SOUTH FORK CLEARWATER RIVER

HABITAT ENHANCEMENT

ANNUAL REPORT - 1985

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TABLE OF CONTENTS

TABLES AND FIGURES

INTRODUCTION

In 1927 a dam was constructed on the South Fork of the Clearwater River at Harpster, which totally eliminated anadromous fish runs into this important spawning and rearing habitat. In 1935 a fish ladder was constructed at the dam but was reportedly only minimally successful. In 1962 the dam was completely removed. By this time, however, the anadromous runs had been eliminated from the drainage. Additional activities in the drainage that have had impacts on the anadromous fish habitat include mining (both dredge mining and hydraulic mining for gold), grazing (especially on private lands in Red River), and timber harvest and road construction which have increased sediment loads in the streams.

Idaho Fish and Game began a program of re-introduction of anadromous salmondis in 1962. Hatching channels were constructed on Red River at the Red River Ranger Station and on Crooked River near Orogrande. These were stocked annually with eyed eggs. Species stocked varied and included coho salmon, chinnook salmon and steelhead. The Crooked River channel was abandoned several yeare ago when the lease on private land terminated; however, the Red River Channel has continued in operation. Host of the recent use (1978-1983) has been with steelhead. In 1977 Idaho Fish and Game constructed a rearing pond at Red River which is used to rear 200,000-300,000 spring chinook salmon annually. The pond is stocked with fry in the spring. After rearing in the pond over the summer, a portion are marked end all are released into Red River at the pond site.

The U.S.F.S. began a program of active habitat inporvement in the Red River, Crooked River, and Newsome Creek drainage systems in 1980. These are continuing on an annual basis utilizing Forest Service funding. Since the B.P.A. project proposal has been approved, the Red River District has directed its emphasis to the South Fork of Red River, and the Elk City District has concentrated on Newsome Creek. These projects will complement the B.P.A. work being carried out in Red River and Crooked River. The U.S.F.S. contribution to the rehabilitation of the South Fork Clearwater system was $7,800 in 1983, $30,157 in 1984, $96,347 in 1985, and is projected to be $120,000 in 1986.

DESCRIPTION OF PROJECT AREAS: The projects are on the Red River and Elk City Ranger Districts of the Nezperce National Forest (Figures 1 & 2).

The Red River project area consists of approximately 19 miles of stream with 50% on U.S.F.S. land and 50% on private land. Stream reaches involved include both meandering meadow reaches and timbered valley bottoms. Fish habitat problems are the result of overgrazing and previous dredge mining for bold.

The Crooked River project area covers 10 miles of stream with more than 90% on U.S.F.S. land. Fish habitat problems are associated with past dredge mining activities, for gold, which channelized the stream channel and eliminated the riparian meadow.

METHODS

Because of the scope of these projects, and multiple land ownership pattern, it was necessary to develop a systematic approach for evaluation, design and execution of the projects. The first step was to separate the streams into reaches with similar characteristics. On Crooked River each reach was considered a project segment while on Red River each reach was separated into individual project segments based on ownership.

After stream reaches have been identified, each reach is evaluated for fish habitat problems and potential habitat improvement projects. The resulting project proposals undergo continuing review and revision until a final project design is selected.

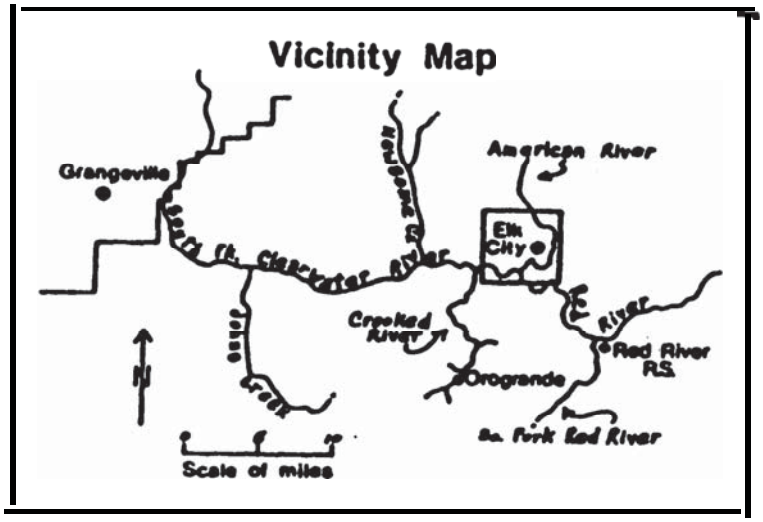
Methods used in 1983, 1984, and 1985 were standard fish habitat improvement projects including log weirs, deflectors, bank overhangs, bank stabilization structures, riparian fencing, boulder placement and riparian vegetation planting.

Descriptions of the habitat problems identified, and various treatments of the problems, were presented in the 1984 annual report which is available from BPA. This progress report will deal with additional treatments which were not covered previously.

Specific activities to be discussed in this report include: 1) flood plain construction, 2) connection or construction of ponds and/or side channels, 3) vegetation “clump” plantings, and 4) test plantings of various shrub species.

