

**UMATILLA BASIN HABITAT IMPROVEMENT
PROJECT**

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: procurement of 6 cooperative lease agreements and one lease addendum with private landowners, design and layout of 4.4 miles of riparian exclosure fence and 1.75 miles of instream structures, development of three fencing contracts and three instream work contracts. Results include implementation OF 3 miles of fencing and 3.7 miles of instream work. Other activities undertaken during this report period are: weekly inspection and maintenance of fencing projects, collection and summarization of temperature data, 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 1987) calls for the rehabilitation of steelhead and salmon populations in the Umatilla River (Section 703) (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. Most chinook were eliminated from the Umatilla over 50 years ago although a few spring chinook salmon were observed as recently as 1963 (OGC 1963) and fall chinook as recently as 1957 (Thompson and Has 1960). Annual runs of summer steelhead have averaged 2,175 adults during the past decade with a low of 768 in 1981-82 and high of 3,124 in 1986-87 (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 have returned to the river starting in 1985, spring chinook starting 1988 and coho in 1989 (Tables 2, 3 and 4).

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 in the Umatilla. The reduction in the amount of riparian (streamside) habitat along the Umatilla 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 (USEFWS and NMFS 1982). approximately 70% of the 422 stream miles inventoried in the Umatilla River Basin need riparian rehabilitation (USEFWS 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 enhancement 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 /3
1981-82	768 /3
1982-83	1,264 /3
1983-84	2,062
1984-85	3,436
1985-86	2,959
1986- 87	3,124
1987-88	2,481
1988-89	2,476 /4
1989-90	1,694

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

/2 September 1 through June 30.

/3 This includes 100 fish (25 males and 75 females which were used for brood stock).

/4 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	
	ADULT /1	JACK /2
1988	13	0
1989	66	98
1990	2,158	32

/1 Adults are greater than 24 inches.

'2 Jacks are precocially mature fish less than 24 inches.

