John Day River Fish Habitat Enhancement

1990
ANNUAL PROGRESS REPORT

by

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TABLE OF CONTENTS

	PAGE
Abstract	1
Introduction	2
Description of Project Area	2
Historical Summary	2
Methods and Materials	4
Results and Discussion	6
Implementation	7
Table 1: 1990 construction activities	8
Maintenance and Evaluation	9
Table 2: Steelhead spawning ground counts	10
Administrative	11
Interagency Coordination/Education	11
Summary and Conclusions	12
References	12
Photographs	Appendix A

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. The purpose of the project is to provide offsite mitigation for spring chinook and summer steelhead adult and juvenile losses at hydroelectric dams on the Columbia River. Activities under the first phase of the report period (January 1, 1990 through June 30, 1990, state FY 90) included landowner contacts and agreement development, personnel training, construction materials purchasing, physical habitat inventory, planning and design, and construction contract development. Activities in the second phase (July 1, 1990 through December 31, 1990, State FY 91) included physical habitat inventory, layout and implementation of instream construction work, photopoints, construction of livestock watering devices and riparian fence, budget development, annual report writing, and landowner contacts for 1990 lease procurement.

During 1990, 5 leases were signed adding 4.9 miles of stream to the program. This required the construction of 8.0 miles of riparian fence, 7 new livestock watergaps and the placing of 3,696 cubic yards of rock structures and 296 fish habitat boulders.

INTRODUCTION

The purpose of the John Day Fish Habitat Enhancement Program is to enhance the production of the indigenous wild stocks of spring chinook and summer steelhead within the basin through habitat enhancement and access improvement. The John Day River system supports the largest remaining totally wild runs of spring chinook salmon and summer steelhead in northeast Oregon. It is the overall goal of this program to preserve and enhance the unique genetic component of these stocks thereby reserving the option for future rebuilding of fish runs in other Columbia River tributaries and for optimally utilizing improved fish habitat in the John Day basin.

DESCRIPTION OF PROJECT AREA

(see figure 1)

The John Day River drains 8,010 square miles of land 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 to where it enters 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 near the town of Granite. 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 originates from Snow Mountain near the town of Burns and drains the south side of the Aldrich Mountains. It flows into the mainstem near the town of Dayville at RM 112.

HISTORICAL SUMMARY

Although several areas of Oregon and the Pacific Northwest were claimed by settlers and had begun agricultural development by the year 1862, the John Day Basin was still considered a wilderness, largely untouched by man.

Apparently the basin was once rich with riparian vegetation and beaver. The Peter Skene Ogden party, sent by the Hudson's Bay Company, frequently commented on the thick, lush vegetation they found while trapping on the John Day River. They caught 985 beaver between the months of January and July, 1826 (Binns 1967). Some of the basin's earliest settlers reported the river bottom as being smothered with cottonwoods and "thornbushes" along the streamlines and across the meadow bottoms (Oliver 1962).

Evidence of greater summer flows exists as described by William C. Aldred, the man who discovered gold in Canyon Creek. He is quoted as saying that in mid June of 1862 he was traveling with a group of men from Canyon Creek to Baker. In the upper end of the John Day Valley, above the town of Prairie City, the leader of his group almost drowned while trying to ford the river. None of the men wanted to attempt crossing because it was so deep and swift. After searching upstream and down for a suitable place to cross, they finally fell some cottonwoods across the channel and completed their crossing (Oliver 1962).

The Canyon Creek gold strike of 1862 began a series of changes within the basin. Almost immediately 5,000 new people began sluicing gravels, homesteading the creek bottoms, and bringing in livestock to feed and finance their newfound homes. Streambottoms were cleared and planted to hayground or grain, and stream courses were channelized and diverted for irrigation.

By the 1930's the drainage had gone through a major vegetative change. The "waving seas of grass" in the foothills were replaced with bitterbrush, sage, cheatgrass and juniper; and the cottonwood/ thornbrush (hawthorn) stream bottoms were replaced with cultivated hay and grain fields.

Extensive large-scale gold dredging then occurred in the 1940's and 1950s. Six miles of the mainstem and 4 l/2 miles of the Middle Fork were overturned. The North Fork, and a major tributary, Granite Creek, were dredged for a total of 28 l/2 miles during this period. The dredges operated during the summer and fall, silting the water for months at a time. They overturned spawning beds, salmon eggs and all, totally altering stream channels and surrounding vegetation. Many of these areas have never recovered.

Fish populations were also apparently greater around the turn of the century. Mr. Irving B. Hazeltine, who later became the Oregon Fish Commissions District Game Warden, reported counting 82 "silver salmon" going over a riffle in less than an hour on the mainstem near the town of John Day one September afternoon around 1905. He went on to say that a dam constructed in the early 1900's, across the lower river (RM 177) near the town of Spray, killed this run of fall migrating silvers. He says this dam was constructed with a useless fish ladder and received heavy poaching losses. The steelhead would begin going over the dam in March and the chinook in early June. All summer or fall migrations were blocked due to lower water and poaching. Fortunately this dam was washed out in 1934 and was never rebuilt. Many more smaller irrigation dams on the mainstem and tributaries have been erected during the summer and fall months since this time. These dams have severely restricted late summer adult migrations and even seasonal. juvenile migrations. (Hazeltine 1954).

These major habitat alterations have left the John Day River in its present state. Steelhead redd counts average 7.1 redds per mile with a spawner escapement of 34,000 adults. Spring chinook salmon redd counts average 10.8 redds per mile with a spawner escapement of 3000 adults. (Averages for the last 10 years).

More passage constrictions occur in the lower Columbia River: the John Day, The Dalles, and Bonneville dams all affect both downstream and upstream migrations. Recent improvements in fish passage technology have reduced these impacts however.

Some improvements to fish production potentials have occurred. These include screening and bypass facilities on all irrigation withdrawals, some livestock control, fish habitat enhancement and the removal of some fish migration barriers. Much remains to be done, however, to return the John Day to an ideal level of production, approaching its turn of the century condition. This is the challenge of our program.

Funding for this endeavor is provided by the Bonneville Power Administration under contract number DE A 179-84 BP17460. This funding provides for private land leasing, stream habitat inventory, planning and design work, contract development, budgeting, instream habitat placement, vegetation enhancement, and post construction review and maintenance. These activities are for anadromous fish habitat improvement on private lands within the John Day Basin. This program coincides with other BPA habitat programs on BLM and Forest Service lands within the basin.

Specific areas that were included in the project during FY 1990 are:
Creek Mile(CM) 13.0 to 15.4 on Canyon Creek, a mainstem tributary entering at River Mile(RM) 247 near the town of John Day.
CM 0.0 to 0.5 on Cottonwood Creek, another mains-tern tributary entering at RM 207 near the town of Dayville.
CM 23.7 to 25.7 on Long Creek, a tributary of the Middle Fork entering at RM 5.5.
See Figure 2 for map.

METHODS AND MATERIALS

All work is completed with the assistance of the Grant Soil and Water Conservation District (GSWCD) and the Soil Conservation Service (SCS) These duties include landowner contacts, the development of 15 year lease agreements, stream inventory, planning and designing habitat treatments, procuring equipment and materials, budgeting, and contract development.
Baseline physical stream measurements are taken on prospective properties. Stream width and depth are measured. Cover area, bank vegetation, and pool/riffle ratio are quantified for all reaches. "Cover" includes any submerged or overhanging material in the stream that provides hiding and resting areas for rearing juvenile salmonids.

Stream reaches planned for work in FY 1990 were surveyed to identify areas of poor instream and riparian habitat, and subsequently design projects. Engineering support personnel from GSWCD make measurements to determine fish habitat structure quantities, bank stabilization needs and locations for jetties, boulder strings, riprap, and check dams.

