

BUCK HOLLOW WATERSHED ENHANCEMENT (SWCD)

9303000

SHORT DESCRIPTION:

Implement fisheries and watershed restoration projects to improve riparian and instream habitat.

SPONSOR/CONTRACTOR: SWCD

Wasco County Soil and Water Conservation District
Ron Graves, District Manager/Project Manager
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SUB-CONTRACTORS:

This project is jointly sponsored by Wasco Co. SWCD and ODFW under separate primary contracts.

GOALS

GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Provides needed habitat protection

WATERSHED:

Implementation

ANADROMOUS FISH:

Habitat or tributary passage

NPPC PROGRAM MEASURE:

7.6B.5

RELATION TO MEASURE:

The project relates to the above program by restoring summer steelhead habitat in the Buck Hollow Creek Basin. The proposed actions are to be undertaken for the purposes of mitigating the losses of fish and wildlife associated with the construction and operation of Federal hydro-power facilities in the Columbia River Basin and to protect and restore, to the extent practicable, the aquatic and terrestrial resources in the Deschutes Subbasin. This project funds the fish habitat related components of a comprehensive watershed enhancement project.

OTHER PLANNING DOCUMENTS:

WY-KAN-USH-MI WA-KISH-WIT Vol. II, page 38: Objective 1 and 2, Summer Steelhead Strategy 3: from Deschutes River Subbasin Plan (1990) BUCK HOLLOW WATERSHED PLAN & ENVIRONMENTAL ASSESSMENT USDA-NRCS 12/94, page 11.

TARGET STOCK

Deschutes Summer Steelhead

LIFE STAGE

Adults and Juveniles

MGMT CODE (see below)

N, W

AFFECTED STOCK

Rainbow trout

BENEFIT OR DETRIMENT

Beneficial

BACKGROUND

Stream name:

Buck Hollow Creek

Stream miles affected:

37.7 miles

LAND AREA INFORMATION

Subbasin:

Deschutes

Land ownership:

95% Private; 5% BLM

Acres affected:

126,800

Habitat types:

Adult holding and spawning, Juvenile rearing habitats.

HISTORY:

Note: This project is in the 3rd year of funding with BPA, however, the project history predates BPA funding and is outlined as follows:

When project implementation was begun in 1991, anadromous fish populations had reached an all time low. Annual summer steelhead production was about 100 out of an estimated potential of 1600 per year. The 1985-1992 drought was a direct contributor to the declining trend, but not the root cause. In general, overgrazing by the sheep and cattle industry since the late 1800's had set the watershed up for the severe damage sustained in 1964 and other runoff events. Land management practices had, in general, precluded vegetative recovery following the 1978 flood. Habitat restoration proposals submitted by the Oregon Department of Fish and Wildlife (ODFW) to the Northwest Power Planning Council and Bonneville Power Administration in the early 1980's highlighted their concern about Buck Hollow and neighboring Bakeoven Creeks. Following meetings between ODFW, Sherman and Wasco County Soil and Water Conservation Districts (SWCD), local farmers and ranchers in the watershed recognized the stream was in trouble. In the mid 1980's they sought assistance from the SWCDs. The passage of the 1985 Farm Bill which implemented the Conservation Reserve Program and mandated specific goals on highly erodible farmland required the full attention of the conservation districts and their principle technical support, the Soil Conservation Service. Buck Hollow was placed on the "back burner." By 1990 the Conservation Reserve Program and other provisions of the Food Security Act were implemented and attention returned to the problems of the Buck Hollow Watershed. The Oregon Soil and Water Conservation Commission approved a planning grant to Sherman SWCD for the Buck Hollow project. Sherman SWCD invited the Wasco County SWCD to participate in a joint Watershed Enhancement Project. The Soil Conservation Service assigned an interdisciplinary planning team to assist with identifying and recommending solutions to problems in Buck Hollow. In 1988 the Oregon Department of Environmental Quality (DEQ) published a stream condition assessment covering problems with streams throughout Oregon. The DEQ report cited problems in Buck Hollow as being severe. Individual meetings with the 52 landowners in the watershed was begun. Landowner inputs on the project were obtained including observed natural resource problems and potential solutions, as well as their objectives for improving their land. The Conservation Districts requested Oregon Department of Fish and Wildlife, the Bureau of Land Management, the Confederated Tribes of the Warm Springs Reservation of Oregon, and Division of State Lands participation in the watershed project. By this time a full state of problems in the watershed had been identified along with potential solutions. In 1991 implementation of Phase One (demonstration phase) of the Buck Hollow Watershed Enhancement project was begun under the auspices of the Sherman and Wasco County Soil and Water Conservation Districts with a grant provided by the Oregon Governor's Watershed Enhancement Board (GWEB).

