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Umatilla River Subbasin Fish Habitat Improvement Program

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Umatilla River Subbasin Fish Habitat Improvement Program

FINAL 2003 ANNUAL REPORT

(Project Completion/Summary Report for 2003 Habitat Improvement Projects and Historical Projects: 1996 to 2002)

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF APPENDICES

ABSTRACT

This annual report is in fulfillment of contractual obligations with Bonneville Power Administration (BPA), which is the funding source for the Oregon Department of Fish and Wildlife's (ODFW), Umatilla River Subbasin Fish Habitat Improvement Program (Program). The last Annual Program Report was submitted in 1997, and described projects undertaken in 1995. This report describes Program activities carried out in 2003, along with a summary of projects undertaken during the years 1996 through 2002.

The Program works cooperatively with private landowners to develop long-term restoration agreements, under which, passive and active Habitat Improvement Projects are conducted. Historically, projects have included livestock exclusion fencing (passive restoration) to protect riparian habitats, along with the installation of instream structures (active restoration) to address erosion and improve fish habitat. In recent years, the focus of active restoration has shifted to bioengineering treatments and, more recently, to channel re-design and re-construction aimed at improving fish habitat, by restoring stable channel function.

This report provides a summary table of past projects (1996-2002), along with a text description of more extensive habitat improvement projects, including: 1) Implementation of a four-phased project on the Lobato property (Birch Creek) beginning in 1996 and involving a demonstration bioengineering site and riparian improvements (fencing, planting), 2) Implementation of stable channel design/instream structure placement on the Houser property, East Birch Creek, beginning in 1998, an 3) Implementation of a joint, US Army Corps of Engineers/ODFW (cost share) project beginning in 2001 on the Brogoitti property, East Birch Creek, which involved implementation of stable channel design/construction and riparian improvement treatments.

Fish Habitat Improvement Projects carried out in 2003 included:

Implementation: One off-site water development (spring fed trough) was installed the Brogoitti property, East Birch Creek, and 0.16 miles of new riparian fence were constructed.

Operations and Maintenance: On the Brogoitti property, East Birch Creek, instream maintenance was completed within 0.35 stream miles on the stable channel design project, riparian planting projects were irrigated, and 3400 supplemental rooted stock seedlings were planted (Houser and Brogoitti properties combined). Fence inspection/maintenance was carried out on all 26 project areas, involving 16.32 miles of fence. Water gaps and stream fence crossings were inspected and maintained on the Gambill, Hoeft, Weinke and McDaniel properties. Weed control treatments were put out to contract, for the Brogoitti and Houser properties (73.6 acres). Program staff applied herbicide treatments within all other properties under lease agreement (246.2 acres). Three off site water developments were maintained and improved upon, on the forest recovery property, Two Mile Creek, upper Meacham.

Monitoring and Evaluation: Forward Looking Infrared (FLIR) flights were completed within the Birch Creek watershed. Fish Habitat and population surveys were conducted on East and West Birch creeks.

Since the inception of the Fish Habitat Improvement Program in 1987, outputs from individual projects total: 319.8 acres currently under lease/easement, 16.48 miles of riparian fencing, 53 stream crossings, 23 water gaps, 15 off channel water developments and 350 instream structures within 12.56 miles of stream. As of December 2003, the Program held 25 active riparian lease agreements, and 1 riparian easement. Of these, 16 leases are scheduled to expire in 2004, with another 6 due to expire in 2005. The program is actively seeking additional areas for lease and project development in the upper West Birch Creek and upper Meacham Creek areas.

1.0 INTRODUCTION

1.1 PROGRAM BACKGROUND

Initiated in 1987, the BPA funded, ODFW sponsored Umatilla River Subbasin Fish Habitat Improvement Program (Program) is aimed at protecting (where possible) and enhancing/rehabilitating (where required) degraded fish habitat on private lands, using both passive and active restoration techniques. The Program was developed following a directive by the Northwest Power Planning Council's Fish and Wildlife Program (NPPC 1987), which calls for the rehabilitation of Umatilla River salmon and steelhead populations (Section 703) (c) (1), to partially mitigate for losses attributable to the implementation of the Federal Columbia River Power System. The ODFW is implementing fish habitat improvement projects as part of its mission statement: "To protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations".

