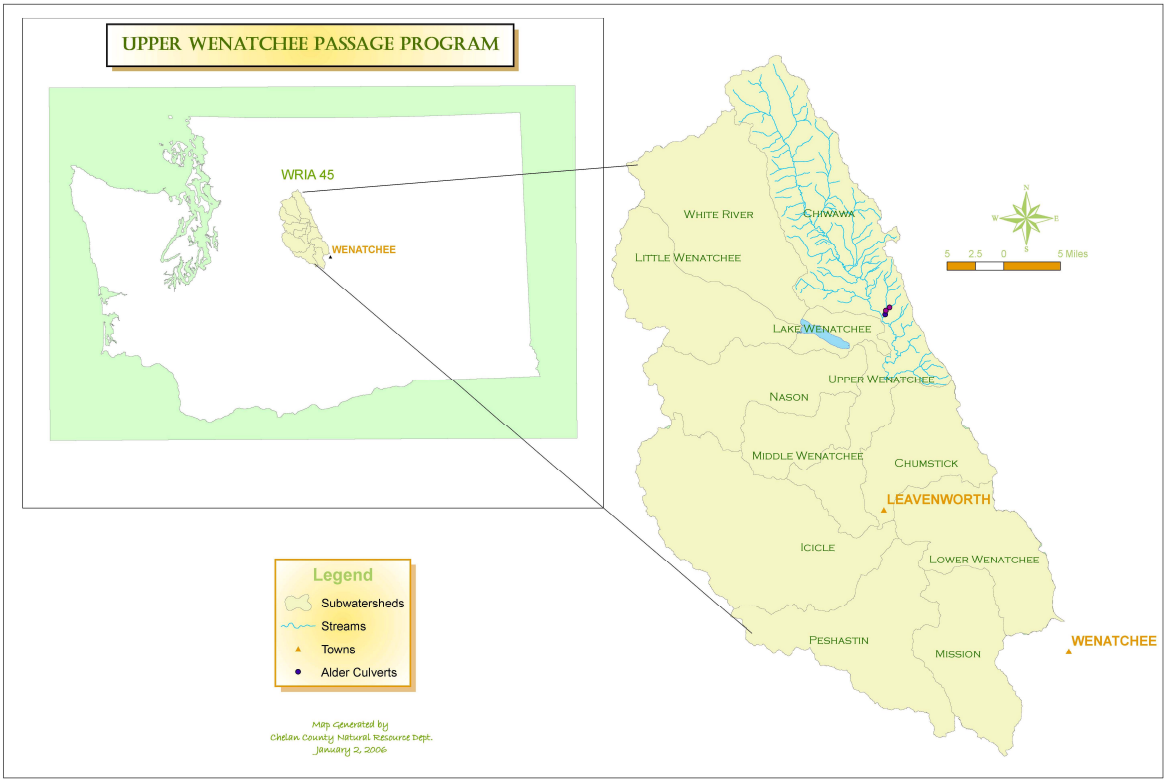

Figure 1. Alder Creek Passage Program Area Map

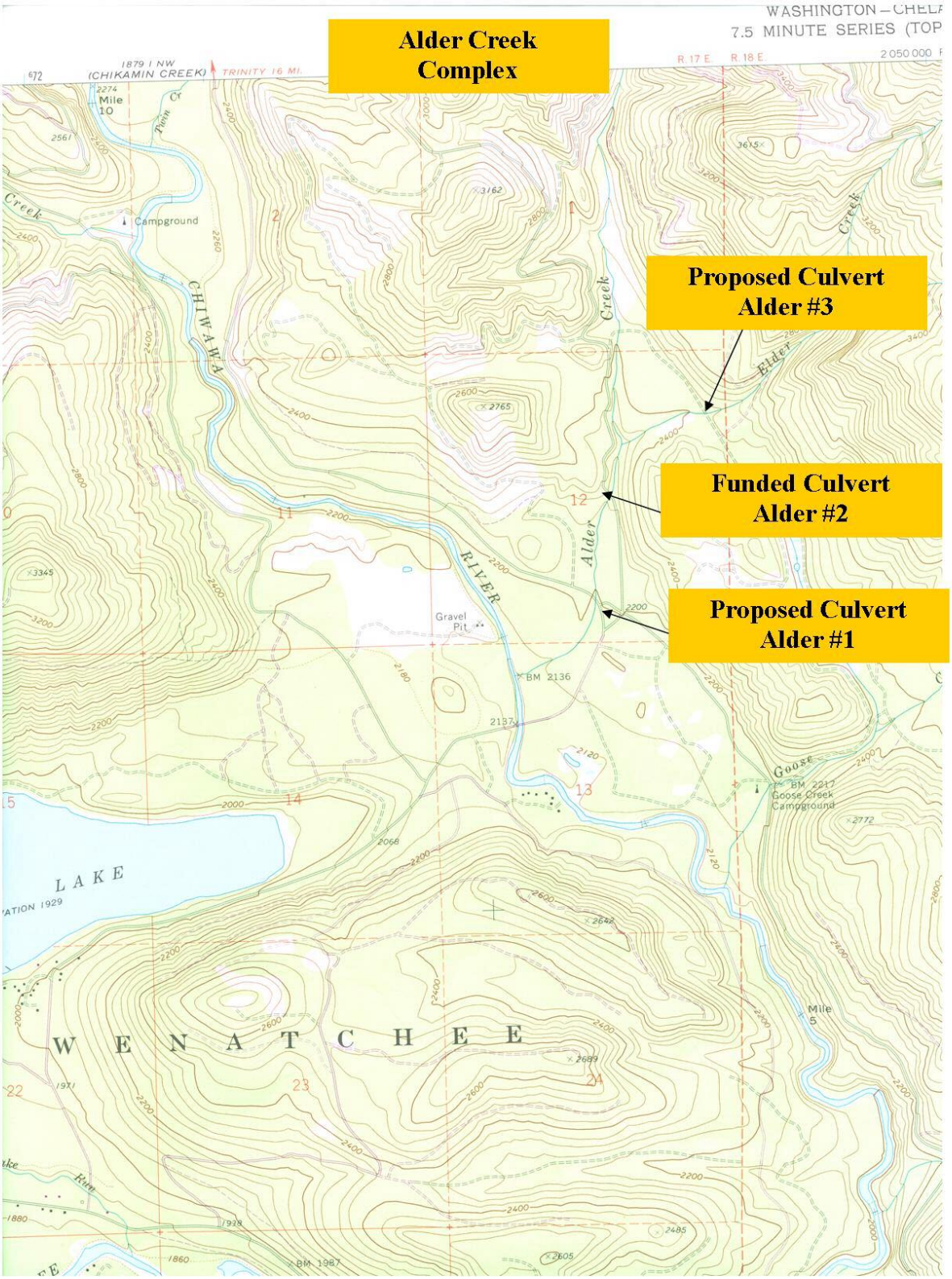

Figure 2. Alder Creek Complex with locations for culvert barriers #1, #2 and #3.

C. Impacted Species

Providing access in Alder Creek will directly benefit ESA listed summer steelhead (Table 1). 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).

Table 1. Species and Life History Stages Affected by the Alder Creek Culvert #1 Project.

Species	Rearing	Spawning	Migration	Passage	High-water refugia
Sockeye salmon					
Coho salmon					
Chinook salmon	X				X
Steelhead	X	X			X
Other (list)					
Bull Trout	X			X	X

Alder Creek Culvert #1 is considered a barrier in part due to the outfall drop and there is no substrate in the culvert. Washington Department of Fish and Wildlife personnel have conducted redd surveys upstream of Alder Culvert #1 and have not found any redds (USFS 2006 Cameron Thomas personal communication). Alder Creek Culvert #1 is a velocity barrier to juveniles especially in the late fall when it rains before it snows (USFS 2006 Cameron Thomas personal communication). This decreases the amount of habitat available to steelhead for rearing and high-water refugia.

