

**Bonneville Power Administration  
Fish and Wildlife Program FY99 Proposal Form**

**Section 1. General administrative information**

**Buck Hollow Watershed Enhancement (for funding in FY99)**

**Bonneville project number, if an ongoing project** 9303000

**Business name of agency, institution or organization requesting funding**  
Wasco County Soil and Water Conservation District

**Business acronym (if appropriate)** WCSWCD

**Proposal contact person or principal investigator:**

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**Subcontractors.** List one subcontractor per row; to add more rows, press Alt-Insert from within this table

<b>Organization</b>	<b>Mailing Address</b>	<b>City, ST Zip</b>	<b>Contact Name</b>
see note below			

Note: Where possible, we give individual landowners the opportunity to install their own practices such as fencing. We cost share with the landowner and, by written agreement, require them to follow NRCS standards and specifications. We require the landowner to provide maintenance for a minimum of 10 years as a condition of receiving cost share. In other cases we allow the landowner to hire the contractor, construct practices to our design, and provide reimbursement for the agreed portion of the work. Only rarely do we contract for the work directly. Accordingly no specific subcontractors are listed.

**NPPC Program Measure Number(s) which this project addresses.**

7.6A1, 7.6A2, 7.6B1, 7.6B3, 7.6B4, 7.6B5, 7.6B6, 7.6C5, 7.6D

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

NONE

**Other planning document references.**

If the project type is “Watershed” (see Section 2), reference any demonstrable support from affected agencies, tribes, local watershed groups, and public and/or private landowners, and cite available documentation.

- Wy-Kan-Ush-Mi Wa-Kish-Wit Vol. II p.38 (CRITFC 1995) Objective 1 ‘protect and enhance aquatic and riparian habitat on all land bordering the Deschutes River and its tributaries to result in a net increase in habitat quantity and quality over time.’ Objective 2. ‘maintain or improve watershed conditions for sustained, long-term production of fisheries and high quality water.’ Objective 3. ‘maintain or improve flow for fish production in the tributaries of the Deschutes River.’ Strategy 2. Support implementation of existing land and resource management plans. ACTION: Enhance natural production of summer steelhead in Buck Hollow Creek.
- Deschutes River Subbasin Plan (1990) Summer Steelhead Strategy 3
- Buck Hollow Watershed Plan and Environmental Assessment (USDA Natural Resources Conservation Service, November 1994) pp. 9-17

Buck Hollow Watershed Project has strong support from local landowners, virtually all of whom are participating in the project, from the two adjoining local Soil and Water Conservation Districts (Sherman and Wasco SWCDs), the Wy’East Resource Conservation and Development Area Council consisting of 6 Conservation Districts in the Hood and Deschutes subbasins, 5 County Governments, and the Confederated Tribes of the Warm Springs Reservation of Oregon has endorsed the project. It has had continuing strong support of the Oregon Governor’s Watershed Enhancement Board (GWEB) and the GWEB Interagency Technical Committee. BLM Prineville has provided consistent support to the project and has installed several miles of fencing in the watershed. USDA NRCS has provided most of the technical support to the project and is providing funding through the Small Watershed Program (PL-566). USDA Farm Services Agency (Formerly ASCS) provided funding through the USDA Agricultural Conservation Program. Private landowners provide cash or in-kind contributions for practices on their land. \$1.2 Million in other funds have been brought to bear in the watershed, exceeding a 2:1 match for every BPA dollar budgeted through FY97.

- Watershed Support References which demonstrate broad involvement and track record of accomplishments through use of a wide variety of funding sources and in-kind support:
  - Buck Hollow Project Phase 1 final report Wasco Co. SWCD, Jan. 1993
  - Buck Hollow Project Phase 2 final report Wasco Co. SWCD, Dec. 1994
  - Buck Hollow Project Phase 3 final report Wasco Co. SWCD, Sep. 1995
  - Buck Hollow Project Phase 4 final report Wasco Co. SWCD, Jul. 1997

- Buck Hollow Project Phase 5 status report, *GROUNDWORK* Wasco Co. SWCD, Dec. 1997
- Wasco County SWCD Long Range Plan (Rev. 1997)
- Wasco County SWCD Annual Plan of Work for July 1, 1997 to June 30, 1998
- Individual Farm / Ranch Conservation Plans covering over 80% of the watershed
- Buck Hollow Interagency MOU of 12/5/1990
- Buck Hollow 2000 Watershed Enhancement and Fish Habitat Project Supplemental MOU April 11, 1994 (interagency support agreement)

**Subbasin.**

Deschutes subbasin, Buck Hollow Creek watershed

**Short description.**

Enhance the health of the Buck Hollow Watershed through comprehensive implementation of conservation systems using a variety of practices to improve land management, moderate hydrology, restore proper riparian functioning, improve water quality, and increase natural fish production.