Subsequently, GWEB grants were approved for phase 2, 3, 4, and 5. In 1991 the SWCDs briefed the Northwest Power Planning Council on Buck Hollow and Bakeoven Watersheds. In 1992 ODFW and SWCDs submitted proposals to Bonneville Power Administration (BPA) for Fish Habitat restoration work on Buck Hollow Creek. BPA approved a combined 3 year effort beginning in 1993. SWCDs received some additional funding for Buck Hollow during 1990-1993 from Northwest Steelheaders, Oregon Wildlife Heritage Foundation, and Pacific Gas Transmission Company. In 1994 the NRCS Small Watershed Program (PL-566) was approved to provide accelerated land treatment assistance. The first contracts under the Small Watershed Program were written in 1995. Significant fish stream improvement implementation began in 1995 with BPA funding.

BIOLOGICAL RESULTS ACHIEVED:

The Buck Hollow project is a relatively new habitat restoration project. Implementation on fish habitat restoration began last summer on upper Buck Hollow Creek, between Kelsey Springs and Macken Canyon. While it remains too early to quantify the biological results with confidence, a positive trend is evident. Redd Counts were up sharply in 1995 and remained about the same in 1996. Significantly, the reach in which redds have been observed continues to increase. Having hit a low of 3 miles, redds in 1996 were observed throughout a 17 mile reach.

PROJECT REPORTS AND PAPERS:

Progress reports and billings due quarterly and monthly respectively. Buck Hollow Phase 1 Final Report 9/91. Buck Hollow Phase 2 Final Report 12/94. Buck Hollow Phase 3 Final Report 9/95. Technical paper presented at International Symposium in Seattle in September 1995. Final completion report 3/96.

ADAPTIVE MANAGEMENT IMPLICATIONS:

The approach taken in this project was carefully thought out and was based on extensive experience in working with private landowners and should be expected to apply to most inter-mountain watersheds in eastern Oregon and Washington. Observations on conditions and trends since we began the project confirm that our approach works. First, a holist watershed approach is essential for success. All the resources must be considered. Collection of resource inventory information is necessary before starting a project. Much information is readily available from agencies, but a key component that needs to be a part of that initial

assessment or inventory is the private landowner. In one on one visits with the landowners in Buck Hollow, we found out first hand what the real and perceived problems were and what the landowners were willing to do if funding assistance could be found. By taking time to visit with the landowners at the outset we gathered a great deal of valuable information and got early buy in for the project. The riparian zone of a watershed is only a fraction of the upland area and cannot be restored in isolation from the uplands. Appropriate conservation measures on upland areas should be done prior to investing in in-stream habitat work. Watersheds should be treated from the top, down. Each improvement high in the watershed will have some incremental benefit to the area below it. As a practical matter, projects should be broken down into manageable parts or phases for sequential treatment. The first phase or demonstration phase area should include a variety of practices and be fairly accessible for educational tours. In our project agreements with private landowners, we require that they agree to work with the SWCD and NRCS to develop a conservation plan or grazing management plan for their operation. While these plans are voluntary and flexible, they provide a basis for continuous resource improvement and an opportunity for education. In watersheds like Buck Hollow where land use changes have altered the hydrology, making the system more prone to flash flooding with heavy runoffs, a balanced approach, using a combination of structural and non structural or vegetative practices, is required. Baseline data for Buck Hollow Creek from the 1991 ODFW physical stream survey was provided to the local landowners. Along with that data, pertinent information relative to fish life cycle needs were provided for educational value. Fish habitat improvement work was begun in the upper reaches of Buck Hollow and is proceeding downstream. Assessments are made each spring on how various measures held up. Plans for the summer season are then made along with needed refinements based on lessons learned. Increasing redd counts, increasing stream miles used by steelhead, improving water quality, reduced peak runoff events, increasing perennial flows, reported improvements in wildlife distribution, and nearly 100% landowner participation all provide confirmation that our approach works.

