

1991 Annual Report

North Fork John Day Anadmmamus Fish Habitat Enhancement

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## ABSTRACT

In 1991, the Umatilla National Forest constructed fish habitat improvements and performed maintenance on Fivemile Creek, Camas Creek, Clear Creek, Big Wall Creek, Little Wall Creek, and Wilson Creek, on the North Fork John Day and Heppner Districts. Riparian fences were also constructed along portions of Fivemile Creek, Bear Wallow Creek, Big Wall Creek, and Wilson Creek which excludes grazing from the riparian zones. Monitoring of all prior stream improvement projects was completed for the North Fork John Day and Heppner Ranger Districts.

A 3.37 mile fence was constructed around 1.5 miles of Fivemile Creek riparian area. Approximately four and one half miles of riparian area had large wood pulled into it. 72 weirs were rebuilt and/or had wood added to them, and one rock deflector was built. The excavator went through the previous year's habitat work and added wood to the riparian area, partially reconstructed some structures, and added rootwads and woody debris to the existing structures.

The stream enhancement project continued in 1991 along two miles of Camas Creek. One large holding pool and 21 pool-creating structures were built to provide quality fish habitat. Each pool was constructed with rootwads, brush, and boulders to provide quality hiding cover. Thirty-four boulders and 28 logs were placed in the channel to provide pocket pool habitat. Six deflectors were used to promote channel narrowing and sediment entrapment. One area of bank armorment was built to stop bank erosion. A few structures from the previous year's work received some minor repairs.

Additional floodplain was treated along 1.5 miles of Clear Creek. Earlier structures were reworked to add 54 rootwads and other woody debris to pools as hiding cover. Seventy-one weir wings were constructed to keep pools excavated by high flows. Large wood was pulled into the channel and riparian area to trap sediment, provide instream habitat and to promote revegetation.

A three mile fence was constructed around 1.5 miles of Bear Wallow Creek riparian area to exclude cattle use of the riparian area. Exclusion of cattle should encourage re-establishment of riparian vegetation and promote stream channel narrowing.

Work continued downstream along 1.7 miles of Big Wall Creek to the National Forest Boundary. Eleven pool forming structures were constructed to provide fish habitat. The addition of 10 instream logs and deflectors will provide quality hiding cover. A total of 17 rootwads were added to pools to create excellent cover for juvenile fish.

Riparian pasture fence projects along Big Wall Creek and Wilson Creek were completed in the fall of 1991. A total of 13.5 miles of fence that totally excludes livestock grazing in these two riparian zones was constructed. Another portion of the range program was to maintain range livestock ponds. The maintenance was completed in the 1991 field season.

Maintenance work was performed on Little Wall Creek in the 1991 field season. The maintenance included reconstruction of damaged structures, relocation of structures not functioning in their present placement, and redesign of structures to enhance performance. The structures were also secured with the Hilti cable method.

Maintenance work was performed on Wilson Creek in the 1991 field season. The maintenance included reconstruction of damaged structures, relocation of structures not functioning in their present placement, and redesign of structures to enhance performance. Budget allowed for the maintenance of the first 49 structures only, with additional structures and cabling process to be completed in the 1992 field season.

Maintenance was completed on 31 weirs in Desolation Creek. The maintenance consisted of rebuilding wings, excavating pools below the weir, and adding additional woody material to each pool. Rootwads were placed in each pool to provide hiding cover for all age classes of fish. Structures were secured with the Hilti Cable method.

## Subproject Ia. - Fivemile Creek System

### INTRODUCTION

The Fivemile Creek riparian fencing project is located on the Umatilla National Forest in T.4 & T.5S, R.29 & r.30E, Umatilla County. Fivemile Creek is part of the Camas Creek drainage which is tributary to the North Fork John Day River.

Historically, Fivemile provided abundant habitat for spawning and rearing summer steelhead. Within the last twenty years, a falls formed one mile from the mouth of Fivemile Creek which became a partial barrier to steelhead migration. Oregon Department of Fish and Wildlife (ODFW) recognized the need to improve passage and in 1987 built several weirs which decreased the vertical jump and velocity barrier at the falls.

In 1986, a physical stream survey was conducted on Fivemile Creek and its tributaries. The survey data indicated that the quantity of pools sufficient to provide adequate rearing was very low - approximately 11% of the surface area. There was very little woody material in the channel or riparian area. Bank erosion was a problem in areas of concentrated cattle use and past logging. Stream surface shading was poor due to the loss of riparian vegetation. There were several long stretches of subsurface flow in the upper reaches of Fivemile Creek as well as its tributaries. Adequate spawning gravel was limited by a heavy silt concentration. There was widening of the stream channel due to the loss of wood and vegetation in the riparian area.

Habitat enhancement work began on Fivemile Creek in 1988 and continued through 1991. First efforts were concentrated on providing adequate pool habitat for smolt survival in winter and summer. Log and rock weirs were built to provide pool habitat and clean spawning gravel. Pools were constructed to contain woody debris, rootwads, and boulders to increase diversity and hiding cover. Many of these pools intercepted cool subsurface flows which improved water quality during the summer low flow period.

Spawning of summer steelhead has increased over the last few years. ODFW biologists have observed redds in the tailout of several pools. ODFW has reincorporated Fivemile Creek into their steelhead census. Observations during biological surveys have revealed more smolts of different age classes using the constructed pools.

Restoration of the riparian area is necessary to provide adequate stream shading and streambank stability. Cattle management plans for this area need to be changed to accomplish this. We are working with the allotment permittee and the range department to make improvements necessary to improve riparian habitat condition. We have met with the allotment user several times in the field to identify utilization of riparian shrubs. Work will continue with the allotment permittee to change allotment use to attain the desired condition for the riparian areas. This may require changes to their present plan, including fencing to exclude grazing.

This year a livestock exclosure fence was completed and 72 structures were reworked to include large and small wood. A total of 3.37 miles of six-strand high tension New Zealand fence was built to exclude 1.5 miles of Fivemile Creek from livestock use. Large and small wood was pulled into the riparian area to increase the riparian recovery. Rootwads and small wood was placed in the reworked pools to provide hiding cover for rearing and spawning steelhead.

## OBJECTIVES

1. Improve instream cover, diversity, and complexity by adding woody material.
2. Increase rearing and hiding habitat for summer steelhead by improving the quality of pools.
3. Improve riparian vegetation and streambank stability by controlling livestock use of riparian area by constructing an enclosure fence.
4. Reduce bank erosion and promote stream channel narrowing by placing large wood in the channel and riparian area.

## PROJECT DESCRIPTION

Project activities began in the spring of 1990 with scoping and analysis of the proposed work area. Restoration opportunities were identified and specific methods of correcting habitat deficiencies were finalized early in 1991 with ODFW, the range department and the allotment permittee. Many field reviews of the project area took place with the Forest biologists, range technicians, hydrologist and the allotment permittee. Plans were prepared, structure design and layouts were completed, and prework conditions were documented.

This year's project work was completed in August. The excavator rebuilt log and rock structures to incorporate small and large wood into the existing pools. This will provide diverse instream habitat and hiding cover. Large wood was pulled into the riparian area to promote recovery of the riparian vegetation by trapping sediment. All wood was taken from the immediate area to incorporate into the stream and riparian area.

The Fivemile livestock enclosure fence was completed in August. A total of 3.37 miles of six-strand New Zealand fence was constructed around 1.5 miles of the creek. This will prevent livestock grazing of this area and promote recovery of the streambanks and riparian vegetation.

## Achievements

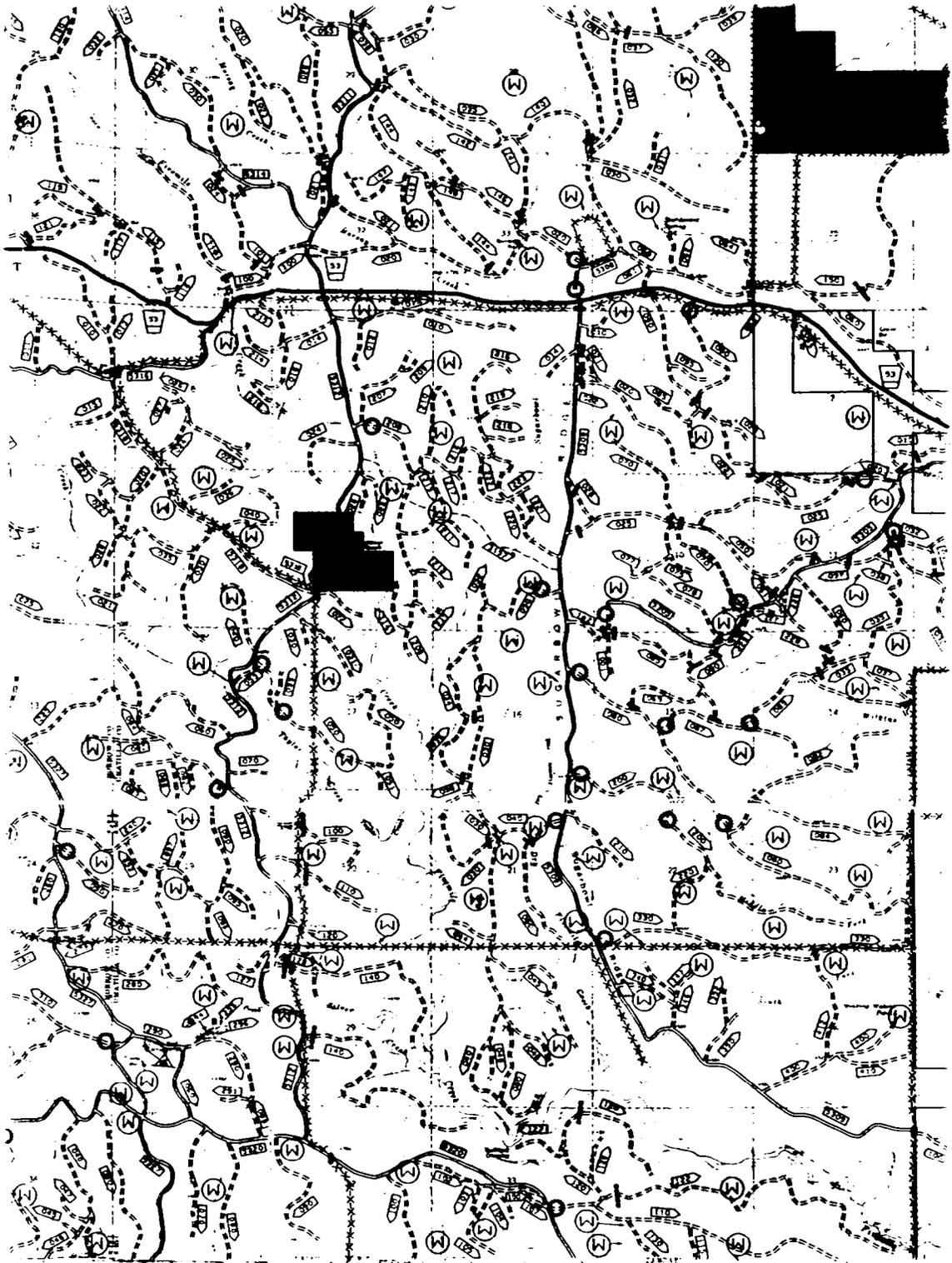
Stream enhancement work took place over 4.5 miles of Fivemile Creek. A total of 72 large pool-creating structures were reconstructed to incorporate large and small wood. This will add hiding cover and create diverse habitat for all age classes of fish. Large wood was placed in the stream to promote stream channel narrowing. Large wood placed in the riparian area will promote riparian recovery. The livestock enclosure fence excludes livestock from 1.5 miles of Fivemile Creek to encourage revegetation and streambank stability.

Table 1. Summary of the Fivemile Creek Project

<b>Structure</b>	<b>1987-1989</b>	<b>1990</b>	<b>1991</b>	<b>Total</b>
Rock Weirs W Pools	37	11	0	48
Log Weirs W/ Pools	21	8	0	29
Sills	1	0	0	1
Deflectors (Log & Rock)	42	9	0	51
Instream Logs	16	6	10	32
Rootwads	42	35	108	185
In Pool Boulders	110	78	0	188
In Stream Boulders	230	75	0	305
Adult Holding Pools	1	0	0	1
Side Channels	0	0	0	0
Side Channel Lengths	0	0	0	0
Debris Jam Bypass	0	0	0	0
Cubic Yds Spawning Gravel Placed	0	0	0	0
Structures Repaired	0	0	72	72
Miles Riparian Fence Built	0	0	3.37	3-37

# FIVEMILE CREEK

1991 RIPARIAN FENCING AND FISH HABITAT ENHANCEMENT PROJECT



## Subproject Ib. - Camas Creek

### INTRODUCTION

The Camas Creek project is located on the Umatilla National Forest in T.5S, R.33E, Umatilla County. Camas Creek is a sixth order stream that flows into the North Fork John Day River 2.75 miles west of Dale, Oregon.

Camas Creek is approximately 38.5 miles long. It, historically, produced a large population of summer steelhead and a population of chinook salmon. Natives to the area talk of the large chinook salmon runs that once migrated upstream into Camas until the mid-1950's. The ODFW estimated that Camas Creek has the potential to increase the present summer steelhead population three to four fold. The remnant chinook salmon run also has good potential to rebound if habitat conditions improve.

A Hankin and Reeves stream survey was completed on 36.5 miles of Camas Creek in 1988. The physical survey revealed very low pool quantity and quality, woody debris absent, and very low stream surface shade. Suitable spawning gravel for chinook salmon was scarce. Much of the stream gravel was in dry areas or in very shallow water during the spawning run. Suitable rearing habitat for steelhead smolts appeared to be unavailable during summer months. The stream channel was confined to a narrow floodplain (less than 100 feet) for much of its length due to placement of State Highway 244. Streambank stability was generally good on state and federal land, but there were areas on private land that had channel widening, mass wasting, and active bank erosion.

