Umatilla River Subbasin Fish Habitat Improvement Project

1992 Annual Report

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ABSTRACT

This annual report is in fulfillment of contract obligations with Bonneville Power Administration which is the funding source for the Oregon Department of Fish and Wildlife's Umatilla Basin Habitat Improvement Project.

The major activities undertaken during this report period were: 1) procurement of one cooperative lease agreement and one access easement with private landowners, 2) design and layout of 1.3 miles of riparian exclosure fence and 1.4 miles of instream structure maintenance, and 3) development of one fencing contract and three instream work contracts. Results include implementation of 1.9 miles of fencing, 1.4 miles of instream maintenance work, reconstruction of 0.75 miles of flood damaged fence, inspection and routine maintenance of 13.5 miles of fence, and planting of grasses, legumes and shrubs along 4.6 miles of stream. Other activities undertaken during this report period are: collection and summarization of temperature data, establishment and data collection from habitat monitoring transects, electrofishing surveys and spawning ground counts, photopoint establishment, coordination with numerous agencies and tribes and education of high school students on habitat improvement and preservation.

INTRODUCTION

The Northwest Power Planning Council's Fish and Wildlife Program (NPPC 1983) calls for the rehabilitation of steelhead and salmon populations in the Umatilla River (Section 303) (c)(1) to partially mitigate for losses due to the Federal Columbia River Power System. Historically, the Umatilla had large runs of spring and fall chinook salmon, which supported productive Indian and non-Indian fisheries. Although most chinook were eliminated from the Umatilla over 50 years ago a few spring chinook salmon were observed as recently as 1963 (OGC 1963), and fall chinook as recently as 1957 (Thompson and Haas 1960). Annual runs of summer steelhead have averaged 2,139 adults during the past thirteen years with a low of 768 in 1981-82 and high of 3,124 in 1986-87; counts for 1991-92 were 2,769 [Table 1). The Oregon Department of Fish and Wildlife (ODFW) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are currently implementing a major salmon reestablishment program in the Umatilla Basin. Fall chinook began returning to the river starting in 1985, spring chinook in 1988 and coho in 1989 (Tables 2, 3 and 43.

Reasons for the decline of anadromous fish in the Umatilla River include passage problems at Columbia and Umatilla River dams and degradation of the quality and quantity of spawning and rearing habitat. Reduction in the amount of riparian habitat along the Umatilla River tributaries contributes to poor stream conditions, which resulted in: 1) greater seasonal variation in flows and water temperatures, 2) unstable streambanks, 3) decreased production of food organisms used by fish, and 4) loss of instream and streamside cover (USFWS and NMFS 1982). Approximately 70% of the 422 stream miles inventoried in the Umatilla River Basin need riparian rehabilitation (USFWS and NMFS 1982) . Intermittent or nonexistent summer flows in some sections of Meacham, Squaw, Wildhorse, and Birch creeks are due in part to extensive losses of riparian vegetation.

The Umatilla Basin has three agencies working on habitat improvement projects on their respective lands of jurisdiction: Confederated Tribes of the Umatilla Indian Reservation on reservation lands; United States Department of Agriculture Forest Service (USFS) on Umatilla National Forest lands; and Oregon Department of Fish and Wildlife on private lands.

TABLE 1. THREE MILE DAM /1, UMATILLA RIVER SUMMER STEELHEAD COUNTS

YEAR /2	TOTAL ADULTS
1979-80	2,367
1980-81	1,298
1981-82	768
1982-83	1,264
1983-84	2,062
1984-85	3,436
1985-86	2,959
1986-87	3,124
1987-88	2,481
1988-89	2,476 /3
1989-90	1,694
1990-91	1,111
1991-92	2,769

/1 See Figure 1 for the location of Three Mile Dam within the Umatilla Basin.

/2 September 1 through June 30.

/3 Trap shut down for extreme cold weather from 2-2-89 to 2-24-89.

TABLE 2. THREE MILE DAM, UMATILLA RIVER SPRING CHINOOK COUNTS

YEAR	TOTAL		
	/1 ULT	JACK /2	TOTAL
1988	13	0	13
1989	66	98	164
1990	2,158	32	2,190
1991	1,291	39	1,330
1992	462	4	466

/1 Adults are greater than 24 inches in length.

/2 Jacks are precocially mature fish less than 24 inches in length.

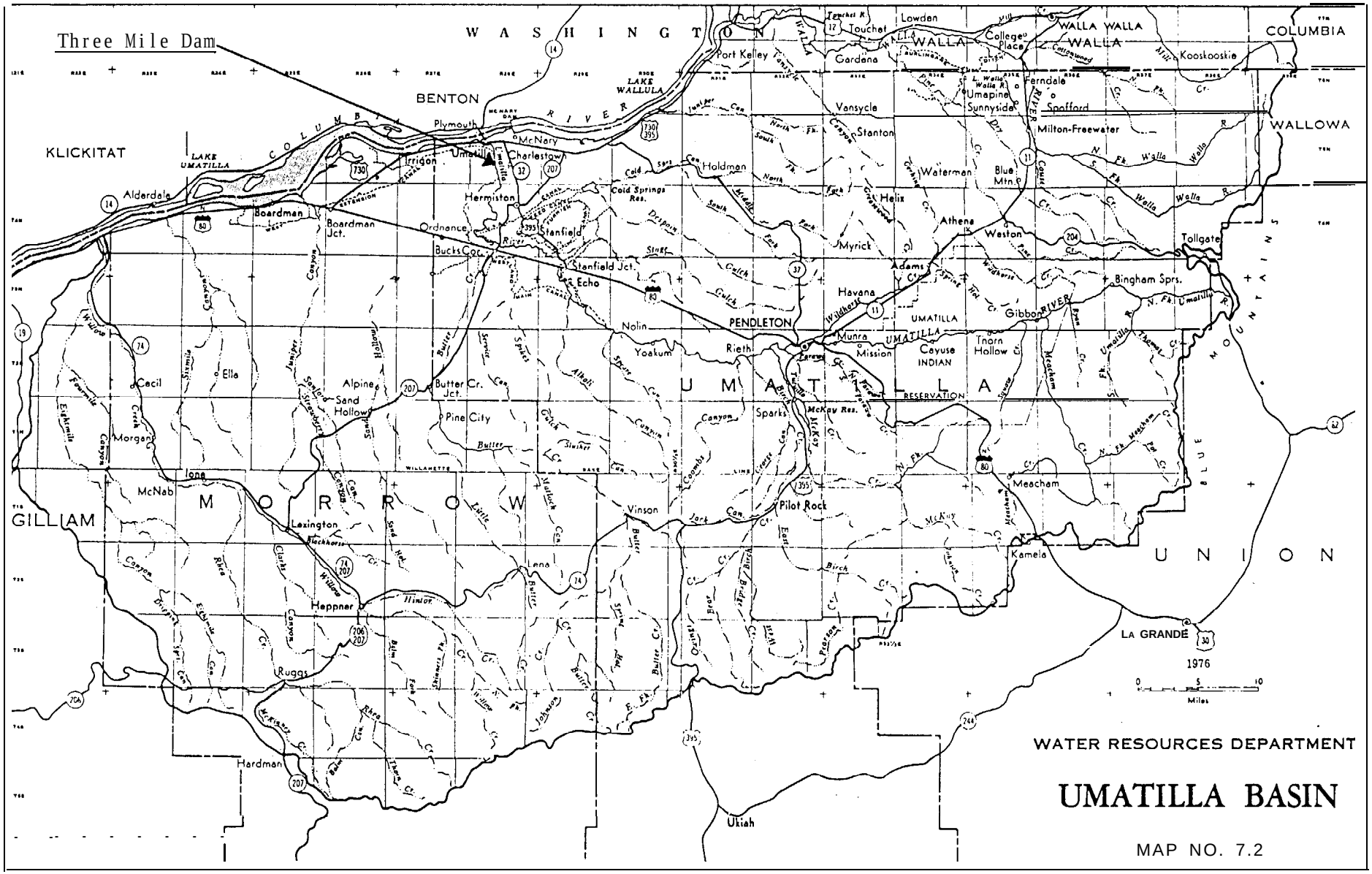

Figure 1. Location of Three Mile Dam within the Umatilla subbasin.

TABLE 3. THREE MILE DAM, UMATILLA RIVER FALL CHINOOK COUNTS

YEAR	ADULT /1	JACK /2	SUBJACK /3	TOTAL
			TOTAL	
1985	6	79	0	85
1986	27	447 /4	0	434
1987	52	52	295	399
1988	94	176	1,283	1,553
1989	279	247	76	602
1990	333	107	621	1,061
1991	522	468	274	1,264
1992	239	64	0	303

/1 Adults are greater than 24 inches in length.

/2 Jacks are precocially mature fish between 18 and 24 inches in length.

/3 Subjacks are precocially mature fish less than 18 inches in length.

/4 A combination of jacks and subjacks.

TABLE 4. THREE MILE DAM, UMATILLA RIVER COHO COUNTS

YEAR	AOULT /1	JACK /2	TOTAL
		TOTAL	
1987	0	29	29
1988	742	610	1,352
1989	3,694	507	4,201
1990	409	511	920
1991	1,733	187	1,920
1992	340	133	513

/1 Adults are greater than 20 inches in length.

/2 Jacks are precocially mature fish less than 20 inches in length.

DESCRIPTIDN OF AREA

The Umatilla River, in northeast Oregon, originates on the western slopes of the Blue Mountains just east of Pendleton. The river flows in a northwesterly direction for approximately 115 miles to its confluence with the Columbia River at River Mile 289 near Umatilla, Oregon (Figure 2). The Umatilla River drains approximately 2,300 square miles and has an average runoff of about 319,500 acre-feet gaged at the city of Umatilla. In downstream order, major tributaries of the Umatilla River are: North and South Forks of the Umatilla River; and Meacham, McKay, Birch, and Butter creeks.

Intensive agriculture [dry land and irrigated crops) is the dominant land use throughout the lower Umatilla Basin while timber harvest and livestock grazing are the predominant uses in the upper basin. Intensive uses of land adjacent to waterways has led to dramatic changes in their characteristics. Channelizing (straightening) and vegetation removal have turned many of the streams in the basin into relatively straight and deeply incised channels with major erosion problems. Streams in the forested areas of the basin are generally in a more natural condition than those in agricultural areas.

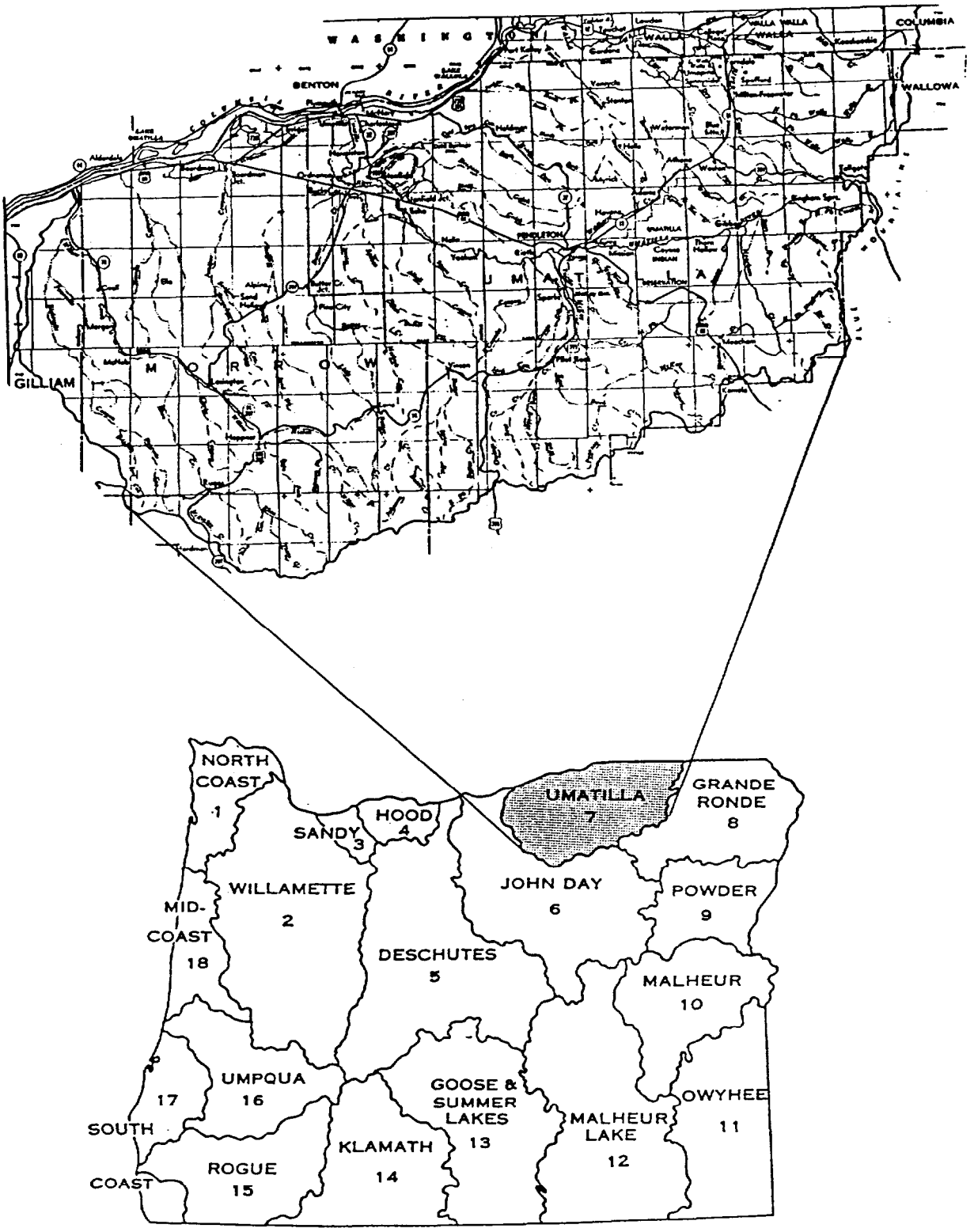

Figure 2. Location of the Umatilla subbasin within Oregon.

METHOOS AND MATERIALS

The goal of this program is to optimize spring chinook and summer steelhead smolt production within the Umatilla River Basin using habitat enhancement measures. To accomplish this goal, work has progressed in three phases:

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

Prework

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

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

Riparian lease procurement is the most critical facet of the program. Without landowner leases the program cannot function. Inherent problems that arise when dealing with landowners make this the most difficult program activity. Landowners receive no monetary compensation for signing a lease, and fringe benefits provided to the landowner as compensation are marginal. To compound the problem the lease becomes an encumbrance on the property title for fifteen years, thereby making this program a low priority for most landowners. To further these difficulties, most landowners are farmers and ranchers, who can be very difficult to contact.

2. Project Planning. Project planning includes design and layout of all work to be done on-site, landowner coordination, development of contracts and contract specifications, and obtaining necessary work permits.

a. Design and Layout. The layout of fencing projects is usually accomplished while lease negotiations take place. Considerable time is spent undertaking this task to produce a fenceline that is structurally feasible and meet the objectives of the State and the landowner.