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:

The watershed project intends to restore health and proper functioning to the Buck Hollow watershed so that it captures, stores, and safely releases water over an extended period of time. To that end, grazing management plans and conservation plans are being developed with local landowners. A variety of funding and technical resources are being focused and coordinated to help local landowners implement those plans. Specific conservation practices tailored for each operation are being implemented to help achieve the goals outlined below.

Based on available riparian habitat restoration/watershed research, and past/present riparian habitat projects, the Buck Hollow cooperators established nine project goals. It was determined that the first eight goals listed below would lead to the success of the ninth goal; increasing Buck Hollow's annual steelhead return to 1,000 adult fish. Baseline data for the below mentioned physical habitat characteristics has been collected. In addition, the data has been summarized according to landowners on or adjacent to Buck Hollow Creek. Each riparian landowner has been assigned a reach number corresponding to the entry and exit of Buck Hollow Creek from their property. The collection of baseline data, creation of reaches, and summarization of data according to reach number will allow the objectives to be measured effectively and efficiently as well as maintain public involvement in the project.

- 1) Shade: The goal is to establish 80% shading of the watercourse. Baseline shading is currently 35%.
- 2) Water Temperature: The goal is to limit the maximum water temperatures to 58°F. State water quality standard is 68°F. Currently water temperatures reach as high as 80°F. some reaches during summer months.
- 3) Flow: The goal is to increase low flows to a minimum of 5 CFS at the mouth of Buck Hollow. Low flow conditions now average 1 CFS.
- 4) Pool/Riffle Ratio: The goal is to achieve a pool/riffle ratio of 40/60. The existing pool/riffle ratio is 10/90.
- 5) Channel Width/Depth Ratio: The goal is to achieve a channel width/depth ratio of less than ten. The existing width/depth is a ratio of 30.
- 6) Stream bank Stability: The goal is to have 80% of the stream banks stable. The existing stream bank condition is measured at 25% stability.
- 7) Woody debris: The goal is to have 20 units per 100 meters of stream corridor. The existing woody debris condition is less than 5 units per 100 meters.
- 8) Substrate: The goal is to limit the percentage of fines in the channel substrate to less than 12 percent. The existing substrate condition is 20% fines in the channel substrate.
- 9) Steelhead: The goal is to increase annual returning steelhead to 1,000 adult fish. The existing annual return of steelhead adults averages 200.

CRITICAL UNCERTAINTIES:

One critical uncertainty is the voluntary cooperation of the private landowners. If an individual landowner chooses not to cooperate in the project then there could be gap in the riparian habitat restoration. If several large adjacent landowners along the stream choose not to cooperate, then the success of the project downstream of those landowners would be difficult. One hundred percent of the riparian landowners in Buck Hollow are cooperating fully.

The Conservation Reserve Program (CRP) which took cropland out of production and established permanent grass cover has had a very beneficial effect in Buck Hollow on both wildlife and water quality. Expiration of most CRP contracts will occur during 1997. If the U.S. Department of Agriculture fails to establish the Columbia River Basin (Watershed) and Plateau as a CRP national priority area as requested by Governor Kitzhaber, most of the CRP land in Buck Hollow will likely return to production in wheat-summerfallow rotation. This will be a set back for the water quality improvements in Buck Hollow and will present a significant conservation challenge.

Other critical uncertainties which may affect the outcome include harvest and ocean conditions which impact potential numbers of returning spawners.

BIOLOGICAL NEED:

Buck Hollow Creek is only marginally functioning as a watershed. In the past Buck Hollow was recognized for its excellent fishery with runs of summer steelhead throughout the 28 miles of main stem. Heavy grazing by the sheep industry in the late 1800's followed by continuous cattle grazing led to the gradual deterioration of the watershed. In recent years (1964 & 1978) intense runoff events have scoured out the stream courses, causing extensive damage to chinook and steelhead habitat. The annual return of steelhead to Buck Hollow is estimated to be approximately 200.