**Section 2. Key words**

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish	+	Construction	X	Watershed
+	Resident fish		O & M		Biodiversity/genetics
+	Wildlife		Production		Population dynamics
	Oceans/estuaries		Research	+	Ecosystems
	Climate	+	Monitoring/eval.	+	Flow/survival
	Other	X	Resource mgmt		Fish disease
		+	Planning/admin.		Supplementation
			Enforcement	+	Wildlife habitat en-
			Acquisitions		hancement/restoration

**Other keywords.**

Watershed Health, natural fish production, habitat restoration, natural resources, rangeland management, conservation

**Section 3. Relationships to other Bonneville projects**

Project #	Project title/description	Nature of relationship
NONE		

## Section 4. Objectives, tasks and schedules

### *Objectives and tasks*

<b>Obj 1,2,3</b>	<b>Objective</b>	<b>Task a,b,c</b>	<b>Task</b>
1	Ensure overall project coordination maintains high level of agency and landowner participation, avoids overlaps and duplications of effort, identifies and resolves issues as they occur	a	Coordinate project activities with participating agencies in accordance with Memorandum of Understanding.
		b	provide regular project updates via newsletter, personal contact, annual all participant meetings, and special meetings as needed
		c	Meet with landowners / landowner groups on-site, ensuring their inputs are obtained and factored in to each stage of the project.
		d	Coordinate with and support involvement of Sherman & Wasco Co. schools in outdoor environmental Education projects.
2	Ensure adequate project documentation	a	Develop and maintain project implementation status, accomplishments to date, and current work status
		b	Develop site specific activity records
		c	Support BPA & NRCS NEPA process as necessary
		d	Develop and maintain a GIS data base and hardcopy USGS quadrangle maps showing location of completed projects
		e	Develop and maintain spreadsheets for each project funding source to track financial contributions and accomplishments
		f	Prepare and submit required reports

3	Ensure overall program and individual practices result in watershed health improvements	a	Take periodic water quality & physical measurements at established monitoring sites to include at a minimum: temperature, flow, and channel cross sections
		b	Take photographs at established photo points annually. Set additional photo points as appropriate.
		c	Review / modify monitoring plan protocols as necessary based on field experience and cost effectiveness
		d	Participate with ODFW in spawning ground survey to document redd counts and fish distribution in watershed
		e	Obtain periodic range condition assessments from NRCS and monitoring data collected by BLM
		f	Evaluate data and observations for trends. Evaluate performance of installed practices
		g	Assess effectiveness of methods/practices. Initiate adaptations as indicated.
4	Ensure work preparations are complete	a	conduct pre-season site checks
		b	review planned work with landowners & supporting agencies
		c	obtain landowner agreements, including their agreement to be responsible for O&M
		d	finalize detailed plans
		e	coordinate work elements with work funded under other programs (PL566, EQIP, GWEB)
		f	obtain necessary permits
		g	obtain materials
		h	prepare contract documents as needed
5	Increase stream shading from 36% to 80%	a	Assist landowners implementing grazing management strategies to reduce or eliminate livestock

			grazing impacts on riparian vegetation which prevents regeneration of woody species.
		b	Assist landowners in establishing fencing systems to control livestock access to riparian areas.
		c	Assist landowners in developing off-stream livestock water.
		d	Assist landowners in developing conservation and grazing management plans to include practices to improve upland vegetation and reduce scouring peak runoffs.
		e	Plant cottonwood and willow cuttings in selected reaches where natural regeneration is unlikely to occur soon.
6	Decrease summer water temperature from 80°F to 58°F	a	Increase shading (tasks 5a,b,c,e)
		b	Narrow channel (Obj.9)
		c	Increase late season low flows (Obj. 7)
7	Increase late season flows from 1 CFS to 5 CFS	a	Augment flows by rebuilding riparian water storage capacity through revegetation and protection of riparian meadow areas. (tasks 5a,b,c,d,e)
		b	Seed selected areas with riparian seed mix to accelerate revegetation
8	Increase pool / riffle ratio from 10:90 to 40:60	a	Reduce sedimentation (tasks 5d, obj 10)
		b	Restore riparian vegetation (tasks 5a,b,c,d,e and 7b)
9	Improve channel width:depth ratio from 30:1 to 10:1	a	Restore riparian vegetation (tasks 5a,b,c,d,e and 7b)
10	Increase bank stability from 25% to 80% stable	a	Restore riparian vegetation (tasks 5a,b,c,d,e and 7b)
		b	Place juniper rip rap on stream banks in selected areas.
11	Increase woody debris from 5 units per 100 meters to 20 units per 100 meters.	a	Plant cottonwood cuttings in selected reaches to help restore potential for future recruitment
		b	Reduce grazing impacts on riparian vegetation (tasks 5a,b,c)

		c	Incorporate junipers into instream work to maximum extent practicable
12	Reduce fines in substrate from 20 to 12%	a	Implement cropland and rangeland conservation systems to reduce erosion and sediment delivery to stream
		b	Stabilize stream banks (task 10a, b)
13	Increase annual returning adult steelhead from 200 to 1,000	a	Improve water quality, quantity, and habitat conditions (all of the above tasks)

**Objective schedules and costs**

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	07/1998	12/2000	4
2	07/1998	12/2000	2
3	07/1998	12/2000	2
4	07/1998	12/2000	2
5	07/1998	12/2000	10
6	07/1998	12/2000	10
7	07/1998	12/2000	10
8	07/1998	12/2000	10
9	07/1998	12/2000	10
10	07/1998	12/2000	10
11	07/1998	12/2000	10
12	07/1998	12/2000	10
13	07/1998	12/2000	10

**Schedule constraints.**

Cooperation of local landowners and continued access to project areas are the only constraining factors to meeting these milestones. Fire danger and wet road conditions routinely hinder access for short periods of time but are accounted for in the schedule.

Major Milestones: 1999 Complete last fencing project.  
2000 Complete last seeding / planting

Final assessment and project Wrap up.