Design and layout of instream structures consists of on-site layout of structures and the development of design criteria for construction purposes. Landowners are usually given the opportunity to review and comment on design and layout of instream structures. The actual quantity and design of structures, however, is

determined by the biologist, with input from other professionals.

b. Landowner Coordination. Landowner coordination is an integral part of planning, implementation and maintenance for all projects. Access, ground conditions, and implementation timing are all important considerations to reduce impacts on landowner's operations.

c. Development of Contracts. Contract documents are developed for all major implementation and maintenance projects. Considerable time is required to develop and collate written contract document components.

d. Obtaining Work Permits. Fill and removal permits must be obtained for all instream projects that involve removal or fill in a waterway. Permits must be obtained from the Army Corps of Engineers, Oregon Division of State Lands, and the Umatilla County Planning Department. The development of permit applications, and correspondence with these agencies requires considerable time.

3. Project Preparation. Prior to signing leases or construction contracts, all lease boundaries and work sites must be identified, staked and agreed upon by the landowner and/or contractor. Work sites may include right-of-ways, fences, instream structures, off-site water developments, planting, and miscellaneous lease or construction related areas.

Implementation

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

1. Instream Work. During late summer and early fall when streamflows are lowest, structures are installed in streams at locations preselected by fishery biologists and/or hydrologists. Structures of various types are used to stabilize streambanks, provide optimum pool/riffle ratios, raise riparian water tables, and collect spawning gravels; thereby increasing quantity and quality of rearing and spawning habitats.

2. Planting. During early spring, shrub and/or tree species are planted at preselected locations along streams within project areas. Since high summer water temperature is a major limiting factor, plantings are made to provide stream shade, thereby reducing summer water temperatures and increasing salmonid utilization. Maximum shade attainable for most streams in project areas is about 80 percent. The objective of this phase of the program is to reach a minimum

of 70% shade and have water temperatures of no more than 68 Degrees F within 20 years of project implementation.

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

3. Fencing. Destruction of streamside vegetation by domestic livestock, and other intensive agricultural practices, is a major problem within project areas. To promote rapid recovery of existing and planted vegetation, fences are constructed along riparian zones within project areas.

4. Water development. Development of springs for livestock watering sites provides water sources other than the stream and causes better livestock distribution on rangelands. This relieves livestock pressure on riparian corridor fencing and reduces need for stream watering sites. Development of a spring includes the installation of a water collection box or dam, watering trough and associated plumbing.

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

Postwork

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

1. Maintenance. Following completion of implementation an annual inspection of all project areas is made. Following this inspection all fence and instream structure maintenance is done. Because of the intensive use by livestock along many project areas, fence inspection and maintenance is a year-round activity.

Since many projects are within areas of intensive agriculture, noxious weed control is necessary. Project areas are monitored throughout the spring and summer for noxious weed occurrence. When discovered these weeds are either sprayed with herbicides or manually removed.

2. Photopoint Picture Takinp. Standardized pictures are taken from preselected photopoints prior to implementation of any project, and then during the fall each year

thereafter. Over time these photopoints will provide a visual record of changes that occur on project streams. They will show the overall healing process resulting from riparian fencing, planting and instream structures.

3. Thermograph Data Collection. Thermographs are installed within or adjacent to project areas. These thermographs are monitored on a regular basis to gather baseline data and detect changes in water temperatures.

4. Habitat monitoring transects. Within selected project areas permanent habitat monitoring transects are established. Channel morphology and vegetative measurements are repeated at regular intervals (3-S years) and compared with original measurements as a means of quantitatively measuring environmental change through time.

5. Biological Sampling. Electrofishing methods are used to gather baseline information on fish residing in project streams. These data are gathered for informational purposes only and are not statistically valid for monitoring or evaluation purposes. Spawning ground surveys are conducted to gather baseline information on adult returns of salmon and steelhead to project streams.

RESULTS AND DISCUSSION I. FIELD ACTIVITIES

Field activities are broken down into three successive phases: 1) prework, 2) implementation, and 3) postwork.

Prework

Prework is broken down into four successive stages: 1) riparian lease development and procurement, 2) project planning, 3) project preparation, and 41 field inventories.

1. Riparian Lease Development and Procurement. One lease was procured for implementation during this report period on 0.90 miles of Twomile Creek (Meacham Creek tributary).

A temporary access easement was procured for the removal of a concrete diversion dam on Birch Creek.

Since this project is moving to a mode of maintenance and evaluation in the 1993-94 contract period, no riparian leases were procured for implementation activities in 1993-94. However, contacts were made with the Umatilla River and Stanley Creek (West Birch Creek tributary) landowners before project personnel were aware of funding levels for 1993-94.

2. Project Planning. There are four stages included in project planning: a) design and layout, b) landowner coordination, c) development of contracts and contract specifications, and d) obtaining work permits.

a. Design and Layout. Layout for 1.3 miles of high tensile smooth wire riparian corridor fencing was completed for the Forest Recovery Inc., Twomile Creek project.

Design and layout for instream structure maintenance was completed on 1.4 miles of Birch Creek.

b. Landowner Coordination. A considerable amount of time was spent coordinating with landowners when developing plans for implementation and maintenance.

Meetings were held with Delvin McDaniel and Yvonne Gambill to discuss the relocation and repair of fencing damaged in the May 1991 flood.

Brad Wheeler was contacted with regard to seeking cost share funds through the Agricultural Stabilization and Conservation Service (ASCS), for streambank stabilization work on his property (formerly belonging to Delvin McDaniel).

A meeting was held with Larry Hoeft to discuss the placement of 0.25 mile of barbed wire corridor fence on his father's property.

A meeting was held with B. Weinke to discuss some instream work that he would like to do within the project area on his property using ASCS cost share funds.

Letters were sent to Larry Russell and Joe Nash (both landowners along the Magic Mile project area) to reaffirm the Department's position regarding the Magic Mile project area. These landowners had previously displayed concern over issues surrounding instream work completed, and future instream maintenance responsibilities.

The Biologist met with John Robinson of Wood Fiber Industries to review progress of their restoration efforts on the Birch Creek/William Weinke property. These restoration efforts are the result of a fill and removal violation by Wood Fiber Industries on the Weinke property in 1991. Wood Fiber Industries has met all of the conditions of the restoration plan. Vegetation recovery will be evaluated every year through 1996 and continued revegetation efforts may be recommended. Due to the marginal success of plantings in 1991-92, the Biologist requested that the area be reseeded this fall, and that Wood Fiber assist ODFW personnel with the planting of willow whips this coming spring.

The Biologist met with Bill Christianson of Louisiana Pacific Corp and Kedrick Preston to discuss removal of a concrete diversion dam on Birch Creek as it runs through their properties. Approval was given for ODFW to remove the dam which is a passage problem at certain flows for both adult and juvenile summer steelhead.

c. <u>Development of Contracts.</u> Two construction contracts were prepared for the maintenance of instream structures on 1.4 miles of Birch Creek; one to supply rock and one to place it. A contract was also prepared for the removal of a concrete diversion dam on Birch Creek.

One high tensile smooth wire fence contract was prepared for the construction of 1.3 miles of fence on Twomile Creek.

d. <u>Obtaining Work Permits.</u> Project personnel coordinated with the Division of State Lands (DSL) and Army Corps of Engineers to secure three fill and removal permits for instream maintenance work.

3. Project Preparation. All instream work sites were staked or otherwise identified. Dump truck access routes were developed and riparian corridor fencing was removed by project personnel prior to starting instream work.

The Twomile Creek fenceline was staked several times during lease negotiation and construction activities.

Implementation

New habitat improvement project implementation occurred along 0.9 miles of Twomile Creek (Meacham Creek tributary) and 0.2 miles of Birch Creek (Table 5).

1. Instream Work. One concrete diversion dam was removed from Birch Creek on Louisiana Pacific property immediately downstream from the City of Pilot Rock.

2. Planting. All ground disturbed by instream maintenance activities and areas generally lacking in ground covering vegetation (4.6 miles) were seeded with grasses and legumes. Two different seed mixtures were used depending on the site. The seed mixtures are: Mix 1 - 85% paiute orchardgrass, and 15% birdsfoot treefoil. Mix 2 - 35% alcar tall wheatgrass, 35% luna pubescent wheatgrass, 15% dryland alfalfa, and 15% yellow blossom sweet clover.

A mixture of shrubs including honey suckle, woody rose, and choke cherry were planted along 3.2 miles of Birch Creek on the F.E. Straughan, J. Straughan, McDaniel, Gambill and Hemphill properties. Approximately 600 shrubs were planted. In addition, approximately 150 russian olive seedlings were

planted on the McDaniel property. All plants were purchased with wildlife habitat funds.

3. Fencing. Approximately 1.3 miles of high tensile smooth wire fence was constructed on the Forest Recovery Inc Twomile Creek (Meacham Creek tributary] property thereby protecting 0.9 miles of stream and 18.3 acres of riparian habitat.

Project personnel installed approximately 0.25 mile of four strand barbed wire fence on the Clarence Hoeft property. This completes the corridor fence on this property. A portion of this property was fenced in 1990 by contract labor.

4. Water development. One spring development was installed by project personnel on the Forest Recovery Inc Twomile Creek property.

Table 5. Fish habitat improvement project implementation activities completed in the Umatilla subbasin by ODFW from 1988 to 1992.

Landowner/Stream	1988-89 Miles Fence	1988-89 Miles Instream	1990 Miles Fence	1990 Miles Instream	1991 /1 Miles Fence	1991 /1 Miles Instream	1992 /2 Miles Fence	1992 /2 Miles Instream
Louisiana Pac./E. Birch	1.25							
Houser/E. Birch	2.01	1.13				1.13		
Magic Mile/E. Birch	1.85	0.90				0.70		
W. Weinke/Birch	0.65	0.45				0.45		
Gambill/Birch			1.25	0.70		0.70		0.70
Hemphill/Birch	0.38							
Hoeft/Birch			0.30	0.50		0.50	0.20	
B. Weinke/Birch			0.50	0.50		0.50		0.50
Rhinhart/Birch		0.30		0.63		0.63		
McDaniel/Birch	1.75	0.90				0.90		0.20
J. Straughan/Birch			0.84	1.00		0.50		
F. Straughan/Birch	0.69	0.31				0.31		
Neal/Birch				0.90		0.90		
Louisiana Pac. /Meacham	0.90			1.25	0.50			
Forest Recovery/Meacham							1.70	
	9.48	3.79	2.89	5.48	0.5	1.22	1.90	1.40

/1 All instream work implemented in 1991 was repair of flood damages.

/2 All instream work implemented in 1992 was maintenance.

5. Photopoint Establishment. Seven new photopoints were established on Twomile Creek.

Postwork

1. Maintenance. Approximately 13.5 miles of project fencing was inspected and routine maintenance activities carried out.

Approximately 0.75 miles of high tensile smooth wire destroyed by flooding in 1991 was rebuilt on the Houser, Gambill, and McDaniel/Wheeler properties.

Additional electric fencing was installed on the F. E. Straughan property on Birch Creek. The entire corridor now has one strand of electric wire in operation.

An extended electric wire was installed on the entire exclosure fence on the McDaniel property.

The corridor fence existing prior to the lease on the Clarence Hoeft property was repaired in preparation for the release of cattle onto the area.

The high tensile fence, and an existing barbed wire fence were repaired. on the T. Rugg property. The barbed wire fence was one that existed prior to the OOFW lease and was incorporated into the project. Maintenance was required to keep cattle from entering the riparian area from an infrequently grazed hay field.

Instream structures were inspected along 6.8 miles of Mainstem and East Birch Creeks. Instream maintenance activities were completed on 1.4 miles of Birch Creek on the Wheeler, B. Weinke and Gambill properties. Following is a summary of the work completed:

Wheeler property

- Five jetties were installed to protect actively eroding streambanks.

B. Weinke property

Two hundred cubic yards of riprap rock were placed along a vertical eroding bank within and adjacent to a livestock watering gap. The work was necessary to make the area functional as a watering site and to prevent further bank erosion. One rock jetty was also constructed.

Gambill property

Six rock jetties were constructed along an eroding bank to protect the riparian corridor fence.

Rock instream structures along six miles of Mainstem and East Birch Creeks were cabled together to increase structure life and efficiency. This was accomplished by connecting strings or clusters of rocks using steel cable.

Weed control activities were conducted along six miles of Mainstem and East Birch Creeks on the J. Straughan, Wheeler, McDaniel, Rhinhart, Hoeft, Hemphill, Gambill, W. Weinke and Houser properties.

2. Photopoint Picture Taking. Photopoint pictures were taken from 13 Meacham Creek photopoints and 43 Birch Creek photopoints.

3. Thermograph Data Collection. Thermographs were deployed at three locations on East Birch Creek, two on Meacham Creek and one on Wildhorse Creek [Appendix 1). On East Birch Creek, thermographs were deployed at Westgate Canyon, the Houser property and the McDaniel property. On Meacham Creek both thermographs were deployed on the Louisiana Pacific property and placed approximately 1 stream mile apart. The thermograph on Wildhorse Creek was deployed at the City of Adams. Beginning this year thermographs were deployed the entire year so that information can be gathered on winter temperatures as well as summer.

Stream temperature data collected from the East Birch Creek drainage shows an increase of five to six degrees Celsius from the upper thermograph site to the lower (distance of 18.25 river miles) during the summer. A smaller increase is evident during the winter. The diffference between monthly minimum and maximum stream temperature also increases from the upper site to the lower. This is indicative of a lack of stream shading that increases downstream as evidenced by the stream habitat inventory conducted in 1988 (Williams et. al. 1989). The increase in stream temperature downstream likely has a strong correlation with the change in fish species composition that is evident from electrofishing surveys conducted in 1992 (Appendix 2).

The physical and biological changes from upper to lower parts of the drainage as indicated by the temperature and biological monitoring data can be explained to a degree by the natural continuum of ecological processes within the stream system (Vannote et. al. 1980). However, intensive uses that occur throughout the drainage, but are most pronounced in its lower reaches, have drastically changed the riparian plant community which shapes both the physical and biological components of the stream (Cummins 1984).

Therefore, the trends in these data are greatly influenced by the land use practices that occur throughout the drainage, but precisely to what extent cannot be quantified with the information presented.

Thermograph data collected from Meacham Creek indicates a decrease in average maximum weekly stream temperature from the upper site to the lower (1 rivermile apart). The difference between maximum and minimum stream temperature also decreased from the upper to the lower site. This is probably attributable to the upper thermograph probe being placed in a shallow riffle while the lower probe is placed in a pool. The fact that water temperatures near the bottom of pools can be S-10 degrees Fahrenheit cooler than the surface water (Bilby 1984) probably accounts for this rather than conditions relating to habitat quality over the one mile of stream between the thermographs. The lower thermograph was placed in a pool because there is virtually no riffle habitat in the lower project area where a probe could be placed effectively. An effort will be made to place the lower probe at a location more likely to have adequate mixing of the water.

At this time there are no apparent trends of changes in water temperatures related to habitat projects. However, given the impacts of the recent flood event, any positive changes in stream temperature associated with habitat projects are likely to have been negated.

4. Habitat monitoring transects. Thirty new habitat monitoring transects were established and data collected on Meacham Creek.

The Biologist spent time reviewing transect data that was run through the summarization programs. Some problems with the computer programs still need to be worked out.

Beginning in 1989 permanent habitat monitoring transects have been established within selected project areas. Creek Channel morphology and vegetative measurements are repeated at regular intervals (3-5 years) and compared with original measurements as a means of quantitatively measuring environmental change through time. Transects have now been established on East Birch, Birch, and Meacham creeks. The East Birch Creek transects have had data collected in 1989 and 1992 while the others have only one year of data collection.

