2006 (7th Round) SRFB Cycle – Grant Application
Chelan County Natural Resource Department
Beaver Creek Passage Program
Project Report

PROJECT SPONSOR INFORMATION

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A. Project Description

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.

B. Project Location

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 (Figure 1 and 2). Beaver Creek is just off the Chiwawa Loop Road near Plain, Washington in T 26N, R 18E, 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. 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.

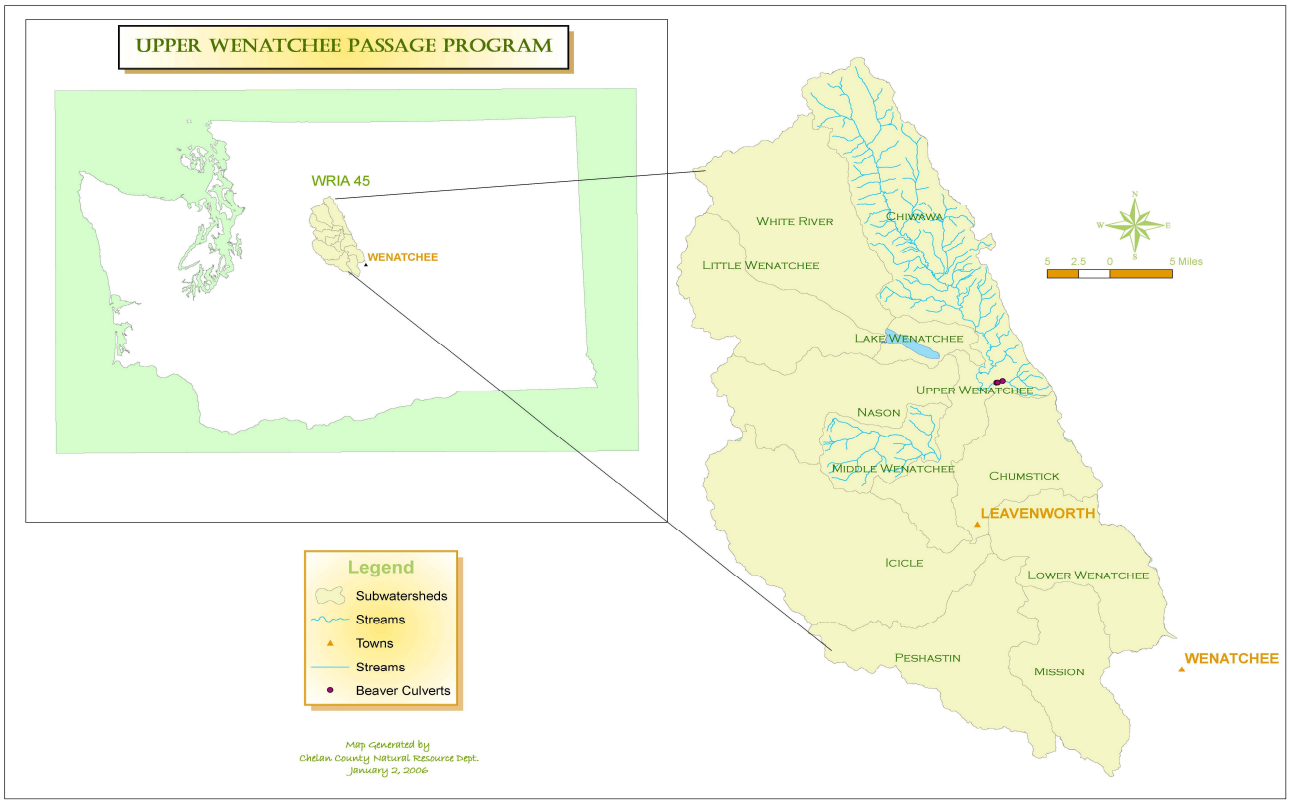


Figure 1. Beaver Complex Area Map

C. Impacted Species

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 (Figure 2) .

Table 1. Species and Life History Stages Affected by the Beaver Creek Passage Project.

