

WALLOWA-WHITMAN NATIONAL FOREST  
FISHERIES HABITAT IMPROVEMENT  
ANNUAL REPORT FY 1987

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GRANDE RONDE RIVER SUBBASIN

UPPER NORTH FORK JOHN DAY RIVER SUBBASIN

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## INTRODUCTION

This report describes fisheries habitat improvement accomplishments on the Wallowa-Whitman National Forest (NF) during FY 87 (April 1, 1987 - March 31, 1988). This multi-year, multi-phase fish habitat improvement effort which began in 1984, is funded under the amended (1987) Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, Measure 703(c)(1), Action Item 4.2. Principal program funding is being provided by the Bonneville Power Administration (BPA).

The overall Forest fisheries program goal is to optimize anadromous spawning and rearing habitat conditions for juvenile and adult chinook salmon and steelhead trout, thereby maximizing smolt production as a mitigation measure for fishery losses due to the mainstem Columbia River hydroelectric system.

Project activities are located on four Ranger Districts (RD) within the Wallowa-Whitman National Forest. The Baker and Unity RD administer the upper headwater portions of the North Fork of the John Day River. The Umatilla National Forest (NF) administers the remaining stream sections downstream on NF lands. The La Grande and Wallowa Valley RD administer streams on NF lands within the Grande Ronde River subbasin; the La Grande RD being responsible for the Upper Grande Ronde and Wallowa Valley RD the Lower Grande Ronde and tributaries.

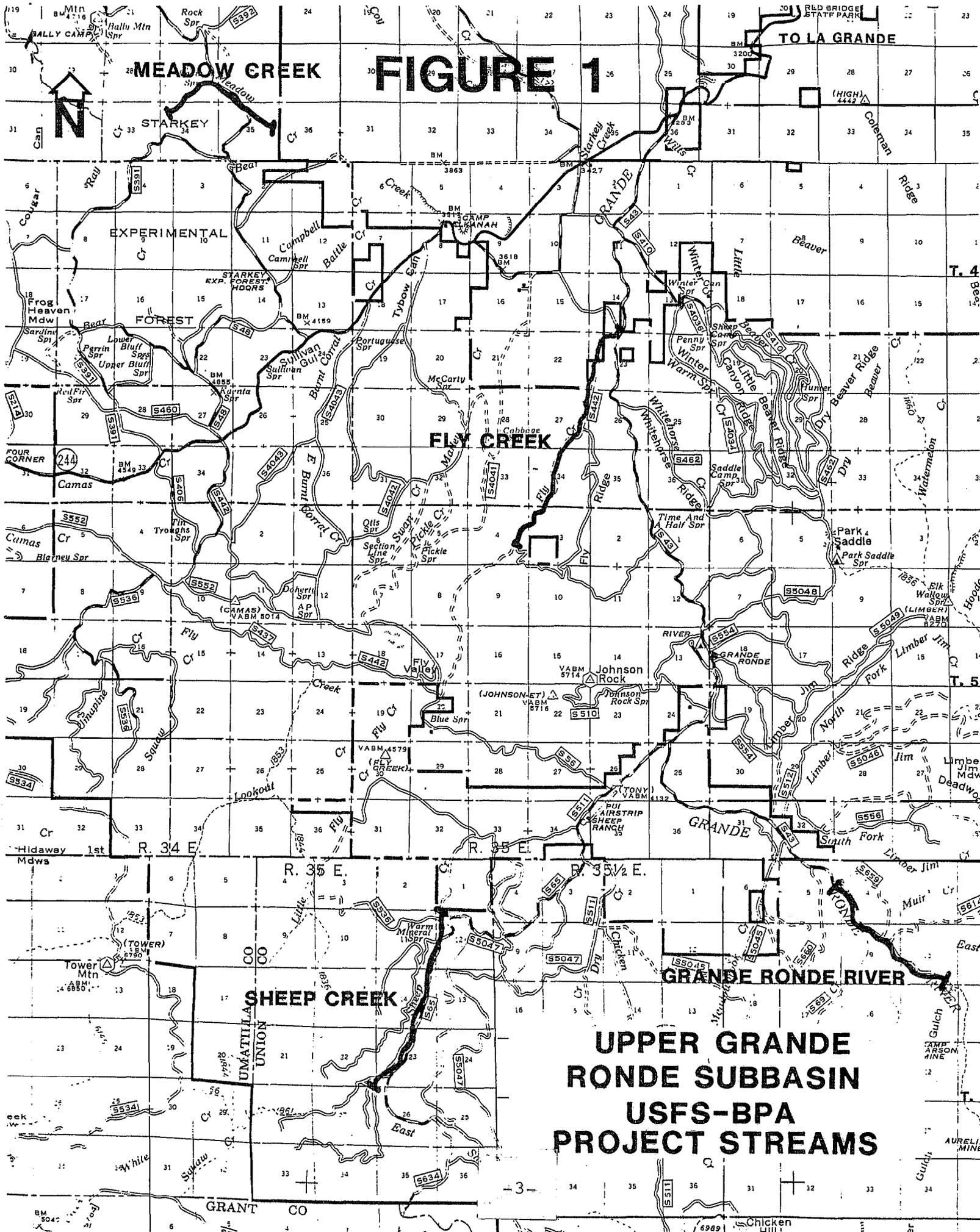
## Subbasin Descriptions, Fisheries Resources, and Limiting Factors

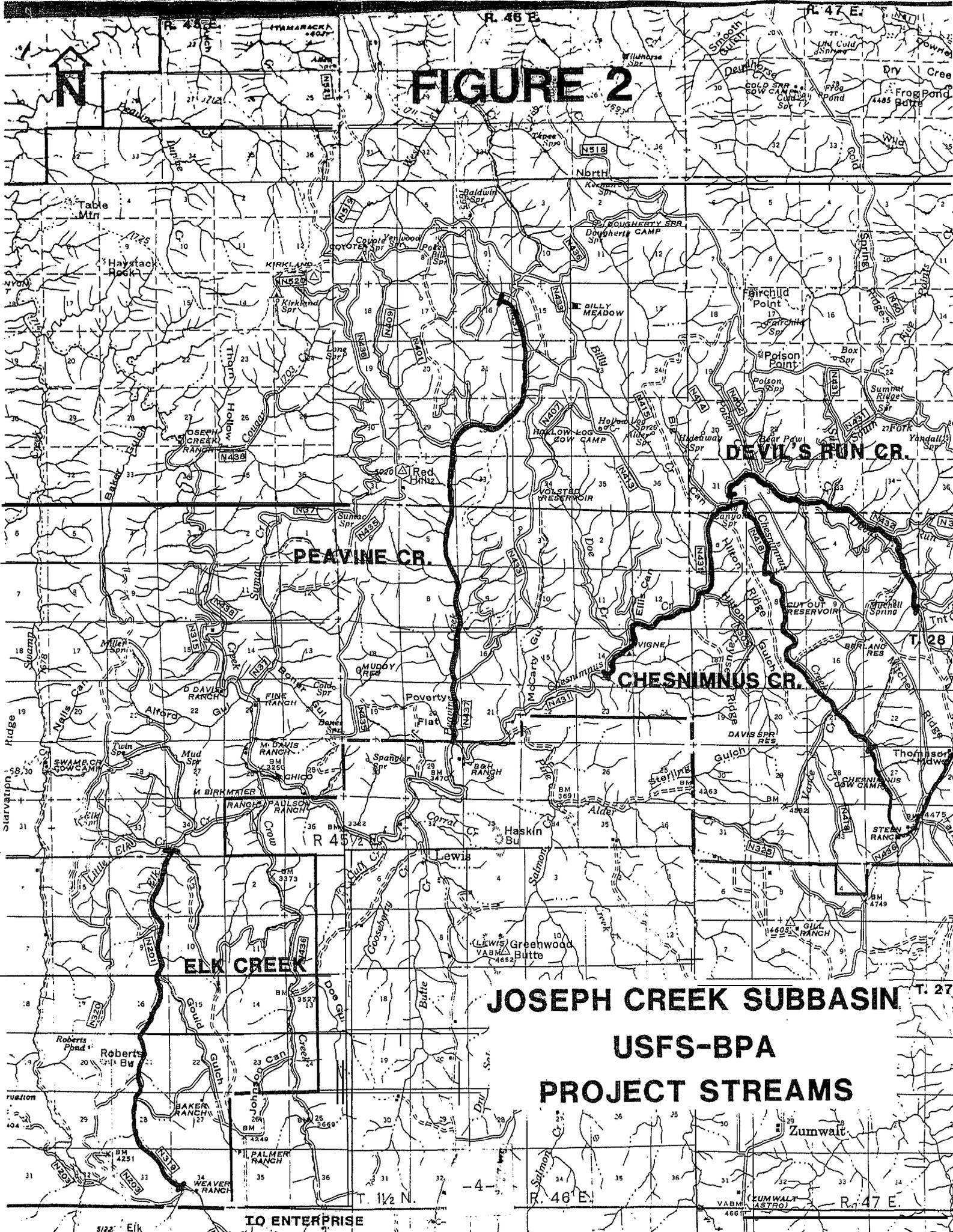
The Grande Ronde River subbasin is comprised of a drainage area of approximately 4,070 square miles in northeastern Oregon. 1/ The river's headwaters originate from several principal drainages, all located on NF lands. Those streams are the Joseph and Catherine Creeks, the Upper Grande Ronde, Wenaha, Wallowa, Lostine, and Minam Rivers, and a few smaller tributaries. The Upper Grande Ronde Drainage, approximately 1,622 square miles above the confluence of the Grande Ronde and Wallowa Rivers, currently contains three ongoing improvement projects on NF lands (Figure 1). The Joseph Creek drainage, the major river drainage within the Lower Grande Ronde River, drains approximately 556 square miles and contains four major ongoing projects (Figure 2). While these upstream areas are all on NF lands, those lands below the headwaters lie primarily in private ownership. Streamflow patterns in the Grande Ronde exhibit typical spring floods common to northeast Oregon streams with minimum flows usually occurring in August or September.

The North Fork of the John Day River originates on the northeast slopes of Columbia Hill, a peak of the Elkhorn Mountain Range within the North Fork John Day Wilderness. After three miles, the stream leaves wilderness at Peavy Cabin, a local landmark, and reenters the wilderness near the North Fork John Day Campground, approximately seven miles of non-wilderness stream. The North Fork of the John Day River is under consideration for addition to the National Wild and Scenic Rivers System. The river and its tributaries provide over 40 stream miles of salmon and steelhead habitat, Anadromous fish contend with the lower three Columbia River dams with regard to upstream and downstream passage, Figure 3 identifies proposed John Day subbasin fisheries improvement projects on NF lands.

The Grande Ronde River subbasin supports both natural and hatchery runs of spring chinook salmon and steelhead trout. Natural rainbow trout are also produced along with a remnant coho salmon run. Chinook salmon juveniles used for hatchery supplementation of natural stocks are currently being produced at Looking Glass Hatchery. A new chinook and steelhead adult trapping and juvenile outplanting facility was recently constructed (1987) at Big Canyon Creek's confluence with the Wallowa River. The Joseph Creek subbasin is managed strictly for wild steelhead production. Current steelhead production potential for the Grande Ronde Basin is estimated at 16,566 adults and 432,844 smolts. 2/ However, actual production is estimated to be near 10-20 percent of potential due to mainstem passage problems for juveniles and adults.

The John Day River subbasin supports the largest remaining, exclusively wild runs of spring chinook and summer steelhead in Northeast Oregon, the North Fork of the John Day River being the most important anadromous producer in the subbasin.





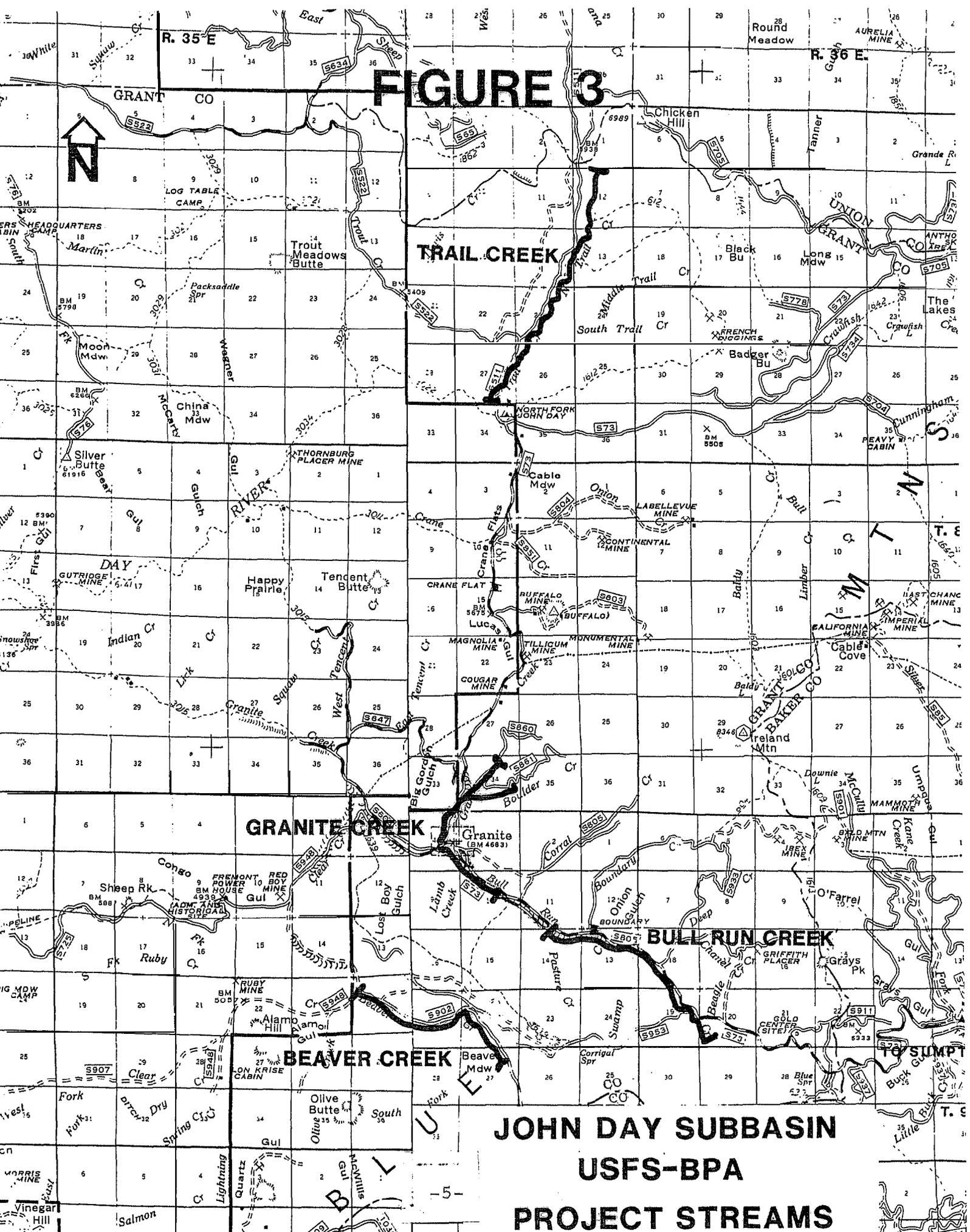
# FIGURE 2

JOSEPH CREEK SUBBASIN

USFS-BPA  
PROJECT STREAMS

TO ENTERPRISE

# FIGURE 3



**JOHN DAY SUBBASIN  
USFS-BPA  
PROJECT STREAMS**

## Limiting Factors

Historic patterns of land use in northeast Oregon have left most riparian areas in far less productive state than their natural potential. Placer mining in the late 1900's left many streams with little or no shade, large sediment loads, and radically disturbed channels. Inadequate control of past activities such as logging, roading, and grazing left managers with degraded habitats in most cases. Symptomatic of these conditions are wide and shallow streams with low summer flows and high water temperatures, channels typically without adequate amounts of instream debris, and low in diversity.

Limiting factors associated with instream and riparian habitat degradation were identified by the Oregon Department of Fish and Wildlife, USDA-FS, and Confederated Tribes of the Umatilla Reservation. 3/ These factors are:

1. High summer water temperature - Loss of riparian vegetation and low summer flows result in water temperatures in excess of 80 degrees fahrenheit. High temperatures limit available summer habitat and make the cooler upstream tributaries relatively more important to salmonid production.
2. Low summer flows - Irrigation withdrawals result in extremely low flows in the Grande Ronde River. Poor watershed management practices further aggravate flow conditions, resulting in many intermittent streams which were once perennial.
3. Lack of riparian vegetation - Riparian vegetation loss, principally from ungulate overgrazing, results in many undesirable conditions. Essential fish habitat is lost along with the riparian area's ability to dampen flood peaks and increase groundwater recharge, Channels become unstable and readily erode, concentrating flows and accelerating downcutting,
4. Lack of habitat diversity - Low habitat diversity, is caused principally from the absence of large, woody debris in and along stream channels. Wood plays a critical role in maintaining stream structure and fisheries production. Past activities such as instream debris cleaning programs, have left many streams without this critical component.
5. Lack of Channel Stability - Low channel stability results from many causes: overgrazing, improper timber harvest methods, instream timber salvage, mining operations, etc. Streams, once narrow and deep, widen out and become shallower, becoming more prone to creating new channels and down cutting.

## METHODS AND MATERIALS

FY 87 FS fisheries restoration projects were designed by federal or contract hydrologists, usually the year prior to implementation. The projects were accomplished by FS personnel using service type contracts for equipment use and project construction.

Two techniques, riparian vegetation restoration and habitat diversity improvement, addressed degraded aquatic habitats common to all project streams. The following discussion highlights critical components of these two techniques:

### Riparian Vegetation Restoration

Fencing - Fencing to control ungulate use along riparian zones is a primary management approach used to protect and rehabilitate habitats. Two commonly used methods are riparian pasture fencing and riparian exclosure fencing. Pasture fencing usually encloses a wide section of riparian zone, allowing for future grazing. Riparian exclosure fencing results in permanent, narrow exclosures along riparian zones with no future grazing. All FS fence projects are currently using riparian pasture fences.

Streamside Plantings - Streamside vegetation plantings were used in conjunction with other rehabilitation measures to provide riparian shade and cover, two essential components of good fish habitat, and to supplement the release of existing natural vegetation. To ensure protection of this investment, supplemental plantings usually occurred within fenced riparian pastures. Species most commonly planted were willow, cottonwood, alder, dogwood, and hawthorne. Plantings are made from small scions (12-16"), larger pole cuttings (3-6"), potted nursery stock from seedlings, and rooted stock from cuttings. A backhoe usually assists planting excavation down to the water table.

### Habitat Diversity Improvement

Adding habitat diversity to a stream channel may occur in many ways and usually results in an improvement of those parameters characteristic of good habitat. Instream structures used were: log weirs in a variety of configurations; whole tree additions with and without rootwads; rock berms; clusters; and deflectors, riprap, rock and log sills. Both designed expensive "hard" structures such as K-dams and elaborate log sills and "soft" structures such as whole tree additions or boulder were constructed. First, the sources of large woody material were identified and individual trees marked for felling. When abundant and not contributing to stream shading, trees were taken from within or near riparian zones. Soft structure additions were added at various angles, usually parallel to shore in order to maximize edge habitat. When possible, leaning trees next to the stream with attached rootwads were pushed over by the backhoe. Whole trees were cabled to their stumps or nearby debris with 3/8" galvanized cable; cabled and revetted into banks; cabled and deadmanned into banks; anchored by piling large boulders on top of the tree trunk; and left uncabled when approximately two-thirds of the tree length was above high water.

### Planning, Inventorying, and Monitoring

Planning, inventory, and monitoring activities were conducted on NF lands in FY 87 in addition to habitat restoration. Each of these activities are ongoing in nature and continue to be refined.

A discussion of FY accomplishments in these three areas is provided in the Results section.

## RESULTS

Fisheries habitat improvement accomplishments during Fiscal Year 1987 occurred in four major work activities: (1) planning, (2) habitat inventory, (3) project implementation, and (4) monitoring. Planning, inventory, and monitoring results are presented followed by habitat improvement implementation results by project.

### Planning

Planning activities consisted of preparation of a long-range implementation plan 4/ for habitat improvements on the Forest. Factors limiting production, fisheries habitat goals and objectives, project implementation strategies, priorities, and costs were identified along with anticipated benefits from improvements. Considerable participation and involvement with subbasin and system planning continues.

### Inventory

Detailed fisheries habitat inventories were completed along 16.9 and 45.2 miles of tributary streams within the Grande Ronde and John Day subbasins, respectively. Inventory methods used were those jointly developed by the Oregon Department of Fish and Wildlife (ODF&W) and the FS. Appendix I lists individual parameter values for each stream along with general comments.

<u>John Day</u>	<u>Miles</u>	<u>Grande Ronde</u>	<u>Miles</u>
Onion Creek	5.21	Burnt Corral Creek	4.73
Olive Creek	2.18	Grande Ronde River	3.5
NF John Day River	4.77	Dark Canyon Creek	8.71
Beaver Creek	4.92		
Bull Run Creek	6.63		
Middle Trail Creek	3.92		
South Trail Creek	7.16		
Trail Creek	6.91		
Granite Creek	3.50		

### Monitoring

Monitoring activities consist of photopoint transects, permanent riparian vegetation transects, and structure effectiveness monitoring.

Photopoints - Eighteen permanent photopoint transects were established on one new project in FY 87 (Upper Grande Ronde) and rephotographed for one existing project (Sheep Creek).

Riparian Vegetation - Permanent riparian vegetation transects exist on three projects, Sheep, Elk, and Chesnimnus Creeks. No permanent stations were remonitored during FY 87.

Structure Effectiveness - The effectiveness of each structure in achieving stated project goals was evaluated for three streams; Sheep, Elk, and Chesnimnus Creeks. Minor structure modifications and maintenance were performed on each of these streams, usually consisting of reinforcement of weir key ends.

### Project Implementation

Implementation activities occurred on six active FS projects during 1987. Habitat diversity improvement activities are now complete on two of those six projects, Sheep and Elk Creeks.

The following discussion presents the current status of each active project along with FY 87 accomplishments:

#### Project I - Meadow Creek

Meadow Creek, a major subbasin of the Upper Grande Ronde River and tributary to the Columbia River, lies within the Starkey Experimental Forest boundary. Meadow Creek and its riparian zone have a long history of impacts dating back to early logging activities. Grazing has further impacted the riparian community. Salmonid populations in Meadow Creek are composed of anadromous summer steelhead trout and residual rainbow trout. Historic Umatilla Indian tribal records document chinook salmon production in this stream. An extensive biological data base exists from aquatic research conducted since 1977.

The Meadow Creek project is a jointly funded BPA-FS improvement and evaluation project. The FS is responsible for funding all pre- and post-project improvement evaluations while BPA funds implementation activities only. The Pacific Northwest Research Station conducted both spring and fall outmigrant smolt sampling during FY 87. Their personnel also conducted an analysis of large woody debris, comparing current conditions to those of an historical U.S. Fish and Wildlife Service inventory. During FY 87, the FS also contracted with Washington State University to conduct a complete hydrological analysis of the Meadow Creek drainage, including design and location of improvement structures. A preliminary design was prepared which identifies improvement designs and locations for 22,400 feet of stream.

#### Project II - Upper Grande Ronde River

The Upper Grande Ronde River (RM 194-212) dams an area of approximately 69 square miles. A FY 85 habitat inventory of the upper reaches identified approximately three miles of poor quality anadromous fish habitat, due primarily to past mining activities. FY 87 was the first of three years implementation work on the Upper Grande Ronde project.

Specific project objectives are (1) adult holding pools construction, (2) spawning gravel retention, and (3) increase juvenile habitat diversity. Approximately one mile of mainstem stream was improved during FY 87 with the addition of 50 major structures, 180 minor structures, and construction of 15 large pools (Appendix II). A hydrological engineering evaluation in June 1987 provided the preliminary and final design for

structure placement. Work was accomplished with a personal services contract for 180 hours rental of a Model 201-C Hydra with operator and 40 hours rental of a 580-c Case tractor and dump truck. Costs were \$74 and \$35 per hour, respectively. Work began July 1 and ended September 1, 1987.

### Project III - Fly Creek

Fly Creek, a significant tributary to the Upper Grande Ronde at river mile 184, has a drainage area of 52 square miles and a stream length of about 16 miles. The stream is characterized by two general reaches. The upper 8-mile reach of stream lies on private land and is a low gradient, meandering meadow-dominated reach that has been heavily impacted by livestock grazing. The lower 8-mile reach lies on NF lands and is a low-moderate gradient stream in a narrow valley bottom. Current habitat conditions on NF lands are poor. A 1985 habitat inventory identified a pool/riffle ratio of .2/.8 with low quality pools and little instream structure.

Instream structure construction and placement along Fly Creek began in FY 87 and will finish in FY 88, followed by riparian enclosure fencing in FY 89. Two hundred-fifty instream structure additions occurred in FY 87 consisting of 56 "hard" structures (log weirs) and 194 "soft" structures (whole tree additions). A standard single log design was used in weir construction; logs 30-35 feet in length and 18-30 inches in diameter, procured away from the stream zone, were bedded and keyed 10-15 feet into each stream bank. Twisted wire mesh (4" X 4") and geotextile cloth were used on the upstream edge. Whole tree additions were added above and below weir structures, being secured to their stumps or deadmanned into the streambank with 3/8 inch galvanized cable (Appendix III). All structures were placed with a personal services contract for 300 hours rental of a John Deere 410 backhoe and operator at \$28.50 per hour. Work began July 15 and ended August 27.

### Project IV - Sheep Creek

Sheep Creek is tributary to the Grande Ronde River at RM 197. The drainage area comprises approximately 58 square miles. Eleven miles of stream contain spawning and rearing habitat for chinook salmon. The upper two miles of stream lie on NF land and is characterized by a moderate gradient, narrow valley floor, which is heavily timbered. The middle three miles are characterized by a low gradient, meadow/timber complex with a high degree of meander. The remaining six miles of stream are low gradient, meadow dominant, and lie on private land. Watershed uses and impacts include roading, logging, livestock grazing, and severe damage to lodgepole pine stands from insect epidemics.

Sheep Creek has received aquatic habitat improvements over a number of years. In 1980, a riparian pasture fence was constructed along one mile of stream, followed by the addition of 101 structures in 1985, creating 10,489 and 3,228 square feet of pool and cover areas, respectively (Appendix IV).

In FY 86, riparian pasture fencing was constructed along an additional 1.6 miles of stream.

A June 1987 habitat improvement project evaluation contract with hydrologist John Osborne, Washington State University, recommended digger log modifications and additional large woody debris placements along Sheep Creek. Twenty-seven structures were modified during FY 87.

#### Project V - Chesnimnus Creek

Chesnimnus Creek is tributary to Joseph Creek at the confluence with Crow Creek. The drainage area is approximately 190 square miles; about 108 square miles are on NF land. There are 12 miles of Chesnimnus Creek on NF land and about 8 miles on private land that require improvement. Chesnimnus Creek is characterized by low gradient, with short stretches of moderate gradient in the middle reaches. Narrow bluegrass meadows dominate the upper reaches, with scattered lodgepole pine overstory. The middle reaches are rocky, narrow ravines which open into broader U-shaped canyon bottoms of logged-over mixed conifer stands. The private land area is dominated by wider canyon bottoms consisting predominately of hay fields and pastures.

Watershed uses and impacts include roading, logging, livestock grazing, and farming. Numerous reaches on both NF and private ground have been channelized to accommodate road construction and hay field development.

Intensive habitat improvement work has been implemented concurrently on both private and public lands for the past several years. Program measures on NF lands to date include instream structure addition, riparian pasture fencing, and vegetation plantings (Appendix V).

During FY 87, the Wallowa Valley RD constructed riparian pasture fencing along 4.63 miles (243 acres) of Chesnimnus Creek. Twenty-five instream structures (weirs) were also constructed.

#### Project VI - Elk Creek

Elk Creek, a significant tributary to Joseph Creek, has a drainage of about 25 square miles, of which 16 square miles are NF lands. Approximately 12 miles of spawning and rearing stream occur within the drainage.

The stream's headwater lies within private farm, timber, and grazing lands. Sediment contributions from these uplands contribute to the current degraded condition in Elk Creek. Activities affecting water quality and streamflows include past and current logging, road construction, grazing, and farming.

Two small, riparian pasture fences were constructed along Elk Creek in 1976. By 1978 about 40 instream structures had been added. Between 1978 and 1987, the stream received about five miles of pasture fencing, another 40 instream structures, and an intensive planting of deciduous vegetation (Appendix VI). Nine additional instream structures (log weirs) were added to Elk Creek during FY 87.

