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John Day River Subbasin Fish Habitat Enhancement Project

1992 ANNUAL REPORT

by

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Funded by
U.S. Department of Energy
Bonneville Power Administration
Division of Fish and Wildlife

Contract No. DE-A179-84 B017460
Project No. 84-21

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January 1993

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ABSTRACT

During 1992, a lease was signed adding 3.0 miles of stream to the program. Protection for this stream reach required the construction of 8.4 miles of riparian fence, 7 livestock water crossings and 6 spring developments. Fish habitat improvement included 3 log weirs for adult steelhead holding. Four hundred and twenty feet of increased stream length was obtained by repairing 2 oxbows. One hundred and forty aspen cuttings were taken and will be propagated 2 years and then planted on Mountain creek and Long creek.

INTRODUCTION

This project, initiated July 1, 1984, under Bonneville Power Administration (BPA) contract number DE A179-84 BP17460 allows for 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 John Day Fish Habitat Enhancement Program is to enhance production of indigenous wild stocks of spring Chinook and summer steelhead within the subbasin through habitat enhancement and access improvement. The John Day River system supports the largest remaining wild runs of spring Chinook salmon and summer steelhead in northeast Oregon.

DESCRIPTION OF PROJECT AREA

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 subbasin 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 its confluence with the Columbia River just above the John Day Dam. The largest tributary, the North Fork, enters the mainstem John Day River at Kimberly (RN 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 212.

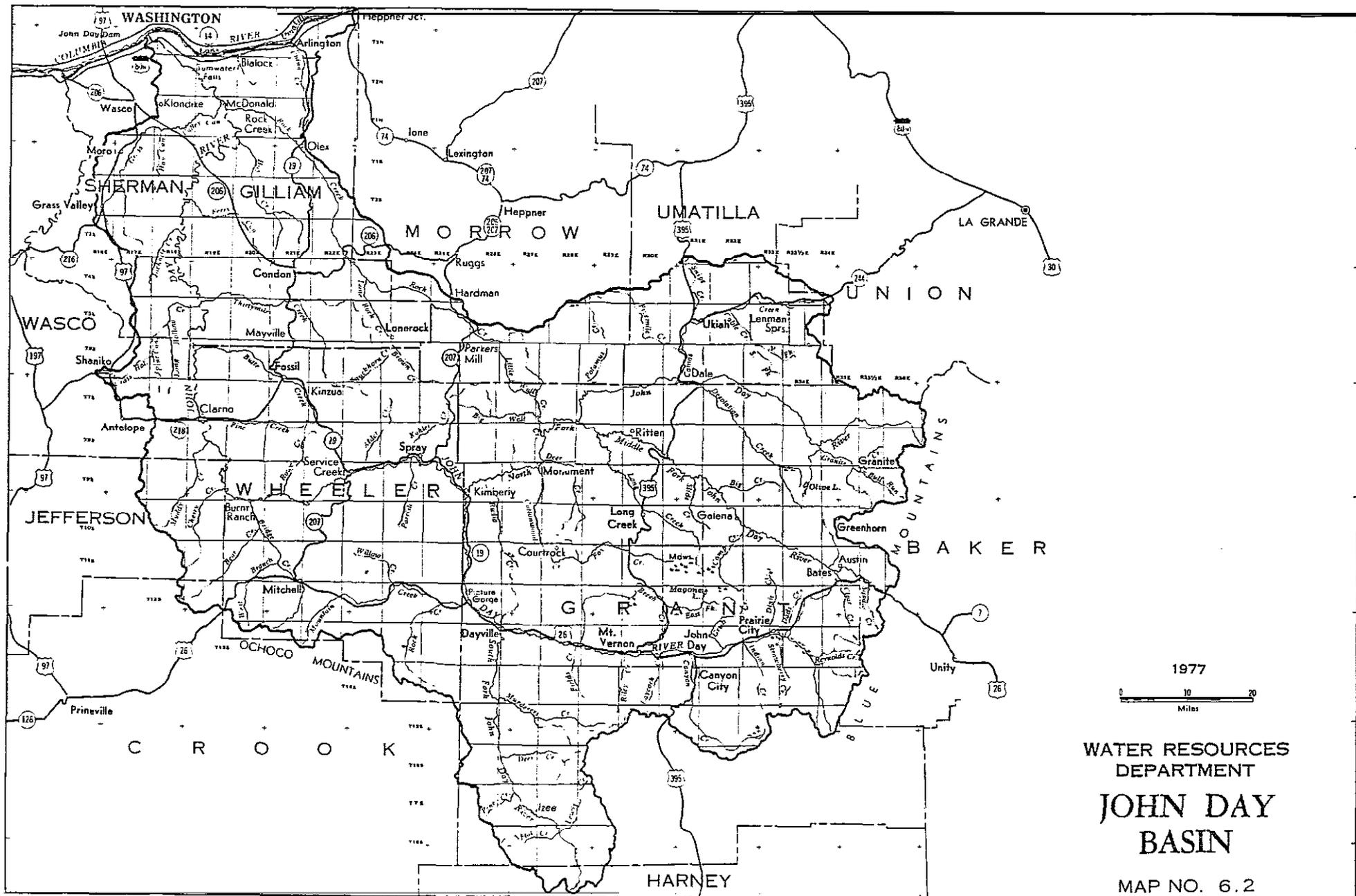


Figure 1

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 subbasin 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 Bay Company, frequently commented on the thick, lush vegetation they found while trapping on the John Bay 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 Bay 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. Stream bottoms were cleared and planted to hay ground or grain, and stream courses were channelized and diverted for irrigation.

By the 1930s 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 1940s and 1950s. Six miles of the mainstem and $4\frac{1}{2}$ miles of the Middle Fork were overturned. The North Fork, and a major tributary, Granite Creek, were dredged for a total of $28\frac{1}{2}$ 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 Bay one September afternoon around 1905. He went on to say that a dam constructed in the early 1900s, across the lower river (RN 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. These are 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.

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 1992 are: Creek Mile (CM) 23.8 to 27.8 on Mountain Creek, a mainstem tributary entering at River Mile (RM) 204.5 near Picture Gorge, and RR 51.0 to 55.7 on the Middle Fork of the John Day River.

METHODS AND MATERIALS

The goal of this program is to optimize spring Chinook and summer steelhead smolt production within the John Day River Basin using habitat enhancement measures. All work is completed with the assistance of the Grant soil and Water Conservation District (GSWCD) and the Soil Conservation Service (SCS). To accomplish this goal, work progresses in three phases:

1. planning and preparation (prework),
2. implementation, and
3. maintenance and evaluation.

PREWORK

Prior to actual project implementation the following activities are to be conducted:

Project Planning

Project planning includes design and layout of all work to be done onsite landowner coordination, development of contracts and contract specifications, and obtaining the necessary work permits.

Project Preparation

Prior to signing leases or construction contracts, all lease boundaries and work sites must be identified, staked, and agreed upon by the landowner and/or contractor. Work sites may include easements or right-of-ways, fences, livestock crossings, instream structures, removal of fish migration barriers, offsite water developments, planting, and miscellaneous lease of construction related areas.