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

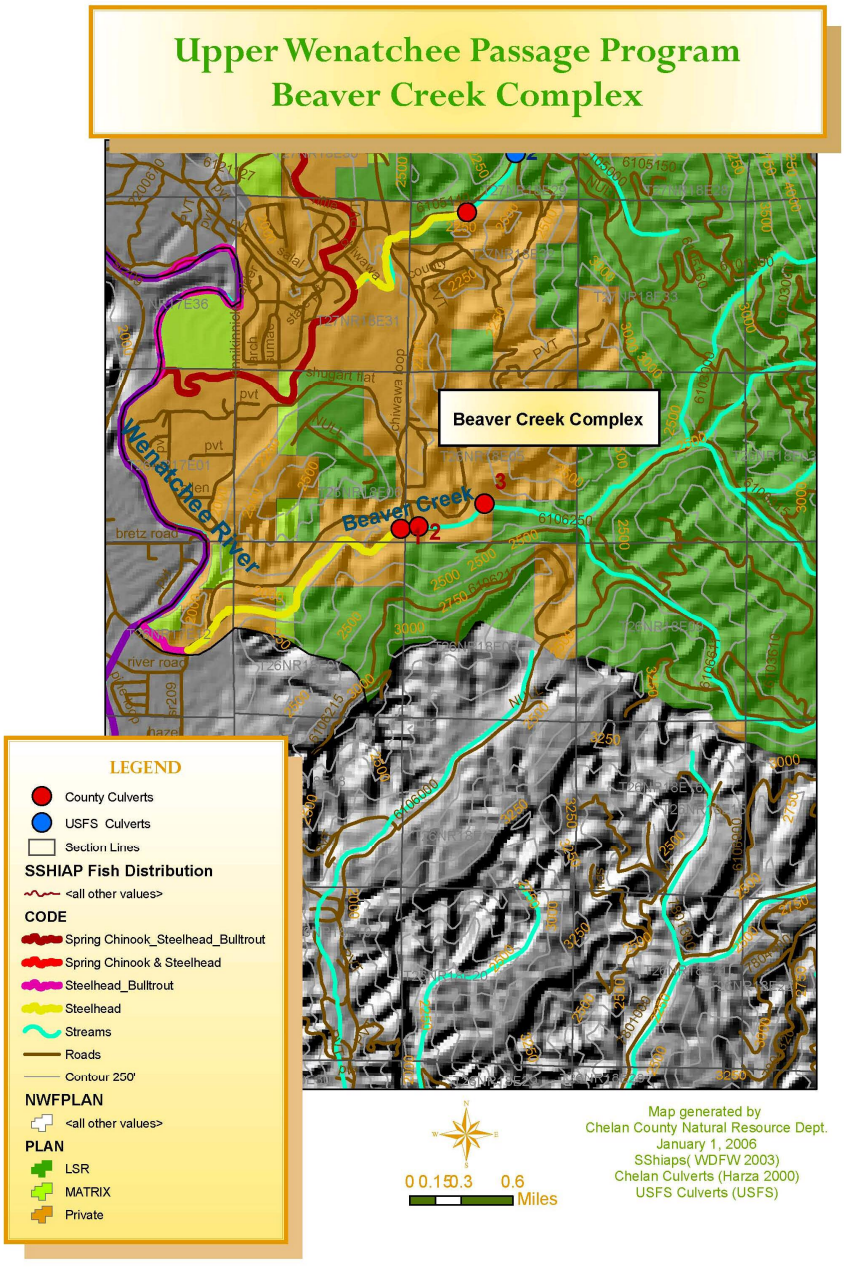


Figure 2. Beaver Creek Complex with SSHIAP Fish Distribution layer.

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 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.