### Project VII - Devil's Run Creek

Devil's Run Creek is a small tributary to Chesnimnus Creek. This stream, inventoried in September 1986, has been heavily impacted by blowdown, logging, fire, and grazing. The lower three miles of stream exhibit little instream cover and low structural diversity. Juvenile young-of-the-year salmonids are abundant, but overwintering habitat is poor, FY 87 activities were limited to the tentative location of riparian pasture fencing along two miles of stream and preparation of a detailed budget for FY 88 design activities.

### Project VIII - Peavine Creek

Peavine Creek, a tributary to Chesnimnus Creek, has a drainage area of approximately 26 square miles. Peavine Creek's stream channel has received extensive alteration, primarily from road building and logging. Three small riparian exclosures were constructed near the mouth of Peavine Creek in 1970. These exclosures dramatically show the effectiveness of riparian exclosure fencing and received plantings of cuttings and rooted, deciduous stock in 1975. In 1984, using BPA funding, the stream received 51 instream structures and 3.25 miles of riparian pasture fencing (Appendix VII).

FY 87 activities along Peavine Creek consisted of repowering the solar-electric fence to prevent ungulate grazing within the riparian zone.

### Project IX - Streamside Vegetation Plantings

Streamside vegetation plantings, used in conjunction with other rehabilitation measures, prove effective in providing riparian shade and cover, two essential components of good fish habitat. Extensive plantings have occurred in the Lower Grande Ronde subbasin, beginning in 1975 with Peavine Creek. More planting occurred in 1983 and 1984 on Peavine and Elk Creeks, and during FY 87 these two streams and Chesnimnus Creek received intensive spot plantings. Chesnimnus Creek received 6,685 plantings, Elk Creek 1,920, and Peavine Creek 600. No plantings occurred in the Upper Grande Ronde subbasin in FY 87, although a procurement contract for the FY 88 delivery of 4,000 rooted stock of mixed species was awarded to the Tree of Life Nursery. These rooted stock will be planted by contract along with approximately 2,000 willow poles in either late FY 87 or early FY 88.

The success rate of streamside plantings has been highly variable. Elk and Peavine Creek planting survival is estimated at 80 percent while Sheep and Chesnimnus Creeks are lower, from 20-50 percent. A non-BPA project, Swamp Creek, has a near 100 percent survival of plantings. The success of streamside plantings is highly correlated several factors, i.e. site selection, handling care, planting method, and species. Both spring and fall plantings are successful, if proper care is taken. To ensure this, future plantings will occur by contract through established nurseries.

## SUMMARY AND CONCLUSIONS

Significant progress has occurred toward improving fisheries resources in the two project subbasins. Recognition of the need to treat habitat units with a combination of treatments is now widespread. Habitat diversity improvements have evolved from single, "hard" engineered structures to diverse, "soft" engineered combination of treatments more representative of natural systems. Also recognized is the need to protect instream improvement investments with strict and judicious management and administration of riparian zones. Research and management applications continue to evolve, along with the understanding that there is no "quick fix." Significant effort is and continues to be focused on clearly measuring and defining riparian management objectives.

System and subbasin planning efforts are proving instrumental in reaching short term improvement goals and providing long-term direction. The Wallowa-Whitman recognizes the abundant opportunities for habitat improvement and is striving to provide additional fisheries expertise. These actions will prove instrumental in restoring the Columbia basin's anadromous fish runs.

LITERATURE CITED

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2. IBID
3. James, Garry. 1984. "Recommended Salmon and Steelhead Improvement Measures." Confederated Tribes of the Umatilla Indian Reservation. 59pp.
4. Uberuaga, Richard. 1988. Wallowa-Whitman NF Fish Habitat Improvement Implementation Plan. U.S. Forest Service, Baker, Oregon.

## APPENDICES

APPENDIX I  
HABITAT INVENTORY  
JOHN DAY AND  
GRANDE RONDE SUBBASINS

ONION CREEK - DATE: August 3-6, 1987

55 Subsections inventoried - stream section length = 27,500' = 5.21 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>7%</b>	<b>33%</b>	<b>60%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>4%</b>	<b>17%</b>	<b>58%</b>	<b>20%</b>	<b>1%</b>

Width: Sectional Ave.

Flood: 13 feet

Present: 5 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>36%</b>	<b>14%</b>

Comments:

Fish present. Upstream end of fish habitat downstream. Old mining sluice box and several old bridges fallen in stream. Dredge tailings evident, old road fords stream. Old log culvert crossing at Rd. #240 (1/2 of road eroded). More dredge tailings. Jeep trail stream crossing. Several 3-4' deep drops. Abundant deadfall in channel. Man-made stream diversion. More tailings. Pumphouse and pipe in stream. More dredge tailings. Old weir and fence structure across stream. New sluice in creek (Frisbee Claim). Metal scrap in stream. Several stagnating seeps into stream. More dredge tailings. Small rock dam. Old remnant weir in stream. Old deteriorating bridge. 20 pieces of old 10" diameter pipe in stream. Dredge tailings. Collapsing wood bridge. NF John Day River.

50 Subsections inventoried - stream section length = 25,000' = 4.73 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
10%	21%	49%

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
19%	48%	24%	8%	1%

Width: Sectional Ave.

Flood: 17 feet

Present: 7 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
39%	36%

Comments:

At confluence with Meadow Cr. upstream. Sec. 1, right bank badly eroded. Sec. 2, algae coating entire streambed. Sec. 4, juvenile fish abundant. Sec. 5, little upstream debris. Sec. 8, braided channel with secondary grade dry. Few good pools. Abundant small fish. Sec. 10, good bedrock fracture pool. Sec. 11, several small fish. Sec. 13, main road parallels creek. Sec. 14, mostly riffle. Sec. 16, private land. Sec. 18, several trees in stream. Sec. 20, heavy overhanging vegetation. Sec. 21, good log jam with tree in channel. Sec. 22, brushy braided channel with undercut. Sec. 23, graded channel. Sec. 24, good debris formed pool. Sec. 26, lots of debris and one foot waterfall. Sec. 27, four logs over channel and debris jam. Sec. 28, large conifer collapsing into channel and livestock erosion starts. Sec. 29, major debris jam. Sec. 30, livestock breaking stream banks down. Sec. 31, major debris jam, fish abundant. Sec. 32, good debris pool with undercut. Sec. 33, stream completely covered with debris and vegetation, livestock damage on banks. Sec. 34, livestock bank erosion, extensive debris over channel. Sec. 35, heavy debris and severe bank trampling. Sec. 36, heavy cattle trampling. Sec. 37, lots of debris, fish, and vegetation. Sec. 38, large debris jam, cattle bank damage. Sec. 39, large debris jam, banks badly damaged by cattle. Sec. 40, entire area heavily trodden by cattle. Sec. 41, overgrown with vegetation. Sec. 42, large debris jam. Sec. 43, channel choked with debris and vegetation, banks broken down by cattle. Fish abundant. Sec. 44, debris abundant, cattle damage. Sec. 45, debris abundant, heavily trampled. Sec. 46, fish and debris abundant. Sec. 47, debris jams. Sec. 48, braided, severely trampled. Sec. 49, debris jams, heavy trampling, East Fork Burnt Corral. Sec. 50, end.

OLIVE CREEK - DATE: August 17-19, 1987

23 Subsections inventoried - stream section length = 11,500' = 2.18 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>14%</b>	<b>28%</b>	<b>58%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>7%</b>	<b>32%</b>	<b>48%</b>	<b>12%</b>	<b>1%</b>

Width: Sectional Ave.

Flood: 22 feet

Present: 5 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>17%</b>	<b>14%</b>

Comments:

Start just below Redbird Mine, downstream. Sec. 1, jeep ford crosses creek, channel brushy. Sec. 2, dredge ditch enters, flow disappears, cattle in stream. Sec. 3, stream goes dry, drainage ditch enters. Sec. 4, entire section dredged, tailings create braids, brush abundant. Sec. 5, creek dredged to bedrock. Sec. 6, jeep trail across stream creating braid. Sec. 7, first fish seen, road and tailings create braids, cattle trampling. Sec. 9, tailing piles, private property begins, survey continues 0.5 miles downstream. Sec. 10, gradient 10%, tailing piles. Sec. 11, tailing piles. Sec. 12, tailing piles. Sec. 13, current mining operation. Sec. 14, road fords creek, tailings. Sec. 15, entire section dredged, a few fish. Sec. 17, seven fresh beaver dams. Sec. 18, beaver dams 9 - 14, fish present. Sec. 19, dams 15 - 19. Sec. 20, dam 20. Sec. 21, jeep trail fords creek. Sec. 23, private land starts.

NORTH FORK JOHN DAY RIVER DATE: September 14 - 17, 1987

28 Subsections inventoried - stream section length = 25,200' = 4.77 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>21%</b>	<b>28%</b>	<b>50%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>16%</b>	24%	37%	<b>22%</b>	<b>0%</b>

Width: Sectional Ave.

Flood: 53 feet

Present: 17 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
29%	<b>22%</b>

Comments:

Sec. 1, begin downstream direction from Peavy Cabin, fine sand, braided, woody debris. Sec. 2, debris jam. Sec. 3, large debris jams. Sec. 4, debris jam, fish. Sec. 5, debris jam. Sec. 6, debris jam, nice pool, fish. Sec. 8, large blowdown. Sec. 9, debris jam nice pools, fish, Sec. 10, debris jam, Sec. 11, abundant wood. Sec. 12, abundant debris, braid. Sec. 13, braided, abundant wood. Sec. 14, large wood nice pools, no fish, sand. Sec. 16, braided, debris jam. Sec. 17, braided, fish. Sec. 20, braided. Sec. 21, large debris jam, braid. Sec. 22, abundant debris. Sec. 24, several debris jams, adult chinook. Sec. 25, braided. Sec. 26, braided. Sec. 27, dead chinook. Sec. 28, end.

BEAVER CREEK - DATE: August 24 - September 2, **1987**

52 Subsections inventoried - stream section length = 26,000' = 4.92 miles

Flow Features:

pool	<u>Run/Glide</u>	<u>Riffle</u>
74%	9%	7%

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
1%	4%	52%	37%	4%

Width: Sectional Ave.

Flood: **25** feet

Present: **5** feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>49%</b>	<b>42%</b>

Comments:

Above Beaver Meadows downstream. Sec. 1, several small fish, stream goes dry. Sec. 2, marshy, poorly defined channel, dead fish. Sec. 3, fish abundant. Sec. 4, several fish, marshy. Sec. 5, lots of standing dead trees, marshy, little water. Sec. 6, braided, dry, cattle present, heavy sedges. Sec. 7, low water, cattle, culvert with 1 foot drop. Sec. 8, heavy cattle sign, abundant dead trees. Sec. 9, heavy cattle erosion, lots of sedges. Sec. 10, heavy sedges and grasses, fish abundant. Sec. 11, heavy cattle trampling, several fish. Sec. 12, very meandering, fish abundant, heavy sedge cover. Sec. 13, heavy sedges, several fish. Sec. 14, heavy cattle use, nice pool. Sec. 15, heavy cattle use, several fish. Sec. 16, debris jam, lots of dead standing trees. Sec. 17, heavy cattle use, several fish, abundant dead trees. Sec. 18, heavy cattle use, meandering, nice pools. Sec. 20, meandering, cattle bank erosion. Sec. 22, heavy cattle use. Sec. 23, meandering, cattle. Sec. 24, meandering, heavy cattle use. Sec. 25, meandering. Sec. 26, very meandering. Sec. 27, very meandering. Sec. 28, bank erosion, heavy cattle use. Sec. 30, heavy cattle use, erosion. Sec. 31, bad erosion from cattle. Sec. 32, very meandering. Sec. 33, heavy cattle use, many fish. Sec. 35, heavy cattle use. Sec. 36, several fish and cows. Sec. 37, heavy cattle use, dead standing trees, SF Beaver enters. Sec. 38, several fish, heavy cattle use. Sec. 39, severe cattle caused bank erosion, several fish. Sec. 40, heavy cattle use, fish abundant, deep pool. Sec. 41, severe cattle damage to banks, fish abundant. Sec. 42, badly eroded banks from cattle, freshwater mussel beds. Sec. 43, dead standing trees and fish abundant. Sec. 45, deep pool, heavy cattle use and bank damage. Sec. 47, old beaver dams throughout. Sec. 48, old beaver dams and deep pools. **\*\*\*THERE WAS AN ARROW AND NO TEXT FOLLOWING\*\*\***

GRANDE RONDE RIVER: FLY CREEK SECTION DATE: November, 4 - 19, 1987

104 Subsections inventoried - stream section length = 13,000' = 2.46 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
20%	<b>55%</b>	<b>25%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>26%</b>	<b>44%</b>	<b>23%</b>	<b>6%</b>	<b>1%</b>

Width: Sectional Ave.

Flood: 43 feet

Present: 31 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>16%</b>	<b>7%</b>

Comments:

Start inventory at Fly Creek mouth and proceeded upstream. No comments

71 Subsections inventoried - stream section length = 35,000' = 6.63 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>43%</b>	<b>16%</b>	<b>41%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>11%</b>	<b>16%</b>	<b>43%</b>	<b>27%</b>	<b>2%</b>

Width: Sectional Ave.

Flood: 26 feet

Present: 6 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>41%</b>	<b>26%</b>

Comments:

Start of watercourse downstream. Sec. 1, stream starts in marshy meadow. 2500 feet downstream is first significant pool. Sec. 3, at 3500 feet down, first fish seen. Sec. 4, mangled 1 foot diameter culvert, blocks adults. Sec. 5, marsh meadow, poor defined channel. Sec. 6, spring enters. Sec. 7, 4 foot diameter culvert, poor passage. Sec. 8, poorly defined channel, heavy cattle use. Sec. 9, meadow wetland. Sec. 10, meadow wetland, poorly defined channel. Sec. 13, abundant dead trees. Sec. 15, fish seen. Sec. 16, abundant dead standing trees. Sec. 17, fish seen, abundant sedges. Sec. 18, cows present, fish, sedges. Sec. 20, several fish. Sec. 21, many fish, little surface cover. Sec. 22, abundant fish, good undercut. Sec. 23, abundant dead standing trees, fish. Sec. 24, abundant dead standing trees. Sec. 25, abundant dead dead standing trees, very bad cattle erosion. Sec. 26, very bad cattle erosion. Sec. 27, several fish, abundant sedges, heavy cattle use. Sec. 28, very bad cattle erosion, abundant dead standing trees. Sec. 29, sedges, fish, bad cattle erosion. Sec. 30, very bad cattle eroded banks. Sec. 31, several fish. Sec. 32, several fish, man-made 3 foot high dam, poor passage. Sec. 33, severe cattle erosion plunging into channel, four foot high jump. Sec. 34, beginning of stream dredge tailings. Sec. 35, entire section dredged, several fish, sedges, heavy cattle use. Sec. 37, several fish, heavy

cattle use. Sec. 38, several fish, heavy cattle use, Sec. 39, several fish, lots of trees over channel. Sec. 40, three log jams. Sec. 41, culvert for Road 7375, high velocity, poor passage. Sec. 43, 2 1/2 foot high barrier, eroded banks. Sec. 44, several fish, badly eroded banks, log jam. Sec. 45, several fish, abundant downed trees. Sec. 46, road construction sidecast in stream. Sec. 48, heavy brush. Sec. 49, mining claim, log jam, poor culvert. Sec. 50, fish, log jam, underbrush. Sec. 52, debris jam. Sec. 53, deep culvert, beaver dam. Sec. 54, several beaver dams. Sec. 55, several fish, two dams. Sec. 56, braided, debris jam. Sec. 57, debris jam. Sec. 58, debris jam, braided channel, several fish. Sec. 59, tailing piles, debris jam, several fish. Sec. 60, very abundant fish, tailing piles, debris jam, braided channel. Sec. 63, log jam. Sec. 64, dead standing trees, debris jam. Sec. 64, braided channel. Sec. 65, old beaver dams, deep pools, 10-12 inch trout. Sec. 66, several fish, nice pools, beaver dams, dredge tailings, large pond. Sec. 67, several fish, beaver dam, dredge tailings. Sec. 68, dredge tailings. Sec. 69, dredge tailings. Sec. 70, nice pool, beaver lodges, several fish, tailing piles, end just below Boundary Creek FS Station.

MIDDLE TRAIL CREEK

DATE: August 27, 1987

23 Subsections inventoried - stream section length = 20,700' = 3.92 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>37%</b>	<b>16%</b>	<b>47%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>16%</b>	<b>23%</b>	<b>48%</b>	<b>12%</b>	<b>1%</b>

Width: Sectional Ave.

Flood: 27 feet

Present: 5 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>29%</b>	<b>23%</b>

Comments:

Sec. 1, begin downstream direction at 7325 crossing, debris jam, braided, poor culvert. Sec. 2, good cover. Sec. 3, debris jams, fish. Sec. 4, nice pool, debris jam, fish. Sec. 5, several fish. Sec. 6, abundant fish, sedges, pools, meanders. Sec. 7, debris jam, fish, braided. Sec. 8, abundant fish, debris jam. Sec. 9, debris jam, fish. Sec. 10, debris jam, gradient 3%. Sec. 11, canyon, velocity chute, braid. Sec. 12, debris jam with four foot jump, braid. Sec. 13, debris jam, braid. Sec. 14, braided, debris jam. Sec. 15, braid, braid, debris jam. Sec. 16, debris jam, braid. Sec. 18, debris jam, braided. Sec. 19, braided. Sec. 20, debris jam, abundant fish, Sec. 21, braided. Sec. 22, braided, fish. Sec. 23, confluence with S. Trail, braided,

SOUTH TRAIL - DATE: September 8 and 9. 1987

42 Subsections inventoried - stream section length = 37,800' = 7.16 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>18%</b>	17%	65%

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	Fine	<u>Hard Pan</u>
<b>16%</b>	<b>34%</b>	<b>31%</b>	<b>18%</b>	<b>1%</b>

Width: Sectional Ave.

Flood: 38 feet

Present: 10 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
32%	21%

Comments:

Sec. 1, begin heading downstream at Road 50 crossing. Burnt lodgepole debris jam, more jams, six foot drop, 12 inch fish. Sec. 2, steep gradient, debris jams, pools. Sec. 3. debris jams, blowdown abundant. Sec. 4, lots of jams, mining water diversion. Sec. 5, several debris jams, lots of fines. Sec. 6, debris jams, mining camp, lots of fines trapped. Sec. 7, debris jam, fish, braided channel. Sec. 8, undercut, debris jams, miners working in creek. Sec. 9, steep, boulders. Sec. 10, abundant debris, steep, boulders. Sec. 11, debris jams, falls, many Brook Trout. Sec. 12, shaded, falls, debris jam. Sec. 13, mining claim, low gradient. Sec. 14, debris jams, six foot drop. Sec. 15, 10 foot bedrock falls, debris jams, placer mine. Sec. 16, mined channel, shallow, uniform. Sec. 17, dredge piles, steep gradient increase. Sec. 18, three foot high falls, braids. Sec. 19, steep riffle, three consecutive falls, 13 foot total. Sec. 20, uniform stream, mined, braided, diverted. Sec. 22, braided. Sec. 23, braided, debris jam. Sec. 24, braided. Sec. 25, braided. Sec. 26, braid, debris jam. Sec. 27, braided. Sec. 28, braided. Sec. 29, braided, debris jam. Sec. 30, two culverts. braided. Sec. 31, wide channel, braids. Sec. 32, braided. Sec. 33. braided, fish. Sec. 34, braided. Sec. 35, braided, debris jam. Sec. 37, mining claim, braided. Sec. 38, jeep ford, braided. Sec. 39, braided, mining claim. Sec. 40, braided. Sec. 41, braided. Sec. 42, end.

TRAIL CREEK - DATE: July 28 - August 11, 1987

73 Subsections inventoried - stream section length = 36,500' = 6.91 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
18%	17%	65%

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
23%	32%	41%	3%	<b>1%</b>

Width: Sectional Ave.

Flood: 38 feet

Present: 12 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
36%	28%

Comments:

Upstream from Trail Cr. - NF John Day confluence. Sec. 1, debris pile, railroad tie in stream forming pool. Sec. 3, braids, small debris jam. Sec. 4, nice pool, debris jam, and braid. Sec. 5, braid. Sec. 8, debris piles, small falls. Sec. 9, debris pile, culvert under highway. Sec. 10, series of small falls 1-2 feet high. Sec. 15, deep run, braid. Sec. 16, braid, undercut. Sec. 17, braid. Sec. 18, large pool with undercut. Sec. 18, major flood plain. Sec. 19, fish present. Sec. 20, large boulders, braid. Sec. 21, braids, fish, aquatic vegetation, undercut. Sec. 22, braided, undercut. Sec. 23, meadow area, S. Trail enters N. Trail. Sec. 24, braids, dead standing trees. Sec. 25, severe erosion. Sec. 26, dead standing trees, braids. Sec. 27, fish, abundant dead standing lodgepole, braids, several fish. Sec. 28, abundant dead lodgepole. Sec. 30, abundant dead lodgepole, braided. Sec. 31, dead trees, large boulders, log jam with chute, badly eroding banks. Sec. 32, several fish, braided. Sec. 33, dead trees, undercut. Sec. 34, debris jam. Sec. 35, eroding bank. Sec. 36, undercut bank, nice pools, log jam. Sec. 37, undercut bank, braid. Sec. 38, old rootwad in water, dead standing trees. Sec. 39, braid with stranded fish. Sec. 40, braided channel, rootwad, large log, debris jam. Sec. 41, nice wood in stream, braided. Sec. 42, braided, eroded bank. Sec. 43, eroding bank. undercuts. Sec. 44, braided. Sec. 45,

two log jams, pools, no fish, braided. Sec. 46, several fish, braided. Sec. 47, nice undercuts, pools, logs. Sec. 48, eroding bank, several fish. Sec. 49, braided, several fish. Sec. **51**, eroded banks. Sec. 52, very braided, lots of wood, meandering. Sec. 53, overhanging vegetation. Sec. 54, undercut, rootwad. braid. Sec. 55, gradient increasing to 3.5%. Sec. 56, debris jam, braids. Sec. 57, abundant alder and fish, braids, undercuts. Sec. 58, eroded banks, undercuts. Sec. 59, several fish, braided. Sec. 60, abundant alder, braided. Sec. 61, steep (3.5%), lots of alder. Sec. 62, large culvert. Sec. 63, old bridge has created four foot high barrier. Sec. 63, braided. Sec. 64, braided, barrier log jam. Sec. 65, debris block, eroded banks, fish. Sec. 66, many logs, 3% gradient, debris block. Sec. 67, braided. Sec. 69, gradient 4%, debris jams, no fish. Sec. 70, steep (5+%), small canyon, bedrock. Sec. 71, back into meadow (3%), braids, dead standing trees. Sec. 73, end at fork of tow small tribs.

GRANDE RONDE RIVER - RIFLE RANGE TG BEAR CREEK

DATE: 11/19/87

12 Subsections inventoried - stream section length = 1500' = .28 miles

Flow Features:

Pool

**11%**

Run/Glide

**56%**

Riffle

**33%**

Substrate:

Boulder

**3%**

Cobble

**74%**

Gravel

**20%**

Fine

**3%**

Hard Pan

**0%**

Width: Sectional Ave.

Flood: 96 feet

Present: 37 feet

Pool Characteristics: Section Ave.

Perimeter Cover

**0%**

Surface Cover

**0%**

Comments:

None.

11 Subsections inventoried - stream section length = 1375' = .26 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>2%</b>	<b>79%</b>	<b>17%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>8%</b>	<b>60%</b>	<b>29%</b>	<b>4%</b>	<b>0%</b>

Width: Sectional Ave.

Flood: 79 feet

Present: 42 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>0%</b>	<b>0%</b>

Comments:

Start inventory at warning sign for rifle range. No comments.

GRANITE CREEK - DATE: August 7 - 13. 1987

37 Subsections inventoried - stream section length = 18,500' = 3.5 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>4%</b>	<b>36%</b>	<b>60%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	<u>Fine</u>	<u>Hard Pan</u>
<b>11%</b>	<b>13%</b>	<b>60%</b>	<b>16%</b>	<b>0%</b>

Width: Sectional Ave.

Flood: 20 feet

Present: 4 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>23%</b>	<b>9%</b>

Comments:

Sec. 1, upstream end of drainage downstream, stream goes underground.  
Sec. 2, spring. Sec. 3, goes underground. Sec. 7, partial cut area. Sec. 10, dredge tailings, steep with Cascades. Sec. 11, cloth covered weir, tailings. Sec. 12, drainage dredge, 250 feet wide. Sec. 13, dredged, 250 feet wide. Sec. 14, clear cut. Sec. 15, road crosses creek. Sec. 16, tailings throughout section. Sec. 17, jeep rail fords creek. Sec. 21, private property. Sec. 22, lots of metal scrap in stream, cans, etc. from mining camp, dredge tailings. Sec. 23, wood structure, culvert. Sec. 24, dredge tailings, braid. Sec. 25, dredge tailings, brushy. Sec. 26, Umatilla NF boundary. Sec. 27, begin 1/2 mile downstream. Sec. 28, first fish seen! Large pond on left with fish. Sec. 29, braids, fish. Sec. 30, braids, tailings, fish. Sec. 31, brushy. Sec. 33, small rock and plastic tarp dam. Sec. 34, marshy, grasses. Sec. 35, braided, algae. Sec. 36, boulder dam. Sec. 37, marshy, end survey. 150 feet downstream begin dredge tailing field.

DARK CANYON - DATE: July 6-13, 1987

92 Subsections inventoried - stream section length = 46,000' = 8.71 miles

Flow Features:

<u>Pool</u>	<u>Run/Glide</u>	<u>Riffle</u>
<b>54%</b>	<b>20%</b>	<b>26%</b>

Substrate:

<u>Boulder</u>	<u>Cobble</u>	<u>Gravel</u>	Fine	<u>Hard Pan</u>
<b>12%</b>	<b>35%</b>	<b>41%</b>	<b>13%</b>	<b>1%</b>

Width: Sectional Ave.

Flood: 18 feet

Present: 7 feet

Pool Characteristics: Section Ave.

<u>Perimeter Cover</u>	<u>Surface Cover</u>
<b>40%</b>	<b>26%</b>

Comments:

Sec. 1, begins at T3S R35E Sec. 14, and proceeds upstream, much algal growth, elaborate dam structure. Sec. 2, shallow, no shade, algae, small log jam. Sec. 3, heavy algae, fish. Sec. 4, algae fish present, broad-leaf vegetation growing in 20% of channel. Sec. 5, well shaded, fish, algae, two nice pools with rootwads. Sec. 6, algae, log jam. Sec. 7, 2% gradient, abundant fish, log jam. Sec. 8, nice pool, sheep on creek. Sec. 9, algae. Sec. 10, old instream structure. Sec. 11, lots of wood on bank, none instream. Sec. 12, algae, log jam, deep pool. Sec. 13, cliff on left, abundant fish. Sec. 14, braided channel, fish, undercut, heavy plant growth. Sec. 15, algae, heavy cattle trampling, plant growth. Sec. 16, log weir with water flowing under. Sec. 17, two structures. Sec. 18, small debris dam. Sec. 19, large rootwad, 2% gradient, road. Sec. 20, broad-leaf vegetation, braided channel. Sec. 21, braided channel. Sec. 22, log jam, confluence with Little Dark Canyon, both streams rapidly go dry above this point. Sec. 23, double log structure forming pool, lots of fish, stream goes dry. Sec. 24,

stream dry. Sec. 25, log weir, fish in pool above and below, stream dry. Sec. 28, salamanders, bedrock pool. Sec. 27, two structures. Sec. 28. log weir with pool and trapped fish, dry stream. Sec. 29, stream dry, braided, log weir, cattle sign in channel. Sec. 30, dry channel, log jam. Sec. 31, debris jam, stream flow starts again. Sec. 32, low stream flow, cattle sign in channel. Sec. 33, cattle sign in stream, stream dry. Sec. 34, heavy cattle bank damage, nice pool, stream dry. Sec. 35, two small debris jams from forest operation slash, stream flow light. Sec. 36, heavy cattle use, tow debris jams, 10+ trees across streambed. Sec. 37, partially dry, several small jams. Sec. 38, cattle trampled banks, large pool, fish, silt. Sec. 39, heavy cattle use. Sec. 40, heavy cattle use in stream, thick algal growth, stream goes dry. Sec. 41, stream goes dry, heavy cattle bank trampling, channel mostly dry. Sec. 42, debris jam, channel dry. Sec. 43, debris jam. Sec. 44, heavy cattle use, rootwad instream, two nice pools, no fish, braided channel. Sec. 45, small pool, gradient 1%, braid. Sec. 46, braided, fish in large pool, heavy cattle trampling. Sec. 47, nice undercut, heavy cattle use, lots of fish. Sec. 48, debris jams, fish, nice pool. Sec. 49, nice pool, stream enters clearcut, heavily trampled banks. Sec. 50, abundant instream debris, severe bank trampling by cattle. Sec. 51, trampled banks, few pools, shade present, debris. Sec. 52, good undercut, fish, braid. Sec. 53, abundant debris, fish. Sec. 54, large pool, algae, fish. Sec. 55, heavy algae. meadow like, debris, channel goes dry. Sec. 56, channel dry, abundant debris. Sec. 57, bed dry, abundant debris. Sec. 58, abundant fish. Sec. 59, very abundant fish, large pool. Sec. 60, abundant fish. Sec. 61, major log jam. Sec. 62, heavy cattle use, culvert. Sec. 63, undercut, abundant debris, heavy livestock use. Sec. 64, nice pool salamander eggs. Sec. 65, heavy silt. Sec. 66, heavy cattle use, fish. Sec. 67, debris jam, stream dry, cattle herd in creek. Sec. 68, trampled banks. Sec. 69, bad erosion from cattle in creek. Sec. 70, blowdown into stream, heavy algae, fish. Sec. 71, stream dry, heavy cattle use, fish stranded. Sec. 74, heavily trampled banks, algae, cattle herd in creek. Sec. 75. broken down banks, standing water only, choked with algae, debris jam. Sec. 78, meadow section, meandering, undercut, fish. Sec. 79, fish, partial cut. Sec. 80, clearcut, fish, debris, undercut. Sec. 81, pools, no shade, fish. Sec. 82, fish, pools, algae, sedges. Sec. 83, fish, deep pool, stream dries up. Sec. 84, little water. Sec. 85, pools, meander. Sec. 86, overhead cover. Sec. 87, heavy algae, fish. Sec. 88, fish, heavy plant growth. Sec. 90, debris, grasses, no fish. Sec. 91, dry. Sec. 92, completely dry, end.