Riparian Lease Development and Procurement

Riparian lease development and procurement includes meeting with landowners and/or their legal representatives specifically for the purpose of developing an acceptable lease text, and/or signing lease documents.

IMPLEMENTATION

Implementation entails the actual on-the-ground work phase of the program and may include any or all of the following:

Instream structures

During late summer or fall when stream flows are lowest, structures will be installed in streams at locations preselected by fisheries biologists and/or hydrologists. Structures of various types will be used to provide optimum pool/riffle ratios, raise the riparian water tables, collect spawning gravels, and increase the amount of large woody debris, thereby increasing quantity and quality of rearing and spawning habitats. Rock jetties and deflectors will be the primary

structures used to stabilize stream banks. Boulders will be used to create small rearing pools and hiding cover.

Planting

During the early spring, shrub and/or tree species may be planted at preselected locations along streams within project areas. Since high summer water temperature appears to be a major limiting factor, plantings will be made to provide stream shade, thereby reducing summer water temperatures and increasing salmonid utilization of streams. The maximum shade attainable for most streams in project areas is estimated at about 80 percent. The objective of this phase of the program is to reach a minimum of 70 percent shade and have water temperatures of no more than 68 degrees Fahrenheit within 20 years of project implementation.

During the fall, areas disturbed while doing implementation activities will be seeded to stabilize soils and discourage weed growth.

Fencing

Destruction of streamside vegetation by domestic livestock has been a major problem within project areas. To provide protection from livestock and thereby promote rapid recovery of existing and planted vegetation, fences will be constructed along riparian zones within project areas.

Photopoint Establishment

Photopoint establishment includes locating and placing permanent markers at sites from which photographs can be taken at regular intervals, thereby depicting riparian changes through time. Also associated with photopoint establishment is the development of a photopoint notebook for each project area.

Offsite Water Developments

In an attempt to reduce the number of watering gaps in riparian fences (thereby reducing fence construction and maintenance costs), and to encourage livestock utilization of vegetation away from riparian areas, offsite water sources will be developed.

Habitat Monitoring Transects

Within selected project areas permanent habitat monitoring transects will be established. Specific measurements will then be taken along each transect. These measurements will be repeated at regular intervals and compared with original measurements as a means of quantitatively measuring environmental changes through time.

Miscellaneous Field Activities

Cooperator sign boards denoting riparian enhancement projects as cooperative efforts between BPA, ODFW and private landowners will be installed at high visibility sites along completed riparian enhancement project areas.

MAINTENANCE AND EVALUATION

Postwork entails all maintenance and evaluation of work which has been done within project areas. This phase of the program will usually begin the year following completion of implementation and will continue for several years. Typical postwork activities may include:

Project Maintenance

Following completion of implementation a biannual inspection of all project areas will be made. Following these inspections all fence and instream structure maintenance will be done. Stream cross fences and/or watergap cross fences will be either put in or removed during these inspections or subsequent maintenance.

Photopoint Picture Taking

Standardized pictures will be taken from preselected photopoints prior to implementation on any project area and then during the spring and fall for two years immediately following completion of a project. Once these initial photos are obtained the frequency of photopoint picture taking may diminish to once every two to three years.

Habitat Monitoring Transect Data

Immediately after establishing habitat monitoring transects, baseline data will be collected. Data collection, following the establishment of baseline data, will be done on the first year following completion of implementation activities and then at approximately 3 to 5 year intervals.

Thermograph Data Collection and Summarization

Thermographs have been installed within and/or adjacent to selected project areas. These thermographs will then be monitored on a regular basis to detect changes in water temperatures.

Miscellaneous Field Activities

Steelhead redds are counted in index areas on three of our recovering streams. These counts will be used to document changes in adult spawner returns to our treated areas.

Waterfowl and other bird species are counted yearly within two index areas. These counts will monitor change in bird species abundance as woody vegetation replaces grass.

RESULTS AND DISCUSSIONS: I. FIELD ACTIVITIES

PREWORK

Riparian Lease Development and Procurement

Project personnel signed one riparian lease, allowing treatment of 3.0 miles of Mountain Creek within the Mainstem subbasin on the Brown Property.

In addition to the one signed lease, the CSWCD pursued leases with the following landowners throughout the year.

- Lloyd Powell who owns 3.2 miles of Mountain Creek and agreed to sign a lease with us for work to be done in 1993.
- Phil Girschner who owns 3 miles of Fox Creek, who we have approached before, and again refused our proposal.
- Lillian Mascall who owns 4.5 miles on Cottonwood Creek, who we have approached before, and again refused our proposal.

In an all out effort to get leases on the Middle Fork, the Grant Soil and Water District, the Monument Soil and Water District and the John Day Fish Habitat Program hired Mr. Ed Chaney of Chinook Northwest consultants to negotiate with the Middle Fork landowners. Our emphasis was on obtaining perpetual easements on the entire riverbottom with each landowner. The following landowners were contacted:

- Lavelle Holmes, who owns 1.7 miles of the Middle Fork. She was approached with an offer to purchase a perpetual 200 ft. easement along the river. In payment the Water Resources Dept. would buy her a sprinkler system, pump and improvements to her existing flood irrigation system. She refused this offer, stating that it would require much more manpower to operate than her present system. We then offered her a 15 year lease on a 200 ft. corridor. Water Resources Department would pay her \$24,990 for lost forage and we would pay her \$15,078 to construct her riparian corridor fence. She submitted a counter offer of \$52,500 for lost forage and \$27,625 for fence construction. We told her our offer was as high as we would go and she said it wasn't worth it. Negotiations ended there.
- Rotchy Barker of the Oxbow Ranch, who owns 3.8 miles of the Middle Fork. He worked with Ed Chaney on a perpetual easement that would allow us to protect his entire riverbottom. This involved getting the value of the land assessed to show Mr. Barker his options. Assessment came to \$606,000 for the entire ranch. Before it could go any further, Mr. Barker said the ranch was worth much more than that and refused to negotiate any further. We then proposed a standard 15 year lease. He said this would work better but had not signed anything by the end of the year. Negotiations are continuing.

Mrs. Joanne Vidando, who owns 2.2 miles of the Middle Fork. She negotiated with Ed Chaney to sell us a perpetual easement. It involved giving us an easement and her Bates Pond property in exchange for a ranch we would have to purchase on the Mainstem. This required assessments of all three properties. We could not get funds for these assessments. Mrs. Vidando took this as a lack of interest on our part and ceased negotiations.

Project Preparation

Mapping, design and layout of construction work was completed and all instream work permits were applied for and obtained.

Contract preparation for materials delivery, instream work and spring development were written by GSWCD for Mountain Creek. Preparation included determining rock quantities, writing contract specifications, mapping project sites and preparing work sites. This resulted in three contracts which were put out for bid and awarded by purchase order.

A Contract was written for fence construction on Mountain Creek. ODFW's Engineers awarded the contract.