Jetties, rock riprap, and juniper riprap are used to stabilize actively eroding stream banks, reduce stream velocities, and provide habitat for rearing juvenile salmonids. Woody debris and boulders are placed instream to provide greater flow diversity, pools and cover for rearing juveniles. Rock wiers are constructed to raise water tables and promote riparian vegetation growth. They also provide pools, spawning gravel, and cover for rearing juveniles.

Fences are constructed to exclude livestock and allow 15 years of recovery in the riparian area. (see Appendix A for photographs).

Spring developments are constructed to mitigate lost livestock watering opportunities and to achieve better animal distribution and forage use.

Livestock crossings are constructed to allow movement between adjoining pastures and provide access to water.

Fish migration barriers are removed or modified to allow year-round access to more areas of the basin for adult and juvenile salmonids.

A riparian grass seed mix is planted by GSWCD personnel along streamlines and areas disturbed by heavy equipment and construction activities. This mix, along with the application rate, is determined by SCS personnel. The mix includes hard fescue (Festuca ovina duriuscula) and pubescent wheatgrass (Agropvron trichophorum), both sod-forming species that develop a good root structure; ladak alfalfa (Medicago falcata ladak), white dutch clover (Trifolium repens), and sweet clover (Melilotus officinalis), which are nitrogen-fixing species that provide rapid establishment of good cover and high quality wildlife forage; and tall wheatgrass (Agropyron elongatum), which produces large amounts of foliage and root mass for soil stabilization, bird nesting cover, and deer fawning cover.

RESULTS AND DISCUSSIONS

Field Activities

Prework

Last year project personnel signed five riparian leases, allowing treatment of 4.9 miles of stream within the basin during 1990. One lease was signed on the Rawlins Land and Cattle Co. property allowing work on 2.4 miles of Canyon Creek. Two leases were signed on the Pete Hettinga and Jim Bahrenburg property allowing us to work on 0.5 mile of Cottonwood Creek. Two leases were signed on the Kent Carter and Richard Courchesne properties allowing work on 2.0 miles of Long Creek.

In addition to the five signed leases, the GSWCD worked closely with nine other landowners throughout the year. These lease negotiations included telephone calls and meetings with:

- the Nature Conservancy regarding their Middle Fork property.
- three Long Creek ranchers who felt that corridor fences would not be compatible with their current ranching practices.
- a landowner on Cottonwood Creek who was interested but would not sign a lease before the deadline.
- four landowners on Canyon Creek who said they thought it would work on their properties very well. All signed leases for 1991.

Sixteen other landowners have came to us expressing an interest in the program, leases were not persued with them due to the lack of funds for 1991. Uncertainty about funding for future project implementation, and a reluctance from the BPA to commit to funding long term maintenance on existing and future projects, has placed the future of the John Day project in doubt.

Mapping, design and layout of construction work was completed and all instream work permits were applied for. Permits for Canyon and Cottonwood Creeks were obtained easily, but Long Creek required a cultural resources clearance This required the hiring of an archaelogist to survey the stream and identify any Indian artifacts located on the work site. Fortunately, Rick Stoots of the BPA arranged for this survey using an archaelogist from Washington State University. He also took care of the budget modifications that this required. Only three artifacts were found on the site and clearance was eventually granted after a 3 month wait.

A 5 year lease agreement was negotiated for a fence materials storage yard. Project staff constructed a 6 ft. high fence around the lot. The landowner bulldozed a truck approach ramp and turn around area on

the site to facilitate loading and unloading of fence materials in the future.

Construction materials were purchased including 8 miles of fence, 8 culverts for equipment access, 50 hog wire panels for livestock crossings and 1500 feet of tiedown cable. These were stored at the yard until they were hauled to the work sites by contractors.

A walk-through habitat inventory was performed on all stream reaches. Survey results showed a lack of riparian vegetation and eroding banks as being the most prevalent stream problems present here.

Contract preparation for instream work was then completed by GSWCD for all three streams. This preparation included determining rock quantities, writing contract specifications, mapping project sites and preparing work sites. These contracts were then announced and awarded by ODFW's Engineering staff.

Contracts were written for fence construction on each stream and then announced and awarded by ODFW Engineering.

Implementation

Instream structure construction, woody debris and boulder placement, began on August 13th and continued until September 11th. A total of 4.9 miles of stream were treated.

Construction was completed during August on 0.98 miles of hi-tensile smoothwire fence which protected 0.5 miles of Cottonwood Creek.

Construction was completed on 3.5 miles of hi-tensile and 0.2 miles of barbed wire fence which protected 2.4 miles of Canyon Creek

Construction was completed on 2.8 miles of hi-tensile and 0.5 mile of barbed wire fence which protected 2.0 miles of Long Creek.

Project personnel constructed a spring development on Long Creek with the help of the Screen progam's backhoe.

Project personnel removed 1.1 miles of obsolete fence on Long Creek.

These implementation activities are summarized in Table 1.

Table 1. Work completed in 1990, by the John Day Basin Private Lands Habitat Improvement Project

Stream	Canyon Creek	Cottonwood Creek	Long Creek		Totals
Landowner	Rawlins	Hettinga/ Bahrenburg	Courchesne	Carter	
Stream length	2.4	8.5	0.8	1.2	4.9 mi
Fence construction	3.7	1.0	1.6	1.7	8.0 mi
Rock Wiers	9	20	11	8	48
Trees cabled	3	0	15	14	32
Boulders	156	0	80	60	296
Stream deflectors	9	2	16	11	38
Rock riprap (ft.)	235	41	130	125	531 ft
Livestock crossings	4	4	2	2	12
Spring developments	1	0	1	0	2
Culvert placement	1	1	5	1	8

Maintenance and Evaluation

Severe windstorms during February blew down several trees over project fences. The biologist and GSWCD engineer spent 4 days apiece cleaning up after this.

All project fences, rock structures and livestock watering devices were again surveyed to assess repair and modification needs in June and in December. No failures were found in any project rock structures or livestock watering devices. Several more fence repair needs were found and corrected by project personnel.

Most fence maintenance problems were the result of beavers falling trees over our fences. We have noticed a sharp increase in the amount of beaver activity within our exclosures in the last two years. Many young willow and cottonwood are now 2 to 4 feet high and the beavers have begun to devour them. Several landowners have mentioned that the beavers have moved out of our riparian areas and are now causing problems on irrigation ditches and pasture fences. A few have blamed us for creating this problem saying that they never had this much activity on their property before we fenced the streams. We have told these landowners that we do not want to eliminate the beaver because they are doing a lot of good along with the bad. So far we have not had any serious confrontations over this situation but it is possible in the future. We appear to have attracted a large influx of beaver into the section of Long Creek that we treated this year. As soon as we constructed our wiers and left with the machinery some beavers built dams on top of the wiers. They increased the water height by 3 feet on one dam and flooded the landowners field. As the fall progressed more and more dams showed up until we now have one on every weir we constructed this year. We seem to have gathered several individuals from the surrounding area and concentrated them in our leased area. We will be watching to see if they impact the vegetative recovery in this area.

Steelhead spawning ground surveys were conducted in April and May. Low flows prevailed throughout the period making conditions very good for viewing. On Fox Creek we counted 3 redds in our index area and found 6 other steelhead blocked by beaver dams below there. On Deer Creek we counted 3 redds in our index area and found another steelhead blocked by a dam. On Fivemile Creek we counted 6 steelhead redds above our passage project and none below it. Also on Fivemile Creek, 4 of the redds were made in riffles created by Umatilla National Forest habitat projects in 1988. These counts required l/2 month of personnel time. Redd counts for the previous 3 years are presented in Table 2.

