Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal

Section 1. General administrative information

Remove 23 migrational barriers and restore the riparian vegetation on Chumstick Creek

Bonneville project number, if an ongoing project 9050

Business name of agency, institution or organization requesting funding
U.S. Fish and Wildlife Service

Business acronym (if appropriate) USFWS

Proposal contact person or principal investigator:

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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
NRCS	301 Yakima RM 307, Federal Building	Wenatchee, WA 98801	Doug Allen
Washington Department of Fish and Wildlife	3860 Chelan Highway North	Wenatchee, WA 98801	Bob Steele
Chumstick Watershed Council	15950 Chumstick Highway	Leavenworth, WA 98826	Lisi Ott
Chelan County Conservation District	301 Yakima, RM 301 Federal Building	Wenatchee, WA 98801	Conrad Petersen
Local Landowners	See Attached Letters		

NPPC Program Measure Number(s) which this project addresses.
7.6, 7.7, 7.9, and 7.10

NMFS Biological Opinion Number(s) which this project addresses.

West Coast Steelhead Briefing Package, Steelhead Conservation Efforts: A Supplemental to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act.

Other planning document references.

Chumstick Stream Survey and Flood Damage Assessment, Chumstick Stream Survey, The Wenatchee River Watershed Planning Project, Wenatchee River Watershed Ranking Report, Mid-Columbia River Tributary Compensation Report, Washington State Salmonid Stock Inventory for Bull trout/Dolly Varden, 1992 Washington State Salmon and Steelhead Stock Inventory, Steelhead Conservation Efforts: A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act.

The following organization and individuals support the restoration efforts on Chumstick Creek. For documentation, please see letters of support.

Washington Department of Fish and Wildlife, The Natural Resource Conservation Service, Chelan County Conservation District, Chumstick Watershed Organization, Private Land Owners including: Lisi Ott, Jeff Johnson, Douglas Himes, Casi Montoya, Loyd Lemons, Mike Schiel, Glenda Devore, Douglas Devore, Stephen Lemons, Peggy Neely, Byron Saliby.

Subbasin.

Chumstick Creek, a tributary to the Wenatchee River.

Short description.

Enhance and restore fish passage in the Chumstick Drainage. Species that will be affected include chinook, steelhead, bull trout, westslope cutthroat, and re-introduced coho. 23 culverts will be replaced and realigned on private land within the watershed. In-stream and riparian habitat will also be restored within these reaches.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
x	Anadromous fish	x	Construction	x	Watershed
*	Resident fish		O & M		Biodiversity/genetics
*	Wildlife		Production		Population dynamics
	Oceans/estuaries		Research	*	Ecosystems
	Climate	*	Monitoring/eval.	*	Flow/survival
	Other	*	Resource mgmt		Fish disease
			Planning/admin.		Supplementation

_____	Enforcement	*	Wildlife habitat en-
_____	Acquisitions		hancement/restoration

Other keywords.

Hydrodynamics, culvert replacement, migrational enhancement, habitat restoration, watershed approach

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
n/a		

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Complete Watershed Assessment	a	Combine the USFS assessment with the USFWS assessment on private land
2	Develop a restoration plan for the sites	a	Re-survey the 23 identified sites
		b	Develop designs for the restoration projects
		c	Comply with ESA, NEPA, ShiPo, county, state and federal agencies
3	Implement the restoration plan	a	Replace culverts
		b	Restore in-stream and riparian habitat
4	Develop and implement a monitoring plan	a	Develop monitoring criteria including snorkeling survey, sediment loads, photo points and cross section.
		b	Install monitoring points
		c	Implement
5	Information and Education	a	Conduct a series of workshops for local land owners and other work groups on the benefit of the restoration project.
		b	Establish a curriculum for local students to use the Chumstick as a

			outdoor classroom.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	10/1998	11/1998	1%
2	11/1998	03/1999	15.5%
3	06/1999	11/1999	69.9%
4	12/1999	on going	7.77%
5	02/2000	on going	5.83%

Schedule constraints.

It will be necessary that all in-stream work be completed during the work window established by Washington Department of Fish and Wildlife.