**Completion date.**

2000

## Section 5. Budget

### *FY99 budget by line item*

<b>Item</b>	<b>Note</b>	<b>FY98</b>
Personnel		40880
Fringe benefits (OPE)	includes basic health, life, dental & employer costs (FICA, Suta, Medicare, Workers comp, etc.)	10792
Supplies, materials, non-expendable property	fencing and plant materials, vehicle usage	15000
Operations & maintenance		0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		0
PIT tags	# of tags:	0
Travel	4 days @ 66	264
Indirect costs	overhead costs (15%)	13025
Subcontracts		20000
Other		0
<b>TOTAL</b>		<b>99861</b>

### *Outyear costs*

<b>Outyear costs</b>	<b>FY2000</b>	<b>FY01</b>	<b>FY02</b>	<b>FY03</b>
Total budget	90000	0	0	0
O&M as % of total	0	0	0	0

## Section 6. Abstract

a. FY99 PROPOSAL

b. Goals: Improve watershed health, improve water quality, restore degraded habitat and increase natural steelhead production

Objectives: Increase shading from 35% to 80%; Decrease summer water temperature from 80°F to 58°F; Increase late season flows from 1 CFS to 5 CFS; Increase pool / riffle ratio from 10:90 to 40:60; Improve channel width:depth ratio from 30:1 to 10:1; Increase bank stability from 25% to 80% stable; Increase woody debris from 5 units per 100 meters to 20 units per 100 meters; Reduce fines in substrate from 20 to 12%; Increase annual returning adult steelhead from 200 to 1,000

c. Project will increase natural steelhead production in largest Deschutes tributary below Sherars Falls. It follows NWPPC policies and addresses many measures of the 1994 Fish and Wildlife Program.

d. Comprehensive watershed treatment approach reduces runoff and erosion from upland areas and damaging stream scour. Land treatment, fencing, livestock water developments, and management systems have helped land owners improve resource use and reduce riparian grazing. Resurgent riparian vegetation including woody species improves cover, bank and soil stability, enhancing natural riparian water storage capacity, increasing late season flow, increasing shading, collecting sediment, narrowing channels, and will reduce temperature extremes, .

e. This project will establish improving trends, already evident, which will continue long after the project ends. .

f. Photopoints, water quality, temperature, flow, cross section are monitored at selected sites. Spawning ground surveys show population increases and expanding reach of spawners since project start..

## **Section 7. Project description**

### **a. Technical and/or scientific background.**

This project addresses goals and objectives of the 1994 Fish and Wildlife Program, the Columbia River Anadromous Fish Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes, and the Buck Hollow Watershed Plan (USDA Natural Resources Conservation Service, November 1994) sponsored by the Wasco County and Sherman County Soil and Water Conservation Districts. Their relationship to this project's objectives are discussed below.

This proposal incorporates the 7 steps of the adaptive management approach outlined in the Technical Recommendations section 5B of the Columbia River Anadromous Fish Plan (Vol. I) and supports the goals identified there. Further, many of the actions identified for tributaries under Land Use Practices, Water Quantity, Habitat Restoration, and Water Quality are addressed in this proposal. It supports all stated objectives for the Deschutes River subbasin: a) maximize protection and enhancement of aquatic and riparian habitat on all land bordering the Deschutes River and its tributaries to result in a net increase in habitat quantity and quality over time; b) maintain or improve watershed conditions for the sustained long-term production of fisheries and high quality water; c) maintain or improve flow for fish production in the tributaries of the Deschutes. (Vol II p.38). It carries out strategy 2 for Buck Hollow by implementing existing land and resource management plans. The Columbia River Anadromous Fish Plan also identifies enhancement of natural summer steelhead production in Buck Hollow Creek as one of four important strategies for the Deschutes subbasin.

This project supports the 1994 Fish and Wildlife Program goals, policies and objectives as outlined below from Sections 7.6 A, B, and C. The habitat goal (7.6) is to "protect and improve habitat conditions to ensure compatibility with the biological needs ..."

This project deals directly with resource management (human activities) systems affecting steelhead production in a coordinated, comprehensive approach to watershed

management (7.6A.1). Project measures protect limited areas of currently good habitat but also improve productivity of steelhead habitat for the weak stock in Buck Hollow (7.6A.2).

It follows the habitat policies through locally led coordination and cooperation (MOU), and strong private landowner involvement in this pro-active project (7.6B.1). Habitat elements of the project are integrated into a full scale watershed improvement project in which cooperative agreements are obtained with all participating landowners (7.6B.3). Habitat improvements place maximum emphasis on implementation of grazing management systems. Those were agreed during plan development to be the most cost-effective system for reaching habitat objectives although, as noted below (NRCS 1994), they act synergistically with other planned management systems (7.6B.4). This project makes extensive use of multiple funding sources including private landowner cost share and in-kind support, GWEB, USDA, Oregon Dept. of Agriculture, BLM, Pacific Gas Transmission Company, BPA, and others as well as technical support and cooperation from OSU Extension, BLM, ODFW, Wasco Co. SWCD, Sherman Co. SWCD, OWRD, The Confederated Tribes of the Warm Springs Reservation of Oregon, and NRCS (7.6B.5). The project promotes education, involving Sherman and Wasco County Schools, Boy Scouts, The Dalles Rod and Gun Club, and others in various habitat projects. Public information and outreach on watershed enhancement are valuable by-products of the project. It has received local, state, and national media attention at different times. Regular newsletter updates are published. Presentations on the project have been given at the 1992 and 1996 Oregon Governor's Enhancement Board (GWEB) Conferences and to various groups in the Deschutes Basin. Numerous tours of the project have been conducted for various groups. The outreach and publicity from this project motivated landowners in adjacent and other nearby watersheds to request Conservation District assistance in forming local watershed councils and developing local assessments and action plans so that they can take a pro-active role in helping solve their own resource problems(7.6B.6). Monitoring, evaluation, and adaptive management are included in the management objectives of the project (7.6C.2). A coordinated effort is underway in the watershed to adopt management practices necessary to meet locally adopted objectives consistent with the regional habitat objectives. Those systems place maximum emphasis on grazing management systems to allow revegetation of riparian areas to restore proper functioning conditions (7.6C.5). This project avoids future Operations and Maintenance (O&M) costs by obtaining landowner agreement to assume that burden as a condition of cost sharing.