Camas Creek runs through land managed by state, U.S. Forest Service, and private interests. On the U.S. Forest Service land, cattle have been excluded from the riparian area for approximately ten years. On the state land, a management plan has been developed by ODFW to protect the riparian area adjacent to Camas Creek. Recovery of riparian vegetation and improved channel morphology is evident in both of these areas. However, the riparian zone throughout most of the privately owned land is in poor condition. There is continual stream channel widening, streambank erosion, loss of riparian vegetation, and woody debris removal.

In 1991, ODFW started restoration and enhancement efforts with private landowners along Camas Creek. They have contacted many landowners along Camas Creek about participating in the landowners program. Several want to have restoration work accomplished on their land. They will concentrate on fencing cattle out of the riparian area and installing instream structures to promote channel narrowing, pool building, and restoration of riparian habitat. A Camas Creek Planning group has been established to create a long term plan for the private landowners on Camas Creek. The planning group will incorporate all concerns, ideas, and opportunities into one plan for Camas Creek.

We have monitored the temperature of Camas Creek and its tributaries for the past three years. Stream temperatures exceeded 80°F during summer low flows, particularly where the channel is wide, no pools exist, and shade is lacking.

Enhancement work began on Camas Creek in 1990 and has continued through 1991. During this time we have worked through three miles of stream and built 38 pool-creating structures. Wood and boulder placements in the stream channel were used to increase channel complexity and provide instream habitat for different age classes of fish. Deflectors and wood have been placed in the riparian area to reduce the channel width and trap sediment during high flows.

## OBJECTIVES

1. Increase juvenile steelhead and chinook salmon survival by creating quality pool habitat.
2. Improve pool quality and diversity by adding rootwads, boulders, and wood to each pool.
3. Provide hiding and thermal cover for adult chinook and steelhead smolts by increasing the amount of woody material in the stream.
4. Increase chinook salmon spawning gravel by creating structures that produce clean gravel at the tailouts of pools.
5. Improve streambank stability and revegetation by adding boulder placements and log deflectors.

## PROJECT DESCRIPTION

We began scoping for this project in the fall of 1990. All project work was coordinated with ODFW and the State Highway Department. Scoping was finalized in the spring of 1991. Structures were staked on the ground and estimates of material necessary for each structure were tabulated. A rock source was located and a contractor was hired to blast the pit to produce boulders for the project. Rock dumps were flagged on the ground. Trees necessary for the project were felled in the project area for the construction of log weirs. In June all boulders and logs were hauled to the project area.

The excavator started building structures in mid-August just west of forest road #54 14 miles east of Ukiah, Oregon. Several structure sites were moved, changed, or eliminated in areas where bedrock was encountered. Structures were created to promote streamside revegetation, channel narrowing, pools, and bedload entrapment. All structures were secured using the Hilti cabling method. A riparian grass seed mixture was planted at each structure site. Much care was given to the aesthetic impact of these structures because of the proximity of the project site to State Highway 244.

## ACHIEVEMENTS

The Camas Creek enhancement project took place over a two mile section of stream. A total of 21 pool-creating weirs were constructed with rootwads and boulders added to each pool. Fifty boulders were placed in the stream to increase channel complexity, create pocket pool habitat, and improve streambank stability where erosion was occurring. Forty-one instream logs and deflectors were used to reduce channel width and trap sediment during high flows.

Table 2. Summary of the Camas Creek Project

<u>Structure</u>	<u>1990</u>	<u>1991</u>	<u>Total</u>
Rock Weirs W/ Pools	11	7	18
Log Weirs W/ Pools	6	14	20
Sills	1	0	1
Deflectors (Log & Rock)	6	15	21
Instream Logs	0	28	28
Rootwads	39	32	71
In Pool Boulders	51	25	76
In Stream Boulders	90	25	115
Adult Holding Pools	0	0	0
Side Channels	0	0	0
Side Channel Lengths	0	0	0
Debris Jam Bypass	0	0	0
Cuttings Planted	0	5	5
Cubic Yds Spawning Gravel Placed	0	0	0
Weir Wings Repaired	0	14	14



## Subproject Ic. - Bear Wallow Creek

### INTRODUCTION

The Bear Wallow Creek project is located on the Umatilla National Forest in T.4S. R.33E. Umatilla County. Bear Wallow Creek is a part of the Camas Creek drainage, which is a tributary to the North Fork John Day River.

Bear Wallow Creek is a first order anadromous stream. Nearly all of the drainage is under U.S. Forest Service management. Bear Wallow Creek, historically, provided rearing and spawning habitat for summer steelhead. Past grazing and timber management practices have made this creek less productive.

Bear Wallow Creek is an important anadromous stream with limited fish production at present. ODFW feel the number of smolts produced from Bear Wallow Creek can triple in size with improved land management and the addition of stream structures.

In 1988, a Hankin and Reeves stream inventory was conducted on Bear Wallow Creek. It indicated rearing and spawning habitat was poor due to the low number of pools, poor stream surface shade and low number of units with woody material. Several reaches have the potential to improve with proper management.

In 1989, a new livestock grazing plan was written. The objectives of the plan are: 1) to increase stream surface shade to 80% of potential on Bear Wallow Creek and its tributaries; 2) reduce stream bank erosion and siltation by 50%; 3) improve livestock distribution; and 4) reduce livestock utilization of shrubs and herbaceous species in riparian areas.

The first restoration efforts started on Bear Wallow Creek in 1989. Several log and rock weirs, wood and boulder placements were constructed to create fish habitat and promote riparian recovery in reach two. In 1990, this area was fenced to exclude livestock grazing. The range department created a livestock and big game enclosure in reach six to monitor riparian recovery under a different grazing strategy.

The 1991 project included fencing 1.5 miles of Bear Wallow Creek in reaches seven and eight to promote revegetation of hardwoods and increase streambank stability. This will prevent further headcutting and streambank erosion.

## OBJECTIVES

1. Increase stream surface shade by fencing the riparian area.
2. Improve streambank stability and prevent erosion by excluding livestock from the riparian area.
3. Improve rearing area and hiding cover for smolts as channel narrows and overhanging banks return.

## PROJECT DESCRIPTION

Field reconnaissance and final scoping for the project was finished in the spring of 1991. Analysis of the project area was conducted by an interdisciplinary team with specialists from the range, fish, wildlife and hydrology departments. Plans were initiated and field verified with ODFW. The contract was prepared by the range department and put out for bid.

The contract for the Bear Wallow fence was awarded in July and the contractor finished the enclosure fence in October. During construction of the fence inspections were made regularly.

## ACHIEVEMENTS

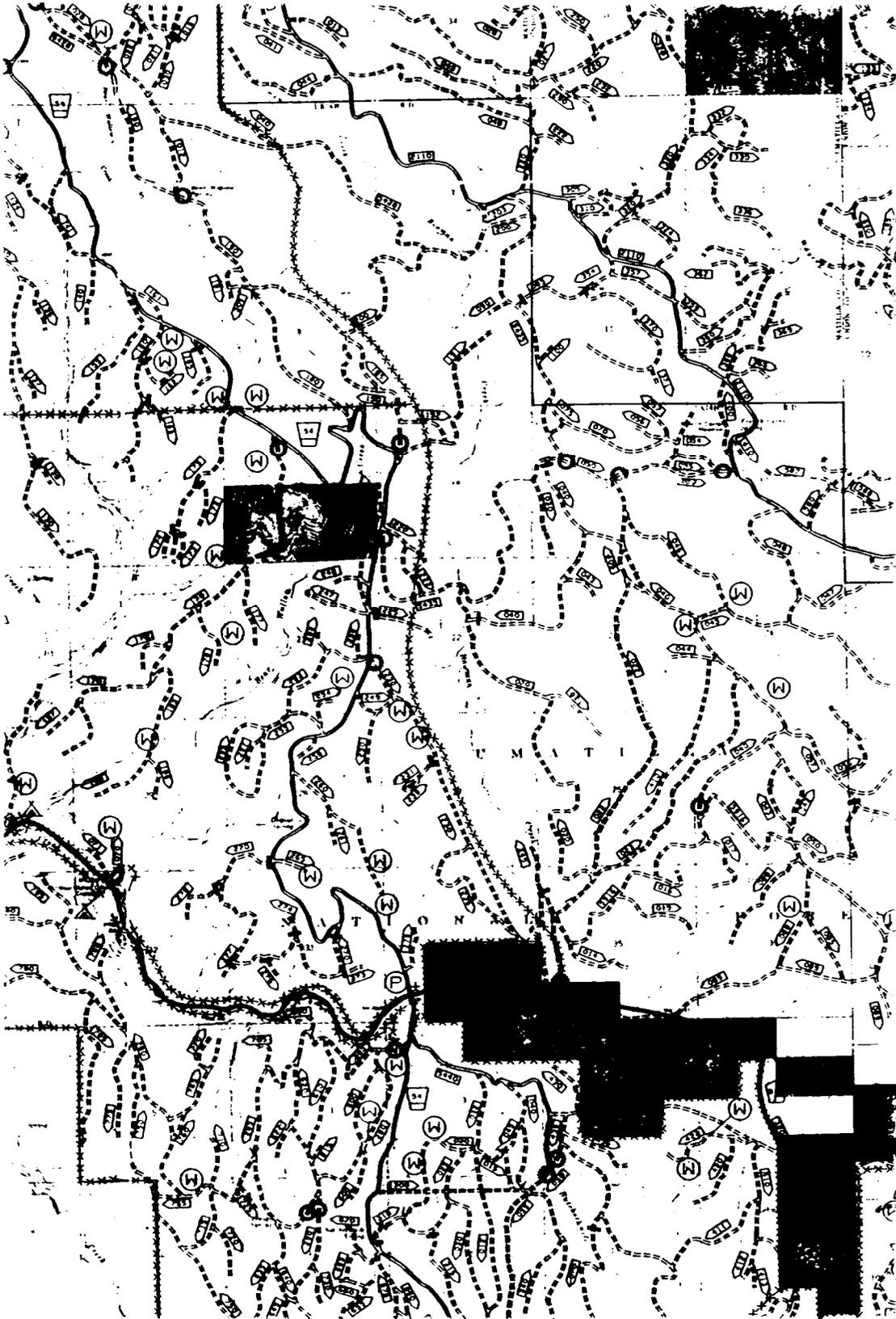
Fencing was constructed around 1.5 miles of Bear Wallow Creek. The fence completely excludes the riparian zone from livestock grazing. Cattle exclusion is expected to help reestablish riparian vegetation, prevent eroding streambanks and increase streambank stability.

Table 3. Summary of the Bear Wallow Fence

<u>Structure</u>	<u>1991</u>	<u>Total</u>
Riparian fence (Miles constructed)	3 miles	3 miles

# BEAR WALLOW

## 1991 RIPARIAN FENCING PROJECT



## Subproject Id. - Clear Creek

### INTRODUCTION

The Clear Creek project is located on the Umatilla National Forest in T.9S. R35E. Grant County. Clear Creek is a tributary to the North Fork John Day River located approximately three miles west of Granite, Oregon.

Clear Creek is an anadromous stream that supports rearing and spawning habitat for spring chinook salmon and summer steelhead. ODFW considers the Clear Creek system to be one of the most important spawning areas for the native run of spring chinook. Spawning counts of the last few years have shown a decline because the system is still not providing adequate habitat, due to past gold mining of the area.

Dredging operations for gold from the 1920's through 1954 changed major portions of Granite Creek and Clear Creek. Changes included major stream course alterations, elimination of spawning gravel, limited pool formation. removal of riparian vegetation, bank erosion, and channel migration. Portions of Clear Creek went subterranean in dredge piles, which blocked migration to former upstream spawning and rearing areas. Water quality degradation occurred as a result of seepage from mine tailings and abandoned mine shafts.

In 1979, an Environmental Assessment Report was completed and approved for portions of Clear Creek and Granite Creek. Since then, extensive work has been accomplished by the Umatilla National Forest using BPA funding. Weirs have been built to provide adult salmonids with resting pools and spawning habitat. Spawning gravel and boulders have been placed in the streambed to increase spawning habitat and cover. Willow and alder trees were planted along rechanneled portions of Clear Creek to provide shade. Three mines have been plugged and the mining effluent has been rechanneled away from the creek.

Due to the importance of this habitat for spawning and rearing chinook salmon, we have coordinated all enhancement efforts with ODFW. Spawning surveys for spring chinook salmon report an average of 11.0 redds per mile, and counts of summer steelhead average 9.0 redds per mile. This portion of the creek has a potential to exceed 50 redds per mile if historical habitat conditions can be duplicated. The Forest Service is in agreement with ODFW that this can only occur if riparian vegetation is reestablished and more woody material is introduced into the system.

The project proposal for 1991 was to pull dredged mining material away from the streambanks to reestablish the floodplain and accelerate riparian recovery. Mature willow and alder plants were transplanted with an excavator in the widened streambanks. Willow gathered from this area last year is being propagated in our nursery and will be transplanted this spring. Wood was added to existing pools to provide hiding and rearing cover. Wood was placed to intercept bedload material during runoff and to help rebuild eroding banks. Wings were added to existing log weirs to constrain the water at high flow and dig out the pools.

## OBJECTIVES

1. Increasing the pool diversity by adding woody material to existing pools.
2. Increasing the riparian area by pulling back mining dredge piles from the streambank.
3. Increasing the stream surface shade and reduce stream temperature by planting riparian hardwoods.
4. Protect structures by resetting and securing rocks on the end of the weirs.

## PROJECT DESCRIPTION

Final scoping and several field inspections were conducted in the spring of 1991. Plans were finalized and areas where habitat enhancement was needed were designated. Structure sites were staked on the ground, and the amount of material necessary for construction was estimated.