Field Inventories

A walk-through habitat inventory was performed on all project stream reaches scheduled for implementation. Observations showed a lack of woody vegetation, high stream temperatures and severely eroding stream bed and banks as being the most prevalent stream problems on Mountain Creek.

IMPLEMENTATION

Materials Delivery

Logs, quarry rock and percolation gravel was delivered to the construction sites on Mountain Creek. Work began on July 8 and was finished on July 14. Five hundred fifty two cu.yds of rock and 3 logs were delivered to the appropriate sites for a cost of \$9080.00.

Instream Structures

Mountain Creek instream structures included 7 livestock crossings, 3 log wiers, and 3 oxbow repairs. Construction began on July 20 and was finished on July 28. This required a total of 44 hours of backhoe time costing \$2486.00.

Offsite Water Development

Mountain Creek required 6 spring developments. Construction began on July 13 and ended on July 17. They required 38 hours of backhoe rental at a cost of \$1064.00.

Fencing

Mountain Creek required construction of 4.7 miles of hi-tensile smoothwire and 0.4 miles of barbed wire fence at a cost of \$33,962.00. Construction began on August 10 and was completed on November 19.

The Nature Conservancy property required construction of 3.3 miles of fence to complete the project this year. Construction was completed in April. The total fence constructed was 9.8 miles at a cost of \$71,589.

Photopoint Establishment

We established 9 new photopoints on Mountain Creek this year.

Planting

100 aspen cuttings on Mountain Creek and 40 aspen cuttings on Long Creek were taken. These will be grown into saplings and planted at a future date. All implementation activities are summarized in Table 1.

**Table 1. Work completed in 1992 by the John Day Basin
Private Lands Habitat Improvement Project**

Stream -	<u>Mountain Cr.</u>	<u>Middle Fork</u>	Totals
Landowner -	Brown	Nature Conservancy	
Stream length	3.0	0	3.0 mi
Fence construction	5.1	3.3	a.4 mi
Increased stream length	420 ft		420 ft
Log wiers	3	0	3
Spring developments	6	0	6
Oxbow repair	3	0	3
Livestock crossings	7	0	7
Plantings	100 aspen cuttings on Mountain Creek. 40 aspen cuttings on Long Creek.		

MAINTENANCE AND EVALUATION

Project Maintenance

A seasonal fence maintenance technician was hired on Feb. 24. He immediately began assisting us with wiring stays and checking project fences.

The Rawlins, Hettinga/Bahrenburg, Carter and Courchesne fences required reinforcing wires on each stay to solve a slipping problem. The Tech II, GSWCD, and the fence maintenance technician worked on this task for 1 1/2 months this spring.

All project fences, rock structures and livestock watering devices were surveyed in April and early May to assess repair needs.

Several project gates were converted from smoothwire to barbed wire because cattle were getting through them.

This year we had a mild winter with very little snowpack. Therefore we had no spring floods but the streams began drying up in June. This resulted in an increase in cattle pressure on our fences and watergaps. Fox Creek dried up except for a few scattered pools. Livestock visited the watergaps constantly and pushed their way into the corridors when water disappeared from the watergaps. We had to temporarily enlarge the watergaps in some areas and construct new watergaps in other areas. This problem dominated our maintenance activities during the hot part of the summer.

Use of an airplane to survey our fences this year allowed us to check our areas once every two weeks. With the help of our fence technician we were then able to identify problems quickly and get them repaired. This really minimized the adverse livestock impacts to the riparian areas.

We replaced a section of rock fence with barbed wire on the Dow property. It required constant rock stacking to keep it cattle proof. This rock fence was incorporated as part of the original riparian fence because of the difficult terrain. We were able to replace it with a wire fence by anchoring to rock bluffs and boulders using new types of technology and equipment.

A rebuild design was made for a section of fence on the Mainstem/Coombs property. This was another section of old fence that became part of our riparian corridor and has failed structurally. We will complete it this winter before irrigation season begins.

After most pastures had been retired for the winter we removed our stream crossfences. Where livestock were still present we lifted the crossfences above the level of spring floodwaters.

Photopoint Picture Taking

Nine new photopoints were established on Mountain Creek. All other project photopoints were retaken this year; most in July. We are seeing some dramatic results in many areas after 6 years of recovery. Several Mainstem photopoints have shown a progression from bare gravel bars and vertical cutbanks to gently sloping banks and cottonwood trees 10 feet high. (Appendix D). We will have shade on the water in many of these areas in 5 years.

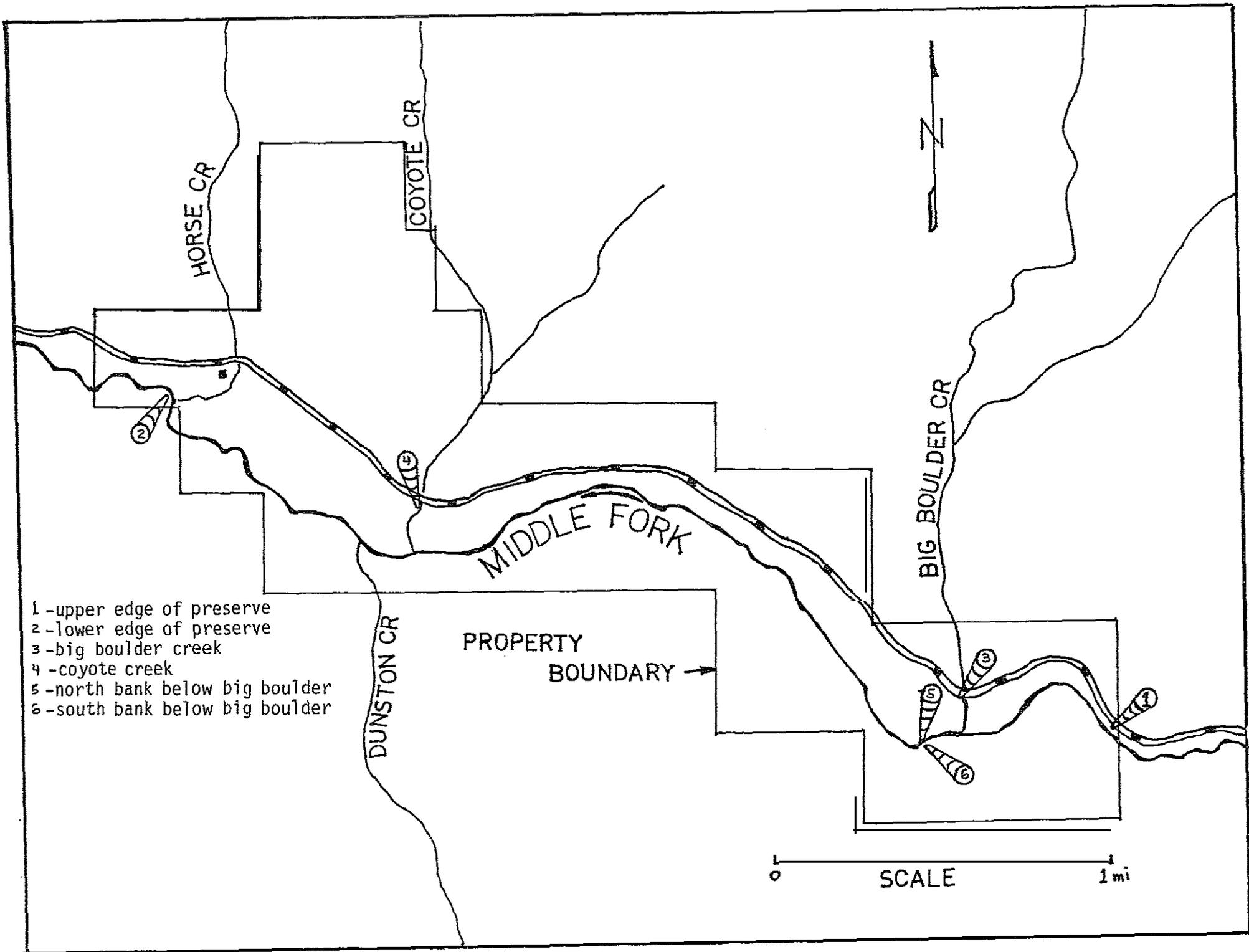
Thermograph Data Collection and Summarization

