UMATILLA RIVER BASIN ANADROMOUS FISH HABITAT

ENHANCEMENT PROJECT

1994 ANNUAL REPORT

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ABSTRACT

The Umatilla Basin Anadromous Fish Habitat Enhancement Project is funded under the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, Section 7.6 - 7.8 and targets the improvement of water quality and restoration of riparian areas, holding, spawning and rearing habitats of steelhead, spring and fall chinook and coho salmon.

The project focused on implementing cooperative instream and riparian habitat improvements on private lands on the Umatilla Indian Reservation (hereafter referred to as Reservation) from April 1, 1988 to March 31, 1992. These efforts resulted in enhancement of the lower 1/4 mile of Boston Canyon Creek, the lower 4 river miles of Meacham Creek and 3.2 river miles of the Umatilla River in the vicinity of Gibbon, Oregon. In 1993, the project shifted emphasis to a comprehensive watershed approach, consistent with other basin efforts, and began to identify upland and riparian watershed-wide causative factors impacting fisheries habitat and natural fisheries production capabilities throughout the Umatilla River Watershed. An additional 4.5 river miles of fisheries habitat improvement projects have been implemented on private properties on and off the Reservation since shifting to a watershed approach. Additional projects have included habitat enhancements in the Meacham, Mission, Wildhorse and Greasewood creek drainages.

During the 1995 - 96 project period, four new habitat enhancement projects were implemented by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) in the upper Umatilla River Basin. A high tensile smooth wire fence was constructed to exclude livestock from floodplain areas on two Indian allotments between river mile (RM) 4.25 and RM 4.75 Meacham Creek. Addition of these two properties into the existing project area provides nearly complete protection of the lower Meacham Creek riparian corridor on the Reservation. Enhancement efforts were iniated on Mission Creek and included installation of a high tensile smooth wire fence on an Indian-owned property between RM 2.9 and RM 3.3 to restrict horses from the riparian corridor. The off-Reservation Wildhorse Creek Habitat Enhancement Project was expanded to include an additional 2.5 river miles of stream protection on mainstem Wildhorse Creek and tributary, Greasewood Creek. High tensile smooth wire fence was constructed to restrict and better distribute livestock on four private properties between RM 11.8 and RM 12.6 Wildhorse Creek, RM 0 and RM 1.5 Greasewood Creek and RM 0 and RM 0.25 West Fork Greasewood Creek. Other enhancements implemented on Wildhorse Creek and the lower Greasewood Creek System included: 1) installation of 0.43 miles of smooth wire between RM 10.25 and RM 10.5 Wildhorse Creek (fence posts and structures had been previously placed on this property during the 1994 - 95 project period), 2) construction of sediment retention structures in stream channels to speed riparian recovery by elevating stream grades, slowing water velocities and depositing sediments onto streambanks to provide substrate for revegetation efforts; maintenance was also performed on existing sediment retention structures between RM 9.5 and RM 10.25 Wildhorse Creek impacted during this time period, and 3) revegetation of stream corridor areas and adjacent terraces with pounds of native grass seed (when commercially available) or close species equivalents and 6,000 native riparian shrub/tree species to assist in floodplain recovery, stream channel stability and filtering of sediments during high flow periods.

Water quality monitoring continued and was expanded for temperature and turbidity throughout the upper Umatilla River Watershed. Survey of stream channel cross sections and photo documentation of riparian recovery within the project areas provided additional baseline data.

Physical habitat surveys were conducted on the lower thirteen river miles of Wildhorse Creek and within the Gresewood Creek Project Area to characterize habitat quality and to quantify various habitat types by area. Information will continue to be collected on upper Wildhorse Creek during the 1996 - 1997 project period and utilized to assist in identification of habitat deficient areas within the watershed in which to focus habitat restoration efforts. These efforts were coordinated with the CTUIR Umatilla Basin Natural Production Monitoring and Evaluation (UBNPME) Project.

Poor land use practices, which have altered natural floodplain dynamics and significantly reduced or eliminated fisheries habitat, continued to be identified in the Mission Creek Subbasin. Compiled data is currently being incorporated into a data layer for a Geographic Information System (GIS) data base. This effort is being coordinated with the Natural Resource Conservation Service (NRCS).

Community outreach efforts and public education opportunities continued during the reporting period.

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TABLE OF CONTENTS

ABSTRACT i

ACKNOWLEDGEMENTS iii

TABLE OF CONTENTS iv

LIST OF FIGURES viii

Introduction 1

Description of Project Areas 3

Project Vicinity Map 5

METHODS AND MATERIALS

Objective I. Maintain and Continue Implementation of Habitat Enhancement Projects throughout the Umatilla River Watershed.

1. Pre-construction Preparation
a. Assess Maintenance Needs 6
b. BIA Right-of-Way Clearances and CTUIR Riparian Easements 6
c. Project Cost Share 6
d. Fill and Removal Permits 6
e. On-site Cultural/Archeological Monitoring 7
f. Design and Layout 7
g. Contracts 7
h. High Tensile Fence Materials Purchase 7
i. Native Grasses, Legumes, Riparian Shrubs and Trees 8
j. Transect and Photo Point Establishment 8

2. Maintain and Implement Habitat Enhancements
a. Rock Delivery 8
b. Contractor Supplies and Materials 9
c. Sediment Retention Structures 9
d. Instream and Bank Stabilization Maintenance 9
e. Livestock Exclusion and Riparian Corridor Fencing 9
f. Construction Activities - Project Review and Inspection 9
g. Revegetation 10

3. Post-construction Activities and Habitat Enhancement Monitoring
a. Post-construction Final Review 10
b. Transect Measurements and Photo Point Monitoring 10

c.Physical Condition of Improvements and General Stream Hydraulics 11

Objective II.Collect Baseline Water Quality Data and Continue Post-project Monitoring to Identify Watershed Health Concerns and to Quantify the Short and Long-Term Effects of Habitat Enhancement Activities in the Umatilla River Basin.

1.Determine Existing Land Use Practices Impacting Salmon and Steelhead Habitat Capability
a.Identification of Major Land Use Practices..... 11
b.Identification of Site Specific Detrimental Land Use Practices 11
2.Fish Habitat Surveys..... 11
3.Riparian Vegetation Sampling 12
4.Aquatic Macroinvertebrate Sampling 12
5.Water Quality Sampling..... 12
6.Water Temperature Monitoring 12
7.Suspended Sediment Monitoring 13

Objective III.Continue Watershed Planning/Scoping/Education Process by Identifying Problems and Developing Creative Solutions to Land Use Problems Impacting Fisheries Habitat in the Umatilla River Basin.

1.Community Outreach Effort..... 14
2.Scoping Groups 14
3.Wildhorse Creek Demonstration Project 15
4.Public Educational Opportunities..... 15
5.Public Monitoring Programs 15
6.Educational Brochure 15
7.Watershed Library 15

Objective IV.Pursue Alternative Management Methods to Mitigate Impacts from Past and Ongoing Land Management Activities

1.Acquisition Land/Management Rights 15

RESULTS AND DISCUSSION

Objective I.Maintain and Continue Implementation of Habitat Enhancement Projects throughout the Umatilla River Watershed.

1.Pre-construction Preparation
a.Assess Maintenance Needs....17
b.BIA Right-of-Way Clearances and CTUIR Riparian Easements....17
c.Project Cost Share 18
d.Fill and Removal Permits....18
e.On-site Cultural/Archeological Monitoring....19
f.Design and Layout 19
g.Contracts 19
h.High Tensile Fence Materials Purchase....20
i.Native Grasses, Legumes, Riparian Shrubs and Trees....20
j.Transect and Photo Point Establishment....20

2.Maintain and Implement Habitat Enhancements
a.Rock Delivery 21
b.Contractor Supplies and Materials....21
c.Sediment Retention Structures....21
d.Instream and Bank Stabilization Maintenance....22
e.Livestock Exclusion and Riparian Corridor Fencing....22
f.Construction Activities - Project Review and Inspection....22
g.Revegetation 22

3.Post-construction Activities and Habitat Enhancement Monitoring
a.Post-construction Final Review....23
b.Transect Measurements and Photo Point Monitoring....23
c.Physical Condition of Improvements and General Stream Hydraulics....24

Objective II.Collect Baseline Water Quality Data and Continue Post-project Monitoring to Identify Watershed Health Concerns and to Quantify the Short and Long-Term Effects of Habitat Enhancement Activities in the Umatilla River Basin.

1.Determine Existing Land Use Practices Impacting Salmon and Steelhead Habitat Capability
a.Identification of Major Land Use Practices....24
b.Identification of Site Specific Detrimental Land Use Practices....24
2.Fish Habitat Surveys....24
3.Riparian Vegetation Sampling....25
4.Aquatic Macroinvertebrate Sampling....25
5.Water Quality Sampling....26
6.Water Temperature Monitoring....27
7.Suspended Sediment Monitoring....28

Objective III.Continue Watershed Planning/Scoping/Education Process by Identifying Problems and Developing Creative Solutions to Land Use Problems Impacting Fisheries Habitat in the Umatilla River Basin.