Table 2. Three year Summary of Steelhead Redd counts within John Day Project Areas.

Stream	Miles Surveyed	Project Type	Redds Counted May 1988	May 1989	May 1990
Fox Creek	3 mi	Habitat Improvement	6	2	3
Deer Creek	2 mi	1986 Passage Barrier Removal and Habitat Improvement	5 above 3 below	2 above 0 below	0 above 3 below
Fivemile Creek	2.5 mi	August 1987 Passage Barrier Removal	4 above 3 below	washed out	6 above 0 below

Bird surveys were performed on Fox Creek and the mainstem John Day River during May. Twenty three different species of birds were counted this year. The biggest increase occurred in tree swallow numbers, many of which are using the nest boxes we provided.

Photopoint monitoring included taking, developing and cataloging 137 pictures of our previous project sites and establishing 15 photopoints on the new areas. Photos were taken at permanently marked locations in the spring and again in the fall and required 3 months of personnel time to complete. Photopoints are used to document riparian recovery, and to help prospective landowners visualize the type of improvements they can expect on their property. Some of them have been included in Appendix A showing recovery in different areas.

Administrative

Mark Lacy began the year as the project technician but he accepted a new job in February. His position remained vacant until June when we hired Larry Brown to replace him.

Monthly progress reports and the 1989 annual report for this habitat improvement project were submitted to BPA during 1990.

Preparation of the 1991\92 work statement and budget began in November and continued through the end of the reporting period, requiring considerable field time and preparation to quantify all work for next year.

Interanencv Coordination/Education

A cooperative agreement was developed between ODFW, the Grant County Soil and Water Conservation District and the Soil Conservation Service to outline each agencies duties for FY 1990. Funding included 12 months of engineering support, 4 months of technician support and l/2 month of District Conservationist's time.

Monthly Grant Soil and Water Conservation District meetings were attended to keep board members informed of the progress of the BPA habitat project.

Consultation and field review was provided to personnel from the Malheur National Forest on their proposed instream construction project on the Middle Fork John Day River.

Project personnel attended a review of the Malheur, Wallowa Whitman and Umatilla National Forest's fish habitat improvements that were constructed within the John Day basin over the last 5 years. A critique was given and several comments were heard that could he incorporated into our program.

A tour of the mainstem John Day treatment area was given to the fisheries staff of the Malheur National Forest to show them our improvement techniques for large rivers. This was done to aid them in designing and installing fish habitat structures in the Middle Fork of the John Day River next year.

A tour of the 1990 project implementation areas was conducted in April for Rick Stoots and Bob Austin. Information was presented at the tour on types and benefits of fencing and instream structures implemented on private lands in the John Day basin.

The biologist gave a presentation to a grade school class on the basin's fishery resources.

S'UMMARY AND CONCLUSIONS

During 1990, 5 leases were signed adding 4.9 miles of stream to the program. This required the construction of 8.0 miles of riparian fence, 7 livestock watergaps, 296 fish habitat boulders and placing 3,696 cubic yards of rock for structures.

We experienced some budget shortfalls this year. We were short on contractual services dollars for our instream and fence construction. We cut back on our rock quantities on Canyon Creek to make up the difference. This unfinished work will have to be completed next year. We had to transfer additional funds into our fence construction budget to make up that shortfall.

There was a new state law passed this year that required us to hire only licensed contractors. Local contractors found it would cost around $2,000 for this license and many did not bid. The contractors who had these licenses boosted their prices and we were stuck with either paying them or cancelling construction. This was largely responsible for our budget shortfall.

Instream construction began later than desired because the awarded contractor was required to fight forest fires with his equipment. Once we got started though construction went very fast.

Due to contract delays and the resulting time overlap when implementing contracts, field personnel were required to work numerous hours of overtime to complete implementation activities.

As a result, most fall maintenance duties did not get accomplished in 1990. All summer and early fall maintenance activities had to be abandoned in order to complete construction and lease negotiation activities. As the average age of completed projects increases, maintenance needs will also increase. Without commitment from the BPA to provide adequate maintenance funding, it may prove impossible in future years to protect the dollars already invested in John Day habitat projects.

REFERENCES

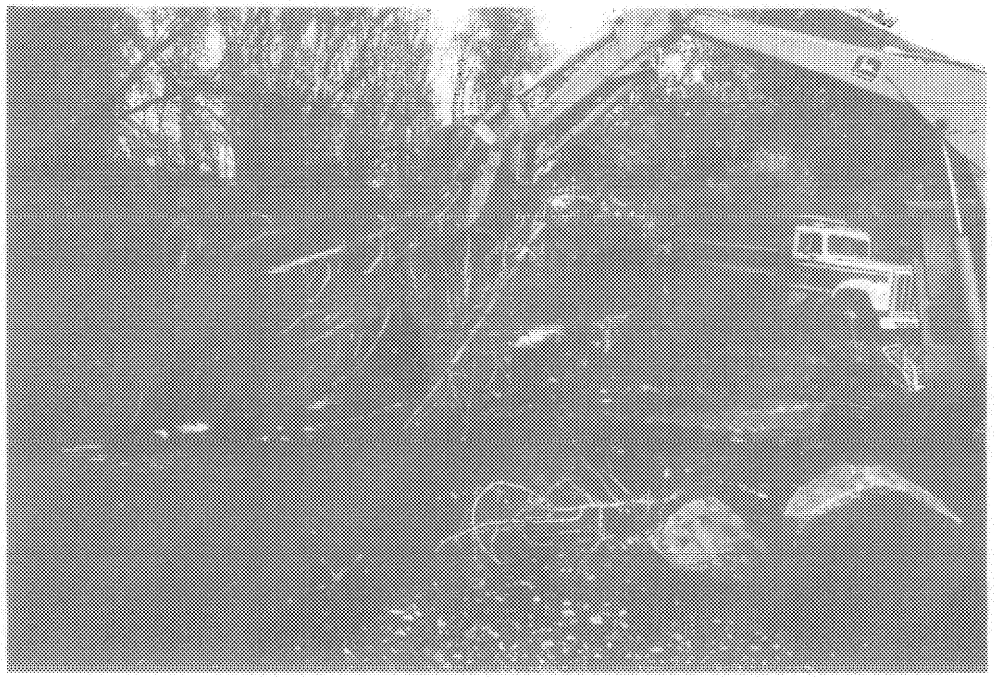
Binns, A., 1967, Peter Skene Ogden: fur trader: Portland, Oregon, Binfords and Mort, 363 p.

Hazeltine, I.B., 1954, Letter to Mr. Chester R. Mattson Oregon State Fish Commission dated March 20, 1952.