Two thermographs were monitored on Cottonwood Creek this year from April through September, one is stationed above and one is stationed at the lower end of our $\frac{1}{2}$ mile long project area. This allows us to record temperature changes as a result of the stream flowing through our project. Weekly maximum water temperatures were found to be 8.4°F cooler in the summer after flowing through our riparian corridor. This means the stream cooled down 8.4°F in only $\frac{1}{2}$ mile of recovered riparian canopy. We also found that the stream was warmer at night by an average of 2.5°F . This means the stream at the lower end of our treatment area goes through less of a daily temperature fluctuation. We recorded these temperatures during a severe drought year so the low water levels may have affected the stream's temperature pattern. Temperatures averaged 10° warmer than last year's data. (see Appendix A).

Six thermographs were deployed for the first time in June on the Nature Conservancy property on the Middle Fork. One was placed at the upper end and one was placed at the lower end, 4 miles away. One was placed in Coyote Creek and one in Big Boulder Creek. The last two were placed on opposite sides of the river at a point 300 yards below the mouth of Big Boulder Creek (Fig. 2). Results showed the Middle Fork's average maximum temperature coming into the property was 73° during July and 77° during August. Big Boulder Creek cools the Middle Fork by 4° at 300 yards below their confluence. The Middle Fork warms back up to within 1° of its former temperature by the time it reaches the bottom of the property (see Appendix B for data). These thermographs will be monitored for the life of the lease to document temperature changes as this area recovers its riparian canopy.

Habitat Monitoring Transect Data

Ten stream transects were remeasured on Fox Creek. After 5 years of recovery this data showed a decrease in width of the creek by an average of 1.7 feet. The channel elevation remained the same. We cannot compare water depth measurements from year to year because it varies depending on the flow volume. We do however have a deeper stream and a higher water table now at any given volume because the channel containing it is narrower (Appendix C). You can see this happening in all our treatment areas, some of which are shown in Appendix D.



- 1 - upper edge of preserve
- 2 - lower edge of preserve
- 3 - big boulder creek
- 4 - coyote creek
- 5 - north bank below big boulder
- 6 - south bank below big boulder

Figure 2

Miscellaneous Field Activities

Bird surveys were performed on two index riparian areas during May. Twenty different species were counted on the Fox Creek/McGirr property and thirty three on the Mainstem/Emmel property in 1992.

Table 2. Species of Birds counted in two index areas between 1986 and 1992.

Location	Year						
	1986	1987	1988	1989	1990	1991	1992
Fox Creek McGirr property	11	24	23	24	18	25	20
Mainstem Emmel property	20	28	24	29	32	26	33

Steelhead spawning ground surveys were conducted in May. Water clarity was good for redd counting, however low water levels made migration difficult for the adult steelhead. Poor migration conditions influenced our count on Deer Cr. where the adult steelhead were not able to reach our index area: we could not find any for 2 miles below it. It does not appear to have affected passage on Fivemile Cr. however as all redds were above our fishladder.

Table 3. Four year summary of steelhead redd counts within Project areas.

Stream	Miles	Project Type	<u>Redds Counted</u>			
			1988	1989	1990	1992
Fox Cr.	3	Habitat Improvement	6	2	3	36
Deer Cr.	2	Barrier removal* and fencing	<u>5 ab</u> 3 blw	<u>2 ab</u> 0 blw	<u>0 ab</u> 3 blw	<u>0 ab</u> 0 blw
Fivemile Cr.	2	Barrier removal*	<u>4 ab</u> 3 blw	<u>0 ab</u> 0 blw	<u>6 ab</u> 0 blw	<u>5 ab</u> 0 blw

* Counts are separated by being above (ab) or below (blw) the previous passage barrier.

Note - No counts were made in 1991 due to floodwaters obliterating the redds before they could be counted.

RESULTS AND DISCUSSION II. PROGRAM ADMINISTRATION

Reports and Data Summaries

Monthly progress reports and the 1991 annual report were submitted to EPA during 1992.

An individual implementation summary was completed for all fish habitat improvements made by the project. This included a breakdown of costs for each landowner. This summary shows we now have 37.5 miles of stream protected using 65.6 miles of fence,

Budgets/Purchases

Preparation of the 1993\94 work statement and budget began in November and continued through the end of the reporting period.

All construction materials for project implementation and maintenance were purchased during the report period.

Capital Outlay included one chainsaw winch purchased for \$ 1080.00.

Monthly purchasing summaries were submitted to the regional office during 1992.

Personnel

Scott Powell was hired as the project's seasonal fence maintenance technician.

Some of the training we attended included: The American Fisheries Society's annual meeting, Core Curriculum for state supervisors, Northeast Region's annual meeting, ATV safety class and a seminar on the propagation of native plants.

INTERAGENCY CODRDINATION/EDUCATION

Interagency Coordination

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 1992. Funding included 12 months of engineering support.

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

An enhancement project was constructed on Cummings Creek this year using construction funds provided by ODFW's Restoration and Enhancement program. A lease was developed with Mr. Rick Page allowing us to work on 3/4 mile of this stream. It is a Mainstem tributary containing steelhead and resident rainbow. Cummings Creek required 1.5 miles of barbed wire fence at a cost of \$6431.00, and included 3 log weirs, 1 rack weir, 10 boulders, 190 ft of juniper riprap, and several juniper limbs. The latter were installed using hand labor, a backhoe and a horse team donated by GSWCD. Construction was completed in January at a cost of \$1083.00.

Twelve photopoints were established on Cummings Creek and Fifteen hundred cultured Wild Rose, Creek Birch, Apple, Plum, Elderberry and Blackberry cuttings were planted to help diversify the recovery of this property. We were assisted in this planting by the Grant Union High School conservation class.