Through cooperative restoration agreements the Program provides technical and financial assistance to landowners and attempts to identify, design, implement, maintain, monitor and evaluate projects deemed beneficial to Umatilla River salmonid fish populations. Historically, projects have included livestock exclusion fencing (passive restoration) to protect riparian habitats and their function, along with the installation of instream structures (active restoration) to halt/prevent erosion and create fish habitat. In recent years, projects have continued to involve riparian exclusion fencing, but the focus of active restoration has shifted to bio-engineering treatments and, more recently, to channel re-design and re-construction to restore stable stream channel function, thereby improving fish habitat.

Broad based, long-term Program goals include the rehabilitation and improvement of anadromous fish spawning and rearing habitat and tributary passage to increase smolt production and contribute to the Northwest Power Planning Council's (NPPC) interim goal of five million anadromous fish returning to the Columbia River Basin. Project and site-specific objectives for Habitat Improvement treatments, vary according to limiting habitat features and channel instability issues being addressed. Most recent Active Restoration projects, have attempted to contribute to the Program's goal of increased smolt production, by addressing the underlying factors adversely affecting fish habitat quality. These projects have attempted to restore a level of channel stability that promotes stable channel, floodplain and riparian function.

1.2 PROGRAM HISTORY

Between 1987 and April 1, 1993 the Program's main emphasis was on implementation of new fish habitat improvement projects and continuing interagency coordination and education regarding riparian and watershed-related projects within the Umatilla River Subbasin. In 1993, Program emphasis was redirected towards Operation and Maintenance (O&M) and Monitoring and Evaluation (M&E) of existing projects. This occurred for two reasons: direction from the funding agency (BPA) and a lack of potential projects at the time. Program emphasis on O&M and M&E continued until 2000, when implementation of new projects once again became priority. Project implementation in recent years has been limited to passive restoration treatments, pending completion of the Subbasin Planning process.

Fish Habitat Improvement Projects have focused on two watersheds within the Subbasin, including Birch and Upper Meacham creeks. Different streams have shown different rates of recovery based on a variety of factors such as stream order, land use constraints, flood plain interventions, location of the

stream, climate, elevation, geology, topography, soil profile, hydrograph, condition of the upper watershed, and past management practices.

Early Program efforts suffered failures, due to a number of flood events which occurred in 1991, 93, 94, 96 and 97. These failures helped Program staff identify and correct shortfalls of the early projects. Many of the treated stream channels had been artificially straightened or otherwise manipulated leading to an unstable situation. Unsuccessful treatments did not address this instability. Lessons learned from early failures helped to ensure that future projects were broader in scope, and addressed the root problems at a given site, rather than simply addressing symptoms of the problem.

The Program resumed new project implementation in Fiscal Year 2000, using newly acquired habitat restoration techniques (stable channel design and bioengineering applications) and applying adequate buffer widths to encompass flood prone areas and make allowances for proper stream function. Accomplishments of these projects include the elimination channelized stream reaches by recreating sinuous/stable channel configurations, planting native vegetation to rehabilitate riparian habitat, and relocating projects fences further out on the floodplain to prevent livestock from damaging the newly created buffer.

The Program has benefited the primary target species (summer steelhead - *Oncorhynchus mykiss*) in addition to other resident fish and wildlife in this basin by re-establishing key riparian habitat features inside corridors that have been leased from private landowners. Program efforts have also helped stabilize eroding streambanks, improve floodplain function, and have begun to provide overhead shading within treated stream reaches.