FIGURE 1

Crooked River Fish Habitat Improvement Project



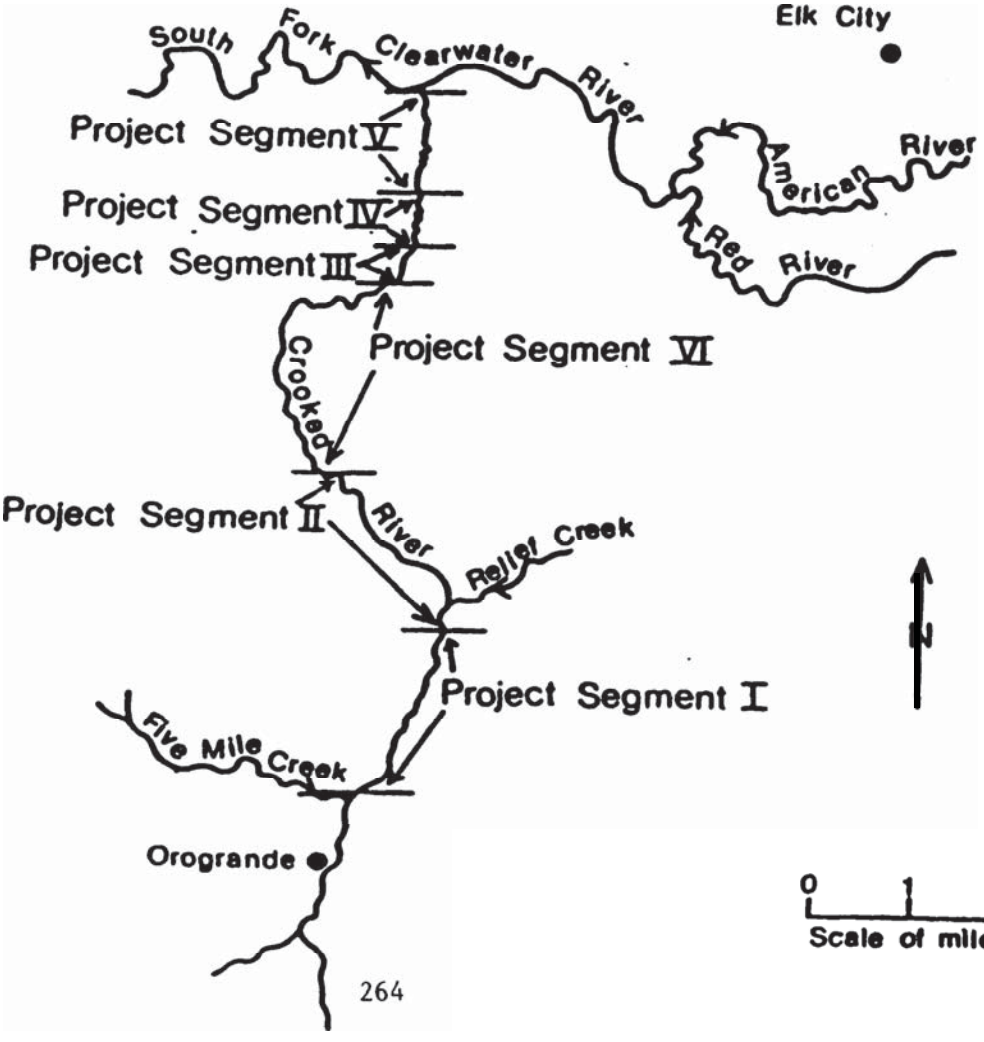
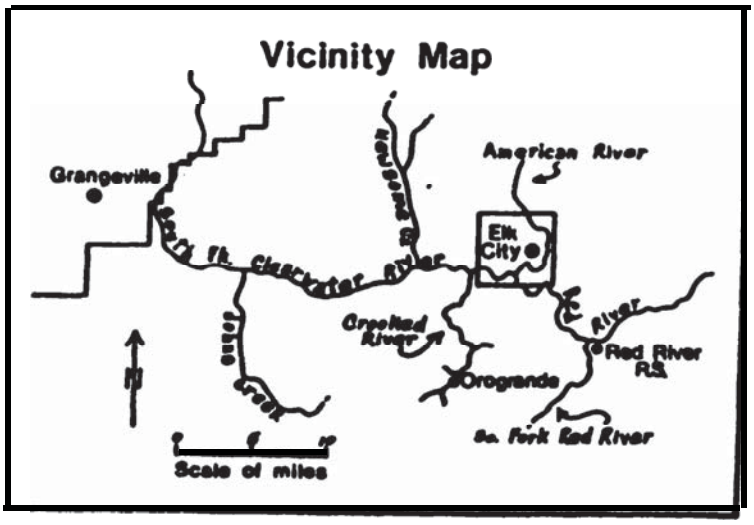
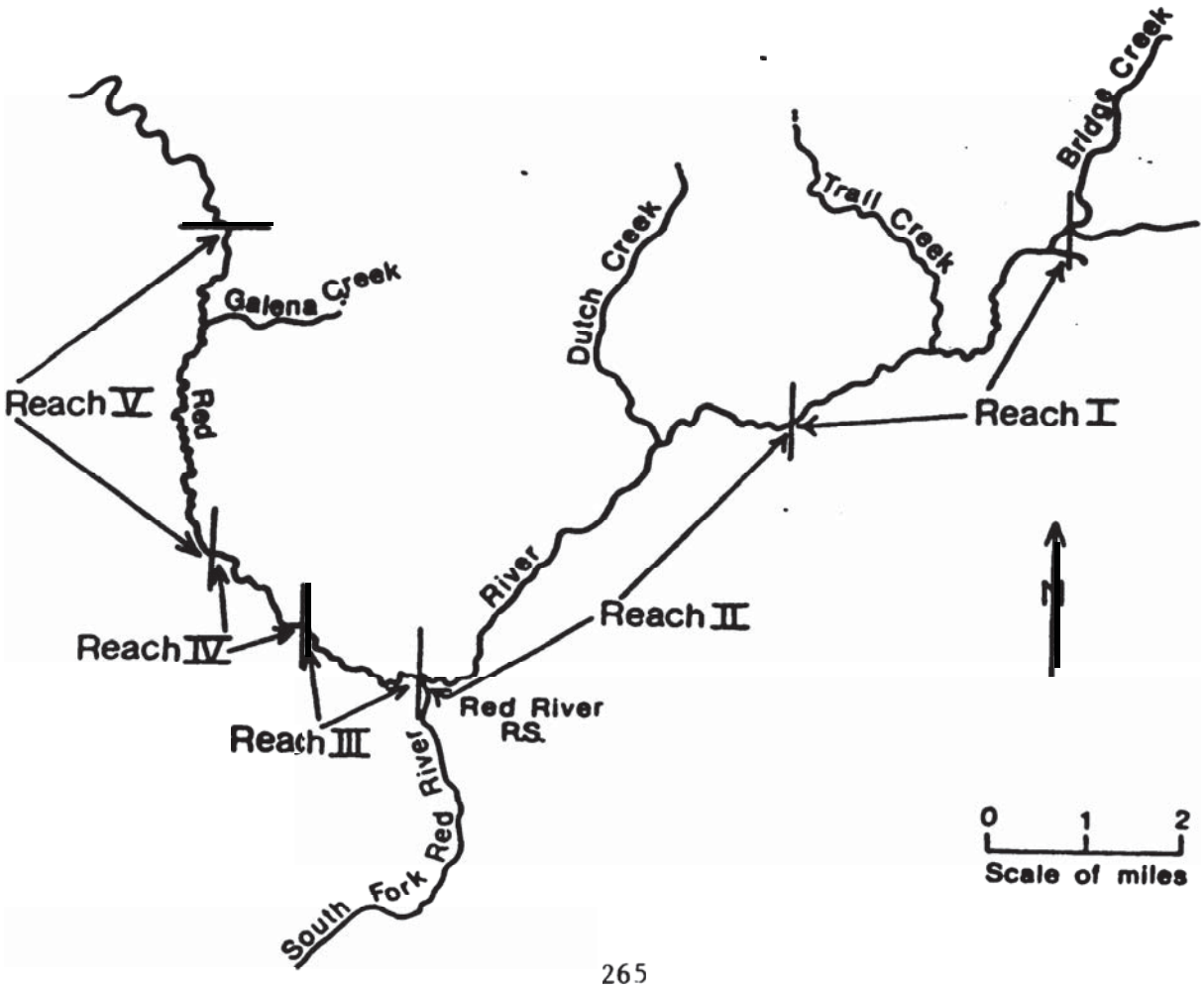