Completion date.
1999

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	To be supplied by USFWS and NRCS 121,875.00	
Fringe benefits	To be supplied by USFWS and NRCS included in personnel costs	
Supplies, materials, non-expendable property		
Operations & maintenance		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		
PIT tags	# of tags:	
Travel	To be supplied by NRCS and USFWS $6,000.00	
Indirect costs		
Subcontracts		$200,000
Other		
TOTAL		$200,000

Out year costs

Out year costs	FY2000	FY01	FY02	FY03
Total budget	0	0	0	0
O&M as % of total	0	0	0	0

Section 6. Abstract

Chumstick Creek is a 3rd order stream, which drains a 78 square mile sub-basin of the Wenatchee River watershed. In 1994, Chumstick Creek was ranked second to Mission Creek as contributing to current and future potential water quality degradation in the Wenatchee River watershed (Hines, 1994). The stream once supported healthy populations of chinook, steelhead and bull trout, however access to Chumstick Creek is now limited due to 23 culverts that are migrational barriers particularly at low flows (Bugert and Bambrick, 1996). Several of these sites were affected by the 1995-1996 floods and the high water run off of 1997. Most of these site are associated with problem culverts. The over all goal of this project is to enhance and improve salmonid migration throughout the Chumstick drainage. In addition to replacing the 23 identified culverts, 10 to 15 sites will be enhanced by improving in-stream habitat and riparian vegetation. All in-stream work will be completed by November 1999. All riparian vegetation will be completed by May of 2000. This project in cooperation with the point source pollution project and the improvement of the large culvert on Highway 209, will restore the health of the watershed and provide 78 square miles of habitat for anadromous and resident fish. In addition to the habitat for fish, this project will provide improved habitat for waterfowl, bald eagles, spotted owls, and grey wolves. Monitoring sites including water quality, cross section, sediment, habitat and photo points will be set up throughout the watershed.

Section 7. Project description

a. Technical and/or scientific background.

Chumstick Creek is a 3rd order stream, which drains a 78 square mile sub-basin of the Wenatchee River watershed. In 1994, Chumstick Creek was ranked second to Mission Creek as contributing to current and future potential water quality degradation in the Wenatchee River watershed (Hines, 1994). The stream once supported healthy populations of chinook, steelhead and bull trout, however access to Chumstick Creek is now limited due to 23 culverts that are migrational barriers particularly at low flows (Bugert and Bambrick, 1996).

Species of salmonids affected within this watershed include: chinook salmon (*Oncorhynchus tshawystcha*), steelhead salmon (*O. mykiss*), bull trout (*Salvelinus confluentus*), and rainbow trout (*O. mykiss*). For the upper Columbia ESU, steelhead have been listed as endangered and chinook are candidates for listing under the Endanger Species Act (ESA) by the National Marine Fisheries Service (NMFS). Bull trout are proposed for listing under ESA by the U. S. Fish and Wildlife Service (USFWS). Coho salmon (*O. kisutch*) were once present in some of the tributaries of

the Mid-Columbi Region (Mullan, 1984; ODFW and WDFW, 1995), but are now considered extinct (Nehlsen et al. 1991). It has been proposed that non-native coho salmon populations be introduced to the Mid-Columbia Region, specifically Chumstick Creek.

Stream-type chinook salmon (spring run) return to the Wenatchee River from late April through June. The primary spawning areas are the Chiwawa River between Grouse and Phelps Creeks, Nason Creek between Kahler and Whitepine Creeks, the Little Wenatchee River between RK1 and 11, the White River between Sears Creek and White River Falls, and the mainsteam Wenatchee River between Chiwaukum Creek and Lake Wenatchee (Peven and Truscott, 1995). Limited amount of spawning has also been reported in Peshastin, Chumstick and Mission creeks (WNF, 1994), and are classified as categories II and III. Spawning begins in early August in the upstream reaches of the tributaries and continues downstream through September. Juveniles emerge from the gravel from late March through early May, generally spend their first summer in the subbasins, and leave in late fall through the following spring. The peak of spring migration is late April through May, but downstream movement from the tributaries may be continuous, and not always associated with parr/smolt transformation (Petersen et al. 1995).

Steelhead use the mainstem Wenatchee River and eight of it tributaries; lower Mission Creek, Sand, Brender, Peshastin, Chumstick, Icicle, Chiwaukum, and Nason creeks, and the Chiwawa, Little Wenatchee, and White rivers. Some fry and parr rear in the mainstem Wenatchee all year. Steelhead that use the upper reaches of tributary habitats (Peshastin and Chumstick, for example) have probably been more heavily impacted by forest practices, improper grazing, stream channel alterations and unauthorized water withdrawals than have stream-type chinook salmon. These problems are in addition to riparian and shoreline impacts.

When adult salmon and steelhead enter freshwater, the maturing fish stop feeding and rely on energy reserves stored in body fat and protein to carry them through migration and spawning. The rate of sexual maturity is established by heredity, and cannot adjust to delays. Barriers that cause excessive delay and abnormal energy expenditures can result in mortality either during the migration or in the spawning areas. Physical barriers such as culverts and log jams can obstruct, either partially or totally, salmon and trout migration. In addition to existing barriers which delay or totally block up stream migration, spawning areas which were originally accessible have become inundated by reservoirs and other in-stream modification. Therefore, existing man-made barriers must be modified to further open the Awindow of passage≅ to spawning areas (Powers and Orsborn, 1984).