1.Community Outreach Effort....30
2.Scoping Groups....32
3.Wildhorse Creek Demonstration Project....33
4.Public Educational Opportunities....33
5.Public Monitoring Programs....33
6.Educational Brochure....34
7.Watershed Library....34

Objective IV.Pursue Alternative Management Methods to Mitigate Impacts from Past and Ongoing Land Management Activities

1.Acquisition Land/Management Rights....34

Literature Cited....35

Appendix A - Water Temperature Graphs....
A-1.Umatilla River - River Mile 56 (West Reservation Boundary)
A-2.Umatilla River - River Mile 78.5 (Downstream Mouth of Meacham Creek)
A-3.Umatilla River - River Mile 79 (Upstream Mouth of Meacham Creek)
A-4.Umatilla River - River Mile 81.7 (USGS Gage Station No. 14020000)
A-5.Wildhorse Creek - River Mile 0 (Confluence with Umatilla River)
A-6.Wildhorse Creek - River Mile 26
A-7.Buckaroo Creek - River Mile 2
A-8.Squaw Creek - River Mile 2
A-9.Squaw Creek - River Mile 9 (Confluence with Little Squaw Creek)
A-10.Meacham Creek - River Mile 2 (USGS Gage Station No. 14020300)
A-11.Meacham Creek - River Mile 5.25 (East Reservation Boundary)

Appendix B - Suspended Sediment Graphs....
B-1.Umatilla River - River Mile 56
B-2.Umatilla River - River Mile 81.7 (USGS Gage Station No. 14020000)
B-3.Meacham Creek - River Mile 2 (USGS Gage Station No. 14020300)

Appendix C - News Articles, CTUIR Habitat Enhancement Efforts

Appendix D - Riparian Recovery Project Photos

LIST OF FIGURES

1.CTUIR Anadromous Fish Habitat Enhancement Project Vicinity Map....5

2.Thermograph Locations for 1994-95 Project Period 13

3.Suspended Sediment Monitoring Sites for the 1994 Annual Year 14

INTRODUCTION

This Umatilla River Basin Anadromous Fish Habitat Enhancement Project Report covers work accomplished by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) from May 1,

1994 through April 30, 1995 as part of the Umatilla Basin Fisheries Restoration Program. This project is funded under the Northwest Power Planning Council's Columbia Basin Fish and Wildlife Program, Section 7.6 - 7.8 to partially mitigate for losses of salmon and steelhead populations in the Columbia River Basin from the construction and operation of hydroelectric dams.

Significant effort and funds have been directed at restoration of anadromous fish in the Umatilla River Basin. This habitat project is one element in the comprehensive Umatilla Basin Fisheries Restoration Program which also includes artificial production, adult and juvenile passage improvements (ladders, screens and trap and haul), instream flow enhancement and monitoring and evaluation. Emphasis on watershed-wide habitat is needed for protection and enhancement of the natural production capabilities in the basin.

The primary problems continuing to impact water quality and limit available habitat and natural fisheries production capabilities in the Umatilla River Basin include: non-point source pollution due to poor cropland tillage and rotation practices, livestock overgrazing riparian and upland areas, over appropriation of necessary instream flows to irrigators, and stream channelization, constriction, and floodplain modification from agricultural and road/railroad building and maintenance activities.

The project represents a continuation and evolution of existing efforts to improve natural production in the Umatilla River Basin. The goal of this project is to enhance natural production of existing summer steelhead and re-introduced chinook and coho salmon in the Umatilla River Basin. Land use practices in the watershed and existing fish and riparian habitats are being analyzed to identify and address the watershed-wide causative factors to reduced fish production capability. The project will continue to provide critical elements to a comprehensive watershed management approach to help guide implementing agencies and CTUIR in promoting anadromous fish rebuilding plans, and recommend necessary changes to management systems.

Technical integration and coordination is being provided by utilizing a GIS data base for such components as habitat condition, land ownership, land use, ecotype and proposed management/restoration actions. The project complements ongoing fish passage and artificial production projects already in place in the basin and will integrate existing on-the-ground management systems and programs on private and public lands with restoration activities to better justify expenditure of funds and time. Stream habitat surveys, summaries of existing survey information and follow up surveys are coordinated with CTUIR's UBNPME Project. Remedial measures will be implemented to reduce or eliminate detrimental land use activities where possible. Continued operations and maintenance of existing enhancement projects are included under this integrated approach.

The restoration of anadromous fisheries resources in the Umatilla River Basin has been a coordinated effort between CTUIR, local, state and federal agencies and the agricultural community. Examples include the Umatilla River Basin Anadromous Fish Habitat Enhancement Project, the Umatilla Basin Project, the Umatilla River Subbasin Salmon and Steelhead Production Plan and development of the Umatilla Hatchery and associated artificial production plans. This

coordination will continue and expand through scoping groups comprised of local land owners, sportsman clubs and resource agencies formed to identify issues and develop creative solutions to land use problems in the basin.

DESCRIPTION OF PROJECT AREAS

Project areas include the Umatilla River between RM 78.5 and RM 82.7, the lower 4 miles of Meacham Creek, the lower 1/4 mile of Boston Canyon Creek and Wildhorse Creek between RM 9.5 and RM 10.5.

The Umatilla River is a tributary to the Columbia River at RM 289. It has a drainage basin of 308 square miles below the confluence of Meacham Creek. The principle aquifer is quaternary alluvium composed of unconsolidated sand and gravel, and some silt. Alluvium may reach a depth of up to 12 feet (Gonthier and Harris, 1975).

Meacham Creek is a major tributary to the Umatilla River, entering at RM 79. It drains approximately 165 square miles and produces 145,000 acre-feet annually at RM 5 near the head of the project area.

Boston Canyon Creek, entering Meacham Creek at RM 2.1, is the largest tributary to Meacham Creek within the reservation. It contributes over 4,000 acre-feet annually to Meacham Creek from a drainage basin of approximately 5.5 square miles. It runs over and through large alluvial deposits as it enters the Meacham Creek floodplain.

Elevations in the Umatilla River, Meacham Creek and Boston Canyon Creek project areas range from 1,760 to 2,000 feet above sea level, giving the area an unusually long growing season. Stream gradients average less than two percent. Flooding in the project area usually occurs in late winter and spring as a result of a rain on snow event. The flood peaks tend to be high and the volumes large, but the duration of damaging stages seldom last more than a day or two (U.S. Army Corps of Engineers, 1975).

The Umatilla River, Meacham Creek and Boston Canyon Creek project areas lie in a big game winter grazing zone as outlined by the CTUIR Land Development Code (1983). The primary land use is livestock grazing from May to November. Timber harvest is permissible under a conditional use permit.

Wildhorse Creek is a 34 mile intermittent tributary to the Umatilla River, entering at RM 55 in the city of Pendleton, Oregon. It drains approximately 190 square miles and produces 14,000 acre-feet annually at the mouth. The highest point on the drainage divide of the basin is at an altitude of about 3,800 feet (Gonthier and Harris, 1975). A steep headwater topography of 15 to 35 percent contributes to rapid runoff rates. The slope in the lower and mid reaches varies from 0 to 3 percent (U.S. Department of Agriculture, Soil Conservation Service, 1988).

Riparian and water storage capabilities in the upper Wildhorse Creek Watershed have been impacted from past timber harvest practices. Mid and low elevation lands are characterized by dryland crop farming, livestock grazing and residential use. Poor land use practices have significantly impacted upland vegetation communities, reduced riparian vegetation, degraded water quality, and diminished water table elevations and instream flows. Lack of conservation farming practices, such as strip cropping, terrace systems and grass waterways, are common problems in mid and lower watershed areas. Overgrazing of livestock and absence of pasture rotation plans have contributed to poor water quality and loss of flood plain function. The communities of Athena and Adams, county and state highway departments and the Union Pacific Railroad have constrained the mainstem stream channel, resulting in downcutting, loss of flood plain function and water quality

impacts.

A map of the Umatilla River, Meacham Creek, Boston Canyon Creek and Wildhorse Creek project areas is illustrated in Figure 1.

METHODS AND MATERIALS

Objective I. Maintain and Continue Implementation of Habitat Enhancement Projects throughout the Umatilla River Watershed.

1.Pre-construction Preparation:

a.Assess Maintenance Needs

The physical condition of all improvements and general stream hydraulics were evaluated in the Meacham Creek, Boston Canyon Creek and Umatilla River project areas in late May 1994, following spring high flow events, to evaluate effectiveness and prescribe improvements and maintenance to occur in the summer 1994 as needed.

b.BIA Right-of-Way Clearances and CTUIR Riparian Easements

The Bureau of Indian Affairs (BIA) requires a land survey of designated project area boundaries and the acquisition of a right-of-way agreement on private, tribally owned Reservation properties (trust lands), prior to pursual of an easement. These agreements require considerable effort and landowner coordination.

