

BUCK HOLLOW WATERSHED ENHANCEMENT (ODFW)

9304500

SHORT DESCRIPTION:

Restore summer steelhead spawning and rearing habitat in Buckhollow. Provide technical support and coordination for planning of watershed and fish habitat improvements.

SPONSOR/CONTRACTOR: ODFW

Oregon Department of Fish and Wildlife

Ray Hartlerode, Project Leader

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SUB-CONTRACTORS:

This project is jointly sponsored by ODFW and Wasco

County Soil and Water Conservation District (WCSWCD)

GOALS

GENERAL:

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

WATERSHED:

Coordination

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.

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

Subbasin:

Deschutes

Stream miles affected:

37.7miles

Land ownership:

Predominantly private, some BLM

Habitat types:

Adult holding and spawning: and juvenile rearing habitat.

HISTORY:

In the past Buckhollow Creek 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. Public concern prompted local, state, and federal agency assistance in habitat restoration efforts for the Buckhollow Creek watershed.

The Buckhollow project began in 1991 by the Wasco and Sherman County SWCD's using a grant from the Governor's Watershed and Enhancement Board. Several subsequent grants from GWEB were used to continue the project. In 1992 ODFW

and WCSWCD submitted proposals to BPA for fish habitat restoration planning work on Buckhollow. BPA funding for riparian habitat restoration began in 1993. Funding from additional sources have allowed upland management treatments to be implemented.

A Buckhollow technical team was established to develop an implementation plan for the restoration of Buckhollow Creek. The implementation plan derived was divided into four main elements. Each element is necessary to meet the primary goal developed by the technical team: to increase the annual return of steelhead to Buckhollow Creek from 200 to 1,000. The first element is to design and apply grazing systems to both the uplands and the riparian zone. The second element consists of placing fish habitat improvements where appropriate. The third element, cropland conservation systems encourages landowners to apply cropland systems in the uplands. Upland range conservation practices, the fourth element encourages landowners to apply water and sediment control basins where feasible. Implementation of management elements has now begun.

BIOLOGICAL RESULTS ACHIEVED:

The Buckhollow project is a relatively new habitat restoration project. Implementation on fish habitat restoration began in the summer of 1995 on upper Buckhollow Creek, between Kelsey Springs and Macken Canyon. It is yet to early to quantitatively measure any biological results. In addition, monitoring activities have started, but once more it is too early for any biological results to be quantitatively measured.

PROJECT REPORTS AND PAPERS:

Progress reports and billings due quarterly and monthly respectively

ADAPTIVE MANAGEMENT IMPLICATIONS:

In 1991, ODFW conducted a Quantitative Stream/Aquatic Habitat Survey for the entire length of Buckhollow Creek. The data collected provided baseline information for the habitat conditions currently found in Buckhollow Creek. In addition, the survey allowed project cooperators (participating government agencies and public organizations) to review current habitat conditions and establish a defined set of habitat conditions needed to improve salmonid populations in the Buckhollow Watershed. Based on the habitat conditions collected in Buckhollow Creek the cooperators focused on management techniques that would have the greatest success for improving salmonid populations in buckhollow. The management plan derived has been divided into four main elements. The first element is to design and apply grazing systems to both the uplands and the riparian zone. The second element consists of placing fish habitat improvements where appropriate. The third element, cropland conservation systems encourages landowners to apply cropland systems in the uplands. The fourth element, upland range conservation practices encourages landowners to apply water and sediment control basins where feasible.

The management implications of this particular project are great. Buckhollow 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 objectives and overall missions of the participating agencies. This cooperative effort can be used as an example for future salmonid habitat restoration projects. The Buckhollow Creek 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.

Another implication is that the management treatments will begin at the head of Buckhollow and proceed to the confluence of the Deschutes River. All treatments will be monitored and any problems encountered will be documented and corrected in future treatments. In addition, any problems that may be encountered with logistics before or during the implementation of treatments will be modified and corrected for treatments downstream. This will ensure greater efficiency and effectiveness of the available resources and treatments implemented as work continues downstream on Buckhollow Creek.