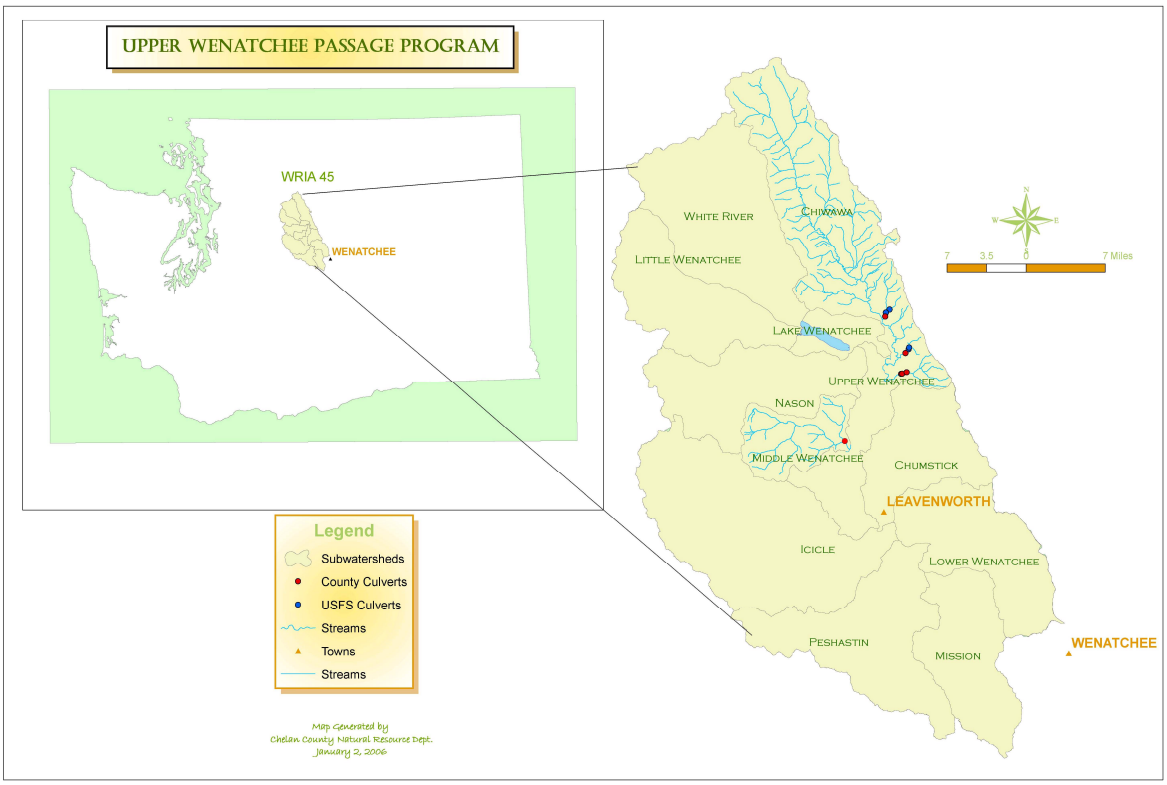


Figure 3. Upper Wenatchee Passage Program Area Map

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

The Wenatchee Subbasin Plan (NPCC 2004) addresses Beaver Creek in the Middle Wenatchee River Assessment Unit and states "Beaver Creek provides steelhead/redband trout habitat and lends to structural diversity for this species." Furthermore in the plan's section Near Term Opportunities and Measurable Objectives, Obstruction to Fish Passage it recommends "Replace all culverts that are currently blocking fish passage in Beaver Creek." In addition, the Harza/BioAnalyst (2000) report emphasizes that "Beaver Creek likely has important rearing habitat for juvenile Chinook, steelhead and cutthroat trout". The correction of the Beaver Creek culvert barriers is also recommended in the Upper Columbia Salmon Recovery Plan's Implementation Schedule (UCSRB 2006).

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
Beaver Creek culverts #1, #2 and #3 were given a "high" priority for replacement by the Upper Columbia Regional Technical Team (Table 3; UCRTT 2006). In addition, Beaver Creek culverts are included in the Implementation Schedule (UCSRB 2006).

Species Use
Upper Columbia steelhead, spring Chinook and bull trout are known to spawn and rear in the Middle Wenatchee Assessment Unit (Table 2). Table 4 shows the known and presumed fish presence in Beaver 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 culverts with modular steel bridges, 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.

Beaver Creek Barriers
From the mouth of Beaver Creek to RM 2.5, seven road crossing structures were surveyed, five of which were determined to be fish passage barriers (Harza/ BioAnalysts 2000). The first barrier occurs at RM 0.3 Section 12, T26N R17 on the Chelan County Chiwawa Loop Road. This failing culvert will be replaced by Chelan County with a modular bridge unit to open up habitat for fish on Beaver Creek. This culvert is not included in this application because Chelan County, as part of the 6-year road improvement program, is scheduled to re-build a portion of the Chiwawa Loop Road. This project is currently in the permitting stage and on the schedule to be replaced in 2007. If all of the Beaver Creek Culverts are corrected, included the scheduled replacement at RM 0.3, it will add 4.6 RM of fish habitat to the system.

Habitat Condition
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.

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 Beaver Creek.

Beaver 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[1,2,3]	0	0	0
Chinook	x	0	0	0
Bull trout	X[1]	0	0	0
Coho	X[1]	0	0	0
Sockeye	x	0	0	0
Westslope cutthroat	x	0	0	0
Rainbow trout	x	0	0	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]: USFS 2006
[3]: USFS 2004

E. Project Proposal

Beaver Creek Barrier Descriptions

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** (Figure 4). 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 (Figure 5). The landowner has been contacted and has filled out a landowner willingness form (See Appendix A).