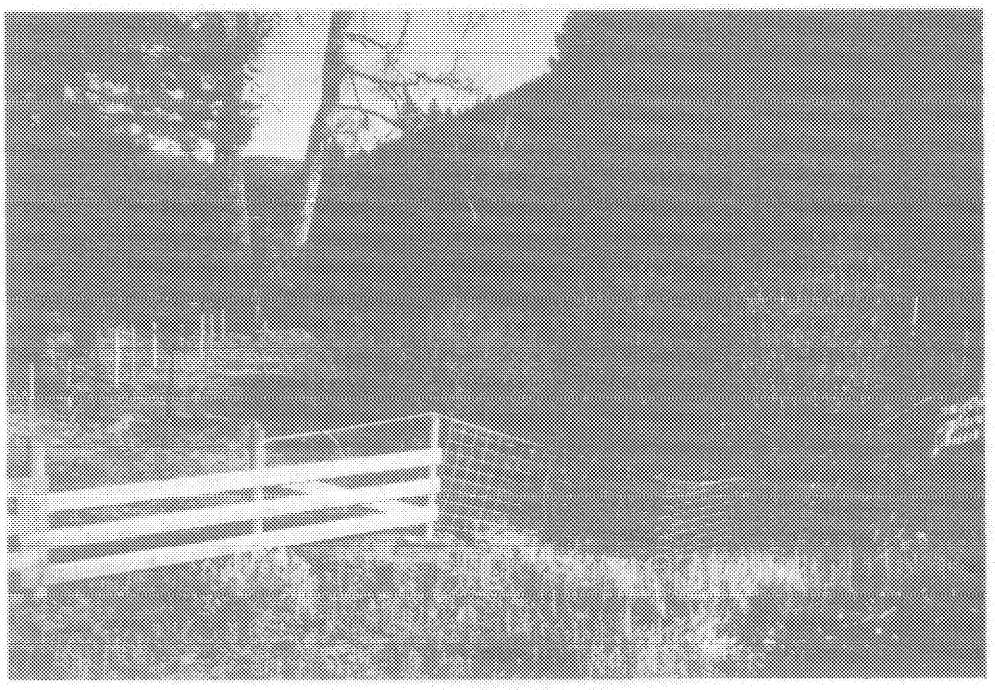
Oliver, H., 1962, Gold and Cattle Country: Portland, Oregon, Binfords and Mort, 312 p.

Mainstem John Day River 1990

The top photo shows a jetty being constructed by a track hoe excavator. The bottom photo shows a track hoe placing woody debris, boulders waiting to be placed, and a dump truck used to haul rock and boulders. This is the typical type of equipment we use for our instream rock contracts.



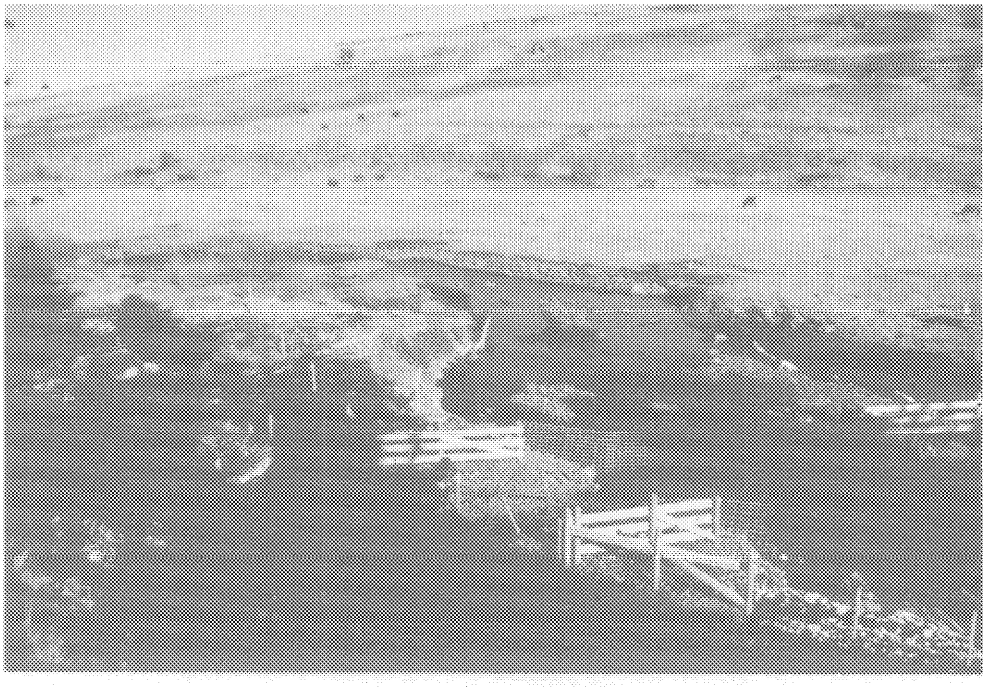
Mainstem John Day River 1990



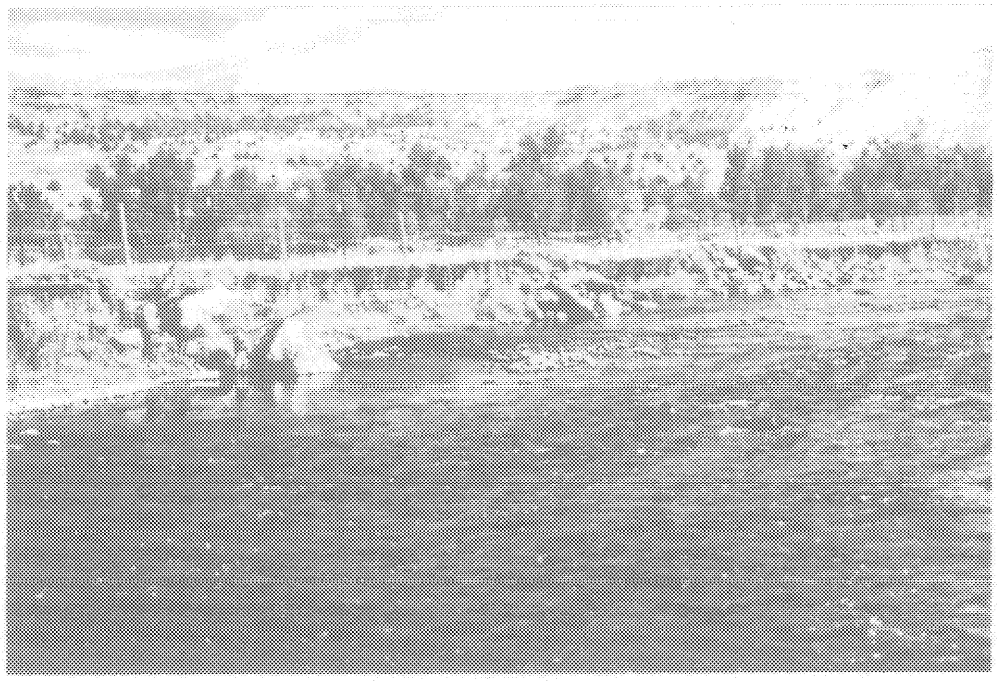
Canyon Creek Rawlins property 1990

The top photo shows an example of the typical type of water crossing built during 1990, using hog wire panels and cable.

The bottom photo shows an example of a livestock crossing that will also be used as an equipment crossing, as well as a water site for livestock. With this design livestock can be watered from either side, or both sides of the creek.