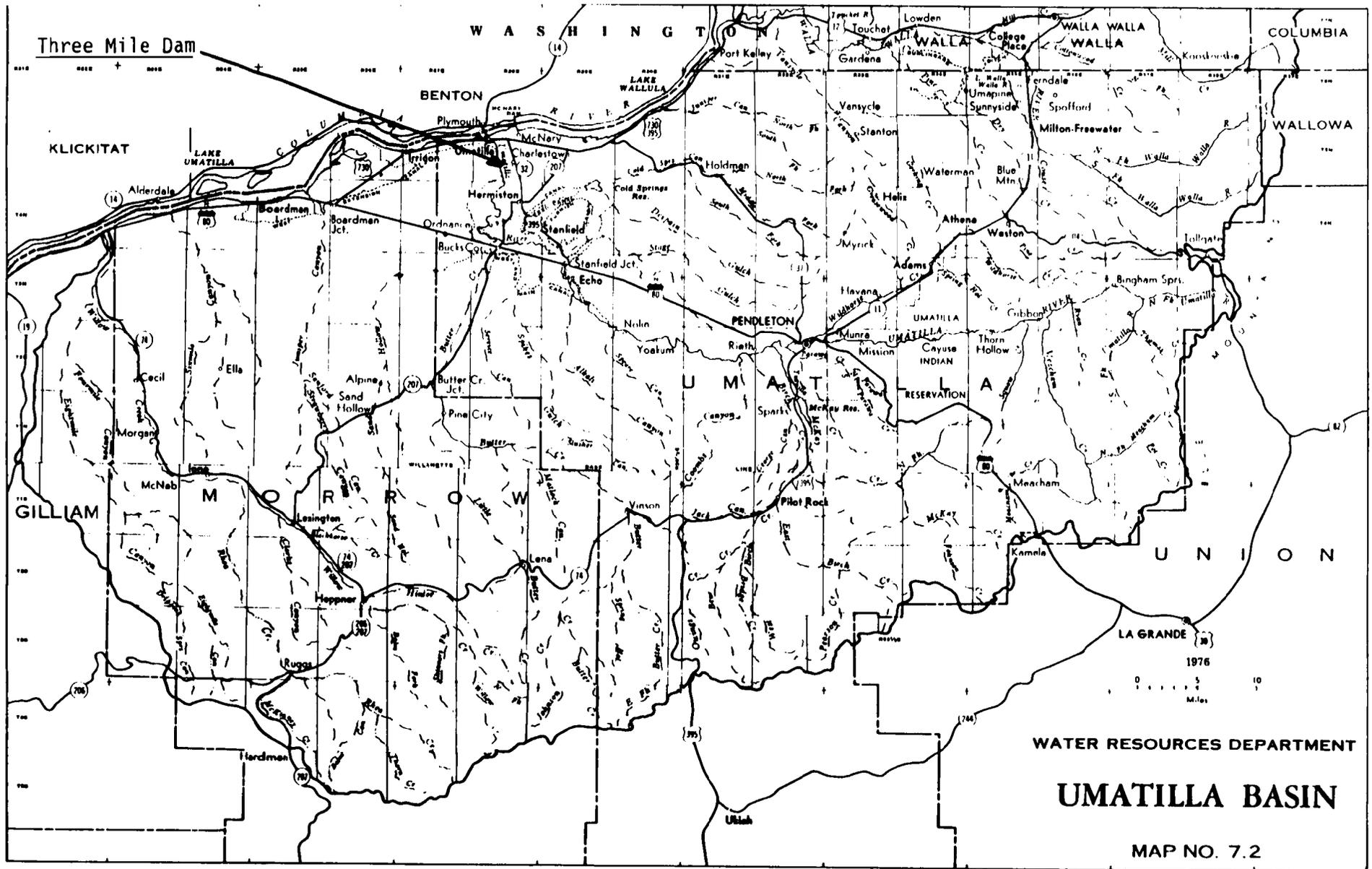


Figure 1. Location of Three Mile Dam within the Umatilla Basin.

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

YEAR	TOTAL		
	<u>ADULT</u> /1	<u>JACK</u> /2	<u>SUBJACK</u> /3
1985	6	79	0
1986	27	447 /4	0
1987	52	52	295
1988	94	176	1,283
1989	279	247	76
1990	333	107	621

/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	TOTAL	
	<u>ADULT</u>	<u>JACK</u>
1987	0	29
1988	742	610
1989	3,694	507
1990	409	511

/1 Adults are greater than 20 inches in length.

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

DESCRIPTION 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 of the Umatilla River; and Meacham, McKay, Birch, and Butter creeks.