As a result of flooding in 1991, 15 of the original 30 transects established on the Houser Property on East Birch Creek were washed out and cannot be relocated. All 30 transects established on the "Magic Mile" along East Birch Creek have been washed out and data collection discontinued. Therefore, comparisons can only be made of the remaining

transects on the Houser property. Table 6 is a summary of averages for data collected from 15 transect in 1989 and 1992. Table 7 is a summary of the change in Land Features, Flow Features, and Channel Dimensions from 1989 to 1992.

Table 6. Land features, flow features, and channel dimensions /1 in 1989 and 1992 from habitat monitoring transects on East Birch Creek.

	LAND FEATURE (FT)			FLOW FEATURE (%)			CHANNEL DIMENSION (FT)			
YEAR	FCOOO PLAIN	BANK	ACTIVE CHANNEL1	POOL	GLIDE RUN	RIFFLE	CHANNEL OEPTH	CHANNEL WIDTH	DISTANCE BANKS	WATER RATIO
1989	48.7	15.0	36.3	27.5	17.5	s5.0	4.44	27.5	38.3	39.3
1992	43.7	19.2	37.0	0.0	31 .a	68.2	3.64	28.1	46.0	-20.6

/1 See Appendix 3 for definitions of land feature, flow feature, and channel dimension terms.

Table 7. Changes in land features, flow features, and channel dimensions from 1989 to 1992 from habitat monitoring transects an East Birch Creeh.

	LAND FEATURE (FT)			FLOW FEATURE (%)			CHANNEL DIMENSION (FT)			
TRANSECT NUMBER	FLOOD PLAIN	BANK	ACTIVE CHANNEL,	POOL	GLIDE RUN	RIFFLE	CHANNEL DEPTH	CHANNEL WIDTH	DISTANCE BANKS	WATER RATIO
T-1	-18.2	0.6	17.6	-6.7	80.0	-73.3	-3.00	12.7	13.1	-17.9
T-2	-17.6	8.2	9.2	-5.6	72.2	-66.7	-3.04	6.7	12.7	-20.6
T-6	10.1	-1.3	-8.7	0.0	-16.7	16.7	-1.62	-5.5	-6.3	-15.6
T-7	-2.7	-1.3	3.9	-27.6	-16.7	44.4	-1.67	2.2	1.5	i2.4
T-16	-5.0	4.1	1.7	-33.3	83.3	-50.0	-0.16	-1.9	4.5	a.2
T-17	2.8	-16.0	13.2	0.0	88.9	-88.9	0.04	9.4	-2.0	-20.1
T-18	-1.6	3.9	-2.3	0.0	-37.5	37.5	-0.58	-1.6	1.2	53.7
T-15	8.6	-9.3	0.7	-8.3	0.0	8.3	-0.26	0.5	-6.6	113.2
T-20	-2.5	1.3	1.1	-100.0	0.0	100.0	0.08	0.1	2.0	7.4
T-21	-2.6	3.8	-1.0	-45.5	90.9	-45.5	0.08	-0.8	2.5	14.3
T-22	-6.3	15.2	-9.0	-38.9	-27.8	66.7	-0.07	-7.1	4.9	3.7
T-27	-5.5	12.8	-7.3	-27.8	0.0	27.8	0.02	-6.2	4.6	-0.8
T-28	-7.3	14.6	-7.4	-37.5	0.0	37.5	0.4'3	-4.8	4.8	21.9
T-29	-21.5	20.3	1.3	-25.0	-25.0	50.0	0.05	0.8	13.4	13
T-30	-5.0	4.8	0.3	-35.3	-42. 1	82.4	0.90	0.3	6.3	-1.9
MEAN	-5.0	a. 1	0.9	-26.1	16.3	9.8	-0.67	0.3	3.8	13.5

It should be understood that none of these data have been statistically analyzed. The inferences made in the following paragraphs represent the Biologists interpretation of general trends in the data. Making statements of fact regarding these data will have to wait until a statistical analysis is complete. With this in mind, the spacing and number of remaining transects is probably not sufficient to characterize the entire one mile length of East Birch Creeh within the project area. Rather it will likely provide reasonable information on local changes where the transects exist.

Since only a period of three years elapsed between data collections, minimal changes were anticipated. However, because of the major flood event in May of 1991, very noticeable channel morphology changes occurred as indicated by these data.

Due to the methods of data collection on vegetation, more data will be necessary before any summary can be made. However, estimates of the percent of the total radiation from the sun hitting the water surface (BTU's/square foot/month) increased by 4.2% from 1989 to 1992. This indicates that the 1991 flooding may have removed some of the shade producing vegetation.

Under a scenario of relatively minor natural disturbance, it is generally understood that stream restoration activities should lead to narrowing and deepening of the channel, and promote the establishment of pool habitat; this is the desired future condition. As indicated by these data, the 1991 flood event actually caused the channel to become wider, shallower, and to have less pool habitat within the area sampled. If the entire watershed were in "good" condition then it would be expected that events such as the 1991 flood should occur infrequently and not have long term destructive affects on the recovery of instream and riparian habitats. But since surrounding landscapes shape the structure and function of stream ecosystems (Gregory et. al. 1991) and the surrounding landscape along East Birch Creek has been greatly altered by land use activities, it is not functioning under natural conditions and flooding does have negative impacts on the habitat. Given the current land management practices in the upper watershed of East Birch Creek (removal of large volumes of insect infested timber) improvement of the current watershed conditions is not likely. In fact, watershed conditions may deteriorate and the frequency and magnitude of floods may increase. We don't have the ability to predict what affect these impacts will have on recovery of instream and riparian habitats on our projects, but changes in the structure and function of the stream ecosystem are imminent.

5. <u>Biological sampling</u>. Project personnel attended a training session on conducting physical and biological surveys.

Summer steelhead spawning ground surveys were completed on one mile of East Birch Creek and 2.5 miles of West Birch Creek.

A 50 meter transect for electrofishing surveys was established on Meacham Creek within the Louisiana Pacific property project area. This area was sampled three times in July and once in October. Data collected include species

composition, lengths, and weights. From collected data length frequencies and condition factors were calculated. See Appendix 2.

Electrofishing surveys were carried out three times from August through December on Mainstem and East Birch creeks. Spot checks were made within several project areas to gather baseline information on presence/absence of salmonids and species composition. Appendix 2.

RESULTS AND DISCUSSION II. ADMINISTRATION

Reports

In compliance with our contract, monthly progress reports, and an annual progress report were prepared and submitted to BPA.

Purchasing

Materials were purchased for the Twomile Creek fencing project and spring development, and for the cabling of instream structures along six miles of Birch Creek.

Approximately 694 cubic yards of riprap stone and boulders were purchased for instream maintenance.

Capital items including a backpack electrofisher and chainsaw auger gear box were purchased.

Budget

The annual 1993-94 budget and statement of work was prepared and submitted to EPA for approval.

Personnel

Tom Demianew was hired for three months as a seasonal Technician. His primary duties included assisting the permanent Technician with fence maintenance and instream rock structure cabling.

Program Development

The District Fish Biologist toured T. Bailey and W. Noll through the Walla Walla River subbasin to discuss possibilities of future habitat improvement work. T. Bailey subsequently contacted C. Scheeler of CTUIR to discuss their preliminary project proposal for the Walla Walla River subbasin.

T. Bailey and W. Noll took an aerial flight over the Umatilla River Subbasin to get an overall perspective of the basin, assess potential project areas, and observe current insect damaged timber harvest operations over the Birch and McKay creek areas.

The Biologist met with W. Noll, J. Phelps and J. Germond to discuss options for collecting biological data.

The Biologist met with C. Scheeler, M. Purser, and K. Hall of CTUIR to make plans for the development of a Wildhorse Creek basin scopeing group to deal with resource problems.

Time was spent reviewing and editing high tensile smooth wire fence specifications. A standardized set of specifications were prepared for fence contracts awarded by the Engineering Section.

Miscellaneous

The Technician attended a pesticide applicators recertification class in Corvallis.

The Biologist spent considerable time preparing a project review presentation for SPA. The Biologist attended the SPA project review meetings and presented the project review for this project.

The biologist attended the Core Curriculum training session for state supervisors.

The Technician and Regional Habitat Coordinator met with State Senator Dick Springer and members of the farming community to discuss riparian area management. This included visiting a habitat improvement project site on Birch Creek.

INTERAGENCY COORDINATION/EDUCATION

A good relationship with the Soil and Water Conservation District (SWCD) is crucial to landowner support of the program. Project personnel attended monthly SWCD meetings.

The Biologist coordinated with the Division of State lands and Army Corps of Engineers on obtaining fill and removal permits for project work as well as work that participating landowners wished to do on their own.

Project personnel assisted landowners in filling out applications for fill and removal permits for instream work on their properties approved by ODFW.

The Biologist attended the EPA funded field review by William Platts, Bob Beschta and Boone Kaufmann of Fifteen Mile Creek and Trout Creek fish habitat improvement projects in central Oregon.

The biologist spent time gathering data and outlining ideas to develop a scopeing group for the Wildhorse Creek subbasin in cooperation with CTUIR.

The biologist attended the Pendleton Chapter FFA Annual Awards Banquet to present the STEP award. The STEP award is given annually to an FFA member excelling in resource activities including ODFW's STEP program.

Project personnel spent time providing leadership for a student apprentice involved with the ASE (Apprenticeships in Science and Engineering) program. The participant was a local high school student with an exceptional background. This individual worked at the Pendleton District Office for eight weeks during the summer spending time with each program. Wages were in the form of a $2,000 scholarship through donations made by the M.J. Murdock Charitable Trust, National Science Foundation, and Bonneville Power Administration. This was an excellent opportunity to interest an exceptional student in a career in Fish and Wildlife Management as well as accomplish some additional program tasks. The student assisted project personnel with electrofishing surveys, habitat monitoring transect establishment and data collection, instream structure cabling, fence maintenance, and other miscellaneous activities. He put together a project using information from electrofishing surveys and developed a computer program for developing population estimates from pass removal electrofishing surveys.

The Biologist attended a meeting with Bill Peal, an instructor from Pendleton High School and Brent Caroll, an instructor from Athena-Weston High School to discuss curricula and possible field projects dealing with the improvement of Wildhorse Creek. Jon Germond (ODFW), Carl Scheeler (CTUIR), and Joe LaVurdure (SWCD) were also present.

The Biologist coordinated with Chet Hadley of the Soil Conservation Service regarding the instream design for the Jim Hatley property restoration plan on East Birch Creek.

Considerable time was spent coordinating with Jim Hatley to develop a restoration plan for East Birch Creek through his property. Mr. Hatley committed a fill and removal violation and was required by the Division of State Lands to cooperate with ODFW in the preparation of a restoration plan and then restore the site. ODFW developed the plan which required Mr. Hatley to stabilize the area using rock structures, revegetate the area with grasses, legumes and woody vegetation, and protect the area from livestock grazing for a period of ten years. The ODFW will monitor the revegetation activities for a period of five years, and suggest continued efforts if needed.

A project proposal prepared by Bill Peal of Pendleton High School requesting funds for environmental education from BPA was reviewed. The Biologist met with Mr. Peal to discuss the proposal.

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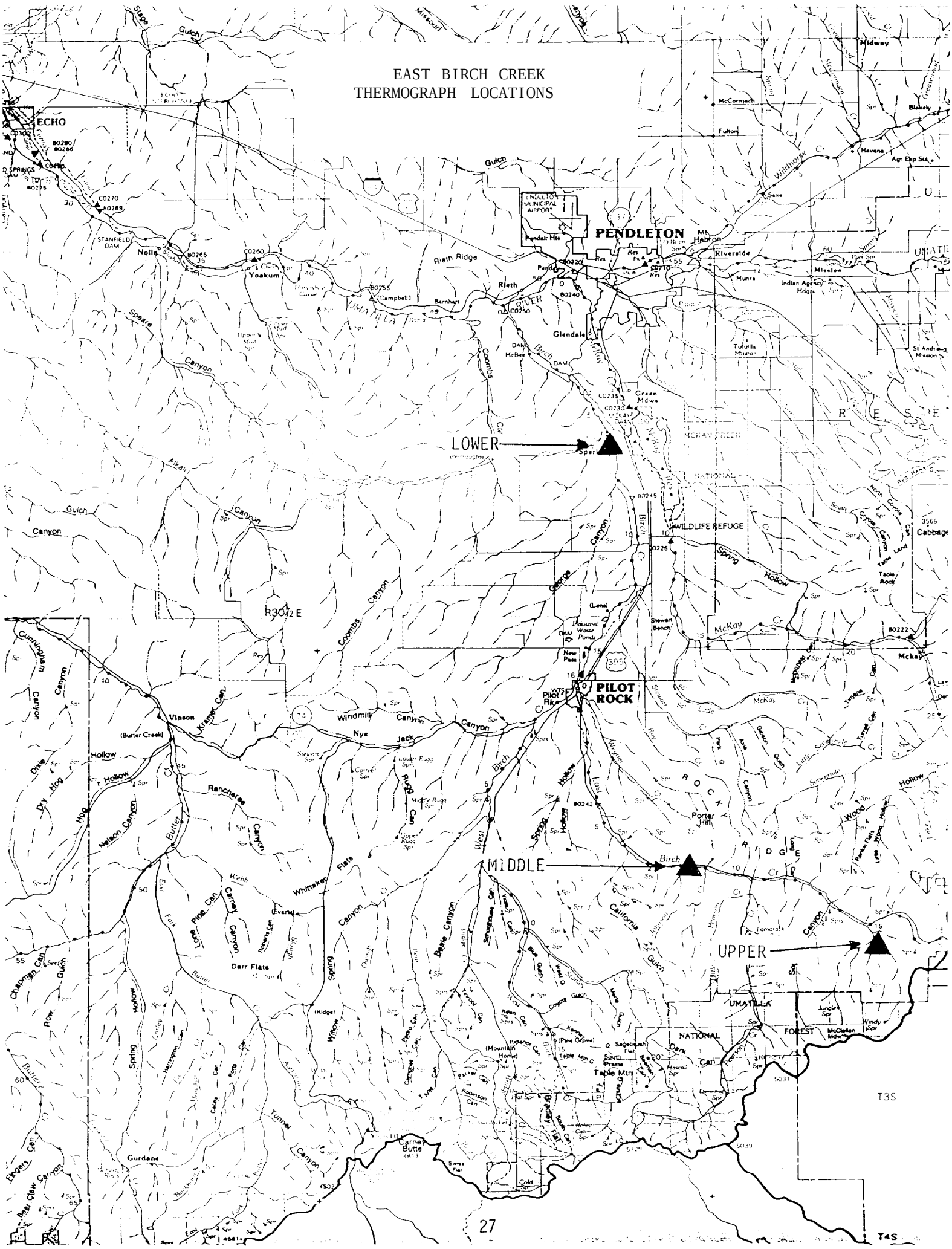
Williams, S.H., R.N. Reeve, and D.R. Haight. 1989. Umatilla basin fish habitat improvement project. Annual Report. Portland, OR: U.S. Department of Energy, Bonneville Power Administration, Division of Fish and Wildlife. 31 p.

