

John Day River Habitat Enhancement

Annual Progress Report

by

Mark Lacy, Amy Stuart, and Brad Smith
Oregon Department of Fish and Wildlife
506 DE Mill Street
P.O. Box 59
Portland, Oregon 97207

Project No. 84-21
Contract No. DE-AI79-85BP17460

January 1 to December 31, 1985

Abstract

This project, initiated July 1, 1984 under Bonneville Power Administration (BPA) contract number DE A179-84 BP17460, provides initial landowner contacts agreement development, project design, budgeting, and implementation for an anadromous fish habitat improvement program on privately owned lands within the John Day Basin. Implementation of the major segment of improvement work under this project occurred after July 1, 1985. Activities under the first phase of the contract period (January 1, 1985 through June 30, 1985) included landowner contacts and agreement development, personnel training, equipment purchase and project inventory, planning and design work.

Because of our agreement and association with the Grant Soil and Water Conservation District (GSWCD) and our cooperative (GSWCD, SCS, and ODFW) working relationship, we had agreements with 6 landowners on 7 properties in 1985.

We completed instream habitat improvement on 3 miles of the mainstem John Day and have constructed 1.7 miles of riparian exclosure fence on this section. We completed 13 miles of electric riparian/pasture fence on Deer Creek and 2.4 miles of electric riparian exclosure fence on Fox Creek. We also constructed 3.0 miles of barbwire exclosure fence on Fox Creek.

Introduction

The John Day River system (Figure 1) supports the largest remaining totally wild runs of spring chinook and summer Steelhead in Northeast Oregon. The genetic component of these runs must be maintained to reserve the option for future restoration of runs in other Columbia tributary systems and for effective utilization of habitat in the John Day system.

Oregon Department of Fish and Wildlife (ODFW) personnel first surveyed the John Day system for spring chinook and summer Steelhead in 1959. Few Chinook redds were found. Gradually over the next 14 years counts of redds in the basin increased and by 1974 there were 8.2 redds per mile. Since 1978 however, John Day chinook returns have declined.

During the 1960's and early 1970's summer Steelhead redd counts remained fairly stable (six - eight redds per mile) with a peak of 16 redds per mile in 1966. Index counts for Steelhead then declined to a low of one redd per mile in 1979. Some improvement has occurred since then. Sport catch of Steelhead varied in recent years and a reduced annual bag limit is currently in effect on the system.

A variety of man's activities have impacted salmon and Steelhead habitat in the John Day system. Placer mining in the late 1800's left many streams with little or no shade, high silt load, and diverted flows. Later, dredging overturned the stream channels in the larger streams changing stream course, silting gravel, and destroying stream cover. In the more recent past, overgrazing, road building, logging, landowner clearing, increased water withdrawals, and channelization created further fish habitat problems by disturbing or destroying riparian vegetation and destabilizing streambanks and watersheds. The results are wide, shallow channels; low, warm summer flows; high, turbid spring flows, and decreased fish production. This situation is improving with proper management on many streams, but much remains to be done to return the John Day system to its once productive state. In addition to the in-basin problems, the Columbia River hydroelectric complex, particularly the John Day dam, is taking its toll on wild smolts migrating from, and adults returning to, the John Day River system, further compounding in-basin problems.

The purpose of the in-stream and riparian restoration work is to maintain wild gene pools and enhance production of smolts and adults to offset losses incurred at the dams. By mitigating for these losses, we hope to restore runs in the system to pre-dam numbers.

Funds provided to the ODFW by the BPA contract number DE A179-84 BP17460 provides for landowner contact and agreements, project inventory, plan and design work, contract development, budgeting, in-stream habitat work, riparian restoration, and post construction review for anadromous fish habitat improvement on private lands within the John Day Basin. The program will compliment ongoing BPA habitat programs on Forest Service and BLM lands in the basin.

Description of Project Area

The John Day drainage contains 8,010 square miles in East Central Oregon and is the third largest drainage in the State (Figure 1). The basin includes a major part of Gilliam, Grant, and Wheeler Counties and portions of Crook, Harney, Jefferson, Morrow, Sherman, Umatilla, Union and Wasco Counties.