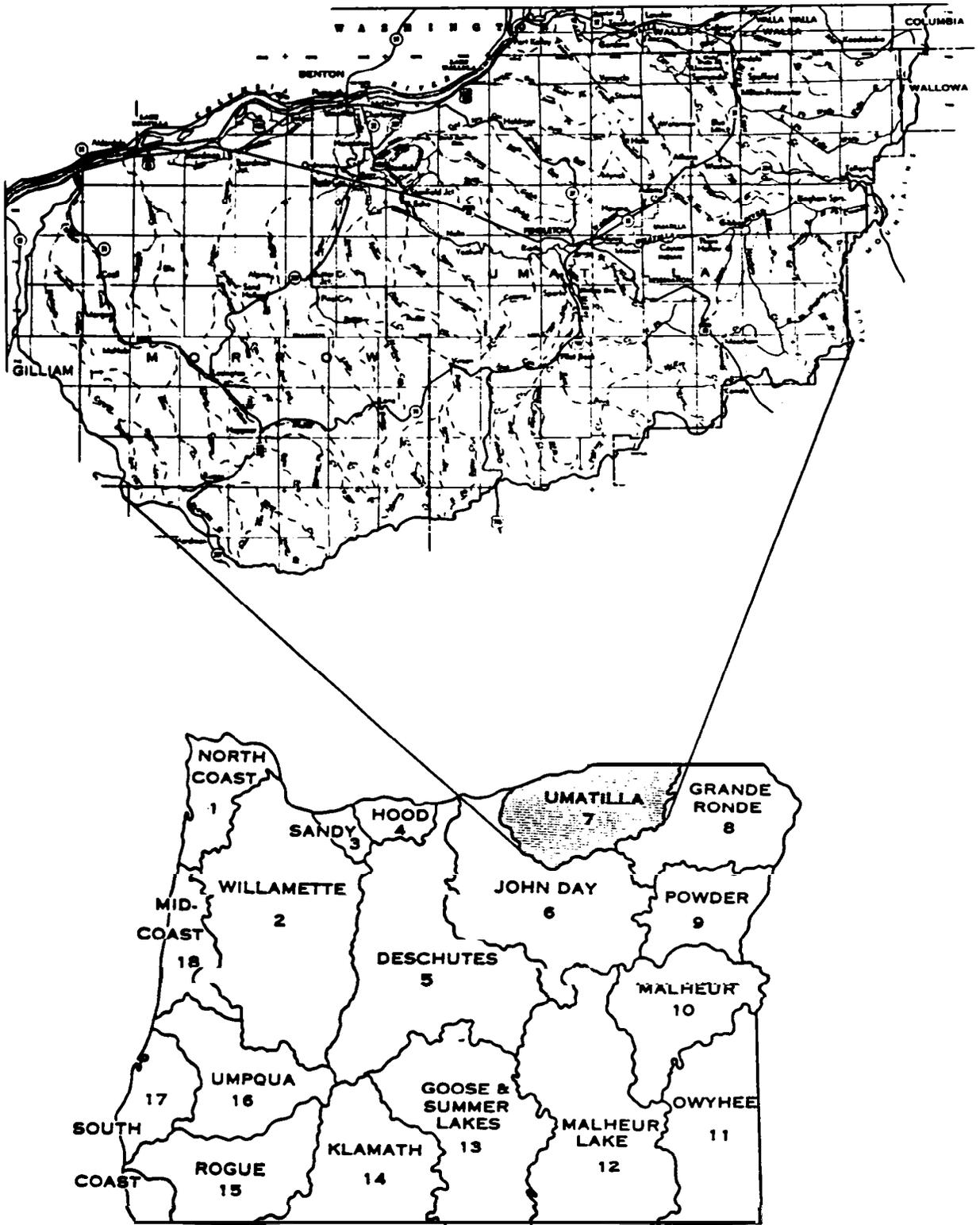


Figure 2. Location of the Umatilla Basin within Oregon.

METHODS 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 at best. 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, the landowners dealt with are farmers and ranchers which 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 completed 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 for all projects. Access, ground conditions, and implementation timing are all important considerations to reduce impacts on the landowner's normal operations. Coordination activities are undertaken with all landowners whose property is involved with implementation and/or maintenance activities.

c. Development of Contracts and Contract Specifications. Contract documents and specifications are developed for all projects except minor implementation and maintenance projects completed by project personnel. Considerable time is required to prepare written contract documents, specifications and drawings.

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 easements of right-of-ways, fences, instream structures, offsite 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 were installed in streams at locations preselected by fishery biologists and/or hydrologists. Structures of various types are used to provide optimum pool/riffle ratios, raise riparian water tables, and collect spawning gravels, thereby increasing quantity and quality of rearing and spawning habitats. Various types of rock placements will be used to stabilize streambanks. Boulders will be used to create small rearing pools and hiding cover.

2. Planting. During early spring, shrub and/or tree species were planted at preselected locations along streams within project areas. Since high summer water temperature appears to be a major limiting factor, plantings are made to provide stream shade, thereby reducing summer water temperatures and increasing salmonid utilization of streams. The maximum shade attainable for most streams in project areas is 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 F within 20 years of project implementation.

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

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

4. 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 several years. Typical postwork activities may include:

1. Maintenance. Following completion of implementation an annual inspection of all project areas will be made. Following this inspection all fence and instream structure maintenance will be done. Fence inspection and maintenance is a year around activity.

2. Photopoint Picture Taking. Standardized pictures will be taken from preselected photopoints prior to implementation of any project area and then during the fall and/or spring of each year. 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.

4. Thermograph Data Collection. Thermographs were 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.

RESULTS AND DISCUSSION I. FIELD Activities

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

Pework

Pework is broken down into four successive stages: lease procurement, 2) project planning, 3) project preparation and 4) field inventories.

1. Riparian Lease Development and Procurement Five leases were obtained in 1990 for 1990 project implementation, all on East Birch Creek (Table 5). Project implementation will continue in 1991 on two of these properties

A total of 22 landowners were contacted verbally or in writing regarding the fish habitat improvement program to develop leases for project implementation in 1991. At present only two leases have resulted from these contacts, but negotiations continue with many.

One new lease and one lease addendum were obtained for project implementation in 1991; one lease on East Birch Creek (H. Peterson) and one lease addendum on Meacham Creek (Louisiana Pacific) (Table 5).

Though the program has been successful at obtaining leases to date, landowner cooperation can vary greatly, thereby affecting future success. With the relatively small size of most properties in the identified project areas, many leases need to be obtained to provide an adequate amount of stream for implementation.

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

a. Design and Layout. During this report period 4.4 miles of fencelines were layed out on 3 properties.

Instream structure design and layout was completed for 1.75 miles of stream on one property. In addition, 1.9 miles of stream previously layed out in 1989 was reviewed and the design modified.

TABLE 5. LEASE AGREEMENTS PROCURED IN 1990.