GRANDE RONDE RIVER: HILGARD SECTION

DATE: November 17, 1987

21 Subsections inventoried - stream section length = 2625' = .5 miles

Flow Features:

Pool

8%

Run/Glide

64%

Riffle

18%

Substrate:

Boulder

8%

Cobble

52%

Gravel

31%

Fine

8%

Hard Pan

1%

Width: Sectional Ave.

Flood: 103 feet

Present: 60 feet

Pool Characteristics: Section Ave.

Perimeter Cover

21%

Surface Cover

11%

Comments:

Start at Ukiah exit sign on 1-84 and proceed upstream to Bridge 244.

APPENDIX II

UPPER GRANDE RONDE  
FISHERIES HABITAT IMPROVEMENTS  
INSTREAM STRUCTURE LOCATIONS

**UPPER GRAND RONDE RIVER**  
**FISH HABITAT IMPROVEMENT-FY 87**  
**KEY**

X23 - Subsection (approximately 250 feet)

LOGS

LJ - natural log jam  
 LJc - log jam created  
 Ls<sub>1</sub> - single log sill  
 LS<sub>45</sub>- single log sill at 45° angle  
 LSV<sub>2</sub>- vee log sill with two logs -  
 LSV<sub>3</sub>- vee log sill using three logs -  
 LD<sub>1</sub> - single log deflector  
 LD<sub>2</sub> - `double log deflector  
 LD<sub>3</sub>- triple leg deflector  
 2LD<sub>2</sub>- double, double deflector

TREES

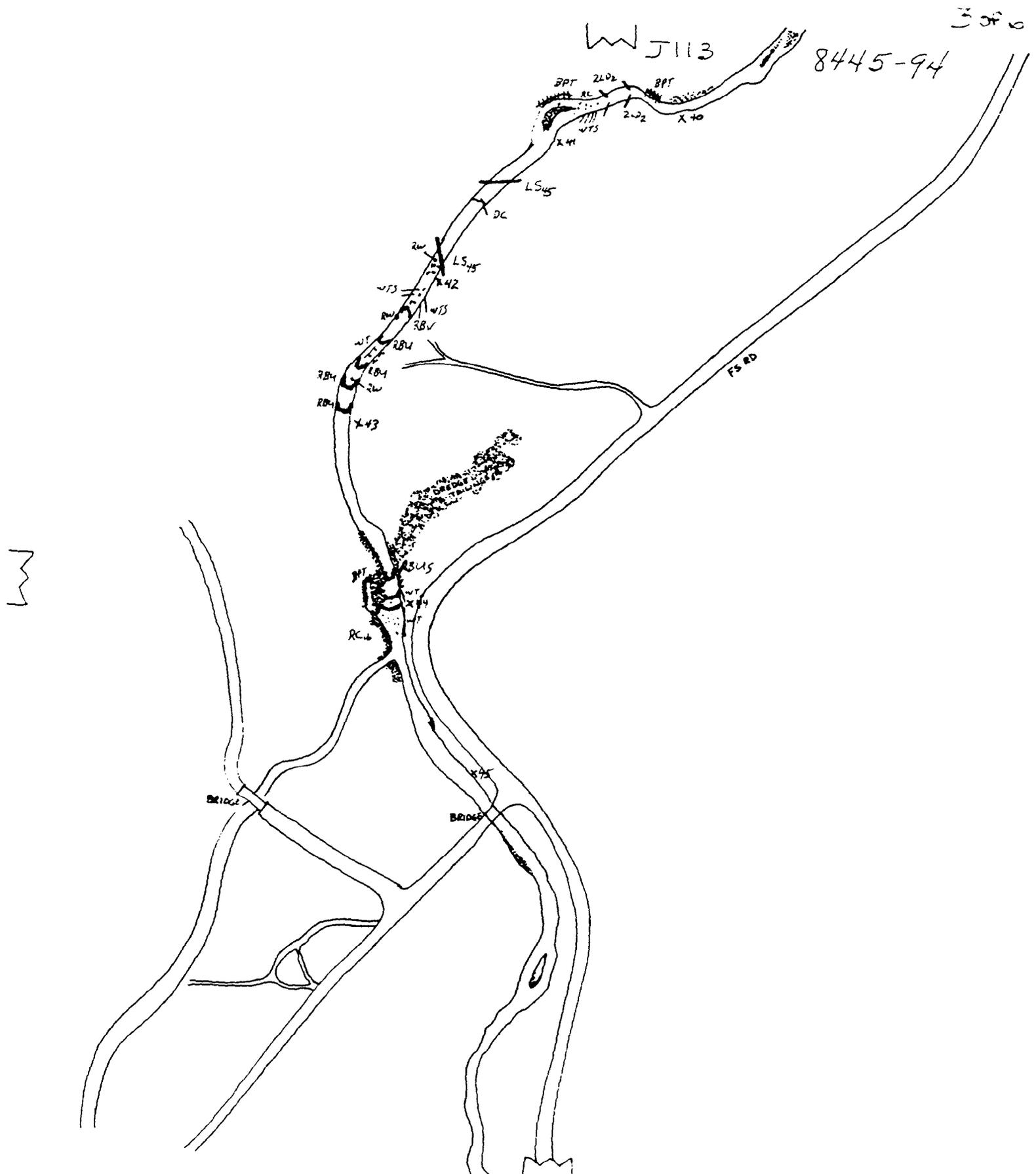
WT -whole tree( s)  
 BPT -bank protection trees  
 RW- root wad

ROCKS

r - single rock  
 RC<sub>2</sub>- two rock cluster  
 RC<sub>3</sub>- three rock cluster  
 RC<sub>4</sub>- four rock cluster  
 RC<sub>16</sub>- sixteen rock cluster  
 RBV - rock berm downstream vee  
 RBU- rock berm upstream U  
 RR- rip rap  
 RT -turning rocks

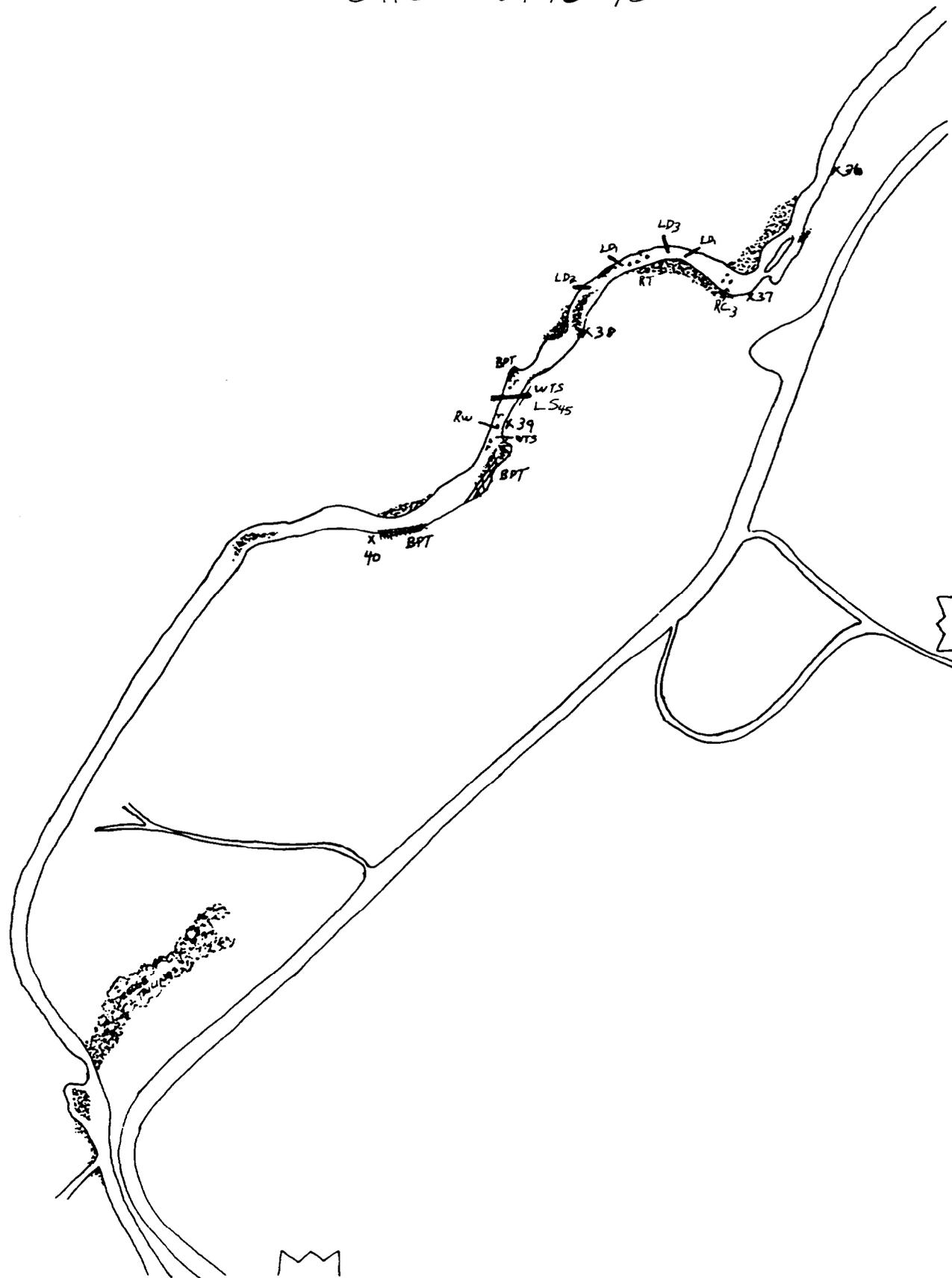
**-CONT.-**

<u>Subsection</u>	<u>Structures Type</u>	<u>Complex</u>	<u>Pieces</u>
23-24	LJ <sub>c</sub> , RR, 3WT, 4RT	6	9
24-25	RC <sub>3</sub> , WT, <u>LS</u> , WT, RC <sub>3</sub> , RR, <del>2LD<sub>2</sub></del> , RC <sub>4</sub> , RC <sub>3</sub> , 4RC <sub>3</sub> , <u>LD</u>	15	24
25-26	RC <sub>4</sub> , <u>LS</u> , WT, RC <sub>4</sub> , RC <sub>4</sub> , <u>LS<sub>d</sub></u> , WT, RC <sub>2</sub> , RC <sub>1</sub> , <u>LD<sub>2</sub></u>	10	20
26-27	RC <sub>4</sub> , <u>LS<sub>d</sub></u> , WT, 4RT, LJ <sub>c</sub>	5	11
27-28	RC, <u>LS<sub>v</sub></u> , WT, RC, WT	5	5
28-29	<u>LS<sub>v</sub></u> , 8WT, RW, 15RC	18	25
29-30	<u>LS</u> , 3WT, RC <sub>1</sub> , RW, WT, WT, 12RC <sub>1</sub> , RW, WT	20	23
30-31	RC <sub>3</sub> , 3WT, <u>LD<sub>1</sub></u>	3	7
31-32	RW, RC <sub>1</sub> , <u>LS<sub>v</sub></u> , RC, 3WT	5	7
32-33	NT	-	-
33-34	<u>LD<sub>1</sub></u> , RC <sub>1</sub> , RC <sub>3</sub>	3	5
34-35	RR, 10WT, RR, RC <sub>2</sub>	2	14
35-36	<u>LS<sub>1</sub></u> , RC <sub>3</sub> , 2WT, LJ <sub>c</sub>	4	7
36-37	<u>LS<sub>1</sub></u> , 5RC <sub>1</sub> , WT, RR, 10WT, LJ <sub>c</sub>	9	19
37-38	RC <sub>3</sub> , <u>LD<sub>3</sub></u> , <u>LD<sub>1</sub></u> , 3RC <sub>1</sub> , <u>LD<sub>1</sub></u> , <u>LD<sub>2</sub></u>	8	10
38-39	WT, <u>LS<sub>d</sub></u> , RC <sub>1</sub> , 5WT, RW, RC <sub>1</sub>	6	10
39-40	3WT, 5WT	2	8
40-41	3WT, <u>2LD<sub>2</sub></u> , <u>2LD<sub>2</sub></u> , 3WT, RC <sub>3</sub> , 5WT, RC <sub>1</sub>	8	19
41-42	RC <sub>1</sub> , RC <sub>1</sub> , WT, WT, <u>LS<sub>d</sub></u> , 2WT, WT, 3WT, <u>LS<sub>d</sub></u> , RW, 3RC <sub>1</sub>	11	16
42-43	RC <sub>1</sub> , RC <sub>1</sub> , WT, WT, <u>RBV</u> , RW, <u>RBU</u> , RC <sub>1</sub> , RC <sub>1</sub> , FL, <u>RBU</u> , <u>RBU</u> , RW, <u>RBU</u> , RW	15	15
43-44	<u>RBU</u> , RC <sub>1</sub> , <u>RBU</u> , <u>RBU</u> , <u>RBU</u> , <u>RBU</u> , 4WT	7	10
44-45	RC <sub>16</sub> , WT, WT	18	18



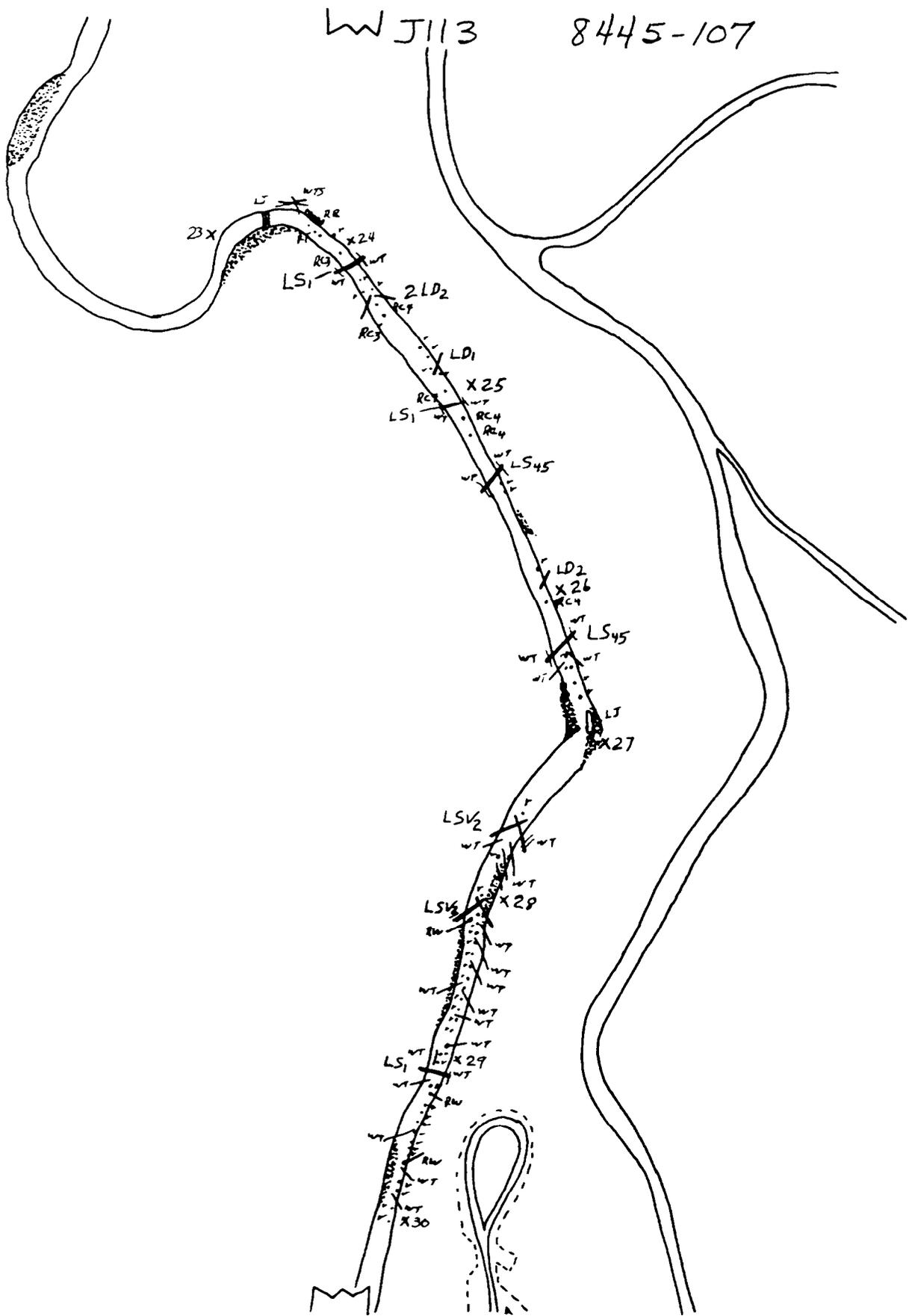
**UPPER GRANDE RONDE RIVER'**  
**FISH HABITAT IMPROVEMENT-FY87**

WJ113 8445-93



**UPPER GRANDE RONDE RIVER**

**FISH HABITAT IMPROVEMENT-FY87**

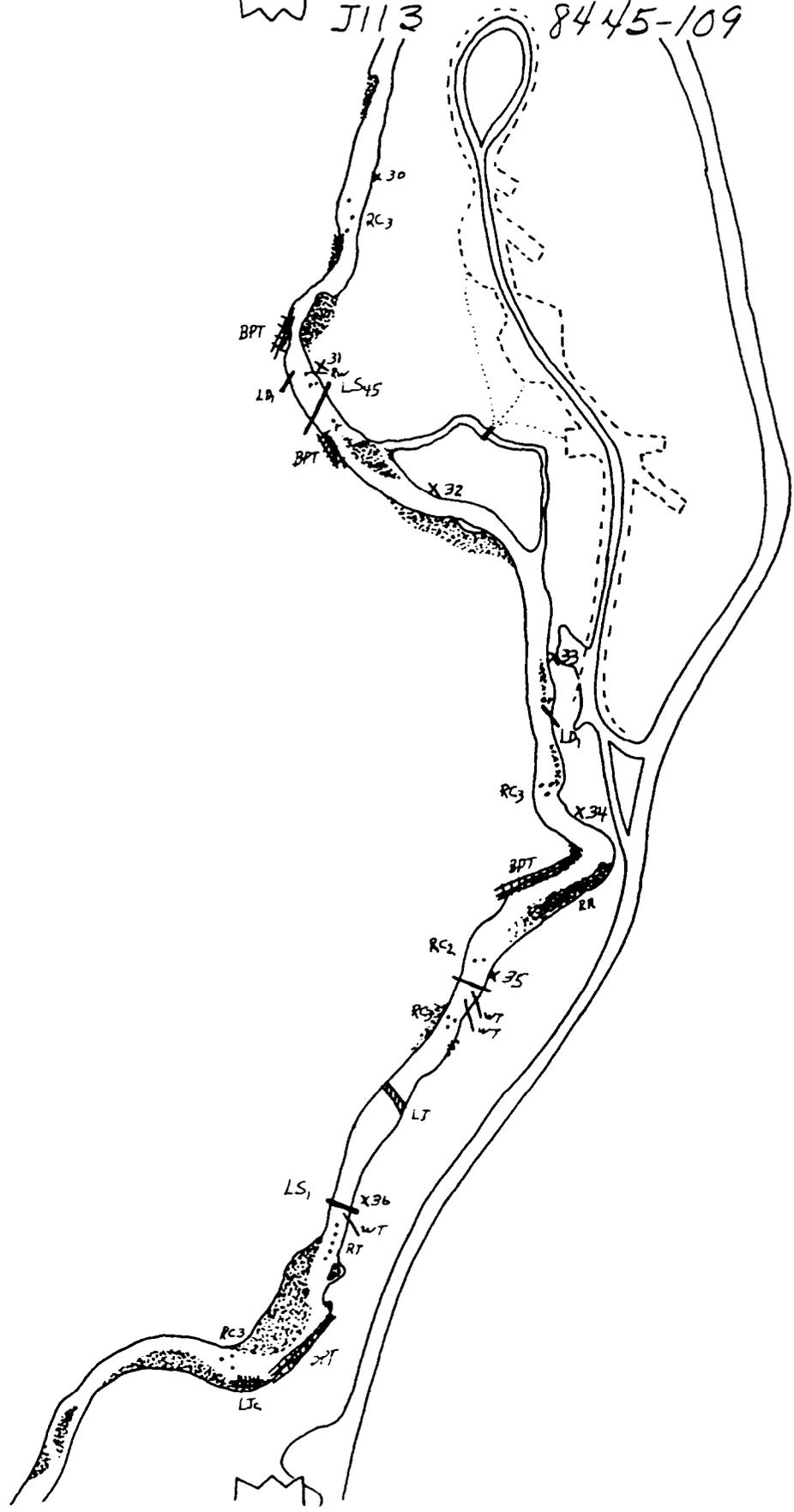


**UPPER GRANDE RONDE RIVER**

**FISH HABITAT IMPROVEMENT-FY87**

W J113

8445-109

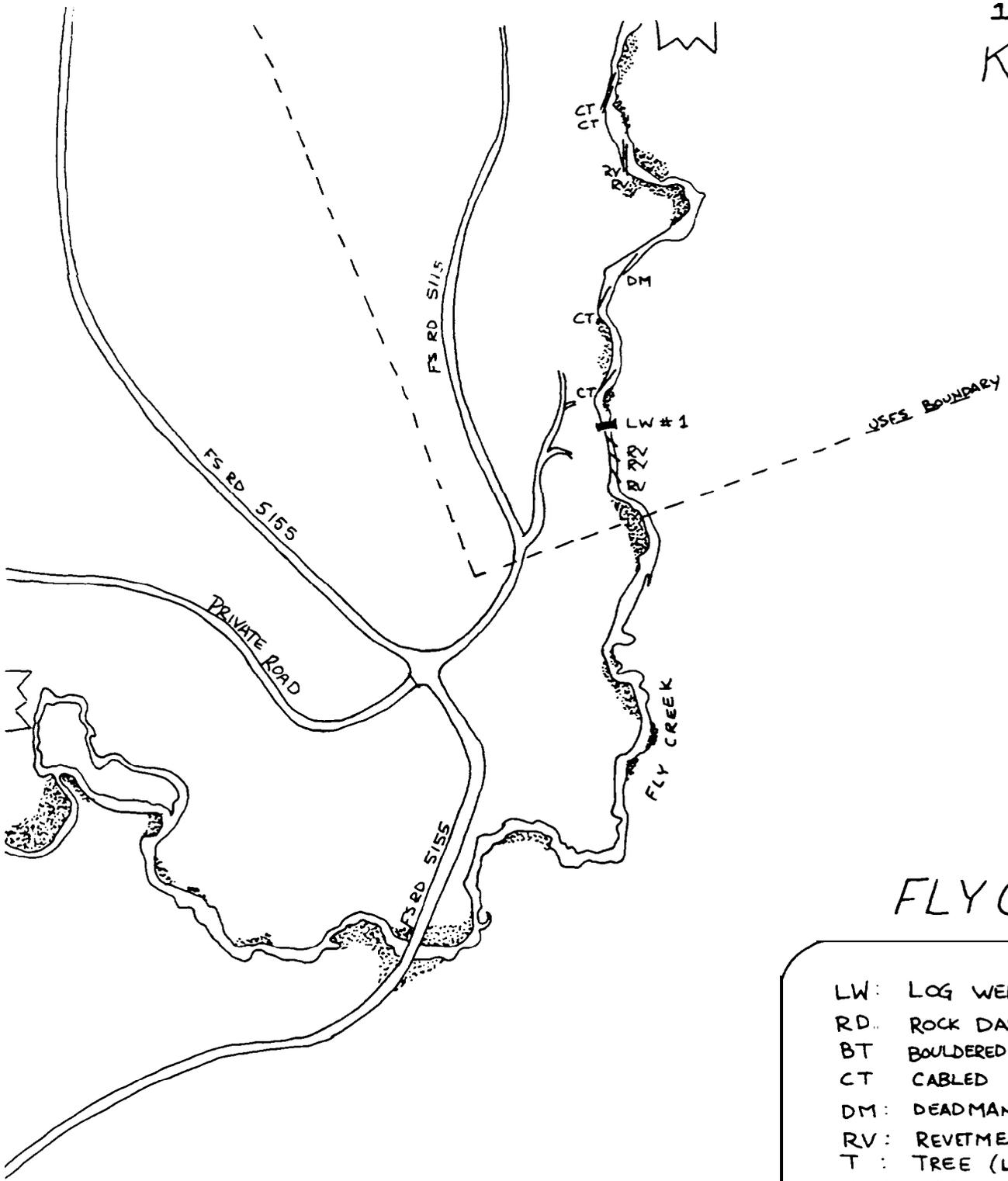


UPPER GRANDE RONDE RIVER

FISH HABITAT IMPROVEMENT-FY87

APPENDIX III

FLY CREEK  
FISHERIES HABITAT IMPROVEMENTS  
INSTREAM STRUCTURE LOCATIONS



# FLY CREEK

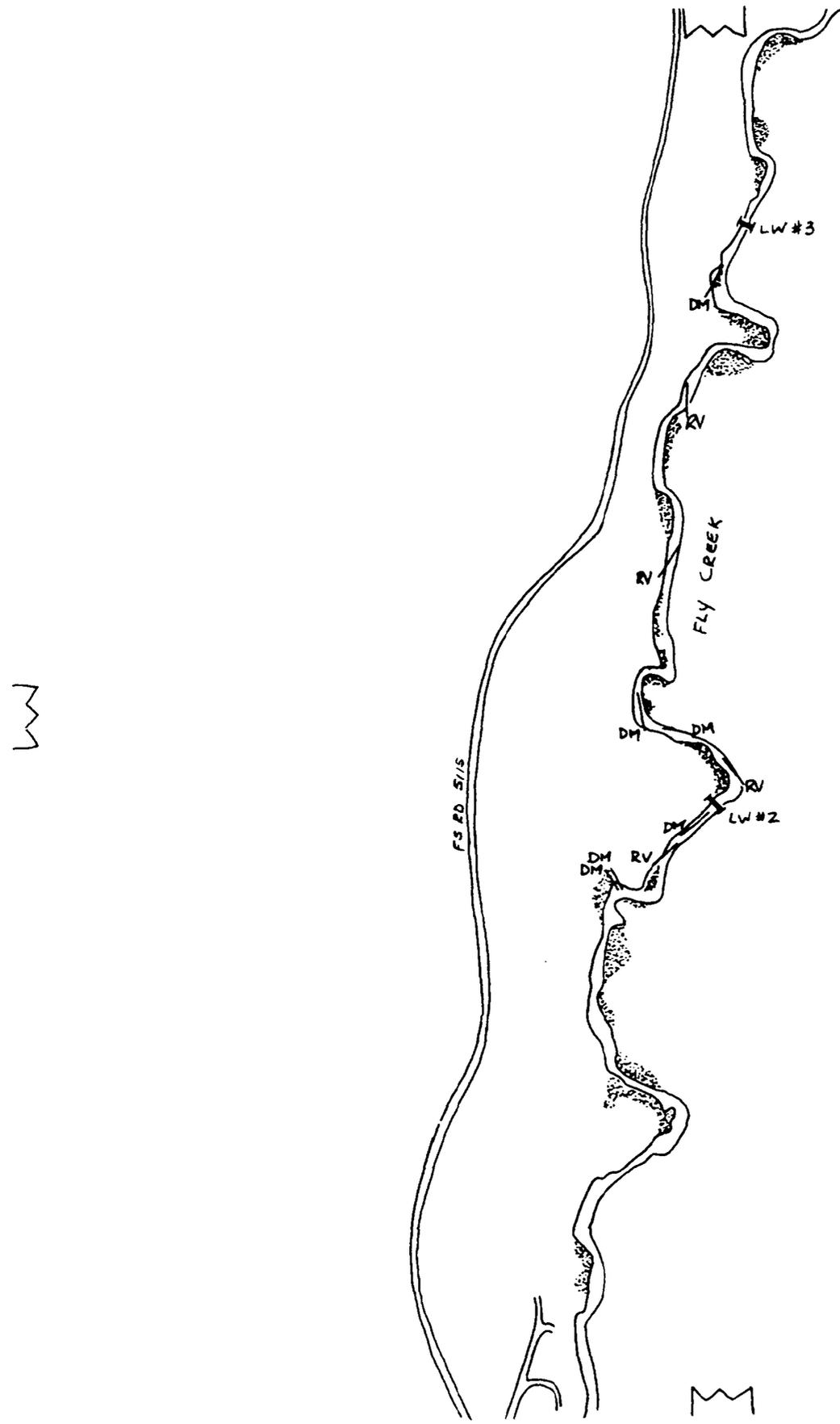
LW:	LOG WEIR
RD:	ROCK DAM
BT:	BOULDERED TREE
CT:	CABLED TREE
DM:	DEADMAN
RV:	REVETMENT
T:	TREE (LOOSE)
L:	LOG
DJ:	DEBRIS JAM
---	FENCE LINE
	GRAVEL BAR