FIGURE 2 •

Red River Fish Habitat Improvement Project



● Elk City



Flood plain construction. Along Crooked River in areas where dredge tailings have created an unnatural channel, especially at high flows, we attempted to create a flood plain. The objective is to provide conditions which more naturally duplicate a meadow type stream. Activities began early in the spring when a D-7 cat was used to create small access roads across the dredge tailings, and to lower and level tailings piles adjacent to the stream. The next step was to install planned instream structures. Finally, a hydraulic excavator was used to move the remaining tailings to a level where the stream would over top the bank during spring runoff (See Figure 3). For the initial trial of this technique, we excavated down to the level where vegetation was growing on the tailings piles. After monitoring for a season, and completion of cross section surveys, we will attempt to refine this technique for future use. Things we hope to accomplish with this technique are: 1) enhanced revegetation success, 2) deposition of fine materials on the flood plain during spring runoff and 3) reduced scouring during floods.

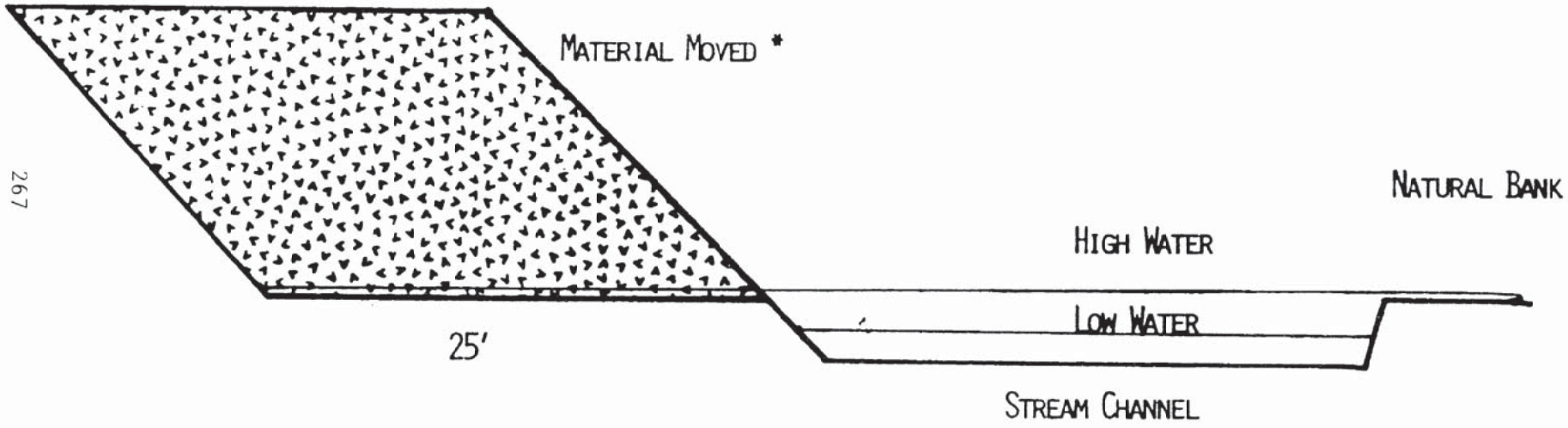
Ponds and side channels. This type of activity was used in both Crooked River and Red River. In Crooked River, existing ponds at three sites were connected to the stream. At two of the sites, the ponds were connected at both the upstream and downstream ends of the ponds so that a small portion of the stream is flowing through the ponds (See Figures 4 and 5). At the other Crooked River site, one pond that has a considerable amount of intergravel flow was connected only at the lower end (See Figure 6). The objective here was to provide an off channel refuge during spring runoff. All of these connections were made using the hydraulic excavator. Finishing touches to the connecting channels (placing rip rap, planting, installing log drop structures) were completed by hand.

In Red River four sites were treated , three by opening existing side channels, and one by excavating a new channel. This work was done using a small track mounted backhoe (John Deere 555-D). It is anticipated that Idaho Department of Fish and Game monitoring will take place on these side channels next season (1986) and will provide information on the extent these add to rearing habitat.

Clump plantings. This technique was observed on the Umatilla National Forest and it appeared to be very successful. We tried incorporating it into our flood plain construction areas on Crooked River. It is done by excavating a hole in the dredge tailings down to water level. Whole clumps of shrubs (several plants) are then dug up away from the site by the excavator and placed in the hole. Our concern is for survival of these plants since it was done during the hottest part of the summer (Kid-late August).