The project participated in a technical work group in charge of managing the fisheries on the Nature Conservancy's Middle Fork property.

Consultation and field review was provided to personnel from the Malheur National Forest on their 1992 instream and fence construction projects on the Middle Fork John Day River. We worked together to get approximately 4 miles of the river fenced. We assisted the Forest with permittee coordination, fence layout, ordering and delivery of fence material and construction inspection to insure a quality product was built.

Smoothwire fence specifications and contract documents were provided to the Los Angeles Power and Light Company. They are beginning to fence several of their streams above reservoirs to improve fish habitat and provide more water for storage.

Smoothwire specifications, contract examples, construction techniques, and assistance with fence layout were provided to a landowner on the South Fork above Izee falls. The landowner used this information to corridor fence two miles of the river. This is the first landowner in the basin to corridor fence his property after giving up on a controlled grazing program. His section of river was not recovering after 3 years of reduced grazing pressure. He realized he would have to rest it completely for a number of years until some bank resiliency was allowed to take hold. He needed to be able to rest the riparian vegetation and still graze the remaining pasture or he would run out of grass. The corridor fence was the only way he could attain his goals so he solicited funds from the U.S Fish and Wildlife Service and the Governor's Watershed Enhancement Board. He used our advice to administer the construction of the entire fence himself.

Advice was given to the U.S. Fish and Wildlife Service, Burns office, on ordering and receiving smoothwire fence materials for the project mentioned above on the South Fork.

Information was provided to Oregon State University outlining the amounts constructed and the costs associated with habitat improvements on the Mainstem/Emmel property. These figures will be used for an economic analysis of fish habitat improvements on this piece of the John Day River.

A critique of the Fifteenmile and Trout Creek fish habitat improvement projects by a team of scientists hired by BPA was attended.. Several tributaries were looked at and we discussed the relative merits of a wide variety of improvement techniques.

A presentation about our project was given to the Wheeler County Soil and Water Conservation District. Several of the District board members own priority streams in the lower John Day River.

Education

A day was spent teaching young anglers about trout and trout habitat during Oregon's free fishing day.

Twelve high school biology students assisted us with vegetative plantings for two days on Cummings Creek. We discussed several topics related to stream restoration and fish biology as they worked. We hope to make this an annual field trip for them.

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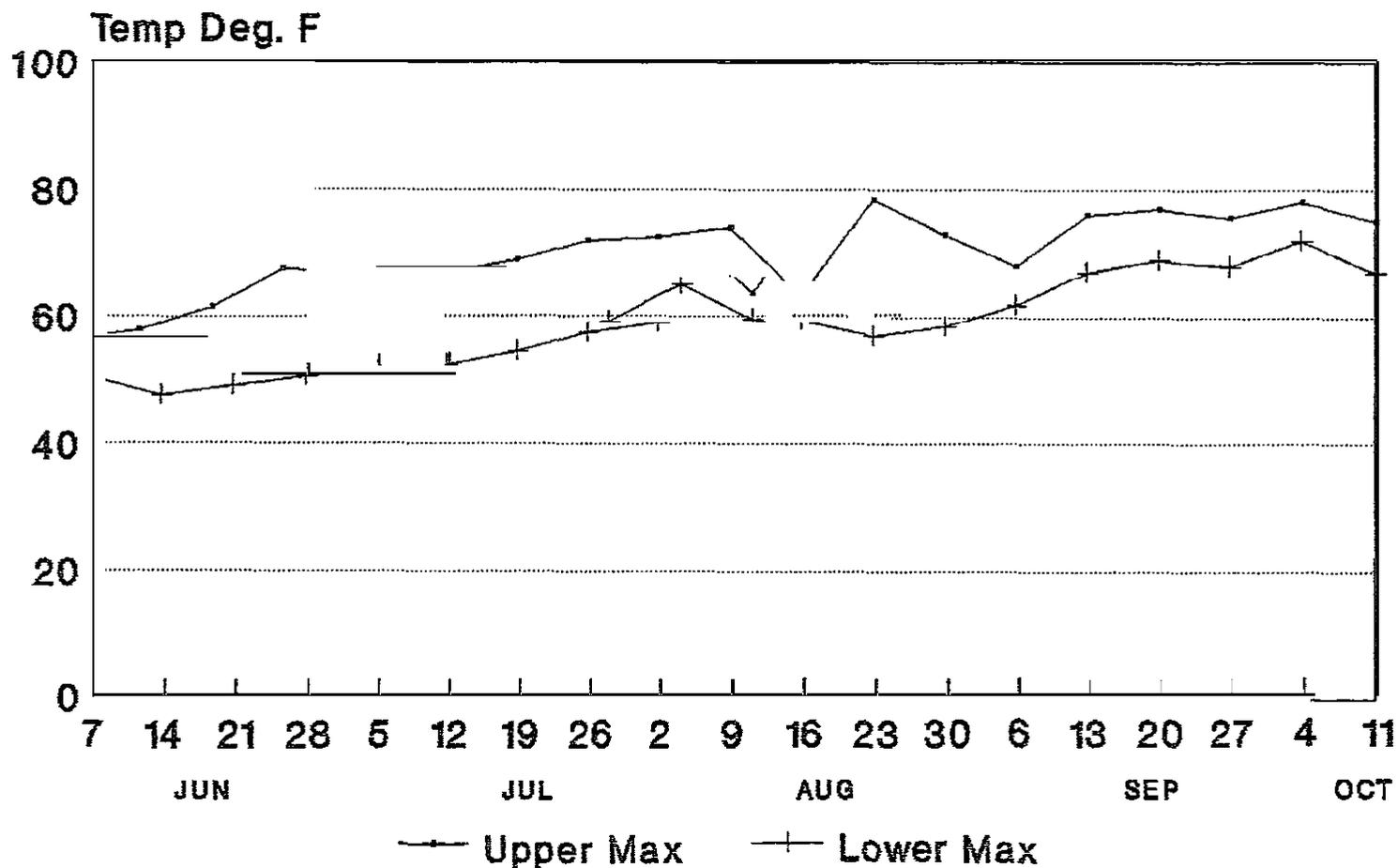
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APPENDIX A