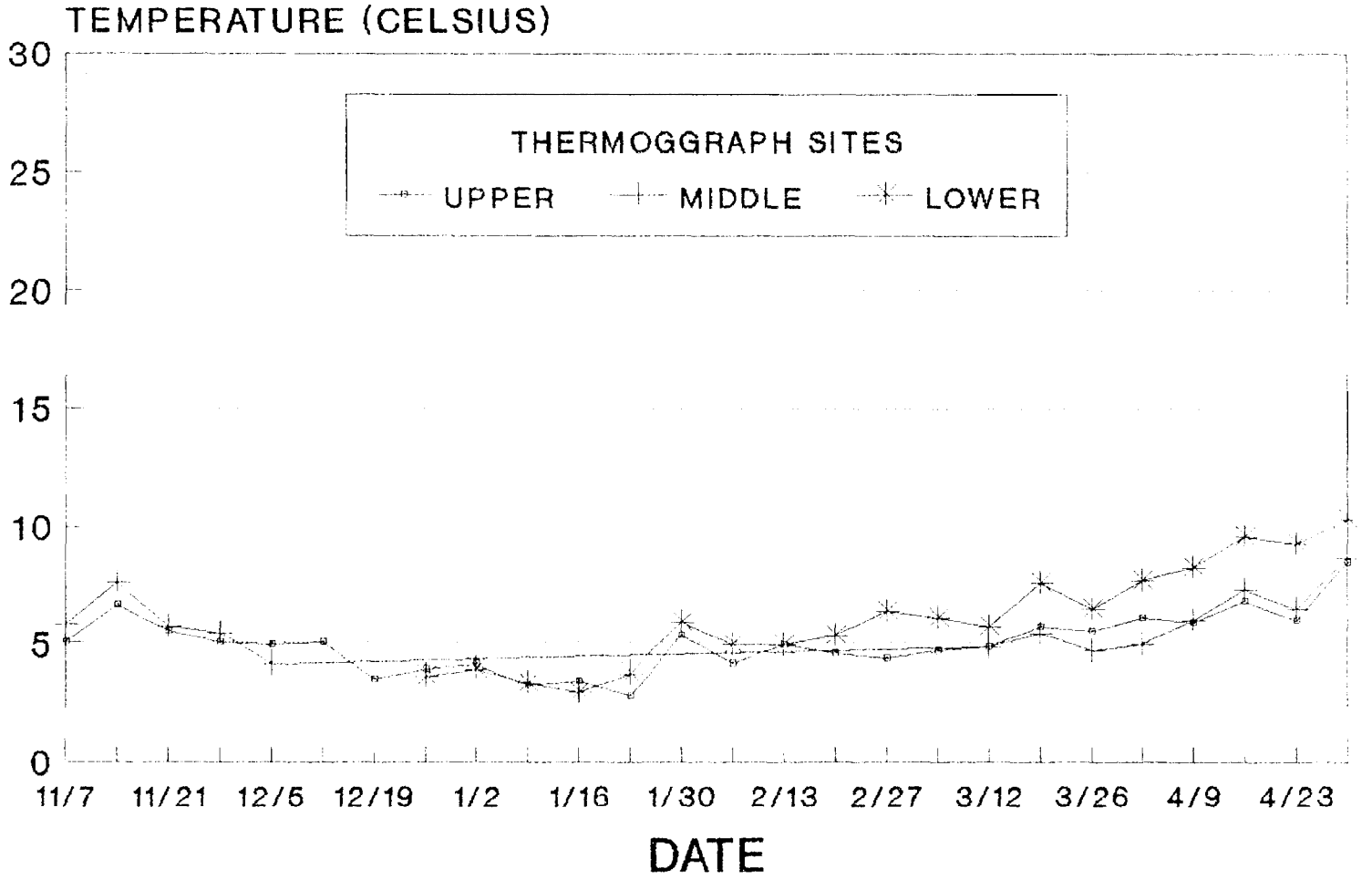
APPENDIX – 1
THERMOGRAPH DATA

EAST BIRCH CREEK
THERMOGRAPH LOCATIONS



EAST BIRCH CREEK

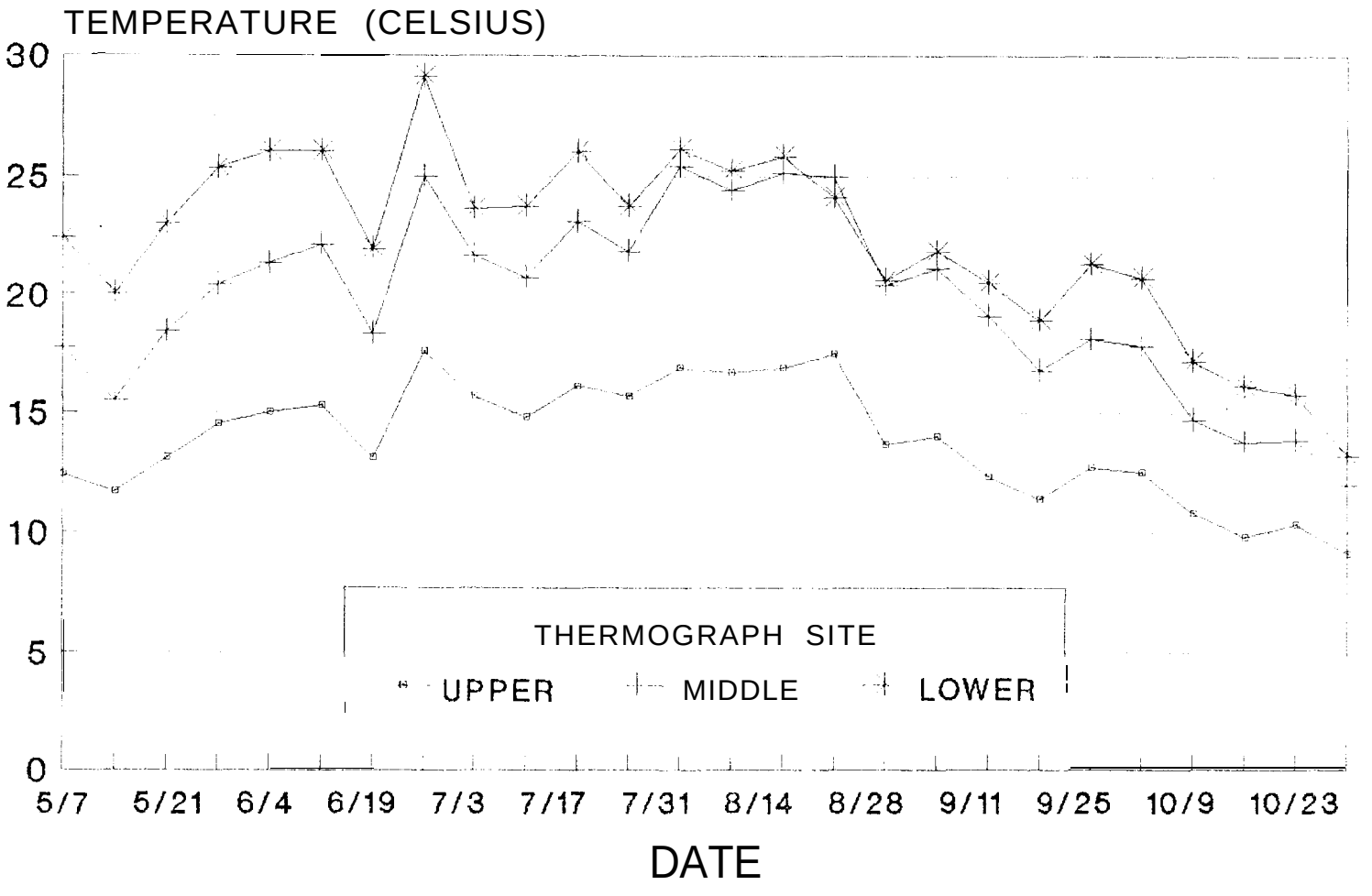
WEEKLY AVERAGE MINIMUM TEMPERATURE



1991-92

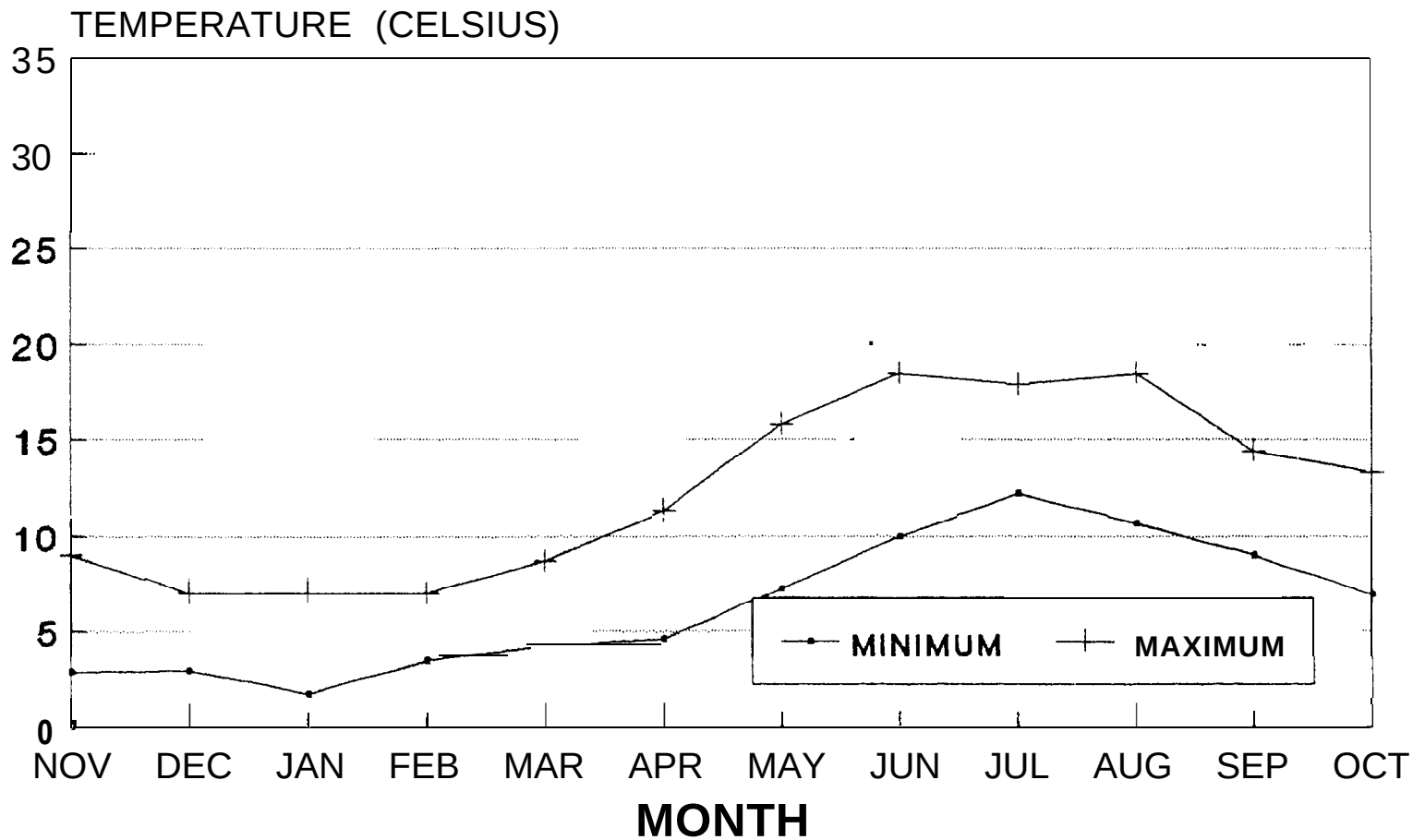
EAST BIRCH CREEK

WEEKLY AVERAGE MAXIMUM TEMPERATURE



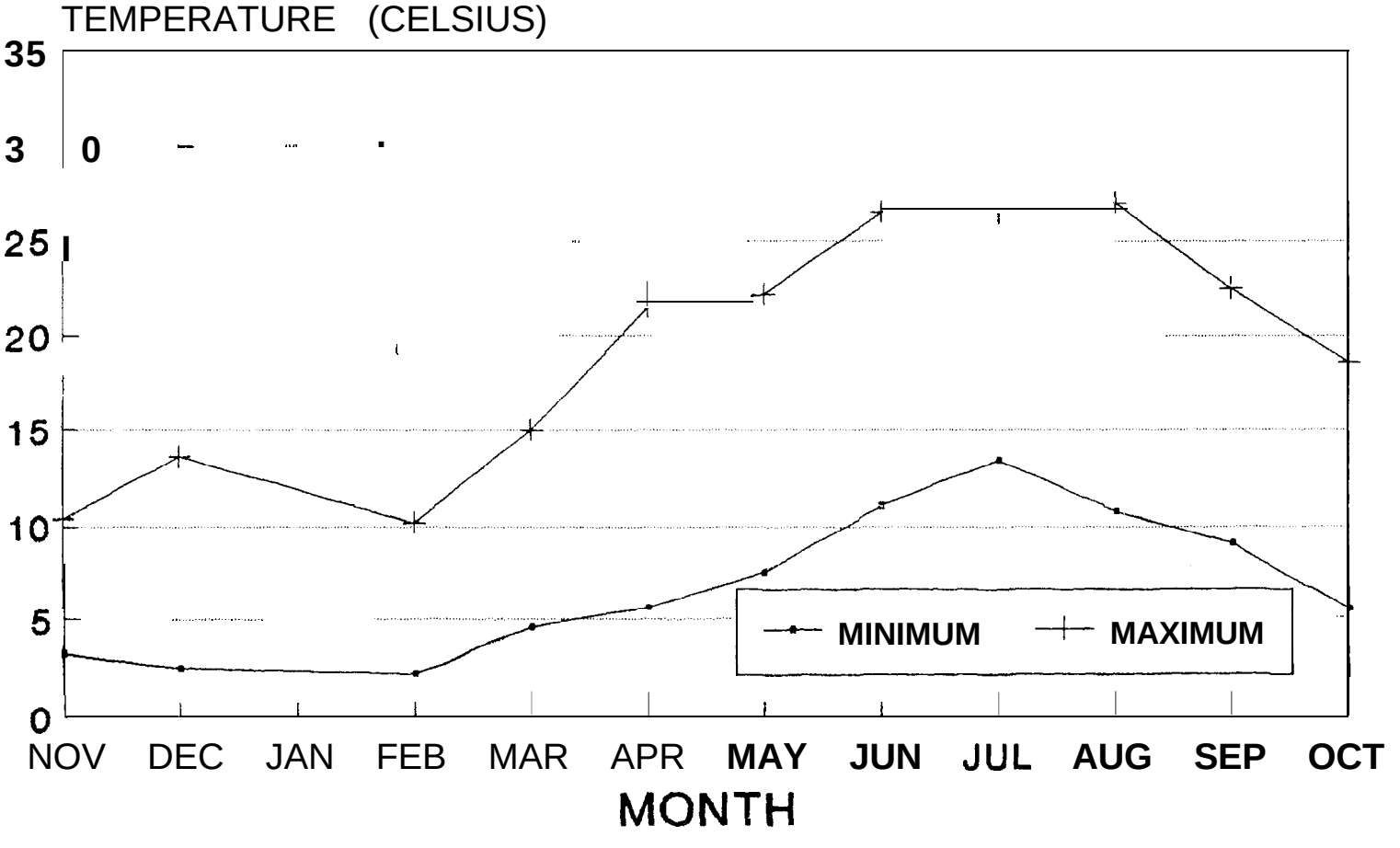
1992

EAST BIRCH CREEK/UPPER
MONTHLY MINIMUM AND MAXIMUM TEMP



1991-92

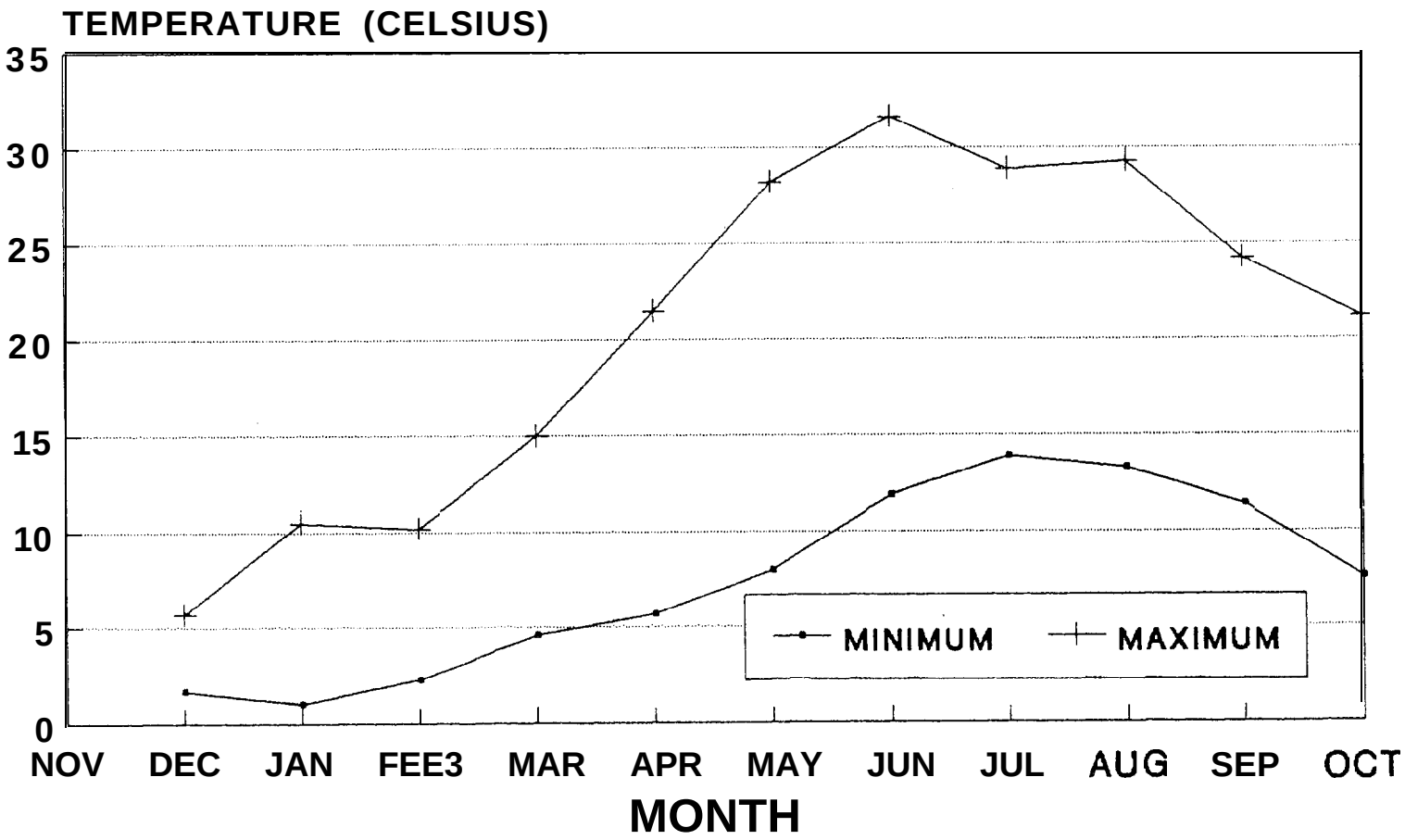
EAST BIRCH CREEK / MIDDLE
MONTHLY MINIMUM AND MAXIMUM TEMP



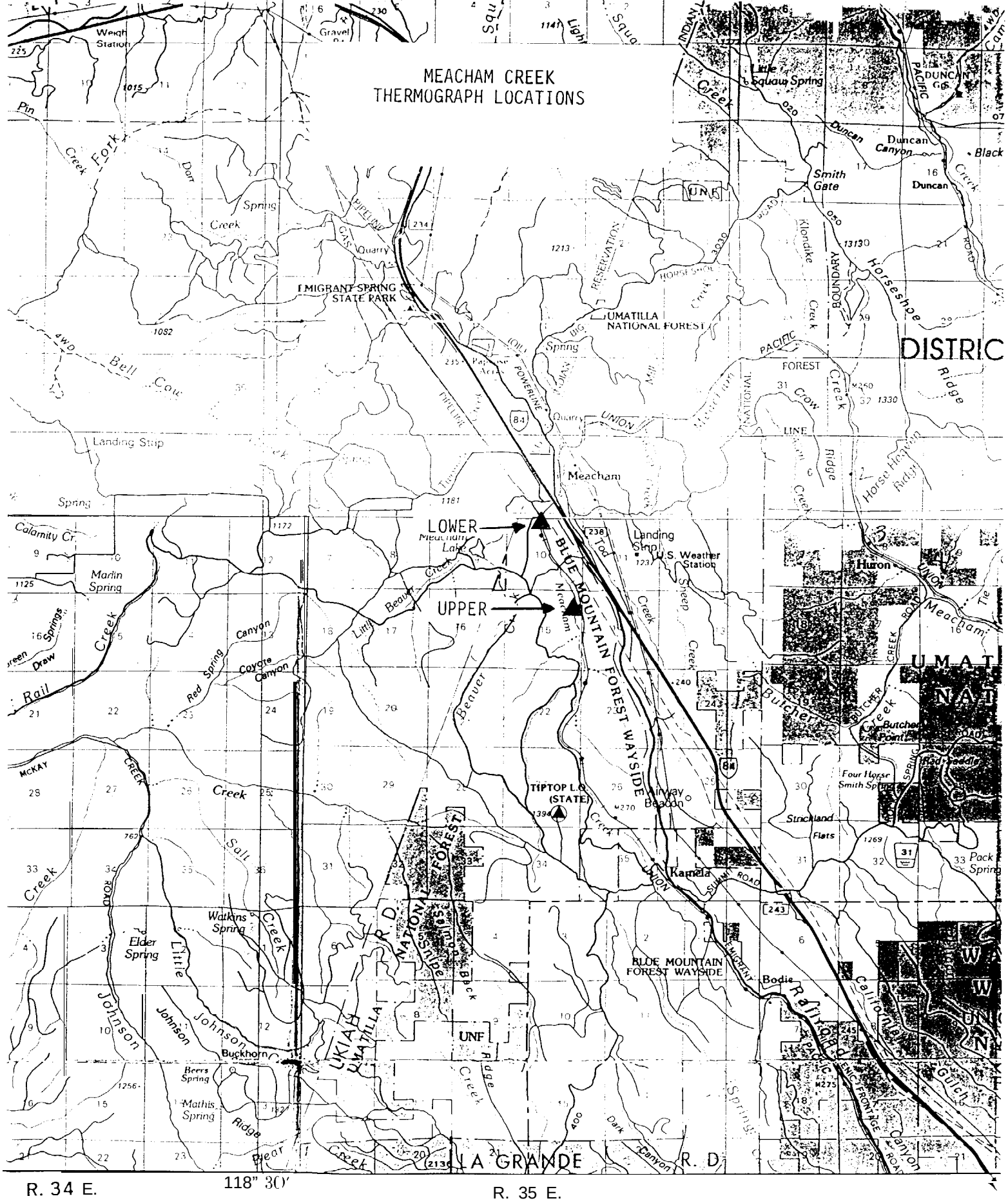
1891-92

BIRCH CREEK/LOWER

MONTHLY **MINIMUM AND MAXIMUM TEMP**

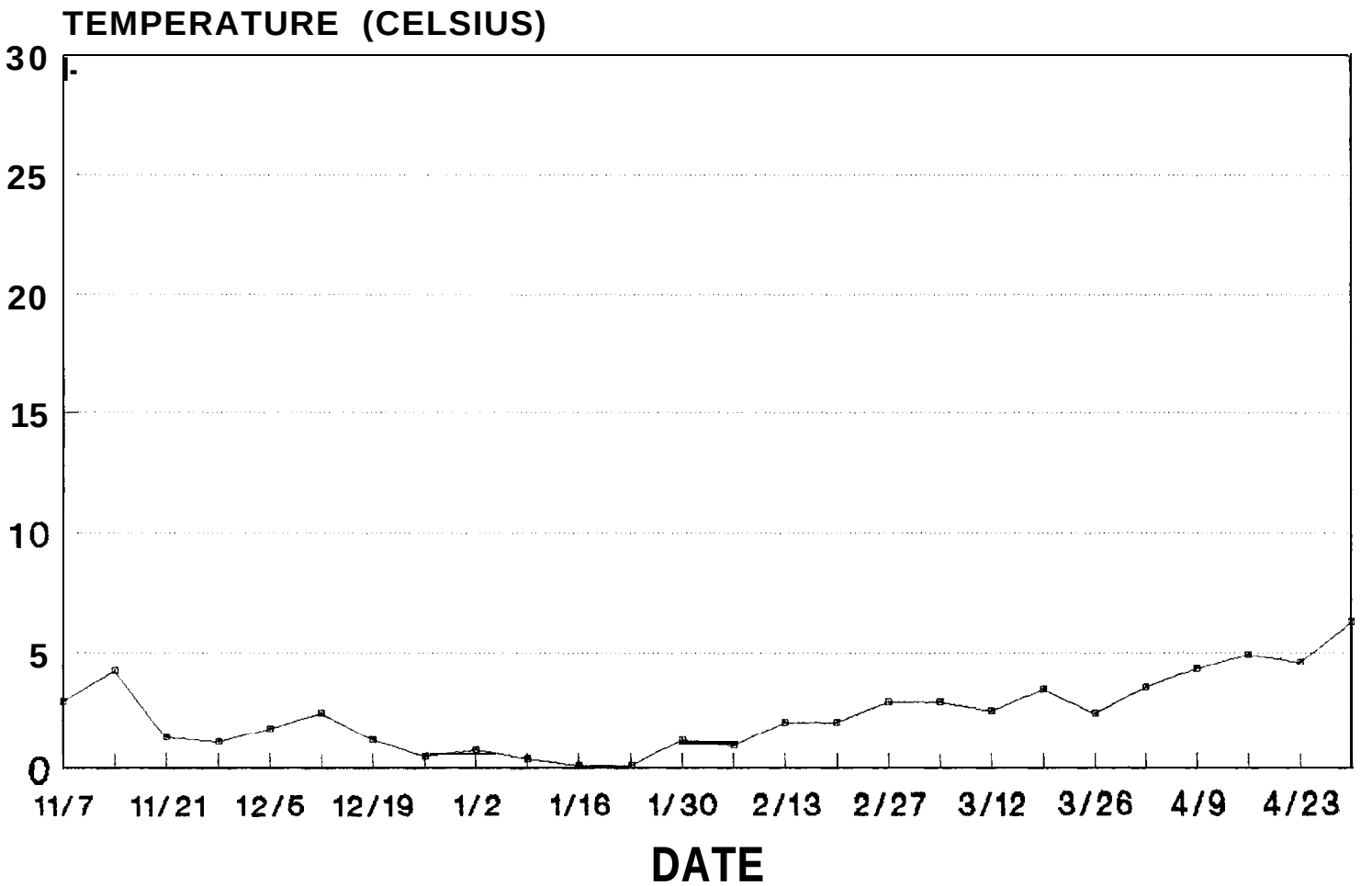


1991-92


MEACHAM CREEK
THERMOGRAPH LOCATIONS
LOWER
UPPER
IMIGRANT SPRING STATE PARK
UMATILLA NATIONAL FOREST
BLUE MOUNTAIN FOREST WAYSIDE
Meacham
Landing Strip
U.S. Weather Station
Huron
Kamela
Bodie
TIPTOP L.O. (STATE)