The mainstem John Day River flows 284 miles from its source in the Strawberry Mountains into the Columbia River just above the John Day dam. The largest tributary, the North Fork, enters the John Day at Kimberly (RM 184) and extends 112 miles to its headwaters in the Elkhorn Mountains at elevations near 7,500 feet. The Middle Fork John Day River originates just south of the headwaters of the North Fork and flows roughly parallel to it for 75 miles until they merge at RM 31 of the North Fork. The South Fork John Day River originates from **Snow Mountain**, elevation 7,163 ft., and drains the south side of the Aldrich Mountains.

Salmon and Steelhead runs in the John Day River consist entirely of wild stocks. Spring chinook salmon spawn in the mainstem John Day River above Prairie City (Figure 1), in the North Fork above Dale including Granite Creek and its tributaries Clear and Bull Run Creeks, and in the Middle Fork above Mosquito Creek. Summer Steelhead utilize virtually all accessible tributaries in the basin (Lindsey, et.al. 1981). In the South Fork up to RM 28 at South Fork Falls, summer Steelhead spawn and rear.

Specific areas included in the project during FY 1985 include; (A) the John Day River above the town of John Day, between RM 247 and 250 and (B) between RM 260 and 272, (C) Fox Creek (Cottonwood Creek drainage, North Fork tributary) between RM 1 and 15, and (D) Deer Creek (North-Fork tributary) between RM 4 and 12 (Figure 1).

Methods and Materials

We continued work on landowner agreements for FY 1985, implemented and established time frames, equipment procurement, hiring personnel, budgeting, and contract development.

We continued collection of baseline physical stream measurements, stream width, depth, cover area, length of bank vegetative cover, and pool/riffle ratio following Platts, et.al. 1983 for comparison to post treatment conditions. We measured stream width and depth on transects located at 50 pace (150 feet) intervals. We used wetted width, with estimates for undercut banks and maximum depth as our measurements. Cover area, bank vegetation, and pool/riffle ratio were quantified for the entire reach. Cover criteria included any submerged or overhanging material providing in-stream cover in an area of water where velocities would allow a fingerling fish to hold. Woody vegetative cover providing shade to any portion of the stream was measured in lineal feet. Pool area was determined to be an area of stream with reduced velocities allowing a fingerling fish to hold and including at least one half of the stream width.

We also walked the stream reaches planned for instream work in state FY 1985 and determined the amount and types of in-stream habitat improvement and riparian fencing needed by identifying areas of poor habitat, i.e. areas lacking pools or cover, and poor riparian cover respectively.

Our engineering support personnel from GSWCD made measurements to determine bank stabilization needs within planned project areas. We implemented stabilization of actively eroding banks with rock riprap and jetties in conjunction with streambank fencing to allow full recovery of the riparian area. Measurements included length of bank and average bank height. These measurements were subsequently used to calculate quantity of rock required to estimate costs, and for contracting. We estimated fencing quantities, number of jetties and boulders, length of riprap and other conditions, and submitted this information to the ODFW engineering section for contracts. Pre-bid tours were conducted and the contracts were then opened for bidding and construction began in mid September.

We determined jetty, boulder, riprap, and water gap locations by walking the mainstem stream reaches and staking these areas. The contractor then excavated these locations and rock was placed under supervision by ODFW personnel. Boulders were individually placed in the stream by the contractor under direct supervision of ODFW personnel. Woody debris was cabled into the bank with $\frac{1}{4}$ inch steel cable by ODFW personnel. Side channels were excavated by the contractor under the direction of ODFW and boulders were placed within these channels. Rock weirs were excavated and constructed with jetty structures, boulder placement, and associated holding pools. A railroad tie corner post, steel post, wood stay, 5-strand barbwire riparian enclosure fence was constructed on one side of the river on the Coombs property (.5 mile). A rock jack, steel post, wood stay, 5-strand barbwire riparian enclosure fence was constructed on the Holmstrom property (1.2 miles). Riparian grass seed was planted on 3.4 miles of streambank on the Coombs and Emmel properties. Several pieces of woody debris, (ie. logs and branches) were placed within the jetties and left projecting into the channel for fish habitat. These will be evaluated for icing and performance throughout the year.