The excavator started in July reworking existing structures. Wings were added to the structures to provide additional habitat. The wings will provide a deeper upstream pool and keep the pools below the weir dug out. Large wood and rootwads were added to the pools to provide hiding cover. Large wood was placed in the floodplain to trap sediment and promote riparian revegetation. The excavator pulled mining debris away from the channel to promote establishment of streambank vegetation.

The Hilti crew followed the machine downstream and used the Hilti cable method to secure all structures. All disturbed areas and low vegetation areas were seeded with a riparian seed mixture. The road to this area has been permanently closed.

## ACHIEVEMENTS

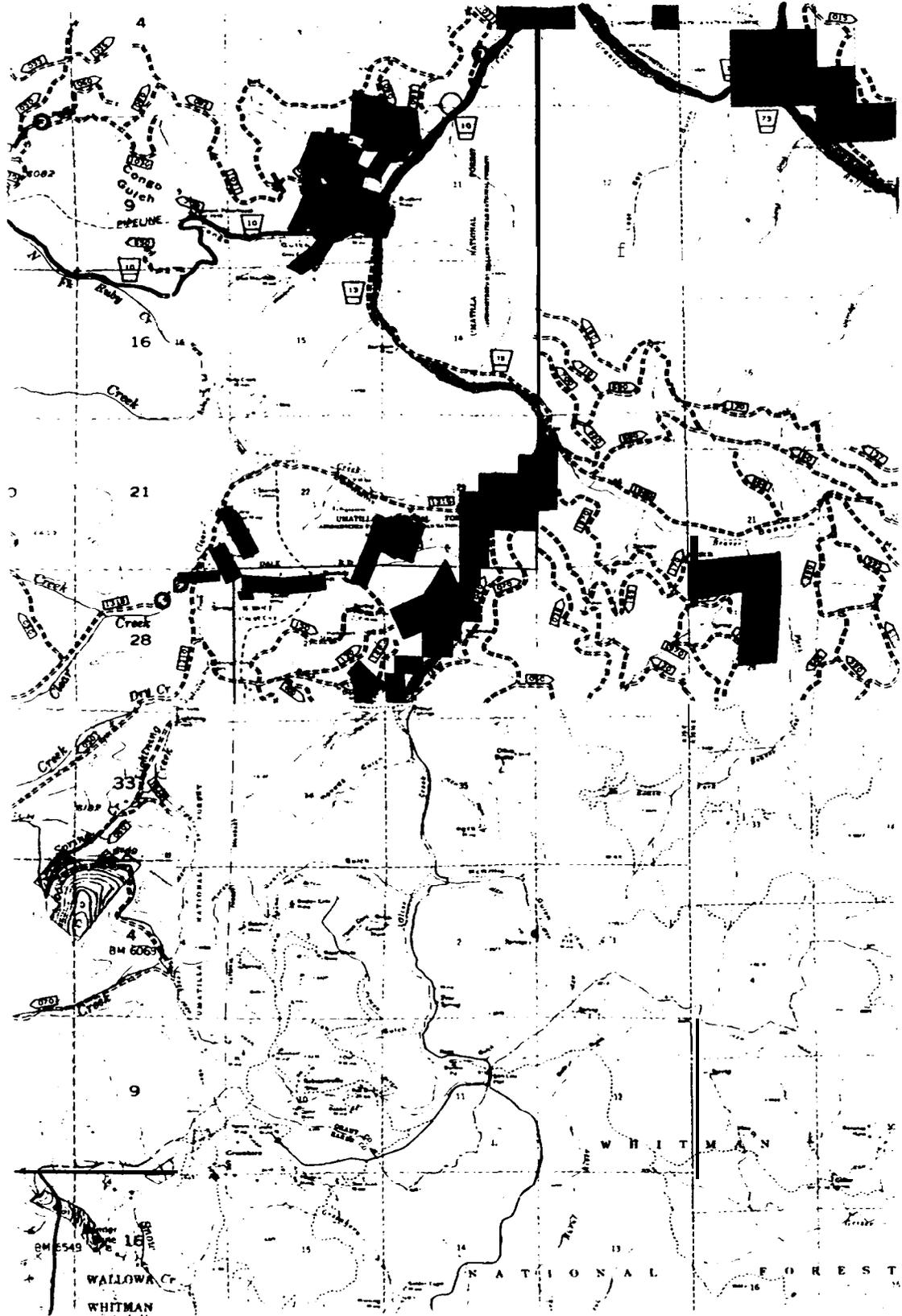
Additional floodplain was recreated along 1.5 miles of Clear Creek. Earlier structures were reworked to add 54 rootwads and other wood to pools as hiding cover. Seventy-one weir wings were constructed to keep pools excavated by high flows. Large wood was pulled into the channel and riparian area to trap sediment, provide instream habitat and to promote revegetation.

Table 4. Summary of the Clear Creek Project

Structures	1979-1990	1991	Total
Rock Weirs W/ Pools	0	0	0
Log Weirs W/ Pools	82	0	82
Sills	0	0	0
Deflectors (Log & Rock)	13	1	14
Instream Logs	0	0	0
Rootwads	0	54	54
In Pool Boulders	300	0	300
In Stream Boulders	600	0	600
Adult Holding Pools	10	0	10
Side Channels	0	0	0
Side Channel Lengths	0	0	0
Cuttings Planted	100	0	100
Cubic Yds Spawning Gravel Placed	8000	0	8000
Mine Plug	3	0	3
Mine Diversion	4	0	4
Bogs Created	1	0	1
Wings Added to Weirs	0	71	71
Flood Plain Improvement (miles)	0	1.5	1.5

# CLEAR CREEK

## 199 1 FISH HABITAT ENHANCEMENT PROJECT



INTRODUCTION

The Big Wall Creek project is located on the Umatilla National Forest in T7S, R26E, sections 29, 30, & 32 in Grant County. Big Wall Creek is a tributary to the North Fork John Day River. The stream produces summer steelhead. Oregon Department of Fish and Wildlife officials believe that there may still be a remnant of a Chinook salmon run in the lower reaches of the creek, downstream of the National Forest boundary.

A Hankin and Reeves physical stream survey was done in 1989, and identified deficiencies in both the quantity and quality of pool habitat on Big Wall Creek. High water temperatures and a lack of large wood in the stream were also noted to be limiting production of juvenile summer steelhead. The stream survey showed that the portion of Big Wall Creek running through Forest Service land has only 5% pool habitat. Water temperatures ranged from 54 degrees F to 74 degrees F. The survey recorded 312 pieces of large wood per mile. Several years of drought conditions have had an effect on Big Wall Creek. Entire stretches of the creek dried up in 1990. The need for instream structures which could intercept cool subsurface flows, and concentrate them into pools to provide rearing habitat for juvenile steelhead, that lasts through the hot dry summers was apparent.

Analysis of the stream survey data, discussions with the Oregon Department of Fish and Wildlife (ODFW), and field inspections led to the selection of the project site. The instream construction began at the upper limits of where anadromous fish are known to exist, and worked downstream from there to the Forest boundary and the end of the Big Wall Project. In addition to a need to improve pool habitat, there were opportunities to add more cover by placing rootwads and woody material in the stream, to correct some unstable streambank conditions by using rock and log deflectors, and to increase the amount of spawning gravel by designing the structures to catch bedloads.

In 1988, two test weirs (K weirs with log wings) were constructed, in Big Wall Creek, a short distance downstream from the mouth of Wilson Creek. In 1990, additional enhancements were constructed, similar to the two test weirs of 1988. Most were pool-forming hard structures, woody material, and stream bank protection devices. Many adult steelhead have been observed in the pools on their way upstream to spawn. Spawning gravels have collected at the tailouts of the pools, and large deposits of bedload have built up on the upstream sides of the wings. Willows are head-high and other riparian vegetation is beginning to appear on what was formerly a dry, rocky streambed.

In 1991. the stream enhancement project work continued, creating structures that withstand high flows while providing excellent pool habitat and stream bank rehabilitation. Another phase of the 1991 project was to construct a fence along a portion of Big Wall Creek to exclude cattle from the riparian area. An allotment boundary fence was already in existence on the north side of the creek which runs from the Forest boundary upstream to just above the mouth of South Fork of Wall Creek. The new fence ties into this existing fence and runs up the south side of the stream until it hits the private land at the mouth of Wilson Creek. Another section of fence continued up Big Wall Creek and excluded the entire anadromous portion of the stream from livestock grazing, with the exception of the piece of private land in the middle. ODFW is still working with the private landowners to finish this final section of fence.

The original fence contract was awarded in late fall 1990, but due to adverse weather conditions, all fencing projects took place in 1991.

#### OBJECTIVES

1. Increase juvenile steelhead rearing habitat by constructing pool-creating structures to improve the previous level of 5% pool habitat.
2. Expand the diversity and complexity of the stream by increasing the amount of woody material in the stream.
3. Stabilize streambanks by using deflectors to control bank erosion and allow vegetative recovery to begin.
4. Increase both the size and quality of anadromous fish spawning areas by installing structures designed to retain bedload gravels.
5. Improve riparian vegetative condition by controlling livestock distribution in the riparian area by constructing a fence.

#### PROJECT DESCRIPTION

Project activities began in the spring of 1991 with scoping and analysis of the proposed work area. Restoration opportunities were identified and specific methods of correcting habitat deficiencies were proposed. Plans were finalized, structure design and layout were completed, and prework conditions were documented. Rock source and rock dump sites were selected, and fueling sites and access roads were staked on the ground. The equipment rental contract was awarded in April and work started in Big Wall Creek on July 9, 1991 with the rock haul portion of the project. The instream work began on July 15, 1991. The excavator moved out of Big Wall Creek on July 30, 1991.

The excavator was brought in to load trucks at the Kinzua rock pit. There were also two dump trucks involved in the rock haul and a track loader that was used to move rock from dump sites to weir sites since the road did not directly parallel the sites. Upon completion of the rock haul, the excavator was then moved to the south end of the Big Wall Creek project to start the instream work. There was a lot of bedrock along this portion of the project, as was the case with the majority of the project, and some sites that were staked had to be relocated to accommodate a pool-forming structure or an enhancement.

Throughout the course of the contract, the excavator was also used to clean up work sites and close any access roads. Grass seed was spread over all access roads and areas where ground disturbance had taken place. Crews returned to Big Wall Creek during July and September to finish cabling all new structures together. and to complete photo documentation of the project.

The primary objective on the Big Wall Creek project is to increase the number and depth of pools. However, of equal importance is the need to improve the overall condition of the entire riparian area. This year's project concentrated as much on stabilizing raw and eroding banks with rock and log deflectors as it did on building pool-forming weirs. The weirs were constructed where breaks in the bedrock allowed the opportunity to do so. They are mainly rock weirs and log weirs, all with rock wings, which have proven their ability to intercept subsurface flows, maintain high quality pools, and provide thermal refuges for juvenile steelhead throughout the hot summer months. Measurements were taken throughout the summer showing a vast temperature difference between riffles and pools. Readings taken in one of the newly constructed pools showed pool temperatures 10 to 20 degrees cooler than the preceding riffle.

Downed logs and woody material were pulled into the riparian area wherever possible to help stabilize the ground, deter livestock from trampling the stream banks, and to provide streamside cover. Rootwads were placed in all of the pools to increase instream hiding cover. One old side channel was blocked to low flow conditions and to expedite rejuvenation of vegetation in the old channel. There were also 4 existing pools that were enhanced by adding whole trees along the rock wall of the pool for habitat and shade purposes.

Another objective was to increase spawning habitat by retaining bedload gravels. The structures were designed and placed in the stream in locations that would catch bedload gravels during high flows and eventually provide added spawning habitat.

The District range conservationist met with the permittees and agreed on a location for the fence during August. The fence location was flagged on the ground, and contract specifications were written. The contract was awarded in the late fall 1990, but was then cancelled because adverse winter weather had stopped the possibility of construction. It was re-awarded in the spring of 1991. and construction took place during October and November.