Figure 4. Beaver Creek Culvert #1

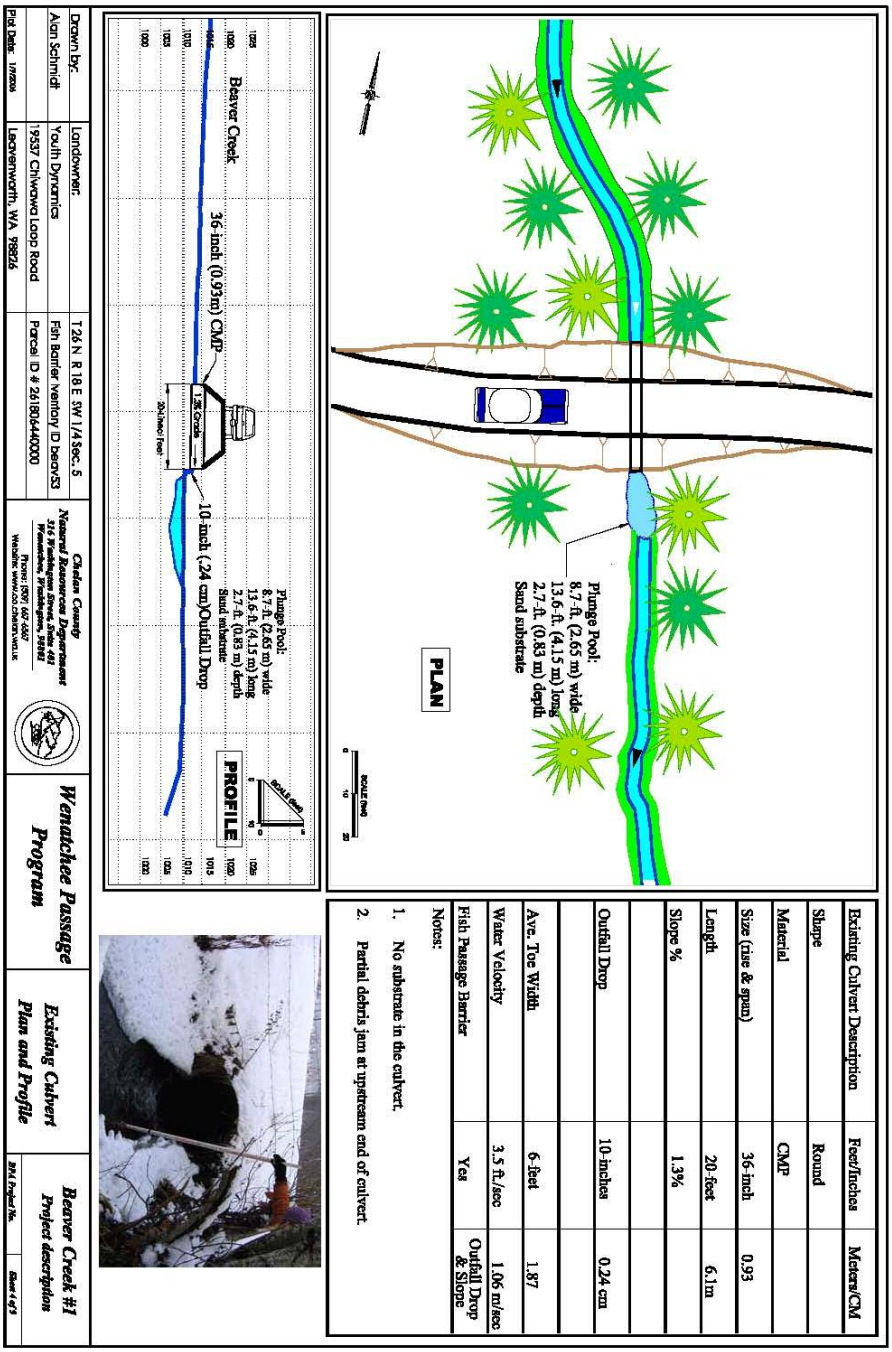


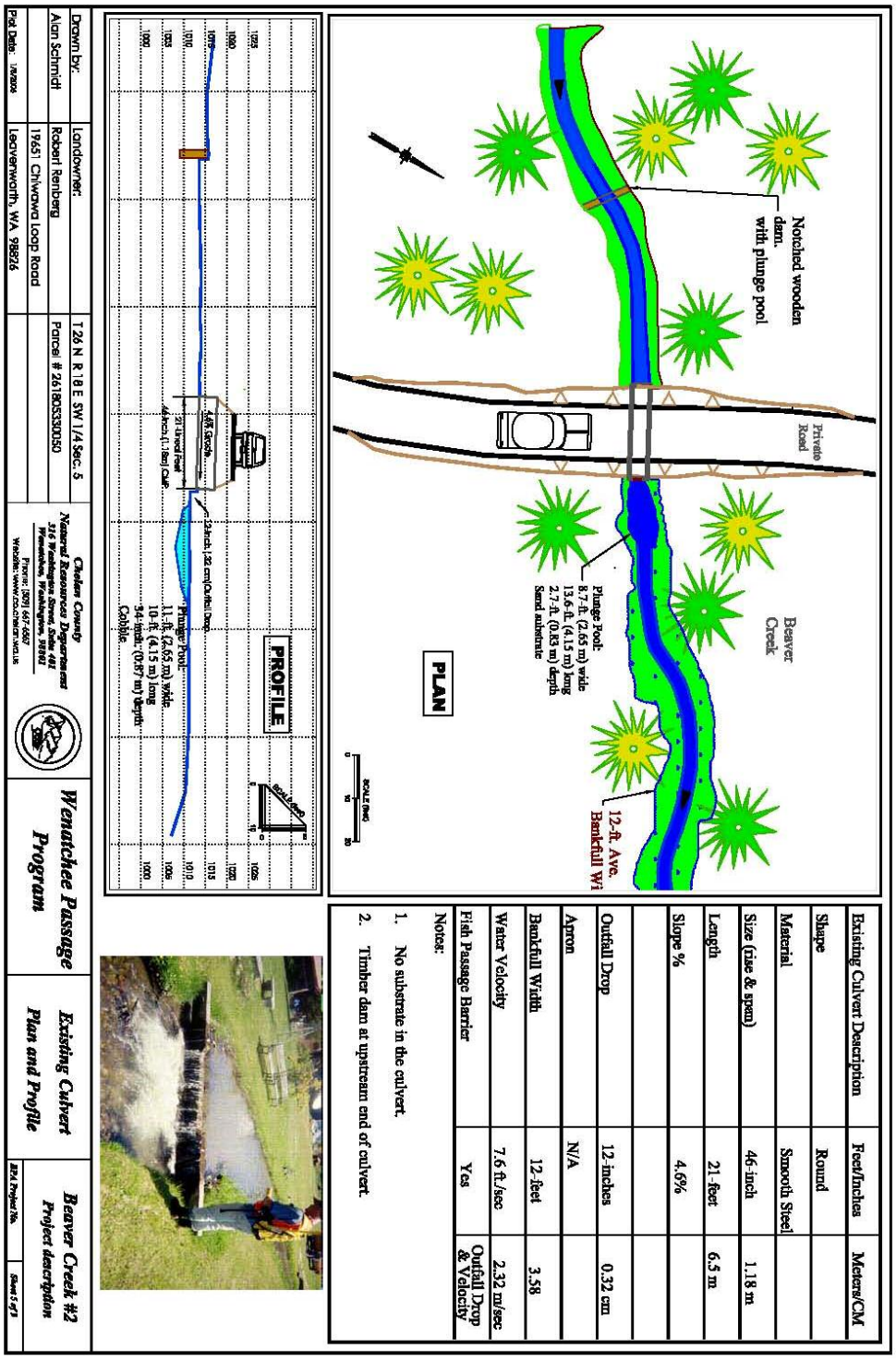
Figure 5. Beaver Creek #1 plan and profile

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 (Figure 6, Figure 8). There is no substrate in the pipe. The timber dam (Figure 7) is approximately 100 feet upstream from the culvert. The landowner has been contacted and has filled out a landowner willingness form (See Appendix A).

Figure 6. Beaver Creek Barrier #2a

Figure 7. Beaver Creek Barrier #2



Existing Culvert Description	Feet/Inches	Meters/CM
Shape	Round	
Material	Smooth Steel	
Size (rise & span)	46-inch	1.18 m
Length	21-feet	6.5 m
Slope %	4.6%	
Outfall Drop	12-inches	0.32 cm
Apron	N/A	
Bankfull Width	12-feet	3.58
Water Velocity	7.6 ft./sec	2.32 m/sec
Fish Passage Barrier	Yes	Outfall Drop & Velocity

Notes:

1. No substrate in the culvert.
2. Timber dam at upstream end of culvert.

Figure 8. Beaver Creek Barrier #2 Plan and Profile (Photo in plan is of small dam only see Figure 6 for 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 (Figure 9, 10). The landowner has signed a landowner willingness form (See Appendix A).