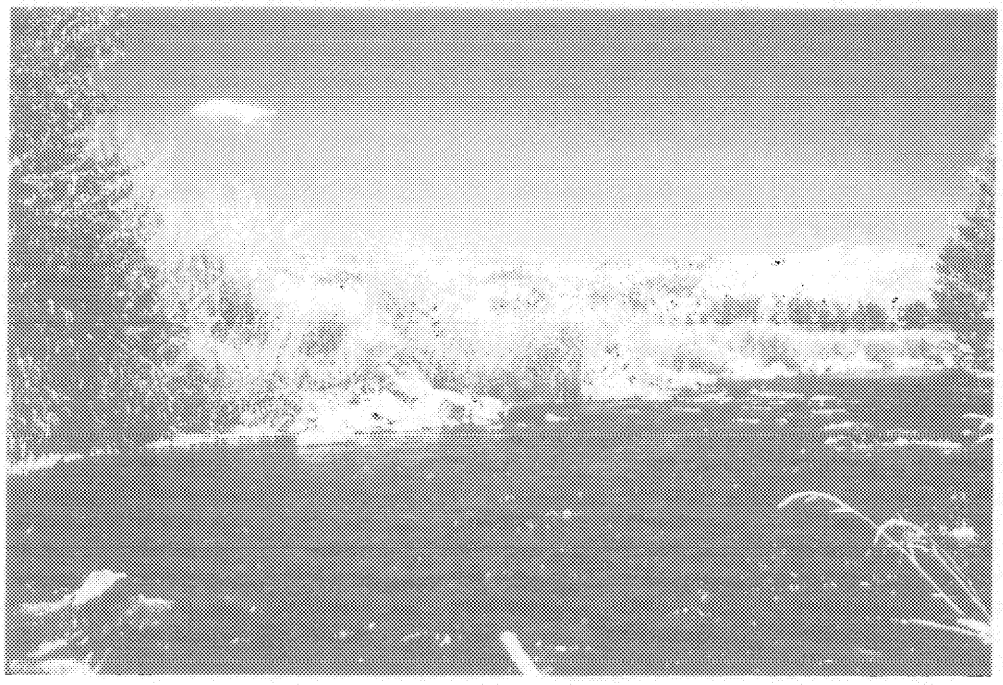
Long Creek Carter property 1990



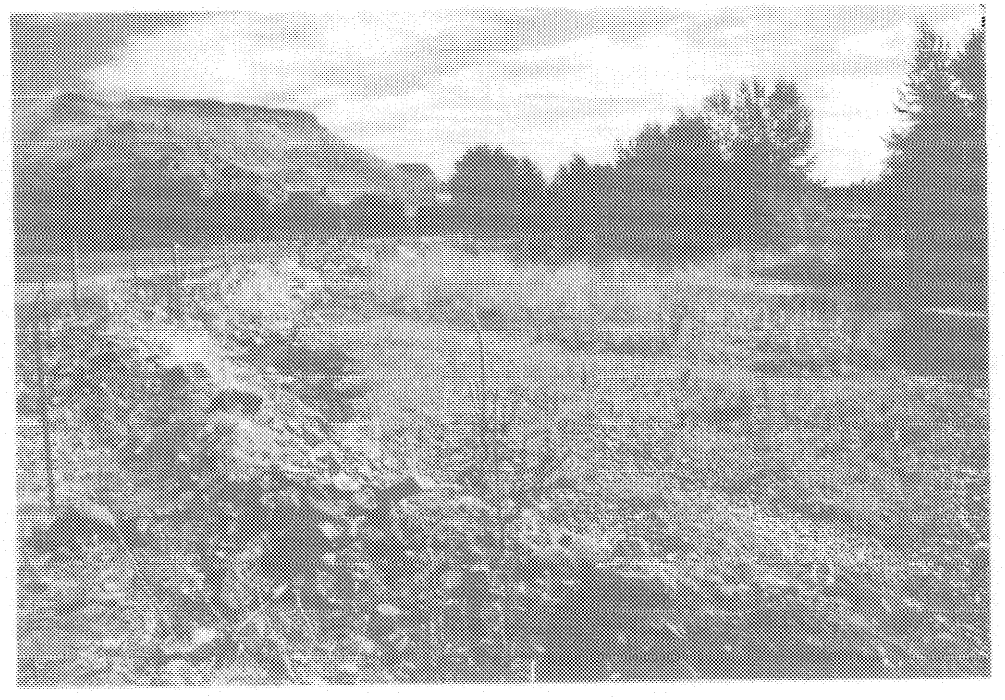
Mainstem John Day River Donna Holmstrom Property 1985

Treeless riverbanks are the reason for a lot of problems effecting streams. With no shade, the water temperature can become lethal, with no root masses the banks fall apart, and with no woody debris, you get very little fish habitat.

This area demonstrates how to grow vegetation on a 4' verticle bank. We used jetties to collect sediment and fence to exclude livestock. After 4 years we have young cottonwoods 8'-12' tall and growing at an astonishing rate.

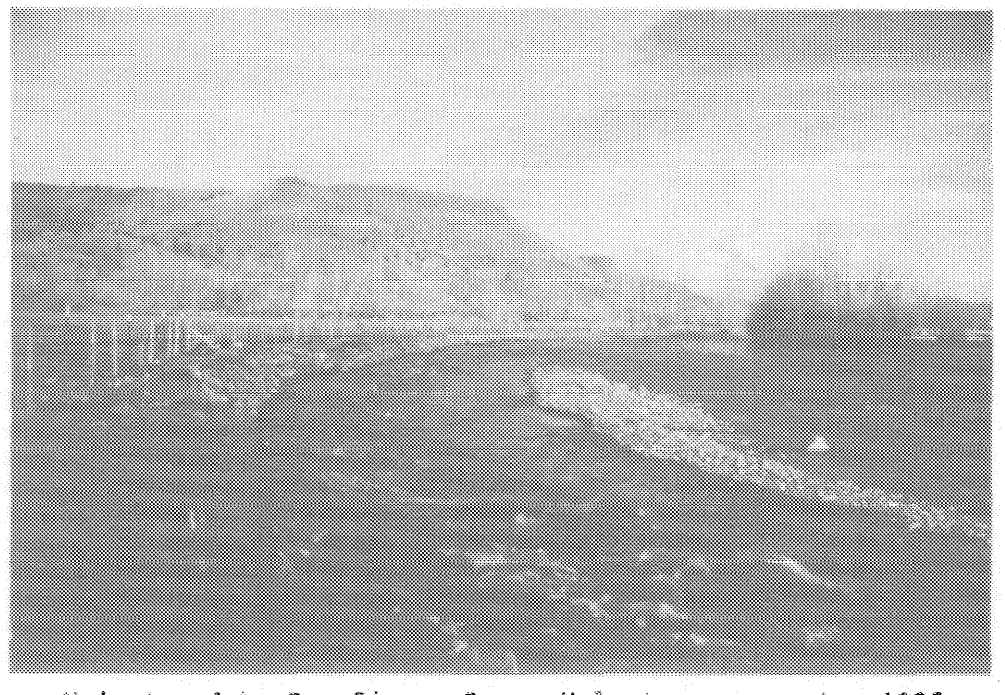


Mainstem John Day River Donna Holmstrom Property 1989

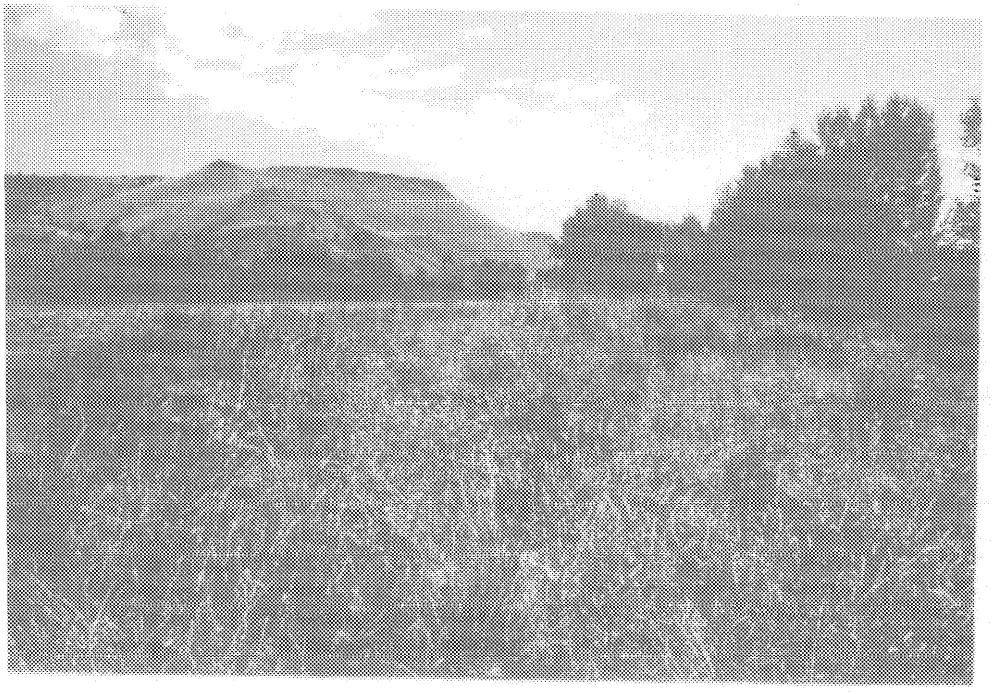


Mainstem John Day River Donna Holmstrom property 1985

The top photo shows a large gravel bar with little vegetation. Stream channel is wide and shallow, providing little fish habitat. It also shows landowners attempts to prevent erosion on corner. Bottom photo shows new riparian exclosure fence and rip-raped bank. New rearing channel to left, river channel to right. Top photo, next page, shows results after 4 years. Both main channel and side channel are stable and provide good fish habitat. Neither side channel or main channel are visiable from the original photopoint due to vegetation growth.