A 14.5 mile long, electric, 4-strand (2 hot wires), wood corner post, steel post and fiberglass stay riparian pasture fence was constructed on Deer Creek (North Fork tributary) for 6.6 stream miles. Associated structures included switches placed every $\frac{1}{2}$ miles on the fence for maintenance, 2 flood gate controllers were placed at the beginning and end of the project site, numerous hog wire gully crossings, and 6 gates for ingress and egress. A total riparian enclosure electric fence was constructed within the above fence along a 400 foot corridor of the stream and 20 feet wide on each side of the creek to monitor plant community, growth, and development in the **riaprian** zone for a comparison between total and partial cattle exclusion. The electric riparian pasture system is a grazing strategy that will allow equitable use of available forage, with carefully managed levels of stocking, and timing and intensity of grazing (Platts and Nelson 1985).

A rock jack, steel post, wood stay, 5-strand barbwire riparian enclosure fence was also constructed on Fox Creek (Cottonwood Creek, North Fork tributary). The 3 mile long fence will allow riparian recovery on 1.5 miles of stream.

An electric 4-strand (2 hot wires), wood corner post, steel post, and fiberglass stay riparian enclosure fence was also constructed along 1.2 stream miles (2.4 fence miles) on a portion of Fox Creek. Three water gaps and 11 gates were also installed.

Fencing projects not completed in 1985 will be incorporated into the 1986 construction contracts. A major portion of this fencing will be coordinated with instream habitat structure work in 1986.

Results and Discussion

We obtained 7 signed riparian lease agreements and worked on 6 properties in FY 1985 (Table 1). We have contacted several more landowners and plan to implement habitat **improvement** on 10 separate projects in FY 1986 which includes 5 of the 7 landowners from FY 1985. These priority areas include the upper mainstem John Day, the upper Middle Fork John Day, Fox Creek, Deer Creek Falls, and Fivemile Creek Falls. This work will treat approximately 18.6 miles of stream and open up spawning and rearing areas above the 2 falls for 38 additional miles.

We completed instream habitat improvement work in the mainstem John Day on 3 properties for a total of 2.9 stream miles. In these 3 reaches, we placed 751 boulders, 2 rock weirs and associated holding pools, 146 rock jetties, 2 side channels for juvenile rearing and overwintering, 1725 feet of rock riprap for bank stabilization, 7 water gap developments, and installed several pieces of woody debris with cables or in association with jetties for fish cover (Table 1). We completed 1.7 miles of riparian barbwire enclosure fence on 2 properties.

We completed approximately 3.0 miles of riparian barbwire enclosure fence and began construction on one spring development on Fox Creek (North Fork tributary). On a second property, we completed approximately 2.4 miles of riparian electric enclosure fence on Fox Creek.

We completed approximately 13.0 miles of riparian pasture electric fence and a riparian enclosure electric fence on a 400 feet by 20 feet section of stream for riparian monitoring on Deer Creek (North Fork tributary).

Summary and Conclusions

Activities under the first half of the contract period (January 1 through July 31, 1985) included landowner contact and agreements, personnel training, project inventory, equipment acquisition, planning, and design work. We obtained agreements with 7 landowners for FY 1985 and have contacted 9 landowners for FY 1986 projects. We have been working with the USFS, Malheur NF to develop a project on the Middle Fork John Day River in 1986 or 1987 on USFS land. Activities in the second half of the contract period (August 1 through December 31, 1985) included the above activities and the following: contracts, pre-bid tours, instream habitat improvement projects, riparian fence construction, budgeting (Table 3) and working on the annual report.

Fish benefits from the instream habitat structures (Table 2) are estimated based on calculations by the USFS (USDA, Umatilla NF 1984). Total number of additional anadromous fish derived from habitat enhancement work is estimated at 7171 smolts and 107.56 adults of spring chinook and 2796 smolts and 111.60 adults of summer Steelhead (Oregon Dept. of Fish and Wildlife, unpublished report 1985).

Our agreement with GSWCD for them to provide the ODFW with engineering support, construction, riparian planting, and landowner agreements has worked well. The John Day project has benefited greatly in terms of landowner acceptance and cooperation from our association working with the GSWCD and SCS (Soil Conservation Service). The GSWCD is a group of landowners set up to deal with local problems and issues related to soil and water. Landowners have been very receptive to being approached through GSWCD about fish habitat improvement projects. SCS personnel have also assisted with landowner contacts, and strategies for management changes and streambank fencing. Landowner contacts have continued to be positive and our staff has projects lined up for FY 1986.