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:

Based on available riparian habitat restoration/watershed research, and past/present riparian habitat projects, the Buckhollow 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 Buckhollow'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 Buckhollow Creek. Each landowner has been assigned a reach number corresponding to the entry and exit of Buckhollow 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. The existing shade condition is currently 35%.
- 2) Water Temperature: The goal is to limit the maximum water temperatures to 58 degrees F. The existing water temperature condition is 80 degrees F. or greater in the summer months.
- 3) Flow: The goal is to augment low flows to a minimum of 5 CFS at the mouth of buckhollow. The existing low flow conditions 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) Streambank Stability: The goal is to have 80% of the streambanks stable. The existing streambank 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:

The most critical uncertainty with this type of project is the fact that it relies heavily on the voluntary cooperation of the private landowners in the Buckhollow Creek Basin. If an individual landowner chooses not to cooperate in the project then there is a 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. However, to date this does not seem to be a problem.

BIOLOGICAL NEED:

Buckhollow Creek is only marginally functioning as a watershed. In the past Buckhollow 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 Buckhollow 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 buckhollow. 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 island refuges.
- 3: Low summer flows: Summer flows in Buckhollow 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 Buckhollow has decreased dramatically. Reduction of riparian habitat has decreased the moisture holding capacity of stream adjacent soils and has diminished summer flows. Buckhollows summer flows in many segments has become intermittent.
- 4: Lack of habitat diversity: Buckhollow 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 Buckhollow due to overgrazing and high flows has reduced or eliminated the natural floodplains and channel sinuosity resulting in higher stream velocities which accelerate bank erosion and downcutting. 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 Buckhollow 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 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%.

ALTERNATIVE APPROACHES:

See NRCS PL 566 plan.

JUSTIFICATION FOR PLANNING:

N/A

METHODS:

The goal of the Buckhollow Watershed Enhancement Project is to increase production of summer steelhead within the Buckhollow Creek Basin by restoring spawning and rearing habitat. To accomplish this goal, work will progress in the following three stages.

- 1. Project planning and coordination.
- 2. Implementation.
- 3. Project monitoring.

Project planning and coordination

ODFW will continue to work with cooperators and landowners providing technical support within the Buckhollow Creek Basin pursuant to a memorandum of understanding developed during the planning stage.

ODFW will participate in negotiations with cooperators in the Buckhollow Creek basin to continue the development of habitat restoration agreements. Technical support and specifications will be provided by ODFW in the development of instream improvement structures, bank stabilization work and riparian fencing.. ODFW will survey Buckhollow Creek to determine if specified fish habitat improvements documented on aerial photos and the project work map require modification due to spring flows. If modification is necessary both aerial photos and project map will be updated. All completed work will also be identified on aerial photos and project work map. In addition, ODFW will continue to provide technical support to all cooperators concerning riparian habitat improvements and riparian grazing management agreements, participate in all technical review, public, landowner and monthly Wasco WCSWCD meetings, participate in the development of upland conservation practices, and provide necessary assistance for ongoing educational activities in the Buckhollow Creek Basin. ODFW will also assist in the development of a GIS data base for the Buckhollow Creek Basin.

Implementation

ODFW will 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.

ODFW, where at all possible, will allow for natural rehabilitation of the riparian and instream fish habitat. Where this is not feasible, ODFW will provide technical assistance and participate in onsite contractor inspection of instream fish habitat and bank stabilization improvements on designated project sites. Technical assistance will be provided for onsite contractor inspection of riparian fence work. In addition, ODFW will participate in the construction of instream fish habitat structures, bank stability improvements, riparian fencing, and bio-engineering projects as needed. Should repairs to fish habitat improvements, bank stability improvements or fencing projects be necessary, ODFW will provide technical support and assistance

PLANNED ACTIVITIES

SCHEDULE:

Planning Phase **Start** Jan 1998 **End** Dec 1998 **Subcontractor**

Task ODFW will continue to work with cooperators and landowners providing technical support within the Buckhollow Creek Basin pursuant to a memorandum of understanding developed during the planning stage. ODFW will participate in negotiations with cooperators in the Buckhollow Creek basin to continue the development of habitat restoration agreements. Technical support, assistance and specifications will be provided by ODFW in the development of instream improvement structures, bank stabilization work and riparian fencing in reaches where landowner agreement has been obtained. ODFW will survey Buckhollow Creek to determine if specified fish habitat improvements documented on aerial photos and the project work map require modification due to high spring flows. If modification is necessary both aerial photos and project map will be updated and cooperators informed. All completed work will also be identified on aerial photos and project work map In addition, ODFW will continue to provide technical support to all coope