Figure 9. Beaver #3 Culvert

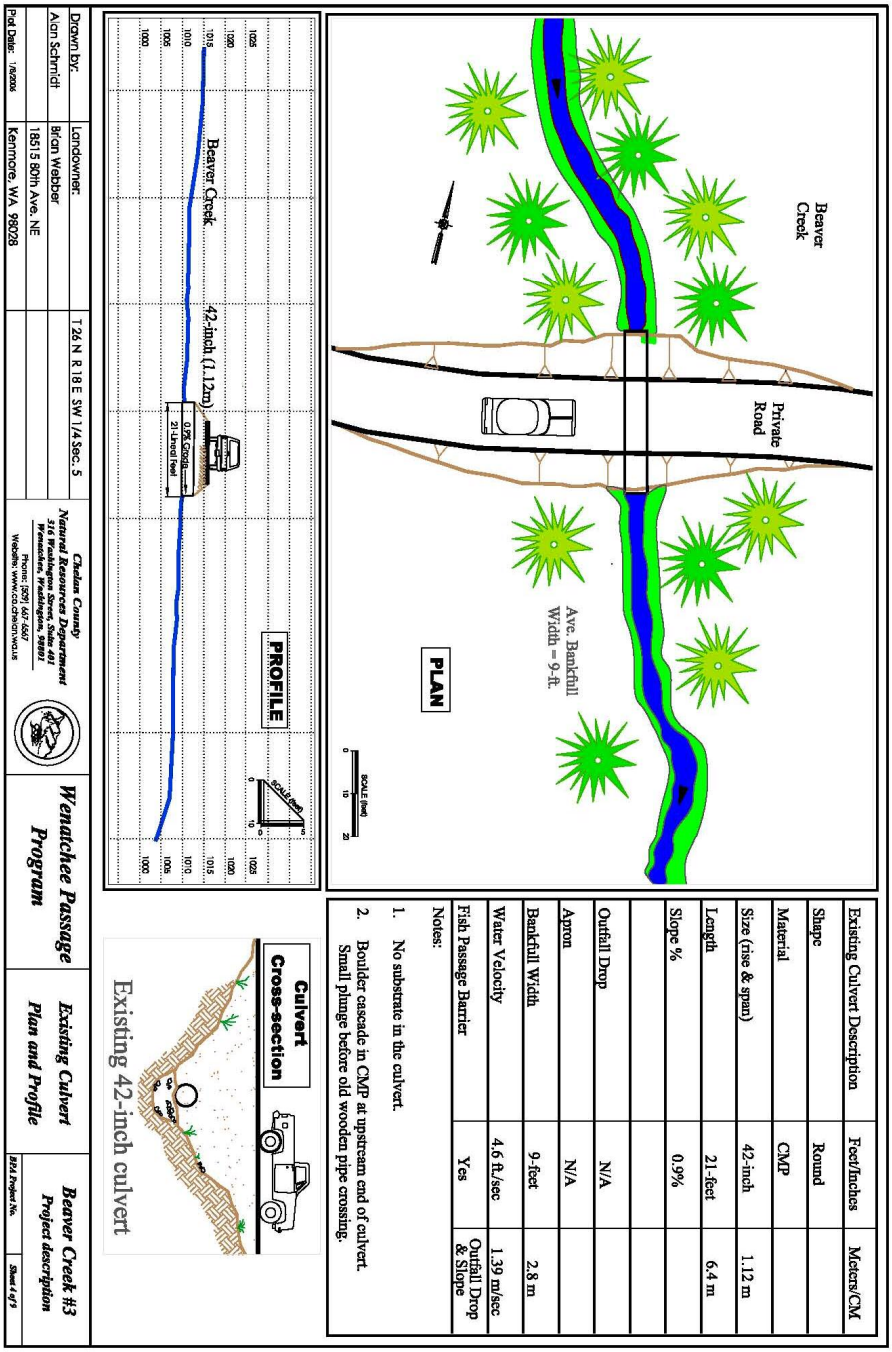


Figure 10. Beaver Culvert #3

Beaver Creek Passage Program Design Concept

Chelan County Natural Resources Department proposes to replace the three passage barrier culverts with modular steel bridge structures. 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 (see Figure 11a 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."*** The manufacturers claim low initial cost, prompt delivery, and fast easy installation. Furthermore, load ratings and normal maintenance practices are preserved.