1: Lack of shade: Shading is extremely important in maintaining viable stream temperatures for salmonids. Shade (vegetation) also is important in providing bank and instream stability, stream complexity, water storage, and resistance to erosion. The existing shade condition is currently 35%, much lower than that required by viable salmonid populations. The lack of shade/vegetation is the primary contributor to the poor quality of the watershed as well as the poor productivity of salmonid populations in Buck Hollow. In addition, lack of cover/shelter promotes steelhead vulnerability to predation.

2: Lethal summer water temperature: High summer temperatures have greatly reduced rearing habitat capability. The lack of riparian vegetation and low summer flows result in water temperatures up to 80 degrees F. or greater. Rearing and holding sites have become scarce and isolated.

3: Low summer flows: Summer flows in Buck Hollow are below the rearing and holding requirements for salmonids. Typical summer low flows do not exceed 1 CFS. Due to low flows the rearing and holding capacity of Buck Hollow has decreased dramatically. Reduction of riparian habitat has decreased the moisture holding capacity of stream adjacent soils and has contributed to diminished summer flows. Buck Hollow is intermittent in some reaches.

4: Lack of habitat diversity: Buck Hollow is currently riffle dominated. The existing pool/riffle ratio 10/90 is much lower than the optimum ratio 40/60. The poor pool/riffle ration is largely due to channelization and the lack of large woody debris input from the riparian area. The lack of pools and cover reduce the rearing habitat for steelhead, particularly yearling and older fish.

5: Lack of channel stability: The lack of channel stability has increased sediment loading and channel width while decreasing effective cover and the quantity of pool habitat. Lack of channel stability in Buck Hollow due to overgrazing and high flows has reduced or eliminated the natural flood plains and channel sinuosity resulting in higher stream velocities which accelerate bank erosion and down cutting. The existing width/depth is a ratio of 30. The optimum channel depth/width ratio is less than ten. The poor width /depth ratio found in Buck Hollow decreases fish passage, shading/vegetation, and negatively affects the ability of sediment and bedload to pass through the system.

6: Sediment loading: Land use within the watershed and severe bank erosion has increased sediment deposition to the stream channel. This increased sediment loading degrades spawning and rearing habitat. The existing substrate condition is 20% fines in the channel substrate. The percentage of fines in the channel substrate should be less than 12%.

HYPOTHESIS TO BE TESTED:

Null Hypothesis: By developing grazing systems to both the uplands and riparian zones, installing fish habitat improvements, applying cropland conservation systems in the uplands, and implementing upland range conservation practices the projected annual return of steelhead to Buck Hollow Creek will not be effected.

Alternative Hypothesis: By developing grazing systems to both the uplands and riparian zones, installing fish habitat improvements, applying cropland conservation systems in the uplands, and implementing upland range conservation practices, the projected annual return of steelhead to Buck Hollow Creek will increase from approximately from 200 to 1,000.

ALTERNATIVE APPROACHES:

Two alternatives were considered. The first alternative: No project action was considered and rejected. It would result in a conti

nued decline of a depressed salmonid fish population. The second alternative: Accelerated land treatment was selected. It will result in improved water quality and increasing salmonid populations. Reference: Buck Hollow Watershed Plan & Environmental Assessment, USDA NRCS 11/94.

JUSTIFICATION FOR PLANNING:

N/A

METHODS:

The goal of the Buck Hollow Watershed Enhancement Project is to increase production of summer steelhead within the Buck Hollow Creek Basin by restoring spawning and rearing habitat. To accomplish this goal, work is progressing in the following three overlapping stages: 1. Project planning and coordination. 2. Implementation. 3 . Project monitoring.

Project planning and coordination

SWCD will continue to work with cooperating local, state, and federal agencies, project sponsors, and landowners providing coordination and leadership for the Buck Hollow watershed project pursuant to an interagency memorandum of understanding developed during the planning stage. The SWCD will develop individual agreements with participating landowners, providing for conservation plans, cost share, technical standards, and maintenance. The District requires cooperating landowners to maintain all installed upland practices for a minimum of ten years. The SWCD will provide project management, administration, and on-the-ground technical support.

Implementation

SWCDs and ODFW will work together to ensure that implementation of habitat protection and enhancement measures will be consistent with the site specific plans that were developed during the planning and coordination activities. SWCD will continue to seek multiple source funding and assist landowners in developing and implementing conservation plans and grazing management plans.