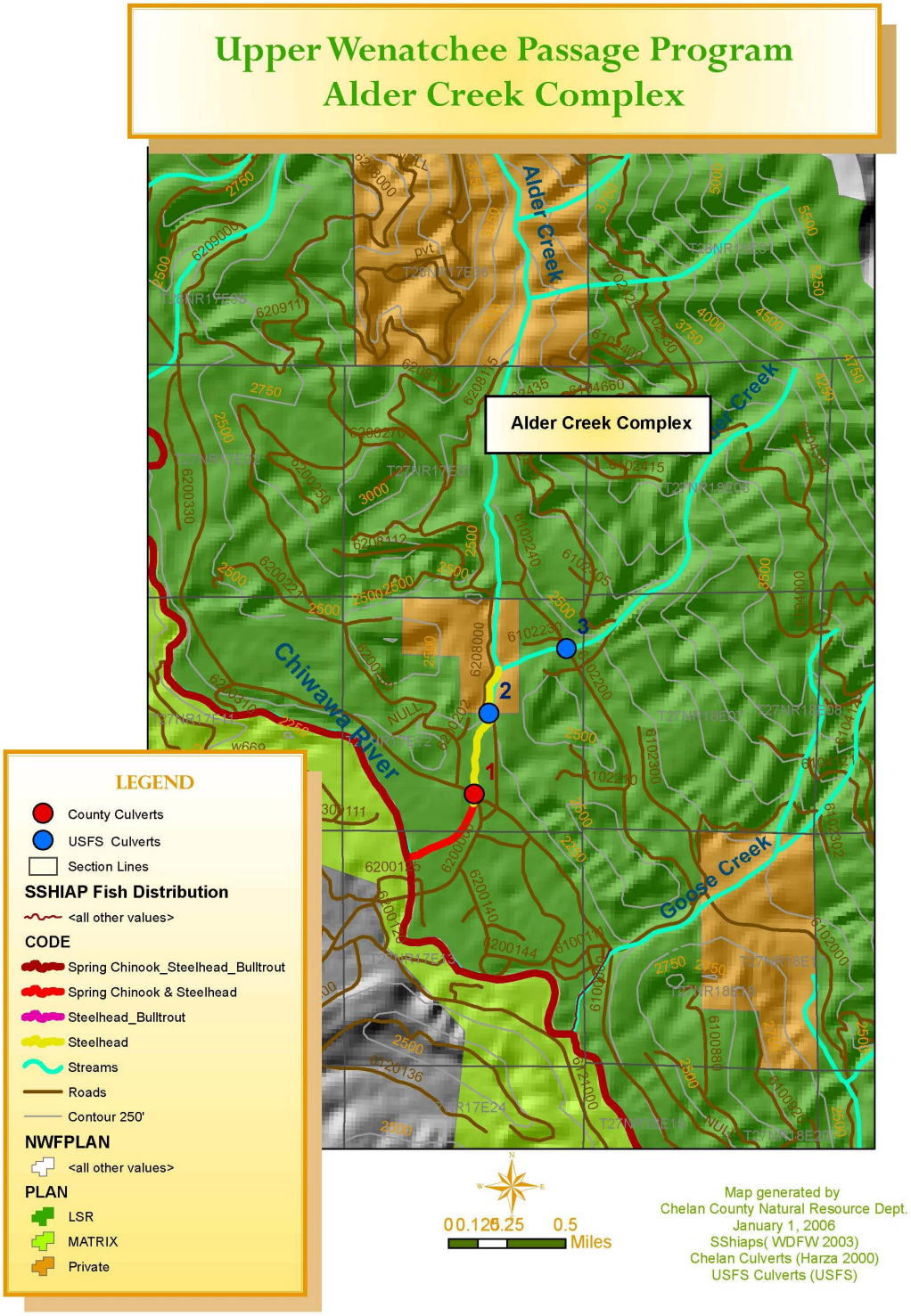

Figure 3. Alder Creek Complex showing Forest Service and Chelan County Culverts and WDFW SSHIAP's Fish Distribution on Alder Creek

D. Current Situation

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 4). 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 RM of additional spawning and rearing habitat for Upper Columbia steelhead, spring Chinook and bull trout. This proposal will replace Alder Creek Culvert #1 on Alder Creek in the Chiwawa subwatershed (Figure 1) to increase habitat quantity. Alder Creek Culvert #2 has been funded with Tributary Funds and is scheduled to be replaced in September 2007.