LANDOWNER	STREAM	MILES STREAM
Y. Gambill	E. Birch	0.70
D. Hoeft	E. Birch	1.00
B. Weinke	E. Birch	0.50
J. Stroughan	E. Birch	1.00
T. Neal	E. Birch	0.90
H. Peterson	E. Birch	1.25
Louisiana Pacific	Meacham	0.60
Total		6.45

TABLE 6. PROJECTS IMPLEMENTED IN 1990-91.

PROJECT	STREAM	MILES STREAM	FENCE MILES	INSTREAM WORK	STATUS
W. Weinke	East Birch	0.44	0.25	No	Complete
Y. Gambill	East Birch	0.70	1.00	Yes	Complete
D. Hoeft	East Birch	1.00	0.30	Yes	Incomplete
B. Weinke	East Birch	0.50	0.50	No	Complete
O. Bishart	East Birch	0.63	0.00	Yes	Complete
J. Stroughan	East Birch	1.00	0.84	Yes	Incomplete
T. Neal	East Birch	0.90	0.00	Yes	Incomplete
Louisiana Pacific	Meacham	1.25	0.00	Yes	Incomplete / 1
Total		6.42	2.89		

/1 Property leased in 1991 remains to be fenced.

b. Landowner Coordination. Project personnel coordinated project implementation with 10 landowners in 1990. Most landowners were contacted throughout this report period regarding maintenance activities.

c. Development of Contracts and Contract Specification. Considerable time was spent during this report period developing contracts and contract specifications for implementation of fencing and instream work.

Three fencing contracts were developed and awarded by field personnel for the construction of approximately 2.3 miles of high tensile smooth wire fence and 0.8 miles of barbed wire fence.

Program personnel reviewed and revised all riparian fence construction specifications.

Three contracts were developed to haul rock and place instream structures and revetments. One contract was developed by the Engineering staff and two contracts were prepared by project personnel.

d. Obtaining Work Permits. Project Personnel coordinated with the Division of State Lands and Army Corps of Engineers to secure five fill and removal permits for all 1990 instream work. Project personnel also coordinated with county planners to secure four county development permits for fill in designated floodways. Considerable time was required to prepare applications and correspond with these agencies.

3. Project Preparation. During this report period 3.1 miles of fenceline on East Birch Creek were staked or otherwise marked prior to construction.

The location of instream structures were marked prior to construction along approximately 3.70 miles of East Birch Creek.

Implementation

Habitat improvement projects were implemented on approximately 4.2 miles of East Birch Creek and 1.25 miles of Meacham Creek in 1990-91 (Table 6).

1. Instream Work. During 1990-91 projects were completed on a total of 1.8 miles of East Birch Creek and 1.25 miles of Meacham Creek. Projects began on an additional 1.9 miles of East Birch Creek in 1990 that will be completed in 1991.

Instream work began on the O. Rhinhart property in 1989 was completed. In addition to work done in 1989, 365 cubic yards of riprap, 14 cubic yards of toe rocks, 5 rock jetty stream deflectors and 26 boulders were placed in 1990. As an experiment, project personnel placed two tons of hay bales along the face of one 3 foot high cut bank. It is hoped that these bales will not only provide a physical barrier to stream flows, but will also sprout and grow sod-forming vegetation thereby preventing bank erosion.

The first phase of a two year implementation plan¹ was completed on the J. Straughan property. In 1990 approximately 850 cubic yards of riprap and one rock jetty stream deflector were placed to protect severely eroding streambanks; some banks being 12 feet high. Implementation planned for 1991 will include placement of rock jetty stream deflectors, habitat boulders, and log weirs to build structural habitat.

The first phase of a two year implementation plan¹ was completed on the T. Neal property. In 1990, approximately 215 cubic yards of riprap were placed. The implementation planned for 1991 will include the placement of rock jetty stream deflectors, habitat boulders, and log weirs to build habitat.

Instream work was completed on the Y. Gambill property. In 1990-91, 295 cubic yards of riprap 90 cubic yards of toe rocks and 3 rock jetty stream deflectors were placed. This work was mainly streambank protection. This property is in such a degraded state that it was decided to give the area some time to heal before evaluating the need for further habitat improvement.

Completed instream work on the C. Hoeft property including placement of 360 cubic yards of riprap as streambank protection.

Instream work was completed by project personnel on the Meacham creek Louisiana Pacific Corp. property in 1990. Thirty-two whole lodgepole pine trees were felled and placed instream without anchoring; this stream is small enough that movement of the trees is unlikely. Additionally, fir tree tops were collected from slash of a nearby logging operation and cabled in as riprap along 200 feet of eroding streambank.