There are six common conditions at culverts that create migration barriers:

- X excess drop at culvert outlet;
- X high velocity within the culvert barrel;
- X inadequate depth within culvert barrel;
- X high velocity and/or turbulence at culvert inlet;

X turbulence within the culvert;
X debris accumulation at culvert inlet.

Culvert barriers are the result of design, improper installation, inadequate maintenance, or subsequent channel changes. They are very often the result of degrading channels that leave the culvert perched. Changes in hydrology due to urbanization are a primary reason for degrading channels. Barriers are also caused by scour pool development at the culvert outlet. The scour pool may be good habitat in itself but it moves the backwater control of the elevation further downstream and therefore to a lower elevation. Large scour pools are often an indicator that a velocity barrier exists within the culvert at high flows (USFWS, 1997).

A stream survey was conducted by USFWS and NRCS during the fall of 1996 (USFWS, 1996). The survey was a modified Hankin and Reeves (USFS, 1991). Information complied into a quantitative and qualitative habitat report focusing on habitat restoration sites. Twenty three culverts were identified as migrational barriers with associated habitat degradation. These sites are the focus of this proposal.

b. Proposal objectives.

MAIN GOALS AND OBJECTIVES: Replace 23 culverts that have been identified as migrational barriers and associated habitat degradation on Chumstick Creek. To improve anadromous salmonid passage and enhance in-stream and riparian habitat. Improvement of habitat quality will allow greater juvenile and adult survival at each freshwater stage and thus may result in more offspring to begin migration to the ocean.

1. Combine stream survey on private land with that of the USFS watershed analysis of Chumstick Creek.

2. Develop a restoration plan for the 23 project site.

3. Coordinate with private land owners and co-sponsors on project design. This is necessary to promote a holistic watershed restoration approach.

4. Implement the restoration plan. This includes replacing 23 culverts and restoring associated habitat.

5. Revegetate the project sites.

6. Establish a monitoring plan including photo points and cross sections.

7. Develop a slide presentation and curriculum for workshops and local students.

c. Rationale and significance to Regional Programs.

Steelhead have been listed as endangered in the Wenatchee River drainage under the Endangered Species Act (ESA) by the National Marine Fisheries Service (NMFS, 1997). Along with the mainstem Columbia River Dams, land use practices and water allocations, loss of habitat is recognized as factors in the decreasing salmonid populations (NMFS 1996, USFS 1995).

Through the restoration of in-stream habitat, riparian vegetation and the reduction of migrational barriers on Chumstick Creek, a migrational corridor will be re-established for chinook, steelhead, and possible induction of coho. This project will open up 78 square miles of spawning and rearing habitat.

This project will further the goals of the FWP by improving habitat degradation and migrational barriers within the Wenatchee River Watershed. It will improve the quality and quantity of habitat available in Chumstick Creek thus allowing greater juvenile and adult survival at each freshwater stage and may result in more offspring surviving to begin migration to the ocean.

In addition to the habitat benefits to Chumstick Creek, this project will be used as a demonstration site to promote a watershed approach to bio-engineering and habitat restoration. Results of this project will be presented at a number of workshops to educate local land owners on the benefits of restoration and how to work within the Endangered Species Act. In addition, this project will serve as an outdoor class room for high school students in the Leavenworth area. This project will provide an opportunity for students to get hands on experience in restoration.

Along with another project proposed for BPA funding (culvert replacement of highway 209), the Chelan County Conservation Grant for point source pollution and the Chumstick Watershed Association=s riparian revegetation efforts, this proposal provides a key element to a watershed approach to restoration. The Chumstick Watershed will be used as a model project to encourage people living in other watersheds to participate in these types of activities.

This project will benefit salmonids along with many other species in this area. These include grizzly bear, gray wolf, wolverine, northern spotted owl, and bald eagle.

The Chumstick Creek Restoration Project is a cooperative effort between U.S. Fish and Wildlife Service, the Natural Resource Conservation Service, Washington Department of Fish and Wildlife, Trout Unlimited, Chumstick Watershed Association, Chelan County Conservation District, and local land owners.

d. Project history

None, this is a new project.

e. Methods.

1. Complete a survey of the project site and combine this information with that of the Forest Service Watershed Analysis.

2. Once both watershed documents have been combined, a restoration plan will be developed. This plan will include the following problems:
    a. Replacement of 23 culverts.
    b. Restore habitat degradation associated with the culverts.
    c. Establish a high poll/riffle ratio.
    d. Increase cover.
    e. Decrease stream gradient.
    f. Increase stream stability.
    g. Improve in-stream habitat for salmonids.
    h. Improve riparian vegetation.