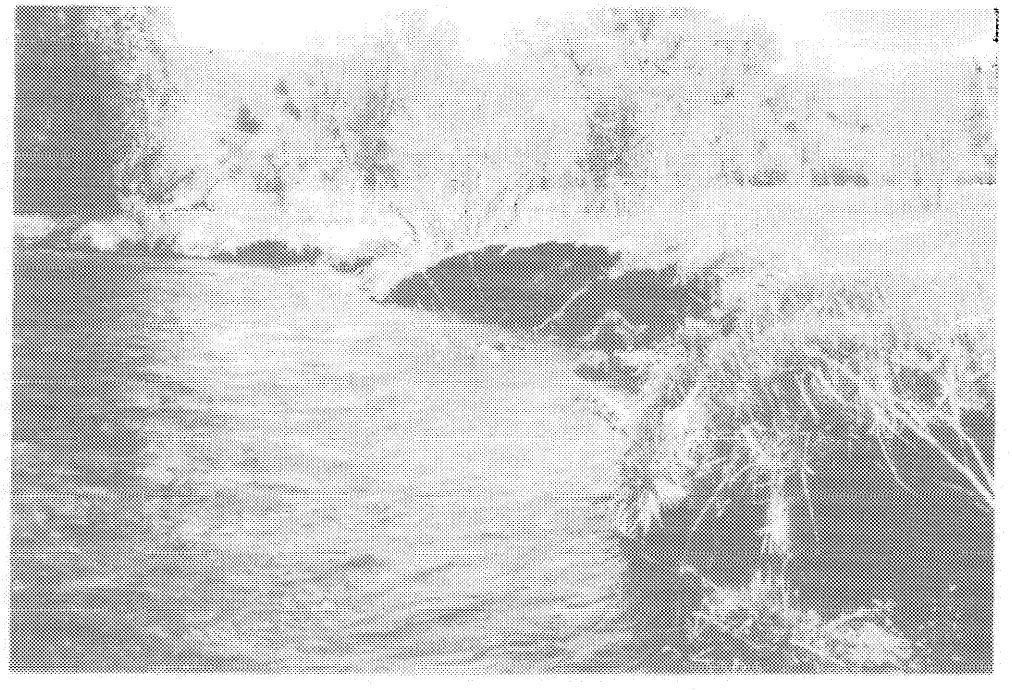
Mainstem John Day River Donna Holmstrom property 1986



Mainstem John Day River Donna Holmstrom property 1990

Top photo shows the results of 4 years of livestock exclusion and erosion control structures on the mainstem John Day River (see previous page)

The bottom photo shows a cut bank eroded during spring flows within Spring Chinook spawning grounds. This sediment later settles upon the salmon redds and smothers the eggs (see next page for recovery).



Mainstem John Day River Alfred Coombs property 1985

Mainstem John Day River Alfred Coombs property 1987

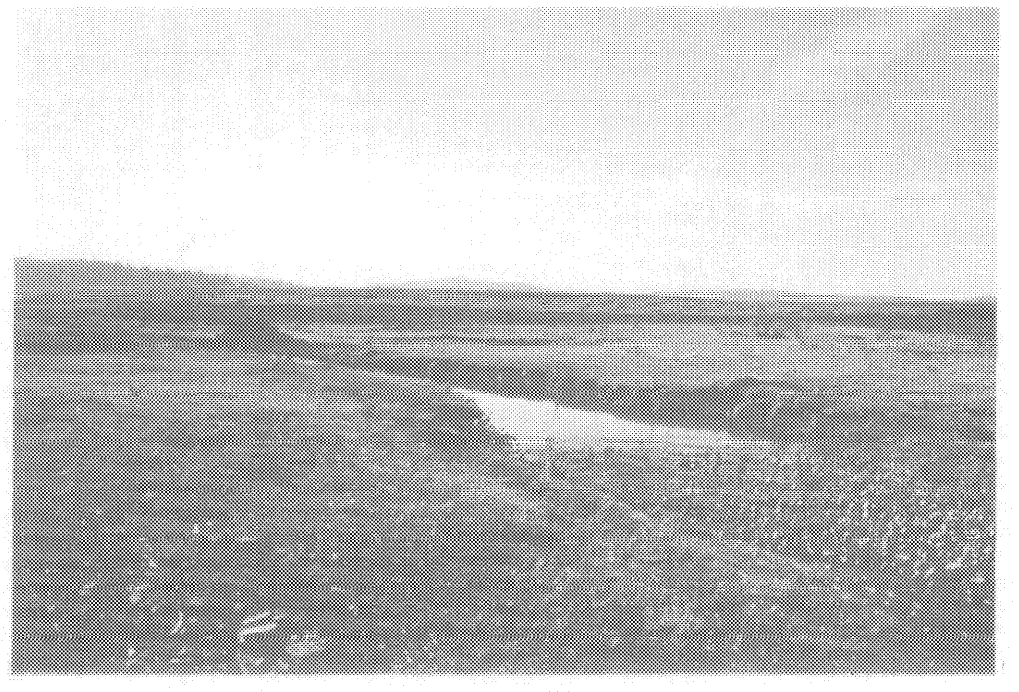
Erosion control structures and livestock exclosure fence were used to end the cutting, provide deep pools, and create more fish rearing habitat. Vegetation is recovering quickly, this will eventually shade the river, provide organic input, and provide bank stability. Note drastic increase in vegetation between 1987 (top) and 1990 (bottom).