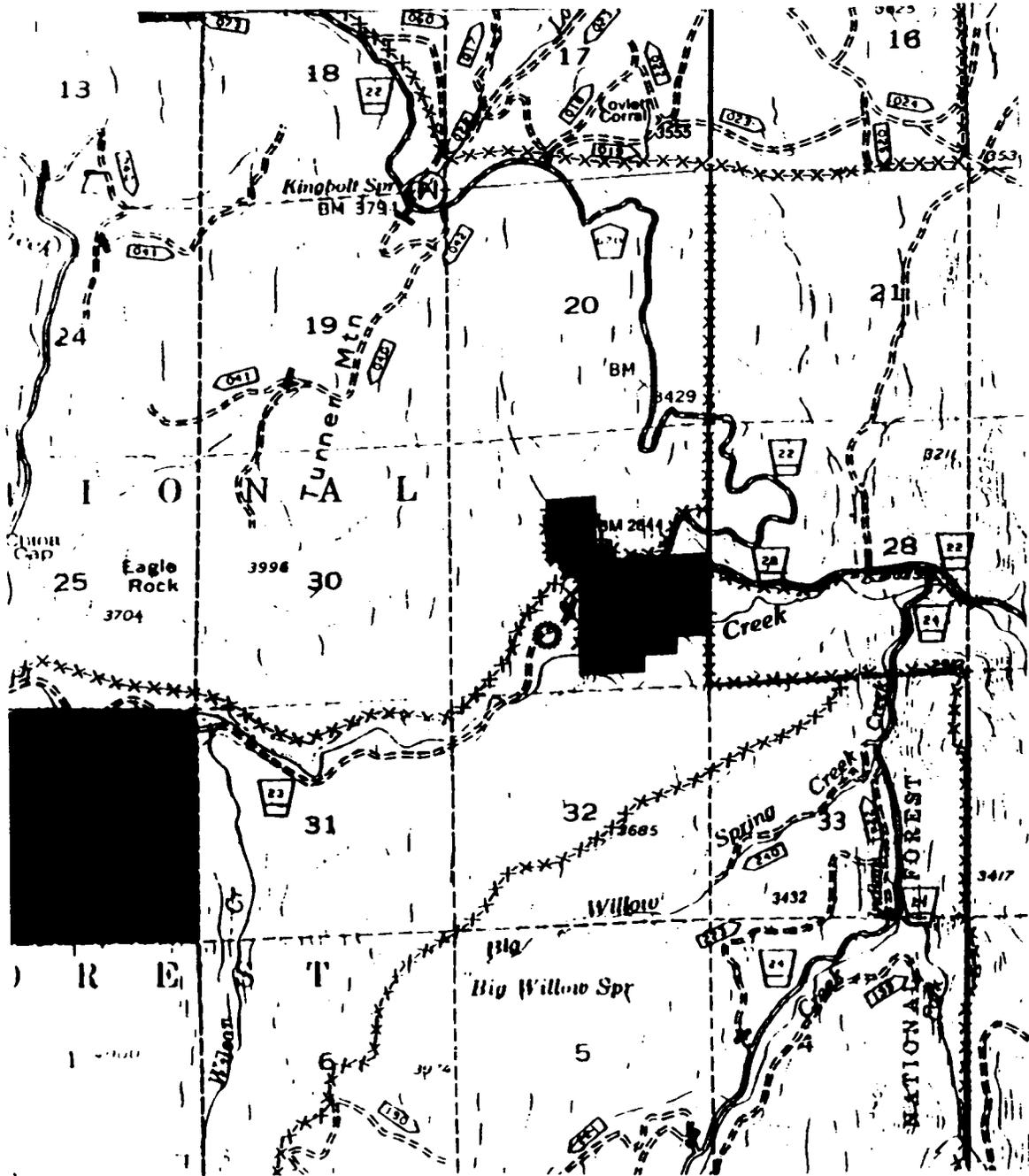
#### ACHIEVEMENTS

Stream enhancement work took place over a 1.7 mile section of Big Wall Creek. A total of 14 pool-creating weirs were constructed, which has now brought the percentage of pool habitat within the treated reach to an optimum level for this stream. These pools will provide thermal and hiding cover, and the addition of 17 rootwads placed in the pools and in the streambed will provide habitat diversity for juvenile steelhead. New spawning areas will be formed at the pool tail-outs as well as upstream of the weirs. Eroded streambanks have been reinforced with 7 rock or log deflectors. one side channel has been closed to low flow conditions, and 10 pieces of large wood have been anchored within the riparian area. These things, in addition to the construction of the fence this year and changes in grazing strategies, will allow vegetative recovery to begin.

TABLE 5: SUMMARY OF BIG WALL CREEK PROJECT TO DATE

Structure	1988	1990	1991	Total
Rock Weirs w/ Pools	0	19	6	25
Log Weirs w/ Pools	2	20	5	27
Sills	0	3	3	6
Deflectors (log & rock)	0	18	7	25
Instream Logs	0	16	10	26
Rootwads	0	37	17	54
Debris Jam Bypass	0	1	0	1
Side Channels Closed	0	3	1	4
Total Structures:	2	117	44	168

BIG WALL CREEK 1991  
Stream Enhancement Project  
Heppner Ranger District  
Umatilla National Forest



T7s, R26E  
Sections 29, 30, 32

SUBPROJECT If - RIPARIAN FENCE: WILSON CREEK & WALL CREEK

The 1991 Riparian Fence project is located on the Umatilla National Forest in T7S, R26E and T7S, R27E. The fence project excludes livestock from the Wilson Creek riparian area and the Big Wall Creek riparian area. There are four separate sections of fence constructions and all have a unique contract number.

The Wilson Creek fence is comprised of two sections, one on either side of the riparian area. This completely excluded the riparian area from the bottom of Wilson Creek at its confluence with Big wall Creek to the Wilson Pasture / Wildcat Pasture Division Fence. A fence on the south side Big Wall Creek was constructed in two phases also. The lower and upper Big Wall Creek fences joined with private land division fences to completely enclose the Big Wall riparian zone.

The Wilson Creek and Big Wall Creek drainages have been sites of extensive instream rehabilitation work for the past 5 years. The project has been jointly funded by BPA and the Forest Service. The stream is an important steelhead spawning and rearing stream. The rehabilitation work has centered around structures that intercept cool subsurface water and keep pools available for juvenile rearing habitat throughout the hot and dry summer months. Wilson Creek and Big Wall Creek have historically had very high summer water temperatures and low water flows. Long stretches of the creeks often dry up completely. The watersheds have also been adversely affected by logging and livestock grazing through the years.

Direction of the new Forest Land and Resource Management Plan emphasizes stringent protection standards for riparian areas through changes in land management practices. It has been recognized that one very necessary step to achieve riparian recovery in the Wilson and Big Wall Creek drainages will be to reduce the amount of damage caused by livestock grazing.

OBJECTIVES

The overall project objective is to increase the rate of riparian recovery in Wilson Creek and Big Wall Creek drainages by:

1. Improve riparian vegetative conditions by controlling livestock grazing on Wilson Creek and Big Wall Creek drainages through the construction of 13.5 miles of fence.
2. Improve stream shading by allowing shrubs to grow in an environment of decreased grazing pressure.

## PROJECT DESCRIPTION

The Wilson Creek riparian fence, comprised of a total of 8.4 miles of fence, is in two parts. Both are almost exactly equal in length, mirror images of one another. The east side of the Wilson Creek fence was constructed above road 2128 and allows ready access from road to creek. The west side of Wilson Creek fence follows the contours of the stream uphill of the riparian zone and divides the Wilson Pasture exactly in half.

The Big Wall Creek fence is also constructed in two portions, the upper and the lower Big Wall Creek fence projects. The upper fence is 2.85 miles in length and parallels south of Big Wall Creek down to a private allotment. The lower Big Wall Creek fence travels for 2.25 miles from the same private allotment down to the forest boundary. Both sections parallel the northern boundaries of the Happy Jack and the Wildhorse Pastures within the Tamarack & Monument Allotment.

## ACHIEVEMENTS

A total of 13.5 miles of fencing was constructed in 1991. This fence completely excludes the riparian zones of Big Wall Creek and Wilson Creek from livestock grazing. The riparian zones will be rested for 3-10 years for rehabilitation of stream banks and vegetation along both systems. Three cattle guards were also installed. All three cattle guards were located along the south side of Big Wall Creek.

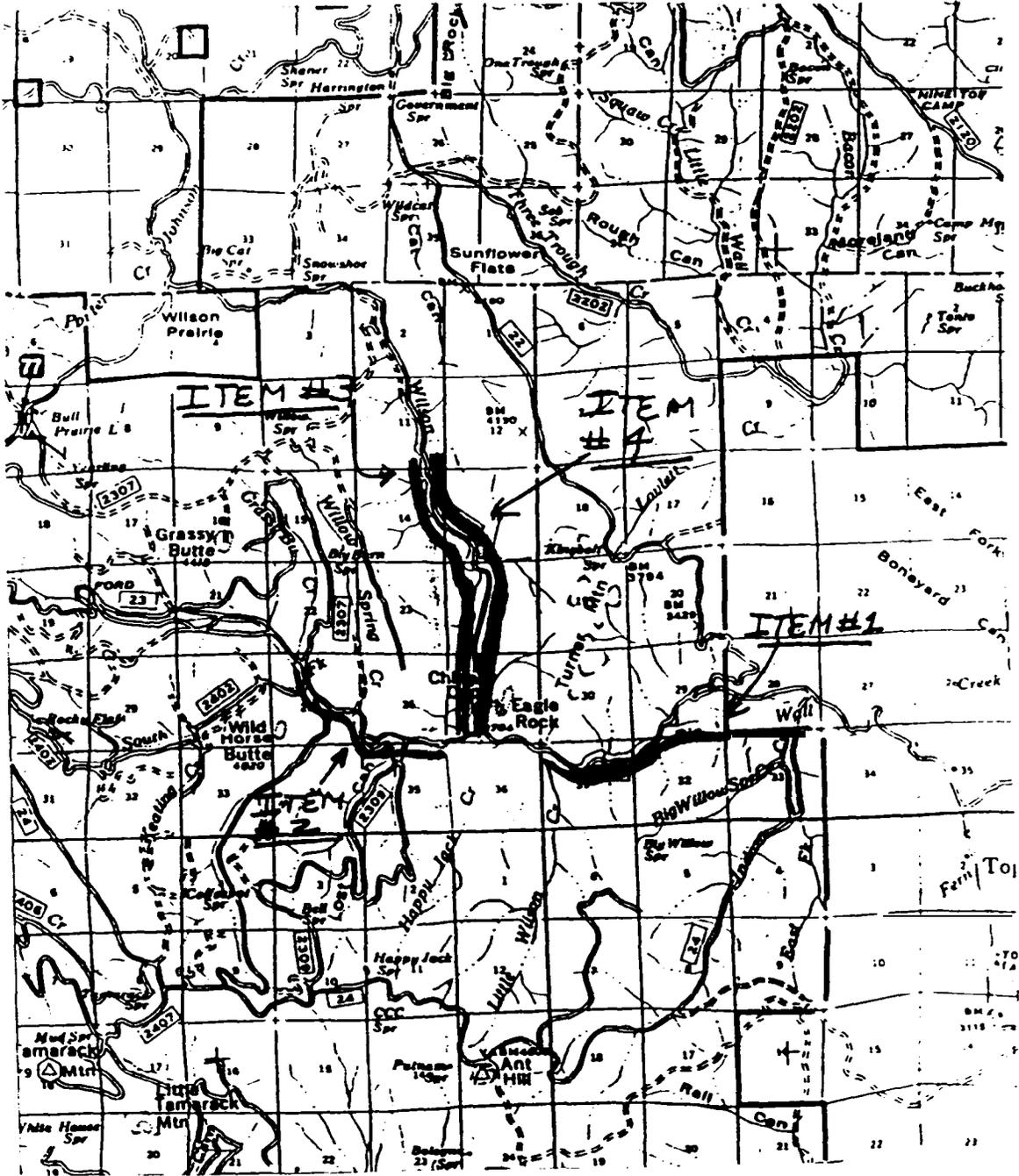
An objective of the stream enhancement project is riparian recovery. To achieve the desired future conditions within the riparian systems, substitute water sources within grazing allotments have to be established and maintained. In the 1991 field season, the excavator contracted for fish enhancement projects on the Heppner District performed maintenance on eight range ponds. The maintenance included repair of dikes, removal of silt, and enlargements of total area. Please see attachments for exact locations of range ponds.

TABLE 6 : RANGE PONDMAINTENANCE

Total Ponds Maintained: 8

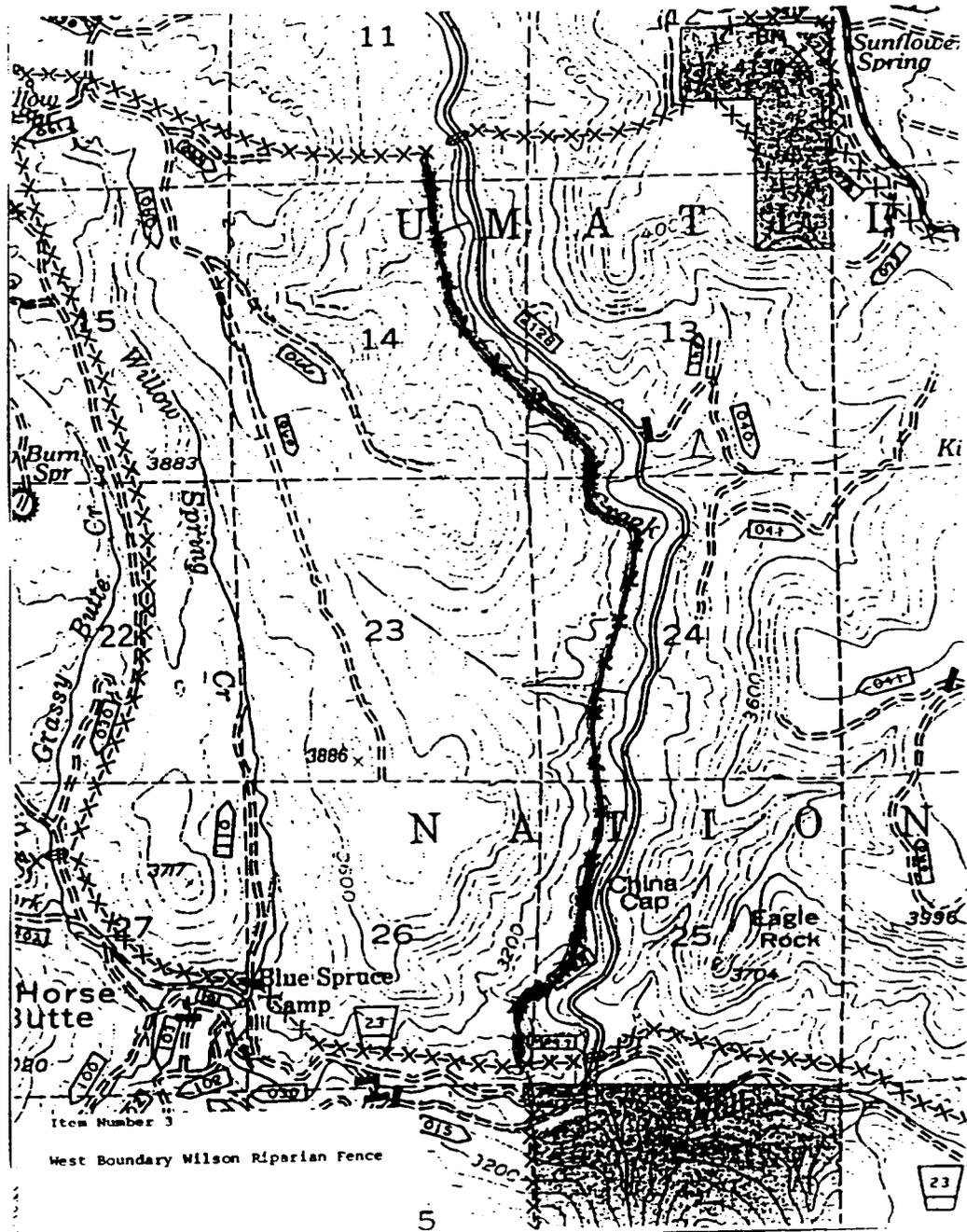
<u>Location Number</u>	<u>Pond Name</u>	<u>Location Legal</u>
#55	West Knob	7S, 27E, Sect 18
#29	Horse Corral	7S, 26E, Sect 14
#41	Bed Ground	7S, 26E, Sect 15
#43	Big Pine	7S, 26E, Sect 16
#59	E. Fort Wildcat	7S, 26E, Sect 12
#32	Kingbolt	7S, 27E. Sect 19
#36	Old Corral	7S, 27E, Sect 20
#13	Head Water Spr.	7S, 26E. Sect 20