Where possible, naturally occurring rehabilitation of the riparian and instream fish habitat will be encouraged. Where use of natural processes does not appear to be feasible, construction of instream fish habitat structures, bank stability improvements, riparian fencing, and bio-engineering projects will be done as needed. ODFW and SWCDs will conduct the work, or supervise/inspect contractor work as required.

Monitoring

Monitoring activities will begin when construction of in stream fish habitat improvements, bank stabilization improvements and fence work has been completed and will continue until the end of the project. This will be done to ensure continued functioning of all habitat improvement projects, thereby ensuring success of the entire habitat project. All fish habitat improvements will be inspected following spring high flows. Performance of fish habitat or bank stabilization work will be documented. Site specific monitoring activities including the establishment of on-going photo sites and cross section measurements. Monitoring sites will be established in each separate management unit (individual reach) following the completion of project work in that reach to ensure efforts are accomplishing the desired effect.

Monitoring sites have been established from Kelsey Springs to the mouth of Buck Hollow Creek to compliment monitoring sites established by BLM. These monitoring sites will record stream flow, channel cross sections, water temperature, pH, and dissolved oxygen. A time series analysis will be done to determine seasonal and yearly variations in selected water quality parameters and improvements over time. SWCDs will assist ODFW as necessary for surveying and evaluating data collected during redd count and spawning ground surveys

PLANNED ACTIVITIES

SCHEDULE:

<u>Planning Phase</u>	<u>Start</u> 1/98	<u>End</u> 12/98	<u>Subcontractor</u>
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Task Detailed site checks will be made to determine if planned work requires modification due to high spring flows. If modification is necessary both aerial photos and project map will be updated and cooperators informed. Permit applications will be developed and submitted for approval to Division of State Lands. Field supplies will be acquired and preparations made for the field season.

Implementation Phase **Start** 2/98

End 12/98

Subcontractor

Task Instream habitat improvement structures, bank stabilization work and riparian fencing will be done in reaches where landowner agreement has been obtained. All completed work will also be identified on aerial photos and project work map. Construction of instream fish habitat structures, bank stability improvements, riparian fencing, and bio-engineering projects are the main effort for the near term along with collection and evaluation of data collected at established monitoring sites. During spring, redd count and spawning ground surveys will be conducted.

PROJECT COMPLETION DATE:

2000

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

The most significant events that could possibly affect the projects timing are weather related. Buck Hollow Creek has experienced two major flood events in the recent past. The first occurring in 1964, the other a localized flashflood event that occurred in July 1978. The most recent flood event to occur in the region was in Feb. 1996. Preliminary assessments showed that upland conservation practices, streambank juniper riprap, and bioengineering instream work completed in 1995 held up well and functioned as designed. Landowner permission for access to implement habitat improvements may be denied due to fire hazard, hunting parties on the ranch, to prevent road damage due to wet conditions, or for other reasons.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:

Increase production of annual returning adult steelhead from 200 to 1,000. In addition, the management techniques will restore Buck Hollow Creek to a biologically and hydrologically functioning watershed.

Present utilization and conservation potential of target population or area:

Observed utilization in 1996 was approximately 17 miles of main stem. Potential utilization exceeds 30 miles.

Assumed historic status of utilization and conservation potential:

Assumed utilization was in excess of 30 miles.

Long term expected utilization and conservation potential for target population or habitat:

Increase production of annual returning adult steelhead from 200 to 1,000; utilization of stream miles to 30.

Contribution toward long-term goal:

Increased natural production of wild salmon and steelhead. Reduce stream temperatures and stream width. Increase rearing and spawning habitat, macro invertebrate populations, dissolved oxygen, bank cover and stream cover.

Indirect biological or environmental changes:

In addition to increased fisheries production there will be: improvements to water quality (reduced sediment loads and summer water temperatures); improved bank stability (resulting from structural treatments and riparian restoration activities); significant increases in the amount and quality of riparian habitat benefiting many wildlife species; and increased landowner awareness, sensitivity and participation in riparian area and fish habitat management. These benefits are tangible and have been proven treatments, similar to those proposed in this program. ODFW's District Wildlife Biologists has noted increases in game numbers in the watershed as well as better distribution as the watershed condition has improved.