FIGURE 3

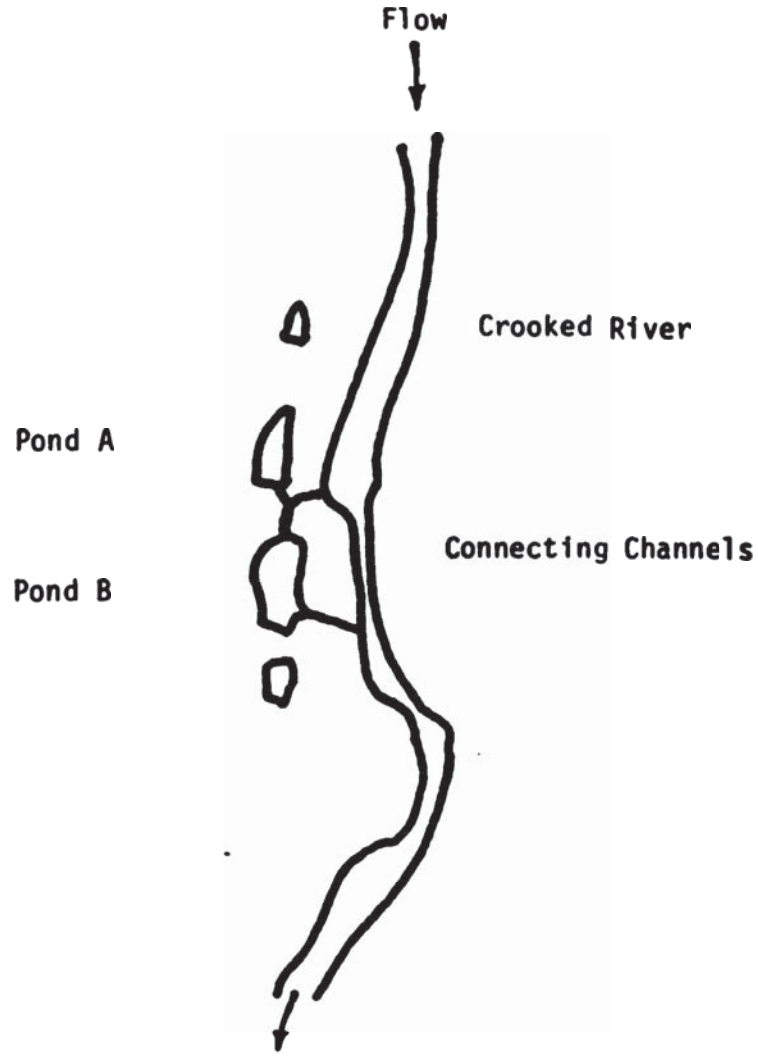
SCHEMATIC OF FLOOD PLAIN CONSTRUCTION



*TREATING 930 LINEAR FEET OF STREAM BANK REQUIRED MOVING APPROXIMATELY 10,300 YD^3 ROCK AND RUBBLE MATTERIAL.

FIGURE 4

Site 1 - Ponds Connected to Crooked River

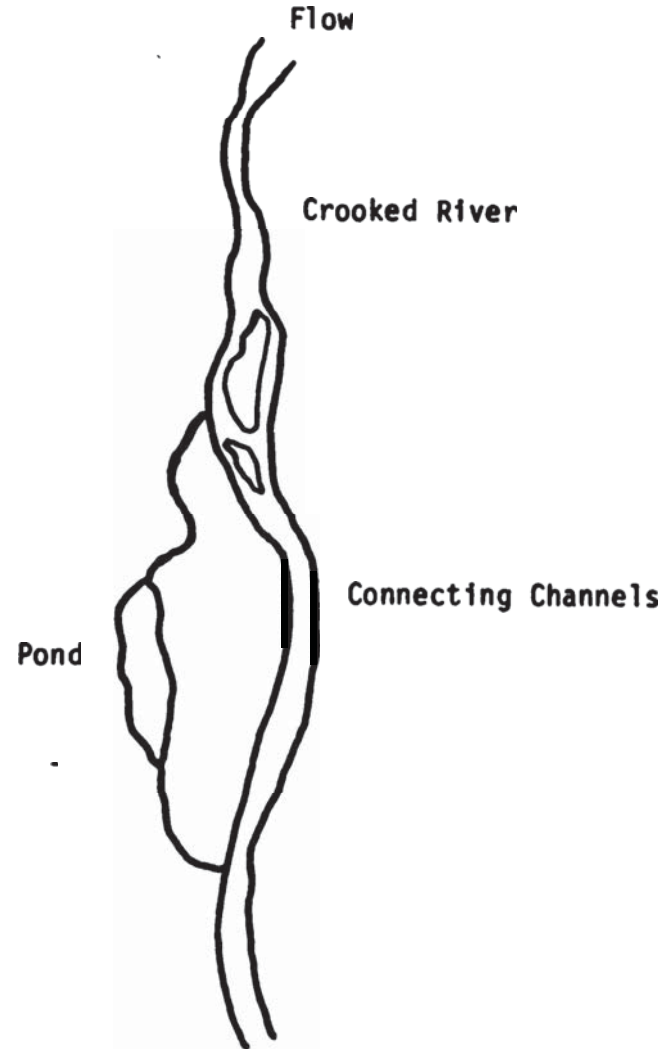


300'

Pond A = 53' x 18' = 954 ft.^{2}
Pond B = 70' x 26' = 1820 ft.^{2}
Channels = 100' x 3' = 300 ft.^{2}

FIGURE 5

SITE 2 - POND CONNECTED AT BOTH UPSTREAM AND DOWNSTREAM ENDS

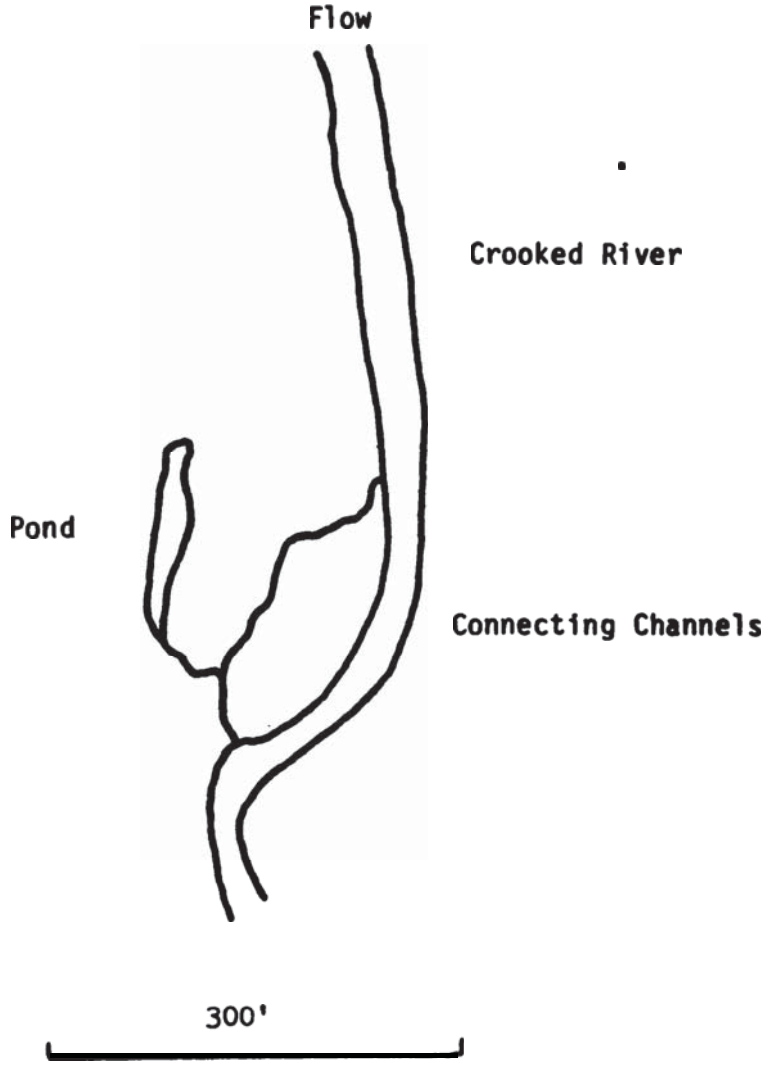


Pond = 142' x 28' = 3976 ft.^{2}

Channels = 200' x 3' = 600 ft.^{2}

FIGURE 6

SITE 3 - POND CONNECTED AT DOWNSTREAM END ONLY



Pond = 130' x 18' = 2340 ft.^{2}

Channels = 95' x 3' = 285 ft.^{2}

Trees placed for cover structures. This activity entailed identifying areas where we could get to the stream and operate without disturbing structures already in place. A hydraulic excavator was moved to the site. It then crossed the stream, accessed pre-selected trees and moved them to the stream where they were placed for cover. Whole trees (including roots) were used instead of cutting trees and cabling them to the banks or leaving large portions of the tree on the banks.