Fifteen year riparian easements were pursued and developed for habitat implementation activities on Reservation trust lands in the Meacham Creek Drainage and on non-Indian owned properties on Wildhorse Creek outside of Reservation Boundaries. An attempt was made to address landowner needs (livestock water gaps, stream crossing sites, etc.) and incorporate these needs into the final project design. Riparian easements protect habitat improvements and insure a fifteen year recovery period within project areas. Some easements developed during the 1994 - 95 work period will not be implemented on the ground until the 1995 - 96 work period.

c.Project Cost Share

Grant applications were submitted to various entities for cost share and technical assistance with 1994 habitat improvement projects. These efforts effectively forge partnerships between resource agencies and the public and allow Bonneville Power Administration (BPA) funds to go further.

d.Fill and Removal Permits

Instream work activities on the Umatilla Indian Reservation require obtainment of a Tribal Stream Zone Alteration Permit and a U.S. Army Corps of Engineer's (COE) 404 Permit. Instream work activities off of the reservation generally require a General Authorization for Fish Habitat Enhancement Permit from the Oregon Division of State Lands (ODSL) in addition to a COE 404 Permit. Applications for these permits should be completed and returned to the respective agencies a minimum of 90 days prior to anticipated instream work. Permitted instream work activities in the Umatilla River Basin are restricted to an instream work period. The instream work period is based upon when migrating and spawning salmonids are least likely to be impacted by fill and removal activities. This work window varies throughout the basin. Instream Fill and Removal Permits for 1994 - 95 habitat

improvement projects were applied for in March 1994, during the 1993 - 94 funding period.

e.On-site Cultural/Archeological Monitoring

All habitat improvement projects involving ground disturbance (high tensile fence construction, instream structures keyed into streambanks, etc.) either on or off the Reservation require a cultural resource clearance, prior to project implementation. CTUIR's Cultural Resource Staff conduct file and literature searches, pedestrian surveys and/or archeological excavations on habitat improvement sites involving ground disturbance activities to determine if cultural resources potentially eligible for inclusion to the National Register of Historic Places are present on the site. Final reports documenting their findings are prepared and submitted to the BIA Umatilla Agency Real Property Management Office (for implementation efforts on the Reservation) and to the State Historic Preservation Office (for implementation efforts, both on and off the Reservation). All cultural clearances are obtained in compliance with Section 106 of the National Historic Preservation Act.

f.Design and Layout

Design and layout of new habitat enhancement projects and existing project areas consisted of determining the quantity and type of materials required to build or repair fence and instream structures and develop heavy equipment access sites, haul roads and boulder/gravel storage sites. Instream structure sites and streambank areas were staked and flagged to provide assistance to the heavy equipment contractor.

g.Contracts

Proposed implementation activities requiring rental of heavy construction equipment were advertised and pre-bid tours provided to potential sub-contractors. A notice to proceed was issued in writing to the selected sub-contractor, and a sub-contract was developed to implement these improvements.

h.High Tensile Fence Materials Purchase

High tensile fence construction materials were purchased for installation of riparian corridor fences. Fence materials were also purchased and stockpiled for implementation activities to occur in the 1995 - 96 project period.

i.Native Grasses, Legumes, Riparian Shrubs and Trees

The CTUIR Habitat Enhancement Project practices and promotes the utilization of "native" plant species for ecosystem restoration. Native plants are acclimated to the local climate, provide natural forage for wildlife and are much more resistent to the area's disease and insect problems. Studies have found that exotic species may outcompete and displace native riparian vegetation (Gordon et al., 1993). The planting of exotic species may also introduce

foreign organic matter into the ecosystem and change the timing and rate of processing of the material (Campbell et al., 1990).

An effort should always be made to locally acquire indigenous tree and shrub species. Native tree species obtained from other localities may not have the long-term ability to survive and reproduce because the environment may be different from their place of origin. There may also be concerns about pollution of the gene pool of existing plant populations when non-local plants are introduced to a site (Lambert et al., 1995). The majority of native trees and shrubs planted in the Wildhorse Creek Project Area were cuttings gathered locally by CTUIR Salmon Corps' participants. However, not all native tree and shrub species could be readily obtained in the local area. Additional trees and shrubs grown at similar elevations as the Wildhorse Creek Project Site were purchased from nurseries in Eastern Idaho and Washington. Native grass seed/legumes and close replicates of native grass seed/legumes were also unavailable locally and had to be purchased from Grassland West Seed Company in Clarkston, Washington.

j.Transect and Photo Point Establishment

Permanent transects were established at channel cross sections in the Wildhorse Creek Project Area, prior to project implementation to obtain baseline data regarding channel morphology and riparian vegetation. These measurements will be repeated annually the first five years following initial implementation and will be repeated at 3-5 year intervals thereafter.

Permanent photo points were established, prior to project implementation in conjunction with the permanent transects. Standardized photos will be taken each autumn to provide a visual record of changes in channel morphology and riparian recovery.

2.Maintain and Implement Habitat Enhancements:

a.Rock Delivery

Diced rock was purchased and delivered to the Wildhorse Creek Project Area for construction of instream sediment retention structures.

b.Contractor Supplies and Materials

CTUIR furnished high tensile fence materials to the fence subcontractor for construction of riparian corridor fencing between RM 9.5 and RM 10.5 Wildhorse Creek.

c.Sediment Retention Structures

Sediment retention structures (check dams) were placed into the stream channel and keyed into

adjacent streambanks in the Wildhorse Creek Project Area. The sediment retention structures are designed to assist in speeding riparian recovery by slowing water velocities, recruiting sediments and depositing sediments onto streambanks to provide substrate for revegetation.

d.Instream and Bank Stabilization Maintenance

CTUIR Habitat Enhancement Project Personnel routinely perform structural maintenance activities in project areas. Structures are periodically hilti cabled to increase stability and ensure long-term structural integrity. Logs recruited into the stream channels are cabled to boulders and structures to provide instream cover for salmonids and to assist in rebuilding streambanks by slowing water velocities and capturing sediment deposits.

e.Livestock Exclusion and Riparian Corridor Fencing

Smooth wire high tensile fences were constructed to exclude livestock and provide riparian protection and recovery. These fences can be installed in such a manner that multiple pastures can be developed in flood plain areas to reduce grazing intensity and assist the landowner in developing rest/rotation grazing systems. The initial short-term cost of constructing this type of fencing is quite expensive. However, long-term maintenance costs remain low and the fence has proven to be much more "user friendly" to wildlife than other types of fencing.

High tensile corridor fencing, gates and cross section fences in existing Meacham Creek, Boston Canyon Creek and Umatilla River project areas were repaired as needed. Frequent fence inspections were conducted throughout the project period to ensure continued exclusion of livestock and to allow for continued riparian recovery inside of project areas.

f.Construction Activities - Project Review and Inspection

Prior to commencement of a sub-contract, the sub-contractor meets with CTUIR Habitat Enhancement Project Personnel to discuss sub-contract terms and work performance requirements, work progress schedule, petroleum spill plans and fire prevention and suppression plans.

The sub-contractor provides and maintains an inspection system acceptable to the CTUIR covering the services under the sub-contract. Complete records of all inspection work performed by the sub-contractor are maintained and made available to the CTUIR during sub-contract performance and for as long afterwards as the sub-contract requires.

Equipment is inspected at the time it is delivered to the worksite. Equipment must be in good working condition, free from excessive leaks in hydraulic, fuel and power systems and clean enough to allow close inspection of these systems. Equipment that does not meet sub-contract specifications and requirements is rejected.

CTUIR Habitat Enhancement Project Personnel monitor the sub-contractor's progress and photo document various stages of project implementation.

g.Revegetation

Native riparian tree and shrub species were planted along toe dikes, bank revetment structures, sediment retention structures and pool edges throughout enhancement areas to improve bank stability, provide insect drop, shade the stream channel and provide future recruitable large woody debris. Streambanks, terraces and disturbed sites within the project areas were seeded with native grasses/legumes and close equivalents of native grasses/legumes to improve bank stability and to provide vertical surfaces to capture and retain sediments during high flow events.

3.Post-construction Activities and Habitat Enhancement Monitoring:

a.Post-construction Final Review

CTUIR Habitat Enhancement Project Personnel visit implementation sites immediately following final construction as indicated by the sub-contractor. Sub-contracted services are inspected to determine whether they conform with sub-contact requirements. If the sub-contract services are not accepted, CTUIR may require the sub-contractor to perform the services again in conformity with the sub-contract requirements.

b.Transect Measurements and Photo Point Monitoring

CTUIR established 42 permanent transects at channel cross sections to measure changes in channel morphology and vegetative response to habitat enhancements in the lower Meacham Creek and Umatilla River project areas, prior to project implementation. These measurements were repeated annually the first five years following initial construction activities and will be repeated at 3-5 year intervals thereafter.

Permanent photo points were established prior to project implementation in conjunction with the 42 permanent transects. Standardized photos continue to be taken each autumn to provide a visual record of changes in channel morphology and riparian recovery. A photo point notebook containing 35 mm slides of annual changes at each photo point is currently maintained by the CTUIR Fisheries Habitat Enhancement Project.

c.Physical Condition of Improvements and General Stream Hydraulics

The physical condition of all improvements and general stream hydraulics were evaluated following spring 1995 high flow events to evaluate effectiveness and prescribe improvements and maintenance to occur in the summer 1995 (1995 - 96 work period) as needed.

Objective II. Collect Baseline Water Quality Data and Continue Post-project Monitoring to Identify Watershed Health Concerns and to Quantify the Short and Long-Term Effects of Habitat Enhancement Activities in the Umatilla River Basin.

1. Determine Existing Land Use Practices Impacting Salmon and Steelhead Habitat Capability:

a. Identification of Major Land Use Practices

Past and present land use practices (dryland agriculture, irrigated agriculture, grazing, timber harvest, community developments, roads and railroads, etc.) within major subbasins of the Umatilla River Watershed continued to be identified during the project period. A data layer based on this theme is being developed for a GIS data base. Individual land use practices are currently being mapped by area. This effort is being coordinated with the CTUIR GIS Planning Staff.

b. Identification of Site Specific Detrimental Land Use Practices

Areas where poor land use practices have altered natural floodplain dynamics and significantly reduced or eliminated critical fisheries habitat continued to be identified. These practices include improper tillage methods, overgrazing, overharvest of timber, floodplain encroachment due to development, stream channel constrainment and downcutting from road and railroad building and maintenance activities, etc. Problem areas are being assigned a rating of poor, fair and good and this information is being incorporated into a data layer for a GIS data base. Maps of major subbasins are being developed illustrating where these problem areas occur. Areas throughout the watershed, which are determined to have poor quality habitat, will be targeted for future habitat enhancement projects. This effort is being coordinated with NRCS and the CTUIR GIS Planning Staff.