Physical products:

Sediment basins 48, Terraces 59,700 ft., Range improvement seeding 557 acres, trees planted 5,500, fencing 112,050 ft., Juniper and Brush control 95 acres, spring developments 8, streambank stabilization 5.2 miles, riparian plantings 6.5 miles, separated riparian pastures 3, riparian enclosures 1, wildlife and upland tree plantings 4 acres, conservation and grazing plans 90, 617

acres, watershed area treated 47,460 acres. Figures do not include phase 4 and 5 which are currently in progress.

Environmental attributes affected by the project:

In addition to increased fisheries production there will be: improvements to water quality (reduced sediment loads and summer water temperatures); improved bank stability (resulting from structural treatments and riparian restoration activities); significant increases in the amount and quality of riparian habitat benefiting many wildlife species; and increased landowner sensitivity and participation in riparian area and fish habitat management. These benefits are tangible and have been proven treatments, similar to those proposed in this program. We have already observed improved flows from some tributaries. Game animals which used to concentrate in the few good habitat areas of the watershed are now more widely distributed.

Changes assumed or expected for affected environmental attributes:

Near term changes are improved riparian and upland vegetation through grazing management systems. Longer term changes are improved riparian zone stability, reduced bank erosion, improved water storage capacity, improved late season stream flows, better shading and cover, narrower and deeper channel, cooler water, an increase in pools.

Measure of attribute changes:

We cannot address this question as presented however, sedimentation is being addressed in the following ways by ODFW, SWCD and the NRCS; construction of mid slope terraces, addition of grassed water ways, conservation tillage practices on adjacent farm land, strip crop farming where applicable, and the elimination of livestock grazing in riparian areas. In addition, bank stabilization projects using rock jetties, deflectors, trees, root wads, and some bio-engineering have been incorporated to address bank erosion. Our plans address sedimentation in terms of erosion reduction from various sources in Tons/Year and not in terms of deposition.

Assessment of effects on project outcomes of critical uncertainty:

Landowner cooperation: In the event a landowner elects not to cooperate in the project we will compare changes in habitat quality on adjacent landowner reaches with the non-participants. Using the 1991 physical stream survey broken down by landowner reaches we will have a basis of comparing effects.

CRP Contracts: Hydrologic analysis will be done on subbasins with significant acreage coming out of the CRP program to compare before and after predictions of runoff and erosion. Monitoring the mouth of those tributaries will provide a direct measurement of the impact of loss of the CRP acres.

Harvest and Ocean Conditions: As habitat improves, an increase in returning adults should be seen. If habitat improves and numbers do not increase, fish counts on the Deschutes and at Bonneville and the Dalles Dam will be examined to see if a general decline in numbers is evident which would be indicative of external factors.

Information products:

Periodic summer temperature data, redd counts, redd distribution, photo points, cross sections, stream flows, and occasional water chemistry at established monitoring sites.

Coordination outcomes:

Have built up high level of landowner and multi-agency support for project. Have opened multiple funding sources for implementation, demonstrating significant leveraging of funds for the various sponsors. Success in Buck Hollow has spawned similar projects in two adjacent watersheds.

MONITORING APPROACH

The goal of the Buck Hollow Watershed Enhancement Project is to increase production of summer steelhead within the Buck Hollow Creek Basin by restoring spawning and rearing habitat and improving watershed health. Water quality and quantity will be a direct measure of the health of the watershed. Trends in redd counts and their distribution in the system can be used to infer the biologic outcome.

Provisions to monitor population status or habitat quality:

Monitoring activities have begun and will continue until the end of the project. This will be done to ensure continued functioning of all habitat improvement projects, thereby ensuring success of the entire habitat project. All fish habitat improvements will be inspected following spring high flows. All damage to or failure of fish habitat or bank stabilization work

will be documented. Monitoring sites are being established in each separate management unit (individual reach) following the completion of project work in that reach to ensure efforts are accomplishing the desired effect. Besides water quality monitoring, photopoints and cross sections are being used. Baseline monitoring is being used to establish a reference from which riparian improvements can be measured, cooperative project progress will be charted and reported to cooperators and landowners. Monitoring sites have been established from Kelsey Springs to the mouth of Buckhollow Creek to compliment monitoring sites established by BLM. These monitoring sites will record stream flow, channel cross sections, water temperature, pH, and dissolved oxygen. The collection of data will be used to create a time series analysis to reflect seasonal and yearly variations in selected water quality parameters and improvements over time. The SWCD and ODFW will work together in the collection of this data. In addition, ODFW will provide the technical support and assistance necessary for surveying and evaluating data collected during redd count and spawning ground surveys.