Cottonwood Creek
Thermograph Data Summarization

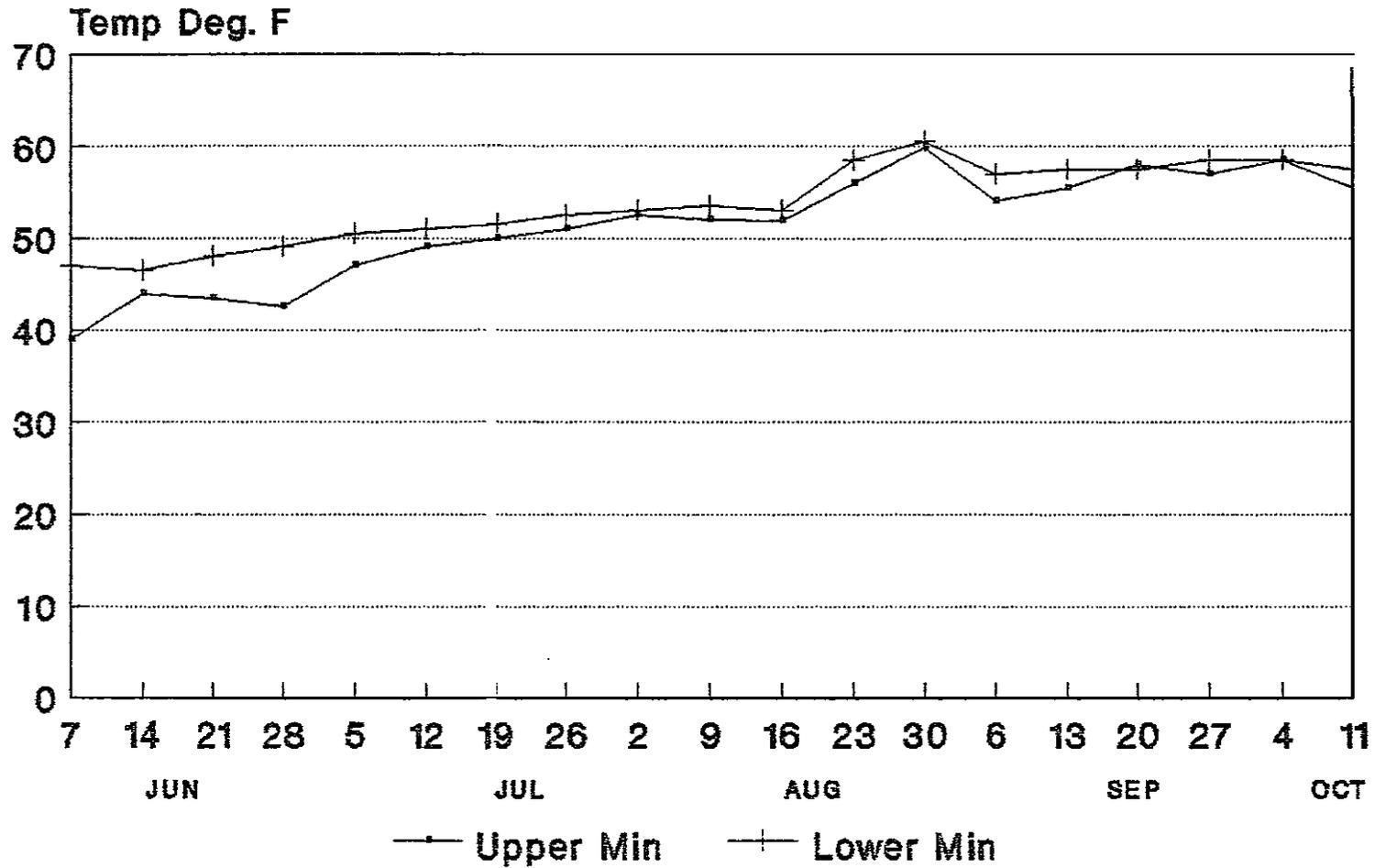
COTTONWOOD CREEK

Mean Weekly Maximum Temperatures



COTTONWOOD CREEK

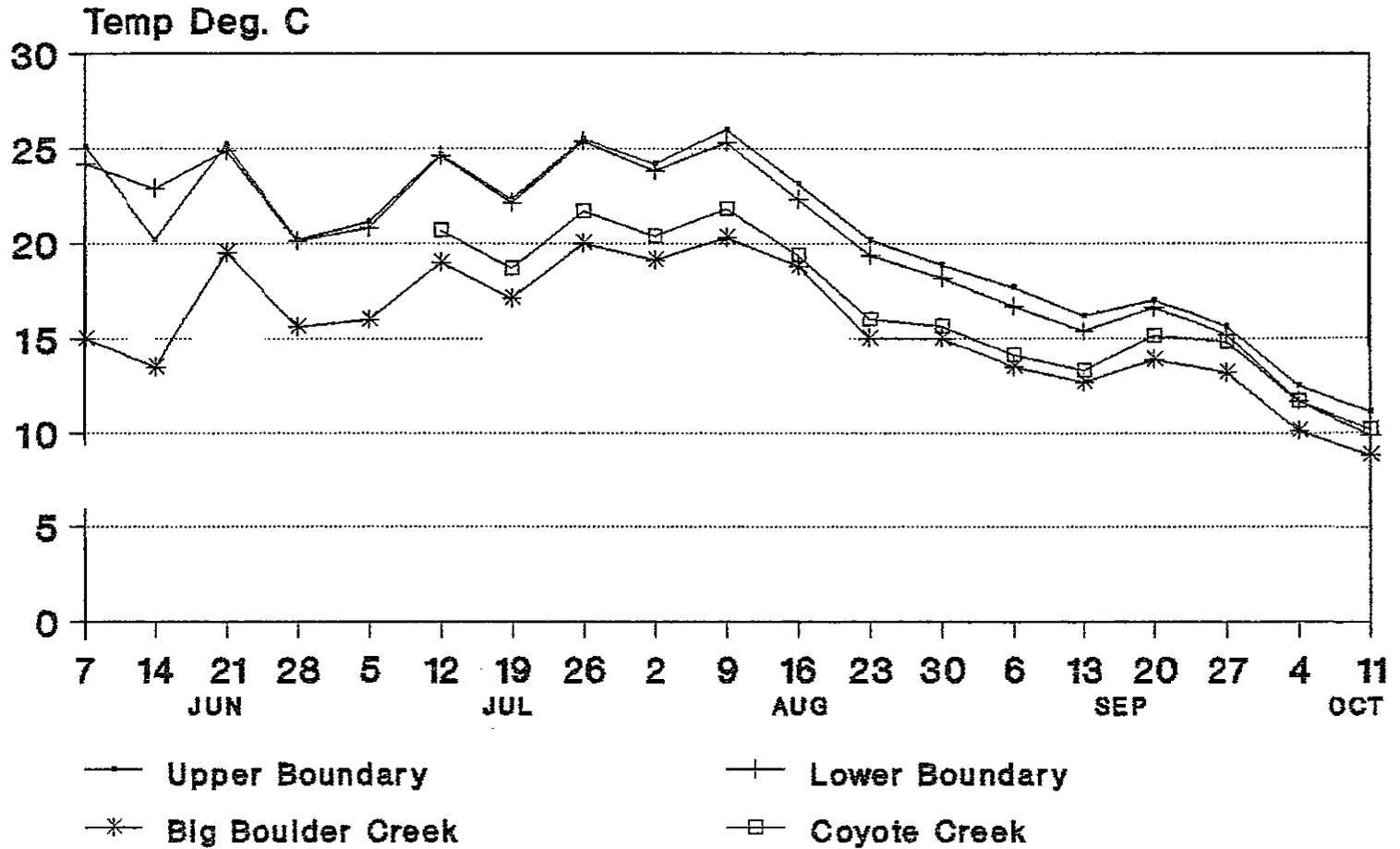
Mean Weekly Minimum Temperatures



APPENDIX B
Middle Fork
Thermograph Data Summarization

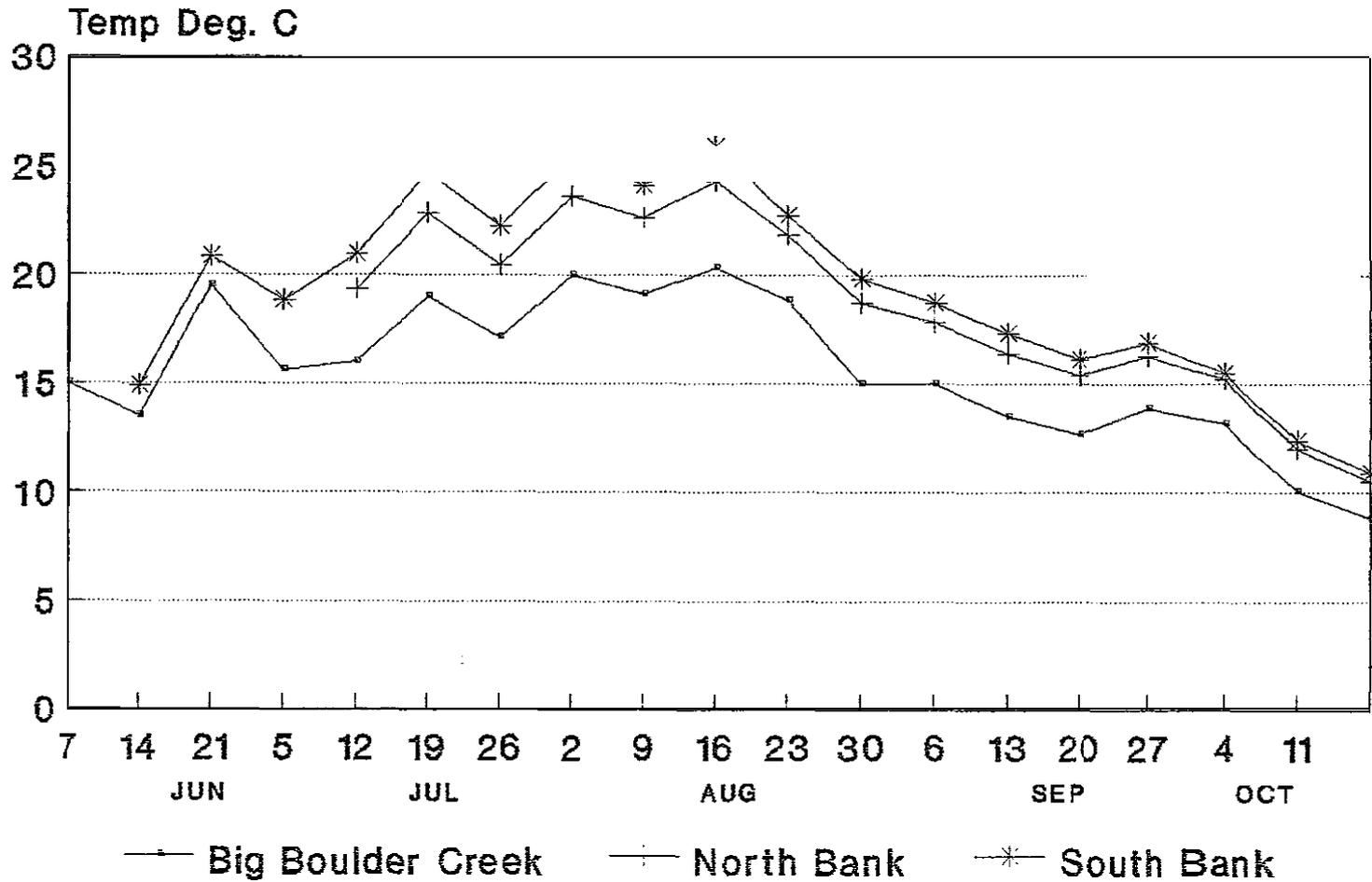