Airway Beacon
Strickland Flats
Four Horse Smith Spring
Smith Gate
Duncan
Duncan Canyon
Little Squaw Spring
Marlin Spring
Calamity Cr
Elder Spring
Watkins Spring
Buckhorn
Beers Spring
Mathis Spring
Snipe Back Ridge
Johnson Creek
Salt Creek
Beaver Creek
Little Beaver Creek
Red Spring Canyon
Coyote Canyon
Butcher Creek
Pack Spring
Horseshoe Ridge
Horse Heaven Ridge
Crow Creek
Klondike Creek
Sheep Creek
Tod Creek
Big Spring
Bell Cow Creek
Pin Fork Creek
Dart Creek
Green Springs Draw
Rail Road
Weigh Station
Gravel
Quarry
Pipeline
Powerline
Reservation
Boundary
Pacific Union Line
Pacific Northern & Oregon Railroad
California Pacific Railroad
Frontage Road
Sunny Road
Butcher Creek Road
Meacham Creek Road
Johnson Creek Road
Dark Canyon
Gulch
Canyon
Springs
Ridge
Bear Creek
Mill Creek
Lake
Meacham Lake
Pack Saddle
Point
UNF
UMATILLA NATIONAL FOREST
LA GRANDE R. D.
R. 34 E.
118° 30'
R. 35 E.