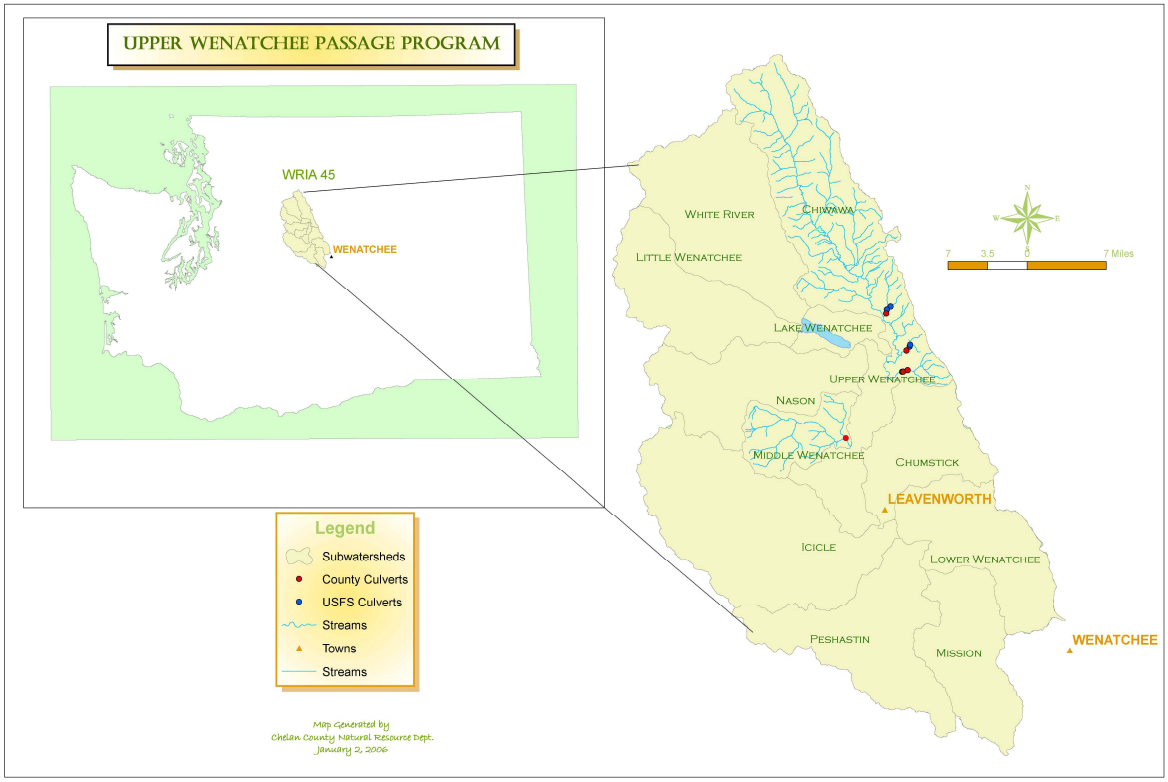

Figure 5. Upper Wenatchee Passage Program Area Map

The Draft Salmon Recovery Plan (UCSRB 2005) describes the Chiwawa watershed as a Category 1 watershed based on the Upper Columbia Regional Technical Team's Biological Strategy (UCRTT 2003). All three listed species are found in the Chiwawa watershed (Table 2). Habitat quantity is identified in the Draft Salmon Recovery Plan as the primary limiting factor (UCSRB 2005), with residential development listed as the primary causal factor and threat. The Alder Creek culverts are also included in the Implementation Schedule (UCSRB 2006).

Table 2. Matrix of known occurrence of spawning and rearing for selected salmonid species in some subwatersheds of Chelan County.

Stream	Steelhead		Spring Chinook		Bull Trout		Recovery Plan Primary Limiting Factor[3]	Recovery Plan Primary Causal Factor[3]
	Spawning	Rearing	Spawning	Rearing	Spawning	Rearing		
Entiat (Middle)	X[2]	X[2]	X[2]	X[2]	X[2]	X[2]	Habitat diversity; Obstructions	Roads; Fires; Riprap; Residential development; Culverts
Chiwawa	X[2]	X[2]	X[2]	X[2]	X[2]	X[2]	Habitat quantity	Residential development
Middle Wenatchee (Tumwater Canyon)	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	None	None
Chiwaukum	X[4]	X[4]	X[1]	X[4]	X[4]	X[4]	Habitat diversity; Obstructions	Roads; Campgrounds

[1]: Andonaegui 2001
[2]: Harza/BioAnalysts 2000
[3]: UCSRB 2005
[4]: WDFW 2005

In the 2007-09 Northwest Power and Conservation Council solicitation for proposals, the Independent Scientific Review Panel (ISRP) evaluated the Wenatchee Passage Program proposal and suggested that the proposal address: 1) how priority was given to the barriers, 2) species currently using the tributaries, 3) an estimate of carrying capacity, and 4) the potential benefit to other species. The following information addresses these topics.

Barrier Prioritization
Alder Creek Culvert #1 was given a "high" priority for replacement by the Upper Columbia Regional Technical Team (Table 3; UCRTT 2006). In addition, Alder Creek culverts are included in the Implementation Schedule for construction in years 3-6 (UCSRB 2006).

Species Use
Upper Columbia steelhead, spring Chinook and bull trout are known to spawn and rear in the Chiwawa watershed (Table 2). Table 4 shows the known and presumed fish presence in Alder Creek up to and beyond each culvert.

Carrying Capacity
Calculating the carrying capacity is beyond the scope of this grant proposal. As a substitute for carrying capacity, we calculated the area by multiplying the bankfull width by the length of stream opened up by replacing the culvert (Table 3).

Benefit to other species
By replacing the fish barrier culvert with a modular steel bridge, the project will provide year-round fish passage to all species at all life stages. Pre- and post-construction effectiveness monitoring will document the species that actually benefit from the project. Native species that are known to exist in the

Wenatchee subbasin and could potentially benefit from culvert replacement projects include westslope cutthroat trout, rainbow trout, coho, sculpin, dace, lamprey, peamouth, chiselmouth, suckers and whitefish. It is unlikely that all of these species will be present at the project site. However, if they are present they will not be impeded in their upstream or downstream migration by the new bridges.