Data analysis and evaluation:

Data will be analyzed by comparison to established parametric goals, such as water temperature. It will be evaluated in terms of how close it comes to meeting the established goal and whether or not a trend has been established over time to determine whether it is improving, remaining stable or declining.

Information feed back to management decisions:

Information will be presented to landowners at the annual all participants meeting, included in reports, and discussed at the technical team meeting. In the event adverse trends are noted, a technical evaluation will be sought to identify the cause and whether or not there is a need to change management direction or emphasis.

Critical uncertainties affecting project's outcomes:

Maintaining good relations and the trust of the landowners by continuing to promote non-threatening, voluntary, economically sound programs and providing technical assistance and financial assistance for implementing conservation.

Getting the Columbia Plateau and Columbia River Watershed included in the U.S. Department of Agriculture's CRP National Priority List or by ensuring that Buck Hollow watershed is included in a State CRP Priority List.

A moratorium on ocean and main stem Columbia River salmonid harvest for at least six years to boost numbers of all populations could certainly be used to selectively increase depressed stocks. While there are numerous contributing causes for declining numbers of anadromous fish runs, documentation existed in the late 1800's showing dramatic declines in runs before any main stem dams were built. That is a strong argument to pay more attention to harvest and would certainly be worth the cost of buying fishing rights for a six year period so that all the runs could cycle at least once unmolested. It could be a salmon/steelhead conservation reserve program for lack of a better name. If such a program could be implemented, Tribal concurrence would be needed and some provision made to meet their cultural needs.

Regarding ocean conditions, National Marine Fisheries should focus more research efforts on that part of the life cycle at sea which we know little about. El Nino and changes in upwelling nutrients are probably significant to the anadromous fish like they were to the South American anchovy fishery. While this is a definite research need, it is not clear that more knowledge about the topic would have any effect on the project.

EVALUATION

Increased late season stream flow, improved water quality including lower summer temperatures, increasing redd counts and utilization of greater stream reaches. Improvements in physical stream parameters, W/D ratio, cover and shading, % bank stability, increase in pool/riffle ratio.

Incorporating new information regarding uncertainties:

New information would be incorporated immediately and an assessment made as to whether we can continue as planned or whether we need to alter our methods. Regarding CRP, if CRP acreages are going back into crop production, a major emphasis will need to be given to accelerating land treatment practices in the effected sub-basins. Key practices that may be used to mitigate that event would be to use incentives for landowners to leave buffer strips or filter strips in grass, incorporate divided slope or strip cropping systems, construct additional terraces and sediment basins.

Increasing public awareness of F&W activities:

Through continued involvement with area schools, private landowners, civic groups, interested persons and organizations. This project has had a great deal of publicity and exposure locally, state wide, and even nationally. Buck Hollow was one of the watershed projects where NRCS filmed parts of A Place to Come Home To. USDA TV did a nationally televised advertisement

with interviews of Buck Hollow Landowners and project personnel. Presentations have been given at Oregon Trout's State of The Deschutes Workshop, at GWEB conferences in 1992 and 1996, at Symposiums in Seattle and Norfolk. This is a well known project which consistently receives positive comments and is often held up as a model.

RELATIONSHIPS

RELATED NON-BPA PROJECT

Buck Hollow PL-566 Project/USDA NRCS

Buck Hollow Watershed Enhancement Project Phases 1-5/GWEB

RELATIONSHIP

Provides for accelerated land treatment to improve watershed health, water quality, fish and wildlife habitat, and sustainability for multiple uses.

Provides for holistic watershed enhancement activities, cost sharing conservation practices with private landowners to improve watershed health. Addresses cropland, rangeland, and riparian areas.