Specific objectives for the project are listed in Section 4 and in Section 7b of this proposal. Project objectives 1, 2, 3, and 4 are practical management objectives which support cost-effective, coordinated implementation as well as progress and effectiveness assessments to allow adaptive management decisions. Objectives 5 through 12 address key habitat and water quality problems affecting natural steelhead production in Buck Hollow Creek and provide the means to meet objective 13 steelhead production numbers, our primary objective.

The Fish and Wildlife Program Habitat Objectives, Section 7.6D are renumbered here followed by project objectives and status at project start:

	<u>FWP 7.6D</u>	<u>PROJECT PLAN</u>	<u>START STATUS</u>
Sediment:	less than 20% fines:	project 10% fines:	start 20% fines

Bank Stability: greater than 90% stable:	project 80% stable:	start 25% stable
Water Temp.: less than 60 deg. F	project 58 deg. F:	start 80 deg F (summer highs)
Pools: quantified by mile based on stream width	project 40/60 pool/ riffle ratio	start 10/90

Other objectives discussed in 7.6D include large woody debris, riparian vegetation, stream morphology, land management, riparian areas, roads, grazing, irrigation, timber harvest, mining, and recreation. Project objectives address all applicable items except roads which are viewed as a component of bank stability. Timber, mining, and recreation are not applicable.

The causes of habitat degradation in Buck Hollow are attributable to land management practices which, over the course of 125 years, adversely affected watershed health. These same causes were, at least in part, responsible for reducing steelhead populations.

The habitat problems and watershed health issues identified in Buck Hollow were examined in the light of current and projected land use and potential treatments. A number of alternatives were considered and rejected. A systems approach to treatment was developed including grazing systems, cropland systems, fish stream improvements, and other conservation practices.

Grazing systems are defined as combinations of practices which target improvement of the ecological condition of the plant community. The focus of grazing systems within the riparian area is livestock management to gain vegetative recovery. Increased riparian vegetation facilitates stream shading, allows the stream to narrow and deepen, improves water holding capacity of alluvial soils which in turn augment low flows. It also stabilizes streambanks, reducing erosion. The focus of grazing systems in the uplands is to improve the hydrologic condition of the grazed lands. Vegetative recovery in the uplands will have a significant and positive impact on reducing the high peak flows which have often scoured the main channels. Improved management of uplands also allows for systems which rest or defer grazing in the riparian zone when the upland and riparian systems are integrated.

Cropland systems are defined as combinations of practices which target the reduction of water, sediment, and nutrient runoff from cropland. The primary focus of cropland management in the uplands is to improve the hydrologic condition of croplands. Increased crop residue, terraces, filter strips, etc. will have a significant and positive impact on reducing the high peak flows which have often scoured the main channels. It will also reduce erosion, sediment and nutrient runoff.

Fish stream improvements are defined as combinations of practices which directly target physical instream or streambank improvements. The primary focus of instream improvements is bank stabilization, acceleration of riparian vegetation by plantings, and use of soil bio-engineering principles to promote instream structure, increase the number of pools, and narrow the channel.

None of these systems when evaluated individually was capable of achieving established objectives. When applied together in combination, the synergistic effect of the systems enables the objectives to be met. (NRCS 1994)

The proposed work will contribute, along with other funding sources, toward grazing system implementation related to riparian areas and toward fish stream improvements.

Significant work history on the project is outlined as follows. Initial project planning was completed in 1990 under an Oregon Department of Agriculture grant and a proposal developed for Phase 1 funding from the Oregon Governor's Watershed Enhancement Board to commence implementation beginning in the upper reaches of the watershed. The project has now completed 4 of 8 planned land treatment phases and is nearly completed on phase 5. Phases are based on subwatersheds. Phases 1 through 5 treated the upper 15 miles of the mainstem together with its tributaries and associated uplands. These phases include the upper 65% of the watershed land base. Phases 6 through 8 will treat the lower 15 miles of mainstem, its tributaries and associated uplands. Completion dates for each completed phase are: 1, Dec. 92; 2, Nov. 94; 3, Sep. 95; 4, June 97. Phase 5 is projected to be completed in June 98. Application for a Phase 6 grant is pending with Phase 6 expected to complete in June 99. Since NRCS Small Watershed Program funding was approved in 1995, treatment has accelerated to the point where we currently believe a combined Phase 7 and 8 to wrap up the project can be undertaken during the July 99 to June 01 time frame. We have an extensive list of accomplishments, most important of which includes implementation of conservation or grazing management plans on 80% of the land in the watershed. Under those plans, large tracts of range formerly in 2 pasture (summer and winter) rotations have been cross fenced, breaking them down into smaller management units for rest-rotation grazing systems under which each unit is rested most of the year and periodically not grazed at all during the year. Ninety percent of the main stem riparian corridor has been fenced and put under a management system either as an enclosure or a riparian pasture. Through considerable work with one local landowner, an extensive reach of approximately nine miles of mainstem, currently used as riparian pasture is likely to be accepted for enrollment in the Conservation Reserve Program (CRP) which will guarantee a minimum of 10 years of rest from grazing. Two other landowners have also submitted bids to enroll Buck Hollow riparian areas into the CRP.

Wasco County SWCD District Manager Ron Graves has been involved as project manager/coordinator since the project began, and is currently involved in early phases of the neighboring Bakeoven Watershed Project. Similar efforts have been initiated in the neighboring Pine Hollow Watershed, another drainage, which, like Buck Hollow is shared with Sherman County.