Mainstem John Day River Alfred Coombs property 1990

Mainstem John Day River Alfred Coombs Property 1985

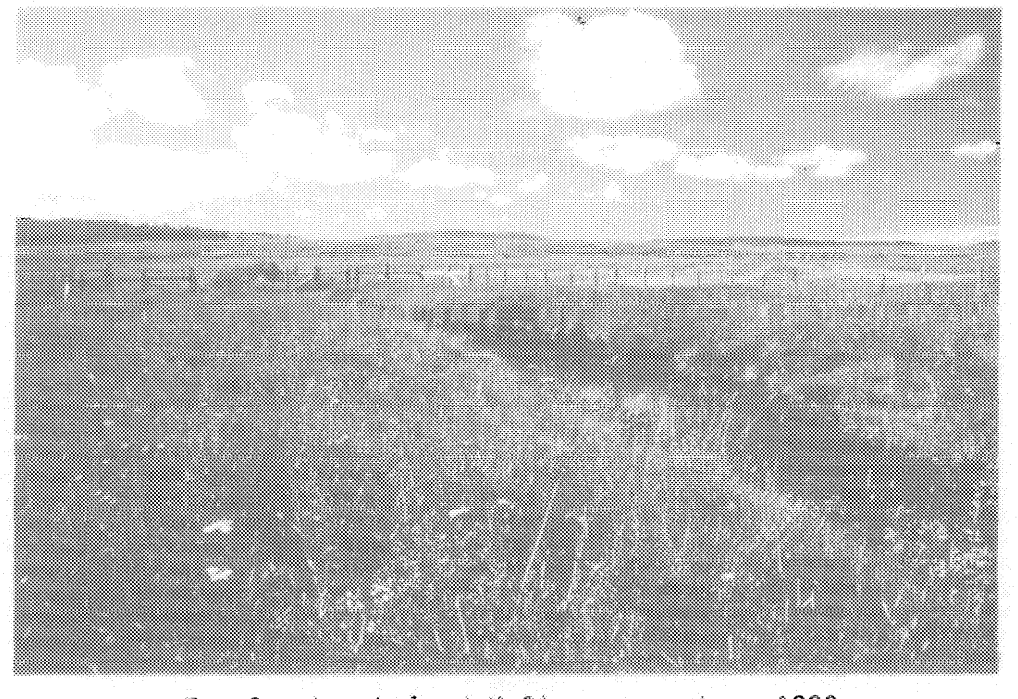
The top photo shows a wide shallow stream with eroding banks and only a small amount of fish cover. The bottom photo shows the results of 5 years of recovery after the installation of jetties, boulders, and livestock exclosure fence. The banks have stopped eroding, the channel has narrowed and deepened. Fish cover has greatly increased, the vegetetation has boomed without livestock pressure. Note the small woody vegetation in the foreground that will soon provide shade and fish habitat to the stream.

Mainstem John Day River Alfred Coombs Property 1990

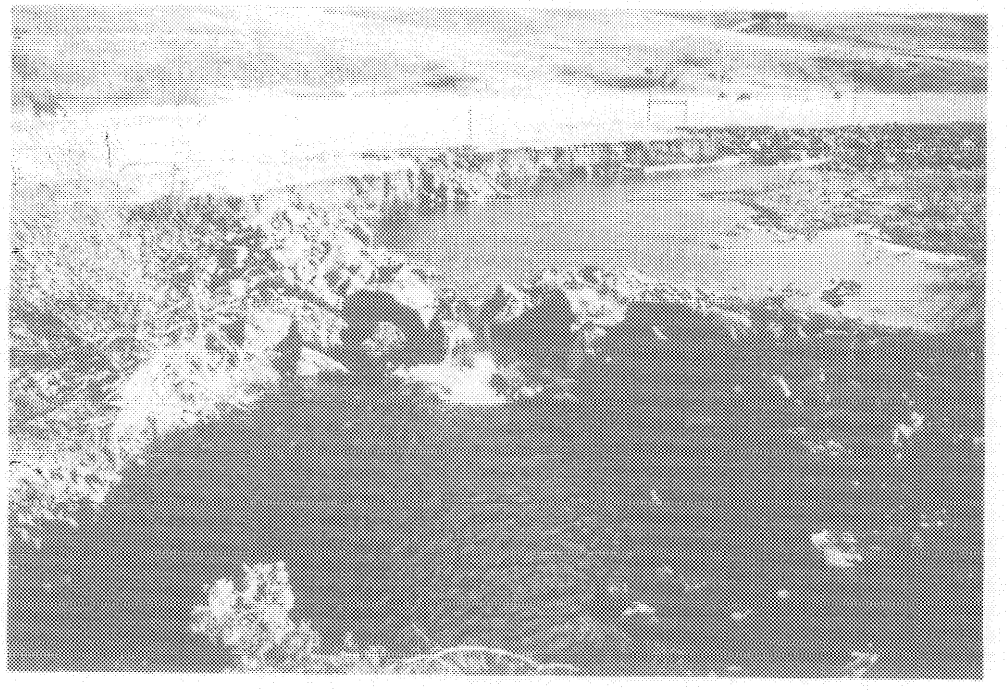


Fox Creek Leland McGirr property 1987

Cattle grazing left this stream with a wide shallow profile that results in extreme water temperatures, poor fish habitat, and very little bank storage of water. After 2 years of livestock exclusion by riparian corridor fence vegetation has recovered, resulting in a deeper, narrower channel, increased fish habitat, and more desireable water temperatures, as well as increased bank water storage and increased bank stability.



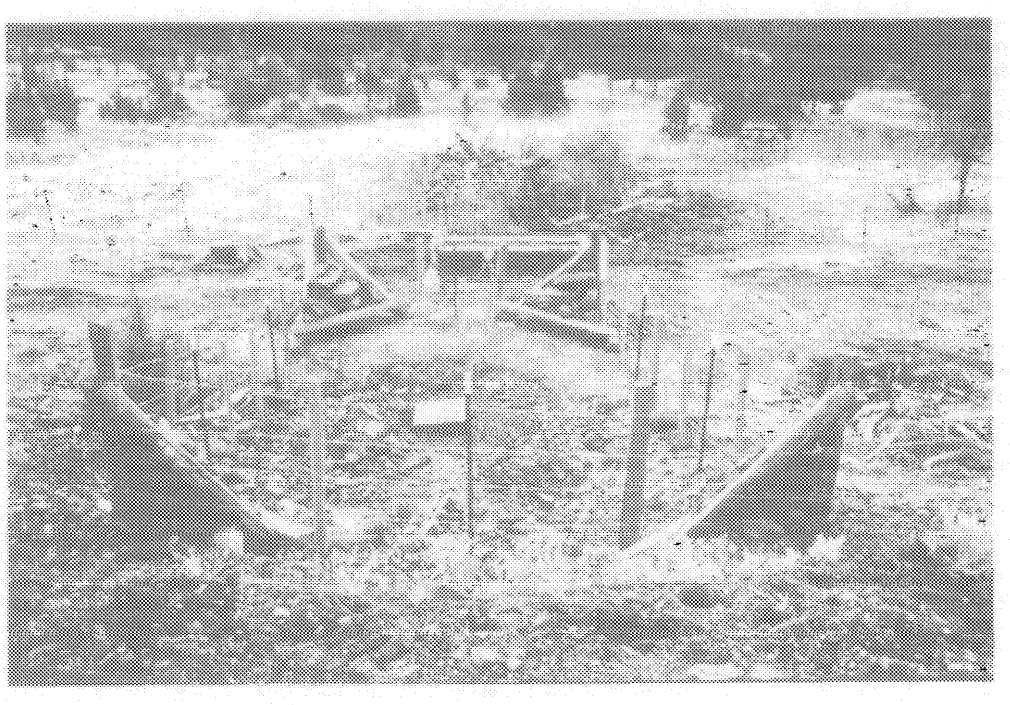
Fox Creek Leland McGirr property 1989



Long Creek Carter property 1990

The top photo shows a rock weir shortly after completion. Beavers arrived within weeks and built their dam on top, more than doubling the height of the weir. The beavers built dams on top of most of our weirs throughout this section of stream

The bottom photo shows an example of a spring development used as an off-creek livestock watering site. Sites like these reduce livestock pressure on riparian areas as well as encourage livestock to better utilize upland forage.