2.0 PROJECT AREA DESCRIPTION

The Umatilla River, located in northeast Oregon, originates on the western slopes of the Blue Mountains (Figure 1). It flows approximately 115 miles northwest to the Columbia River and drains an area of roughly 2,290 square miles. The confluence of the Umatilla with the Columbia River is located at River Mile (RM) 289 near the town of Umatilla, Oregon. The Subbasin consists of the high relief of the Blue Mountains region with elevations from 3,000 to 6,000 feet, and the Deschutes-Umatilla Plateau, a broad upland plain that slopes northward from the Blue Mountains to the Columbia River. Most of the subbasin is situated within Umatilla County and Morrow County (Butter Creek Watershed), with some small, headwater tributaries originating in Union County.

Approximately 51 percent of the subbasin is privately owned; 37 percent is managed by federal agencies, principally the U. S. Forest Service, 1 percent is owned by the state of Oregon, and approximately 11 percent lies within the boundaries of the Umatilla Indian Reservation. Forestlands within the basin are managed for timber harvest, grazing and recreation. Much of the mid-subbasin is used for dry-land wheat farming and irrigated agriculture. Irrigation is the largest use of surface and groundwater in the subbasin, and many streams are over appropriated.

3.0 DESCRIPTION OF AQUATIC AND FISHERIES RESOURCES

Main tributary systems in the Subbasin include (upstream to downstream) Meacham, Squaw, Wildhorse, McKay, Birch and Butter creeks. Indigenous anadromous fish species in the basin include summer steelhead, spring and fall chinook salmon (*O. tshawytscha*) (extirpated and reintroduced), coho salmon (*O. kisutch*) (extirpated and reintroduced), and pacific lamprey (*Entosphenus tridentatus*).