References:

Buck Hollow Watershed Plan and Environmental Assessment, USDA NRCS, Nov. 1994  
Bakeoven Watershed Action Plan (Bakeoven Watershed Council 95)  
Pine Hollow Watershed Demonstration Phase Action Plan (Pine Hollow WS Council 96)

**b. Proposal objectives.**

Specific Measurable objectives are: 1. Increase shading from 35% to 80%, 2. Decrease summer water temperature from 80°F to 58°F, 3. Increase late season flows from 1 CFS to 5 CFS, 4. Increase pool / riffle ratio from 10:90 to 40:60. 5. Improve

channel width:depth ratio from 30:1 to 10:1, 6. Increase bank stability from 25% to 80% stable, 7. Increase woody debris from 5 units per 100 meters to 20 units per 100 meters, 8. Reduce fines in substrate from 20 to 12%, and as an overall objective, 9. Increase annual returning adult steelhead from 200 to 1,000. These measurable objectives will be used to determine the success of the project. Progress toward meeting the objectives will be used in adaptive management decisions. (See objective number 3, tasks f and g in Section 4, Objectives and Tasks). The habitat objectives are also discussed in much greater detail in Section 7e, Methods. These objectives closely match those established in Fish and Wildlife Program, with minor differences. We believe they are achievable with the possible exception of the temperature objective in the lower reaches. Buck Hollow is a spring-fed system with spring temperatures of 55°F.

Riparian vegetation improvements have been documented in the Phase 1-2 areas which were put under grazing management plans. In those areas bank stability has improved and channel narrowing is evident. Redd counts and miles of mainstem utilized by spawners have been documented. Since project start, miles of mainstem used has increased steadily to the current 20 miles, showing a clear positive trend. Redd counts also indicate a positive trend but external influences on 2 years data suggest that at least 2 more data points are needed to be confident that a definite trend is established.

Products resulting from this project include Conservation Plans and Grazing Management Plans, required progress reports and other project documentation. Specific conservation practices, fencing, off-stream water developments, etc. applied on the ground and associated resources improvements are the real products. All O & M costs are expected to be borne by local landowners under project agreements with the SWCD.

### **c. Rationale and significance to Regional Programs.**

The proposed project will complete implementation of remaining fencing and associated practices needed to fully implement grazing management systems on riparian areas in Buck Hollow. It will implement active revegetation in selected areas along with limited, active bank stabilization measures. Other funding sources will be used for land treatment and upland range improvements. Like the habitat objectives in the Anadromous Fish Plan and the Fish and Wildlife Program, the proposed project devotes most of its effort to practices aimed at vegetative recovery.

The proposed project needs to be viewed in the context of its relationship to the rest of the comprehensive watershed plan. The rationale for the project is simple. The stream corridor had been subject to repeated scouring flood events in recent decades. The magnitude of and damage caused by those events was due in large part to hydrology changes resulting from land use changes and land management practices. The watershed had lost its ability to capture, store, and safely release water over an extended period of time. The riparian areas were part of large pasture systems which were managed for maximum forage value (upland grasses) for over 100 years. Riparian systems don't respond well to being managed for upland grasses and became increasingly vulnerable to the higher runoffs than historically experienced. Considerable effort has been put into upland treatment to reduce runoff and erosion from upland areas. Improved management systems along with appropriate tools (fencing and water developments) are being put into place to better manage upland range and cropland, reducing both runoff and erosion, and

providing some protection to the stream corridor from damaging events. At the same time, riparian areas are being fenced as separate ecological units from upland pastures. In some cases these are exclosures with no grazing and in some cases they are riparian pastures with managed, rest-rotational grazing. In all cases they are being managed for riparian values, not solely forage and vegetative recovery is occurring. The recovery of riparian vegetation is the critical component in meeting project objectives. This will improve shading, increase bank stability, reduce erosion and sedimentation. Vegetation will trap fines along the bank and on the flood plains. Well vegetated banks, accumulating sediment or 'aggrading' will assist in narrowing the wide, shallow channels. For a given volume of water flow, a narrower channel will run deeper. This effectively narrows and deepens the flow. (BLM 1993) Narrowing of the streams will reduce exposed water surface area, helping keep water cooler. The increased shade will reduce direct solar heating. Trees growing along the stream as a component of riparian vegetation will provide for future LWD recruitment. As the riparian system revegetates, natural riparian water storage capacity will improve, effectively augmenting late season flows. These habitat improvements will result in improved adult passage throughout the system over its current wide, shallow morphology and reduce mortality in life stages from eggs to smolts. It will also dramatically improve juvenile rearing habitat, leading to increased juvenile survival and therefore more smolts. More out-migrating smolts should result in greater numbers of returning adults. A critical assumption here is that mortality rates outside the watershed will remain stable.

As indicated in Section 7 a., this project strongly supports the goals and objectives of the 1994 Fish and Wildlife Program and the Columbia River Anadromous Fish Plan helping restore a weak stock of summer steelhead in the principle Deschutes tributary below Sherars Falls. Buck Hollow is critical to the Deschutes run because it provides a critically located refuge and essentially the only one below the falls. Two other watershed projects have come on-line in the neighboring watersheds of Pine Hollow and Bakeoven.

Buck Hollow was the catalyst for those initiatives. A number of local landowners have part of their ranch in Buck Hollow and a portion in one of the neighboring watersheds. Those people are already well schooled in watershed restoration. The other watersheds both have high levels of local interest and many of the agency personnel who have and are supporting the Buck Hollow project are also involved in the new projects. It is anticipated that proposals will be submitted for future habitat work in both Bakeoven and Pine Hollow watersheds. While each has some unique attributes, there is enough in common with Buck Hollow watershed that those groups and projects should be able to draw heavily on experience and work done in Buck Hollow.