2. Planting. Little planting of trees and shrubs took place in this contract period. a total of 25 willows were planted on the McDaniel property on East Birch Creek.

¹ This plan was created when it was realized that funds budgeted for 1990 would not cover the cost of the project.

All areas that were disturbed as a result of project implementation were reseeded with a mixture of grasses and legumes.

On the J. Straughan property where farm ground has been taken out of production a buffer strip has been seeded to provide a cover crop and reduce the invasion of weeds. This buffer strip was planted with a mixture of common cover fescue and Sherman big bluegrass. The landowner prepared the ground and planted the seed.

3. Fencing During this report period 2.90 miles of fence were constructed to protect 3 miles of East Birch Creek. Fencing projects were carried out by contract on the J. Straughan, C. Hoeft, B. Weinke, W. Weinke and Y Gambill properties. The fencing project on the C. Hoeft property was not completed because of poor ground conditions and the contractor did not have the appropriate equipment to complete the project; 0.3 miles of fence remains to be constructed and will be completed by project personnel.

4. Photopoint Establishment No photopoints were established prior to 1990 except three on Meacham Creek. Permanent photopoints were established on all projects in 1990 except for three established on Meacham Creek in 1989; 44 on East Birch Creek and 3 on Meacham Creek. Total photopoints established to date are 44 on East Birch Creek and 6 on Meacham Creek.

Postwork

1. Maintenance. During this report period, fence maintenance activities were carried out on 9.1 miles of East Birch Creek and 0.65 miles of Meacham Creek. As a result of livestock use along East Birch Creek, fence maintenance has become a task that is performed on a weekly basis throughout the year. Many landowners graze livestock on streamside pastures the entire year or a majority of the year. Therefore, fences undergo year-around pressure which intensifies in the fall when pasture vegetation becomes scarce and riparian vegetation is abundant.

There are currently 56 stream crossing fences on East Birch Creek and 4 on Meacham Creek. These stream crossing fences have proven to be the weakest aspect of the fencing system. Crossings **must be built sturdy enough** to exclude livestock, yet flexible enough to allow passage of high flows and associated ice and debris jams without being damaged. This can only work with constant inspection and maintenance.

To reduce impacts of high flows on stream crossings all stream crossings were modified so that they can be easily raised and lowered. During times of high, fluctuating flows, **considerable** time was **spent adjusting these**

crossings. In some cases conventional stream crossing designs have not proven to be effective, so new designs are now being experimented with. Four stream crossing fences were refitted with hogwire panels and two with electric fencing. These new designs will be incorporated into new and existing projects in the future.

Corridor fences also required maintenance and refitting, but to a lesser degree than the stream crossing fences.

Miscellaneous fence maintenance activities included:

- Thirty **barbless** wire gates were replaced with barbed wire. Bar-bless wire has not proven to be a deterrent to cattle.
- The fence on the T. Rugg property was reconstructed to withstand high pressure from an adjacent feed lot used during the winter.
- Bottom wires were added to the McDaniel/E. Birch and Louisiana Pacific/Meacham Creek fences to deter the entry of sheep.
- Other activities included, replacement of damaged hardware, splicing broken wires, removing fallen trees, adding electric wires in problem areas, tightening high tensile wires, and general fence inspection.

Considerable time was spent maintaining the McDaniel fence on the East side of Birch Creek to deter the entry of sheep. A high tensile wire was added to the bottom, but proved insufficient. An electrified wire was also added to the bottom and maintained, but again was insufficient. It is planned to replace the high tensile wire on the east side of the stream with woven wire which should effectively exclude sheep.

Since many project sites are associated with intensive agriculture, weed control is of particular concern to participating landowners. Weed control was required on all properties except for Louisiana Pacific's. Targeted species for control were mainly scotch and **Canadian** thistle. Methods for weed eradication included use of herbicides, and manual removal.

Instream structures were inspected for maintenance needs, and no maintenance activities were undertaken. Two sites are scheduled for **minor maintenance** activities in 1991.

2. Photopoint Picture Taking. Photopoint pictures were taken on all established **photopoints**; 44 on East Birch Creek and 6 on Meacham Creek

3. Thermograph Data Collection. Thermographs were deployed at three locations on East Birch Creek and two locations on Meacham Creek. 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. See Appendix 1 for plotted thermograph data.

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

Considerable time was spent soliciting bids, and purchasing and receiving fencing materials for construction of approximately 2.90 miles of fence.

All budgeted capital items were purchased.

All other purchasing consisted of acquiring miscellaneous field and office supplies.