Riparian Fence Project 1991  
Expanded View of Entire Project Area  
Heppner Ranger District  
Umatilla National Forest



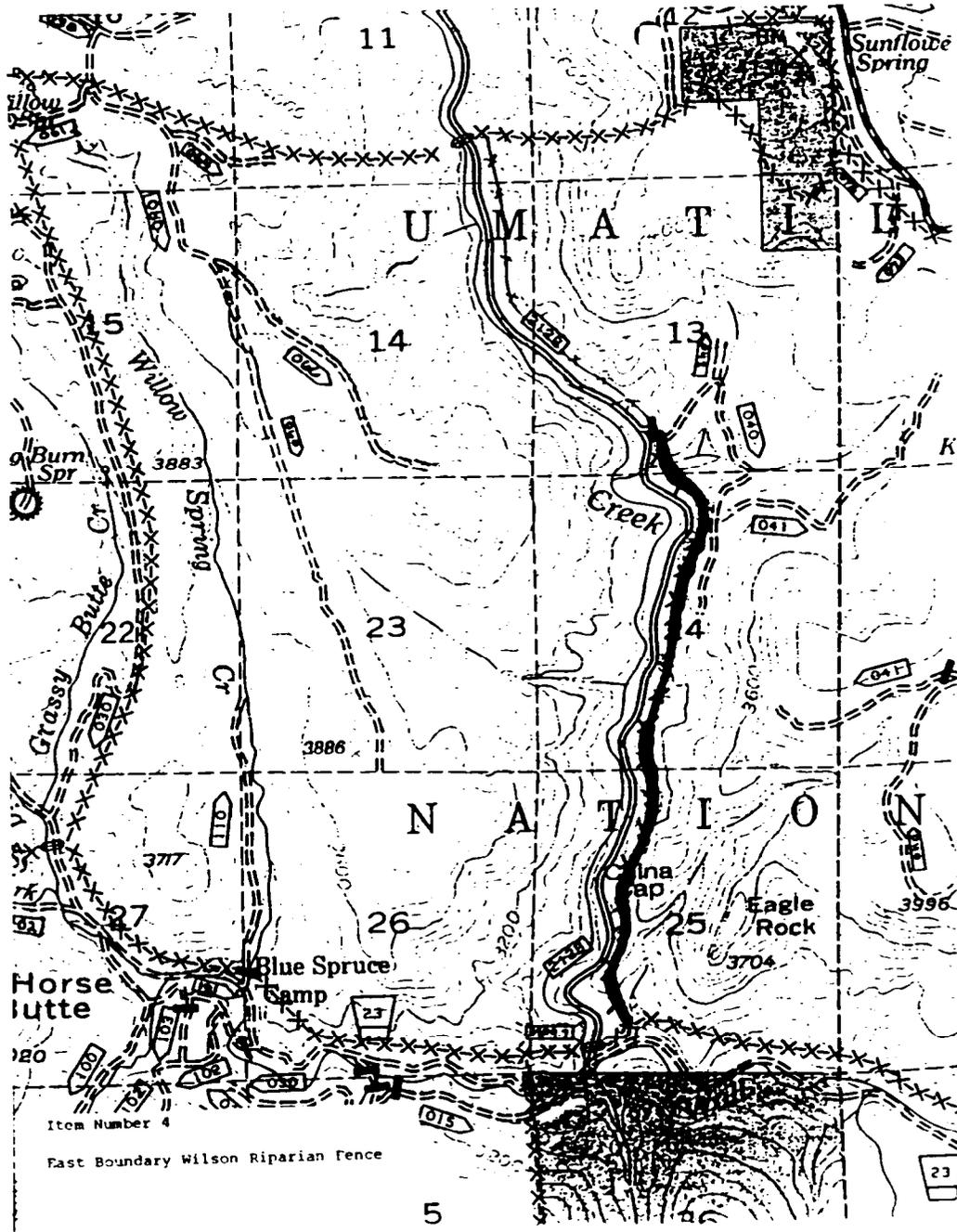
Maps and locations of individual subprojects are attached. Subprojects #1, #2, #3, and #4.

Wilson Creek 1991  
Riparian Fence Project  
Heppner Ranger District  
Umatilla National Forest



T7S, R26E  
Sections 11,13,14,24,25,26

Wilson Creek 1991  
Riparian Fence Project  
Heppner Ranger District  
Umatilla National Forest

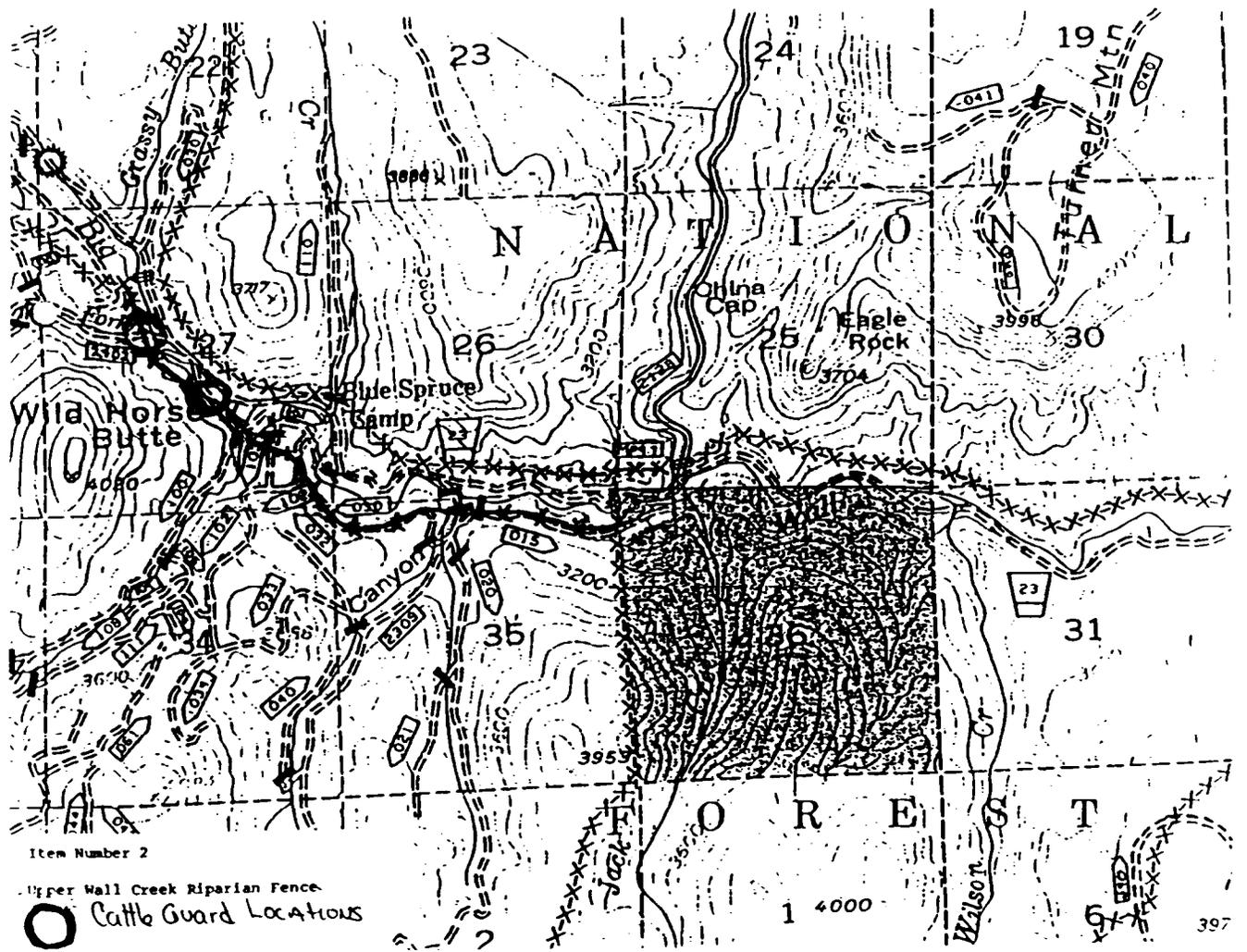


T7S, R26E  
Sections 13,24,25

Big Wall Creek 1991  
Riparian Fence Project  
Heppner Ranger District  
Umatilla National Forest