While routine for SWCDs, landowner assumption of O&M responsibilities and associated costs may be a new or novel approach when compared with other habitat projects.

#### **d. Project history**

This is a continuing project. Project reports include regular progress reports to Bonneville Power Administration, Phase 1, 2, 3, 4 completion reports to GWEB, Fact sheets covering Watershed Characteristics, project status, accomplishments, and results.

Major results achieved include: 102,000 acres covered by conservation and grazing management systems; steelhead redd counts have increased steadily each year, approaching 140\* in 1997 (Note:\*District Fish Biologist urges caution with 1997 numbers due to large number of non-Deschutes hatchery strays observed); extent of main stem utilized by spawners has increased significantly since 1993 and is currently about 20 miles compared to about 4 miles in 1991-3; considerable natural healing has occurred in riparian areas put under grazing management systems during the first two project phases; damaging peak flows have been reduced as evidenced by observation in the February 1996 flood and by analysis of the Spears Canyon subwatershed hydrology after treatment. Additionally, one of 4 temperature monitoring stations showed maximum temperatures of 60.5 deg F in mid August giving hope that our goal is achievable. The 3 other monitors, however, showed considerably higher temperatures.

**Adaptive Management Implications:** Having observed the natural revegetation and healing in riparian zones in phase 1 and 2 treatment areas which occurred over a 3 year period, we reassessed our original plan for a considerable number of instream structures such as weirs, jetties, deflectors, barbs and pared down our work list to limited amounts of bank stabilization, selected active revegetation, and concentrated the bulk of our efforts on riparian grazing management systems and practices to support those systems such as fencing and off-stream water developments, which has proven to be highly cost-effective. As revegetation and natural healing processes take hold in other treated areas, we will need to reassess the need for additional pools. We are currently monitoring a riparian enclosure adjacent to a riparian pasture on one ranch to compare recovery rates. The concept of riparian pastures and appropriate management changes is much easier to implement on private lands than total enclosure. If recovery rates are proven to be substantially better in enclosures than in well managed riparian pastures, then a demonstration site will exist to help make the case to private landowners in favor of enclosures. If the three pending CRP bids for riparian forest buffers are accepted by USDA, a significant new tool will be available to accelerate riparian restoration.

Years underway: 5 years (counting current year)

Past costs: \$582,588 (including approved FY97 funds)

**e. Methods.**

Early project planning was assisted by USDA NRCS's interdisciplinary planning team. Because the watershed was prone to flash flooding a decision was made to start in the headwater areas and work down the watershed toward the mouth. It was determined that upland work should be done in conjunction with or prior to work on adjacent riparian areas. Riparian fencing to the extent practicable was to be built away from the stream and where possible above the flood plain.

A systems approach was selected to address the problems in the watershed and was discussed earlier. Details including specific practices contained in each of the management systems are included in the Buck Hollow Watershed Plan and Environmental Assessment (NRCS 1994). Technical Standards and Specifications adhered to for each practice are contained in the USDA Natural Resources Conservation Service Field Office Technical Guide. Monitoring procedures based on EPA monitoring protocols, are contained in the Monitoring Handbook developed for this project.

Conservation and Grazing Management Planning follow the steps laid out in the National Planning Handbook (USDA NRCS). Qualified NRCS Resource Conservationists prepare those plans. When riparian zones are included in a grazing management plan, inputs on the specific needs of the riparian area are solicited from ODFW. When plans are reviewed with the landowner and signed, they are submitted to the local Soil and Water Conservation District Board for review and approval. Tasks associated with each objective are explained in the following paragraphs. Tasks associated with management objectives are omitted from this discussion.

1. Increase shading. Task a. Assist landowners to implement grazing management strategies to reduce or eliminate livestock grazing impacts on riparian vegetation which prevents regeneration of woody species. This task is really the key to success of the project. A critical assumption made early in the project was that 80% of the private landowners would participate. We have exceeded 80% participation. Planning methods were discussed above. Task b. Assist landowners in establishing fencing systems to control livestock access to riparian areas. This is one of the practices documented in the Watershed Plan and one which is planned for cost sharing under this proposal. Ranch specific fencing locations are included in plans developed under Task a. Task c. Assist landowners in developing off-stream livestock water. This is another practice planned under task a and is frequently a requirement to make riparian fencing feasible. Water gaps are an alternative, but drive up O&M costs for the landowner, who through our cooperative agreements, is required to maintain installed practices. Task d. Assist landowners in developing conservation and grazing management plans to include practices to improve upland vegetation and reduce scouring peak runoffs. This is done at the same time riparian grazing planning is done so that the whole grazing plan is integrated. Practices associated with this portion of the plan are not cost shared under this proposal but by other funding sources. Task e. Plant cottonwood and willow cuttings in selected reaches where natural regeneration is unlikely to occur soon. Cottonwoods are present only in decadent stands on the mainstem. Willows are present throughout the system, but are missing from some reaches.