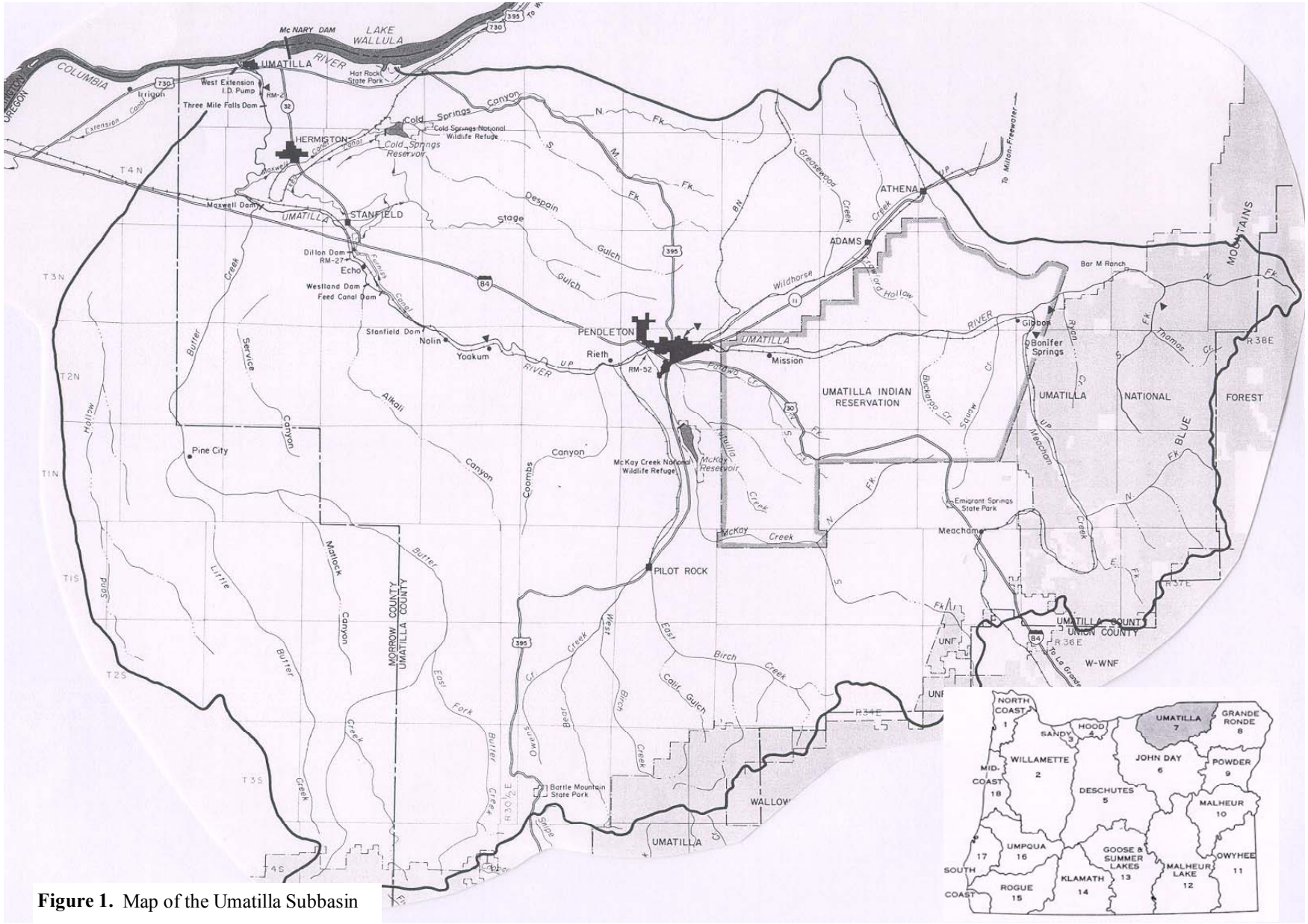

Figure 1. Map of the Umatilla Subbasin

Historically, the Umatilla River Subbasin supported large runs of spring and fall chinook and coho salmon. Native salmon populations had become extinct by the mid 1900's (OGC 1963, Thompson and Haas 1960), while populations of native steelhead, redband trout and bull trout (*Salvelinus confluentus*) continue to persist, albeit at depressed levels. The actual historic run size of steelhead in the basin is not known, but based on the amount of habitat lost to steelhead production (both McKay and Butter Creek drainages are no longer accessible to anadromous fish) and the degradation of the existing habitat, current runs are thought to be a fraction of their historical size (CTUIR and ODFW 1990). In recent years, runs have ranged from a low of 768 during the 1981-82 run year to a high of 5518 in 2001-02 (Figure 2).

Factors contributing to the decline of anadromous salmonids in the Umatilla River Subbasin include extensive water use, overfishing, habitat degradation and Columbia River hydroelectric projects (Boyce 1986). Current monitoring and evaluation efforts all identify the need for substantial habitat improvement to meet natural production goals. Monitoring and Evaluation biologists stress the need for substantial improvements in water quality, spawning, instream, and riparian habitats (Umatilla Basin Research and Management Review 1998). Approximately forty streams/segments in the Umatilla basin are on the Oregon Department of Environmental Quality's list of water quality impaired water bodies (303 (d) list). Of these streams/segments, 18 are listed for temperature, 17 for sedimentation and 21 for habitat modification.

4.0 METHODS AND MATERIALS

In 1987-88, ODFW, CTUIR and the Umatilla National Forest developed a plan for the implementation of fish habitat improvement projects (Reeve et al. 1988). A prioritized list of streams in need of restoration was established based on habitat condition (level of degradation and potential for recovery), fish species presence, fish use and logistical constraints (accessibility, technical feasibility, etc.). Geographic areas identified for treatment within the Subbasin, were then divided amongst the agencies; ODFW was assigned responsibility for the Birch Creek and upper Meacham Creek watersheds.

The Methods and Materials section of this report provides a summary of the generic steps required to complete individual phases of Habitat Improvement Projects. This general description applies to all projects conducted from 1996 to 2003. Fish Habitat Improvement Projects are generally carried out in four phases:

1. Implementation - Pre-Work
2. Implementation - On-Site Development
3. Operations and Maintenance
4. Monitoring and Evaluation

4.1 IMPLEMENTATION - PREWORK

During this phase, Habitat Improvement Projects are identified, communication/coordination with landowners is initiated, and the specific goals and objectives of a project (relative to known or perceived limiting habitat conditions) are established. The Implementation - Prework phase includes four separate activities including; project development, project preparation, riparian easement development, and field inventories.