→ DRAWN FROM AERIAL PHOTOGRAPHS



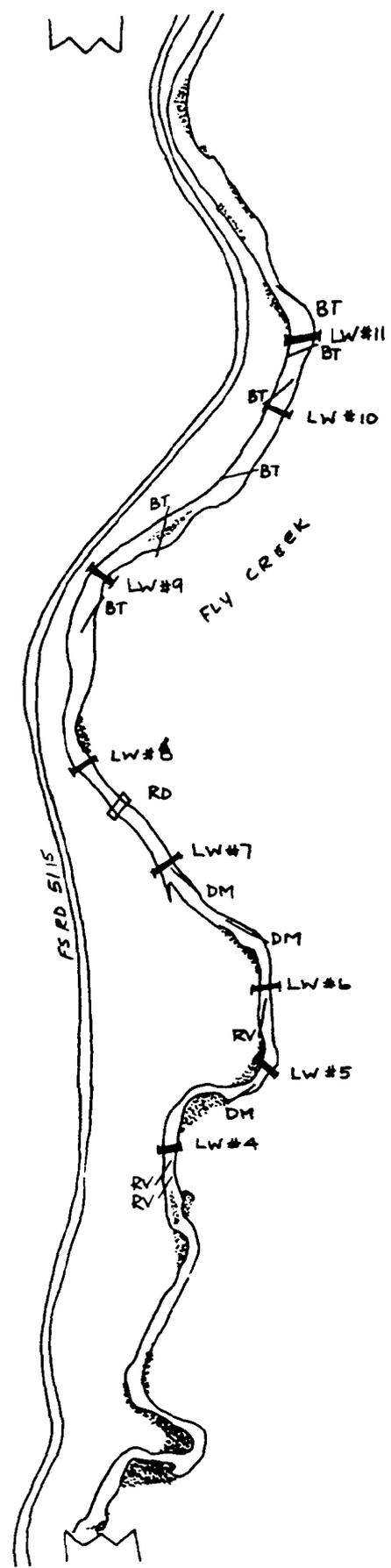
## FLY CREEK

### FISH HABITAT IMPROVEMENT-FY 87



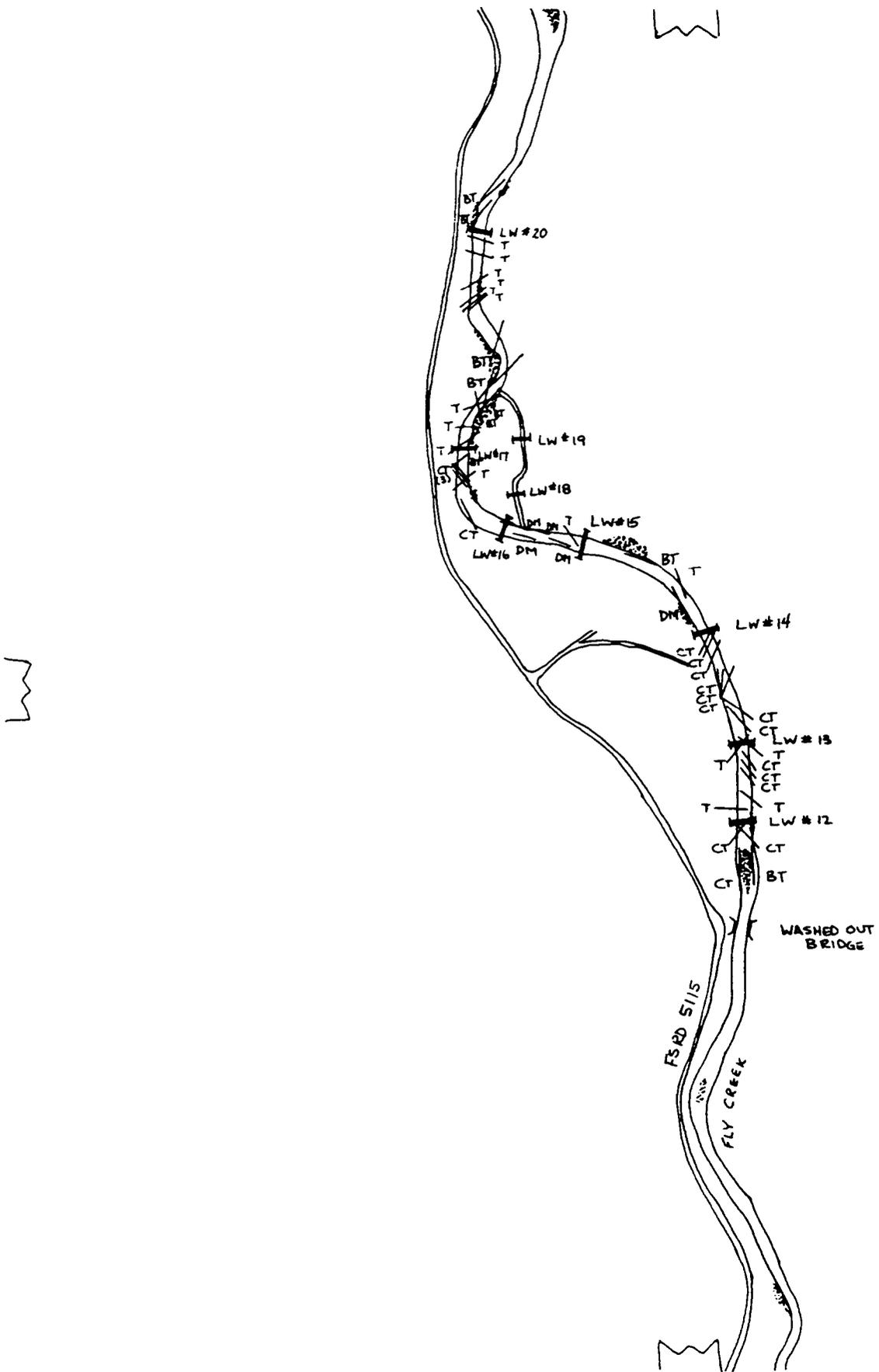
**FLY CREEK**

**FISH HABITAT IMPROVEMENT-FY 87**



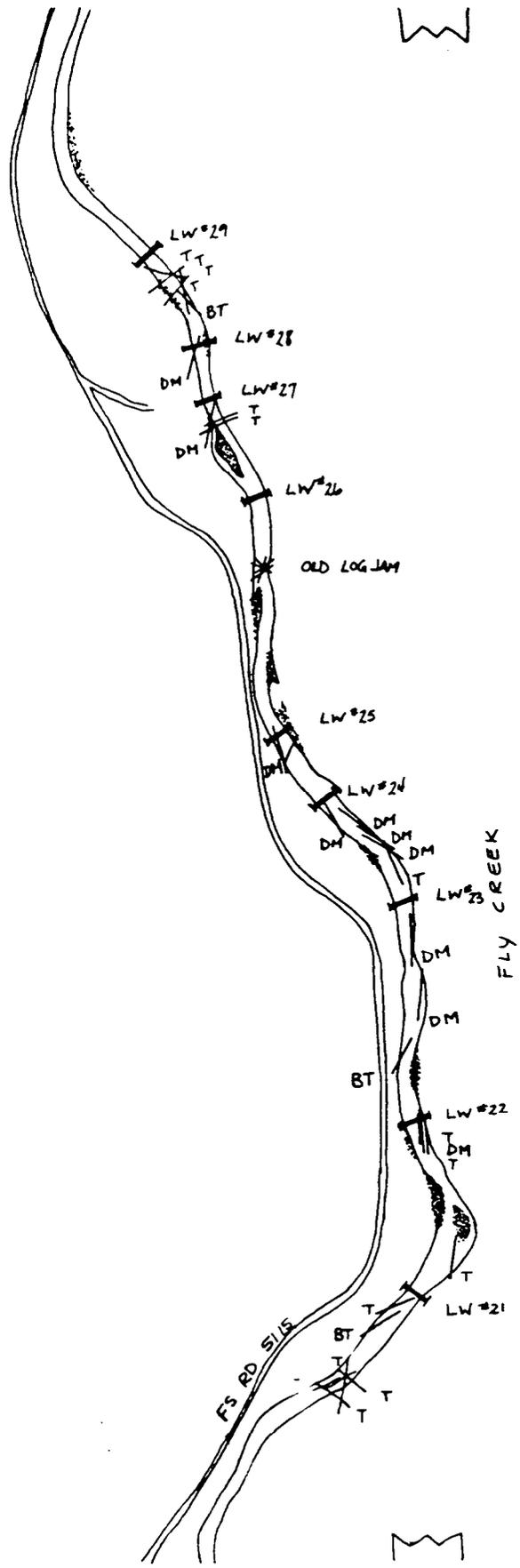
**FLY CREEK**

**FISH HABITAT IMPROVEMENT-FY 87**



**FLY CREEK**

**FISH HABITAT IMPROVEMENT-FY 87**

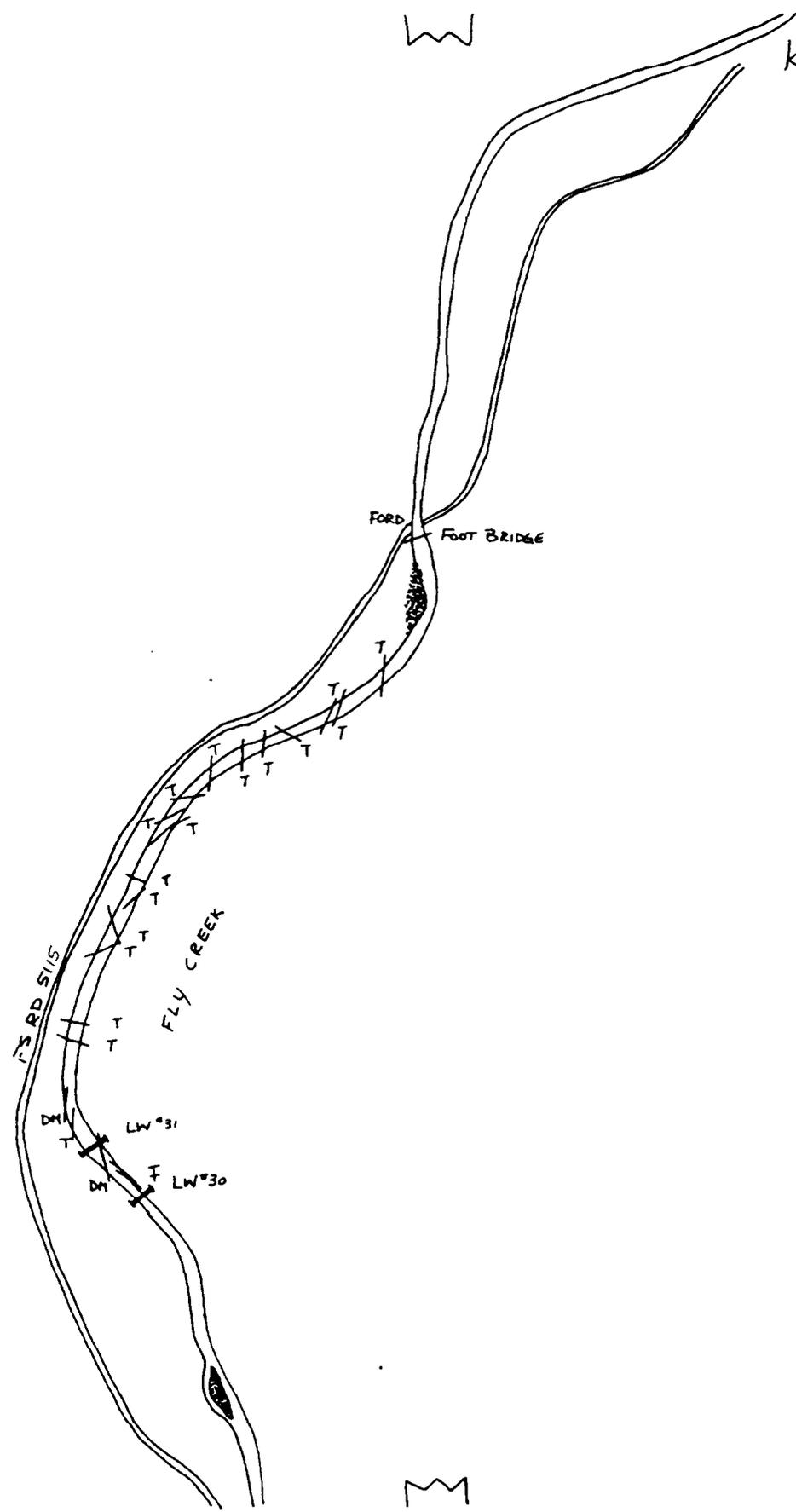


**FLY CREEK**

**FISH HABITAT IMPROVEMENT-FY 87**

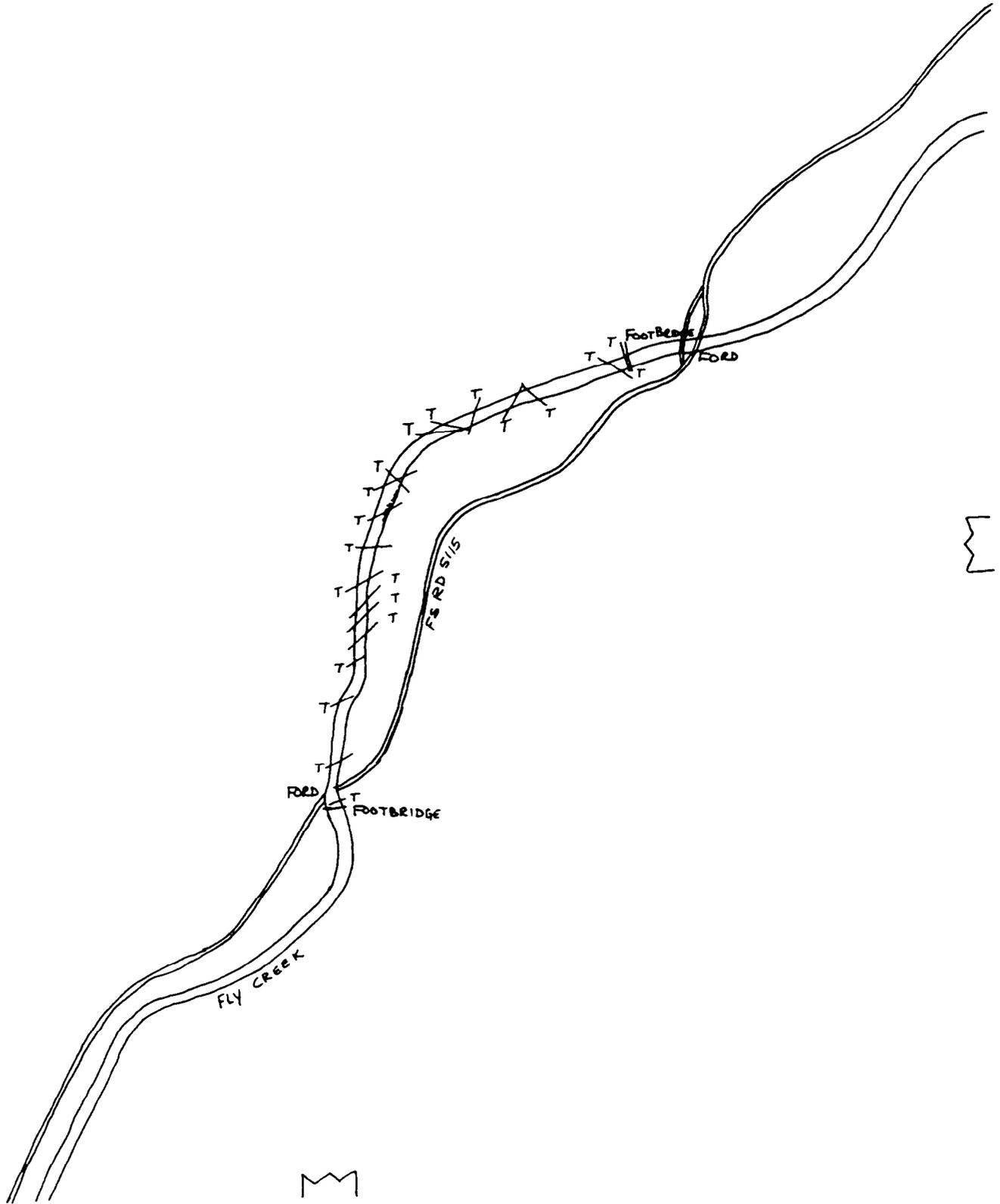
6 00 11

K064 8614-14



### FLY CREEK

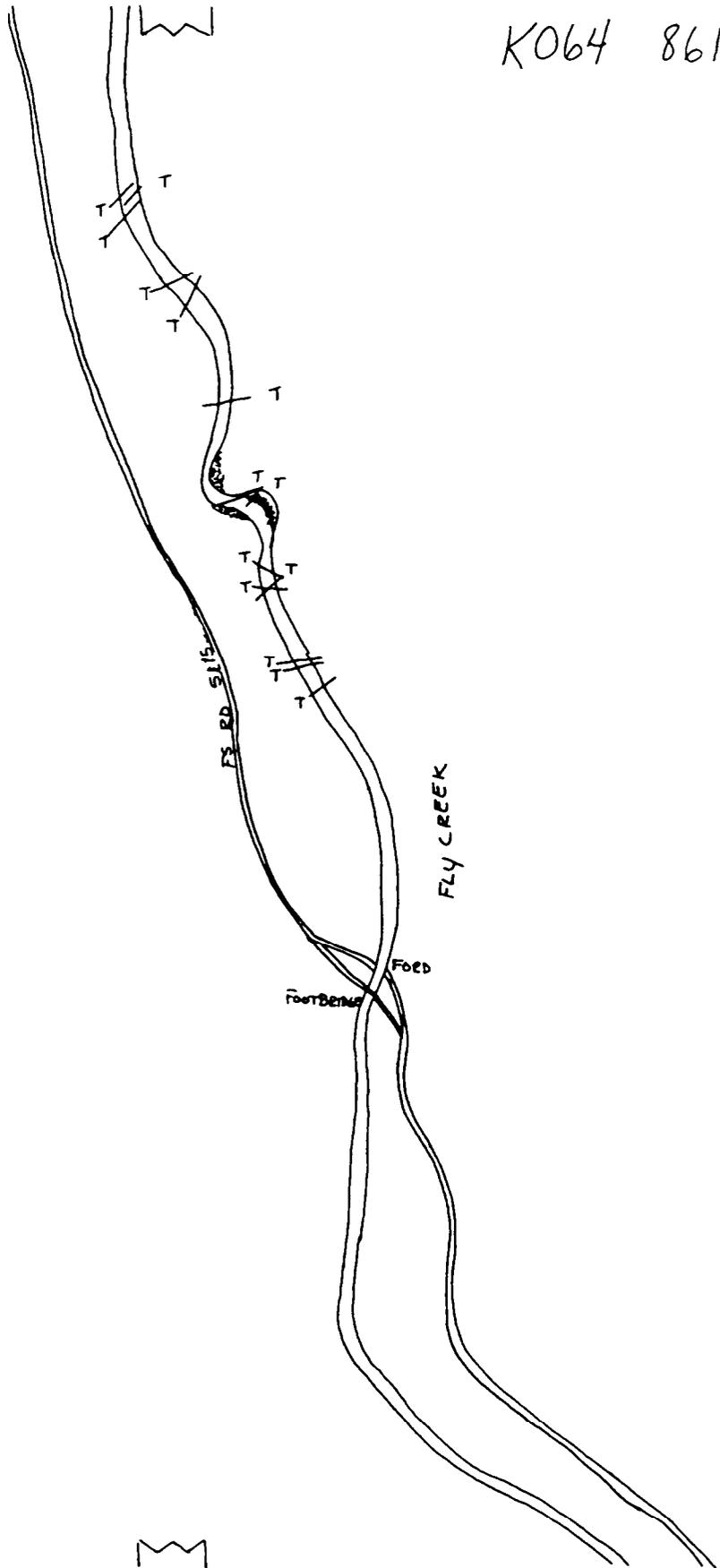
## FISH HABITAT IMPROVEMENT-FY 87



FLY CREEK

FISH HABITAT IMPROVEMENT-FY 87

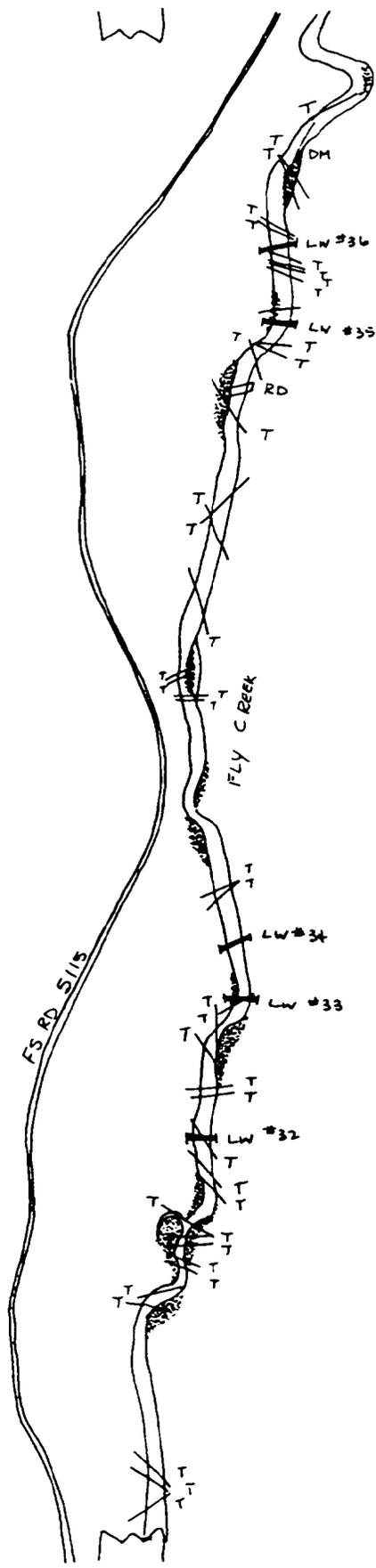
K064 8614-19



FLY CREEK

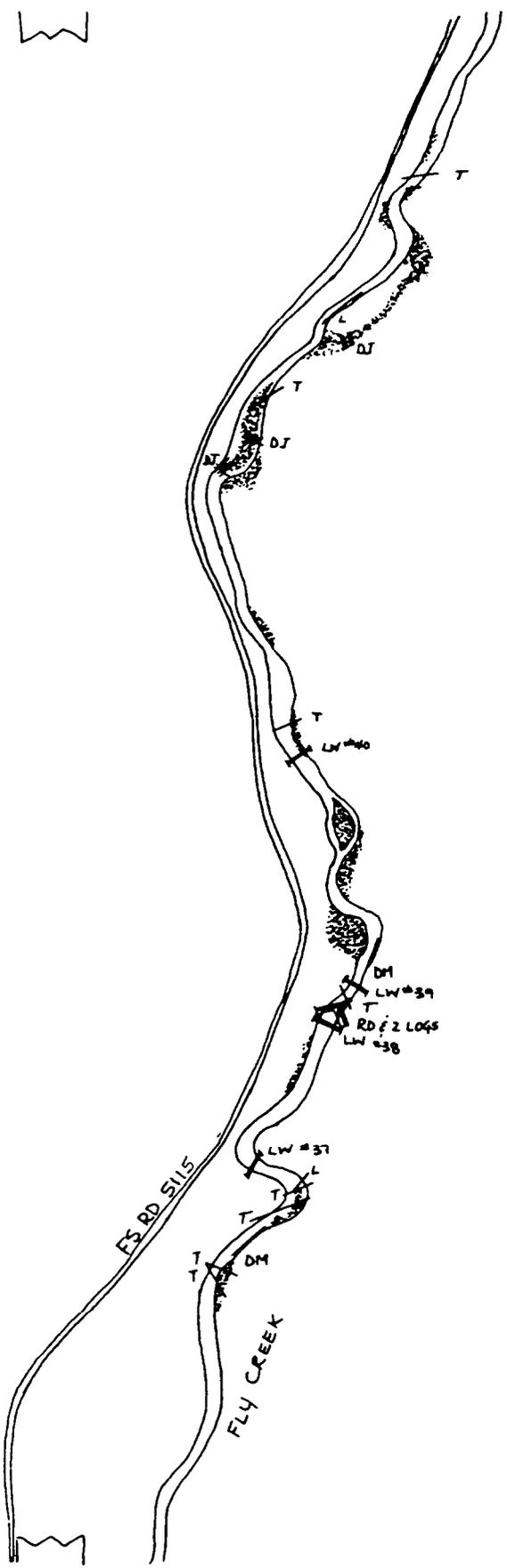
FISH HABITAT IMPROVEMENT-FY 87

K064 8614-22



### FLY CREEK

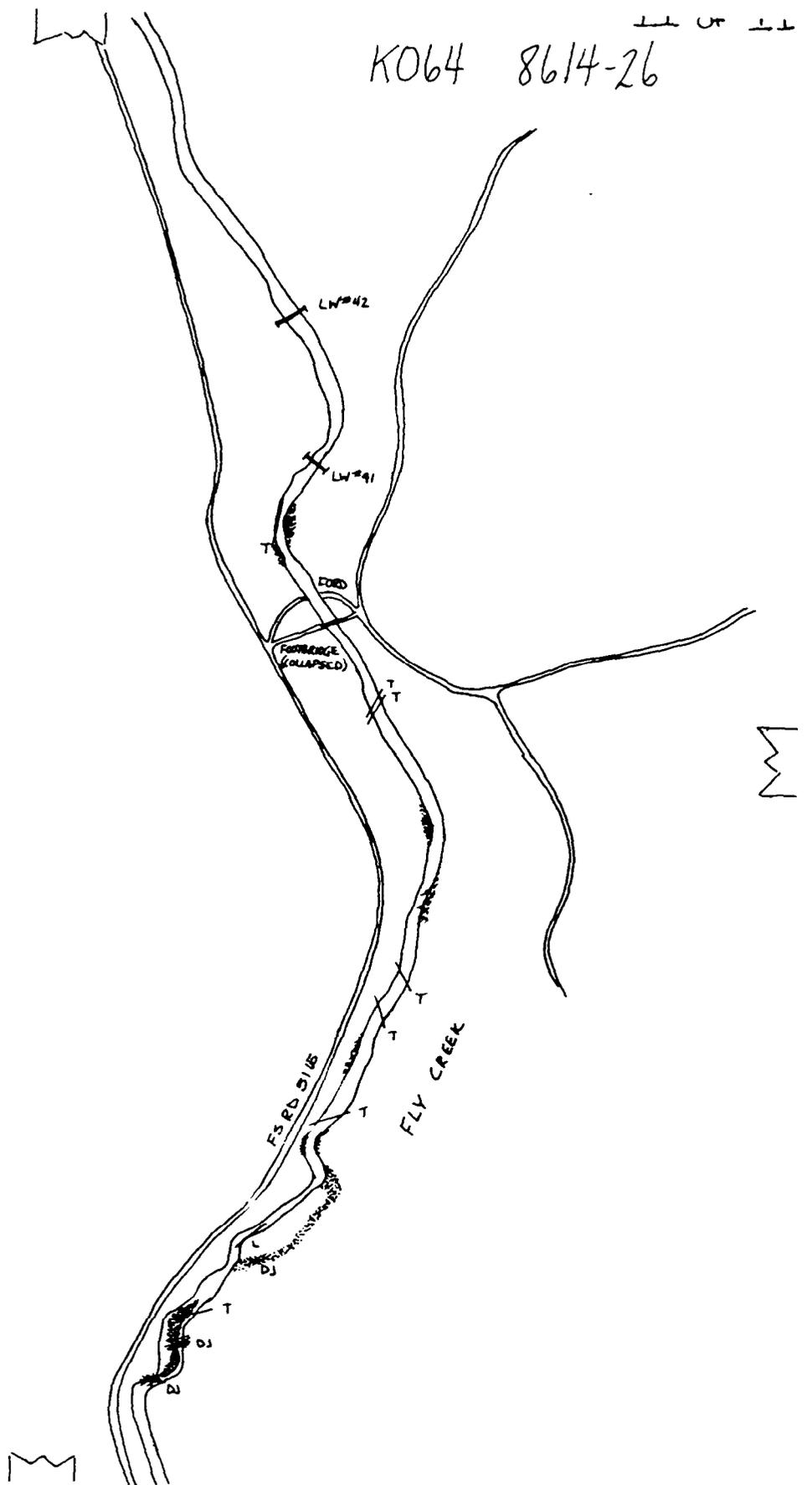
## FISH HABITAT IMPROVEMENT-FY 87



# FLY CREEK

## FISH HABITAT IMPROVEMENT-FY 87

K064 8614-26 III OF III



FLY CREEK

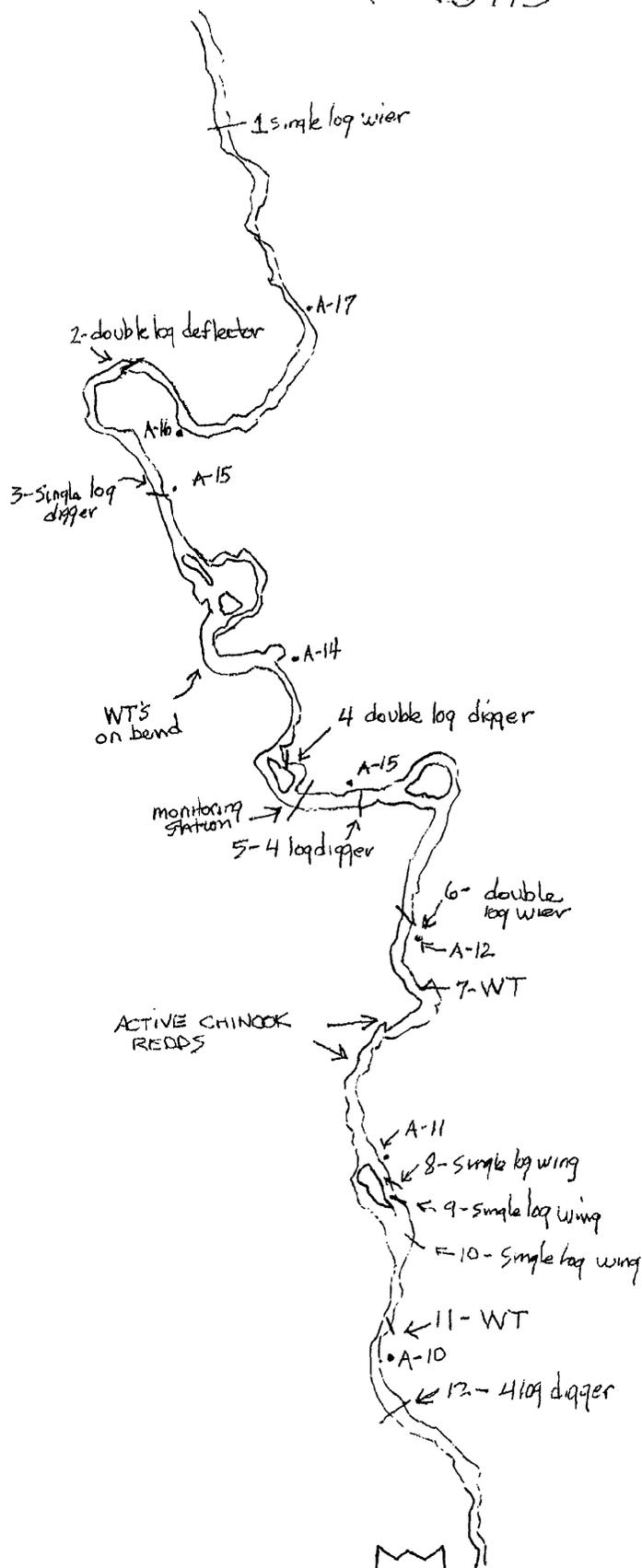
FISH HABITAT IMPROVEMENT-FY 87

APPENDIX IV

SHEEP CREEK  
FISHERIES HABITAT IMPROVEMENTS  
INSTREAM STRUCTURE LOCATIONS

WJ113

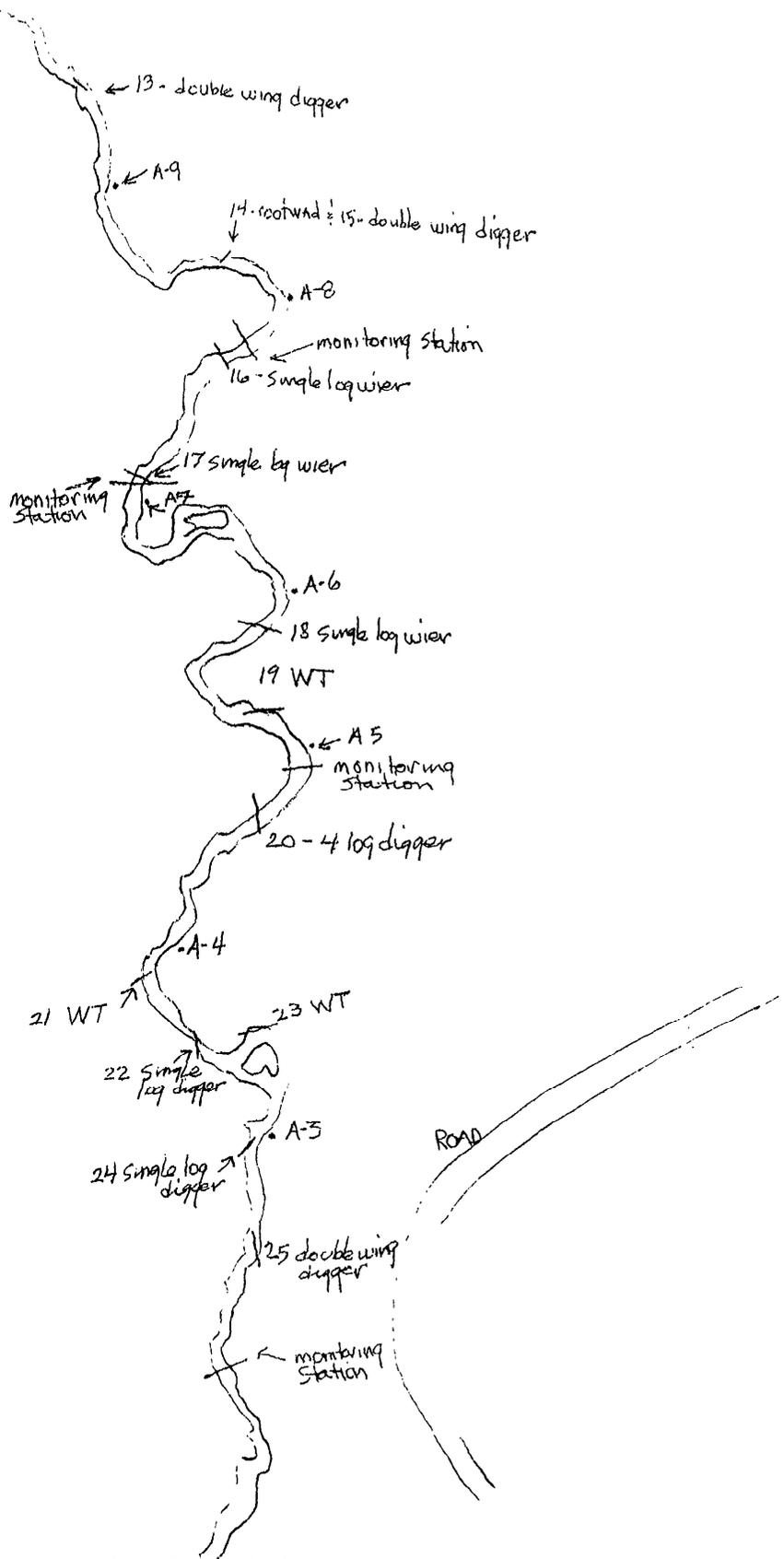
8445-3



**SHEEP CREEK**

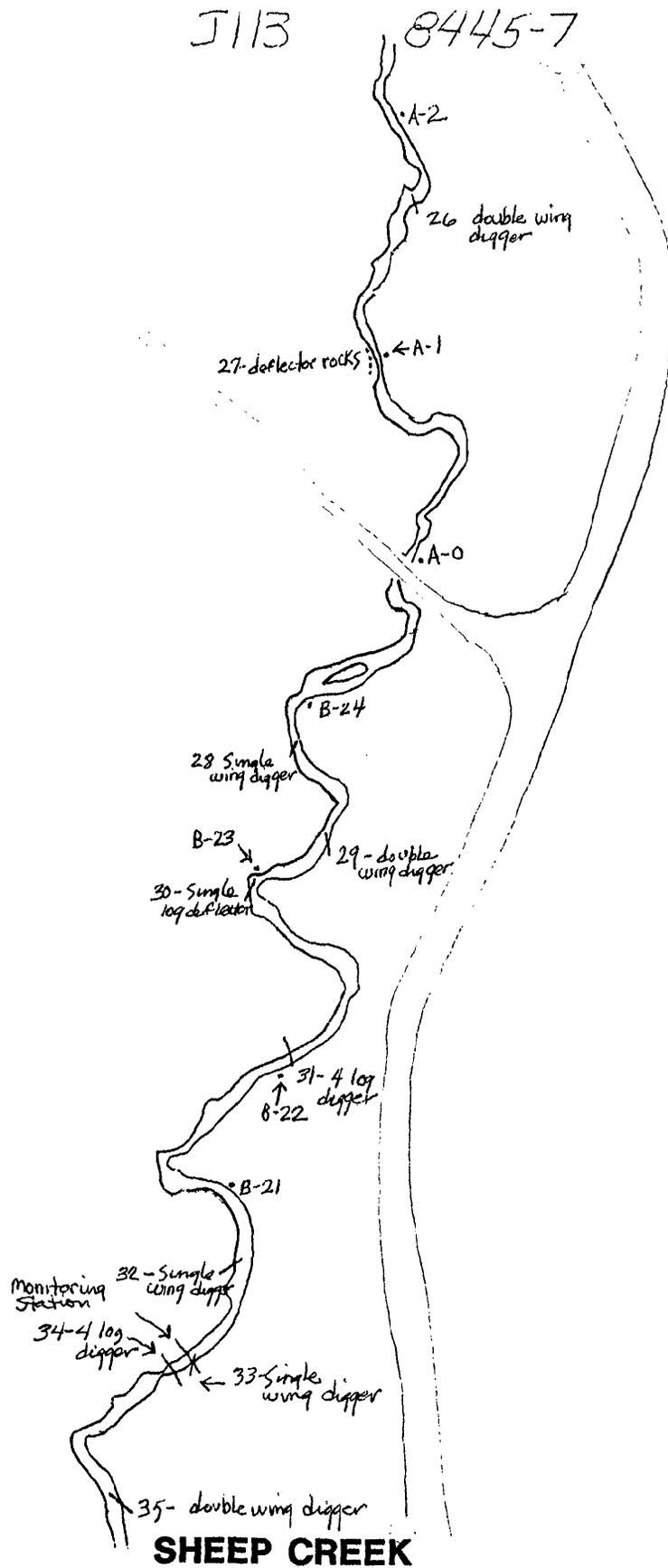
**FISH HABITAT IMPROVEMENTS-FY 85**

WJ113 8445-5

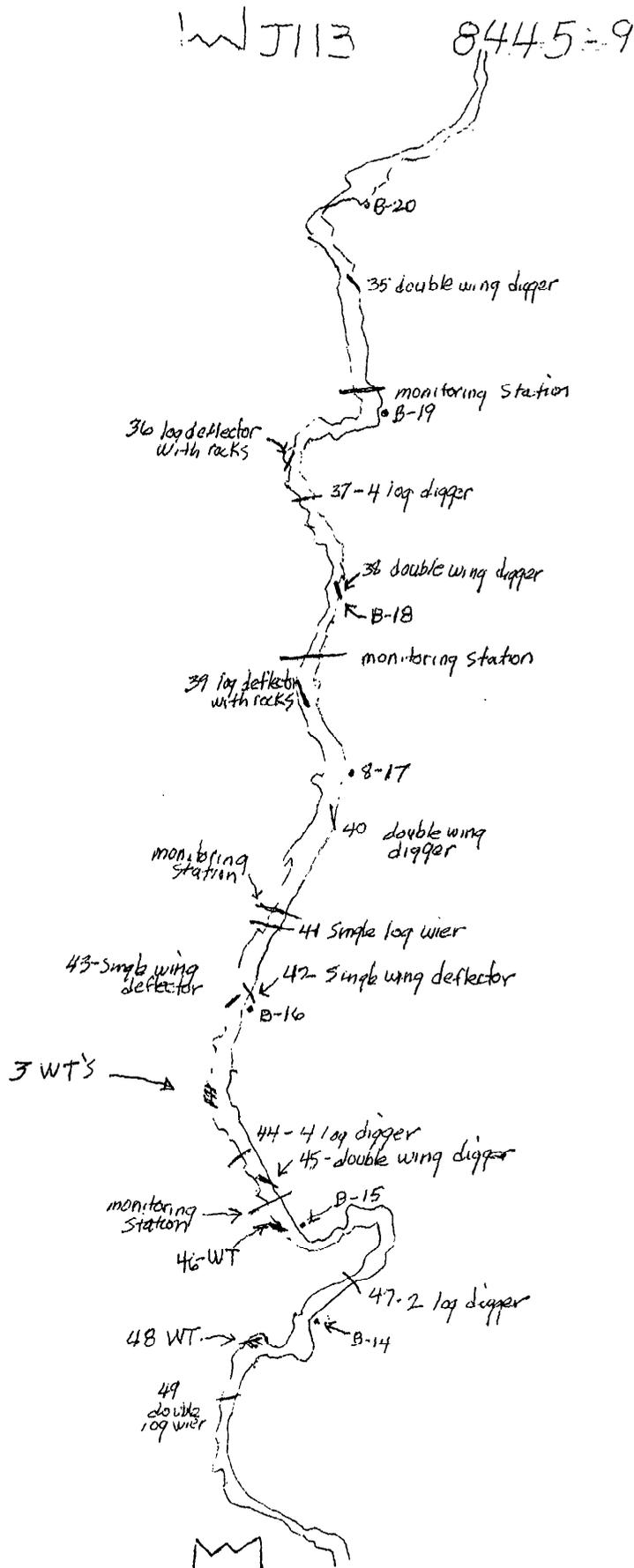


**SHEEP CREEK**

**FISH HABITAT IMPROVEMENTS-FY 85**

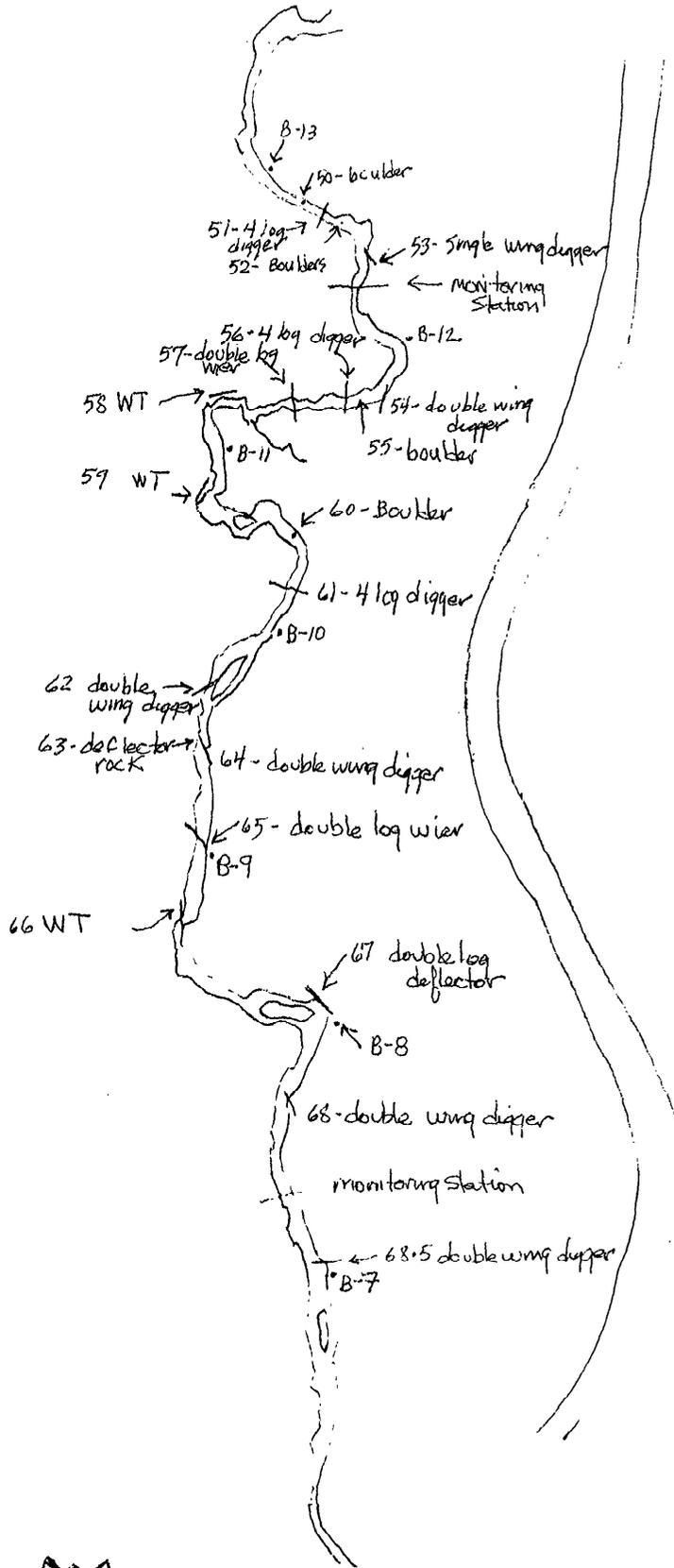


**FISH HABITAT IMPROVEMENTS-FY 85**



**SHEEP CREEK**  
**FISH HABITAT IMPROVEMENTS-FY 85**

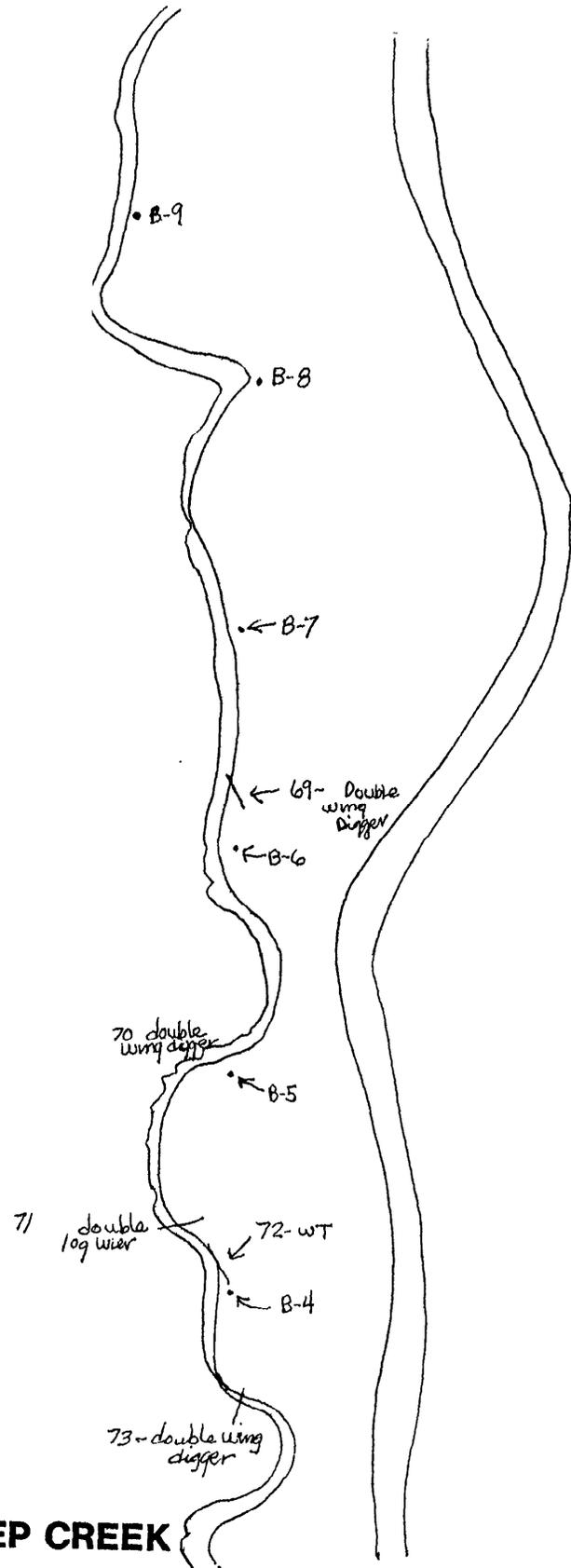
WJ113 8445-11



**SHEEP CREEK  
FISH HABITAT IMPROVEMENTS-FY 85**

LWJ113

8445-12