OPPORTUNITIES FOR COOPERATION:

Buck Hollow Creek is located primarily on private property. It is also important to note the fact that the project was initiated by the local communities surrounding the watershed. Restoration efforts are therefore tied directly to the support of these local communities. In addition, restoration efforts revolve around the cooperation of a myriad of government agencies. Each government agency is responsible for their particular area of expertise. However each agency must cooperate not only with the individuals within the communities, but also with the other participating agencies. This cooperative effort can be used as an example for future salmonid habitat restoration projects. The Buck Hollow watershed project is a prime example of local communities and various agencies cooperating and working together to restore a watershed from a top down approach for the long term improvement of its riparian area and salmonid populations.

The voluntary, cooperative nature of the Buck Hollow Project and its success is beginning to spread. In 1995 the private landowners in the adjacent Bakeoven Watershed requested assistance in initiating a similar watershed project there. The SWCD assisted them in forming a watershed council and in obtaining 2 project grants from the Oregon Governor's Enhancement Board which are currently being implemented. In 1996 Sherman and Wasco Co. SWCDs assisted the private landowners in Pine Hollow Watershed just east of Buck Hollow in forming a watershed council and obtaining a grant from Oregon Department of Agriculture which is currently being implemented.

The Conservation Districts and Oregon Department of Fish and Wildlife continue to share equipment on projects. USDA NRCS assists the SWCDs with both equipment and technical expertise. All of the state, federal, tribal, and local agencies in the mid-Columbia readily share information and provide each other such technical assistance as may be available.

Observed Results to Date: Peak runoff events have been reduced. Using the 10 year, 24 hour storm runoff as a yard stick, peak flows have been reduced an average of 25% in the phase 1, 2, and 3 areas. Spears Canyon sub-basin in a phase 1 treatment area was intermittent in late summer and now exhibits perennial flows. Steelhead are now using 17 miles of main stem compared to less than 8 miles when the project began. After the peak of the February 1996 flood, Buck Hollow Creek was providing clean water to a muddy Deschutes River.

Project Phase / Total Cost / BPA Cost

1 / \$169,068 / 0

2 / \$432,411 / \$125,000

3 / \$413,912 / \$125,326

4 / Pending

5 / In progress

COSTS AND FTE

1997 Planned: \$105,477

FUTURE FUNDING NEEDS:

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$100,000	20%	75%	5%
1999	\$100,000	20%	75%	5%
2000	\$100,000	20%	75%	5%
2001	\$50,000	10%	10%	80%
2002	\$50,000	10%	5%	85%

PAST OBLIGATIONS (incl. 1997 if done):

<u>FY</u>	<u>OBLIGATED</u>
1993	\$63,225
1994	\$125,464
1995	\$78,781
1996	\$209,641
TOTAL:	\$477,111

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

<u>FY</u>	<u>OTHER FUNDING SOURCE</u>	<u>AMOUNT</u>	<u>IN-KIND VALUE</u>
1998	GWEB, & other State & local Sources	\$60,000	\$40,000
	USDA NRCS, & other Federal		\$70,000
1999	GWEB, & other State & local Sources	\$60,000	\$40,000
	USDA NRCS, & other Federal		\$70,000
2000	State & local Sources	\$20,000	\$30,000
	USDA NRCS, & other Federal		\$70,000
2001	State & local Sources	\$15,000	\$25,000
	USDA NRCS, & other Federal		\$30,000
2002	State & local Sources	\$10,000	\$20,000
	USDA NRCS, & other Federal		\$25,000

OTHER NON-FINANCIAL SUPPORTERS:

OSU Extension Service, BLM, Oregon Water Trust, Wasco Union High School, South Sherman Elementary, Boy Scouts, The Dalles Rod & Gun Club, WyEast RC&D Area Council, Oregon Trout, 50 landowners, Confederated Tribes of the Warm Springs Reservation of Oregon have all contributed to the project in some way.

LONGER TERM COSTS: \$20,000 or less.
O & M only

1997 OVERHEAD PERCENT: 17%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:
Applies only to personal services (PS) and services and supplies (SS)

CONTRACTOR FTE: 2

SUBCONTRACTOR FTE: 0

SUPPLEMENTAL RESIDENT FISH EVALUATION FACTORS:

While project is geared toward anadromous fish, riparian habitat improvements and water quality improvements will benefit rainbow trout as well.

SUPPLEMENTAL WILDLIFE EVALUATION FACTORS:

Although this is the fish habitat part of a comprehensive watershed improvement project, numerous benefits have already accrued for both game and non game wildlife species.