2. Fish Habitat Surveys:

CTUIR-DNR Fisheries Habitat Enhancement Personnel coordinated with the CTUIR UBNPME Project to conduct physical habitat surveys during the 1994 field season. Data collection methods developed by the ODFW Aquatic Inventory Program were utilized to sample various habitat parameters. Sufficient surveys continued to be conducted to characterize habitat quality and quantify various habitat types by area in the surveyed stream reaches. This information should prove useful in identification of habitat deficient areas within the watershed in which to focus habitat restoration efforts. The UBNPME Staff conducted biological inventories in conjunction with the physical surveys. These surveys assist in determining the relations of anadromous fish habitat and abundance in different types of stream channels from a total basin perspective. Physical habitat and biological inventory summaries compiled from the 1994 field season will be published in the 1993 - 94 UBNPME Annual Progress Report.

3. Riparian Vegetation Sampling:

CTUIR Habitat Enhancement Project Personnel met with the CTUIR Botanist to discuss various riparian vegetation sampling methods and the potential development of a monitoring program to comparatively measure vegetative response in enhanced versus unenhanced stream corridors.

4.Aquatic Macroinvertebrate Sampling:

CTUIR Habitat Enhancement Project Personnel contacted other resource agencies in the Umatilla River Basin to determine which agencies were sampling macroinvertebrate populations and to identify sampling sites. This information assisted the CTUIR Habitat Enhancement Project in establishing a sampling plan to comparatively monitor macroinvertebrates within enhancement areas and in adjacent unenhanced stream reaches.

5.Water Quality Sampling:

CTUIR Habitat Enhancement Project Personnel contacted other resource agencies in the basin to determine which agencies were monitoring various water quality parameters, such as acidity, alkalinity, carbon dioxide, chloride, dissolved oxygen, hardness, nitrite and pH. The purpose of this effort was to determine the need for a coordinated, basin wide water quality sampling effort.

6.Water Temperature Monitoring:

Ryan Tempmentor Thermographs were deployed within selected stream reaches (see Figure 2) in the upper Umatilla River Watershed. Several of these instruments were installed upstream, downstream and/or within project areas in Meacham Creek and the upper Umatilla River to monitor the effectiveness of habitat improvements on water temperature cooling. The remaining thermographs were installed in Wildhorse Creek, Buckaroo Creek, Squaw Creek and at RM 56 Umatilla River to obtain data on potential habitat limiting factors and existing water quality conditions. Two additional thermograph sampling sites were identified during the 1994 - 95 project period. These sites include RM 3.5 Mission Creek and the lower project area in Wildhorse Creek at RM 9.5.

Thermographs were deployed in the winter of 1993 - 94 and the fall of 1994. Thermographs were recovered and downloaded into a computer program in November 1994 and May 1995. The thermographs collected one temperature reading per hour. Maximum, minimum and average daily water temperatures were compiled in tabular form. Water temperatures were graphed during critical warmer months (June, July, and August) to determine if temperatures were reached which could prove detrimental to salmonids.

Figure 2. Thermograph Locations 1994-95 Project Period

Location
1.Umatilla River - RM 56 @ West Reservation Boundary
2.Umatilla River - RM 78.5 (downstream mouth of Meacham Creek)
3.Umatilla River - RM 79 (upstream mouth of Meacham Creek)
4.Umatilla River - RM 81.7 @ USGS Gage Station No. 14020000 (East Reservation Boundary)
5.Wildhorse Creek - RM 0 at confluence with Umatilla River
6.Wildhorse Creek - RM 26
7.Buckaroo Creek - RM 2
8.Squaw Creek - RM 2
9.Squaw Creek - RM 9 @ Little Squaw Creek confluence
10.Meacham Creek - RM 2 @ USGS Gage Station No. 14020300
11.Meacham Creek - RM 5.25 @ East Reservation Boundary

7.Suspended Sediment Monitoring:

Three Isco Model 2700 Wastewater Samplers were deployed to obtain estimates of suspended sediments. These sampling sites include RM 81.7 Umatilla River, RM 56 Umatilla River and RM 2 Meacham Creek. These sampling sites were located at or near thermographs and gage stations (see Figure 3 for gage station agency and identification numbers).

Samples were taken year round at 6 hour intervals to create a composite daily sample. The samples were processed monthly by Umatilla National Forest Service Personnel at the U.S. Forest Service (USFS) Lab in Pendleton, Oregon to determine Jackson Turbidity Units, conductivity and total dissolved solids. CTUIR staff correlated suspended sediment data with stream flow data collected from the adjacent gage stations to arrive at daily sediment loads (tons/day) estimates.

A Hach 2100P portable turbidimeter was purchased to measure turbidity levels in the Wildhorse Creek Project Area. Due to the lack of a stream gage station on Wildhorse Creek, an ISCO Sampler cannot be utilized on the stream at this time.

Figure 3.Suspended Sediment Monitoring Sites 1994 Annual Year
Location
Umatilla River - RM 56 @ West Reservation Boundary

Umatilla River - RM 81.7 @ USGS Gage Station No. 14020000 (East Reservation Boundary)
Meacham Creek - RM 2 @ USGS Gage Station No. 14020300

Objective III:<u>Continue Watershed Planning/Scoping/Education Process by Identifying Problems and Developing Creative Solutions to Land Use Problems Impacting Fisheries Habitat in the Umatilla River Basin:</u>

1.Community Outreach Effort:

An extensive outreach effort at the local community level continued to be conducted throughout the 1994 - 95 project period to identify interested individuals, special interest groups and agencies and encourage their involvement for scoping of issues, identification of opportunities and development of mitigation efforts. This educational effort involved distribution of habitat/watershed literature, attending public and agency meetings to promote watershed restoration efforts and providing presentations to the public and special interest groups. Such activities serve to increase public awareness of habitat and watershed health issues in the Umatilla River Basin and foster landowner cooperation regarding habitat restoration efforts.

2.Scoping Groups:

The CTUIR Habitat Enhancement Project continued to meet with scoping groups comprised of local landowners, sportsman clubs, special interest groups and resource agencies in the upper Umatilla River Watershed (upstream of Mission, Oregon) and the Wildhorse Creek Watershed to assist in identification of problems and to develop long term innovative methods of improving land use practices impacting fisheries habitat. Scoping group input was documented.

3.Wildhorse Creek Demonstration Project:

A habitat enhancement project was implemented between RM 9.5 and RM 10.5 on Wildhorse Creek. Habitat improvements included placement of instream sediment retention structures, riparian corridor fencing and native revegetation. The project site is located in a highly visible area between Oregon State Highway 11 and Umatilla County Road 425. The purpose of the project is to recover the riparian corridor, demonstrate the benefits of naturally functioning flood plain and wetland functions and to promote landowner participation. BPA funds were cost shared with BIA monies to accomplish this effort.

4.Public Educational Opportunities:

The CTUIR Habitat Enhancement Project sponsored workshops, provided riparian improvement training opportunities and provided tours of habitat enhancement project areas to interested public and resource agency personnel throughout the 1994 - 95 project period.

5.Public Monitoring Programs:

The CTUIR Habitat Enhancement Project coordinated with other resource agencies and environmental groups to promote citizen involvement and commitment to watershed health by encouraging the development of community stream monitoring programs.

6.Educational Brochure:

Development of a brochure to highlight successful CTUIR riparian enhancements in the Umatilla River Basin was started during the 1994 - 95 project period. Upon completion, this information will be dispersed to the public at educational functions to promote watershed and habitat restoration efforts.

7.Watershed Library:

Development of a watershed library containing reference materials (brochures, books and videos) to give or loan to the public was started during the project period to promote landowner education on habitat enhancement needs and methodologies.

Objective IV.<u>Pursue Alternative Management Methods to Mitigate Impacts from Past and Ongoing Land Management Activities:</u>

1.Acquisition Land/Management Rights:

An attempt was made to identify properties available for purchase, containing significant reaches of high quality or potentially high quality anadromous salmonid habitat in the Umatilla River Basin, and explore funding opportunities for land acquisition. Properties purchased will be restored as needed and/or protective management measures implemented.

Management rights, including water rights, timber rights and grazing rights, can also be acquired to provide adequate fisheries habitat protection. Purchase of management rights would restrict landowners from various land use activities over a period of time. The term of an agreement is dependent upon the current habitat condition of the site being protected and the desired future condition.

RESULTS AND DISCUSSION

Objective I. Maintain and Continue Implementation of Habitat Enhancement Projects throughout the Umatilla River Watershed.

1. Pre-construction Preparation:

a. Assess Maintenance Needs

The physical condition and structural integrity of improvements within Meacham Creek, Boston Canyon Creek and Umatilla River project areas was evaluated following spring 1994 high flow events. Due to a relatively mild winter, it was determined that sub-contracts would not be developed for instream structure and high tensile fence maintenance in the 1994 work season. These project areas have now had 3 to 5 years of rapid riparian recovery. Future

maintenance activities will most likely be limited to fence repair and opportunistic instream placement of available large woody debris.

b.BIA Right-of-Way Clearances and CTUIR Riparian Easements

CTUIR hired a sub-contractor to survey property lines and proposed right-of-way areas (designated flood plain areas to be enclosed with high tensile fencing) to satisfy BIA requirements on Indian allotments 1232 and 1138 on Meacham Creek during the 1993 - 94 project period. Maps developed from these surveys were presented to the BIA Umatilla Agency Real Property Management Office for property appraisal (value of the area to be enclosed in fencing) in June 1994. The BIA granted CTUIR 15 year riparian easements for allotments 1232 and 1138 on March 10, 1995.