MIDDLE FORK JOHN DAY RIVER - TNC PROPERTY

Mean Weekly Maximum Temperatures



MIDDLE FORK JOHN DAY RIVER - TNC PROPERTY

Mean Weekly Maximum Temperatures



APPENDIX C
Habitat Transect Data

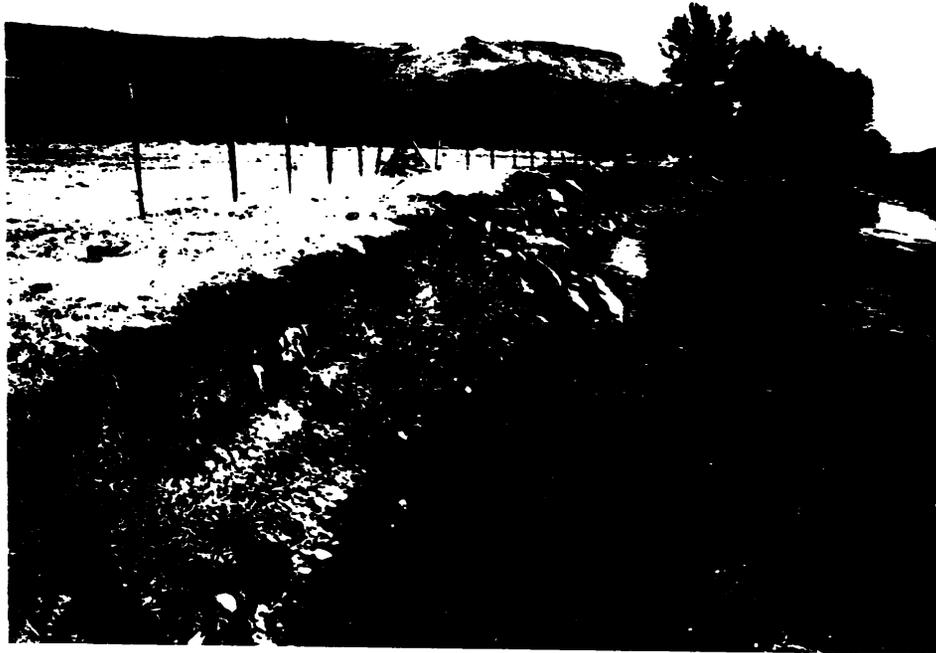
Comparison of 1987 and 1992 habitat monitoring transect data collected from Fox Creek on the McGirr property.