John Day River Drainage Indicating Work Areas in 1985

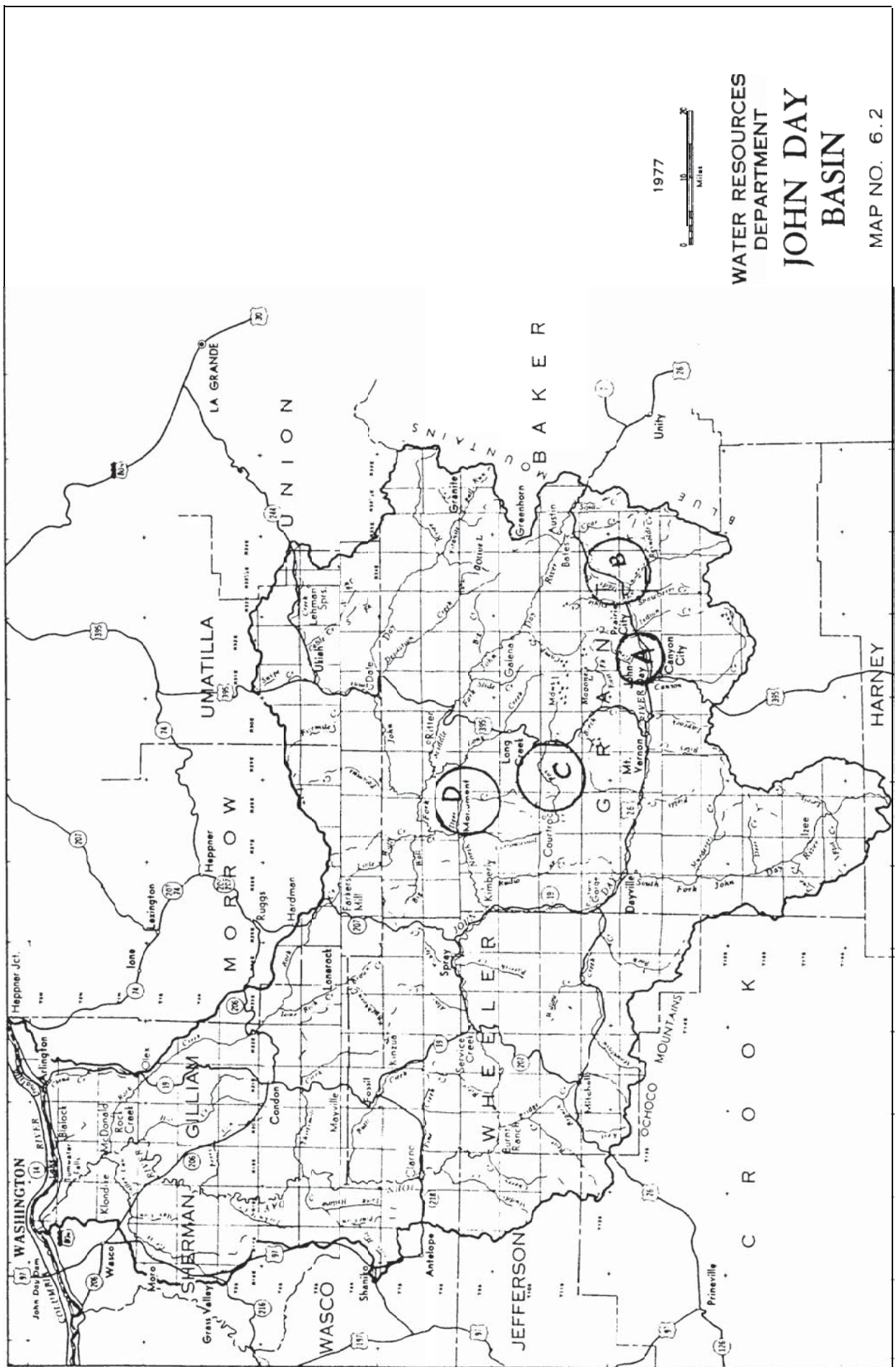


TABLE 1

Work Completed for the John Day Basin in 1985
Private Lands Habitat Improvement Project, State FY 1986