These properties are located between RM 4.25 and RM 4.75 Meacham Creek. Allotment 1232 is owned by Mrs. Merna Tovey, Mr. Emmet Williams (Estate), Ms. Fawn Williams and Mrs. Kathy Williams. Allotment 1138 is owned by Mrs. Cecelia Bearchum, Ms. Brenda Bearchum, Mrs. Theresa Johnson and Mrs. Eleanor Houle. These individuals are very interested and supportive of implementing habitat improvements on their respective properties. Inclusion of these properties into the project area will provide nearly full coverage of lower Meacham Creek corridor areas on the Reservation with the exception of three small properties where the landowners have been unwilling to participate.

CTUIR Habitat Enhancement Project Personnel also pursued development of a riparian easement for a property located between RM 4.75 and RM 6 on Meacham Creek. This property straddles the East Reservation Boundary just upstream of allotments 1232 and 1138. The landowner was not receptive to signing a fifteen year riparian easement at this time, due to concerns regarding exclusion of livestock and unavailable forage. The property is being leased to a local cattleman. However, the landowner is currently participating in several fifteen year riparian easements with CTUIR and has indicated that she may be willing to exclude livestock from this property in the future.

CTUIR pursued development of three riparian easements on Wildhorse Creek during the project period. CTUIR entered into a fifteen year riparian easement with Mr. Melvin Schmidtgall and Mr. Robert Miller (S&M Farming Company), Mrs. Terry Schmidtgall, Mrs. Janet Miller, Mrs. Lynn Walker and Ms. Virginia Whitacre on October 24, 1994 for improvement of the riparian corridor between RM 9.5 and RM 10.25 Wildhorse Creek. A fifteen year riparian easement was entered into on November 4, 1994 between CTUIR, Mr. Samuel Haynes and Mrs. Frances Myers for improvement of the stream corridor area between RM 10.25 and RM 10.5. CTUIR also attempted to develop a fifteen year riparian easement on a property located between RM 10.5 and RM 11 Wildhorse Creek. The property owner was very receptive to CTUIR's proposed habitat enhancements. However, he is currently grazing horses on the property and was unwilling to reach an agreement with CTUIR on an acceptable corridor width. Due to concerns regarding potential fence failure and maintenance liability, CTUIR chose not to develop an agreement with this particular

individual at this time.

c.Project Cost Share

CTUIR prepared a Partners for Wildlife Habitat Restoration Grant Proposal and submitted it to the U.S. Fish & Wildlife Service (USFWS) during the project period. This effort resulted in a $10,000 grant being awarded to CTUIR on August 26, 1994. These monies will be cost shared with BPA funds to construct a high tensile riparian fence on Wildhorse Creek properties during the 1995 - 96 work period.

BPA funds were cost shared with BIA funds to construct a smooth wire high tensile fence between RM 9.5 and PM 10.5 Wildhorse Creek during the project period. BPA funds were used to purchase fence materials, while BIA monies paid for sub-contracted services.

A grant proposal was also submitted to the Governor's Watershed Enhancement Board (GWEB) for habitat restoration efforts on Wildhorse Creek. CTUIR was unsuccessful in obtaining the requested funds.

d.Fill and Removal Permits

Instream fill/removal permit applications for the placement of gravel sediment retention structures between RM 9.5 to RM 12 Wildhorse Creek were completed and submitted to the COE and ODSL for permit obtainment during the 1993 - 94 project period. CTUIR received a General Authorization for Fish Habitat Enhancement from ODSL on June 2, 1994 and a 404 Permit from COE on August 15, 1994 authorizing these instream activities.

e.On-site Cultural/Archaeological Monitoring

The CTUIR Cultural Resource Staff conducted pedestrian surveys in proposed habitat enhancement project areas to determine if cultural resources potentially eligible for inclusion to the National Register of Historic Places were present on the sites. These surveys were required prior to project implementation. A pedestrian inventory conducted between RM 9.5 and RM 12 Wildhorse Creek on October 18, 1994 failed to find any prehistoric or historic cultural materials eligible for inclusion to the National Register. A cultural resource monitor was present on the site during placement of instream sediment retention structures to monitor ground disturbing activities.

A pedestrian survey was conducted on March 8, 1995 to determine if installation of a high tensile fence line between RM 4.25 and RM 6 Meacham Creek would potentially impact cultural resources. Several historic properties have been recorded within the proposed project area in the past. The CTUIR Cultural Resources Staff determined that a riparian corridor fence would have no adverse impacts on cultural resources in the area and would aid in protecting historic properties located within the proposed fence boundaries from further disturbances.

Final reports documenting these findings were prepared and submitted to the BIA Umatilla Agency Real Property Management Office (for Meacham Creek properties on the Reservation) and to the State Historic Preservation Office (for all properties surveyed).

f.Design and Layout

Proposed riparian corridor fence lines and fence structure locations were staked between RM 4.25 and RM 4.75 Meacham Creek and between RM 9.5 and RM 10.5 Wildhorse Creek to aid the fence subcontractor. Instream structure locations were staked within the Wildhorse Creek Project Area to provide site assistance to the heavy equipment operator. Diced rock varying from 2 to 20 inches in diameter was delivered to the Wildhorse Creek Project Area for construction of sediment retention structures and to be stockpiled for repair of these structures during the 1995 - 96 project period.

g.Contracts

An 11 day heavy equipment sub-contract was issued to Pioneer Construction, Inc. on October 17, 1994 for placement of instream sediment retention structures in the Wildhorse Creek Project Area. Pioneer Construction, Inc. completed all contracted services within a 2 day period.

A fence sub-contract for installation of 1.4 miles of high tensile fence line and placement of 0.43 miles of fence posts and structures on Wildhorse Creek was funded with BIA monies.

h.High Tensile Fence Materials Purchase

Pressure treated, pointed and capped fence posts, tamarack fence stays, high tensile wire and miscellaneous fence hardware were purchased to maintain and/or construct riparian fence lines on the Umatilla River, Meacham Creek and Wildhorse Creek during the project period and in the 1995 - 96 project period.

i.Native Grasses, Legumes, Riparian Shrubs and Trees

Approximately 4,000 native trees and shrubs were purchased or gathered for planting in the Wildhorse Creek Project Area. Bareroot trees purchased included the following: 450 black cottonwoods, 400 red osier dogwoods, 200 serviceberries and 100 chokecherries. All bareroot trees and shrubs were purchased from Plants of the Wild in Tekoa, Washington and Clifty View Nursery in Bonners Ferry, Idaho. An additional 2,800 to 3,000 black cottonwood, red osier dogwood and willow (various species) cuttings were gathered locally by CTUIR Salmon Corps participants.

Grass seed was purchased from Pendleton Grain Growers and Grassland West Seed Company in Clarkston, Washington. One hundred and fifty pounds of annual rye was purchased to seed streambank areas disturbed by heavy equipment in the Wildhorse Creek Project Area. Two hundred and seventy-five pounds of native grass seed and native grass seed equivalents were

purchased to seed riparian corridor areas in the Wildhorse Creek Project Area. This seed mix contained 40% western wheatgrass, 25% sand dropseed, 18% great basin wildrye and 17% sherman big bluegrass. One hundred pounds of native grass seed and native grass seed equivalents were purchased to seed terraces and dry sites in the Wildhorse Creek Project Area. This seed mix included 36% Indian ricegrass, 36% western wheatgrass, 12% great basin wildrye, 9% sand dropseed and 6% sherman big bluegrass. Twenty-five pounds of tufted hairgrass was purchased to seed sediment retention structures and channel margins in the Wildhorse Creek Project Area. Two hundred pounds of native grass seed and native grass/legume seed equivalents were purchased to seed riparian corridor areas in the Meacham Creek Project Area. This seed mix contained 33% alsike clover, 17% sodar streambank wheatgrass, 17% sheep fescue, 17% cicer milkvetch and 16% mountain brome. One hundred pounds of native grass seed and native grass/legume seed equivalents were purchased to seed terraces and dry sites in the Meacham Creek Project Area. This seed mix included 23% yellow sweetclover, 16% bluebunch wheatgrass, 16% western wheatgrass, 15% mountain brome, 15% sheep fescue and 15% canby bluegrass.

An additional 269 lbs of native grass seed was purchased with BIA funds to seed riparian corridor areas, terraces and pastures in the Wildhorse Creek Project Area.

j.Transect and Photo Point Establishment

Transects were established at 14 channel cross section sites between RM 9.5 and RM 10.5 in the Wildhorse Creek Project Area to obtain baseline data regarding channel morphology and riparian vegetation, prior to project implementation. These measurements will be repeated annually for a five year period and will be repeated at three to five year intervals thereafter.

Permanent photo points were established in conjunction with the transects. Slides were taken at the 14 transect sites to document pre-project conditions. Slides will continue to be taken each autumn to provide a visual record of changes in channel morphology and riparian recovery.

2.Maintain and Implement Habitat Enhancements:

a.Rock Delivery

Pioneer Construction, Inc. delivered 360 cubic yards of diced rock varying from 2 to 12 inches in diameter to the Wildhorse Creek Project Area for construction of instream sediment retention structures in late October 1994. Shockman Brothers Company delivered an additional 222 cubic yards of diced rock varying from 2 to 20 inches in diameter to the Wildhorse Creek Project Site in February 1995. This rock was stockpiled at the project site where it will be used for repair of sediment retention structures during the 1995 - 96 project period.

b.Contractor Supplies and Materials

CTUIR supplied high tensile fence materials to the fence contractor for construction of two miles (one stream mile) of riparian corridor fence line in the Wildhorse Creek project Area.

c.Sediment Retention Structures

Eighteen sediment retention structures (check dams) were placed into the stream channel between RM 9.5 and RM 10.25 Wildhorse Creek. The sediment retention structures were designed by Ed Calame, Hydrological Technician, with the Umatilla National Forest. Each structure consists of approximately 18 to 20 cubic yards of diced rock varying from 2 to 12 inches in diameter. The structures were placed throughout the length of the project, so that there is one structure per each one foot rise in stream bed gradient from the upper to lower pool to create a back water and allow for sufficient fish passage. The structures have an 8:2 slope of repose and are keyed into adjacent streambanks. The structures are approximately 12 feet in length.