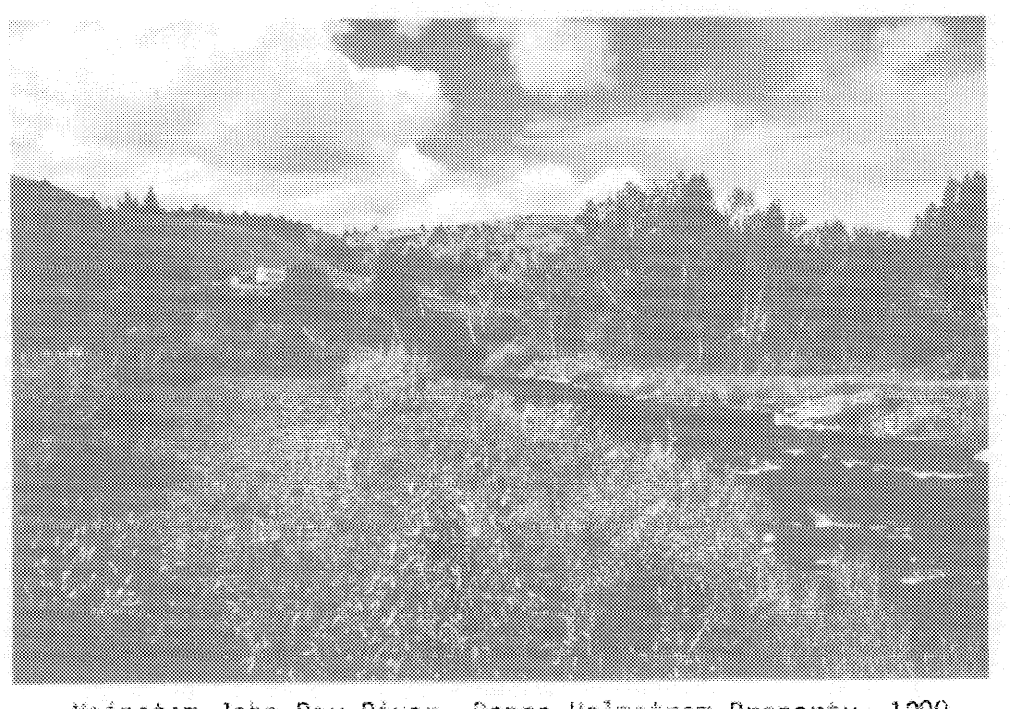


Fox Creek Johns property 1988

Mainstem John Day River Donna Holmstrom property 1985

The top photo shows wide, flat, featureless section of river with very little riparian vegetation. The small jetty was constructed by the landowner. Very little fish habitat exists.

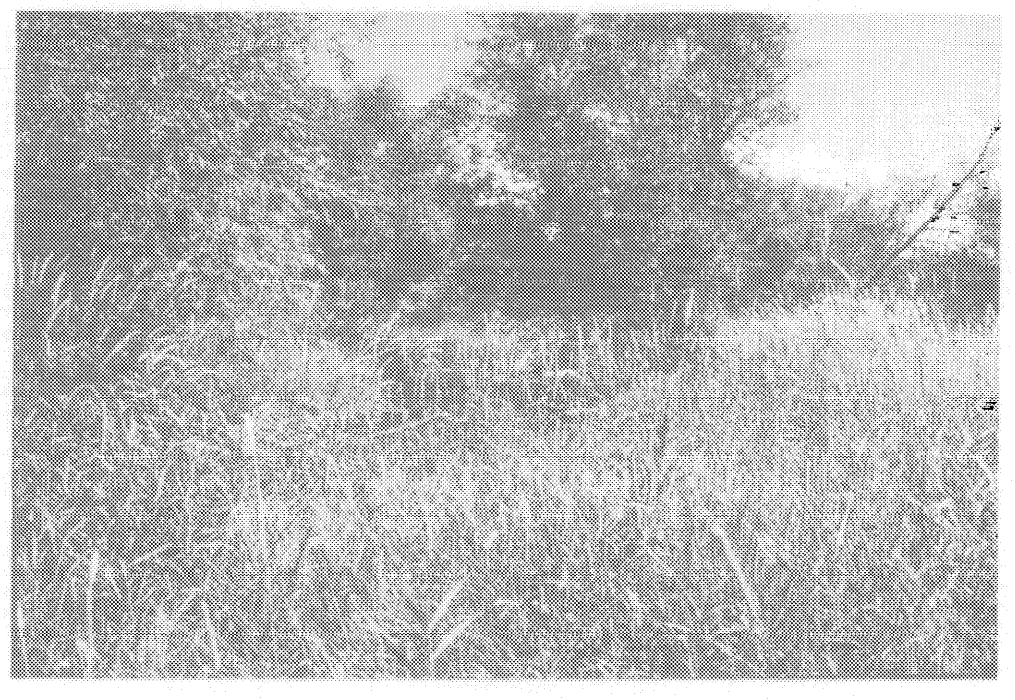
The bottom photo shows recovery after 5 years of livestock exclusion, installation of the proper number and size of jetties and the introduction of boulders. The stream channel has narrowed and deepened. Fish habitat has been drastically increased, and bank stabilization has increased. Woody and grassy stream vegetation is increasing at a dramatic rate.



Mainstem John Day River Donna Holmstrom Property 1990

Mainstem John Day River Stefansky property 1985

Livestock exclusion and instream structures have deepened and narrowed the channel, increased stream side vegetation. This type of activity improves both water conditions and bank stability. Improvements made at a site such as this will also help improve water conditions throughout the system below this point.

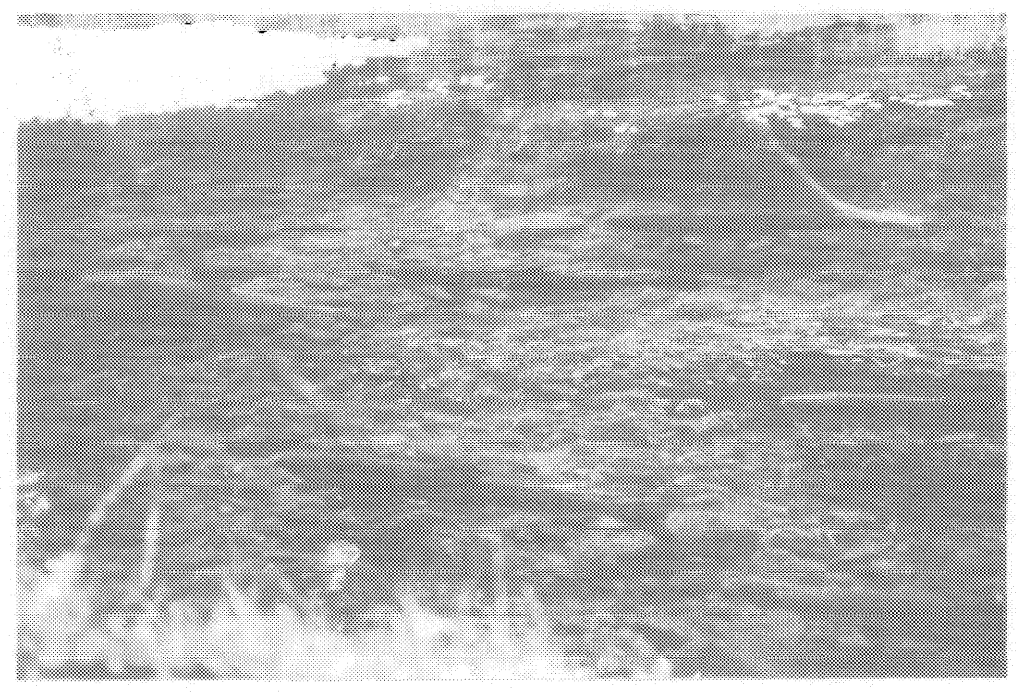


Mainstem John Day River Stefansky property 1989

Mainstem John Day River Stefansky property 1990

The top photo was taken from the same location as the two on the previous page. In just 5 years, the stream is no longer visiable from the original photopoint due to vegetation growth.

The goal of this project is basically to increase and improve the habitat available for spawning adults and rearing juvenile salmon and steelhead. Adult Spring Chinook migrating upstream toward spawning grounds on the Middle Fork John Day River.



Middle Fork John Day River 1988