Transect number	<u>Stream Width (feet)</u>			<u>Channel Depth (feet)</u>		
	<u>1987</u>	<u>1992</u>	<u>Change</u>	1987	1992	<u>Change</u>
1.	17.7	14.2	-3.6	9.57	8.93	+0.64
2.	7.7	3.7	-4.0	7.45	7.65	-0.20
3.	5.5	5.0	-0.5	5.73	5.95	-0.22
4.	6.4	7.0	+0.6	6.13	6.08	+0.05
5.	8.0	5.7	-2.3	5.93	6.10	-0.17
6.	8.2	4.7	-3.5	5.38	5.49	-0.11
7.	8.1	7.7	-0.4	5.62	5.60	+0.02
8.	6.8	5.3	-1.5	4.14	4.05	+0.09
9.	7.6	6.3	-1.3	4.88	4.80	+0.08
10.	10.2	9.0	-1.2	5.11	5.03	+0.08
Averages	8.6	6.9	-1.7 ft	5.99	5.97	+0.02 ft

After 5 years of riparian recovery, this section of Fox Creek has decreased in width by an average of 1.7 feet, The stream has moved from side to side, scoured and deposited, but overall its channel depth has virtually remained the same.

These transects were taken at 30 foot intervals on the McGirr property at Creek Mile 11.3 during the summer low flow period.

APPENDIX D
Photographs



MAINSTEM JOHN DAY RIVER HOLMSTROM PROPERTY 1985

This channel was eating away a hayfield. Calves would fall into the river each spring. The landowners rock jetties were too small to stop the erosion even though they were very expensive. We were able to solve their problems and put alot of fish habitat into the river when we worked together. Growth has been so good here that we had to take the picture 20 ft. to the right in order to see beyond the new trees.



MAINSTEM JOHN DAY RIVER HOLMSTROM PROPERTY 1992



MAINSTEM JOHN DAY RIVER MCNEIL PROPERTY 1989

This area suffered from the continuous deposit and scour of bedload. It would deposit in one event, scour in the next, but never stabilize. Vegetation would grow rapidly but livestock and scour would destroy it each year. We stabilized some eroding banks and fenced out the livestock. This is allowing the willows, cottonwoods and grasses to survive, catch sediment and stabilize the bedload with their roots.



MAINSTEM JOHN DAY RIVER MCNEIL PROPERTY 1992

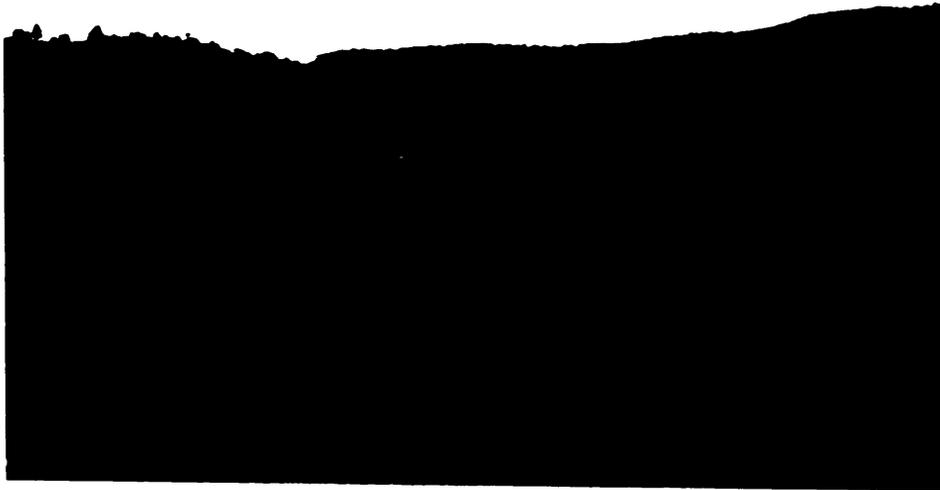


MAINSTEM JOHN DAY RIVER DOW PROPERTY 1987

This area was stabilized with jetties in 1984 but was not excluded from livestock until 1987. During the 3 years without livestock exclusion the river remained wide and shallow and continued to erode streambanks in other areas. Following fencing in 1987 the streambanks have begun to revegetate and stabilize in all areas even those that had PO jetties.

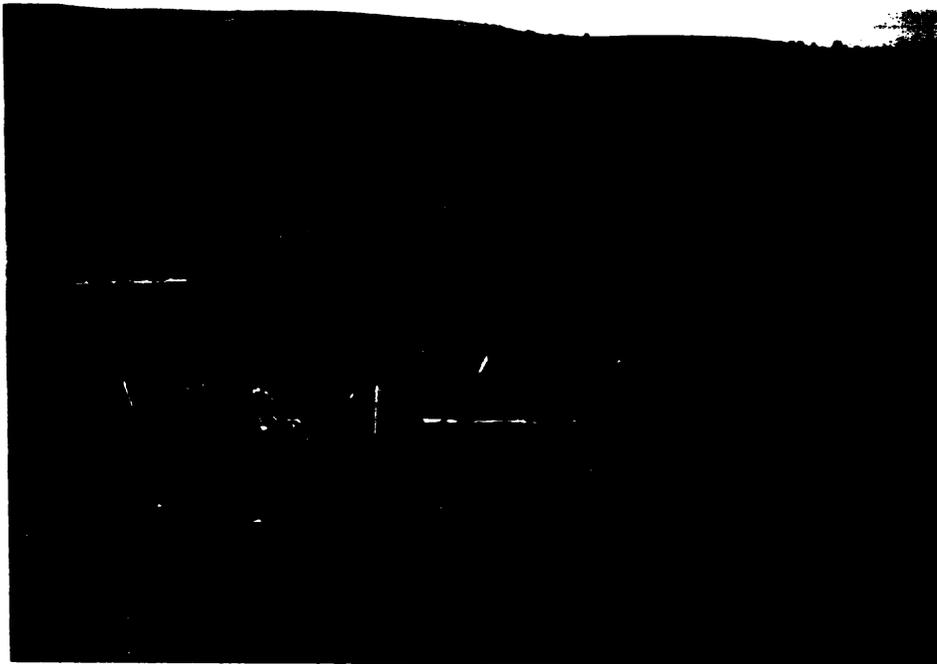


MAINSTEM JOHN DAY RIVER DOW PROPERTY 1992



MOUNTAIN CREEK BROWN PROPERTY 1992

This is the stream we worked on this year. It lost its woody vegetation 30 years ago when it was channelized. It has since eroded back into a meandering channel with a good pool to riffle ratio but browsing has prevented any woody vegetation from returning. It has now been fenced and will begin to recover.



MOUNTAIN CREEK BROWN PROPERTY 1992

This is one of six springs developed to attract livestock away from the newly fenced riparian area along Mountain Creek. Though not discernable in this photograph, Mountain Creek flows through the meadow in the background. Reestablishment of riparian vegetation within the fenced riparian area should make the location of Mountain Creek obvious in future photographs.

MAINSTEM JOHN DAY RIVER
EMMEL PROPERTY
1986 1989 1992



This piece of river was channelized several years ago for a bridge. The right side was allowed to recover because it was the landowners yard. The left bank was bulldozed up into a dike after each flood and grazed. We were able to level out the dike, install some low deflectors and fence it. Following 6 years of recovery, grasses, shrubs, and trees have become well established on the left bank thereby providing the needed shade and stability.