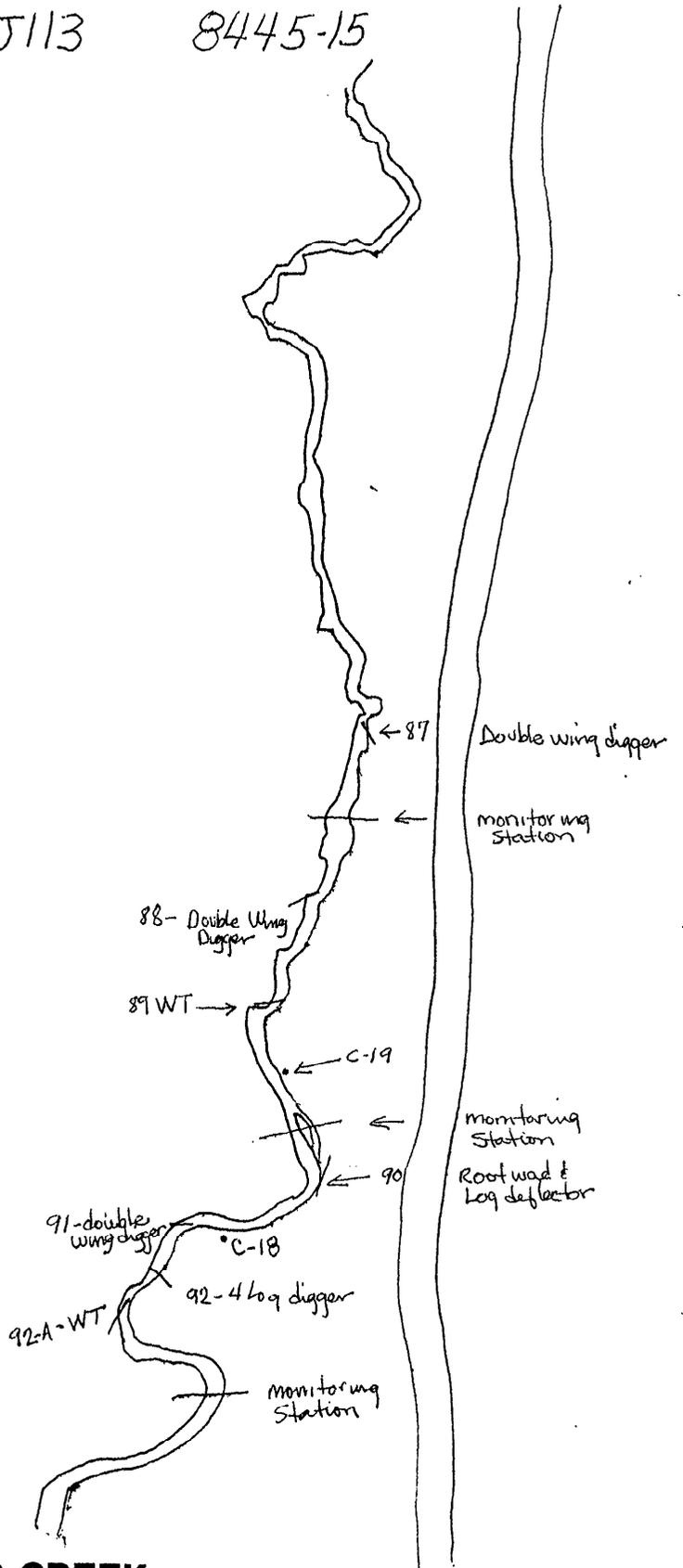


**SHEEP CREEK  
FISH HABITAT IMPROVEMENTS-FY 85**



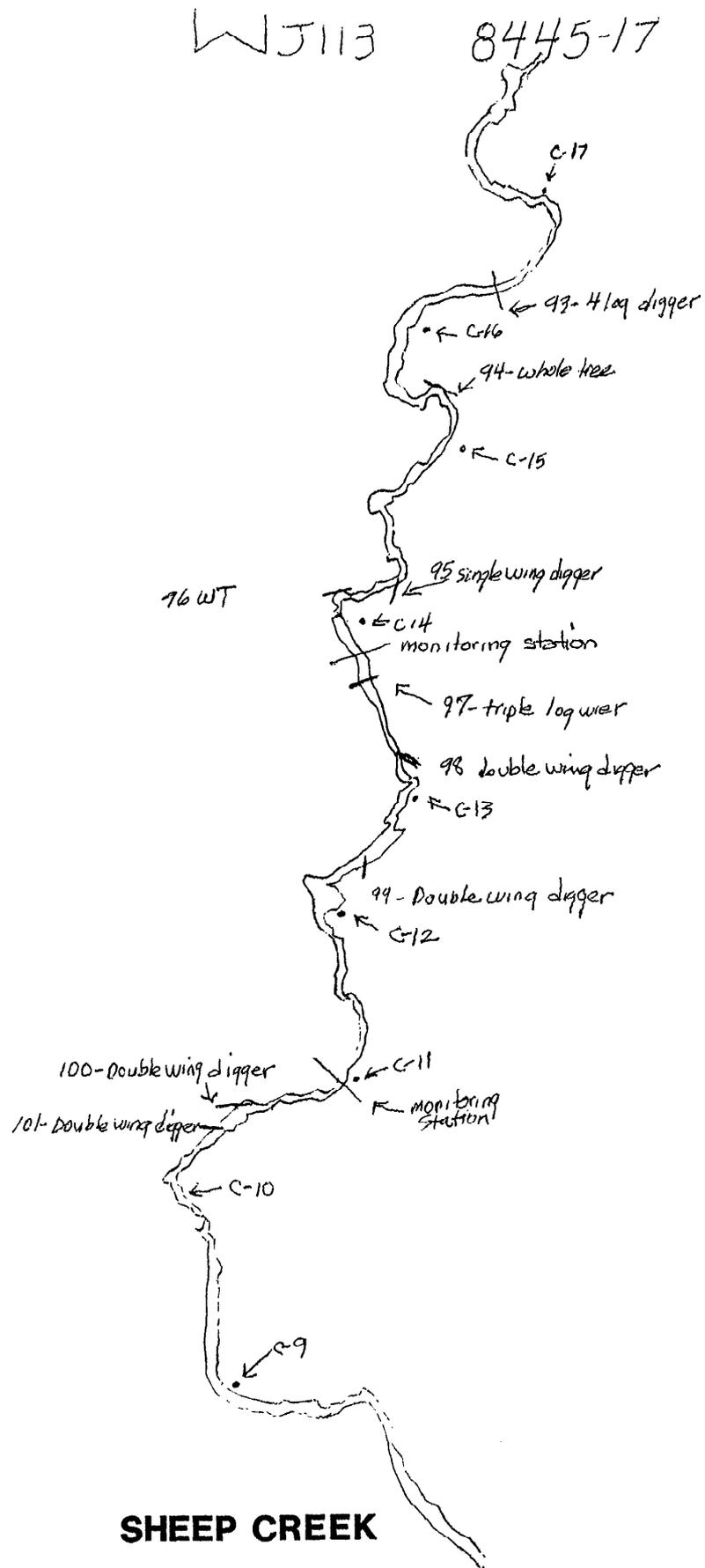
WJ113

8445-15



**SHEEP CREEK**

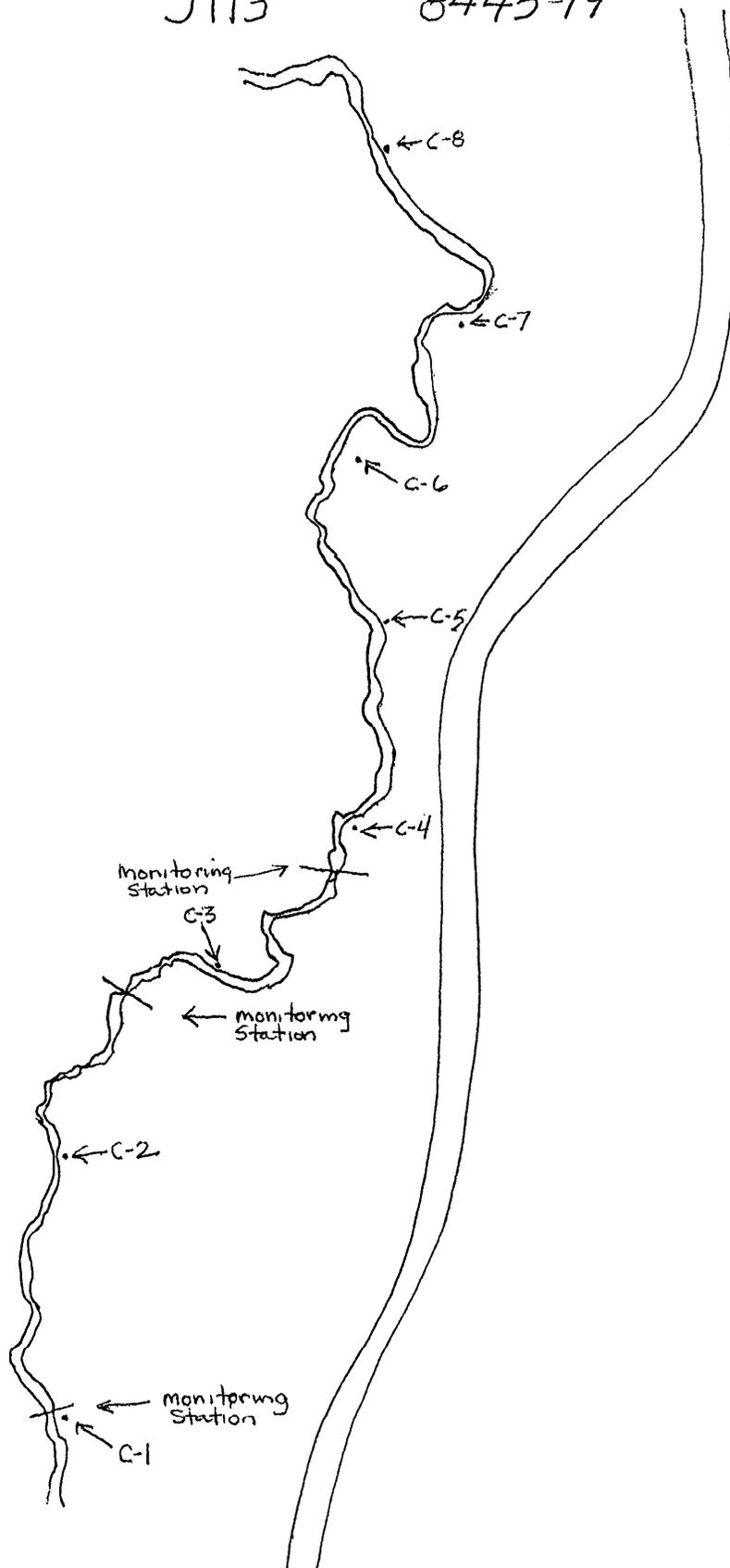
**FISH HABITAT IMPROVEMENTS-FY 85**



**SHEEP CREEK  
FISH HABITAT IMPROVEMENTS-FY 85**

J113

8445-19



**SHEEP CREEK**

**FISH HABITAT IMPROVEMENT-FY87**

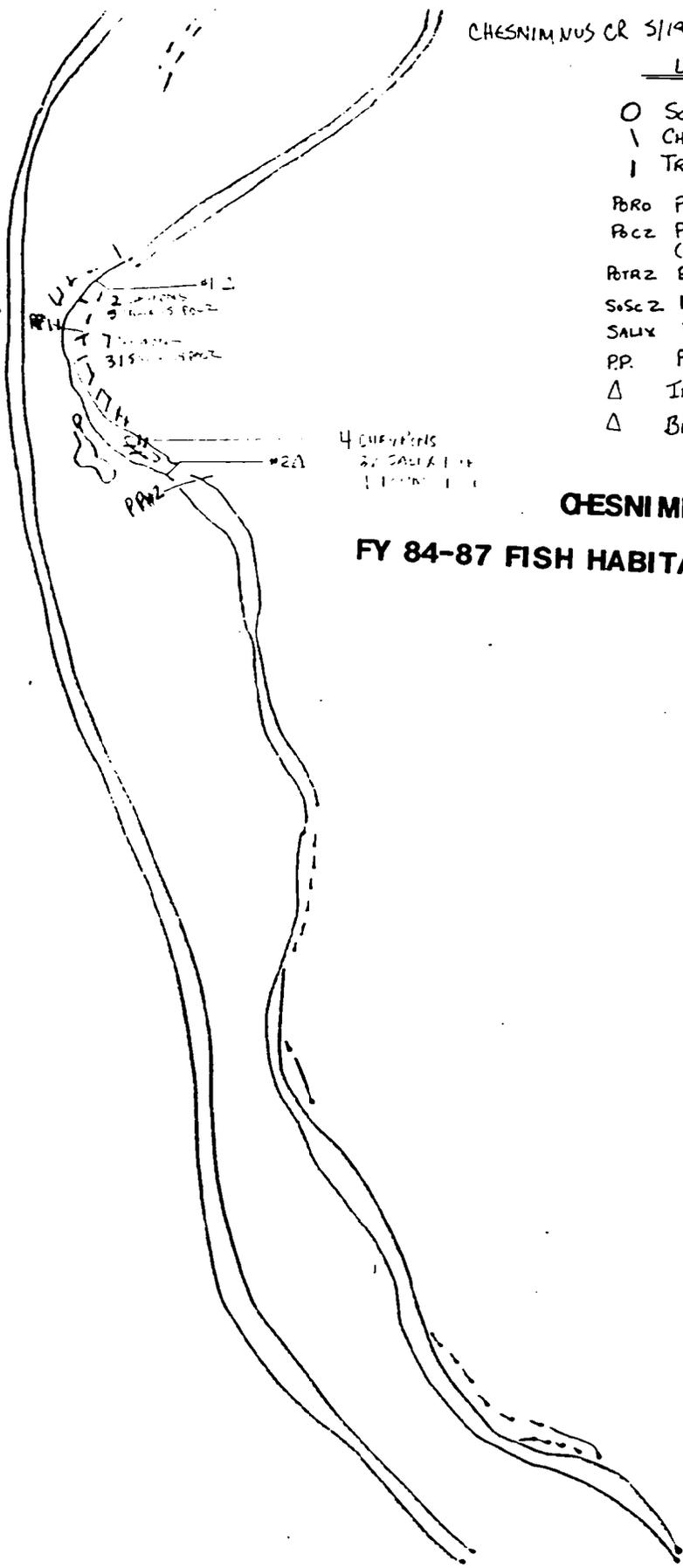
APPENDIX V

CHESNIMNUS CREEK  
FISHERIES HABITAT IMPROVEMENTS  
INSTREAM STRUCTURE LOCATIONS

LEGEND

- O SCALP
- \ CHEVRON (diagonal to stream)
- | TRENCH (parallel to stream)
- PBR Populus Robusta
- PBCZ Populus Crown Zellerbach (HYBRID FROM CROWN ZELLERBACH)
- PBRZ Black Cottonwood
- SsScZ Mountain Ash
- SALIX Willow
- PP Photo Point
- △ INSTREAM STRUCTURE
- △ BANK PROTECTOR

CHESNIMNUS  
 7 SALIX Poles  
 9 PBCZ Poles  
 2 PBRM Poles

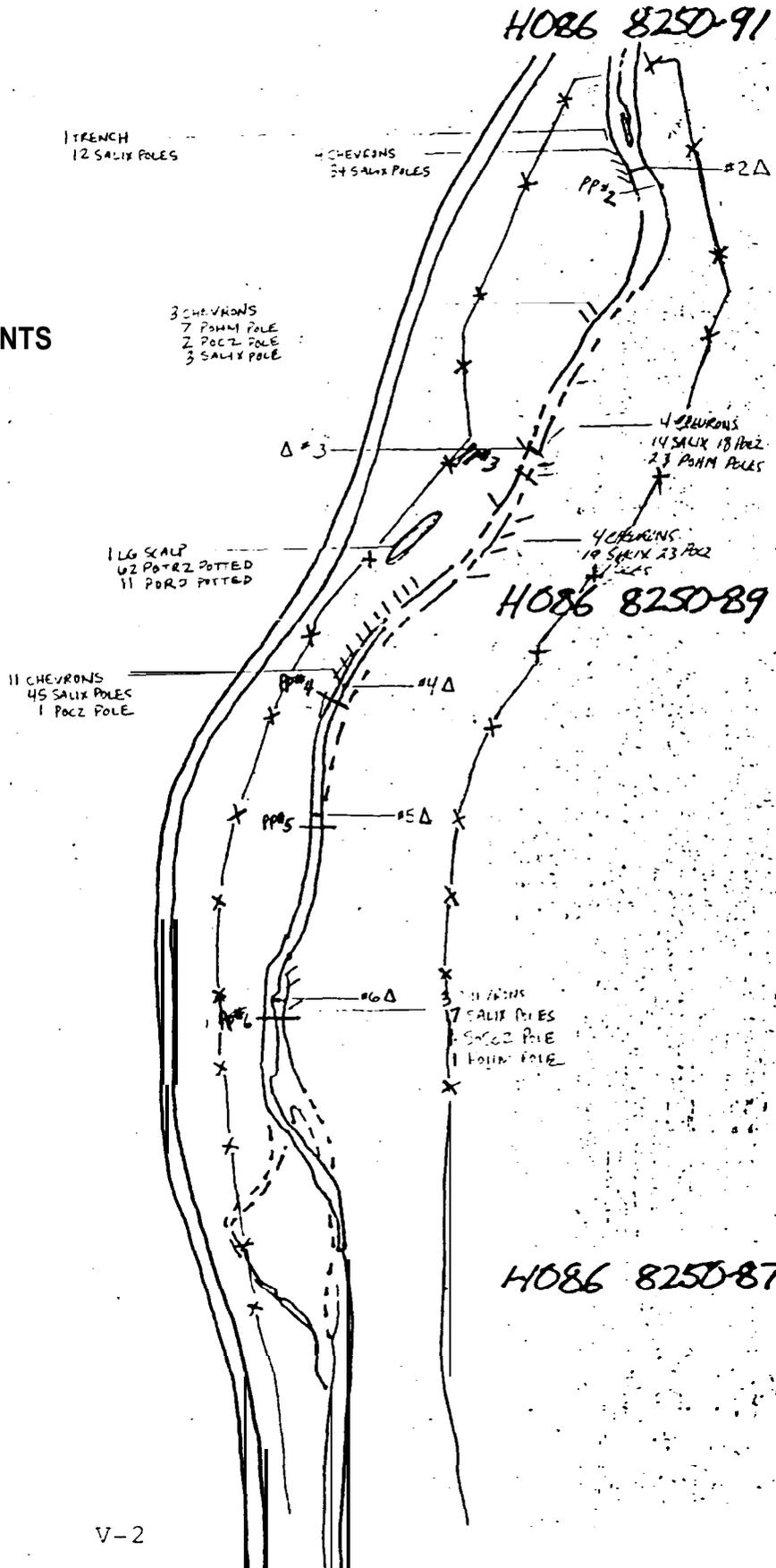


4 CHEVRONS  
 22 SALIX POLES  
 1 TRENCH

**CHESNIMNUS CREEK**  
**FY 84-87 FISH HABITAT IMPROVEMENT**

- O SCALP
- \ CHEVRON (diagonal to stream)
- | TRENCH (parallel to stream)
- Δ INSTREAM STRUCTURE
- Δ BANK PROTECTOR
- PoRo Populus Robusta
- PocZ Populus Crown Zellerbach  
(Hybrid from Crown Zellerbach)
- PotrZ Black Cottonwood
- SoScZ Mountain Ash
- SALX Willow
- P.P. Photo Point
- \* \* ENCLOSURE
- OG CANYON ENCLOSURE

**CHESNIMNUS CREEK  
 FY 84-87 FISH HABITAT IMPROVEMENTS**



LEGEND

- O SCALP
- \ CHEVRON (diagonal to stream)
- | TRENCH (parallel to stream)

PoRo Populus Robusta  
 PocZ Populus Crown Zellerbach  
 (Hybrid from Crown Zellerbach)

POTRZ Black Cottonwood

SoScZ Mountain Ash

SALIX Willow

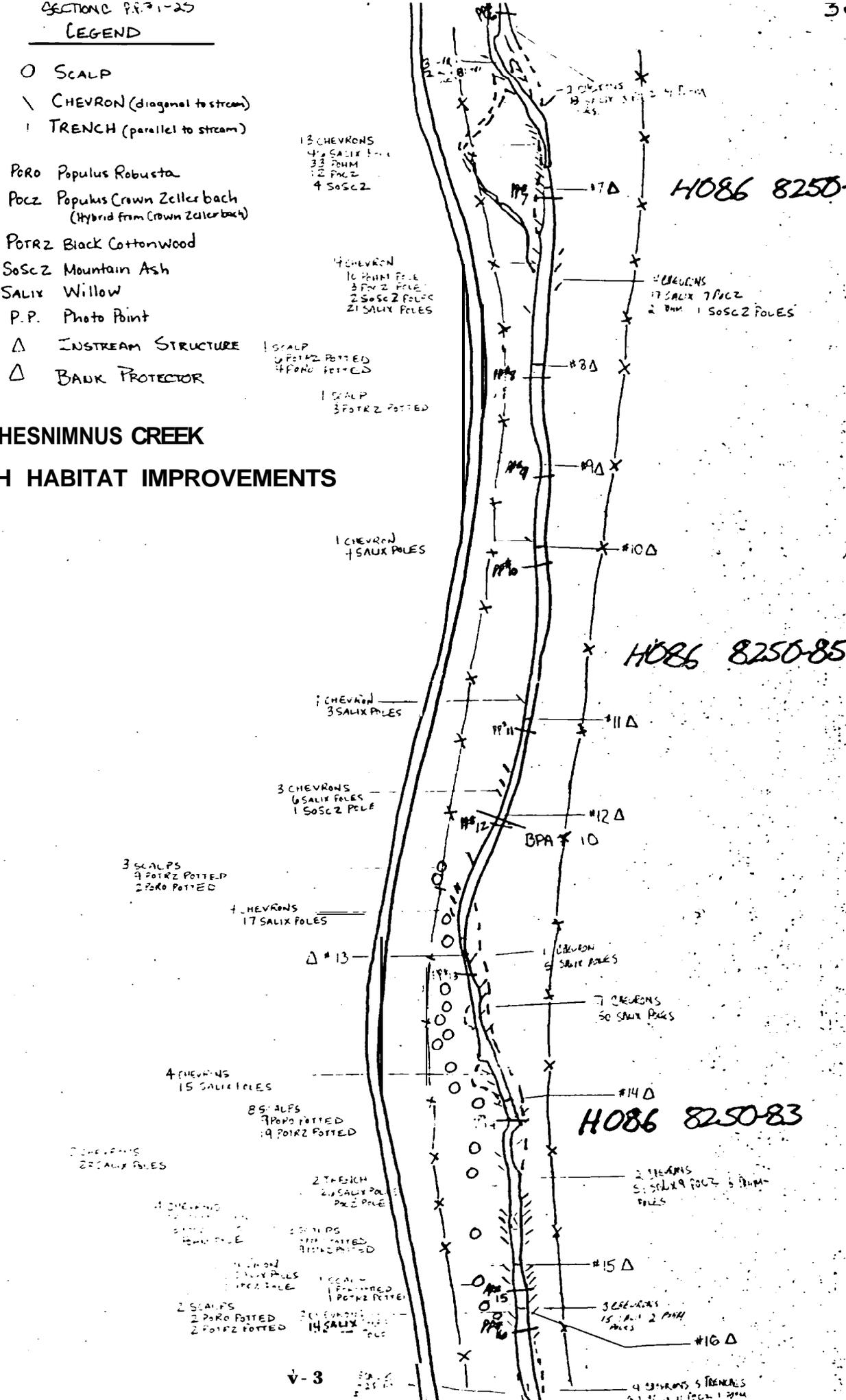
P.P. Photo Point