3. Designs will be developed to implement the restoration plan. These designs will be bio-engineered. This will incorporate new culverts, large woody debris, rock and vegetation.

4. Biological assessment on permits applications will be submitted to the state, local and federal agencies.

5. Construction will take place during the 1999 field season. Structures will include the following:

    a. Replacement of the 23 culverts.
    b. Installation of root wad revetments.
    c. Installation of rock veins and vortex weirs.
    d. Installation sunken log habitat structures.
    e. Re-sloping existing banks.

7. Establish a monitoring plan. This will include the following parameter:

    a. Riparian vegetation.
    b. Deposition pattern
    c. Debris occurrence
    d. Meander pattern
    e. Sediment supply
    f. Bed stability
    g. Width/depth ratio

8. Establish monitoring points

9. Re-establish riparian vegetation. This will be accomplished by planting bare root stocks of black cotton wood, quaking aspen, willow sp., red-osier dogwood, snowberry, service berry and wild rose. All disturbed area will be reseed using native streambank grasses.

10. Develop a slide presentation and curculum for educational presentation.

f. Facilities and equipment.

U.S. Fish and Wildlife Service and the Natural Resource Conservation Service will supply all materials necessary to preform the surveys and develop the restoration and monitoring plans. This proposal is a request for on the ground restoration materials and equipment needed for installation of the project. A contractor will be hired to supply all construction equipment, rock, root wads, and culverts necessary for construction of the projects. The IDT will work with the contractor to obtain all materials necessary for the project.

USFWS and NRCS portion of the cost share includes the following at a cost rate of $625.00 per bio-day:

Objective

1. Complete Watershed Assessment 5 bio-days @ $625 per day = $ 3,125.00

2. Develop Restoration Plan 80 bio-days @ $625 per day = $50,000.00

3. Implementation 40 bio-days @ $625 per day = $25,000.00

4. Develop and implement monitoring plan 40 bio-days @ $625 per day = $25,000.00

5. Information and Education 30 bio-days @ $625 per day = $18,750.00

6. Travel $ 6,000.00

Total cost share for USFWS and NRCS = $127,875.00

g. References.

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U.S.D.A. Forest Service. 1995. Stream Inventory Handbook Level I and II, (Hankin-Reeves Inventory).

Section 8. Relationships to other projects

Along with another project proposed for BPA funding (culvert replacement of highway 209), the Chelan County Conservation Grant for point source pollution and the Chumstick Watershed Association=s riparian revegetation efforts, this proposal provides a key element to a watershed approach to restoration. The Chumstick Watershed will be used as a model project to encourage people living in others watershed to participate in these types of activities.

The Chumstick Creek Restoration Project is a cooperative effort between U.S. Fish and Wildlife Service, the Natural Resource Conservation Service, Washington Department of Fish and Wildlife, Trout Unlimited, Chumstick Watershed Association, Chelan County Conservation District, and local land owners.

Section 9. Key personnel

Kate Terrell is a fish and wildlife biologist with the U. S. Fish and Wildlife Service in Moses Lake, Washington. She received a bachelors degree in biology from the University of Oregon and a masters of fisheries from the University of South Carolina. She joined the U. S. Fish and Wildlife Service in 1992. Prior to working for the USFWS, she worked for the Oregon Department of Fish and Wildlife and the U. S. Forest Service. Her work currently focuses on habitat restoration in anadromous systems.

Currently, she is working with private land owners, local groups and other agencies in the Chewuch, Entiat, Wenatchee, and Methow Rivers as well as Swale, Rattlesnake and Chumstick creeks. This work focuses on the development and implementation of restoration plans. During the past field season, six of these projects were completed. They ranged from riparian fencing to Rosgen-type root wad revetments.

Rodrigo A. Lobos is a civil engineer for the Natural Resource Conservation Service in Wenatchee, Washington. He received his bachelors degree of engineering from Washington State University in Pullman, Washington in 1995. Since graduation he has worked for the NRCS, where he has focused on designing bio-engineered projects in Chelan, Okanogan and Douglas Counties. During the summer of 1997, Rod designed and assisted in the implementation of 6 to 8 projects, two of which were located on Chumstick Creek.

During the fall of 1996, Rod participated in the stream survey of Chumstick Creek. This team identified the 23 culverts that needed to be replaced.

Construction will be completed by a licenced construction firm experienced in these types of activities.

Section 10. Information/technology transfer

A series of workshops will be held within the region to show the benefits of a watershed approach to restoration. These workshops will include point and nonpoint source pollution, riparian restoration as well as in-stream habitat. It is our goal to educate the public on how to restore and maintain a healthy ecosystem. The Chumstick drainage will also be used as an outdoor classroom for the local schools.