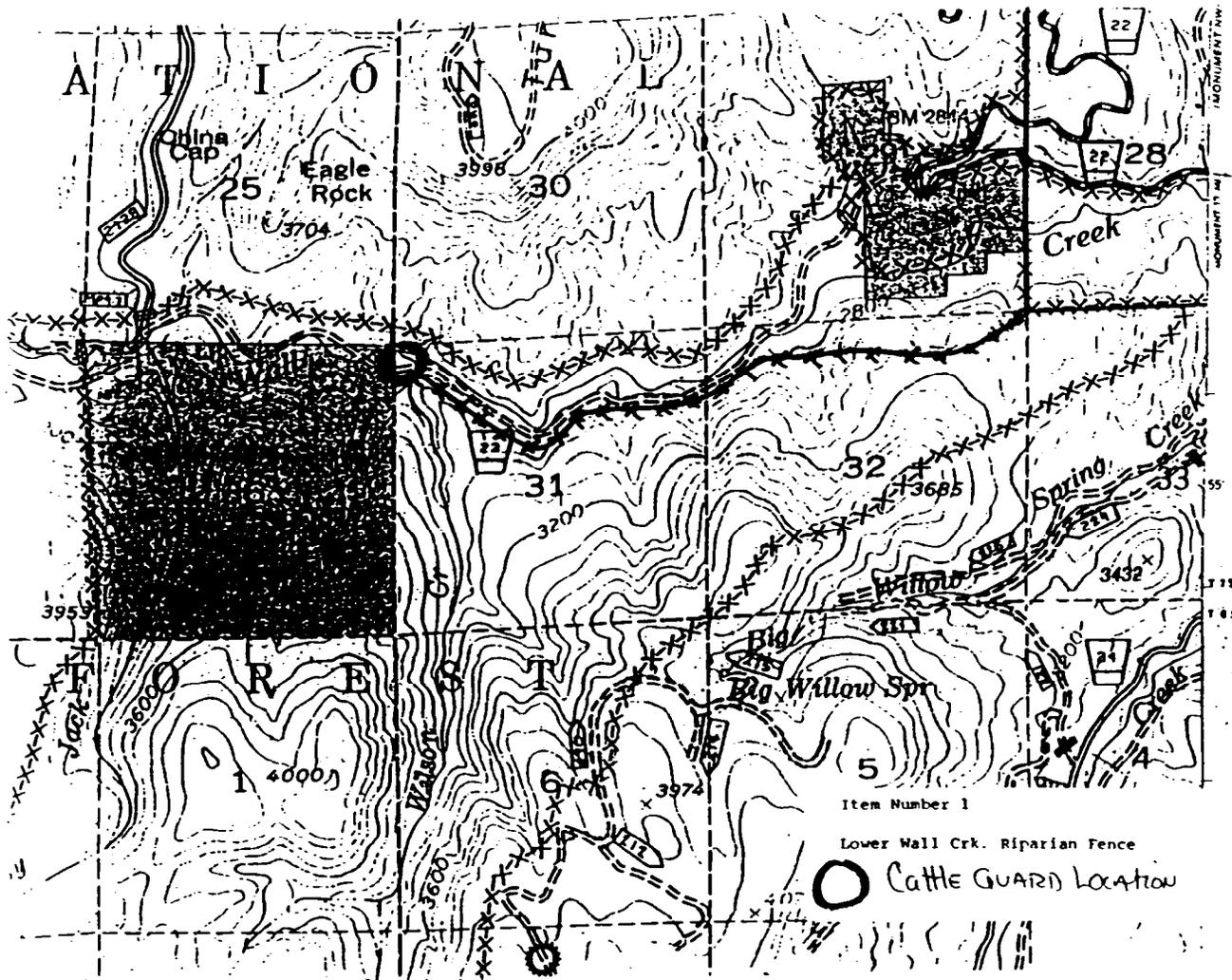
T7S, R26E  
Sections 27, 34, 35



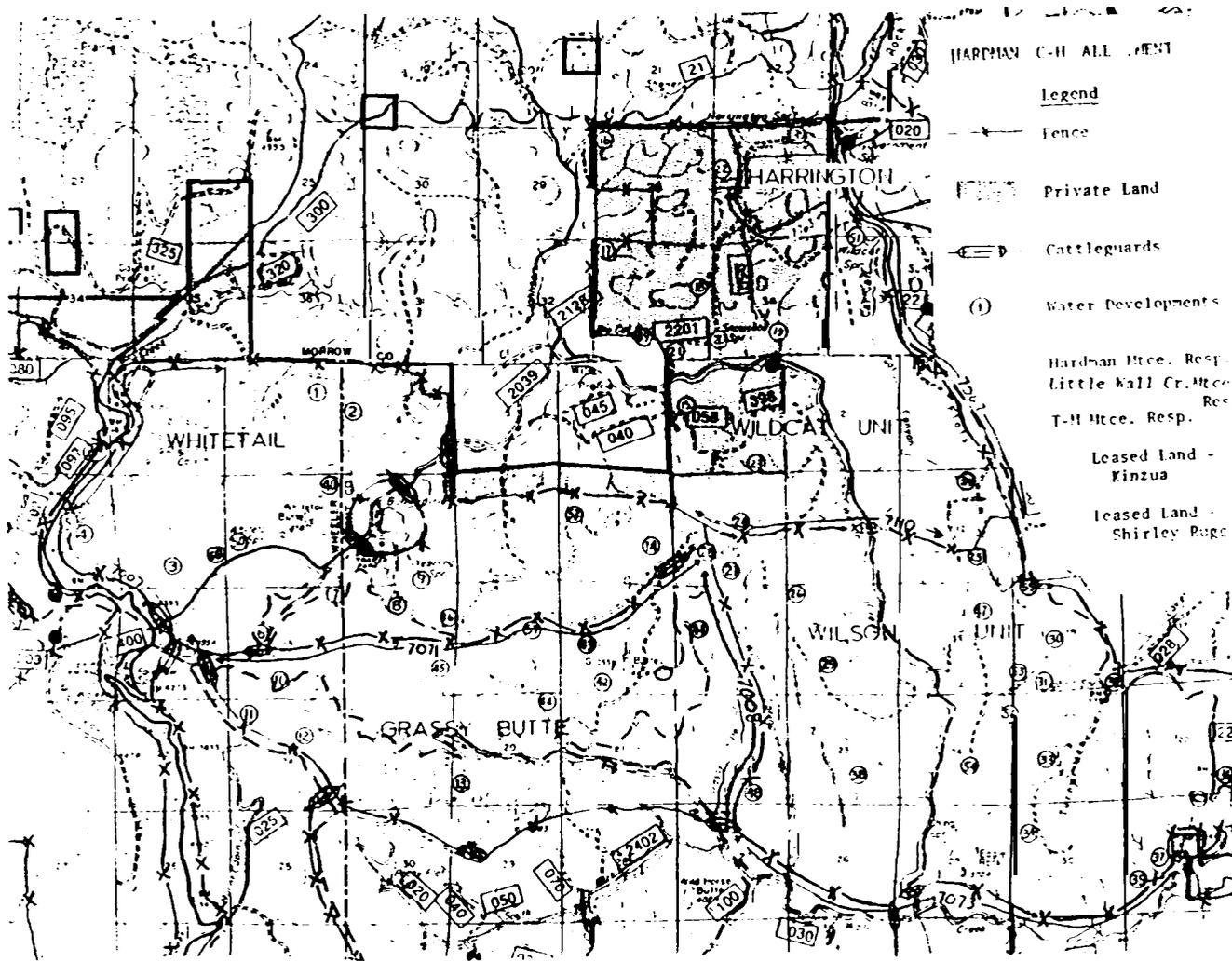
Big Wall Creek 1991  
Riparian Fence Project  
Heppner Ranger District  
Umatilla National Forest



T7S, R27E  
Sections 31,32



Big Wall Creek 1991  
 Wilson Creek  
 Riparian Fence Project  
 Range Pond Maintenance  
 Heppner Ranger District  
 Umatilla National Forest



Location Legal Descriptions - See Table 6



Preconstruction view of a riffle in Big Wall Creek, Note the absence of adequate pools, woody material, and instream boulders.



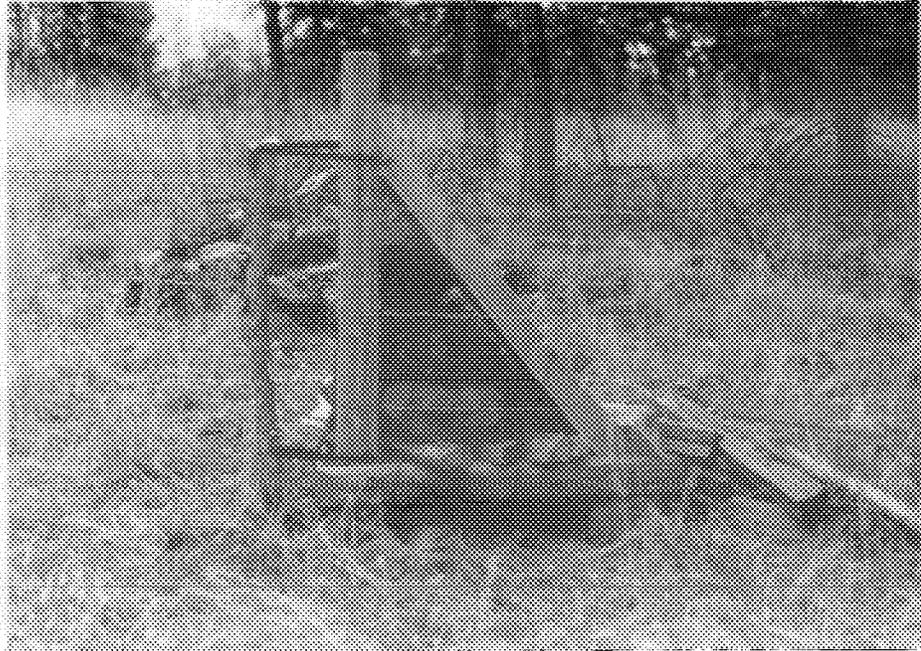
**A post construction view of the previous stream** segment. A pool-creating log weir with rock wings has been constructed. Note the addition of a rootwad for hiding cover.



Pre-construction view of an existing pool on Big Wall Creek. Note the lack of cover and shade.



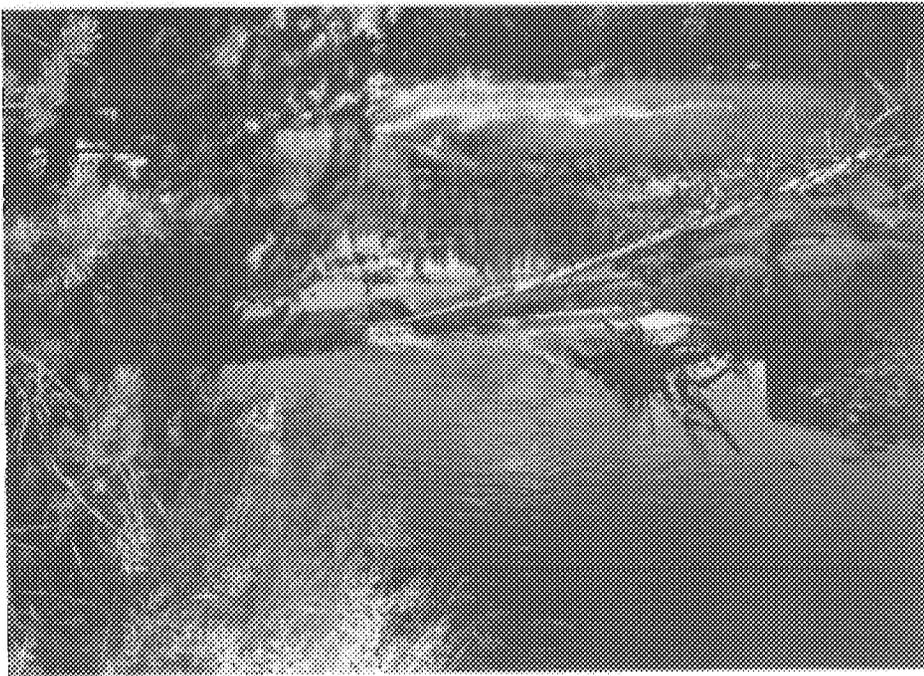
The same site following the addition of large wood to existing pool. Two whale logs and rootwads have been cabled to the rock wall and provide quality hiding cover and shade for juvenile fish.



Riparian fence segment along Wilson Creek. This is an access gate and its corresponding rock anchor points.



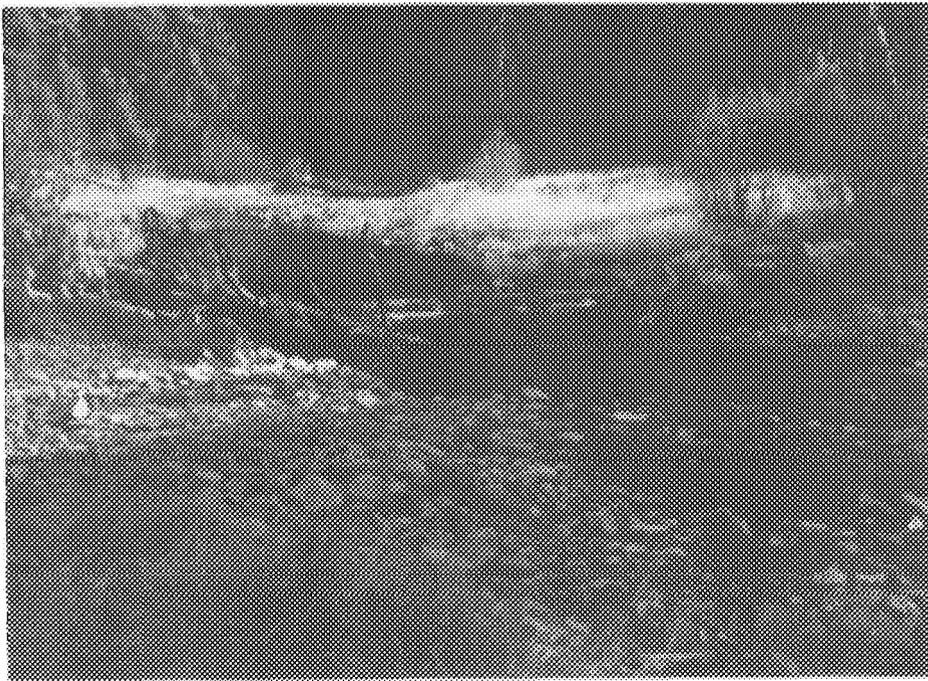
The spider excavator maintaining a rock weir on Wilson Creek. The weir failed to function as designed and was reconstructed to enhance its ability to maintain pool depth. A rootwad was also added to this pool.



Log weir with excavated pool below. Rootwads and small wood will provide hiding cover in pool on Camas Creek.

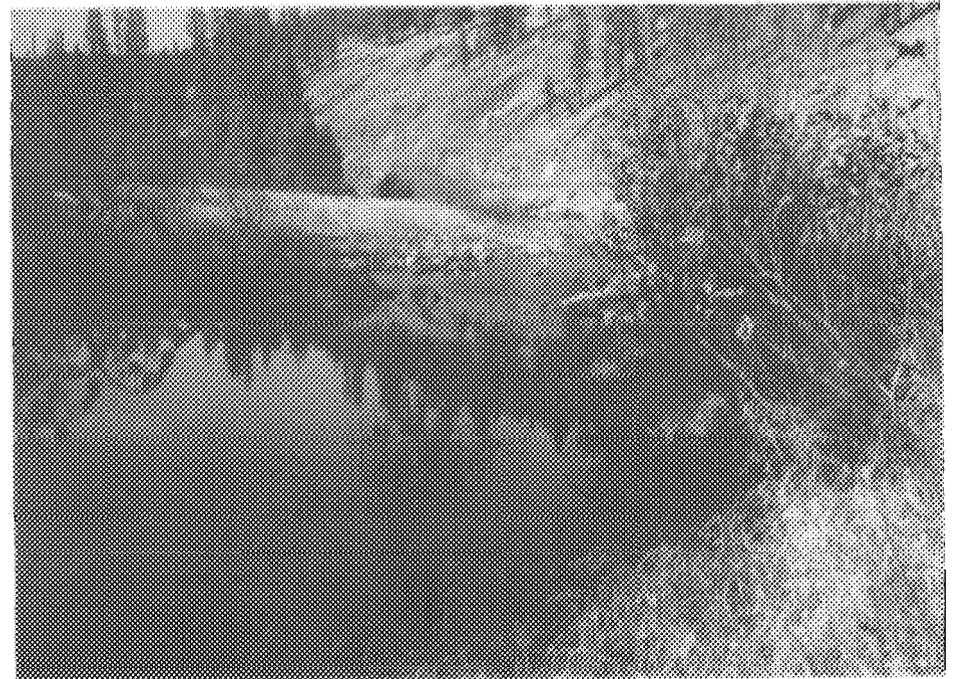
Large wood used to block eroding bank. Instream habitat was diversified by the addition of boulders and wood.





Post construction view of log weir in Camas Creek. Large wood was used in the pool to provide instream fish habitat. Wood was placed along the streambank to collect sediment and to promote stream channel narrowing.

Pool habitat provided by the weir. Overhanging banks provide additional cover.





Excavator starting to rework weir on Clear Creek.  
Note the lack of cover and shade.

Completed weir with wings built onto it to keep pools dug during high flow. Woody material was added to the pool to provide hiding cover for salmon and steelhead.





Excavator pulling back dredge pilings, created by previous mining activity, to create additional floodplain for Clear Creek. The additional floodplain will collect silt and grow vegetation. This will help shade the creek and provide nutrients to the stream system.



## SUBPROJECT IIIa - STRUCTURE MONITORING

### INTRODUCTION

Physical monitoring of BPA funded project work began in 1989 and continued through 1991. A two-person monitoring team went to each project site on both districts and collected data from a representative sample of the work completed.

This year's monitoring indicated that structures were, for the most part, unchanged from last year. The exception was Lane Creek in which 22 of the 35 structures were either damaged or blown out. It appeared that a large debris jam in the narrow canyon above the structures had been caused by a wind storm during the previous winter. During the spring run-off the jam had dammed water and blown out, causing the damage on the Lane Creek structures below. The structures on all other creeks remained stable during average rainfalls and light spring run-offs. Structures in need of maintenance were identified. Results indicate that structures which had been properly cabled remained secure. Structures built before the Hilti cable method was used had changed function somewhat over time.