Δ INSTREAM STRUCTURE

Δ BANK PROTECTOR

CHESNIMNUS CREEK

FY 84-87 FISH HABITAT IMPROVEMENTS





**LEGEND**

- SCALP
- ∖ CHEVRON (diagonal to stream)
- | TRENCH (Parallel to stream)
- △ INSTREAM STRUCTURES
- △ BANK PROTECTOR
- PORO Populus Robusta
- Pocz Populus Crown Zeikerbach (Hybrid from Crown Zeikerbach)
- POTRZ Black Cottonwood
- SoSc2 Mountain Ash
- SALIX Willows
- P.P. Photo Point

8250-187

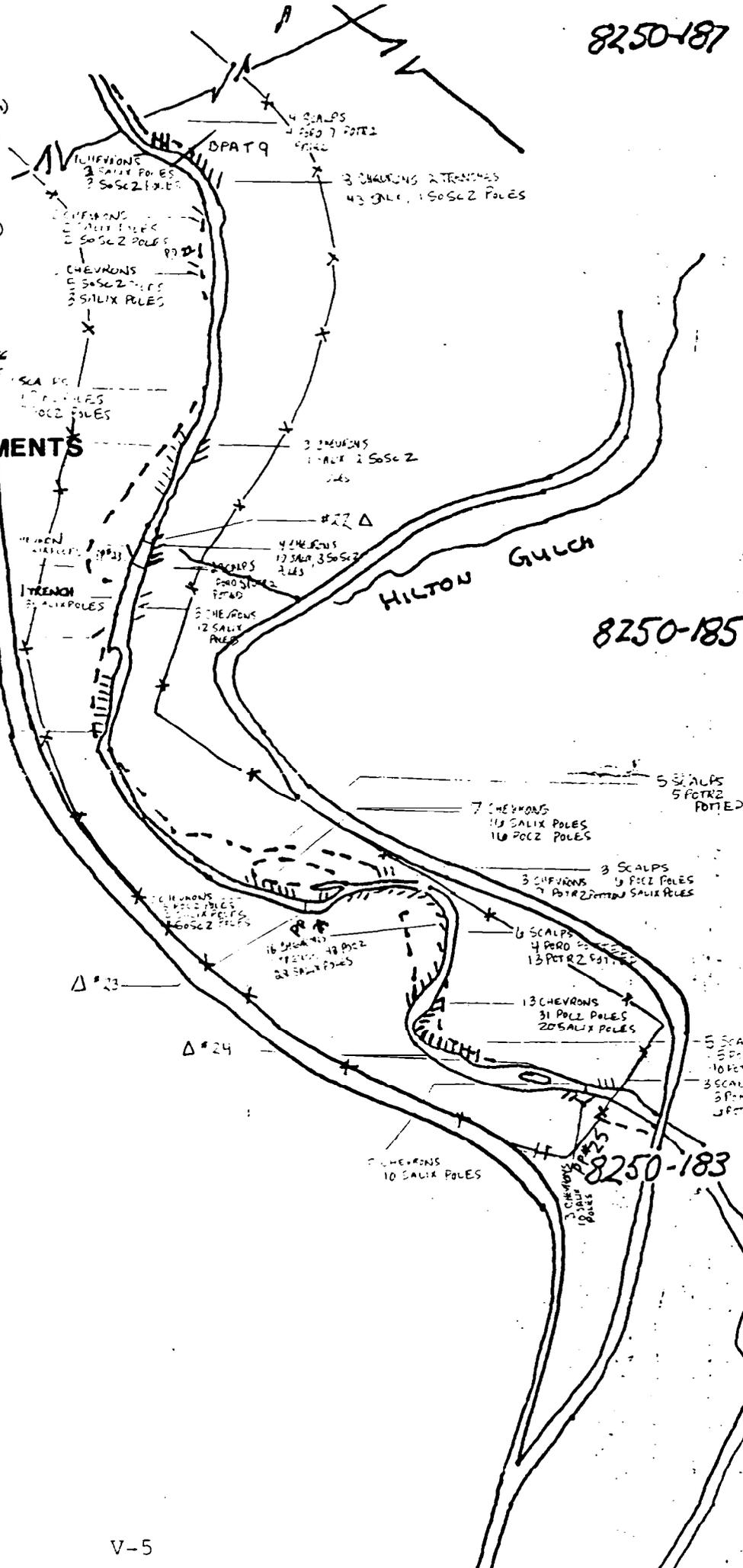
**CHESNIMNUS CREEK**

**=Y 84-87 FISH HABITAT IMPROVEMENTS**

PAT GREENING  
LIZZO WILKIS

**CHESNIMNUS CREEK**

- 3 SCALPS  
1 POTRZ POTTED  
3 PORO POTTED
- SCALP  
1 POTRZ POTTED  
1 POTRZ POTTED
- 1 SCALP  
2 POTRZ POTTED
- 1 CHEVRON  
1 SALIX POLE  
1 POCZ POLE
- 5 CHEVRONS  
22 SALIX POLES  
4 POCZ POLES



8250-185

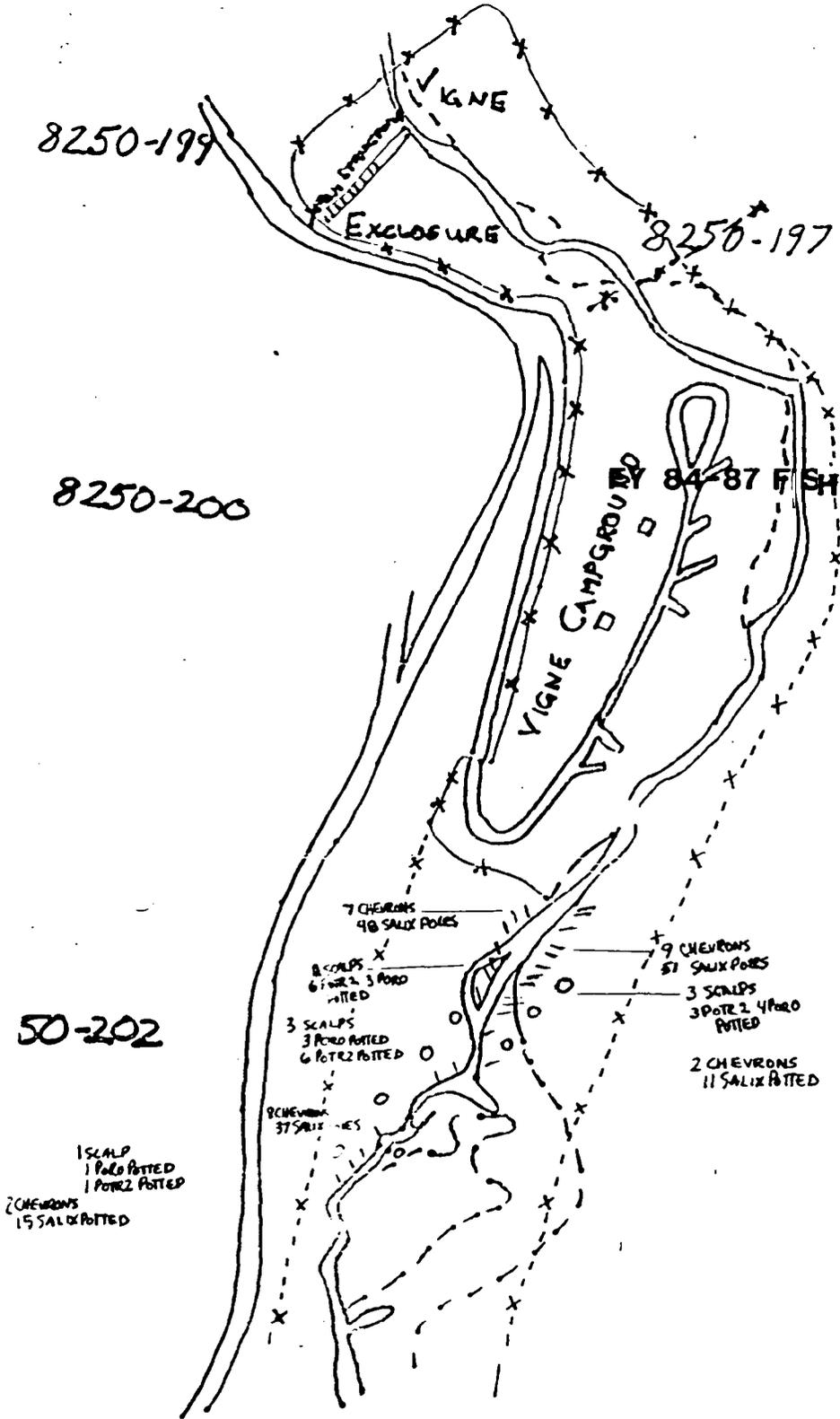
8250-183

LEGEND

- SCALP
- ∨ CHEVRON (Diamond to Stream)
- | TRENCH (Parallel to stream)
- ⊙ TEST PLOT SPECIES GROUP
- SCALP - NOT PLANTED

- PORO Populus Robusta
- POTR2 Black Cottonwood
- SALIX Willows
- \*\* EXCLOSURE
- VIGNE EXCLOSURE

**CHESNIMUS CREEK**  
**84-87 FISH HABITAT IMPROVEMENT**



1 SCALP  
 1 PORO POTTED  
 1 POTR2 POTTED  
 2 CHEVRONS  
 15 SALIX POTTED

7 CHEVRONS  
 90 SALIX POLES

8 SCALPS  
 6 PORO 3 PORO POTTED

3 SCALPS  
 3 PORO POTTED  
 6 POTR2 POTTED

8 CHEVRONS  
 37 SALIX POLES

9 CHEVRONS  
 57 SALIX POLES

3 SCALPS  
 3 PORO 4 PORO POTTED

2 CHEVRONS  
 11 SALIX POTTED

INITIAL PLANTING MAP CHESNIMNUS CK SECTION C 5/1/87  
 VIGNE CAMPGROUND - Aerial Photo # 8250-202

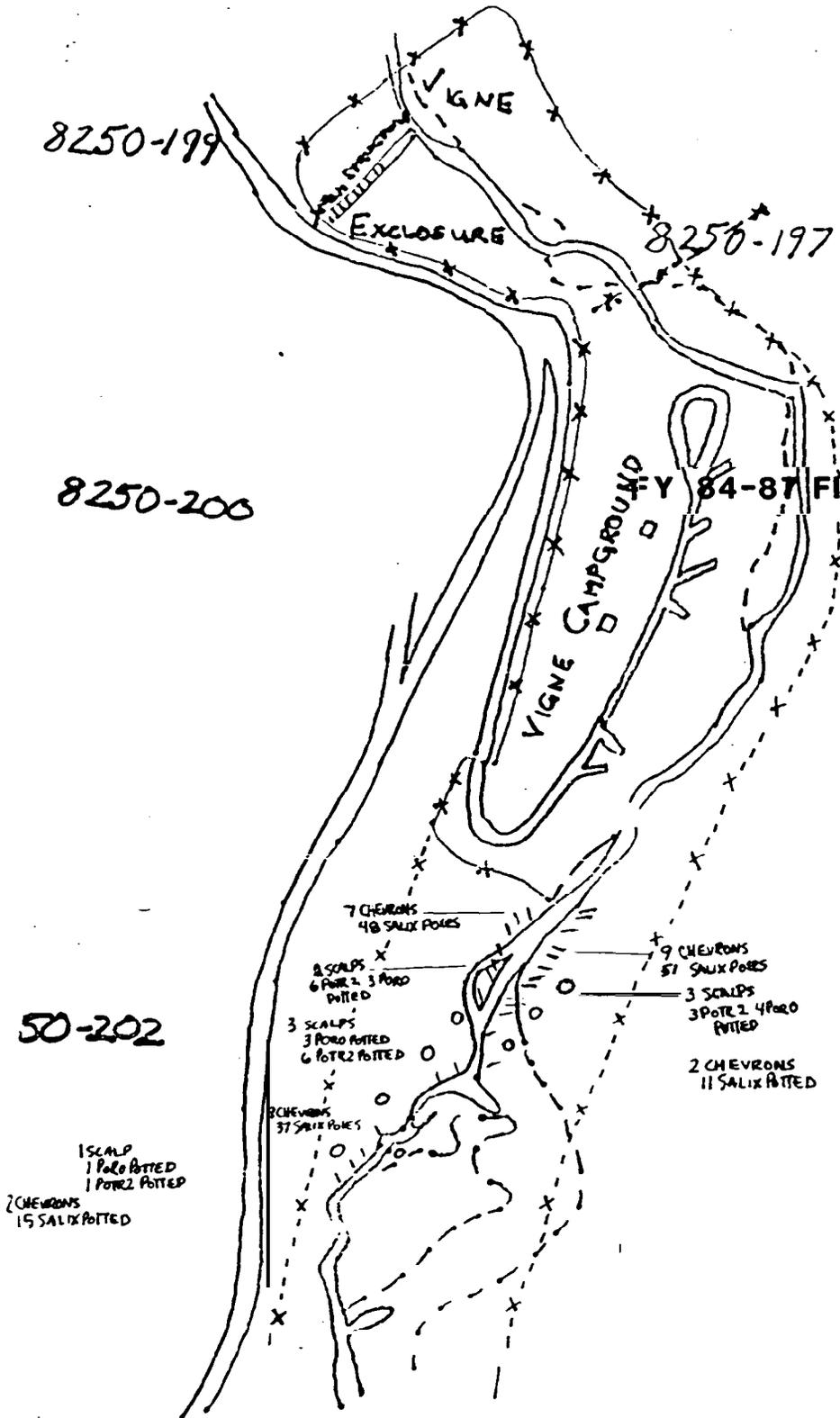
LEGEND

- SCALP
- ∖ CHEVRON (Diagonal to stream)
- | TRENCH (Parallel to stream)
- ⊙ TEST PLOT SPECIES GROUP
- SCALP - NOT PLANTED