Implementation Phase **Start** Feb 1998

End Oct 1998

Subcontractor

Task Assist with implementation of Fish Habitat Restoration Plan. Conduct site checks in preparation for field season. Assist in obtaining concurrence for implementation work. Assist in obtaining necessary permits and leases. Provide technical assistance necessary to implement on the ground habitat improvements.

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. Buckhollow Creek has experienced two major flood events in the recent past. The first occurring in 1965, the other a localized flood event that occurred in 1978. The most recent flood event to occur in the region was in Feb. 1996. However, it is to soon to assess the damage since it is still to wet to gain access to the creek. Extreme flood events could possibly damage riparian fencing and/or newly placed fish habitat improvements.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

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

Increase production of annual return of steelhead from 200 to 1,000. In addition, the management techniques will return Buckhollow Creek to a biologically functioning watershed.

Present utilization and conservation potential of target population or area:

unknown

Assumed historic status of utilization and conservation potential:

unknown

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

Increase production of annual return of steelhead from 200 to 1,000.

Contribution toward long-term goal:

Increase 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 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.

Physical products:

Information will be provided by SWCD.

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.

Changes assumed or expected for affected environmental attributes:

Near term. Control of livestock grazing in riparian area, reduced sedimentation from adjacent crop lands, increased shading, increased pool habitat, increased rearing habitat, increase in available spawning habitat. Long term. A healthy and productive stream and riparian area.

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.

Assessment of effects on project outcomes of critical uncertainty:

By a more detailed monitoring and evaluation project sometime in the future if funding is available.

Information products:

Available form SWCD.

Coordination outcomes:

Some stream bank stabilization using juniper rip rap has been accomplished. Riparian pastures have been created to accelerate vegetation improvement on approximately 3 miles of stream. This has been done in conjunction with development of rest, rotation grazing management systems. December 1994: Completed work on upper 3 miles of stream.

MONITORING APPROACH

Monitoring activities will begin when construction of instream 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. All damage to or failure of fish habitat or bank stabilization work will be documented. In addition, ODFW will assist in the development of site specific monitoring activities that will include 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. ODFW will also participate in the collection of baseline monitoring data 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 crosssections, 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. ODFW will provide technical support and assistance 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, evaluated and compared to previous years data.

Information feed back to management decisions:

Through normal channels, i.e., reports, memos and presentations.

EVALUATION

Incorporating new information regarding uncertainties:

New information would be incorporated immediately, if it would affect the project in a positive manner.

Increasing public awareness of F&W activities:

Through continued involvement with area schools, private landowners, civic groups and interested persons.

RELATIONSHIPS

RELATED BPA PROJECT

RELATIONSHIP

8805304 Hood River Production Program - Odfw - M&E

Share office space only

9304000 Fifteenmile Creek Habitat Restoration Project

Share office space, equipment, and some personnel

OPPORTUNITIES FOR COOPERATION:

We currently share office space, some manpower, equipment, and tools with the Fifteenmile Creek Project 9304000, and the Hood River Project 8805304.

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COSTS AND FTE

1997 Planned: \$54,139

FUTURE FUNDING NEEDS:

PAST OBLIGATIONS (incl. 1997 if done):

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$75,000			
1999	\$75,000			
2000	\$75,000			
2001	\$75,000			

<u>FY</u>	<u>OBLIGATED</u>
1993	\$87,925
1994	\$30,141
1995	\$57,202
1996	\$52,269

TOTAL: \$227,537

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>
1998	NRCS

AMOUNT IN-KIND VALUE

OTHER NON-FINANCIAL SUPPORTERS:

BLM, Oregon Water Trust

1997 OVERHEAD PERCENT: 22%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:

[Overhead % not provided so BPA appended older data.] The above percentage applies only to personal services and services and supplies, it does not apply to contractual services.