### OBJECTIVES

1. Identify physical changes occurring to structures over time so that design changes can be implemented to improve the strength and effectiveness of future structures.
2. Monitor structure effectiveness for increasing fish production by evaluating pool habitat.
3. Survey a representative number of structures at each project site to give collective information of the total project.

### PROJECT DESCRIPTION

Physical structural monitoring was done at 5% of the instream structures which have been built in previous years. Measurements taken at each structure included:

1. length, width, maximum depth of pool, and depth at pool tail crest;
2. air and water temperature;
3. stream flow.

Two photographs were taken of each structure. A new sketch was drawn in those cases where the structure had changed naturally, had been modified during maintenance. or had been reconstructed in last fiscal year.

The condition of cover within the pool was recorded. Riparian habitat condition, percent of stream area shaded, and bank stability were also noted. In addition, water temperature and discharge were recorded for each stream surveyed.

## **ACHIEVEMENTS**

The team monitored structures in twelve creeks on the North Fork John Day and Heppner Ranger Districts in 1991. They were the North Fork John Day River, Fivemile Creek, Desolation Creek, Bear Wallow Creek, Hidaway Creek, Clear Creek, Lane Creek, Rancheria Creek, Camas Creek, Little Wall Creek, Wilson Creek, and Big Wall Creek. Sixty of the 1000 plus structures which have been completed over the last several years were monitored in 1991. Physical monitoring was reduced this year from 10% to 5% of the total structures, because of additional monitoring emphasis placed in other areas such as vegetation utilization. The effectiveness of each of these structures is now known and changes can be made to create more effective structures. Maintenance needs have also been identified through this monitoring procedure.

## SUBPROJECT IIIb - RIPARIAN SHRUB MONITORING

### INTRODUCTION

Utilization monitoring was initiated this year to determine the degree of ungulate utilization on riparian shrubs. In the past, riparian vegetation utilization has been mainly done by the Range program and the emphasis has been on grasses and grass-like plants. The new Forest Plan Standards and Guidelines will place emphasis on shrubs within the riparian areas.

This year's program began from square one. since no publications or other shrub utilization programs could be found to emulate. After several weeks of coordination and trial and error by specialists from the two district Range, Wildlife and Fisheries Departments and the Forest Botanist, an acceptable program was developed.

### OBJECTIVES

1. Verify shrub utilization to ensure compliance with the Forest Plan.
2. Identify levels of past and present utilization.
3. Inventory all species age classes and numbers of shrubs within survey area.
4. Identify abundance or lack of species in a riparian area.

### PROJECT DESCRIPTION

Surveys were conducted in grazing allotments which contain streams that have been sites of instream structural work funded by BPA. No prior inspection of units was done before choosing the survey sites. Survey areas were all determined to have good accessibility to cattle and game animals. The surveys were conducted in the center portion of grazing units, in open areas away from boundary fences to prevent unreliable figures at bottle-neck areas such as fence lines. Survey length was between 1000 feet and 1500 feet.

The data recorded on each tagged shrub included: leader counts, utilized leader counts. historic utilization, height, width, age, and alpha code of each shrub. Only one shrub was monitored per station with a total of thirty shrubs in each survey area.

When thirty shrubs had been surveyed, the average utilization percentage, height, age, and historic utilization for those shrubs was calculated and recorded in the utilization survey summary.

## ACHIEVEMENTS

Monitoring was completed on four creeks in five different locations on the Heppner and North Fork John Day Ranger Districts in 1991. The creeks included Fivemile Creek, Taylor Creek, Swale Creek, Little Wall Creek, and two locations on Wilson Creek. Four of the five locations exceeded the Forest Plan Standards and Guidelines of forty percent utilization, and ranged from fifty-six to seventy-eight percent shrub utilization. Cattle were moved early from two of the Heppner Ranger District units when this utilization information was provided to the Range Conservationist.



Monitoring team measuring pool parameters for physical survey of fish enhancement structures.

Measuring utilization of riparian shrubs in cattle allotment. Plants were monitored through the summer to look at livestock utilization.



## SUBPROJECT IVa - MAINTENANCE: LITTLE WALL CREEK

### INTRODUCTION

The Little Wall Creek project is located on the Umatilla National Forest in T6S, R27E, Section 32 and T7S, R27E, Section 4, one third in Morrow County and two thirds in Grant County. Little Wall Creek is a tributary of Big Wall Creek, which in turn flows into the North Fork John Day River. The stream produces summer steelhead.

The original stream enhancement project began in 1986 and continued through 1989. A total of 78 structures were constructed and a number of other miscellaneous riparian enhancements also took place. Due to the absence of an adequate structure securing system such as the Hilti cabling systems, failure was experienced to some degree along the entire course of the project. Now that the Hilti system is in use on other projects, we are finding that failure is less common and maintenance on the structures is minimal. There is still some degree of failure in high flows, but the percentage has been drastically reduced.

In past years, construction had taken place in large quantities, but these early structures were not cabled. In addition to some reconstruction of weirs, the 1991 maintenance program included funding to cable the entire Little Wall Creek project.

### OBJECTIVES

1. Maintain the desired function of all instream structures by redesigning and reconstructing structures that did not function as planned.
2. Reconstruction of structures lost to failure.
3. Maintain the integrity of strong functioning fish habitat structures by securing the weirs with the Hilti cable method.

## PROJECT DESCRIPTION

Project scoping and final plans for project maintenance were completed in the spring of 1991. The amount of material needed was estimated for each structure and the locations for the work were flagged on the ground.

Maintenance began on Little Wall Creek in July of 1991. The spider excavator completely reconstructed 4 weirs and repaired 22 structures. Of the original 77 structures that were present in the spring of 1991, 46 needed no repair or alterations. Woody material was also added to structures that were deficient in hiding cover and large wood was placed in the riparian zone. In the spring of 1991, 500 willow cuttings were planted. This enhancement was outside the realm of the present BPA contract and was funded by another source.

Securing the structures in Little Wall Creek took place in the fall of 1991. This stream has been on the backlog list for a number of years and is now one hundred percent cabled and secure.

## ACHIEVEMENTS

Maintenance took place on all weirs in Little Wall Creek. either by reconstruction and redesign or cabling. In all, 77 structures were cabled, 22 were repaired, 4 were redesigned and reconstructed. The Hilti crew finished all cabling and securing of the structures. and vegetative plantings of willows were completed.

TABLE 2

LITTLE WALL CREEK MAINTENANCE

Total Structures Maintained: 77

<u>Repair &amp; Degree of Repair</u>	<u>Reconstruction</u>	<u>No Repair Needed</u>	
#2-50%	#1	#11	#63
#3-50%	#20	#12	#64
#4-30%	#55	#13	#65
#5-50%	#69	#14	#66
#6-75%		#17	#67
#7-60%		#18	#68
#8-50%		#19	#70
#9-10%		#21	#71
#10-15%		#22	#72
#15-75%		#25	#73
#16-60%		#26	#74
#23-50%		#27	#75
#24-60%		#30	#76
#28-50%		#33	#77
#29-20%		#34	
#31-50%		#36	
#32-70%		#37	
#35-20%		#38	
#39-10%		#40	
#41-10%		#42	
#59-10%		#43	
#60-50%		#45	
		#46	
		#47	
		#48	
		#50	
		#51	
		#52	
		#53	
		#54	
		#61	
		#62	
<hr/>			
Total Structures:			
22	4	46	
<hr/>			

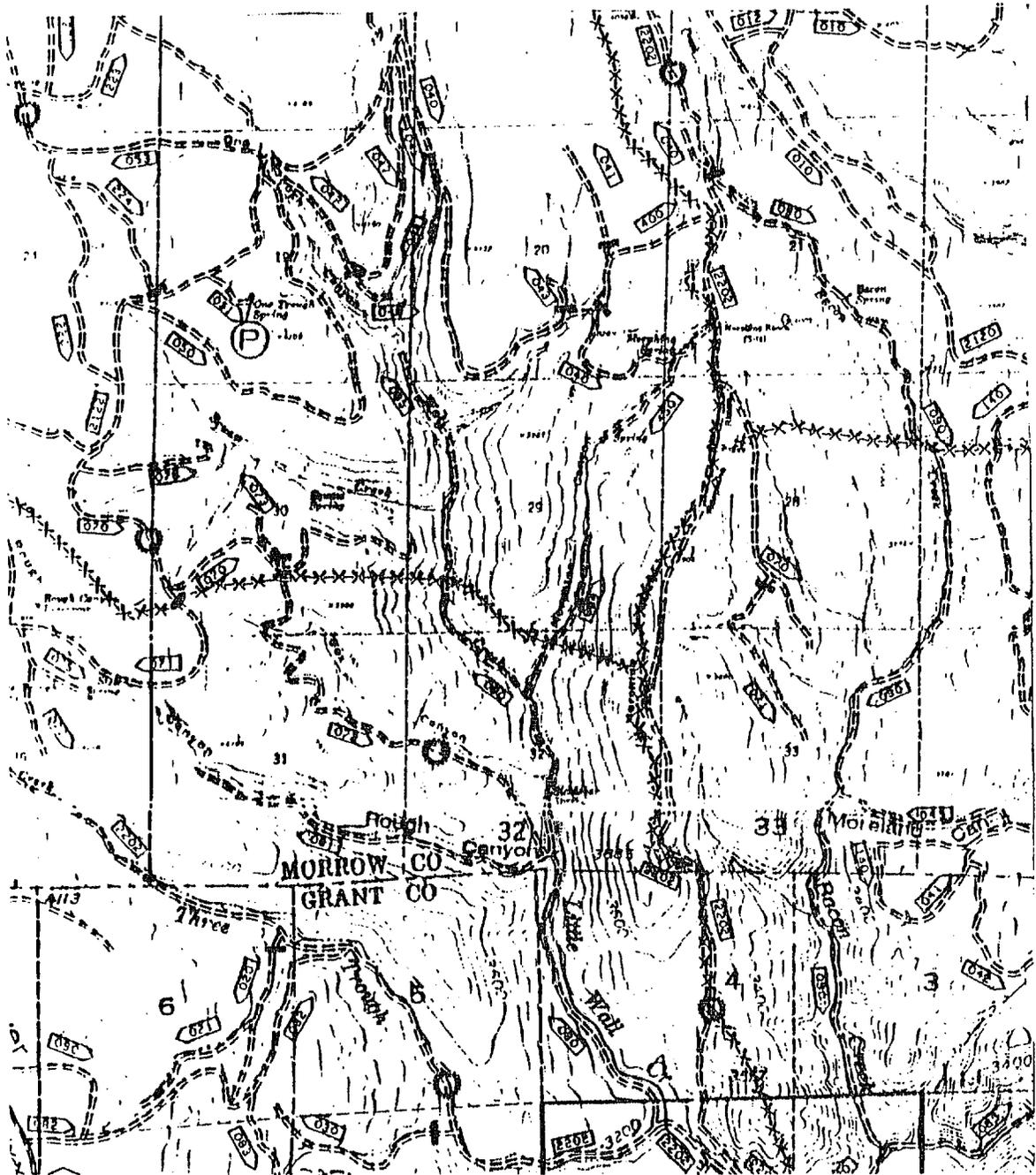
TABLE 3: Summary OF LITTLE WALL CREEK PROJECT TO DATE

Structures	1990 & Earlier	1991	Totals
Rock Weirs w/ Pools	5	M A	5
Log Weirs w/ Pools	55	I N	55
Sills	0	T E	0
Deflectors (Log & Rock)	21	N A	21
Instream Logs	101	N C	101
Rootwads	44	E	44
In Pool Boulders	0	T A	0
In Stream Boulders	68	B L	68
Debris Jam Bypass	0	E	0
Side Channels Closed	2	#9	2
Vegetative Plantings	No Totals Avail.	1 *500	500
RipRap	11	0	11
<hr/>			
Total Structures:	217	500	717
<hr/>			

• \* WAS NOT A BPA FINANCED PROJECT

LITTLE WALL CREEK 1991  
Stream Enhancement Project  
Heppner Ranger District  
Umatilla National Forest

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T6S, R27E  
Sections 29,30,31,31

T7S, R27E  
Sections 4,5,9

## SUBPROJECT IVb - MAINTENANCE: WILSON CREEK

### INTRODUCTION

The Wilson Creek project is located on the Umatilla National Forest in T7S, R26E, Sections 2, 11, & 14, in Grant County. Wilson Creek is a tributary of Big Wall Creek which in turn flows into the North Fork John Day River. The stream produces summer steelhead.

The original stream enhancement project work began in 1986 and has continued up to 1990. In 1991 a repair project was implemented throughout the summer season. The repair took two forms; 1) redesign and reconstruction of weirs that were damaged, and 2) redesign and reconstruction of weirs that were not functioning as desired and needed fine-tuning. These improvements were rootwads and woody material for hiding cover and shade, altering constrictions, or simply adding more rock to the wings to reinforce the wings or constrict more volume of flow.

This year, a total of 49 structures were maintained to some degree. Of that total, 8 were redesigned and reconstructed, 24 were repaired but only to some degree of modification, and 9 were in no need of repair.

In the past years, construction has taken place in large quantities leaving a backlog of unsecured structures on Wilson Creek. Funding for weir repair and cabling was provided by BPA during the 1991 season, The cabling is almost completed. Due to the scheduling of excavators and the cabling crew's assigned projects, this stream is the only stream that has structures that have not been secured with the Hilti cable method, Adverse winter weather halted all cabling for the winter months. The project will be finished during the 1992 field season.

### OBJECTIVES

1. Maintain the desired function of all instream structures.
2. Maintain the integrity of fish habitat structures by securing the weirs with the Hilti cable method.