DISTRICT

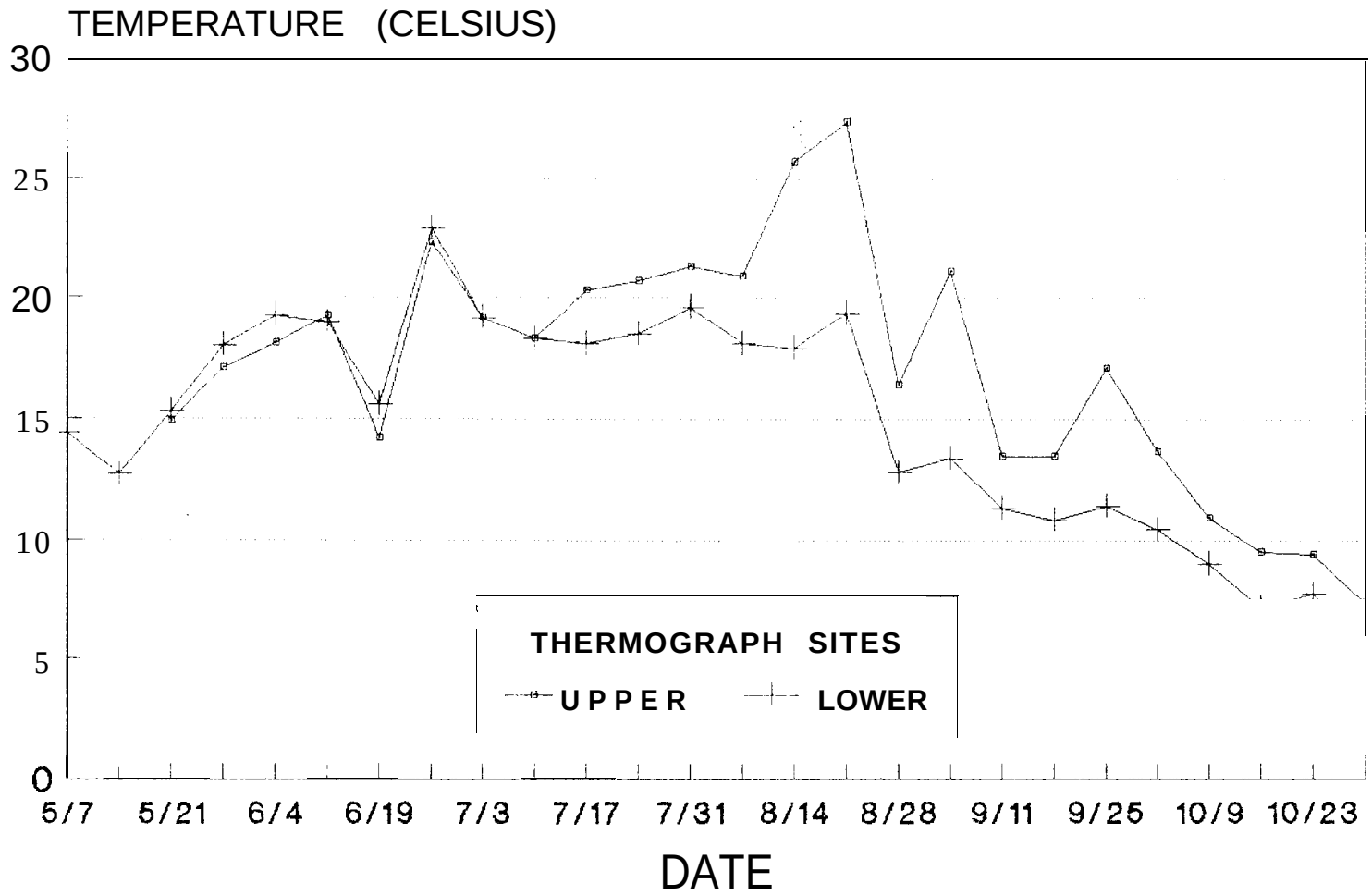
UPPER MEACHAM CREEK
WEEKLY AVERAGE MINIMUM TEMPERATURE



1991-92

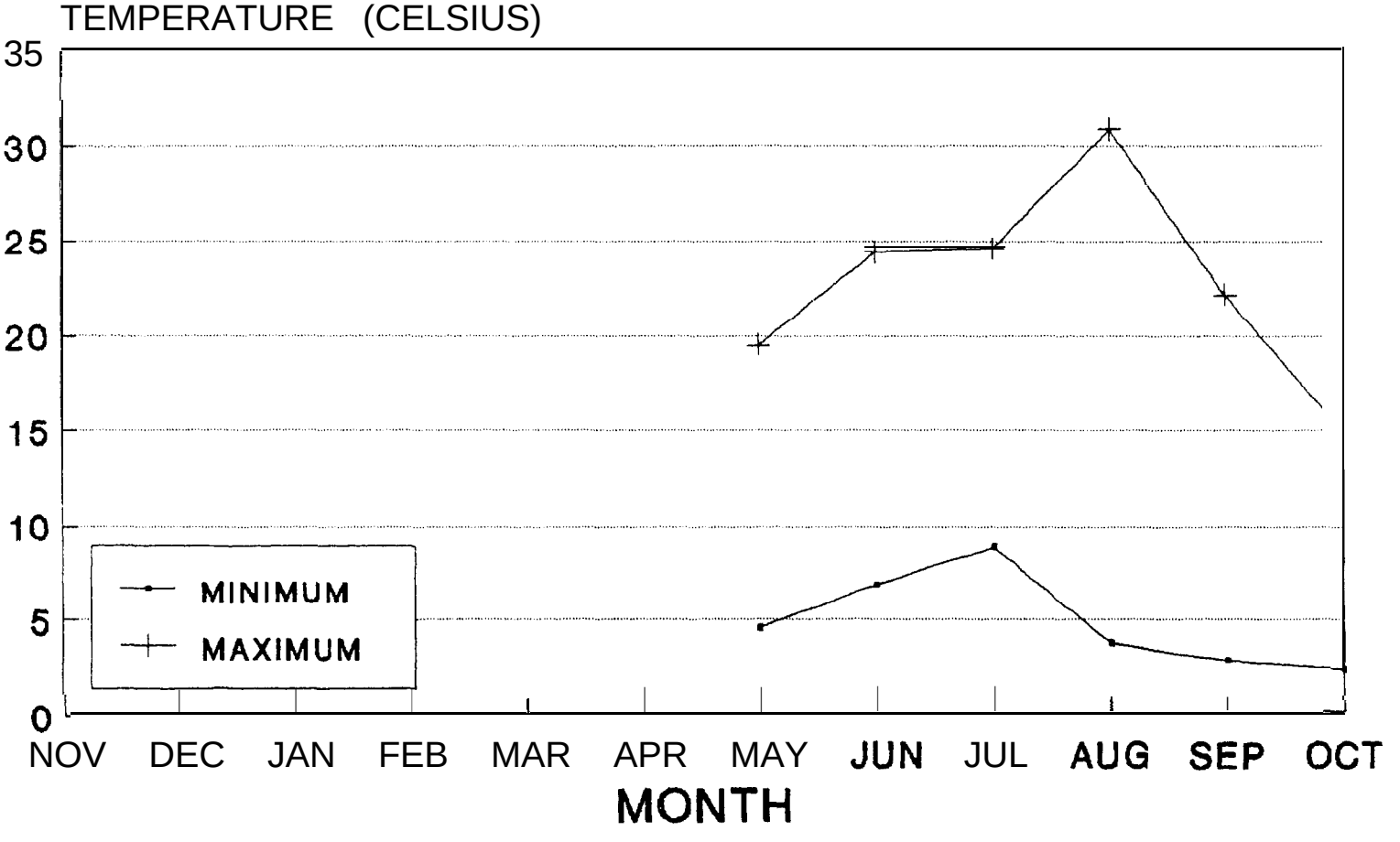
MEACHAM CREEK

WEEKLY AVERAGE MAXIMUM TEMPERATURE



1992

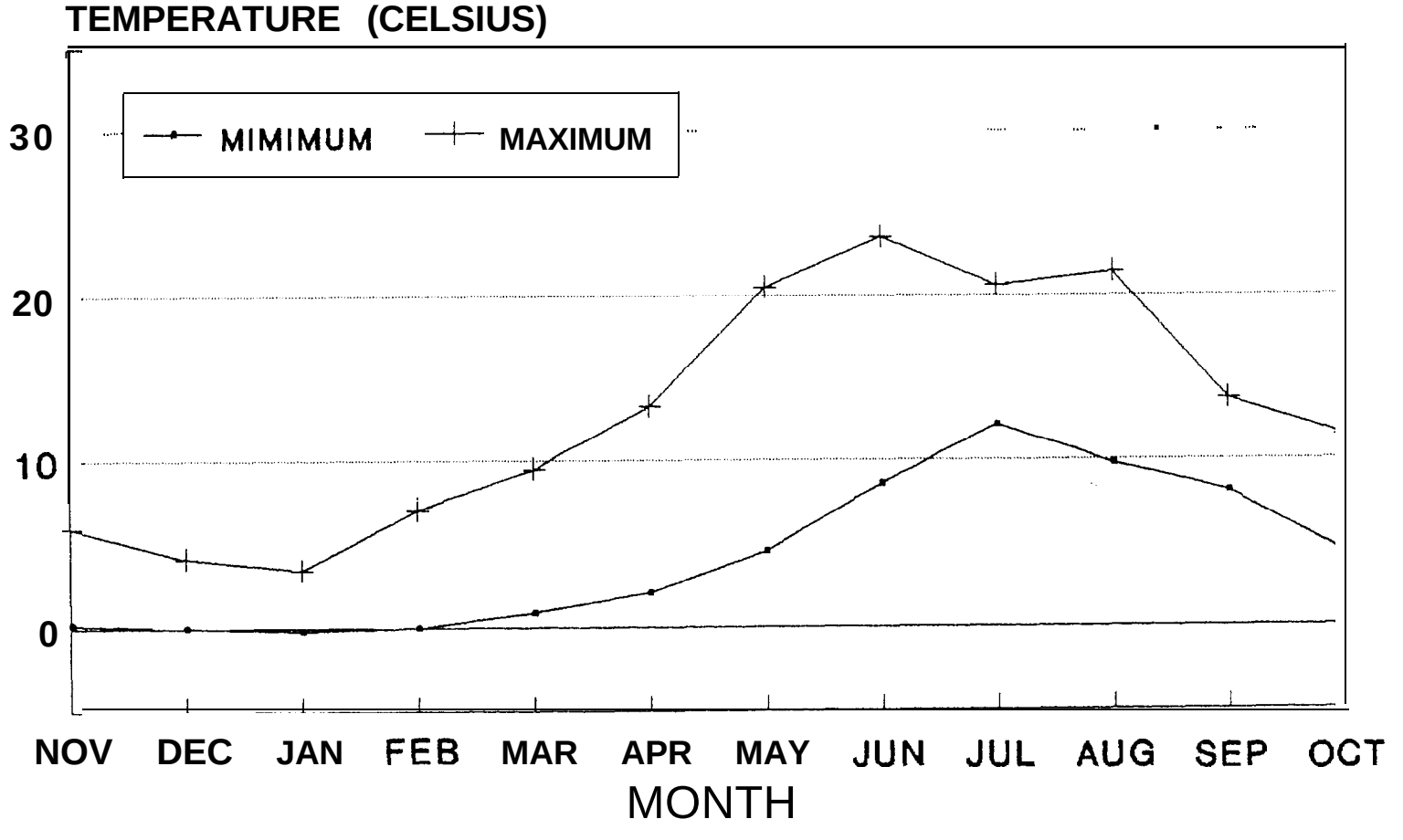
MEACHAM CREEK/UPPER
MONTHLY MINIMUM AND MAXIMUM TEMP



1991-92

MEACHAM CREEK/LOWER

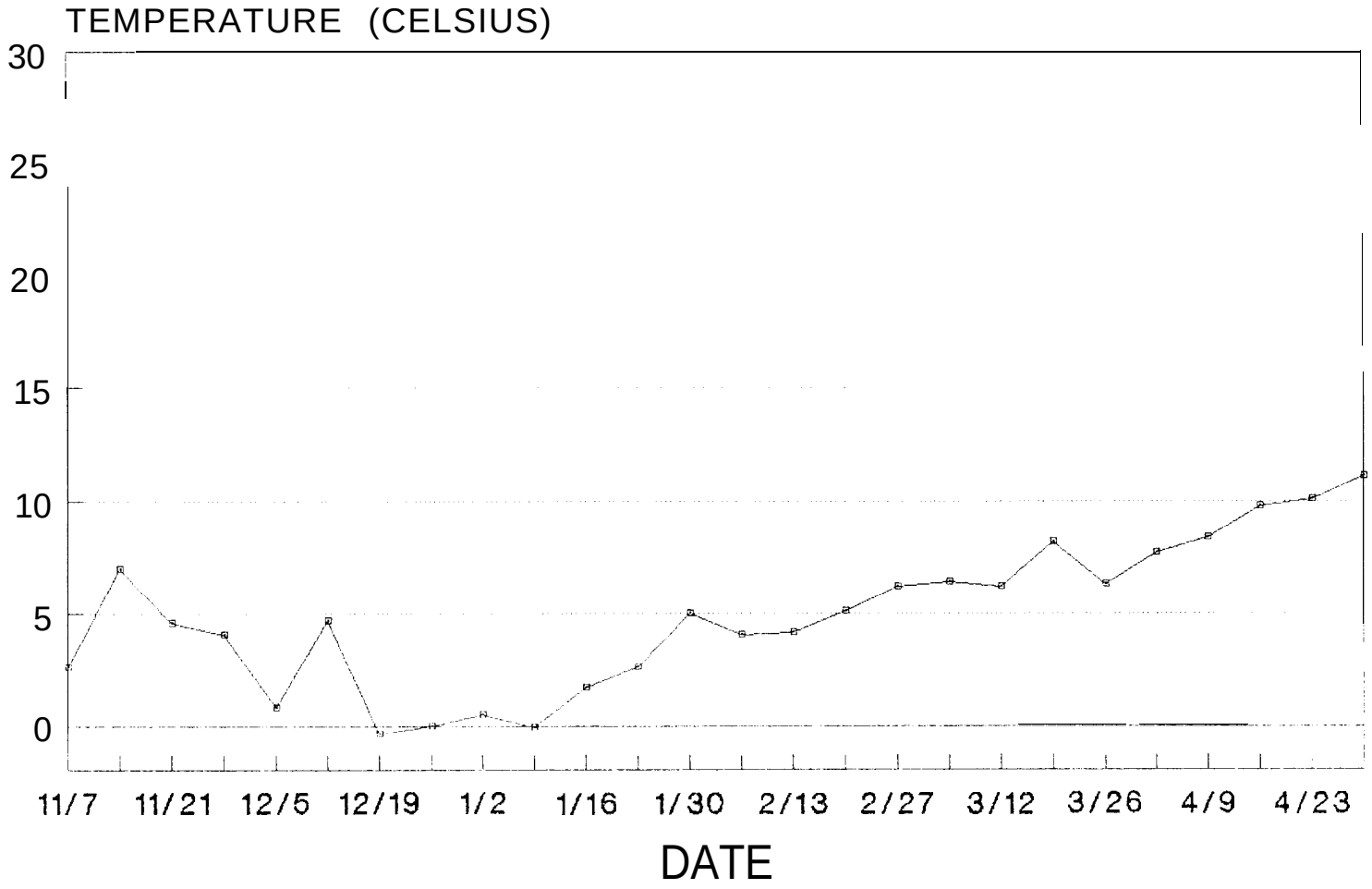
MONTHLY MINIMUM AND MAXIMUM TEMP



1991-92

WILDHORSE CREEK AT ADAMS

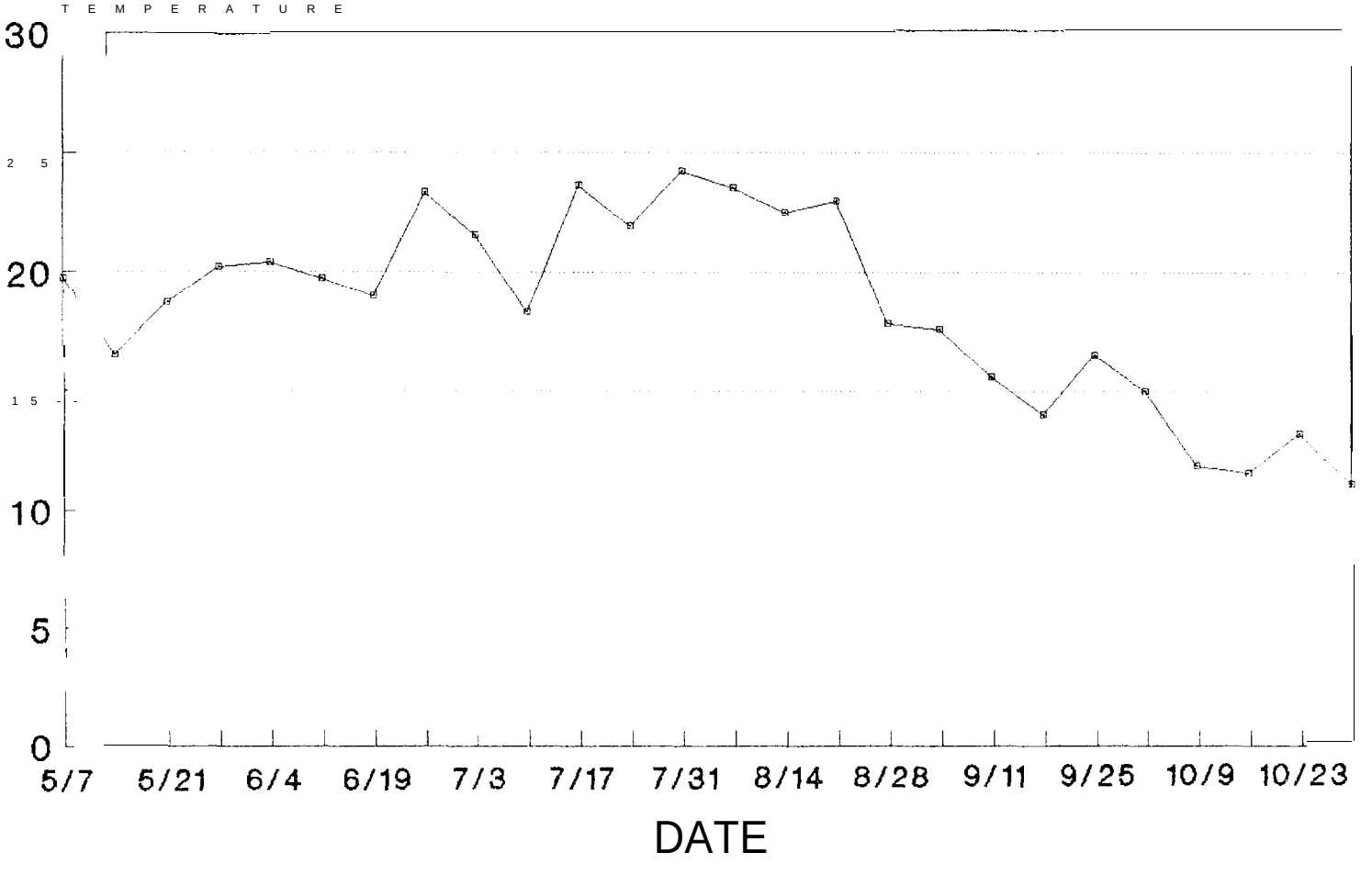
WEEKLY AVERAGE MINIMUM TEMPERATURE



1991-92

WILDHORSE CREEK AT ADAMS

WEEKLY AVERAGE MAXIMUM TEMPERATURE



1992

APPENDIX – 2
BIOLOGICAL SAMPLING DATA