Test plantings - To better evaluate survival of plantings in the dredge tailings, we set up test plots. These included both local cuttings and rooted nursery stock. Plantings were on a 2' x 2' spacing on tailings piles with six rows of four plants in each test plot. The planting plots were marked with metal fence posts at the corners and 1/2 the plantings were protected with vexar tubes held up with bamboo stakes.

Instream structures (described in 1984 annual report).

Results and Discussion

Accomplishments -

Crooked River - During 1985, treatments were carried out in two stream reaches. In Reach I (treated last year) additional instream cover was added in the form of trees, root wads and boulders. In Reach II treatments included use of pool forming structures, cover structures, boulder placements, bank stabilization activities and connecting ponds to provide additional habitat. See Table 1 for a summary of structures used in each reach.

Red River - All improvement activities were carried out in Reach II this year. improvements were designed to enhance pools habitat, instream cover, bank stability and provide additional rearing habitat by opening side channels. (See Table 2).

Monitoring (Results and Needs)

Revegetation Efforts - In Crooked River three test sites were marked with metal fence posts and various containerized shrubs and Local cuttings planted on a 2' x 2' spacing. Observations in the fall indicated very low survival. See Appendix 1 for a summary report of the planting activities. A systematic survey of the plots will be carried out in the spring of 1986 to determine 1st year survival.

Additional activities which need to be carried out include planting additional test plots and then treating these with some type of regular irrigation system. This may be critical for establishment of trees and shrubs on the rubble tailings piles.

Table 1. Summary of accomplishments, Crooked River, 1985.

Treatment	Number
Upstream V Boulder Weirs	8
Upstream V Log Weirs	1
Downstream V Boulder Weirs	6
Diagonal Log Weirs	14
Deflector Logs	12
Treated Cut Banks	3 (3,750 square feet)
Root Masses	6
Random Boulders	104
Ponds Connected	4 (9,090 sq. ft. surface area)
Trees or L.W.D.	59
Fish House	1
Newly Created Side Channels	7 (395' total length)
Existing Side Channel Opened	1 (100' total length)
Flood Plain Created	3 Sites (21,145 sq. ft.)
Transplanted Brush Clumps	
Willow 12	
Snow Berry - 4	
Alder 17	
Service Berry - 1	
Shrubs Planted	
Cottonwood	50
Red Osier Dogwood	125
Siperion Pee	25
Hybrid Poplar	300
Golden Willow	25
Arctic Blue Willow	25
Alder	500
Red Osier Dogwood (cuttings)	2,150
Willow (cuttings)	- 12,150

Table 2. Summary of accomplishments, Red River, 1985.

Treatment	Number		
Log Weirs			
Perpendicular			
With filter cloth	2		
Without filter cloth	1		
Diagonal			
With filter cloth	3		
Without filter cloth	5		
Boulder weirs[a]			
Perpendicular	1		
Upstream V	2		
Downstream V	1		
Rock weirs			
Perpendicular	1		
Diagonal	1		
Upstream V	4		
Boulder clusters[a]	4		
Rock deflector	1		
Log deflectors	5		
Anchored debris			
Cabled logs or trees	8		
Hoot wads	2		
Bank cover	5		
Instream cover	7		
Bank stabilization	4		25 m^2
Bank stabilization and bank cover	2		18 m^2
Off channel rearing			
Channel opened	3		175 m total length
Entire channel dug	1		98 m total length
Seeding, fertilizing, and mulching[d]	35	sites	10,500 m 440 m
Boulders hauled from Crooked River			
Used in 1985	125		
Mot used in 1985 section of stream	42		
For use in 1986 section of stream	82		
Additions to structures built in 1984	3		
Shrub plantings			
Rooted stock			
Red-osier dogwood	115		
Utah honeysuckle	120		
Russian olive	50		
Willow cuttings	500		

a Granite boulders
b Instream rock and boulders
c Includes only root wads as independent structures. Two other root wads are part of structures.
d A few sites in Reach II were seeded, but not mulched becaused the areas were small, the site was level, and the straw supply was nearly gone. The bank in Reach IV was not mulched because much of it was too steep, and seeded in spring.

Another revegetation technique used in Crooked River that will be monitored for success is "clump plantings". These are vegetation mate including shrubs that were transplanted using the hydraulic excavator. We anticipate potential problems because of the time of yeor that the plantings were done. If survival is low we will want to redo them either in the early spring or late fall and monitor results.

Both Red River and Crooked River received large numbers of planting6 of local unrooted cuttings of willow and Red Osier dogwood. as many of these sites as possible will be reviewed for survival after spring run off. If successful this technique will be used more in the future because it is realitively inexpensive compared to purchasing rooted nursery stock. Initial observation indicated good survival the first season of plantings in both Red River and Crooked River.

Instream Structures - observation of previously installed structures indicated failure of only one type of structure, a downstream V shaped rock wier failed, and that may have been caused by vandalism. All other structures were functioning as designed. Maintenance was minimal for structures installed in 1986. The true teat of these structures will come with a 20 year recurrence, or greater, flood even t. Condition of structures will be monitored annually and maintenance scheduled as needed to assure that the structures continue to function as designed. Specific conditions we will check for this season include undercutting of the structure causing flow to percolate through the structure, erosion at end6 of the structure and downstream erosion.

Food plain - The constructed flood plains sites will be checked to determine if they are functioning as designed i.e. overflowing the banks and depositing fine material during spring runoff, reducing erosion during highflows and providing good sites for revegetation. Additional work scheduled includes a site survey with flood plain and channel cross sections each 25 feet. The information resulting from this survey will be analyzed to estimate velocity and water depths at various flows. This information can then be compared to the calculated flow duration curves for Crooked River and will allow us to improve our design of flood plains for future projects in dredged areas.

Fish - population monitoring ie being carried out by Idaho Department of Fish and Game under another contract with BPA. New or additional monitoring which would be helpful to this project includes monitoring use of ponds connected in 1986 and 1985 in Crooked River and density of fish in side channels opened in Red River. It would be especially useful to have seasonal (spring, summer and winter) density information. It would also be extremely helpful to have fish density and numbers for each age class presented by habitat type (pool, riffle and run). This would give us some clues on how effective we are at providing habitat for all age classes.