- PORO Populus Robusta
- POTR2 Black Cottonwood
- SAUX Willows
- \*\* ENCLOSURE
- VIGNE ENCLOSURE

**CHESNIMNUS CREEK**

**FISH HABITAT IMPROVEMENT**

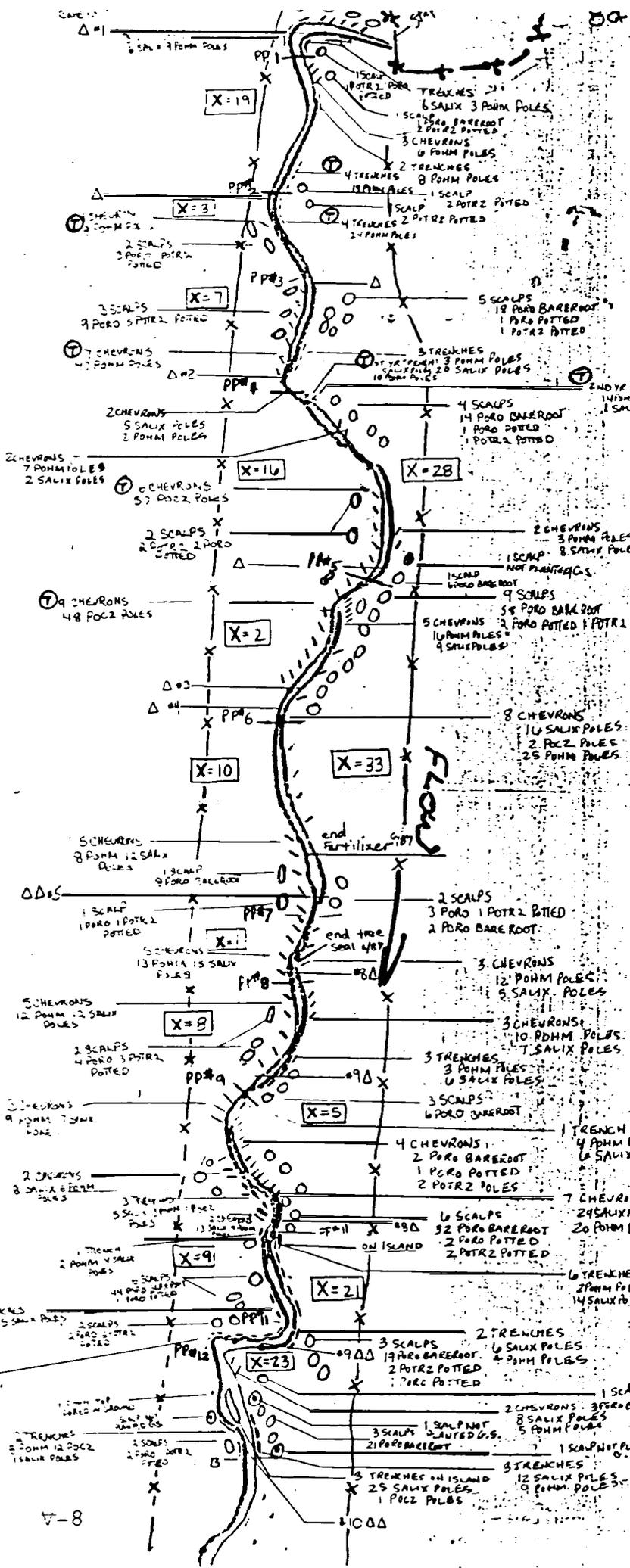


**LEGEND**

- SCALP
- \ CHEVRON (diagonal to stream)
- | TRENCH (Parallel to stream)
- ⊕ TEST PLOT SPECIES GROUPED
- ⊙ SCALP - NOT PLANTED grass seeded
- \* [ ] CONIFERS *ponderosa Pine* 1/1/87  
Seedlings Douglas Fir
- \* [X] MIX (PBM, POCZ, SALIX)  
POES
- POB Populus Robusta
- PBM Populus Hermiston (Hybrid from Hermiston)
- POTRZ Black Cottonwood
- POCZ Populus Crown Zellerbach (Hybrid from Crown Zellerbach)
- SALIX Willows
- GS Grass Seed
- P.P Photo Point
- \*\* ENCLOSURE (VANCE DRAW)  
POTRZ GREENWILL
- # HAND PLANTED  
LAWN WILLOWS
- Δ INSTREAM STRUCTURE
- △ BANK PROTECTOR

**CHESNIMNUS CREEK**

**FY84-87 FISH HABITAT IMPROVEMENTS**



LEGEND

- O SCALP
- \ CHEVRON (diagonal to stream)
- | TRENCH (Parallel to stream)
- ⊕ TEST PLAT SPECIES GROUPED
- ⊙ SCALP - NOT PLANTED grass seeded
- X X CONIFERS *Abies* *Picea* *Sequoia*
- X X MIX (POHM, POZZ, SALIX)

- PORO *Populus Robusta*
- POHM *Populus Hormanston* (Hybrid from Hormanston)
- POTRZ Black Cottonwood
- POZZ *Populus Crown Zellerbach* (Hybrid from Crown Zellerbach)

SALIX Willows

GS Grass Seed

PP Photo Point

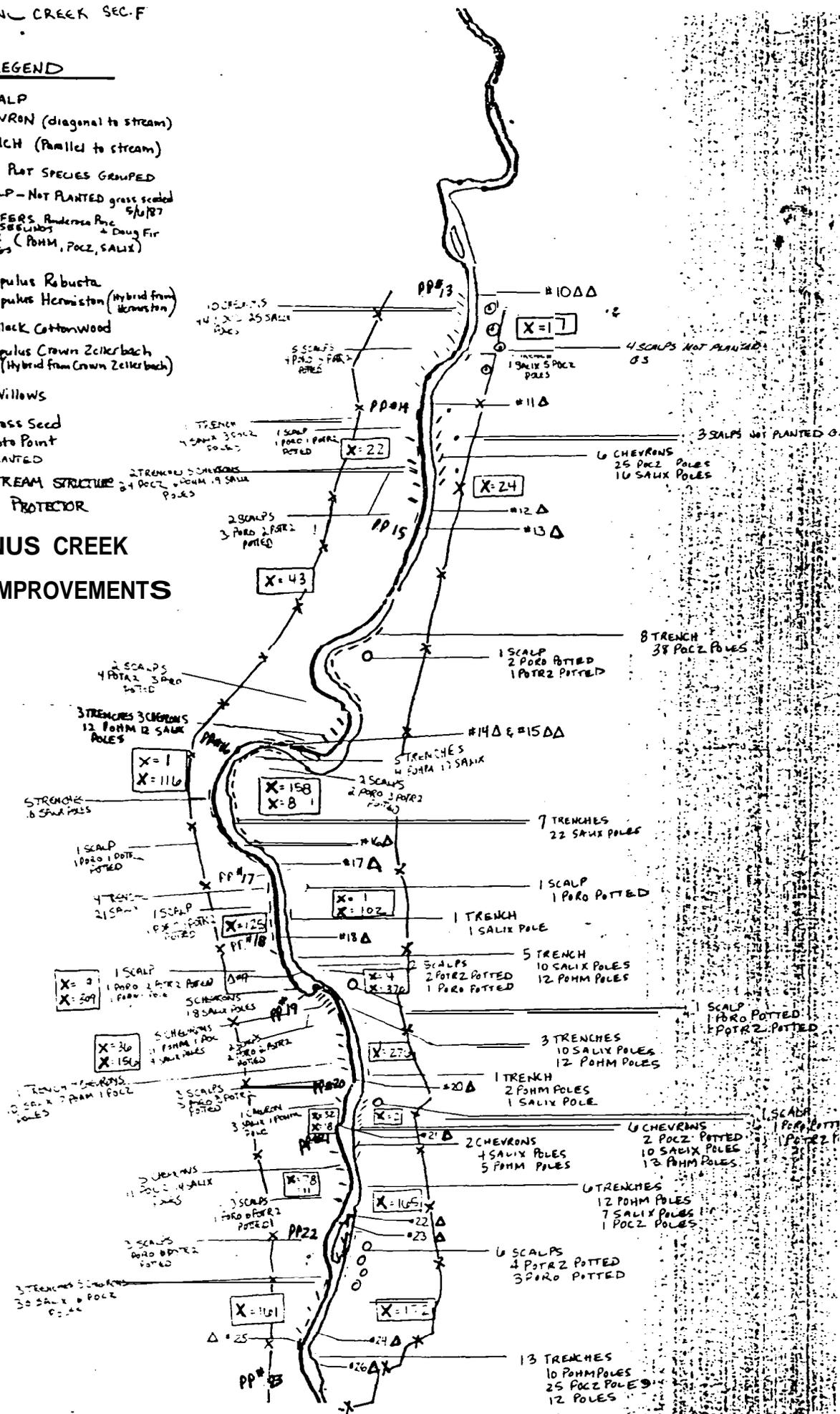
X HAND PLANTED

Δ INSTREAM STRUCTURE

Δ BANK PROTECTOR

CHESNIMNUS CREEK

FY 84-87 FISH HABITAT IMPROVEMENTS



APPENDIX VI  
ELK CREEK  
FISHERIES HABITAT IMPROVEMENTS  
INSTREAM STRUCTURE LOCATIONS

ELK CREEK.  
FY 85 FISH HABITAT IMPROVEMENT

ELK CK ENCLOSURE #1  
CONST JUL 85

4600959

8230-

8230-203

BOISE CASCADE USFS

T. 2 N., R. 45 E., sec. 33  
T. 2 N., R. 45 E., sec. 34

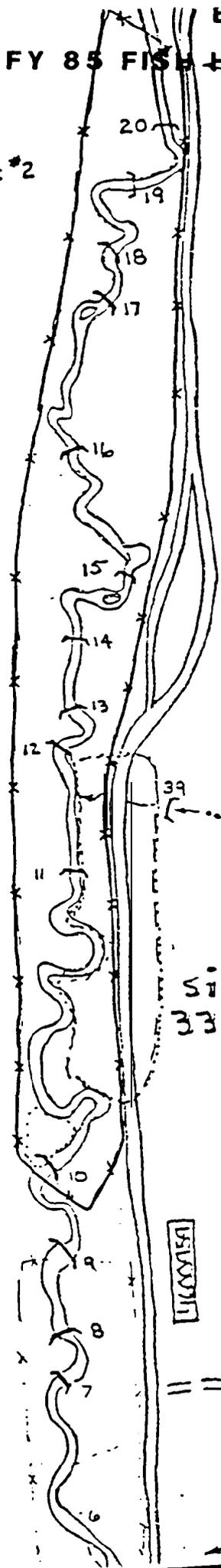
LOGGING RAVINE ROAD GRADE

8230-205

ELK CREEK  
FY 85 FISH HABITAT IMPROVEMENT

LOT 7

Elk Ck EXCLOSURE #2  
cont. Jun '79  
extended Jun '85



8230-198

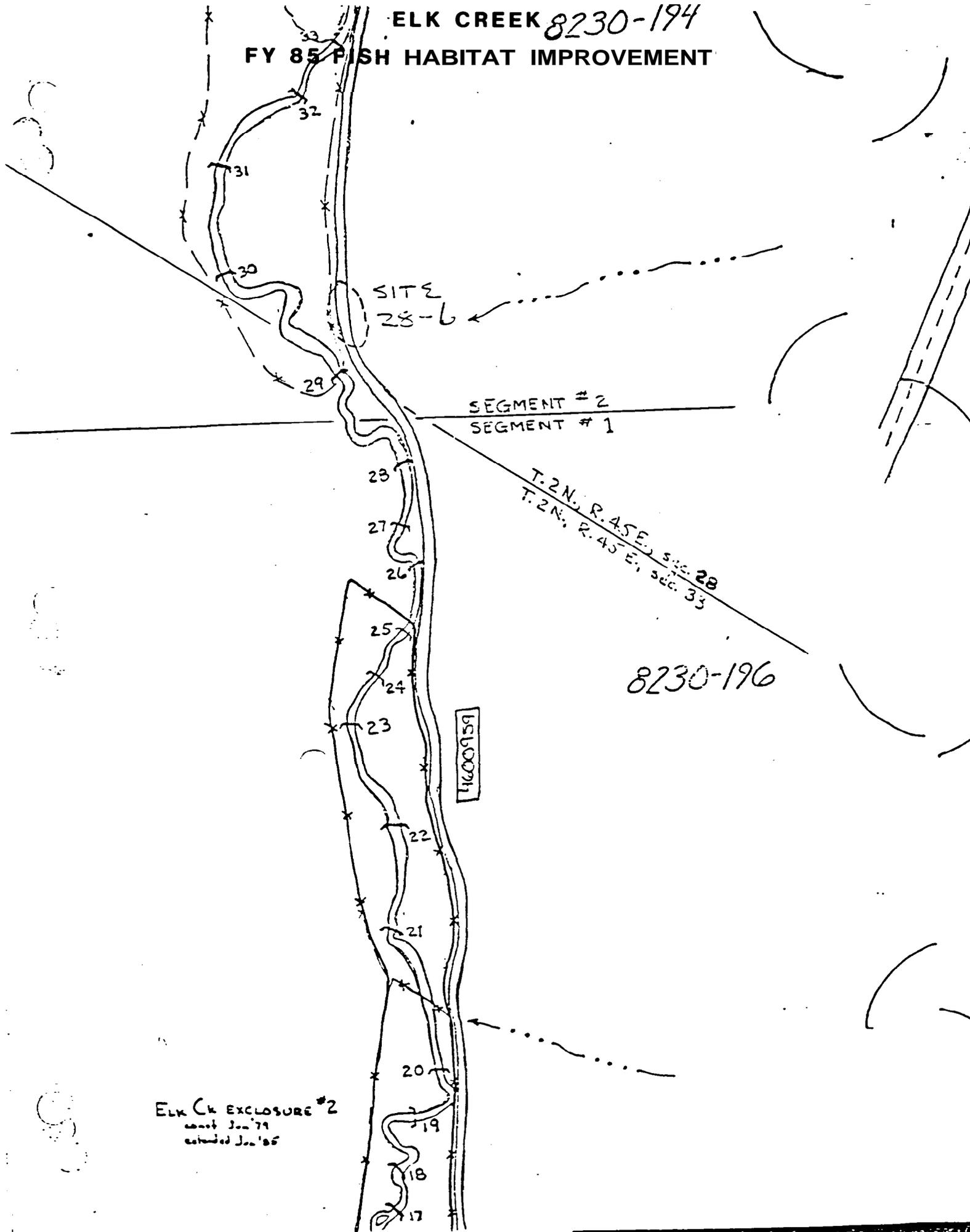
SITE  
33-2

8230-200

BIVOUAC

JSC

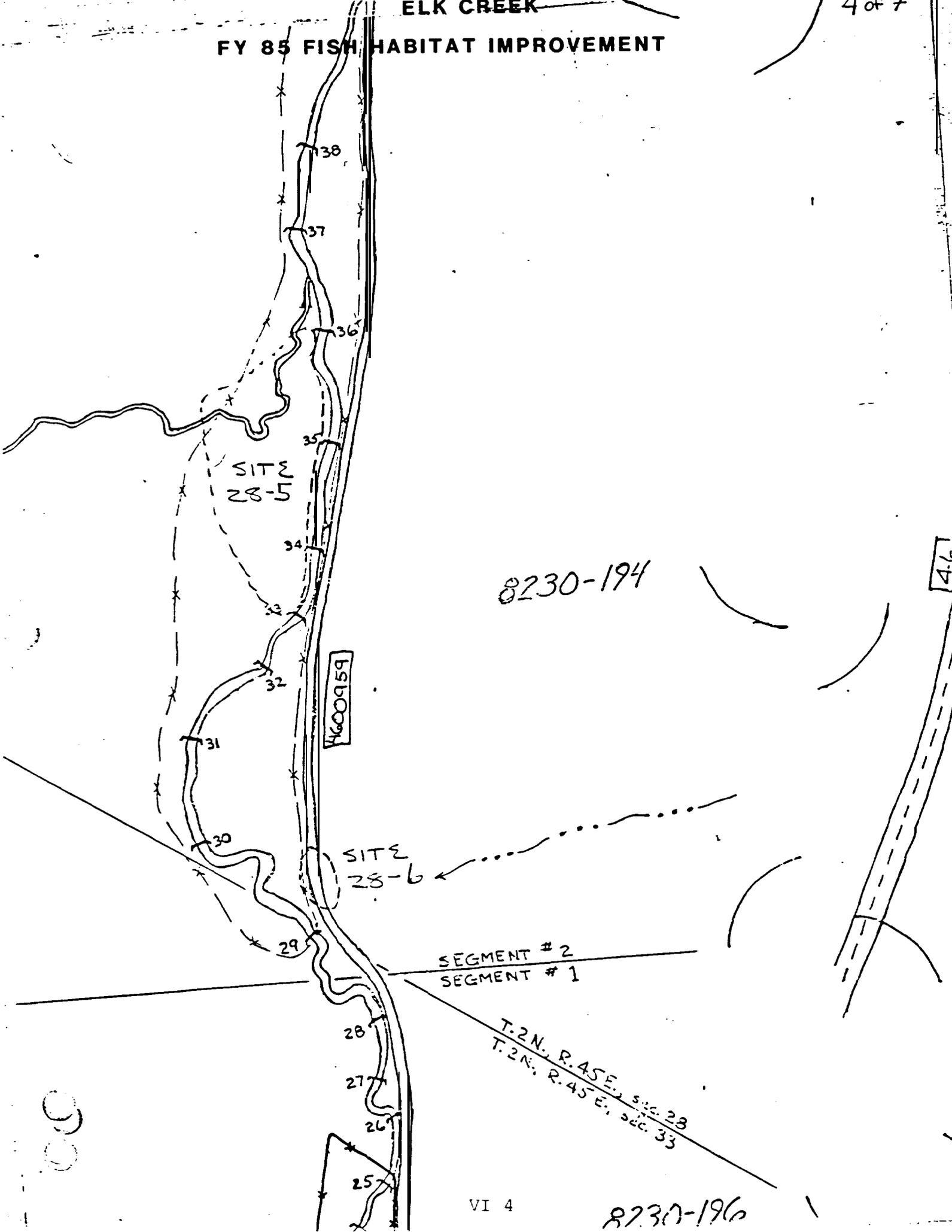
ELK CREEK 8230-194  
FY 85 FISH HABITAT IMPROVEMENT



8230-196

Elk Ck ENCLOSURE #2  
waived Jan '79  
extended Jan '85

FY 85 FISH HABITAT IMPROVEMENT



8230-194

550059

SITE 28-5

SITE 28-6

SEGMENT # 2  
SEGMENT # 1

T. 2N., R. 45E., SEC. 28  
T. 2N., R. 45E., SEC. 33

46

00

8230-196

# BLK CREEK FY 85 FISH HABITAT IMPROVEMENT

SEGMENT #7  
SEGMENT #6

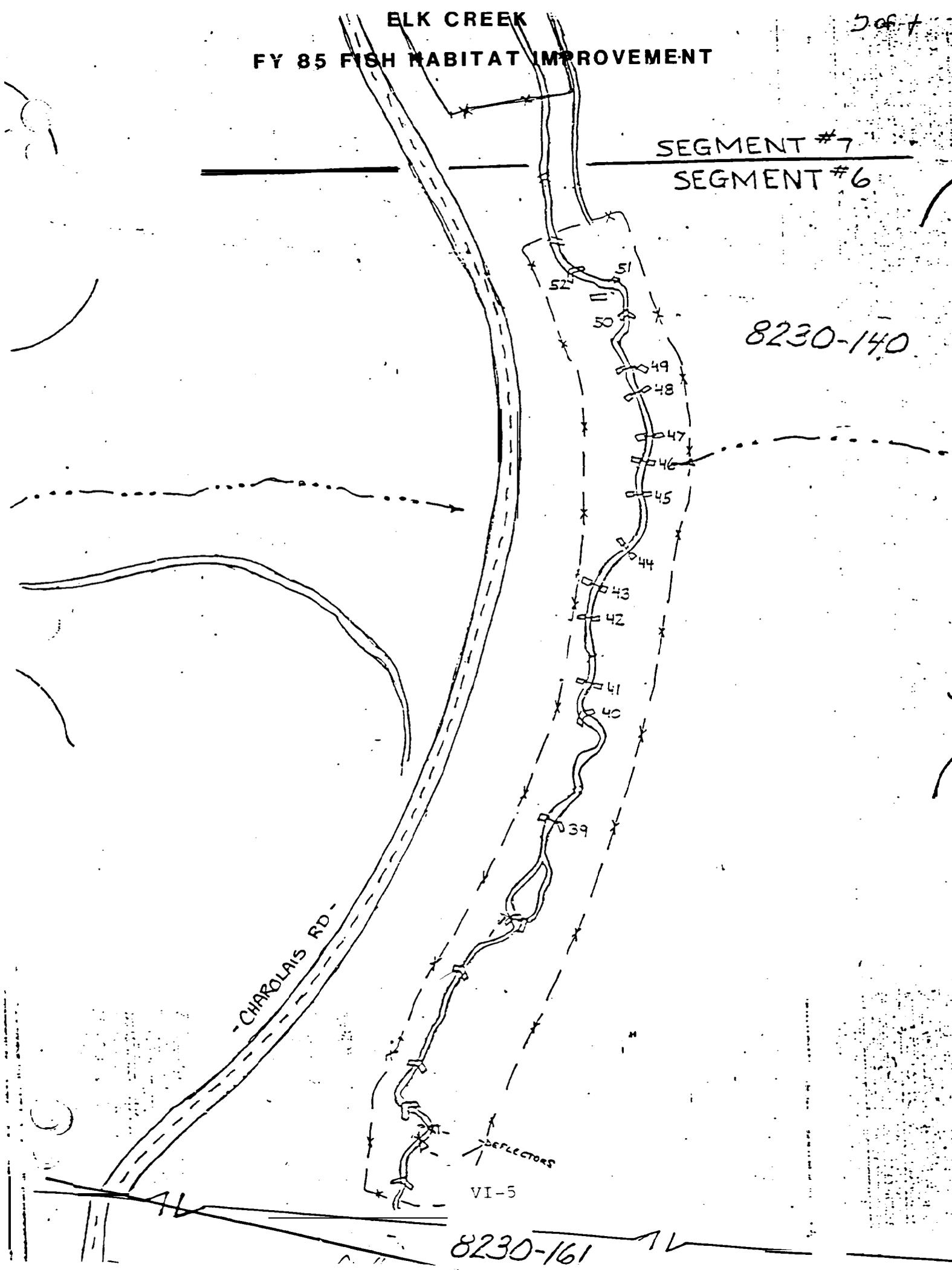
8230-140

CHAROLAIS RD

DEFLECTORS

VI-5

8230-161



ELK CREEK

FY 85 FISH HABITAT IMPROVEMENT

SEGMENT #8

SEGMENT #7

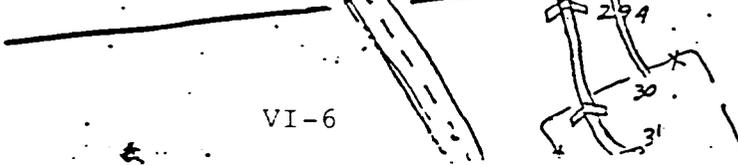
8230-1

8230

CHARLOTTE RD

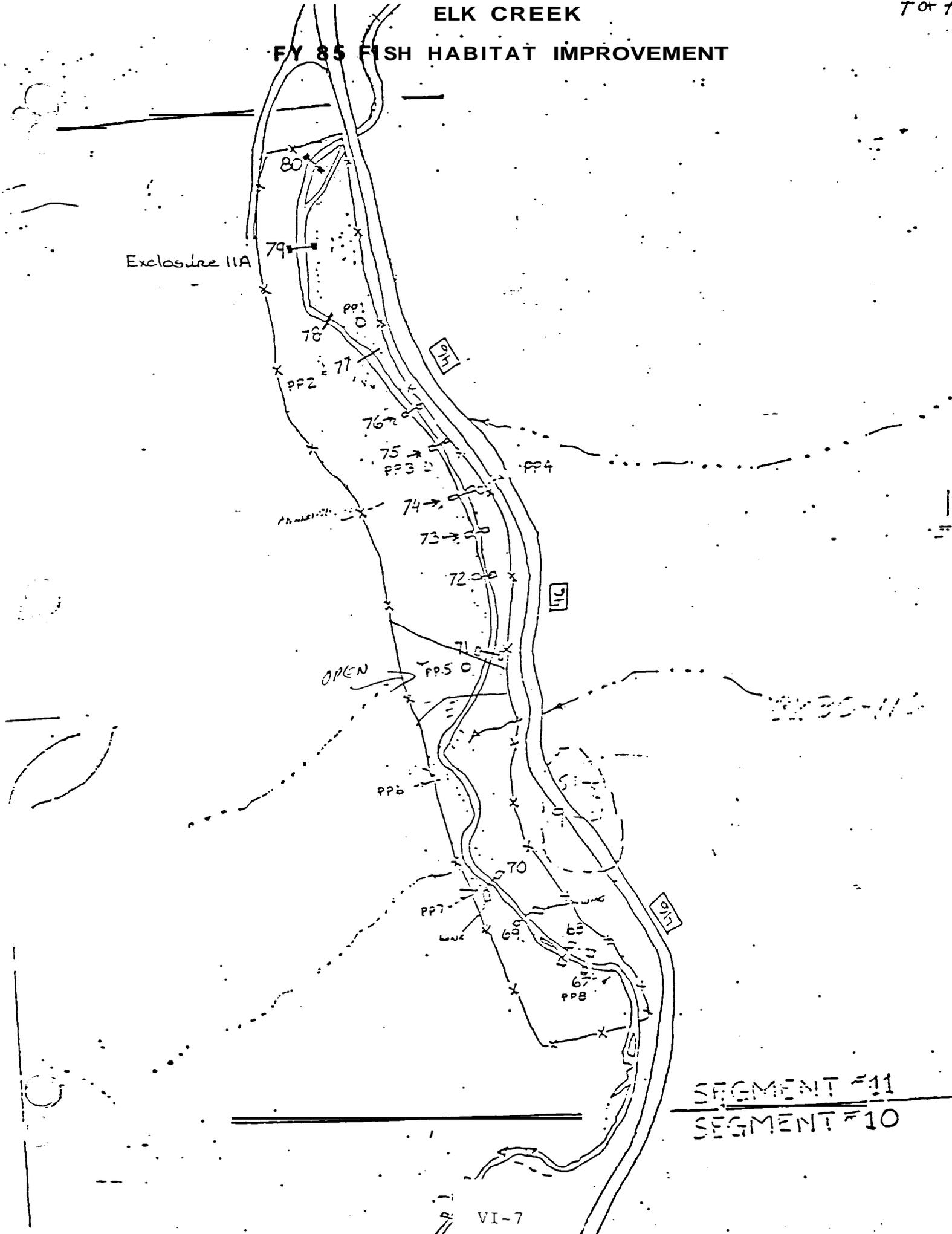
VI-6

SEGMENT  
SEGMENT



# ELK CREEK FY 85 FISH HABITAT IMPROVEMENT

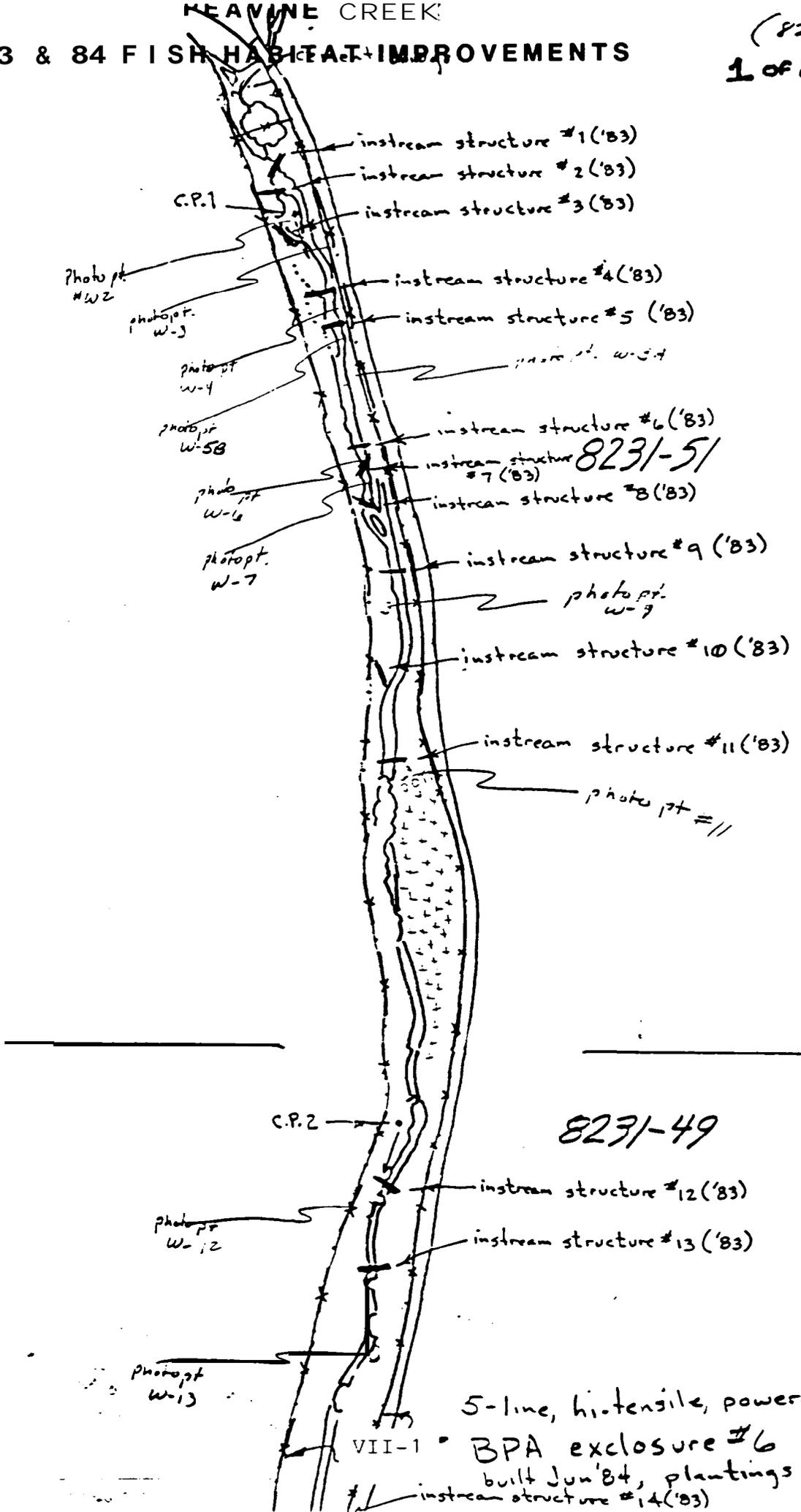
Enclosure 11A



SEGMENT #11  
SEGMENT #10

APPENDIX VII

PEAVINE CREEK  
FISHERIES HABITAT IMPROVEMENTS  
INSTREAM STRUCTURE LOCATIONS



8231-49

VII-1 5-line, hi-tensile, powered fence  
BPA enclosure #6  
built Jun '84, plantings Apr '84  
#14 instream structure #14('83)