Budget

The annual 1991 budget and statement of work was prepared and submitted to BPA for approval.

Personnel

Greg Rimbach was hired as the permanent Technician on February 1, 1990. Since that time there have been no changes in permanent personnel.

Guy Gregg was hired for three Months as a seasonal Technician. His primary duty was to assist the permanent Technician with fence maintenance activities.

INTERAGENCY COORDINATION/EDUCATION

Interagency Coordination

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 provided input to the Army corps of Engineers on a fill project proposed by the Union Pacific Railroad on Meacham Creek within the proposed project work area. The Biologist Provided input to the District Biologist for a written response on this matter.

The CTUIR and ODFW continue Aoorinate their programs. ODFW provided CTUIR with h some field support and technical specifications for high tensile smooth wire fencing.

Education

The Technician assisted personnel in the upper Grande Ronde project area instruct high school students on the collection of habitat monitoring transect data. This is part of an annual field day for the Imbler High School biology class involving an ongoing habitat project on Spring Creek.

The Technician worked with Students of the Pendleton High School Biology and Vocational Agriculture classes to develop fish population estimates on Wildhorse Creek.

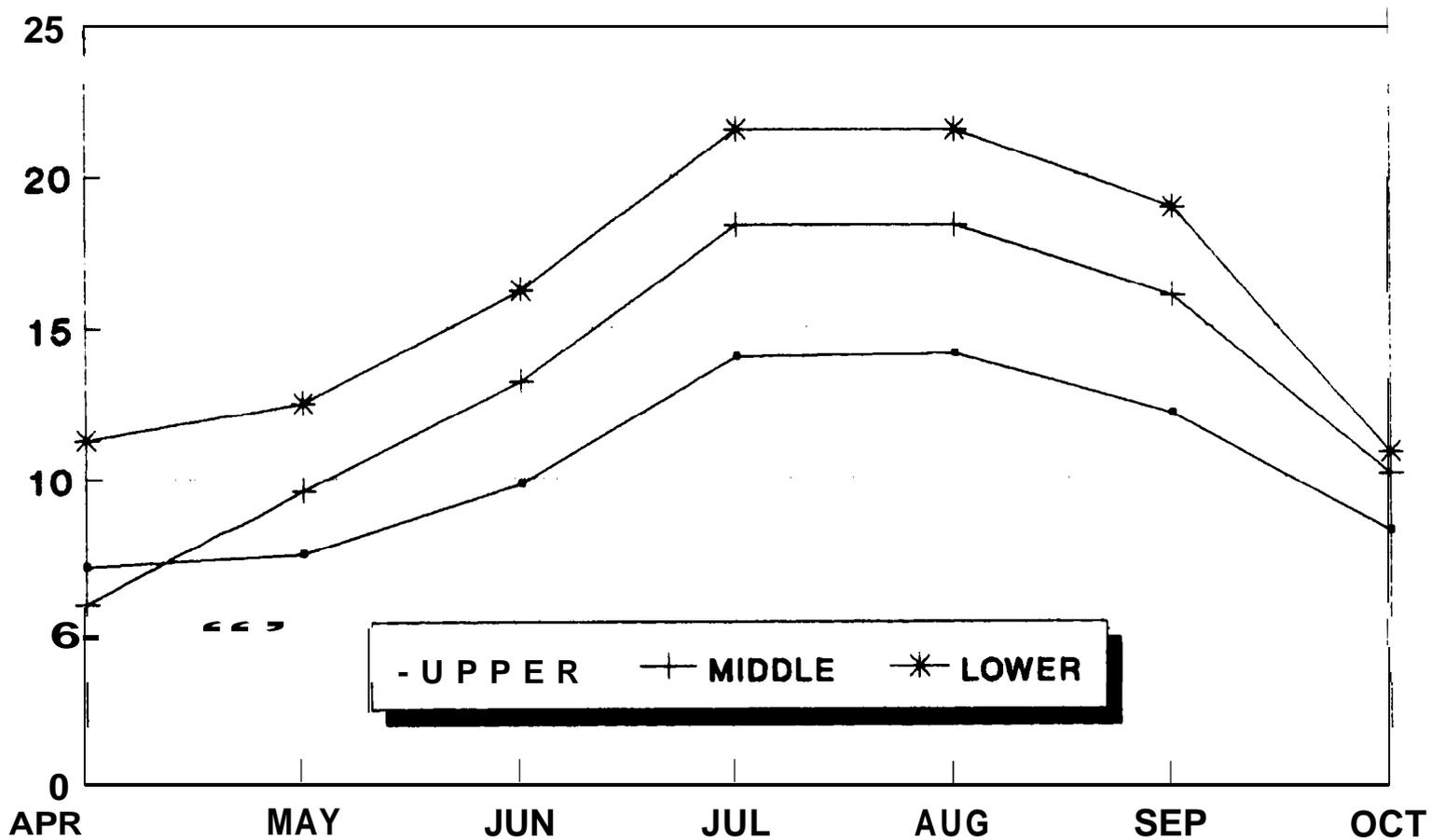
The Biologist worked with the instructors from the Pendleton High School biology and vocational agriculture classes, individuals from the Soil Conservation Service and Umatilla County Soil and Water Conservation District to develop a high school field project on wildhorse Creek. This project has not been fully developed or implemented because one of the instructors involved resigned his position at the school.