Harza/ BioAnalysts completed a habitat survey in the reach directly upstream of the 2nd Alder Creek barrier culvert. Two hundred meters of stream habitat was 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 (1998) Priority Index. Results from this analysis show spring Chinook with a Priority Index (PI) of 5.8, steelhead with a PI of 3.1, cutthroat trout with a PI of 5.4, rainbow with a PI of 2.8, and bull trout with a PI of 2.3 for a total Priority Index for Alder Creek at 19.3. This was the second highest PI of the creeks that were surveyed for potential habitat above a barrier. Fixing Alder Creek Culvert #1 will help realize the full biological potential of replacing Alder Creek Culvert #1.

Table 3. Relative priority, biological benefit, feasibility and costs for replacing selected culverts in Chelan County.

Watershed	Creek Complex	CCNRD Barrier No.	UCRTT Overall Priority (draft)	UCRTT Category[4]	Harza/ BioAnalysts Rank	River Miles upstream	Area upstream of culvert (sq ft)	Feasibility	Total Project Cost when completed as a Complex	Cost of project if constructed separately
Chiwawa	Alder (RM 0.5)	1	High	1	0	0.4	25,344	High	$148,536	$152,536
Chiwawa	Alder (RM 0.9)	2	High/ Funded	1	Top 5	0.5	31,680	High	N/A	N/A
Chiwawa	Alder/ Elder (RM 1.4)	3	High	1	0	0.06[1]	1,267	High	$104,664	$108,664
		Total				**0.96**	**58,291**		**$253,200**	**$261,200**
Chiwawa	Clear (RM 0.5)	1	High	1	Top 10	1	52,800[3]	High	$99,936	$103,936
Chiwawa	Clear (RM 1.5)	2	High	1	0	0.2	10,560	High	$109,152	$113,152
Chiwawa	Clear (RM 1.7)	3	High	1	0	1.49[1]	78,672	High	$109,152	$113,152
		Total				**2.69**	**142,032**		**$318,240**	**$330,240**
Middle Wenatchee	Beaver (RM 1.9)	1	High	1	Top 20	0.1	6,336[3]	High	$96,336	$100,336
Middle Wenatchee	Beaver (RM 2.0)	2	High	1	Top 20	0.5	31,680	High	$97,536	$101,536
Middle Wenatchee	Beaver (RM 2.5)	3	High	1	Top 25	2.39[1]	113,573	High	$99,936	$103,936
		Total				**2.99**	**151,589**		**$293,808**	**$305,808**

Table 3. continued.

Watershed	Creek Complex	CCNRD Barrier No.	UCRTT Overall Priority (draft)	UCRTT Category[4]	Harza/ BioAnalysts Rank	River Miles upstream	Area upstream of culvert (sq ft)	Feasibility	Total Project Cost when completed as a Complex	Cost of project if constructed separately
Chiwaukum	Lower Skinney (RM 0.25)	1	Moderate	2	Inventoried by USFS	1.25	79,200	High	$130,200	$134,200
Chiwaukum	Upper Skinney (RM 1.5)	N/A	Moderate / Funded	2	Top 25	3.45[1]	N/A	N/A	N/A	N/A
		Total				**4.7**	**79,200**		**$130,200**	**$134,200**
Chumstick	North Road	1	High	3	Inventoried by USFWS & NRCS	7[2]	517,440[3]	Moderate	$129,360	$129,360
		Total				**7**	**517,440**		**$129,360**	**$129,360**
Entiat Middle	Stormy Creek (RM 0.2)	N/A	NR/ Replaced	1	Top 25	0.5	N/A	N/A	N/A	N/A
Entiat Middle	Stormy Creek (RM 0.7)	1	NR	1	Top 25	0.2	10,560[3]	High	Construct only as a complex	Construct only as a complex
Entiat Middle	Stormy Creek (RM 0.9)	2	NR	1	Top 25	3.24[1]	171,072[3]	High	Construct only as a complex	Construct only as a complex
		Total					**181,632**		**$139,512**	

[1]: GIS was used to measure the upstream length of mainstem and tributaries to the 8% gradient. Field truthing is recommended.
[2]: Length is estimated, which affects the overall area computation.
[3]: Bankfull width is estimated, which affects the overall area computation.
[4]: UCRTT 2003

Table 4. Fish presence in Alder Creek.

Alder Creek				
Fish Presence (pre-construction)				
Species	**Mouth to Barrier 1**	**Barrier 1 to 2**	**Barrier 2 to 3**	**Barrier 3 to 8% gradient**
Steelhead	X[1,3, 4, 5]	X[1]	X[1]	0
Chinook	X[1,5]	0	0	0
Bull trout	X[4]	0	0	0
Coho	0	0	0	0
Sockeye	0	0	0	0
Westslope cutthroat	X[2]	0	0	0
Rainbow trout	x	x	x	0

Key:
X: known presence
x: presumed presence
0: none documented

Presumed presence:
For rainbow trout, possible presence reflects known steelhead presence. For other species, possible presence indicates that a tributary adjoins the stream with known fish presence and no barriers would hinder their use of the area.