## PROJECT DESCRIPTION

Project scoping and final plans for project maintenance were completed in the spring of 1991. The amount of material needed was estimated for each structure and the locations for the work were flagged on the ground. Maintenance began on Wilson Creek in July of 1991. The spider excavator completely reconstructed 8 structures and added a rootwad and woody material to all. There were 24 structures that were repaired to some degree with six rootwads added.

## ACHIEVEMENTS

In all, 49 structures were maintained, 9 were not in need of repair. The photo documentation of all the repair work performed has been completed and stream enhancement structure design sheets have been adjusted.

TABLE 7: WILSON CREEK MAINTENANCE

Total Structures Maintained: 51

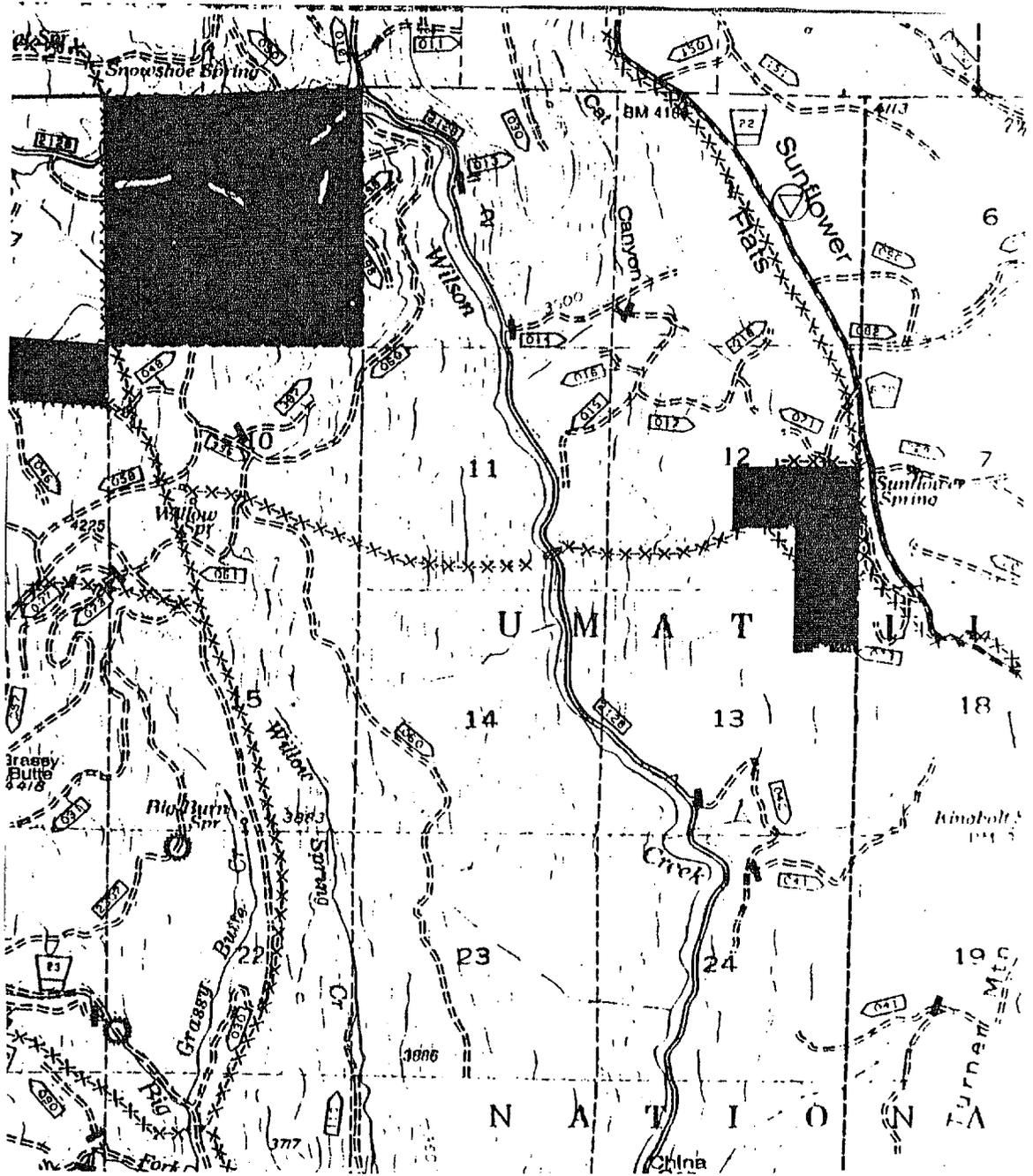
<u>Repair &amp; Degree of Repair</u>	<u>Reconstruction</u>	<u>No Repair Needed</u>
#1-25%	#2-rootwad	#6
#4-50%	#3-rootwad	#8
#5-25%	#26-rootwad	#12
#7-75%	#38-rootwad	#16
#9-50%	#43-rootwad	#17
#10-60% rootwad	#44-rootwad	#18
#11-25%	#46-rootwad	#34
#13-30%	#48-rootwad	#41
#14-40%		#45
#15-25%		
#25-60%		
#28-50%		
#29-75% rootwad		
#30-50% rootwad		
#31-40%		
#32-25%		
#35-25% rootwad		
#36-40%		
#39-60%		
#42a-50%		
#42b-70% rootwad		
#42c-10%		
#47-75% rootwad		
#49-50%		
<hr/>		
TOTAL STRUCTURES:		
24 - 6 rootwads	8 - 8 rootwads	9
<hr/>		

TABLE 8: SUMMARY OF WILSON CREEK PROJECT TO DATE

Structure	1986	1987	1988	1989	1990	1991	Total
Rock Weirs w/ Pools	39	12	6	26	6	M A	89
Log Weirs w/ Pools	9	13	16	27	2	I N	67
Sills	63	0	0	3	0	T E	66
Deflectors (log & rock)	24	19	1	40	19	N A	103
Instream Logs	18	0	13	0	2	N C	33
Rootwads	53	38	32	42	8	E	173
In Pool Boulders	12	13	8	0	0	T A	33
In Stream Boulders	171	13	8	2	0	B L	194
Debris Jam Bypass	1	0	0	0	1	E	2
Side Channels Closed	15	0	1	2	2	#7 ****	20
Vegetative Plantings	196	291	30	0	0		517
RipRap	0	17	13	0	0		30
<hr/>							
Total Structures:	601	416	118	142	40		1318
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++3c\* . . .See Table 4: Wilson Creek Maintenance  
 Structures maintained - 41, Reconstructed - 8,  
 New construction - 2, Repairs - 24.

WILSON CREEK 1991  
Stream Enhancement Project  
Heppner Ranger District  
Umatilla National Forest



T7S, R26E  
Sections 2,11,14

## INTRODUCTION

Physical monitoring of structures identified the need for maintenance of some of the instream structures. The use of the Hilti cabling method in recent years to secure structures has reduced the number of structures requiring maintenance to less than 1%. Most maintenance will take place on structures built during the early years of this project when cabling was not done.

Maintenance typically consists of fine-tuning the structure's design to better achieve desired results. In most cases, pools were deepened and woody debris was added to the pool to improve the quality of juvenile rearing habitat. Large and small wood that was available on site was added to the structure or pulled into the riparian area to provide additional habitat. Partial reconstruction was completed on some structures damaged by high flows. After structures were repaired, they were secured using the Hilti cabling method.

## OBJECTIVES

1. Maintain the desired function of all instream structures.
2. Maintain the integrity of fish habitat structures by securing them with the Hilti cable method.

## PROJECT DESCRIPTION

Project scoping and final plans for project maintenance were completed in spring of 1991. The amount of material needed to reconstruct the weirs was estimated for each structure. Locations for the work were flagged on the ground.

Maintenance on the North Fork John Day District occurred on Desolation Creek weirs that were constructed in 1988. The spider (excavator) reworked rock weirs. Pools were created below each weir. Rootwads and boulders were added to each pool for hiding cover. Available boulders were reworked into wings to increase the velocity of water at the weir and clean out the pool at high flow.

The spider reworked all structures by moving through the stream channel. The spider has the capability to move over boulders and large wood. Using the spider to rework the structures minimized riparian disturbance. Additional dead spruce and fir were pulled into the riparian area and stream channel to prevent streambank erosion and provide additional habitat.

## ACHIEVEMENTS

Maintenance was completed on a total of 31 rock weirs in Desolation Creek. Each weir was reworked to become a functional structure. Pools were excavated below each weir and additional woody material was added to each pool. Wings were added to each structure to promote pool creation during high flow. Additional woody material was added to each pool to provide instream habitat.

Table 10. Summary of the Desolation Creek Maintenance Project

Total Structures Maintained:

<u>Repair &amp; Degree of Repair</u>	<u>No Repair Needed</u>
#49-40% 2 rootwads	#65
#50-20% 1 rootwad	#67
#51-10%	#68
#52-20%	#79
#53-40% 2 rootwads	#80
#54-50% 2 rootwads	#81
#55-10%	#84
#56-50% 2 rootwads	#89
#57-50% 2 rootwads	
#58-10%	
#59-10%	
#60-50% 2 rootwads	
#61-50% 2 rootwads	
#62-50% 2 rootwads	
#63-10%	
#64-50% 2 rootwads	
#66-50% 2 rootwads	
#69-50% 2 rootwads	
#70-40%	
#72-40%	
#73-50% 2 rootwads	
#74-50% 2 rootwads	
#75-40%	
#76-50% 2 rootwads	
#77-40% 1 rootwad	
#78-40%	
#82-50% 1 rootwad	
#83-10%	
#85-20% 1 rootwad	
#86-10%	
#88-20%	

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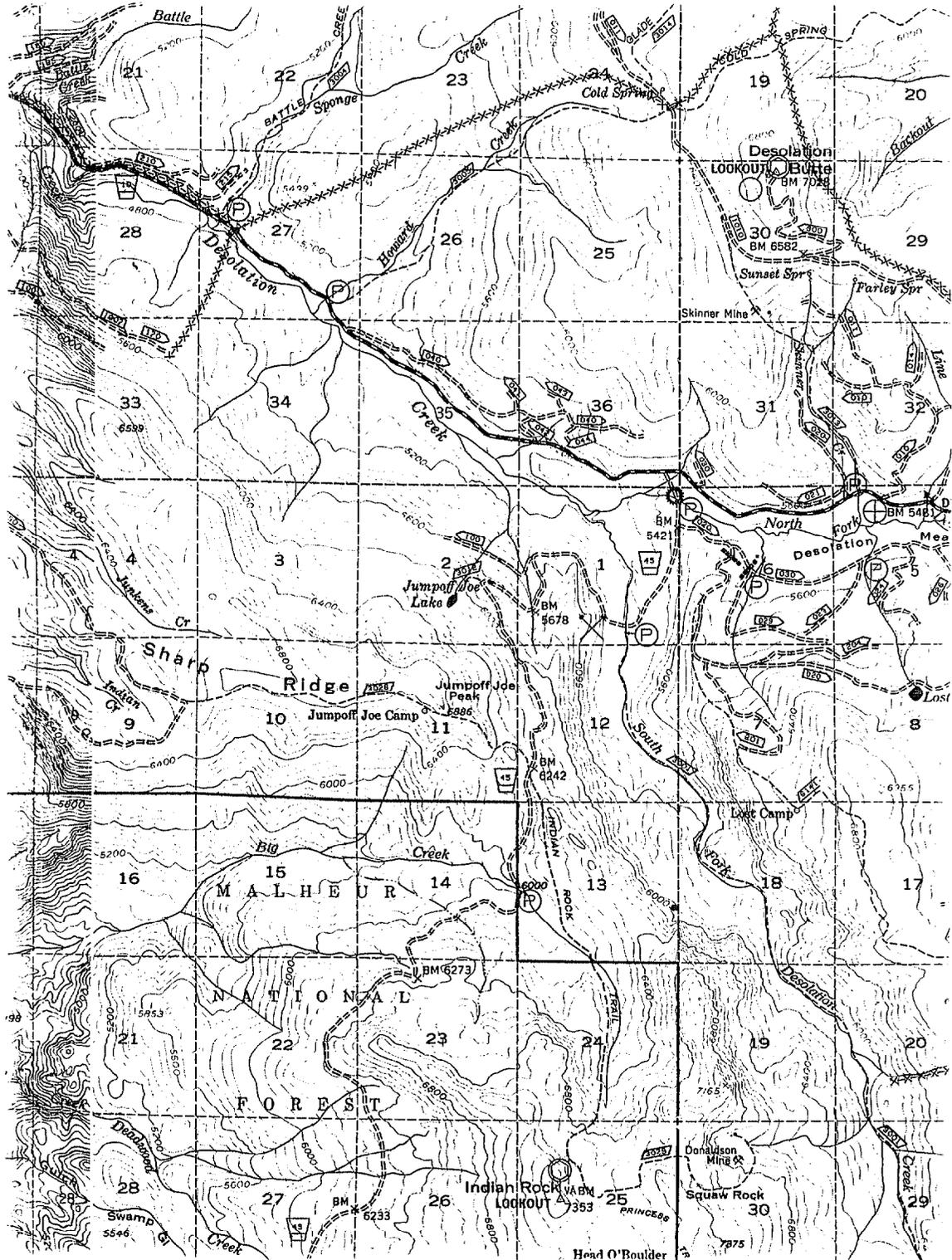
TOTAL STRUCTURES:  
31 - 32 ROOTWADS

8 LEFT AS IS

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# DESOLATION CREEK

1991 MAINTENANCE



PROJECT COSTS

Table 11. Project Costs, April 1, 1991 to March 30, 1992

Bonneville Power Administration Funds:

a.	Salaries .....	\$ 55,837
b.	Transportation and Travel .....	\$ 7,250
c.	Materials and Supplies	
	Expendable .....	61,765
	Nonexpendable .....	\$ -0-
d.	Equipment Rental Contracts .....	..\$108.13 9
e.	Overhead @ 10.7%. . . . .	..\$24,930
		\$257,921.