MEACHAM CREEK RIVER MILE 31.5
FISH INVENTORY DATA
1992

Species Composition

7-3-92	Rough: 81%	Salmonids: 15%
7-17-92	Rough: 62%	Salmonids: 18%
7-31-92	Rough: 82%	Salmonids: 18%
10-12-92	Rough: 84%	Salmonids: 16%

Lenpth (Rainbow/Steelhead Trout)

7-3-92	Mean = 114.2mm	N=24
7-17-92	Mean = 99.8mm	N=21
7-31-92	Mean = 91.7mm	N=12
10-12-92	Mean = 111.4mm	N=14

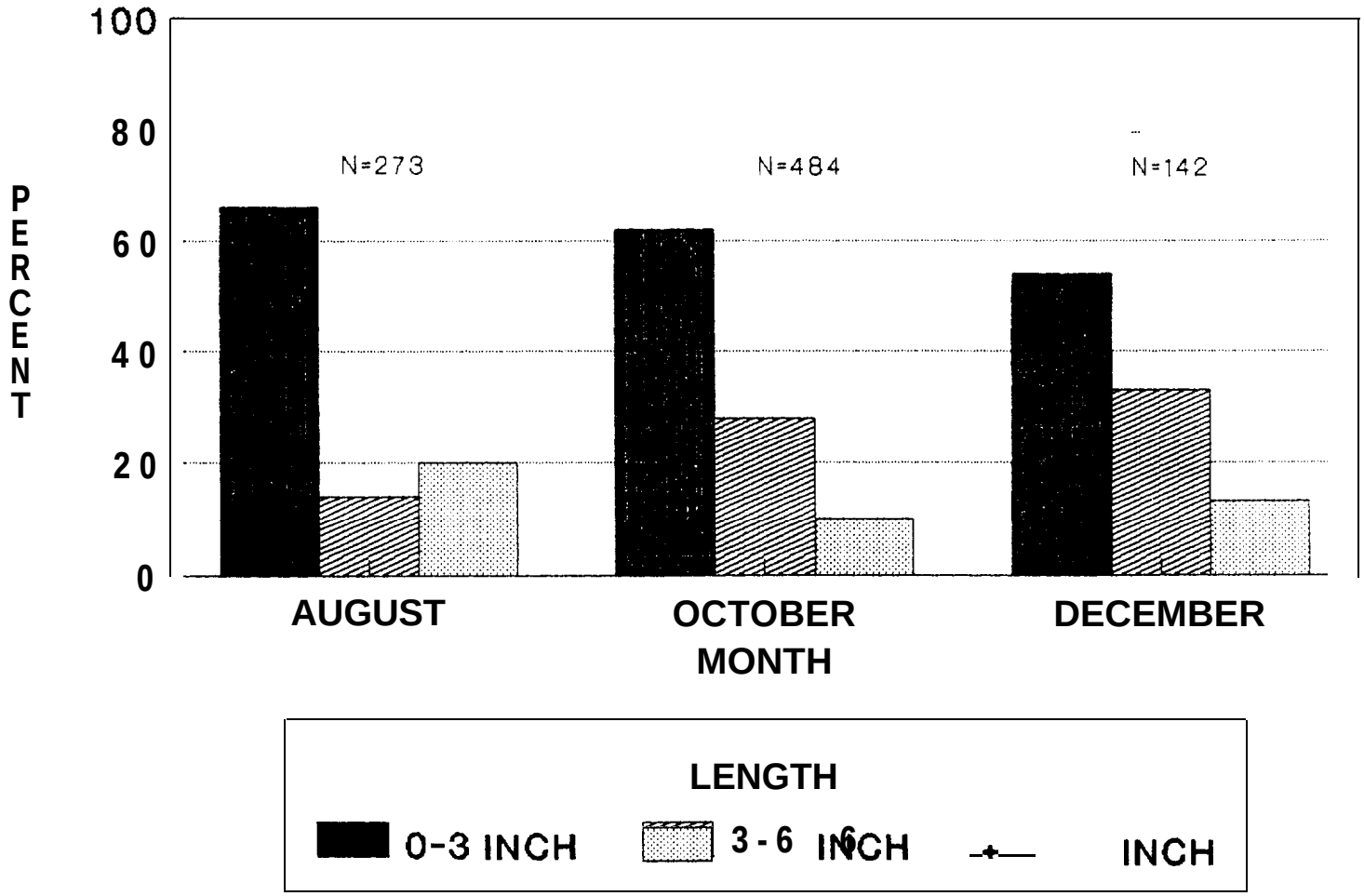
Weight (Rainbow/Steelhead Trout]

7-17-92	Mean = 26.3g	N=14
3-31-92	Mean = 22.9g	N=?
10-12-92	Mean = 19.5g	N=11

Condition Factor (Rainbow/Steelhead Trout]

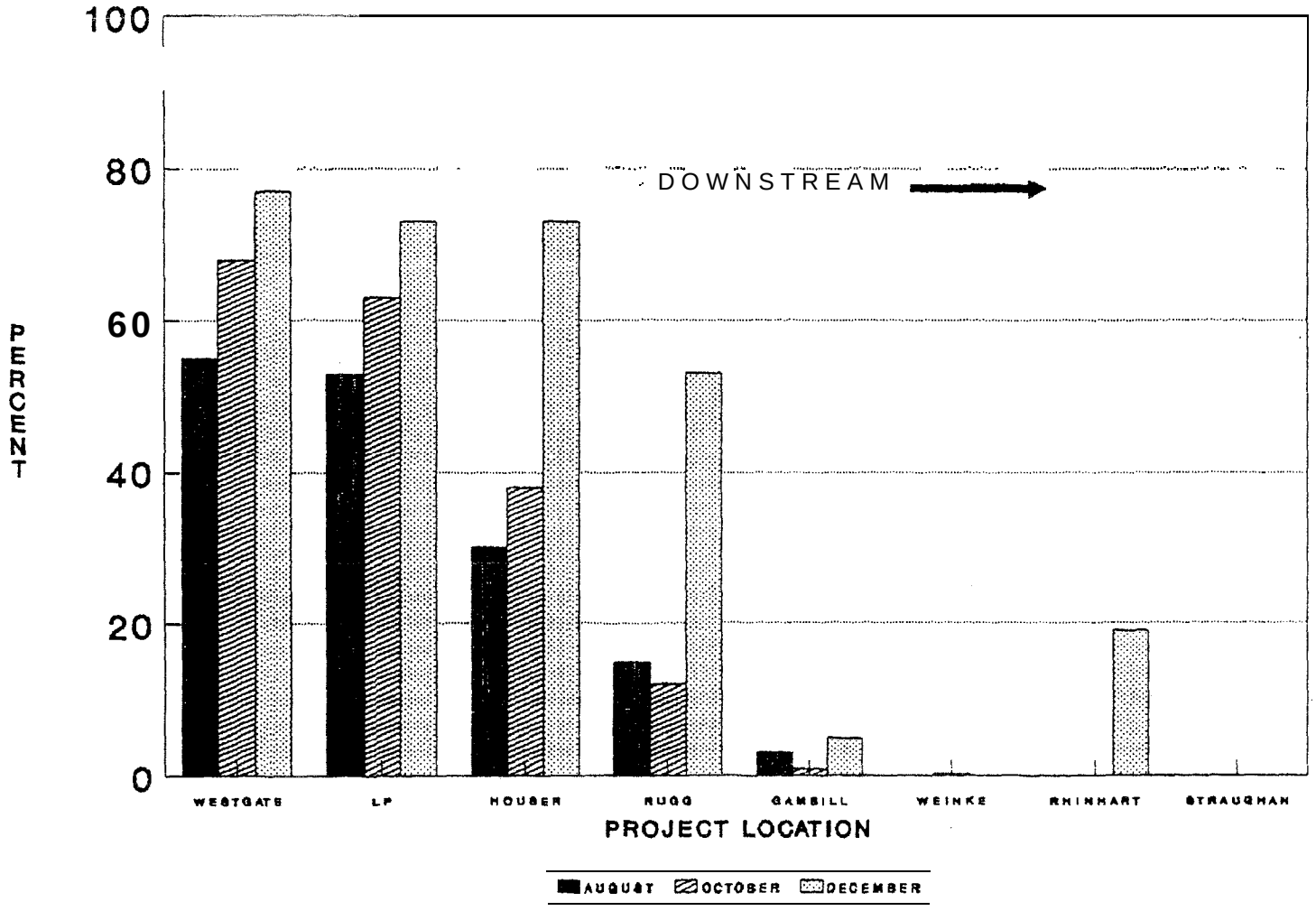
7-17-92	Mean = 1.04	N=14
7-31-92	Mean = 0.50	N=6
10-12-92	Mean = 0.94	N=11