The sediment structures were effective in capturing sediment loads and depositing sediments onto streambanks during 1994 - 95 high flow events. Sediment bars, which formed on streambanks upstream of the structures, were seeded with native grasses and planted with trees and shrubs. Structural maintenance will be performed during the 1995 - 96 project period.

d.Instream and Bank Stabilization Maintenance

CTUIR Habitat Enhancement Project Personnel hilti cabled existing bank and instream structures, following spring 1994 high flow events, in the Meacham Creek, Boston Canyon Creek and Umatilla River project areas to increase stability and long-term structural integrity. Logs recruited into the stream channels during high flow periods were cabled to boulders and structures to provide instream cover for salmon and steelhead and to assist in rebuilding streambanks by slowing water velocities and capturing sediments for substrate.

e.Livestock Exclusion and Riparian Corridor Fencing

A high tensile smooth wire fence was installed between RM 9.5 and RM 10.25 Wildhorse Creek to exclude cattle from the riparian corridor. Two livestock water gaps/equipment crossings were included in the fence design and four multiple pastures created in surrounding floodplain areas. Fence posts and structures were constructed between RM 10.25 and RM 10.5 Wildhorse Creek. Smooth wire will be installed on this property during the 1995 -96 project period, following placement of sediment retention structures in the stream channel.

Minor fence repair was performed by CTUIR Habitat Enhancement Project Personnel in the Meacham Creek, Boston Canyon Creek and Umatilla River project areas.

f.Construction Activities - Project Review and Inspection

CTUIR Habitat Enhancement Project Personnel met with Pioneer Construction Inc., prior to

placement of instream sediment retention structures, to discuss sub-contract terms and work performance requirements, work progress schedule, petroleum spill plans and fire prevention and suppression plans.

Equipment was inspected at the Wildhorse Creek Project Site by CTUIR Habitat Enhancement Project Personnel and determined to be in good working order, free from excessive leaks in hydraulic, fuel and power systems. Pioneer Construction, Inc. maintained a daily equipment inspection log and work progress schedule.

CTUIR Habitat Enhancement Project Personnel photo documented various stages of project implementation.

g.Revegetation

CTUIR Salmon Corps participants, Blue Mountain Chapter of Trout Unlimited volunteers and other local volunteers assisted the CTUIR Habitat Enhancement Project in planting approximately 4,000 native trees and shrubs throughout the Wildhorse Creek Project Area. Dibble bars were utilized to plant bareroot trees and tools fabricated from 1/2-inch rebar were used to plant cuttings. Trees and shrubs were planted in November, March and April of the project period.

Willow cuttings were periodically planted in the Meacham Creek Project Area throughout the 1994 - 95 work period. No intensive tree planting efforts were undertaken in this area due to high natural recovery rates of alder and willow species in the riparian corridor.

Streambanks in the Wildhorse Creek Project Area disturbed from heavy equipment were seeded with annual rye immediately following placement of sediment retention structures to slow potential erosion during the winter months. The Wildhorse Creek and Meacham Creek project areas were seeded with native grass and legume mixes or close equivalents in March and April of the project period to assist in stream channel stability and filtering of sediments during high flow periods. Sediment retention structures in the Wildhorse Creek Project Area will be seeded with tufted hair grass during the summer of 1995 to assist in stabilization of these structures.

Umatilla County Weed Control addressed noxious weed problems in the Meacham Creek, Boston Canyon Creek and Umatilla River project areas on two occasions during the project period. Sub-contract funds were not required to treat noxious weeds on these Reservation properties. Umatilla County Weed Control treated noxious weeds in the Wildhorse Creek Project Area in April 1995 and will treat this area again during the summer of 1995. These sub-contracted activities are currently being funded with BIA funds.

3.Post-construction Activities and Habitat Enhancement Monitoring:

a.Post-construction Final Review

CTUIR Habitat Enhancement Project Personnel inspected final construction of sediment retention structures in the Wildhorse Creek Project Area and determined that services performed were consistent with the sub-contract requirements.

b.Transect Measurements and Photo Point Monitoring

Stream channel cross sections were not measured at established transect sites in the Meacham Creek, Boston Canyon Creek and Umatilla River project areas. These cross sections are not scheduled to be measured again until the 1996 - 97 work period.

Slides continued to be taken at all 42 photo point locations within the Boston Canyon Creek, Meacham Creek and Umatilla River project areas to document project recovery and to provide a visual record of annual changes within the floodplain. Photographs indicate an upward, downward, or static trend in woody vegetation, streambank stability and cover (Meyers, 1987). However, initial vegetation "expression", obvious in photographs, should not be confused with vegetation "succession" required for stream ecosystem health (Elmore and Beschta, 1987).

c.Physical Condition of Improvements and General Stream Hydraulics

The physical condition and structural integrity of improvements within project areas was evaluated following spring 1995 high flow events. It was determined that repair and maintenance of sediment retention structures in the Wildhorse Creek Project Area would be required in the 1995 - 96 project period. Larger, better quality rock up to 20 inches in diameter will be incorporated into the sediment retention structures during the summer of 1995 to improve structural integrity and to prevent future structural failure. It was determined that high tensile fence maintenance sub-contracts would not need to be developed for the 1995 - 96 project period.

Objective II.Collect Baseline Water Quality Data and Continue Post-project Monitoring to Identify Watershed Health Concerns and to Quantify the Short and Long-Term Effects of Habitat Enhancement Activities in the Umatilla River Basin.

1.Determine Existing Land Use Practices Impacting Salmon and Steelhead Habitat Capability:

a.Identification of Major Land Use Practices

CTUIR Habitat Enhancement Project Personnel continued to gather historical and current land use data regarding the Mission Creek Subbasin and developed a data layer based on current land use practices for a GIS data base.

b.Identification of Site Specific Detrimental Land Use Practices

CTUIR Habitat Enhancement Project Personnel continued to coordinate with the CTUIR Water Resources Program and NRCS Conservationists, Bob Adelman and Lisa Greber, to identify poor land use practices impacting fisheries habitat in the Mission Creek Subbasin. Identified poor land use practices are currently being incorporated into a GIS data layer for a GIS data base.

2.Fish Habitat Surveys:

Physical habitat surveys were coordinated with and conducted by the CTUIR UBNPME Project on 39.4 stream miles in the Umatilla River Basin. Streams surveyed included RM 56.1 to RM 81.8 Umatilla River, Squaw Creek, Camp Creek and an unnamed tributary on Camp Creek. The UBNPME Project conducted biological inventories in conjunction with the physical surveys. Physical habitat and biological inventory summaries compiled from the 1994 field season have been published in the 1993 - 94 Umatilla Basin Natural Production Monitoring and Evaluation Annual Progress Report. Habitat survey data will be used to determine habitat deficient areas throughout the watershed in which to focus habitat restoration efforts.

3.Riparian Vegetation Sampling:

A study conducted by the USDA, Soil Conservation Service (1989) found that only two percent of privately owned rangelands in the West are in excellent forage condition. Streams which provide the best conditions for fish are those with dense, vigorous and diverse riparian vegetation (Platts, 1991). Dense vegetation provides shade, energy (nutrients and food) and erosion resistance (Bauer and Burton, 1993). Development of a vegetative monitoring program would be of value in assessing the effects of grazing on riparian vegetation. The dimensions of non-point source impacts from grazing is not well documented. State non-point source reports provided to the U.S. Environmental Protection Agency (EPA) usually combine stream miles affected by grazing in a general category with agriculture (Bauer and Burton, 1993).

CTUIR Habitat Enhancement Project Personnel discussed vegetative sampling methodologies and potential development of a monitoring program with the CTUIR Botanist during the project period. The purpose of such a monitoring program would be to comparatively measure vegetative response in enhanced versus unenhanced stream corridor areas. It was determined that such a program would be beneficial. However, development of a vegetative monitoring program at this time is unrealistic due to limited project personnel and lack of available staff time.

4.Aquatic Macroinvertebrate Sampling:

Macroinvertebrate surveys are an important tool in describing the condition and relative health of the aquatic ecosystem. Macroinvertebrates are components of the aquatic environment that provide a connecting link in the food chain between multicelled periphyton, detritus from terrestrial sources and the fish population. As a food source they are essential to the growth

and production of fish and, because of their strict habitat requirements, are very useful as indicators of changes in aquatic habitat (USDA, Forest Service, 1985).

CTUIR Habitat Enhancement Project Personnel contacted various resource agencies in the Umatilla River Basin to determine which agencies were sampling macroinvertebrates, where sampling was occurring and to identify potential sampling sites. It was discovered that the Umatilla National Forest has sampled macroinvertebrate populations in the past, but no longer conduct these surveys. No other agencies in the basin are currently sampling macroinvertebrates.

The CTUIR Habitat Enhancement Project identified sampling sites upstream, downstream and within CTUIR Habitat Enhancement Project Areas to sample macroinvertebrate populations. Sampling equipment will be purchased during the 1995 - 96 project period. Macroinvertebrate samples will be collected twice a year with initial sampling efforts to begin in the fall of 1995, prior to high flows, and again in the spring of 1996, immediately following high flow events. Samples will be sent to the Bureau of Land Management (BLM) Aquatic Ecosystem Lab in Logan, Utah for processing. Information obtained from the samples should prove useful in providing comparisons between enhanced stream habitat and adjacent unenhanced stream reaches.