2. Decrease summer water temperature: Task a. Increase Shading. This task is accomplished by developing and implementing grazing management systems which protect riparian vegetation and active revegetation as described in the tasks associated with the shading objective. This reduces direct solar radiation and associated warming. Task b. Narrow and Deepen channel. This reduces water surface area exposed to high summer air temperatures, reducing total heat transfer at the air-water interface. This is accomplished by developing and implementing grazing management systems which protect riparian vegetation and active revegetation as described in the tasks associated with the shading objective. In addition to woody species, active seeding of selected reaches with an appropriate riparian grass seed mix will be done. A healthy stand of vegetation on banks and flood plain will collect silt and gradually cause the channel to narrow. Task c. Increase late season stream flows. Improvement in riparian vegetation, narrowing of channels as addressed in other tasks will enhance riparian water storage capacity, enhancing stream flow late in the season as stored water returns to the channel. Ground water, as it returns to the stream in summer is cooler than surface water. Ground water temperatures in our area are generally about 55 deg. F.

3. Increase late season flows. Task a. Augment flows by rebuilding riparian water storage capacity through revegetation and protection of riparian meadow areas. (refer to paragraph 1, tasks a,b,c,d,e above.) Task b. Seed selected areas with riparian seed mix to accelerate revegetation. Note: actions to achieve the late season flow objectives are not separate tasks. With minor exceptions the full set of tasks that help in protection and establishment of riparian vegetation work toward meeting all the objectives.

4. Increase pool / riffle ratio. Task a. Restore riparian vegetation Task b. Reduce sedimentation from upland sources Task c. Reduce erosion from riparian sources. (see paragraph 6 below)

5. Improve channel width:depth ratio. Task a. Restore riparian vegetation (paragraph 1 tasks a,b,c,d,e and paragraph 3 task b)

6. Increase bank stability. Task a. Restore riparian vegetation (paragraph 1 tasks a,b,c,d,e and paragraph 3 task b) Task b. Place juniper rip rap on stream banks in selected areas.

7. Increase woody debris. Task a. Plant cottonwood cuttings in selected reaches to help restore potential for future recruitment. Task b. Reduce grazing impacts on riparian vegetation (paragraph 1 tasks a,b,c). Task c. When instream structures or physical bank stabilization is deemed necessary, use of junipers will be made to the maximum extent practicable

8. Reduce fines in substrate Task a. Implement cropland and rangeland conservation systems to reduce erosion and sediment delivery to stream. Task b. Stabilize stream banks (task 10a, b).

9. Increase annual returning adult steelhead from 200 to 1,000. All tasks aimed at increasing habitat quantity and quality above are related to this overall objective.

The Buck Hollow Monitoring Plan (Wasco Co. SWCD, 3/94, 145pp.) provides a project overview including monitoring objectives for each project goal, describes the monitoring approach, monitoring strategy, design, and type of monitoring. It lays out the sampling design, including rationale, methodology and site selection, maps monitoring sites, establishes the parameters, frequency, and duration for monitoring, and a monitoring schedule. It also includes a detailed chapter on Data Collection, Reduction, and Analysis.

The monitoring plan is based on EPA monitoring protocols (EPA 1993). Monitoring includes critical parameters for limiting factors: Water Temperature (recording thermograph), streamflow, stream channel morphology, bank stability, streamside vegetation, shading, and photopoints. Specific protocols were selected for use based on repeatability, cost effectiveness, and usefulness in detecting trends in critical parameters. Additionally, redd counts are used to infer adult returns. Juvenile monitoring at this point in the project is judged to be inappropriate due to high variability and relatively high cost.

The task table in section 4 identifies monitoring activities, data assessment and evaluation.

Factors which may limit the success of the project include landowner participation as indicated earlier. However, we have currently exceeded the 80% level of participation needed to reasonably assure success. Other factors which are beyond control of the project include Deschutes and Columbia River smolt and returning adult mortality and oceanic conditions affecting fish survival.

**f. Facilities and equipment.**

Office space in the USDA Service Centers in The Dalles and Moro will be used to support the project. Macintosh and Pentium computers are available as well as a variety of printers and a plotter. Adequate field equipment is available to support the project and includes water quality monitoring equipment, survey instruments, a leased 4wd pick-up, an ATV, seeders, planting bags and tools. Specialized equipment such as a track hoe for juniper placement is available to be rented for the short periods it would be needed.

No capital expenditures are planned.

**g. References.**

Barrett, Hugh, et al, Riparian Area Management, 1993. Technical Reference 1737-9, USDI Bureau of Land Management, Denver Colorado.

Bauer, Stephen and Burton, Timothy, Monitoring Protocols to Evaluate Water Quality Effects of Grazing Management on Western Rangeland Streams, October 1993. EPA 910/R-93-017, US Environmental Protection Agency Region 10, Seattle, WA.

Schattin, Robert, et al, November 1994, BUCK HOLLOW Watershed Enhancement Plan & Environmental Assessment, United States Department of Agriculture, Natural Resources Conservation Service, Portland, Oregon.

## **Section 8. Relationships to other projects**

This project is a stand-alone project with respect to other work funded under the Fish and Wildlife Program. Until December 1997 this project was supported full time by an ODFW biologist under project number 9304500. That project has been eliminated for future funding purposes. However, the District has access to fish biologists, technical personnel, and other support from ODFW, BLM, Natural Resources Conservation Service, OSU Extension, Farm Services Agency (formerly ASCS), Sherman County SWCD, Forest Service, and the Confederated Tribes of the Warm Springs Reservation through the Buck Hollow MOU, and other formal agreements.

Project Manager has been involved in early phases of the neighboring Bakeoven Watershed Project. Similar efforts have been initiated in the neighboring Pine Hollow Watershed, another drainage, which, like Buck Hollow, is shared with Sherman County. Buck Hollow provided the example and model for those initiatives. Several local ranches straddle the watershed boundary of Buck Hollow and either Bakeoven or Pine Hollow. Watershed restoration activities are well understood and supported by the private landowners in the area. Bakeoven and Pine Hollow both have high levels of local interest and many agency personnel who have participated in the Buck Hollow project are also involved in the new projects. It is anticipated that proposals will be submitted for future habitat work in both Bakeoven and Pine Hollow watersheds. While each has some unique attributes, there is enough in common with Buck Hollow watershed that those

groups and projects should be able to draw heavily on experience and work done in Buck Hollow.