LENGTH FREQUENCY OF SALMONIDS
EAST BIRCH CREEK



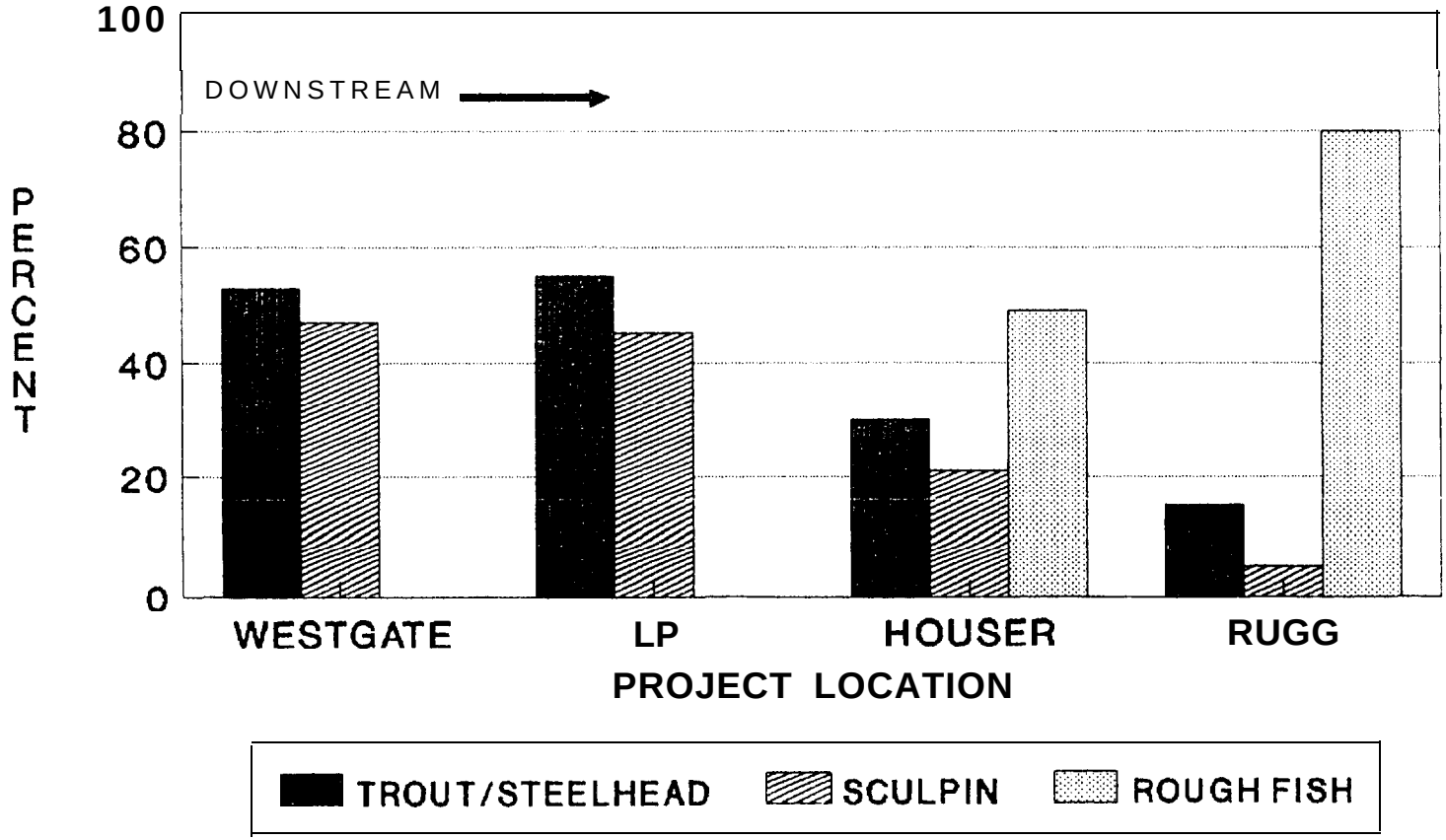
1992

SPECIES COMPOSITION/PERCENT OF SALMONIDS
EAST BIRCH CREEK



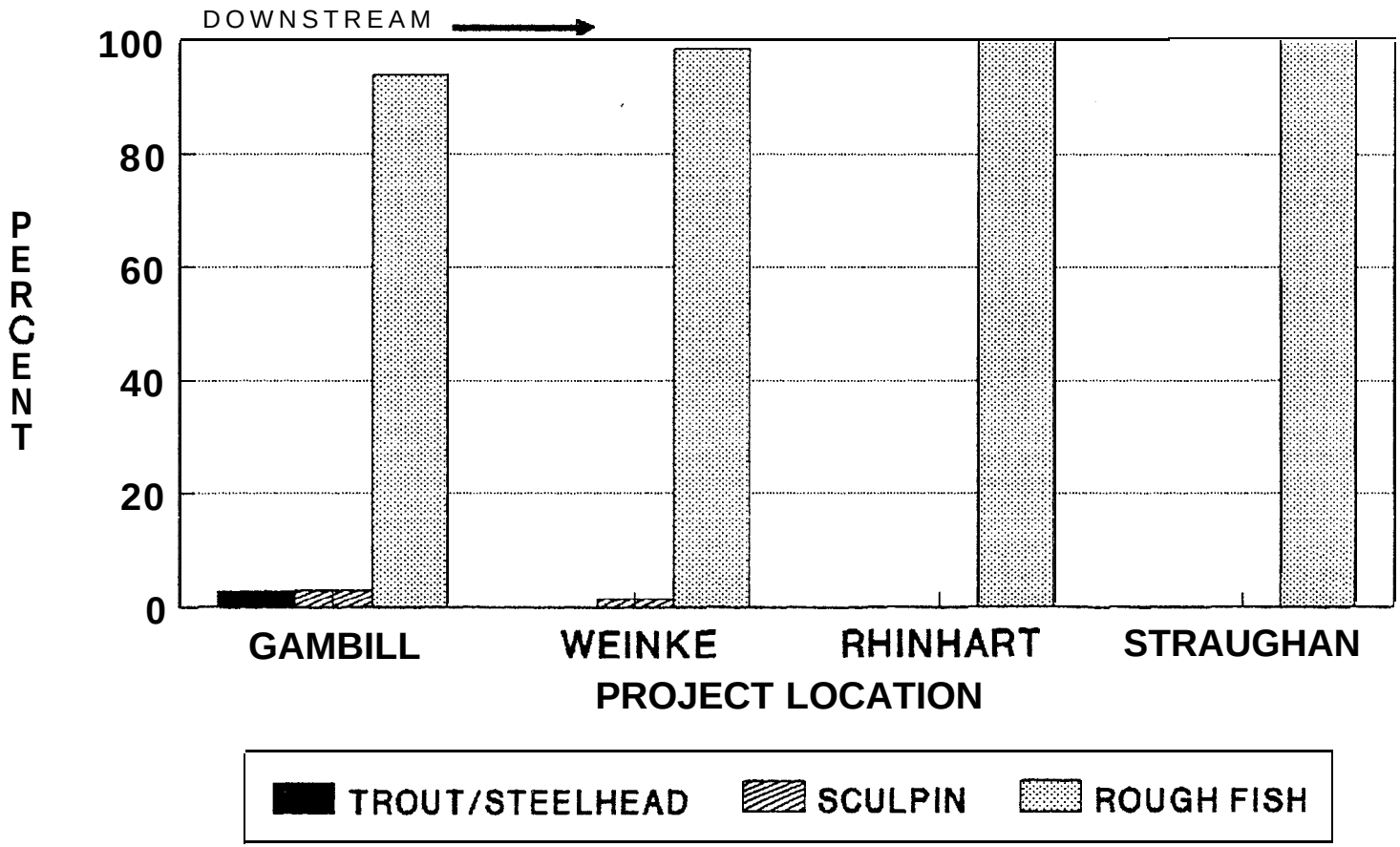
1992

Fish Species Composition
East Birch Creek



August 1992

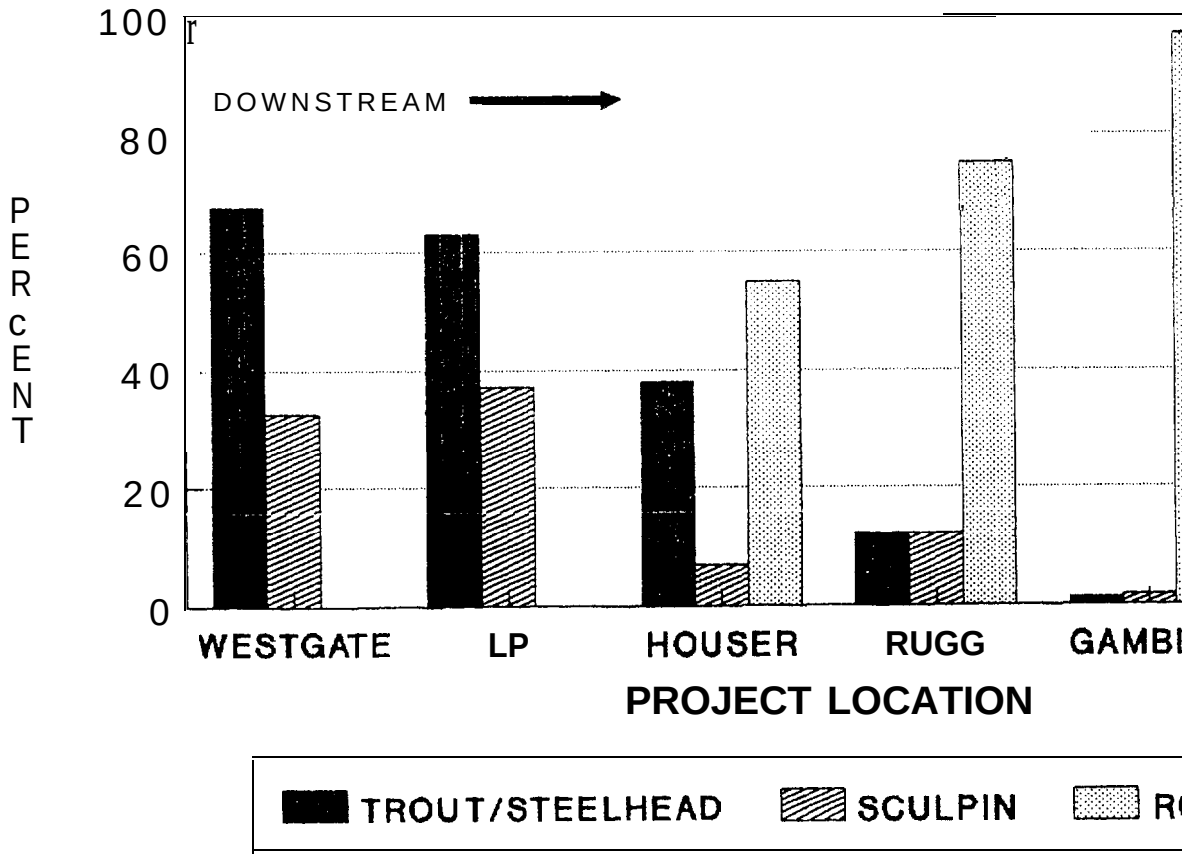
Fish Species Composition
Birch Creek



August 1992

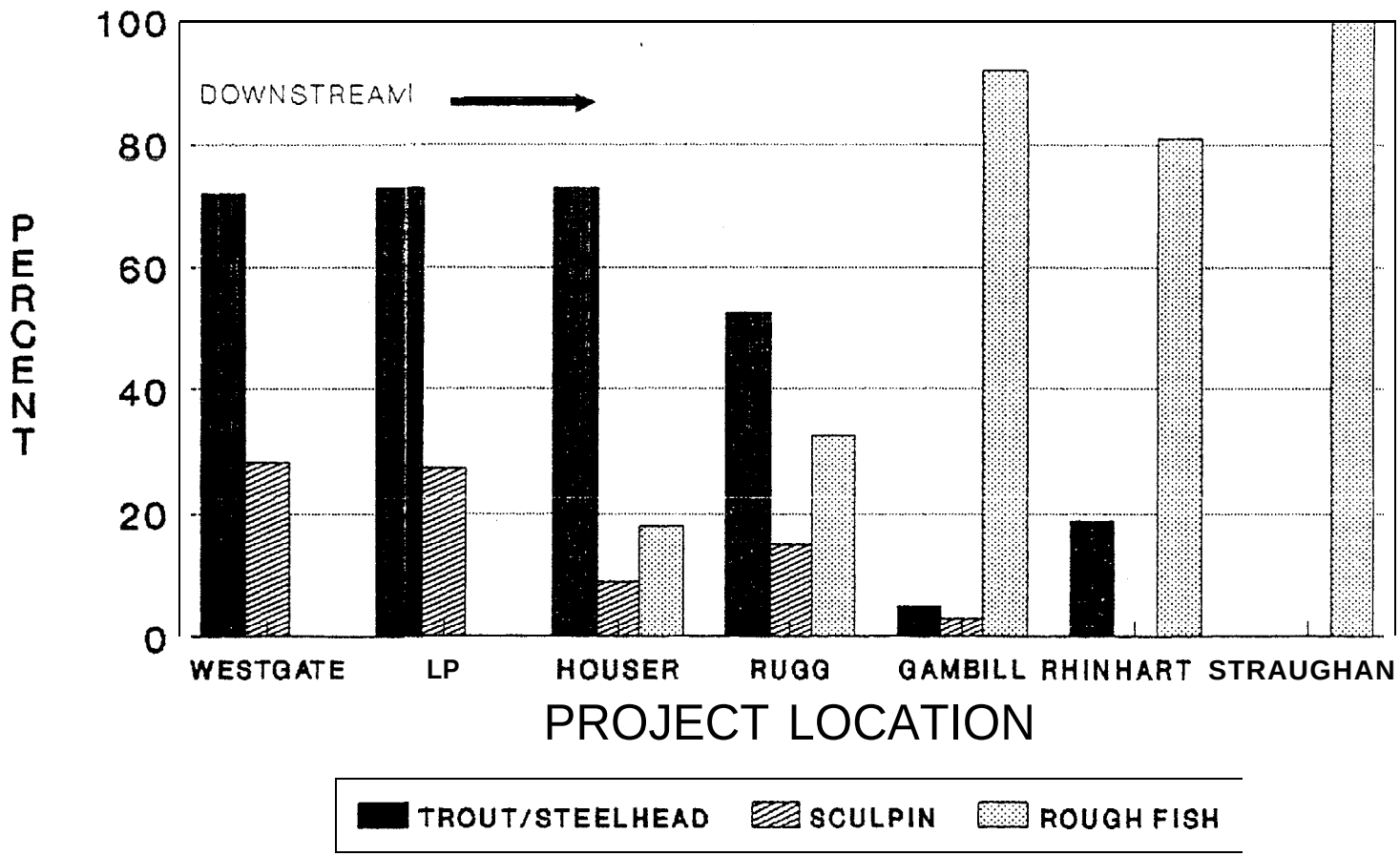
FISH SPECIES COMPC

EAST BIRCH CREEK



OCTOBER 1992

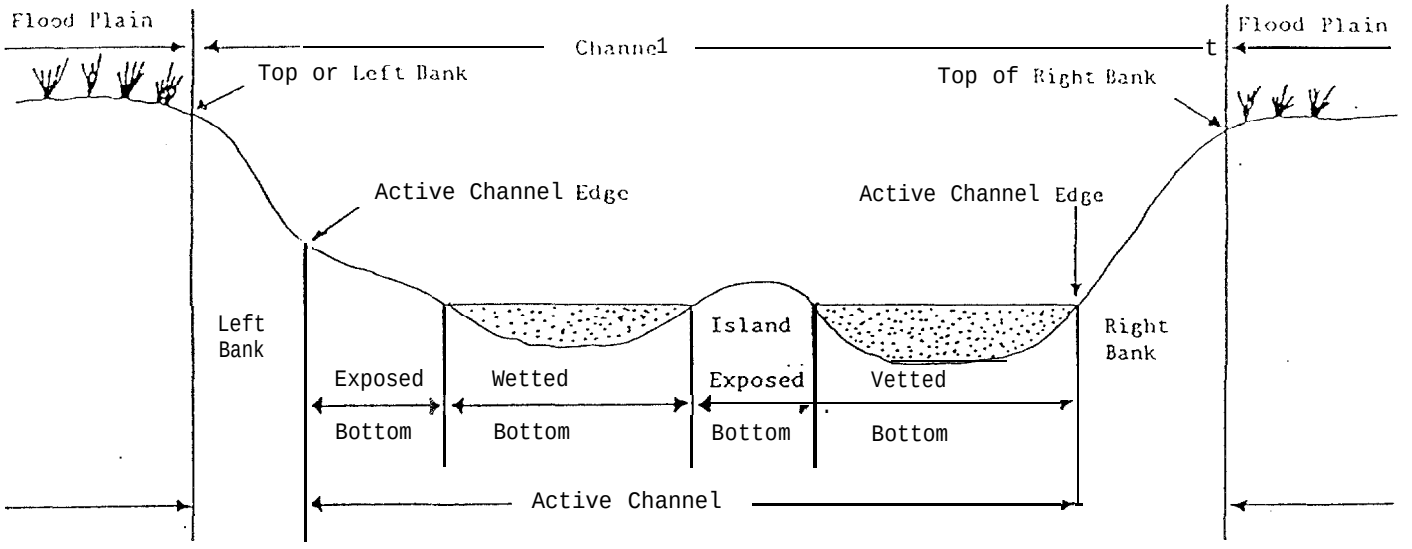
FISH SPECIES COMPOSITION
EAST BIRCH CREEK



DECEMBER 1992

APPENDIX – 3

DEFINITIONS FOR HABITAT MONITORING TRANSECT DATA



Flood Plain: Portion of the transect adjacent to the channel that is occasionally submerged under water. The flood plain is usually a low gradient area well covered by various types of riparian vegetation. Measured to the nearest 0.1 foot.

Bank: Portion of the channel within the transect that restricts lateral movement of water. The Bank usually has a gradient steeper than 45 degrees and exhibits a distinct break in slope from the active channel. Measured to the nearest 0.1 foot.

Active Channel: Stream bottom within the transect which includes the wetted and the dry or exposed channel area. Portion of channel between banks where annual bedload movement occurs. Measured to the nearest 0.1 foot.

Pool: Portions of the wetted channel where the water is deeper and of lower velocity than the main current.

Glide/Run: Portion of the wetted channel where the water surface is not broken but is shallow and has a faster velocity than a pool.

Riffles: Portion of the wetted channel that is faster and shallower with the water surface broken into waves by wholly or partly submerged obstructions.

Channel Depth: Average elevation of the active channel bottom. Measured to the nearest 0.05 foot.

Channel Width: Horizontal distance from the left to right edge of the active channel. Measure to the nearest 0.1 foot.

Distance Banks: The horizontal distance between the top edges of opposite banks. Measured to the nearest 0.1 foot.

Water Ratio: Ratio of the water width divided by the average water depth.

DOE/BP-35769-4
March 1993
700