5.Water Quality Sampling:

No concerted, consistent or spatially integrated water quality sampling has occurred in the Umatilla River Basin. The only continuous, long term, baseline sampling to occur has been done by the Oregon Department of Environmental Quality (DEQ) at Pendleton (STORET station 402076) and Yoakum (STORET station 402074) from 1960 to the present, and at McKay (STORET station 402767) from 1971 to the present. The parameters sampled include pH, conductivity, turbidity, total solids, suspended solids, nitrate, nitrite, TKN (Total Kjeldhal Nitrogen), ammonia, dissolved oxygen, BID, COD, total phosphorous, chlorophyll a and bacteria (CTUIR, 1994).

Many tributaries in the Umatilla River Basin have one or more water quality parameters out of compliance with state water quality standards according to information accessed from the STORET water quality database (EPA - Region 10) and temperature data collected under this project. Non-point source pollution from agricultural practices appears to be the primary cause of impaired waterways in the Umatilla River Basin. Salmon and trout require high quality waters. Continual degradation of subwatersheds in the basin can seriously impact fisheries populations and in some localities has most likely decimated fish populations.

CTUIR Habitat Enhancement Project Personnel determined that a coordinated, continuous basin wide water quality sampling effort is needed to monitor parameters, such as acidity, alkalinity, carbon dioxide, chloride, dissolved oxygen, hardness, nitrite and pH. The CTUIR Habitat Enhancement Project will rely on the recently developed CTUIR Non-Point Sources of Water Pollution Assessment and Management Plan - Umatilla River Basin for guidance

in addressing water quality concerns. Due to limited project personnel and unavailable staff time, a water quality monitoring program cannot be implemented at this time.

6.Water Temperature Monitoring:

Temperatures in excess of 65 F impair growth and survival in salmonids (USFWS and National Marine Fisheries Service, 1981). Abnormally high temperature conditions during migration can contribute to outbreaks of disease among adult chinook salmon often resulting in prespawning mortality. Temperatures in excess of 68 F have been shown to result in impairment of chinook salmon. High stream temperatures may also stress juvenile steelhead during warm summer months. Temperatures exceeding 73 F result in direct mortality to chinook salmon and steelhead (Bell, 1984).

Thermographs were deployed at ten locations, including two sites on Meacham Creek, two sites on Squaw Creek, one site on Buckaroo Creek, two sites on Wildhorse Creek and four sites on the Umatilla River (see Figure 2 page 13 for river mile locations). Stream temperature data was summarized into tabular form illustrating maximum, minimum and average daily celsius and fahrenheit temperatures during thermograph deployment periods. A binder containing annual water temperature tables is maintained in the CTUIR Habitat Enhancement Project Office. Water temperatures have been graphed during critical warm season months (June, July and August) to determine whether temperatures were reached which could prove detrimental to anadromous salmonids. Graphed data can be viewed in Appendix A.

RM 2 Squaw Creek data, collected in the spring and early summer of 1994, was lost due to a tempmentor being stolen. This resulted in no June temperature data being graphed for this stream reach. However, July through September 1994 temperature data was graphed for RM 2 Squaw Creek. Data collected in the winter and spring of 1994 - 95 at RM 9 Squaw Creek near the confluence with Little Squaw Creek was lost due to the tempmentor being washed away in a late spring high flow event. In addition to the two tempmentors lost during the project period, several others had to be sent to Ryan Instruments for repair. The majority of these instruments are five to six years old and are beginning to require frequent technical repair.

Two Ryan Instrument RTM 2000 Thermographs were purchased for deployment at RM 3.5 Mission Creek and in the lower Wildhorse Creek Project Area at RM 9.5. Initial data will be obtained from these instruments during the 1995 - 96 project period.

Stream temperatures at RM 56 Umatilla River exceeded 80 F, 47 out of 60 days between June 21, 1994 and August 19, 1994. Temperatures at this location exceeded 68 F for 18 to 21 hours per day during this time period and reached a maximum summer temperature of 89.8 F on July 21, 1994. Stream temperatures at RM 78.5 Umatilla River, RM 79 Umatilla River and RM 81.7 Umatilla River frequently exceeded 70 F from mid June through mid August 1994 for two to six hour periods. During these warm months, temperatures in these stream

reaches often exceeded 65 F for 12 to 14 hour periods.

The maximum summer stream temperature at RM 26 Wildhorse Creek was 69.3 F on July 9, 1994. During the summer of 1992, temperatures exceeded 80 F on 25 days between June 19 and August 18 and exceeded 70 F on eight days during the summer of 1993 at this same location. This is an anomaly because there were drought conditions and intermittent flows during the summer of 1994, whereas the summers of 1992 and 1993 where more normal flow years. This cooling trend might be explained due to the presence of a spring at this site. Higher, warmer instream flows might dilute the cooling effect the spring has on this reach during normal flow years. During lower flow conditions, the spring may have more of an influence on stream temperatures obtained at this site.

Stream temperatures obtained at RM 0 Wildhorse Creek were consistent with temperatures recorded in previous years. Temperatures ranged between 5 and 17 F warmer at RM 0 Wildhorse Creek than at RM 26 Wildhorse Creek. Temperatures exceeded 80 F for seven to ten hour daily intervals over a 23 consecutive day period in July 1994 with a maximum summer water temperature of 86.2 F being reached on July 21, 1994.

Stream temperatures at RM 2 Buckaroo Creek exceeded 80 F on five different days in late July and early August. Temperatures in this stream reach frequently exceeded 70 F for four to fourteen hour daily time intervals from mid June into early September 1994.

Stream temperatures often exceeded 70 F for three to four hour intervals at RM 2 Squaw Creek from early July to mid August 1994. Water temperatures recorded at RM 9 Squaw Creek near the confluence with Little Squaw Creek exceeded 70 F from mid June into early September 1994 for three to ten hour time periods.

Maximum stream temperatures were similar between RM 2 Meacham Creek and RM 5.25 Meacham Creek with slightly less of a diurnal flux at RM 2 Meacham Creek. This difference could be the result of vegetative riparian recovery and reduced solar input within the habitat enhancement project area between RM 2 and RM 4.25 Meacham Creek. Stream temperatures at both, RM 2 and RM 5.25 often exceeded 75 F from mid June through mid August.

In general, stream temperatures were 2 to 6 F warmer in the summer of 1994 than during previous years with the exception of RM 26 Wildhorse Creek. This increase can be attributed to drought conditions and associated low stream flows. All stream reaches monitored, periodically exceeded the state water quality standard, 68 F, for stream temperature.

7.Suspended Sediment Monitoring:

Siltation, a leading cause of non-point source pollution, is especially harmful to fish and aquatic ecosystems. Sediments harm fish by reducing dissolved oxygen levels and by smothering eggs and newly hatched fry. Sediment deposits also can eliminate aquatic plants that provide

cover for fish and the invertebrates they consume (Trout Unlimited, 1994).

CTUIR Habitat Enhancement Project Personnel collected daily suspended sediment data from three ISCO Model 2700 Wastewater Samplers. Data obtained was averaged and combined with gage station stream flow data to arrive at daily estimates of total sediment yield at RM 2 Meacham Creek, RM 56 Umatilla River and RM 81.7 Umatilla River for the 1994 annual year. This information is presented in graphical form in Appendix B. Tabular daily sediment yield data is maintained at the CTUIR Habitat Enhancement Project Office.

Stream flows during 1994 ranged from a peak of 1,650 cfs on March 4, 1994 to a minimum of 9.5 cfs in late August, September and early October 1994 at RM 2 Meacham Creek, a peak of 3,810 cfs on March 4, 1994 to a minimum of 31 cfs on August 15, 1994 at RM 56 Umatilla River, and a peak of 1,400 cfs on March 2, 1994 to a minimum of 38 cfs in late August and early September 1994 at RM 81.7 Umatilla River. The peaks in sediment yield correspond closely to high flow events in winter and early spring. Maximum recorded 1994 daily sediment yields of 1,168 tons per day at RM 2 Meacham Creek on March 6, 1994, 977 tons per day at RM 56 Umatilla River on December 18, 1994 and 184 tons per day at RM 81.7 Umatilla River on December 1, 1994 occurred during major high flow events. Sediment yields were much lower during the 1994 annual than in previous years. This can be attributed to less precipitation and resultant lower stream flows.

Data could not be compiled for spring 1995 of the project period because flow data was not yet available for this time period from the U.S. Geological Survey (USGS) and the Oregon Water Resource Department (OWRD). Spring 1995 sediment yield data will be included in the 1995 Umatilla River Basin Anadromous Fish Habitat Enhancement Annual Report.

Periodic malfunctioning of the sediment samplers resulted in incomplete data. When possible, unavailable daily sediment yields were obtained by averaging sediment data obtained prior to and following the period of malfunction. These daily sediment yields were incorporated into corrected monthly sediment load calculations.

Some discrepancy exists in sediment yield data obtained at RM 56 Umatilla River because the sediment sampling station located at RM 56 is upstream from the Wildhorse Creek confluence, and flow data was obtained from OWRD Gage Station No. 14021000 at RM 53.5 Umatilla River downstream from the mouth of Wildhorse Creek. The CTUIR Water Resources Department plans to install a gage station at RM 56 in the near future. This should help to overcome this problem.

A Hach 2100P portable turbidimeter was purchased to monitor turbidity levels in the Wildhorse Creek Project Area. Turbidity levels will begin to be monitored during the 1995 - 96 project period.