Source:
[1]: WDFW 2005
[2]: NPCC 2004
[3]: USFS 2006 Cameron Thomas, personal communication
[4]: ISEMP 2005
[5]: Harza/BioAnalysts 2000

E. Project Proposal

Alder Creek Barrier #1

Three barrier culverts that occur in Alder Creek are partial or complete barriers to juvenile and adult upstream fish passage of ESA listed summer steelhead. Alder Creek #1 culvert is a 72" by 120" corrugated metal pipe arch and is a barrier due to a high outfall drop and high velocity (Figure 5 and 6). There is also no substrate in the pipe.

Figure 5. Alder Creek Culvert #1

Alder Creek Culvert barrier #2 at RM 0.9 has been funded for replacement with a fish friendly structure. It is scheduled for completion in September 2007. The biological benefits of completing this project will not be fully realized until Alder Creek Barrier #1 is replaced. Funding for Alder Creek Culvert #3 is not being requested at this time.

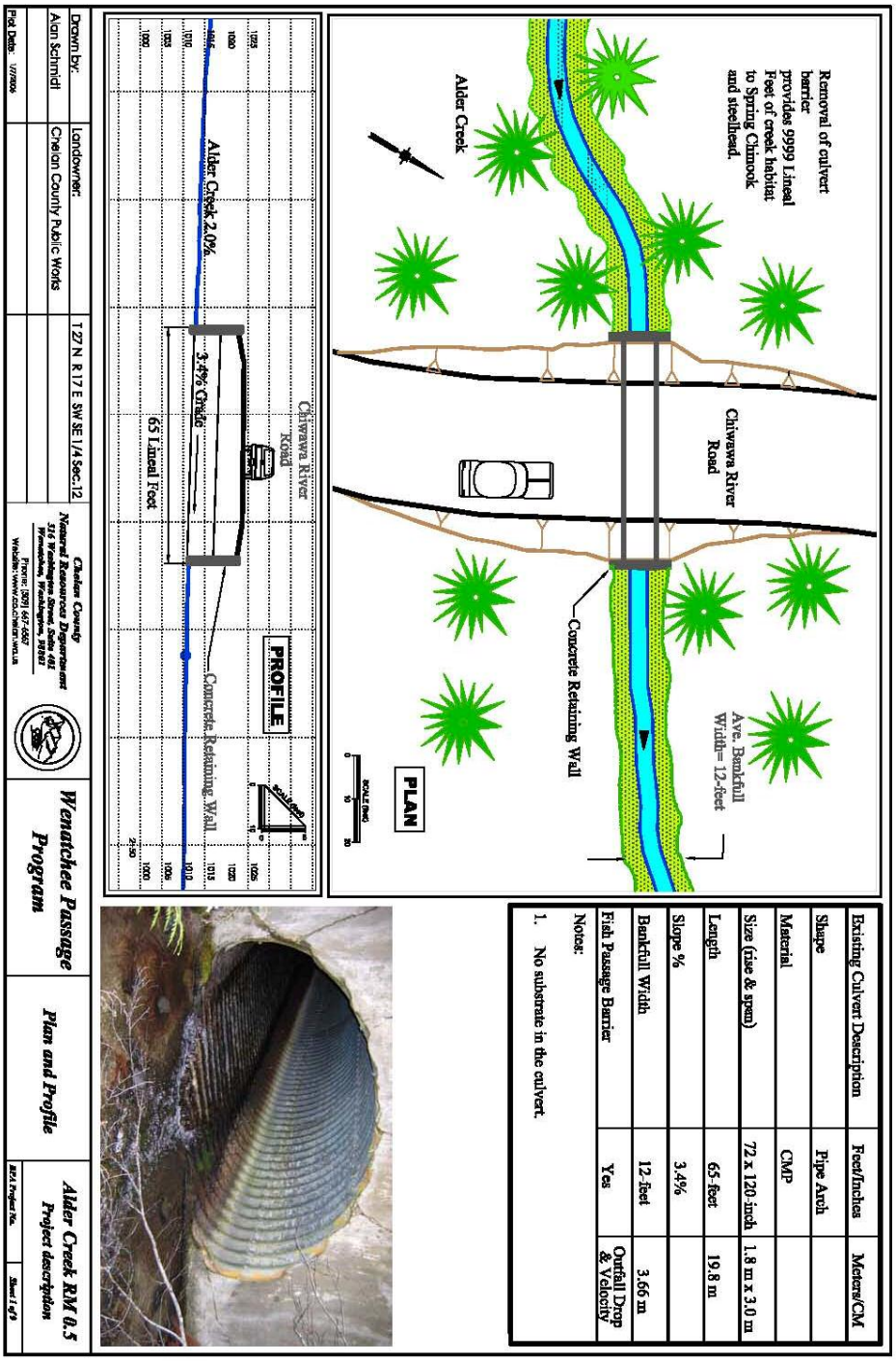

Figure 6. Alder Creek Barrier #1, Plan and Profile

Alder Creek Culvert #1 Design Concept

The Chelan County Natural Resources Department proposes to replace the passage barrier culvert with a modular steel bridge structure. Alder Creek barrier #1 also has concrete headwalls that will be removed and disposed of off site. 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 the 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 (see Figure 7a and b photos below). 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."*** Manufacturers claim low initial cost, prompt delivery, and fast easy installation. Furthermore, load ratings and normal maintenance practices are preserved.

Figure 7a. The modular steel bridge on a similar project in Idaho.
Pre-cast concrete abutments are set in the "dry". Standard heavy equipment sets the modular steel superstructure on the abutments.

Figure 7b. Modular Steel Bridge

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.

Project Alternatives

In keeping with the above objective, three (3) alternatives were actively considered, including retrofitting the existing culverts, bottomless arch culverts, and modular steel bridges.
1) Retro-fit the existing culvert. A low-cost option to eliminate a fish passage barrier is to retro-fit the existing culvert structure with a modified roughened channel or with baffles where necessary. This method often does not adequately address the fish passage barrier problem or requires an unacceptable commitment to maintenance. In addition, the local permitting agencies prefer other alternatives. However, based on the RTT evaluation on August 18, 2006, the Chelan County Natural Resource Department will complete an analysis with the Bureau of Reclamation to evaluate the possibility of retrofitting this culvert. If a retrofit alternative is feasible, it will be sent to the funding source for review prior to implementation. With the removal of Alder #1, the project costs will be reduced from $253,200 to **$148,536**. If retrofitting is a viable option, the project costs will be substantially less than to replace the culvert with a modular bridge.
2) Bottomless arch structure. This type of structure provides fish passage and is relatively easy to construct. It typically includes sections of galvanized steel arch plates which are bolted together and connected to pre-cast concrete footings. Estimated costs are typically equal to modular steel bridges.