LANDOWNER	AREA	LENGTH OF STREAM (MILE)	Habitat Improvements a/						H ₂ O DEV	FENCING (MILE)	PHYSICAL INVENTORY DATE
			BOULDERS	JETTIES	WEIRS	RIPRAP	SIDE CHANNEL	DEV			
Coombs	Upper Mainstem	0.4	117	25 a/	-	25'	-	-	1	0.5 b/	Y-85
Emmel	Upper Mainstem	1.2	323	62 a/	2	925'	-	1	2	b/	Y-85
Holmstrom	Upper Mainstem	1.2	311	59 a/	-	775'	-	1	-	1.2	Y-85
Johns	Fox Creek	5.0	-	-	-	-	-	-	1	c/ 2.0 d/	Y-85
Bentley Ranch	Fox Creek	1.2	-	-	-	-	-	-	3	2.4	Y-85
Bentley Ranch	Deer Creek	6.5	-	-	-	-	-	-	-	13.0	Y-85
McGirrs	Fox Creek	1.5	-	-	-	-	-	-	-	1.0 d/	Y-85
TOTAL		17.0	751	146	2	1725'	2	2	7	19.6	

a/ Woody debris installed with cables or in association with some jetties on mainstem projects

b/ Fencing incomplete as of January 1986

c/ 1 spring development begun in 1985; 2 more planned for 1986

d/ Fencing incomplete; major portion of fencing will be included with instream habitat structure work in 1986

TABLE 2

Estimated Fish Benefits from Instream Habitat Structures
in 1985 on the Mainstem John Day River a/ b/

STRUCTURE TYPE	# STRUCTURES	#CHINOOK SMOLTS	#STEELHEAD SMOLTS
Boulder	751	3,755	1,502
Jetty	146	2,920	876
Weir	2	120	36
Sidechannel	2	376	376
Total Smolts		7,171	2,796
Total Adults		107.56	111060

a/ Assumptions for calculations:

1. Chinook spawner produces 160 viable smolts
2. Steelhead spawner produces 150 viable smolts
3. A placed boulder produces rearing habitat for 5 salmon and 2 Steelhead smolt, or 5 Steelhead smolt if in a Steelhead only stream.
4. A side channel produces habitat for 1800 chinook and 540 Steelhead smolt.
5. Other structures produce habitat for 40 chinook and 12 Steelhead smolt or 24 Steelhead smolt if in a Steelhead only stream.

b/ Assumptions from USDA U.S. Forest Service, Umatilla National Forest Environmental Assessment, September 1984.

TABLE 3
BUDGET SUMMARY FORM

Project Title: John Day River Habitat Enhancement
 Project Number: 84-21
 Contract: DE A179-84 BP 17460
 Agency: OR Dept. of Fish & Wildlife
 Agreement Period: 7/1/85 - 3/31/86

July 1 - Nov. 30 Expenditures a/

ITEM	CONTRACT	CONTRACT	TOTAL
	<u>659</u>	<u>660</u>	
1. Personnel Salaries	35,760.27	23,158.84	58,919.11
2. Labor Overhead 36%	12,605.03	8,194.01	20,799.04
3. Travel /Per diem	3,387.28	5,336.78	8,724.06
4. Training	--	--	--
5. Expendable Equipment	4,360.12	26,578.34	30,938.46
6. Non-Expendable Equipment	2,008.78	1,017.55	3,026.33
7. Rent	--	--	--
8. General Services	6,441.18	1,788.19	8,229.33
9. Indirect Overhead 23%	14,387.39	14,962.92	29,350.31
10. Subtotal	78,950.05	81,036.36	159,986.41
11. Subcontracts	56,213.19	193,514.86	249,728.05
12. Total Expenditures	135,163.24	274,551.22	409,714.46
13. Budget	263,970.00	263,970.00	527,940.00

a/ Expenditures available through February 1986

References

- Lindsay, R.B., B.J. Smith, and E.A. Olsen. 1981 Spring Chinook Studies in the John Day River. Federal Aid Progress Report-Fisheries. Oregon Department of Fish and Wildlife, Corvallis. 48 pp.
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- Oregon Department of Fish and Wildlife, unpublished report. 1985. Draft Report John Day River Basin: Summer Steelhead Production Plan. Portland, Oregon. 18 pp.
- Platts, W.S., and R.L. Nelson. 1985.. Impacts of Rest Rotation Grazing on Streambanks in Forested Watersheds in Idaho. North American Journal of Fisheries Management 5:547-556
- Platts, W.S., W.F. Megahan, and G.W. Minshall. 1983. Methods for Evaluating Stream, Riparian and Biotic Conditions. Ogden, UT: U.S.D.A. Forest Service, Intermountain Region. Gen. Tech. Rep. INT-138. 70 pp.
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