Maintenance - If structures show as little deterioration as last year the amount of maintenance required will be minimal, and will be incorporated in the seasons normal work load with no additional funds required. If maintenance becomes a major need the structure designs will be re-evaluated prior to maintenance to determine if design changes are required. All previously completed project activities will be reviewed early in the 1986 season.

Design

Flood plains areas in Crooked River to be constructed in 1986 will be surveyed and designed based on flow data rather than by "gut feel" as done during 1985. The success of these two approaches can then be compared and refined in the future. During 1985 the flood plain was excavated by eye to a level where vegetation was growing on the stream banks (approximately the height of the "natural" stream bank on the other side.

Problems Encountered

Coordination and Easements - Coordination with other agencies, minerals claimants and the general public went well this year. We had a potential conflict with one miner, but we managed to avoid major difficulties.

Red River

Idaho Department of Fish and Game was not able to obtain easements for working on private lands along Red River. Consequently we had to shift our efforts to placing instream structures in Reach II which is all Forest Service land. We have requested that these easements be obtained for the 1986 field season. If the easements are not obtained by the field season, there is still enough work to do in Reach II that we can shift our activities one more season. After that, it is doubtful that the project can continue except at a minimal maintenance level in the future. The Forest Service and Idaho Department of Fish and Game are continuing their efforts in this area.

Crooked River

We had a problem with a proposed engineering design contract that was advertised for a portion of the Crooked River project. The contract was to design a project segment which requires connecting several ponds to the stream channel. The contract was threatened with appeal, under the Brooks Act, by an an engineering group in Boise. Because of this appeal, the Forest withdrew the contract and we are now re-evaluating the best way to accomplish this project segment.

APPENDIX 1

SPRING - FALL PLANTING 1985
CROOKED RIVER FISHERIES HABITAT IMPROVEMENT
BONNEVILLE POWER ADMINISTRATION
U.S. FOREST SERVICE

In late April, a four-person crew was hired to begin the task fo revegetating the dredge tailings along Crooked River. Willow and red osier dogwood cuttings were taken along Highway 14 near the mouth of Crooked River. The cuttings were 14-16 inches long, bundled in groups of fifty and stored overnight in a snow bank.

Planting sites on Crooked River were concentrated in Reach I where in-stream structures had been installed the summer of 1984. Planting was concentrated between access I and III. A re-bar planting tool was used to plant the cuttings In the tailings. The willow and red osier dogwood word planted at water level or slightly below.

Rooted planting stock was ordered from a commercial nursery to determine what species would grow in this altered environment. Four test plots were established to aid in this evaluation. Each plot contains a row of six different species. The spacing used was 2' x 2' and 50% of the plants were protected by 18" vixar tubes held in place with bamboo stakes. Green metal fence posts were driven to mark the corners.

After the test plots were established, the remaining stock was planted throughout Reach I. In all 50 cottonwood (rooted), 125 red osier dogwood (rooted), 25 Siberian Pea (rooted), 300 Hybrid Poplar (non-rooted), 25 Golden Willow (non-rooted), 23 Arctic Blue Willow (non-rooted), 12,150 willow cuttings and 2,150 Red Osier Dogwood cuttings were planted.

Due to the drought conditions through the month of July, it is estimated that 80% of the plantings died. The willow and dogwood cuttings along the stream did well and some of the rooted stock planted on the east bank where there is more shade and better soil, also did well. It may be necessary to have an Irrigation system, using floation pump, available for use during these dry periods. Hauling in top soil has also been discussed.

FALL PLANTING

500 rooted elder were planted October, 1985 along newly created channels - Reach II, Crooked River.