3) Modular Steel Bridges. These structures are consistent with the intent of WAC 220-110-070- Water Crossing Structures, which contains specific language for encouraging bridge structures at road crossings as opposed to culvert pipes. The proposed design concept for the Alder Creek Culvert #1 is to utilize modular steel bridge super structures set in place on pre-cast concrete abutments.

Construction

The construction and planting work will be accomplished through the combined efforts of the Forest Service, Chelan County Natural Resource Department and private contractors. 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.

Monitoring

Monitoring and Evaluation will consist of implementation monitoring and Level I effectiveness monitoring as described in "Project Monitoring: A Guide for Sponsors in the Upper Columbia Basin" (Hillman 2005).

Implementation Monitoring

Implementation Monitoring will be conducted by the Chelan County Natural Resources Department to ensure that the Alder Creek Culvert #1 replacement is implemented as planned. This will be an administrative review and will not include measurement of any parameters. Photos will be obtained pre- and post-construction to document project completion. The implementation monitoring will address the design goals of the installed structures. The data collected will include the number and location of fish passage structures installed and Engineering specifications (e.g., HS20-44 rating, length of bridge; stream slope; presence of substrate; bridge span to streambed width ratio; and fill depth) (Hillman 2005).

Effectiveness Monitoring

Level 1 effectiveness monitoring will focus on addressing the biological goals and objectives of the project. Level I effectiveness monitoring will be performed to establish baseline conditions prior to project construction, and then following the installation of the fish-friendly structure. The U.S. Forest Service and the Chelan County Natural Resources Department will implement the Level 1 effectiveness monitoring. For all culvert replacement projects, data (including photographs) will be collected at least once before implementation of the project and then annually for five years following replacement. Other data collected will include maximum water velocity within culverts; maximum water depth within culverts; outfall drop; presence/absence of steelhead redds; presence/absence of juvenile or adult steelhead.

The sampling scheme as described in Hillman's protocols include taking physical measurements (velocities, depths, and outfall drop) and will be collected at each barrier during high flow (spring) and low flow (late summer) one year before barrier replacement and each year for five years after replacement. Thus, physical measurements will be collected twice per year for the six-year period and will be collected at the same place and time each year. Photographs (taken upstream, downstream, and of the culvert/bridge) will be collected during high-flow and low-flow periods before and after installation. Photographs will be taken from the same locations during each survey period.

Because suitable spawning and rearing habitat exists immediately upstream and downstream of each culvert, a 300-m reach of stream downstream from the barrier and a 300-m reach upstream from the barrier will be surveyed by walking the stream bank and looking for the presence of steelhead and other species. Foot surveys will be conducted twice per year; once during the spring to find steelhead redds and again during the low-flow period to find juvenile steelhead. Snorkeling or electro-fishing will be used when a positive identification of a juvenile fish cannot be made from the bank.