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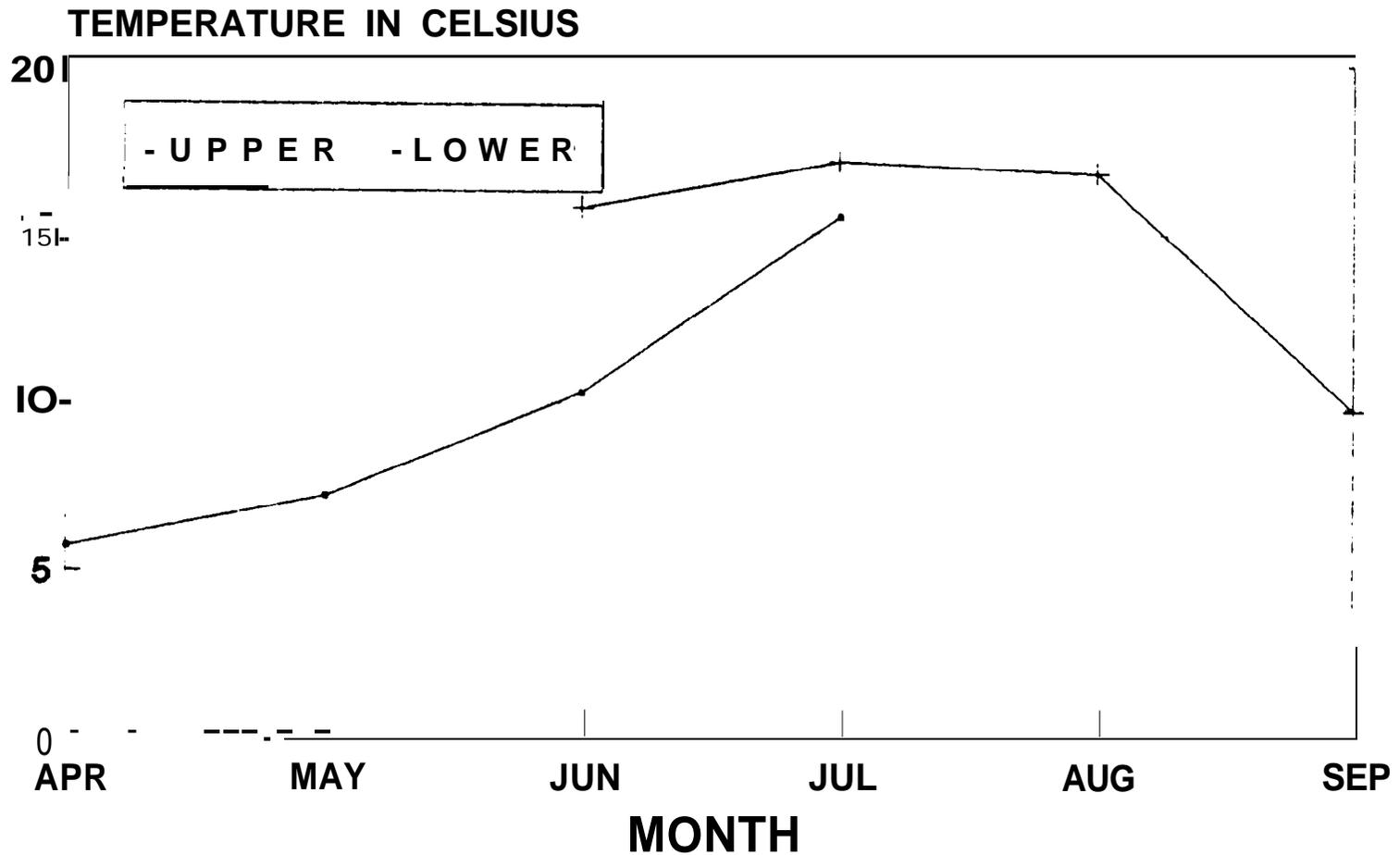
APPENDIX - 1
THERMOGRAPH Data