Figure 11a. 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 11b. Modular Steel Bridge

Stream crossing structures consisting of modular steel bridge components manufactured in pre-selected span lengths offer the most natural tributary stream conditions at accepted road crossings. The Beaver Creek Passage Program design concept contains commonly accepted designs with required materials and will use local, qualified construction contractors. Typical construction after requirements for all permitting and contracting documents have been secured 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 culvert, bottomless arch culverts, and modular steel bridges. A cost estimate for each alternative is appended to the barrier inventory form and attached in PRISM.
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 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.
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 Beaver Creek Passage Program is to utilize modular steel bridge super structures set in place on pre-cast concrete abutments.

The **primary objective** of this project is to remove three (3) fish passage barriers 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.

In 2006, Chelan County and the Reclamation will begin conducting engineering surveys and pre-project implementation and effectiveness monitoring at each of the 3 culverts and 1 wooden dam sites and will also develop engineering design and construction specifications to replace and correct them. During the permitted work window in 2007 existing culverts will be removed and replaced with bridges. In addition to the correction of barriers, second and third year activities will include riparian plantings to restore and enhance habitat.

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. 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, 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 Replacements are 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 structures. 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 of each culvert (taken upstream, downstream, and each culvert) will be collected during high-flow and low-flow periods before and after installation of the squash culverts. 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 each barrier and a 300-m reach upstream from the upper 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 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 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. Reclamation and the USFS have utilized the Economy Act to group projects within a close geographical area into management units. This allows Reclamation to develop project plans on all three project sites in the Beaver Creek Complex even with Beaver #3 under Forest Service jurisdiction. In turn, the Forest Service will provide engineering for the three projects sites on the Clear Creek Complex.

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.

Economy of Scale

The Chelan County Natural Resources Department has identified three passage barriers in each of the Alder Creek, Beaver Creek, and Clear Creek subbasins for removal and replacement. Funding is requested for each subbasin in order to realize the greatest biological benefit while also taking advantage of the reduced costs of grouping each structure of three passage barriers into one project. All three culverts on Beaver Creek are being surveyed and designed by Reclamation.

Construction costs will be reduced by allowing the contractor to mobilize equipment and purchase materials for all three sites instead of one at a time. For example, mobilization of heavy construction equipment will require transport of approximately 30 miles over county roads. The same heavy equipment is required for each site; therefore the equipment can be used at each site before transport back to the contractors shop.

Purchase of materials for all three sites allows the supplier to more efficiently transport such items as the modular bridge superstructures, pre-cast concrete abutments, ecology blocks, and rip rap slope retention rock. As result of the recent fuel price increases, all suppliers and contractors are including in their contracts a provision for a “Fuel Surcharge”. While it is difficult to estimate fuel price increases, much of the increased costs can be avoided by grouping each subbasins three sites under one contract. Permitting costs could be reduced by replacing all the culverts in each of the subbasins by taking advantage of the Consolidated Permit provision provided by Washington Department of Fish and Wildlife.

I. References

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Appendix A. Landowner Willingness Forms

16. Landowner Willingness Form

Landowner Information:

Name of Landowner: Youth Dynamics

Landowner Contact Information:

Contact Mailing Address:

Youth Dynamics
19537 Chiwawa Loop Road
Leavenworth, WA 98826
Contact E-Mail Address:

Property Address or Location:
19537 Chiwawa Loop Road

I certify that Youth Dynamics is the legal owner of property described in this grant
(landowner or organization)
application to the Salmon Recovery Funding Board (SRFB). I am aware the project is being proposed on said property. My signature authorizes the applicant listed below to seek funding for project implementation, however, does not represent authorization of project implementation.

Paul Beaver for Youth Dynamics 12-27-05
Landowner Signature **Date**

Project Applicant Information:

Project Name: Entiat River Habitat Improvement Project

Project Applicant Contact Information:

☐ Mr. ☐ Ms. Title **Habitat Program Manager**

First Name: **Alan** Last Name: **Schmidt**

Contact Mailing Address: **Chelan County Natural Resource Department**
316 Washington St. Suite 401
Wenatchee, WA 98801

Contact E-Mail Address: **alan.schmidt@co.chelan.wa.us**

Lead Entity Organization: **Chelan County Natural Resource Department**

763-3161

Landowner Willingness Form for Beaver Creek Culvert #1

16. Landowner Willingness Form

Landowner Information:

Name of Landowner:

Landowner Contact Information:

☑ Mr. ☐ Ms. Title

First Name: Robert & Ruth Renberg Last Name: Renberg

Contact Mailing Address:
19651 Chiwawa Loop Road
Leavenworth, WA 98826

Contact E-Mail Address:

Property Address or Location:
19651 Chiwawa Loop Road
Leavenworth, WA 98826

I certify that ROBERT N. RENBERG is the legal owner of property described in this grant
(landowner or organization)
application to the Salmon Recovery Funding Board (SRFB). I am aware the project is being proposed on said property. My signature authorizes the applicant listed below to seek funding for project implementation, however, does not represent authorization of project implementation.