Permit applications are submitted to Division of State Lands for review and approval. Nearly all project instream work falls in a special category which can be handled on a form called a Fish Habitat Reporting Form (formerly a waiver form). These reporting forms expedite the approval process because key reviewing authority signatures are obtained before the form is submitted.

## **Section 9. Key personnel**

The Project Manager is Ron Graves. He is planned for 0.33 FTE in FY98. Duties include overall project coordination and management. He serves as point of contact for participating landowners and agencies. Financial management aspects of the job include accounting for expenditures against authorized line items, obtaining other grants to assist in implementation, developing cost breakdown spreadsheets to share costs for individual practices or systems of practices between authorized funding sources, typically BPA, GWEB, NRCS PL-566 Program, and landowner. He is designated as the District Contracting Officer and where contracts are required, prepares all contract documentation and solicitations. He conducts site showings and bid openings in accordance with the contracting manual and procedures adopted by the District Contract Review Board. In addition he obtains landowner agreements for participation in the project. He prepares all project related invoices and payments. These are reviewed monthly by the District Board of Directors. He prepares and submits all required project reports and necessary permit applications. Plans and conducts project related meetings as required and an annual all-participants meeting. Prepares briefings on the project for different forums and regular newsletter articles. He provides daily supervision to the Project Technician and assists with field work as needed.

Project Technician is Ryan Bessette. He is planned for 0.90 FTE in FY98. His responsibilities include serving as inspector during and on completion of practice implementation, obtaining and compiling monitoring information, including photo documentation. He records completed watershed work on appropriate maps. He works with the landowners and NRCS planners in developing grazing management plans and with NRCS technicians in the Moro and The Dalles Field Offices in laying out practices in the field. He prepares topographic maps and associated aerial photography for field use to assist in laying out portions of ranch plans. He obtains plant materials, cuttings and seed mixes for use in the project and assists in planting and seeding activities, including supervising planters.

## Resumes:

Ron Graves Education: - BS Oceanography,  
University of Washington 1977  
- MS Meteorology and Oceanography,  
Naval Postgraduate School Monterey 1982

Employer: Wasco County Soil and Water Conservation District  
May 1990 to present

Duties: District Manager with responsibilities for all aspects of  
District Operations, Administration, Project Management

Recent United States Navy  
Employment 1966-1977 Naval Communications Technician  
1977-1990 Naval Surface Warfare Officer

Expertise: Extensive leadership and management experience in the U.S. Navy, with extensive planning experience ranging from routine operations, to amphibious assaults which required extremely detailed, down to the second planning, to Battleship Surface Action Group deployment which required broad knowledge of naval operations, tactics, and operating characteristics of a wide range of ships and aircraft. Extensive project management experience at Naval Weapons Center, China Lake as project manager for the NATO Anti-Air Warfare System where the Center was Missile Design Agent. Systems engineering was the watchword for that program, where direction was provided to 21 scientists and engineers at the Center and efforts of 5 other nations and 3 U.S. laboratories were coordinated. Recent project completions include the first 4 of 8 Buck Hollow project phases most recent of which was Phase 4, completed in July 1997; a combined Oregon Dept. of Agriculture Planning and Implementation Grant and DEQ Water Quality (319) grant to implement best management practices to reduce erosion and runoff in the Fifteenmile Watershed completed in June 1997; and a bio-engineering demonstration project on lower Fifteenmile Creek using multiple funding sources, completed in November 1997.

Ryan Bessette Education - BS Rangeland Resources, Oregon State University  
with minor in Natural Resources, 1992

Employer: Wasco County Soil and Water Conservation District  
November 1996 to present

Duties: District Technician, assigned full time to Buck Hollow  
Watershed Project with responsibilities, in planning,  
implementation, monitoring, compiling data

Recent United States Forest Service  
Employment 4/93 - 11/96 Range Technician Mt. Hood NF  
6/92 - 2/93 Range Technician Malheur NF  
6/91 - 9/91 Range Technician Mt. Hood NF  
Oregon State University  
6/90 - 9/90 Research Assistant

Expertise Has a wealth of experience relating to range and riparian systems. Has experience conducting stream surveys for vegetative cover and stream bank stability. Surveyed mountain streams for fish habitat and livestock impacts. Conducted juniper debris loading operations on various streams. Coordinated several range projects on Mt. Hood NF and Columbia Gorge Scenic Area. Has worked on watershed analysis for White River and Environmental Assessments for various grazing allotments. Supervised and managed cattle grazing activities and monitored vegetative conditions of grazing allotments. Has supervised Youth Conservation Corps and Youth Forest Camp crews in fence construction and provided oversight and inspector duties on fencing contracts and bio-engineering contracts. Has supervised Americorps crews in riparian planting and grass seeding activity. Collected data on research plots of various seeded grasses. Has collected baseline and monitoring data on water quality, flows, and stream geomorphology. Plant identification of forbs, grasses, and shrubs.

## **Section 10. Information/technology transfer**

This is an implementation project. Information gained from the project is related to practices used and results obtained from those practices. That information is distributed in a regular, bi-monthly newsletter, at annual, all participants meetings, and occasional workshops. Tours are used to show the project. Presentations to various groups are also used to convey information about the project and observed results. In addition, a project fact sheet is updated periodically with cumulative accomplishments, observed results including trends. The fact sheet is available on request.