EAST BIRCH CREEK MONTHLY MEAN TEMPERATURE



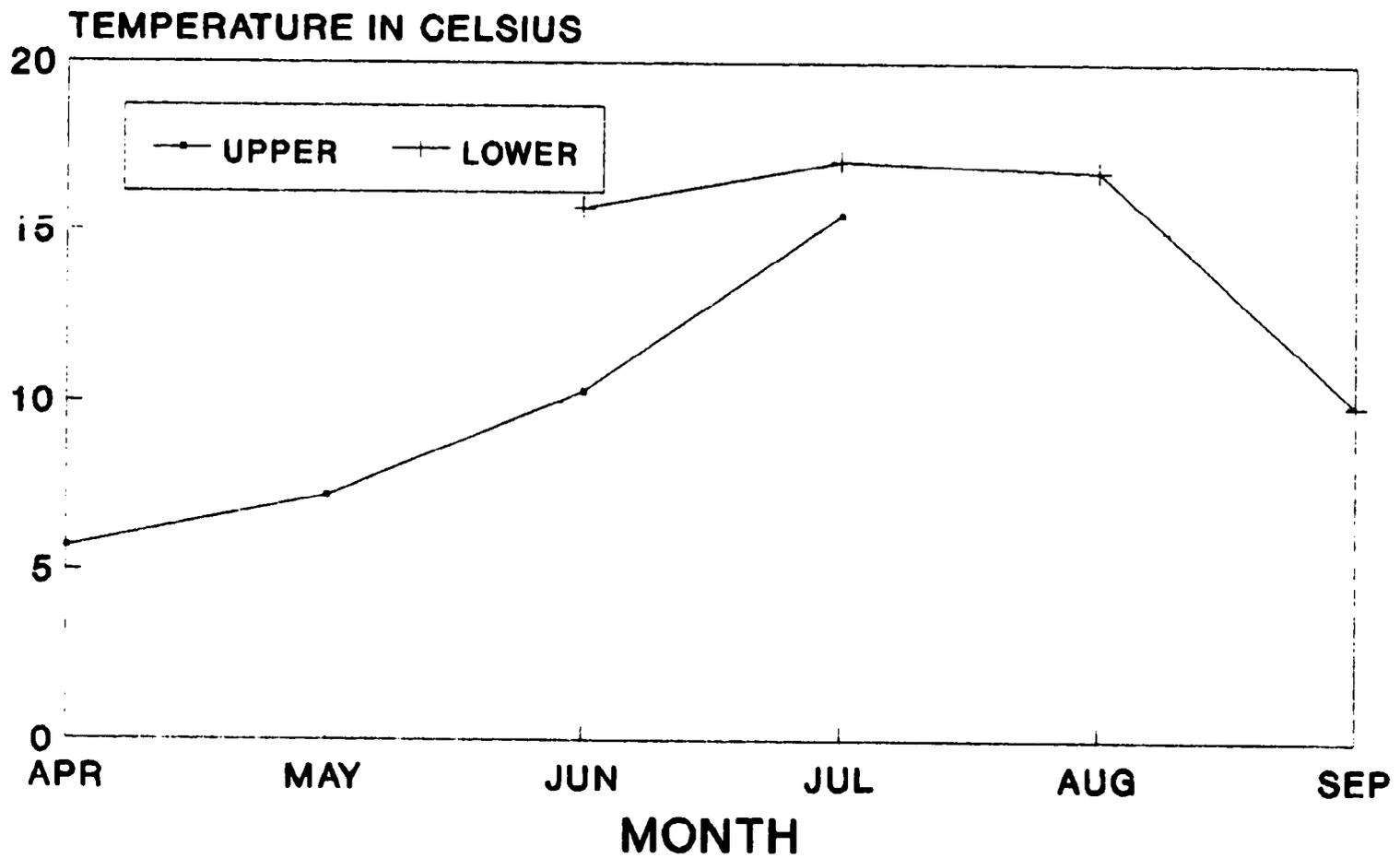
APRIL 1990 - OCTOBER 1990

MEACHAM CREEK MONTHLY MEAN TEMPERATURE



APRIL 1990 - SEPT 1990

MEACHAM CREEK MONTHLY MEAN TEMPERATURE



APRIL 1990 - SEPT 1990