Objective III. <u>Continue Watershed Planning/Scoping/Education Process by Identifying Problems and Developing Creative Solutions to Land Use Problems Impacting Fisheries Habitat in the Umatilla river Basin:</u>

1.Community Outreach Effort:

CTUIR Habitat Enhancement Project Personnel participated in the following outreach efforts during the project period:

.Provided educational instruction and distributed literature regarding watershed health and fisheries habitat issues to Pendleton School District sixth grade elementary students at the 1994 Outdoor School.

.Coordinated with resource agencies and Union Pacific Railroad (UPRR) to develop a mitigation plan for habitat degradation caused from UPRR's Blue Mountains Project double track expansion activities and to develop a cumulative impact assessment to mitigate for past detrimental UPRR railroad building and maintenance activities in the Meacham Creek Canyon.

.Met with the Oregon Water Trust to discuss potential sites in the Umatilla River Watershed where instream water rights could be leased.

.Attended a meeting in Helix, Oregon to discuss local land owner concerns regarding flooding of upper Greasewood Creek (Wildhorse Creek tributary). The CTUIR Habitat Enhancement Biologist and ODFW, District Biologist, Tim Bailey encouraged landowners to address poor cropland practices in the upper watershed. Improvements suggested included installation of grass waterways and filter strips and construction of terraces to decrease the rate of rapid water runoff and loss of top soils.

.Coordinated with UPRR Personnel regarding the removal of abandoned bridge abutments between RM 2 and RM 12 Wildhorse Creek.

.Attended Oregon Concrete and Aggregate Association luncheon and presentation.

.Coordinated with Grassland West Seed Company Sales Consultant, Jim Loiland, in identification of native grasses to be reintroduced at the Wildhorse Creek Project Site.

.Coordinated with the Oregon Department of Transportation (ODOT) to discuss potential restoration of a small wetland area in the Greasewood Creek Drainage.

.Attended Umatilla River Basin Watershed Council meetings to assist with watershed health planning and to secure their endorsement of proposed CTUIR Habitat Enhancement Projects.

.Provided tours of BPA funded habitat enhancement areas on Meacham Creek, Wildhorse Creek and in other impacted Umatilla Basin Subwatersheds to: 1) the Oregon Water Trust, 2) Adopt-A-Stream Foundation, 3) Anne Beier, Umatilla Basin Watershed Council Coordinator and 4) Jeff Spencer, Umatilla Basin Irrigation Districts Environmental Advisor to demonstrate program successes and/or possibly obtain potential cost share funding for future Umatilla River Watershed restoration efforts.

.Coordinated with NRCS Personnel regarding a watershed restoration project on Mission Creek to address upland impacts in the Mission Creek Watershed. CTUIR would address riparian impacts with separate funding.

.Provided a tour of the Wildhorse Creek Project Area to the Blue Mountain Chapter of Trout Unlimited to encourage their participation with enhancement efforts.

.Provided a display and literature at the Umatilla Basin Ecosystem Forum.

.Coordinated with Ed Calame, Umatilla National Forest Hydrological Technician, regarding sediment retention structure design and placement for the proposed 1995 Greasewood Creek Project.

.Participated in Umatilla River Basin Regulatory Work Group Meetings with ODSL, COE, other commenting agencies and the public. The focus of this group is to provide technical assistance to landowners before submitting permit applications, provide a more streamlined permit review process for land owners and to address instream activities on a reach by reach basis to discourage unnecessary detrimental instream practices. CTUIR participated not only because of our role as a commenting agency, but also to address detrimental instream practices impacting watershed health.

.Provided a presentation of detrimental land use practices impacting fisheries habitat in the Umatilla River Watershed and CTUIR habitat enhancements to : 1) the Homestead Youth Lodge, 2) Adopt-a-Stream Foundation Workshop, 3) Umatilla Basin Watershed Council, 4) Pendleton High School Agricultural Students, 5) CTUIR Salmon Corps participants, 6) Native Plant Society and 7) Blue Mountain Chapter of Trout Unlimited.

.Provided interviews and tours of BPA funded habitat enhancement areas on Meacham Creek, Wildhorse Creek and/or other impacted Umatilla Basin Subwatersheds to Lewis and Clark Law School, Walla Walla Union Bulletin and the

East Oregonian to promote watershed restoration efforts in the Umatilla River Basin and to encourage land owner participation in CTUIR's Habitat Enhancement Projects (see news articles in Appendix C).

2.Scoping Groups:

Initial scoping meetings were conducted during the 1993 - 94 work period to identify landowners, sportsman clubs, special interest groups and resource agencies to assist in identification of problems areas in major subwatersheds and in development of long term innovative methods of improving detrimental land use practices impacting fisheries habitat. Additional scoping meetings were conducted during the 1994 - 95 project period to receive input from landowners regarding specific subbasins in which to focus implementation efforts and to appraise participants of ongoing CTUIR Habitat Enhancement Project efforts.

A scoping meeting was conducted on the evening of June 15, 1994 at Weston-McEwen High School in Athena, Oregon to discuss potential project areas in the Wildhorse Creek Watershed and to receive any additional input from scoping group participants. Scoping group participants indicated that tributaries flowing into Wildhorse Creek from the northwest, Gerking Creek, Sand Hollow Creek and Greasewood Creek, appeared to be having the most impact on the system. It was collectively suggested that CTUIR focus their efforts on headwater areas in these systems and attempt to improve land use practices and restore water quality. Scoping group participants also indicated that land owners wanted scientific evidence of poor watershed conditions. It was suggested that data collection stations should be established in the Wildhorse Creek Subbasin to monitor sediment loads. Ten people attended the scoping meeting.

A scoping meeting was conducted on the evening of July 6, 1994 at Yellowhawk Clinic on the Reservation to discuss potential project areas in the upper Umatilla River Watershed (the mainstem Umatilla River and tributaries upstream of Mission, Oregon) and to receive any additional input from scoping group participants. Scoping group participants indicated that CTUIR should focus immediate restoration efforts on Meacham Creek, Buckaroo Creek and Mission Creek. It was suggested that holistic approaches, addressing all detrimental land use practices, needed to be implemented in these subbasins. Scoping group participants further indicated that tributaries exhibiting the most potential of sustaining high numbers of salmonids, should be

priority restoration areas. Two people attended the scoping meeting.

Future scoping meetings to obtain additional public input and to update the public regarding proposed CTUIR habitat enhancements will be held in the future.

3.Wildhorse Creek Demonstration Project:

A habitat enhancement project was implemented between RM 9.5 and RM 10.5 Wildhorse Creek to recover the riparian corridor, demonstrate the benefits of naturally functioning flood plain and wetland functions and to promote landowner participation. The project site is located downstream of Adams, Oregon in a highly visible area between Oregon State Highway 11 and Umatilla County Road 425. Response from this project has been very favorable. Ten additional landowners in the Wildhorse Creek Watershed have indicated that they wish to participate in a habitat enhancement project with CTUIR. Collectively, these landowners own over 20 river miles of stream corridor throughout the watershed.

4.Public Education Opportunities:

The CTUIR Habitat Enhancement Project provided a variety of educational opportunities to the public during the project period. CTUIR cooperatively sponsored a bioengineering workshop with ODFW on February 23, 1995. The **Streambank Stabilization Workshop - Bioengineering Techniques** featured 12 guest speakers and attracted a combined total of over 270 participants at day and evening sessions. Nurseries, grass seed companies, geotextile vendors and consulting firms provided displays for the workshop.

The purpose of this workshop was to provide information to land owners to utilize appropriate resources for planning, designing and implementing bioengineering projects. A free reference notebook was given to each participant. Numerous resource agency personnel also attended the workshop.

Riparian habitat improvement training was provided to the CTUIR Salmon Corps Program and to Blue Mountain Chapter of Trout Unlimited volunteers. These individuals were trained to assist CTUIR Habitat Enhancement Project Personnel in planting native trees and shrubs in riparian corridor areas, maintaining high tensile fence lines, installing cross section fences and maintaining instream structures.

Additional public education opportunities provided during the 1994 - 95 project period are listed on pages 30, 31 and 32 under **Objective III**., **1. Community Outreach Effort**.

5.Public Monitoring Programs:

High school students, tribal youth, scoping group participants and others were encouraged to develop long term community stream monitoring programs (such as the EPA Region 10 Streamwalk Program). These efforts were directed at promotion of citizen involvement,

ownership and commitment to watershed health.

6.Educational Brochure:

Development of a brochure to highlight successful CTUIR riparian enhancements in the Umatilla River was started during the project period. Pre-project and recovery photos have been developed (see photos in Appendix D), a design and layout prepared and cost estimates obtained. The brochures will be produced during the 1995 - 96 project period for dispersal to the public at educational functions to promote watershed and habitat restoration efforts.

7.Watershed Library:

Seven educational videos were purchased by or donated to the CTUIR Habitat Enhancement Project during the project period. Miscellaneous literature and brochures have been donated to the project. These materials are loaned or given to the public to promote land owner education on habitat enhancement needs and methodologies.

Objective IV.<u>Pursue Alternative Management Methods to Mitigate Impacts from Past and Ongoing Land Management Activities:</u>

1.Acquisition Land/Management Rights:

No properties containing significant anadromous salmonid habitat or management rights were purchased during the project period. CTUIR Habitat Enhancement Project Personnel coordinated with CTUIR Wildlife Program Personnel in identification of potential management right (water, timber and/or grazing) acquisitions.

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Appendix A

Water Temperature Graphs

Appendix B

Suspended Sediment Graphs

Appendix C

News Article, Habitat Enhancement Efforts

Appendix D

Riparian Recovery Project Photos