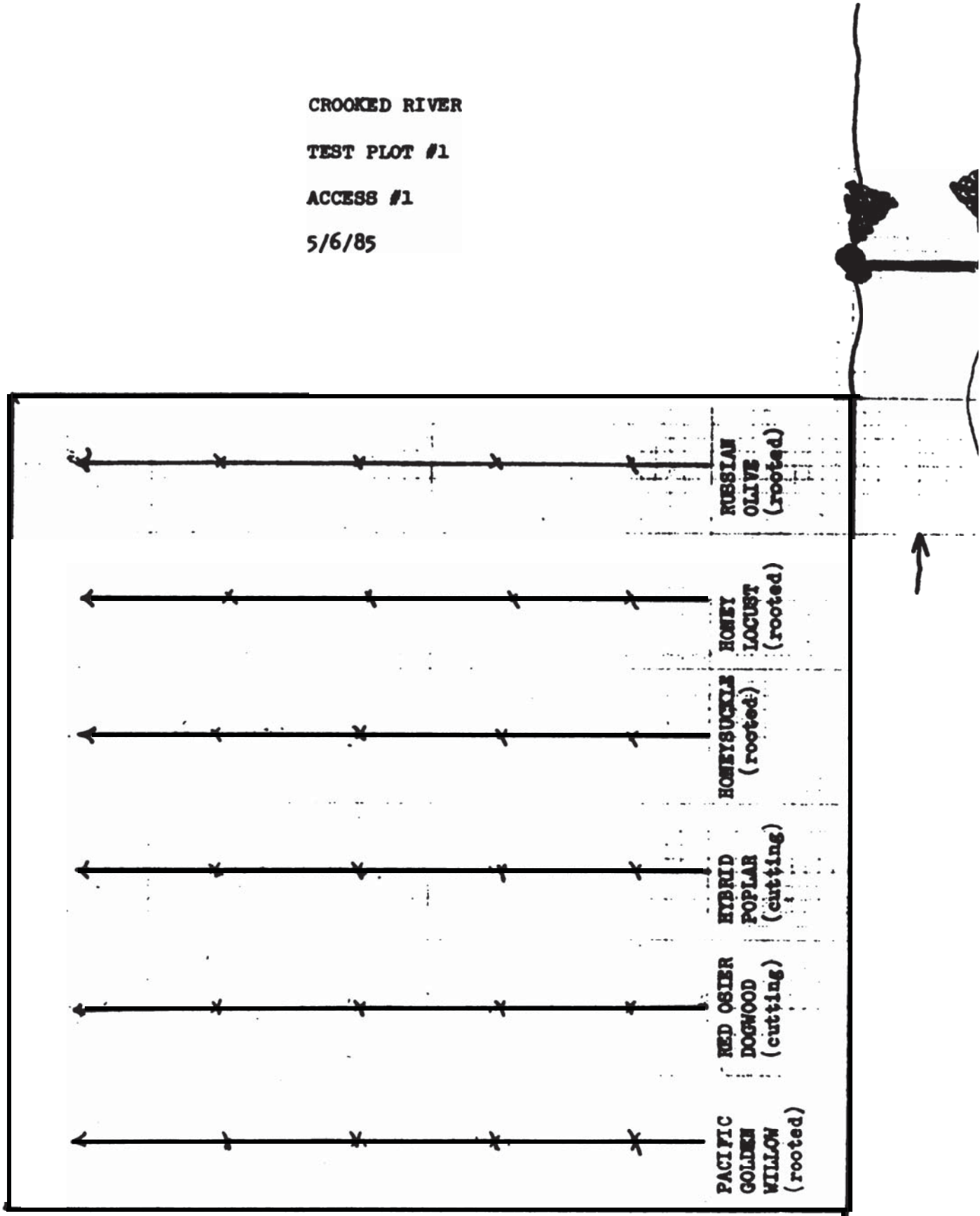
WAYNE PARADIS
BIOLOGICAL TECHNICIAN

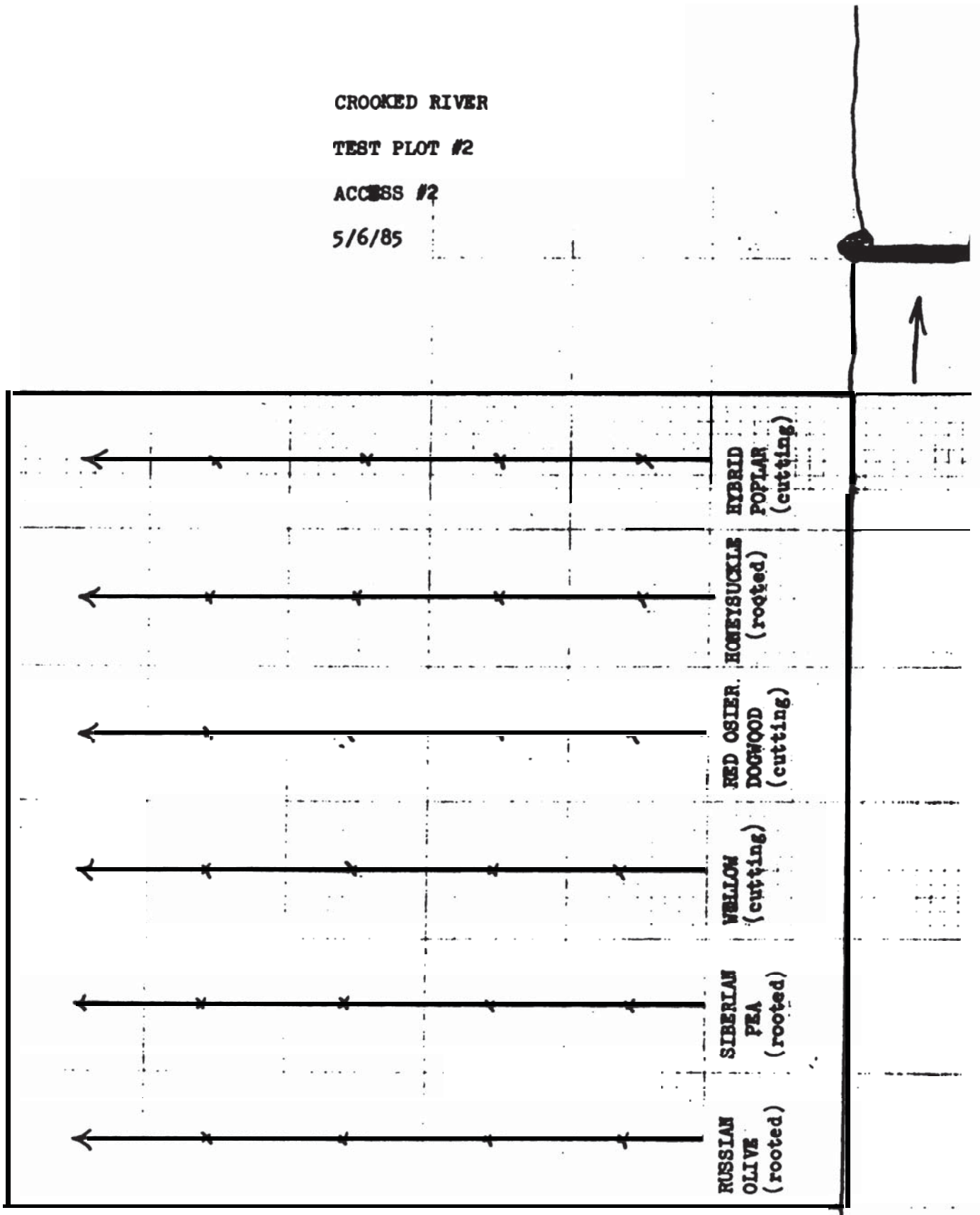
CROOKED RIVER

TEST PLOT #1

ACCESS #1

5/6/85



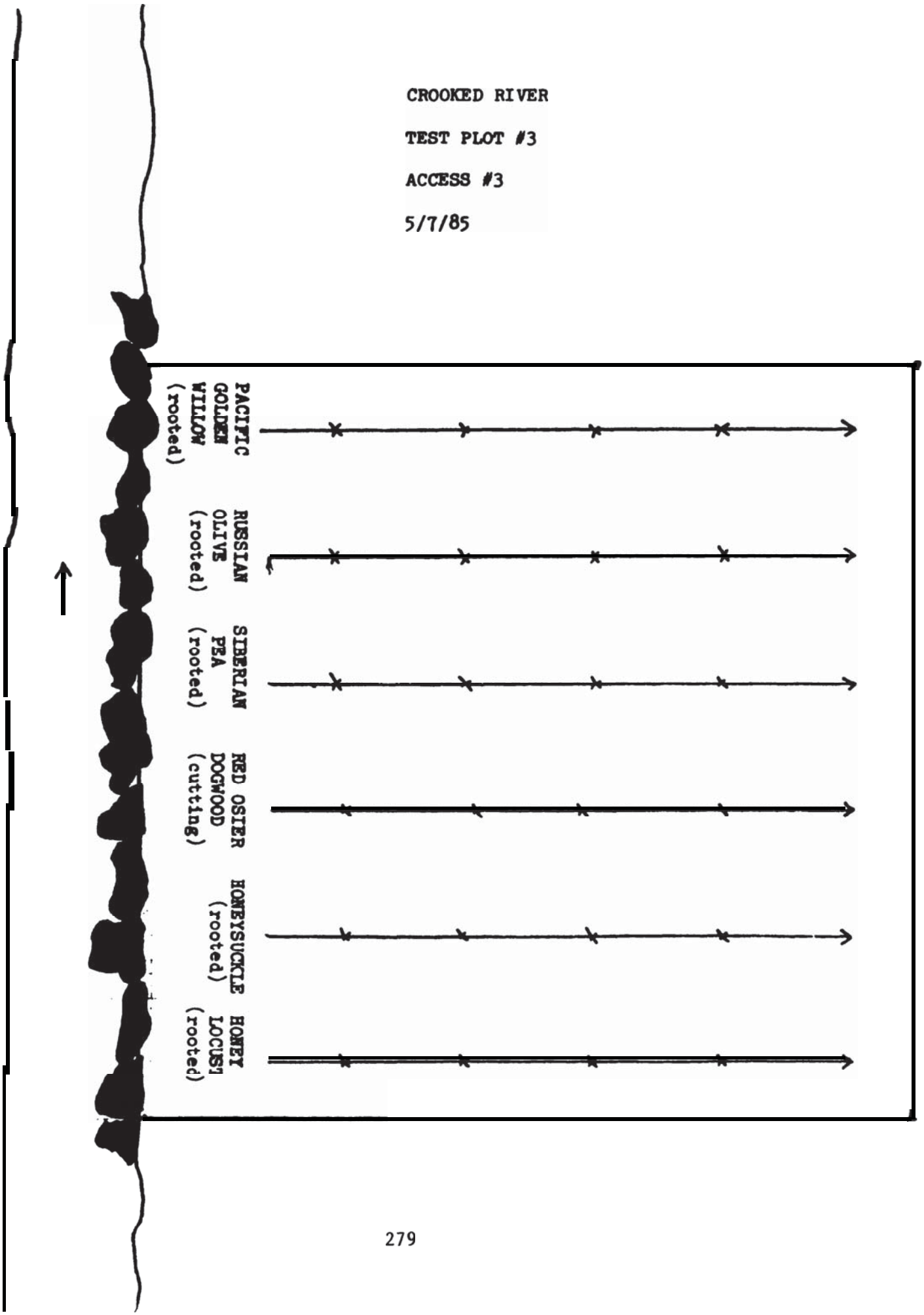

CROOKED RIVER
TEST PLOT #2
ACCESS #2
5/6/85
HYBRID POPLAR (cutting)
HONEYSUCKLE (rooted)