FY 83 & 84 FISH HABITAT IMPROVEMENTS

photo pt  
W-13

5-line, hi-tensile, powered fence

BPA enclosure #6

built Jun '84, plantings Apr '84

instream structure #14 ('83)

photo pt  
#14

instream structure #15 ('83)

instream structure #16 ('83)

instream structure #17 ('83)

photo pt  
#17

instream structure #18 ('83)

8231-47

instream structure #19 ('83)

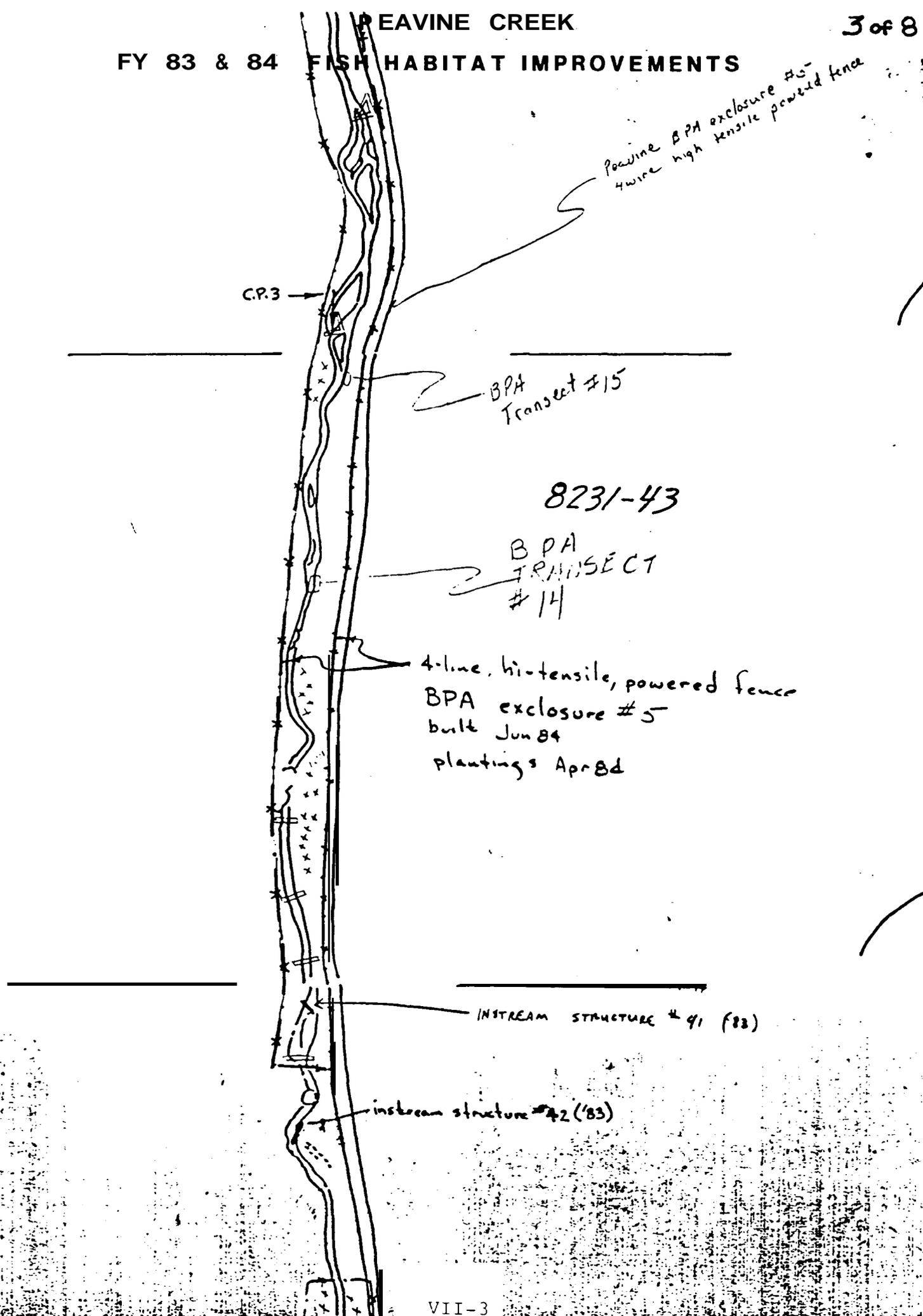
instream structure #20 ('83)

photo pt  
#W-20

CRM site

8231-45

FY 83 & 84 FISH HABITAT IMPROVEMENTS



Powerline BPA enclosure #5 -  
4 wire high tensile powered fence

CP.3

BPA  
Transect #15

8231-43

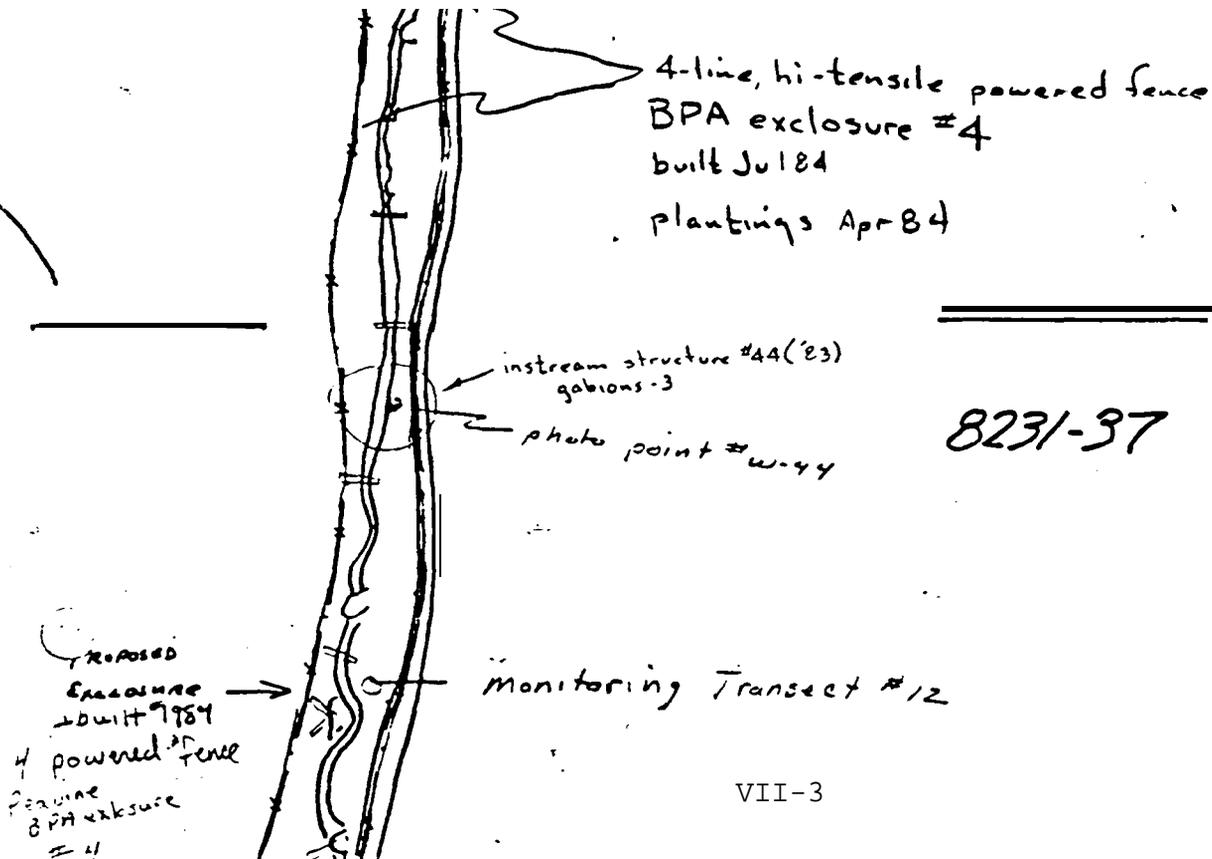
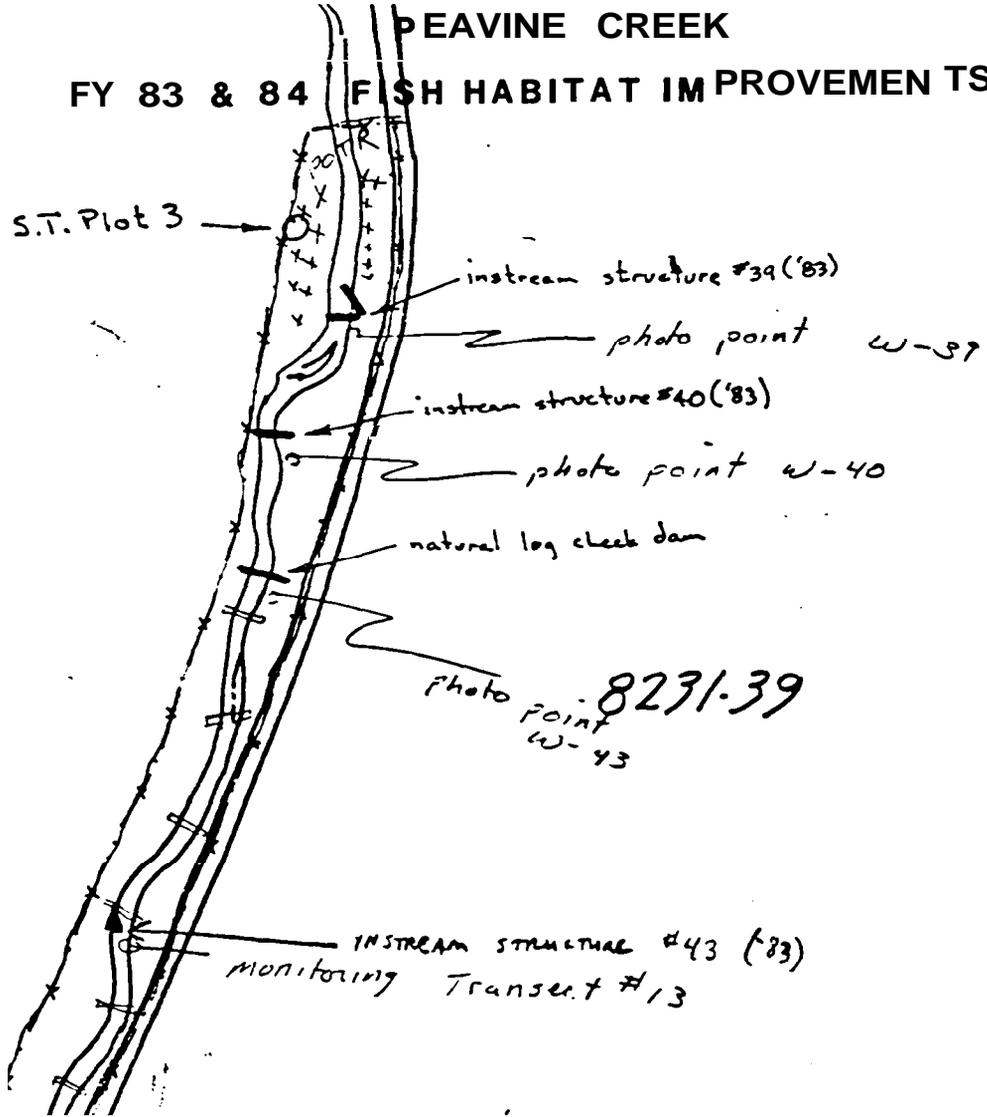
BPA  
TRANSECT  
#14

4-line, hi-tensile, powered fence  
BPA enclosure #5  
built Jun 84  
plantings Apr 84

INSTREAM STRUCTURE #91 (83)

instream structure #42 (83)

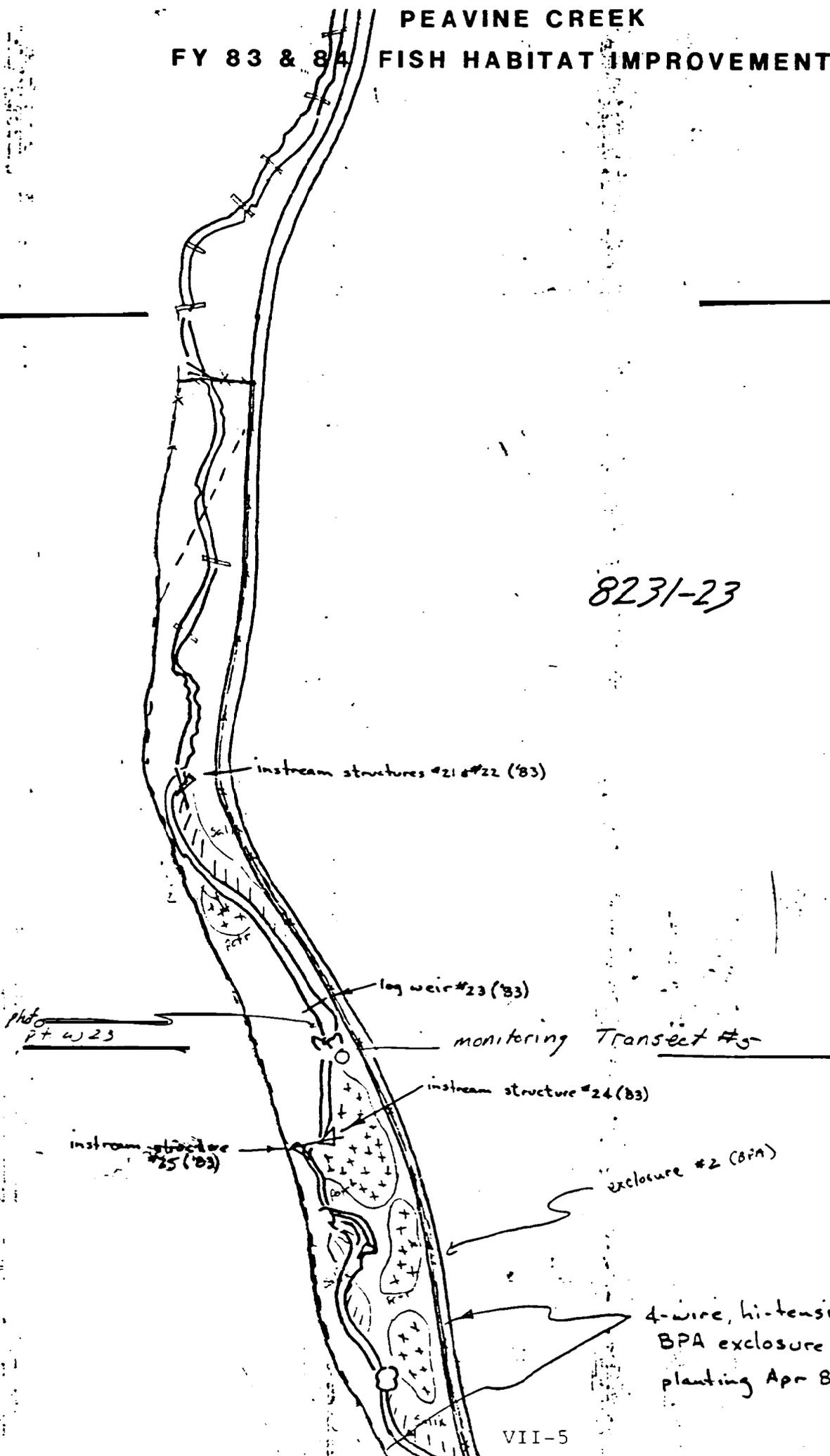
PEAVINE CREEK  
 FY 83 & 84 FISH HABITAT IMPROVEMENTS



8231-37

PEAVINE CREEK  
FY 83 & 84 FISH HABITAT IMPROVEMENTS

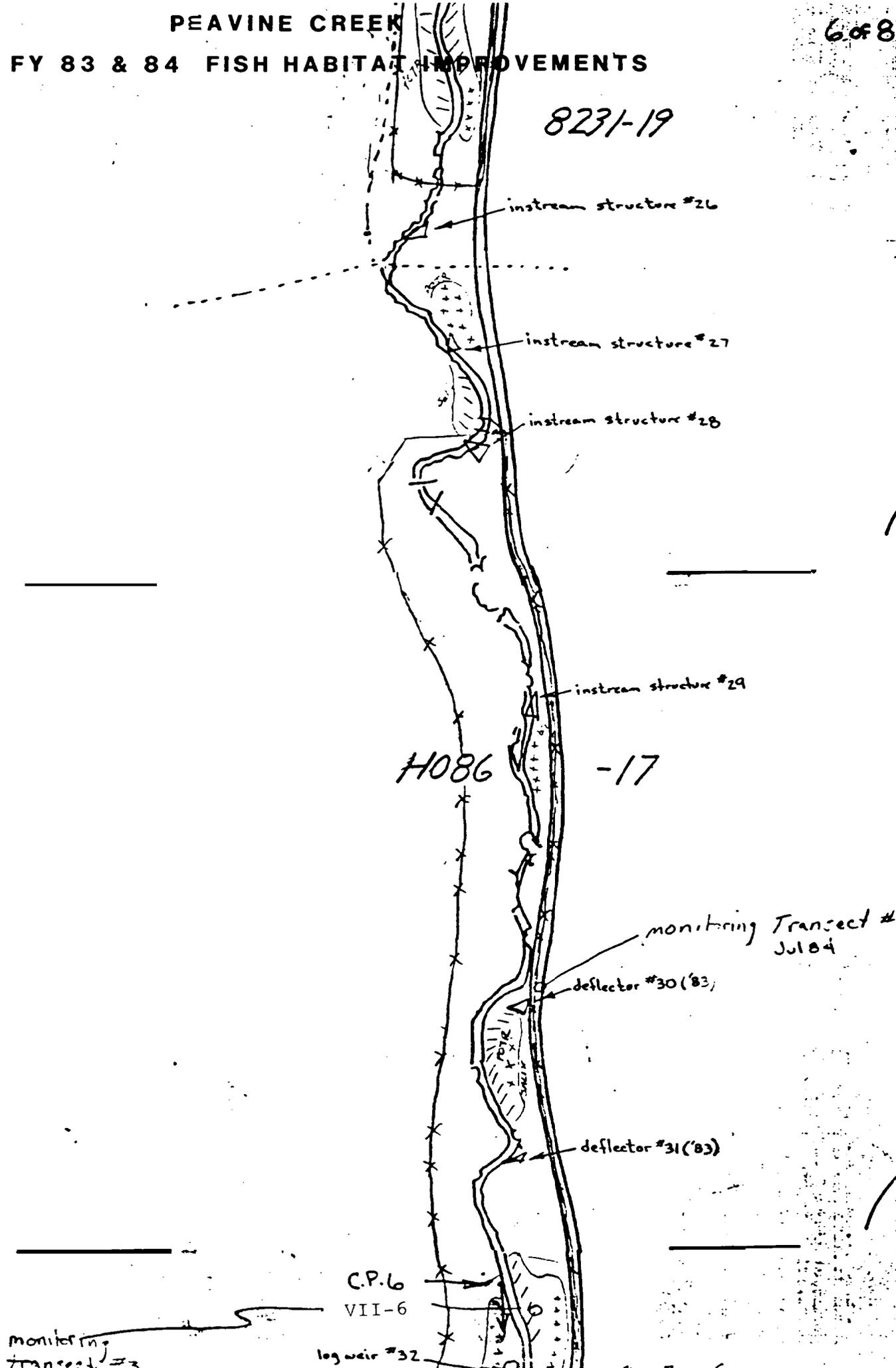
8231-23



4-wire, hi-tensile powered fence  
BPA exclosure #2. built Aug 83  
planting Apr 84

PEAVINE CREEK  
FY 83 & 84 FISH HABITAT IMPROVEMENTS

8231-19



instream structure #26

instream structure #27

instream structure #28

instream structure #29

H086 -17

monitoring transect #4  
Jul 84

deflector #30 (83)

deflector #31 (83)

C.P. 6  
VII-6

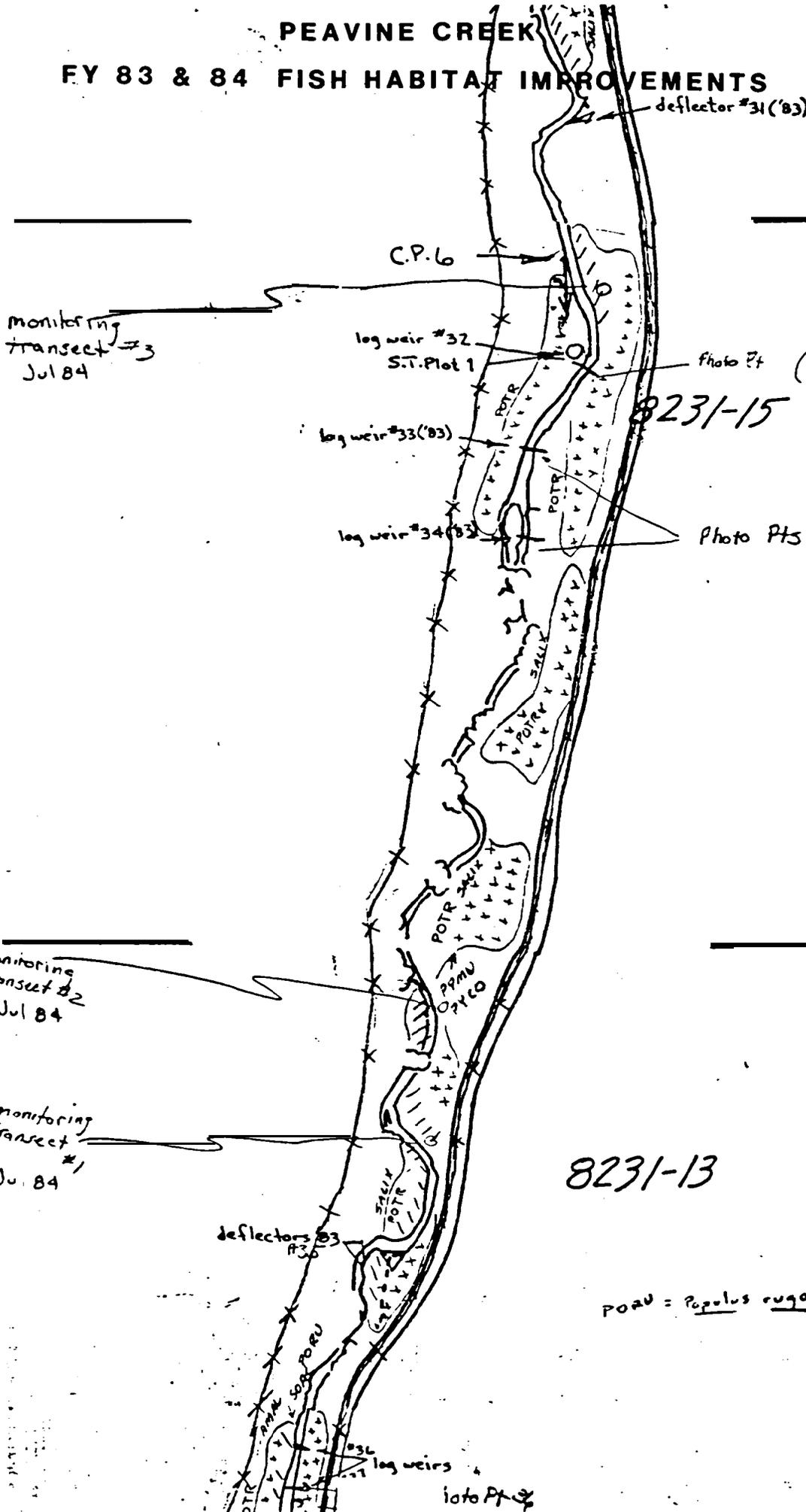
log weir #32

monitoring  
transect #3

scale 1:1000

PEAVINE CREEK

FY 83 & 84 FISH HABITAT IMPROVEMENTS



deflector #31 ('83)

C.P. 6

monitoring  
transect #3  
Jul 84

log weir #32  
S.T. Plot 1

Photo Pt (NOTE: ORIGINAL PT. REMOVED  
BECAUSE OF WINDFALL)

8231-15

log weir #33 ('83)

log weir #34 ('83)

Photo Pts

monitoring  
Transect #2  
Jul 84

monitoring  
Transect #1  
Jul 84

8231-13

deflectors #33  
#36

PORU = Populus rugosa

log weirs

Photo Pt 3

VII-7 to 10/33

monitoring  
transect #1  
Jul 84

# PEBBLE CREEK FY 83 & 84 FISH HABITAT IMPROVEMENTS 8231-13

POAU = Populus rugosa

deflectors #3  
#35

#36  
#37 log weirs

photo Pt #  
photo pt #37

Deflector #38 83

4 wire high tensile powered fence  
enclosure # 1 (BPA)  
built Jun '84  
planted Apr 84 (some residual plantings  
from Apr 74)

8231-11

VEG

gate

McCarty Creek