Robert N. Renberg 1-3-06
Landowner Signature **Date**

Project Applicant Information:

Project Name: Entiat River Habitat Improvement Project

Project Applicant Contact Information:

☐ Mr. ☐ Ms. Title **Habitat Program Manager**

First Name: **Alan** Last Name: **Schmidt**

Contact Mailing Address: **Chelan County Natural Resource Department**
316 Washington St. Suite 401
Wenatchee, WA 98801

Contact E-Mail Address: **alan.schmidt@co.chelan.wa.us**

Lead Entity Organization: **Chelan County Natural Resource Department**

Landowner Willingness Form for Beaver Creek Culvert #2

16. Landowner Willingness Form

Landowner Information:

Name of Landowner: Brian Webber

Landowner Contact Information:

Contact Mailing Address:
Brian Webber
18515 80th Ave. NE
Kenmore, WA 98028

Property Address or Location:
19665 Chiwawa Loop Road
Leavenworth, WA 98826
Chelan County Parcel ID # 261805300100

Alan-
When the time is appropriate, we would like to discuss removal of Beaver Dams which obstruct Beaver Creek.

Please notify me prior to further evaluation of Beaver Creek on our property.

Thanks
Brian

I certify that ____**Brian Webber**__ is the legal owner of property described in this grant application to the Salmon Recovery Funding Board (SRFB). I am aware the project is being proposed on said property. My signature authorizes the applicant listed below to seek funding for project implementation, however, does not represent authorization of project implementation.
(landowner or organization)

Brian Webber
Landowner Signature

1.9.06
Date

Project Applicant Information:

Project Name: Entiat River Habitat Improvement Project

Project Applicant Contact Information:

☐ Mr. ☐ Ms. Title **Habitat Program Manager**

First Name: **Alan** Last Name: **Schmidt**

Contact Mailing Address: **Chelan County Natural Resource Department**
316 Washington St. Suite 401
Wenatchee, WA 98801

Contact E-Mail Address: **alan.schmidt@co.chelan.wa.us**

Lead Entity Organization: **Chelan County Natural Resource Department**

Landowner Willingness Form for Beaver Creek Culvert #3

Appendix B. Budgets

12b. Beaver 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	37,000	Length/width	30x16
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	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
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		1,200	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	.5	1,000	Describe	Re-vegetation
Sales Tax			**5,504**		
Sub-Total			**74,304**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**22,291**		
SRFB Request			**96,595**		
Match			**31,000**		
TOTAL COST			**127,595**		

12b. Beaver Creek Barrier #2 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	37,000	Length/width	30x16
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each	1	1,000	Describe	Remove existing wooden dam
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
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		1,200	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	.5	1,000	Describe	Re-vegetation
Sales Tax			**5,584**		
Sub-Total			**75,384**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**22,615**		
SRFB Request			**97,999**		
Match			**31,000**		
TOTAL COST			**128,999**		

12b3. Beaver Creek Barrier #3 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	37,000	Length/width	30x16
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	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	6	9,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,000	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,000	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	.5	1,000	Describe	Re-vegetation
Sales Tax			**5,659**		
Sub-Total			**76,896**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**23,069**		
SRFB Request			**99,965**		
Match			**31,000**		
TOTAL COST			**130,965**		

12b4. Total Beaver Creek Passage Project 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	3	111,000	Length/width	30x16
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each	1	1,000	Describe	Remove existing wooden dam
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	3	10,200	Length/width	120ft/24ft
Log control (weir)	Each			Optional	
Mobilization	Lump sum		6,000	Optional	Transport equipment
Permits	Lump sum		21,000	Optional	Design coordination
Rock control (weir)	Each	14	21,000	Optional	Grade control structures
Roughened channel	Linear ft	360	9,000	Describe	New streambed
Signage	Each		3,400	Describe	Construction signing
Site maintenance	Lump sum		3,000	Describe	Dust abatement
Traffic control	Lump sum		1,400	Describe	Flaggers as necessary
Utility crossing	Lump sum		3,000	Describe	Future utility extension
Water management	Lump sum		15,000	Describe	Stream diversion
Work site restoration	Acres	1.5	3,000	Describe	Re-vegetation
Sales Tax			**16,747**		
Sub-Total			**226,584**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**67,975**		
SRFB Request			**294,559**		
Match			**93,000**		
TOTAL COST			**387,559**		