RED OSIER DOGWOOD (cutting)
WILLOW (cutting)
SIBERIAN PEA (rooted)
RUSSIAN OLIVE (rooted)

CROOKED RIVER

TEST PLOT #3

ACCESS #3

5/7/85

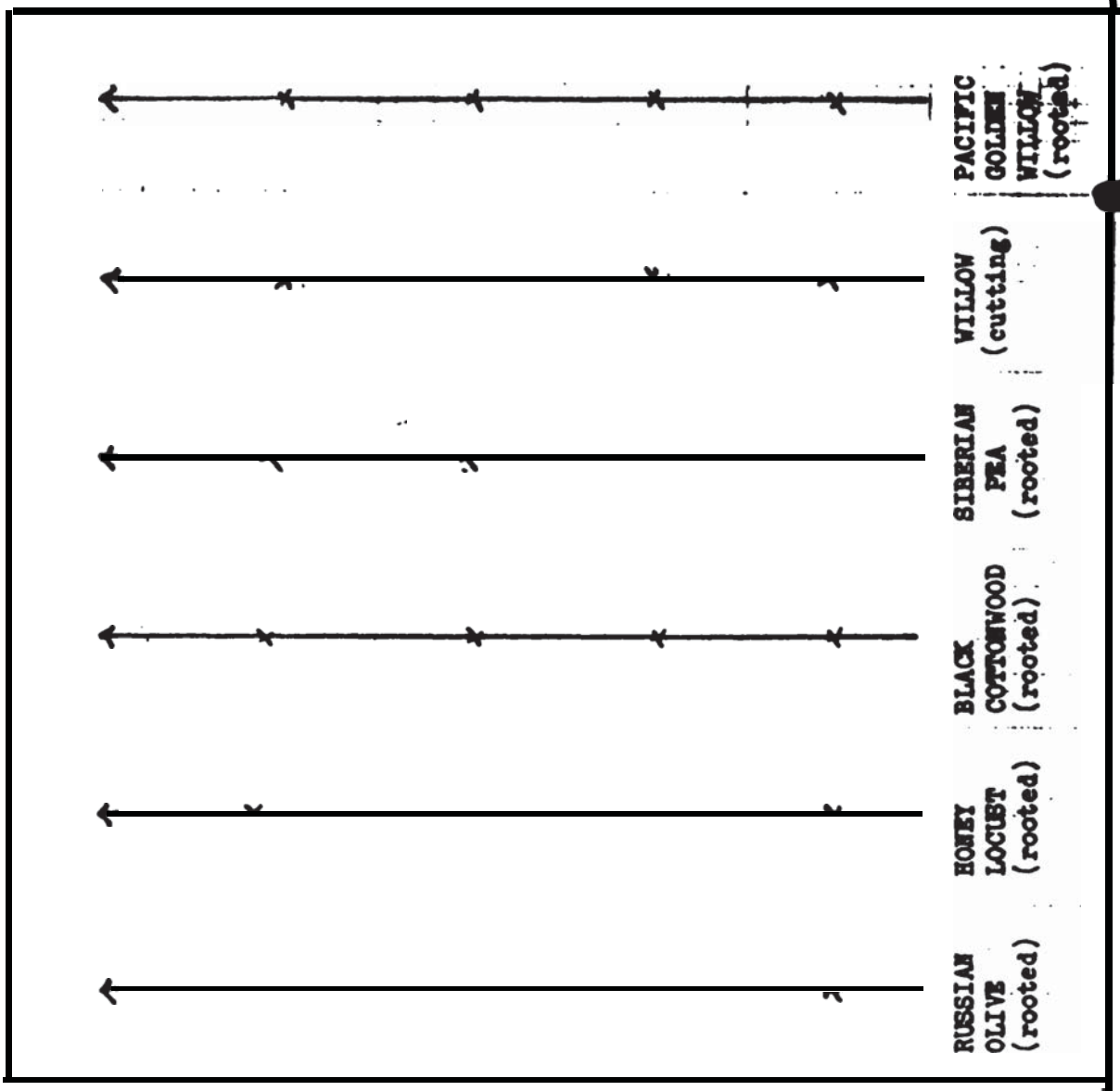


CROOKED RIVER

TEST PLOT #4

LANDING STRIP

5/7/85



CROOKED RIVER LANDING STRIP

5/8 DiameterRE-BAR PLANTING TOOL