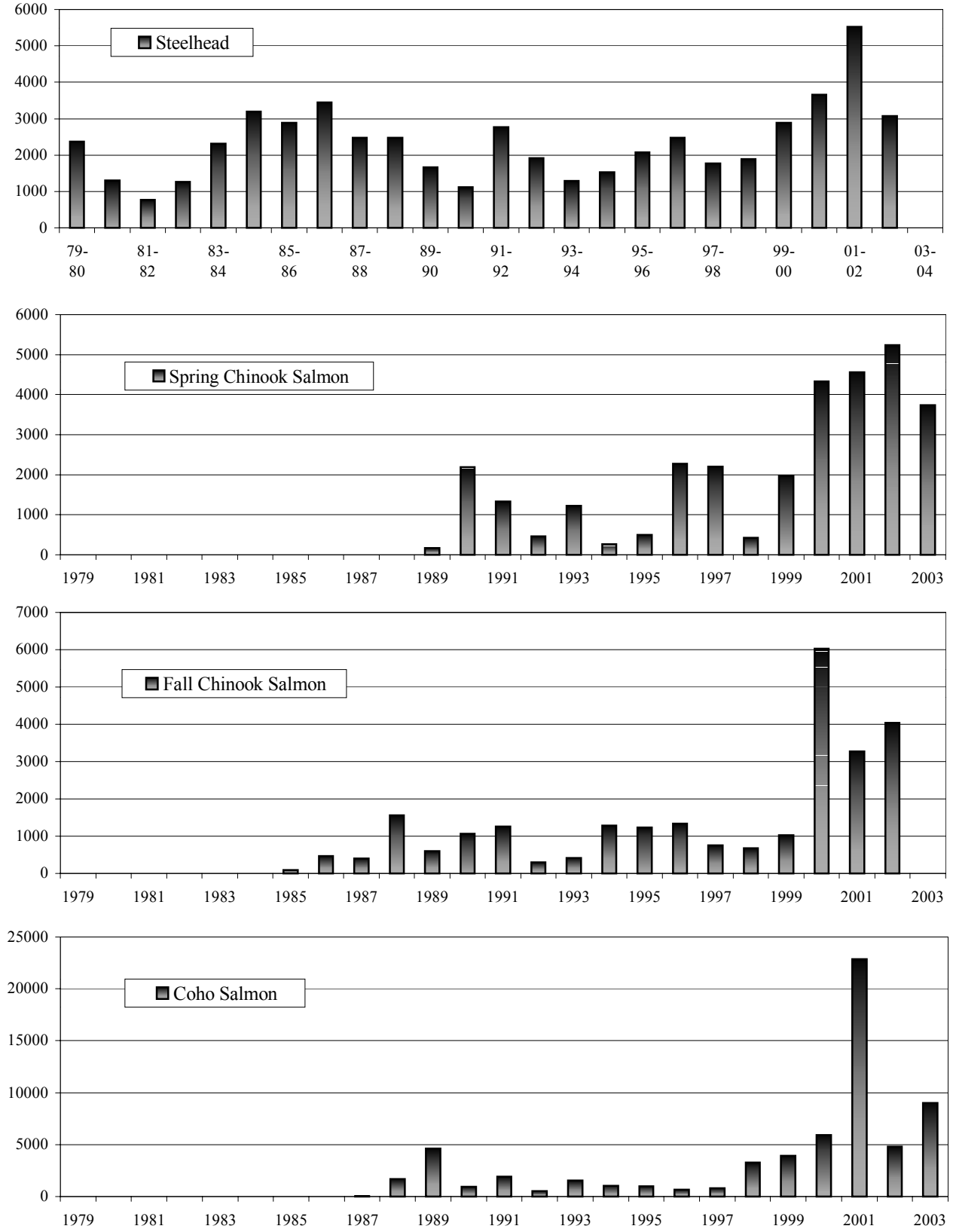

Figure 2. Steelhead and Salmon Returns to Three Mile Falls Dam

4.1.1 Project Development

Project development involves the identification and initiation of Habitat Improvement Projects. Landowner coordination is an essential component of this phase. Once potential projects are identified, Program staff contact landowners to discuss proposed habitat improvement activities, and explore the possibility of entering into a long-term agreement. Projects are not pursued with landowners who were not amenable to long-term agreements.

Once projects are identified and initial landowner consent is obtained, project plans and designs are prepared, field work sites are located, laid out and mapped, and contract specifications are developed.

For most projects, site-specific work plans are developed which included a description of existing conditions, proposed methods for treating affected riparian and/or habitat conditions, desired post-treatment conditions, and measurable parameters for evaluating the effectiveness of selected treatments.

4.1.2 Project Preparation

Prior to signing long-term agreements, project area boundaries and specific work areas (agreeable to the landowner and Program staff), are identified and field located (staked). Work sites may include easements or right-of-ways, fences, livestock watering gaps, instream structures, offsite water developments, planting sites, and other project related areas.

4.1.3 Riparian Easement Development

Prior to implementing work on private property, the Program enters into written agreements with the landowners. Agreements are normally in the form of long-term riparian easements (15 - 25 year terms),. The agreements specify the exact geographic location(s) under easement, and outline the roles and responsibilities of each of the parties, including what types of activities may and may not occur within the specified area, during the term of the agreement.

Agreements are developed in cooperation with the landowner to ensure that the final, legal document is acceptable and meets the requirements of both the landowner and the Program. All project agreements are signed, notarized, and filed at the county courthouse.

4.1.4 Field Inventories

These include pre-work stream surveys (recording and plotting longitudinal profiles, channel cross sections, floodplain areas, etc.) fish habitat or fish population surveys to provide baseline, pre-treatment data and photo-documentation to provide baseline information on habitat condition and potential for improvement, prior to implementation. Field surveys are also conducted to fulfill permitting requirements.