F. Project Partners and Roles

The Alder Creek Culvert #1 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 contractors.

The Chelan County Natural Resources Department and the Bureau of Reclamation have established a partnership to develop habitat restoration projects within WRIA 45 and WRIA 46. The Bureau of Reclamation will conduct site surveys, reach analysis, and develop final engineering plans and specifications. The Reclamation contribution consists of the following:

Project Partner: Bureau of Reclamation
Mr. Steve Kolk, P.E.
Wenatchee Sub-basin Liaison
301 Yakima St., Room 311
Wenatchee, WA 98801

(509) 667-8494
(509) 667-8495 fax
(509) 679-2856 cell

Description of contribution to project:

• Project Coordination and Administration:	$3,500
• Site surveys utilizing a total station electronic transit will create a digital terrain model (DTM):	$5,000
• A Reclamation engineer will produce a design that complies with permitting agency requirements. Each site will be analyzed for the 100-year storm event. Structure is intended to withstand any anticipated storm water flows as well as winter ice/snowmelt conditions. Each structure design will be stamped by a licensed engineer:	$20,000
• Post Construction Assessment and Completion Report:	$2,500
Total Bureau of Reclamation contribution per project site:	**$31,000**

G. Project Timeline

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

H. Staff Descriptions

Chelan County will be responsible for the administration of the project. Design, permitting, implementation and monitoring will be done in coordination with the Forest Service and the Bureau of Reclamation.

Mike Kaputa, Chelan County Natural Resource Department Director
Mike is the Director of the Natural Resource Department and has a bachelor and master degrees in environmental science and environmental policy and planning. Mike has over 15 years experience in natural resource planning, assessment and project implementation, including the past five years as Director of the Chelan County Natural Resource Department. Mike reports directly to the elected County Commissioners and represents the County on land, water, and other natural resource issues.

Joy Juelson, Chelan County Natural Resource Specialist
Joy Juelson is the staff scientist for the department providing various biological, hydrological, and ecological services related to project development and policy justification. She has a Master's Degree in Natural Resource Management with an emphasis in ecological restoration. Joy has 15 years experience with the US Forest Service as an ecologist. In addition to Joy's extensive field work experience in a variety of areas, Joy worked on a variety of fisheries related projects and has experience in snorkeling, electro-fishing, radio telemetry, spawning and stream surveys.

Lee Duncan, Chelan County Natural Resource Specialist
Lee Duncan is the staff scientist responsible for providing technical expertise in the development and implementation of watershed management plans. His background is in geomorphology, hydrology and water quality. Lee has 4 years experience with the US Forest Service as a Hydrologic Technician. This included leading stream survey crews, coordinating habitat and stream assessments and analyzing field data. Lee's experience also includes several years as a watershed coordinator which involved developing, overseeing and implementing stream restoration projects.

Alan Schmidt, Chelan County Habitat Program Manager
Alan Schmidt has over 25 years of experience with project management and implementation. Alan has owned his own forestry resources consulting business, served as a Transportation Engineer 2 for the Washington Department of Transportation, and managed major development and utility projects for the Chelan County Public Works Department. Alan's areas of expertise include project surveying, engineering and design, on-the-ground project implementation, including bid procedures, construction management and landowner negotiations.

Dolanna Burnett, Chief Accountant
Dolanna Burnett recently joined Chelan County Natural Resources in May 2006. She moved to Eastern Washington last year with her family and brings with her six years of experience in the field of conservation work; previously working with Thurston Conservation District located in Olympia, Washington. Dolanna's experience includes over 12 years of accounting work in both private and public sector companies, along with an extensive knowledge of budgeting, grant management, and governmental reporting requirements. Dolanna's work with the District resulted in three successful audits conducted by the Washington State Auditor's Office: Financial Statements and Federal Single Audit Report, as well as individual granting agency audits over the past six years. Dolanna Burnett has a B.A. and strives to continue her education in the field of natural resources.

I. References

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Appendix.

12b. Alder Creek Culvert #1 In-Stream Passage Cost Estimate					
IN-STREAM PASSAGE includes those items that affect or provide fish migration up and downstream to include road crossings (bridges and culverts), barriers (dams, log jams), fishways (ladders, chutes, pools), and log and rock weirs.					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**
Bridge	Each	1	72,000	Length/width	60x26
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	34,000	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	
Permits	Lump sum		7,000	Optional	
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		2,200	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**8,464**		
Sub-Total			**114,264**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**34,279**		
SRFB Request			**148,543**		
Match			**31,000**		
TOTAL COST			**179,543**		