All necessary work permits are obtained during this phase of the project, including Fill-Removal Applications obtained jointly from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE).

4.2 IMPLEMENTATION - ONSITE

Habitat Improvement Projects conducted during the years of 1996 to 2003 included the following types of active and passive techniques.

4.2.1 Instream Habitat Improvement

Instream Habitat Improvement projects are implemented during late summer and early fall (within the designated in-water work window for a given stream) when stream flows are expected to be at their lowest. Instream projects are implemented at locations pre-determined by fishery biologists and/or hydrologists, based on careful assessment of site conditions, limiting habitat features and expected response to prescribed treatments.

Instream Projects may include the placement of individual structures intended to address specific factors limiting fish production within a given reach (increase pool frequency/complexity, large woody debris, available spawning and rearing habitat, etc.), or may involve stable channel design projects aimed at re-establishing stable channel function. Instream habitat improvements may also include bioengineering techniques for bank stabilization.

Stable channel design projects are based on principals and techniques described by Rosgen (1994, 1996 and 1998). Major instream Habitat Improvement Projects (active restoration) implemented during the period covered by this report, have included the use of "J-Hook" and "Cross-Vane" structures (Appendix A) and root wad revetments.

4.2.2 Revegetation

Revegetation is often carried out as part of the implementation phase of instream restoration and stable channel design projects, where mechanical soil disturbance has occurred. Sites are also re-vegetated in conjunction with passive restoration techniques, such as livestock exclusion fencing, to accelerate recovery in heavily grazed riparian areas. Revegetation projects normally involve seeding native grasses, willow cutting (whip) plantings, and/or rooted stock plantings.

Willow 'whips' are planted manually, as individual stems, or in mechanically excavated trenches. Rooted-stock species are planted individually, in holes excavated using a shovel or hand-held, gas-powered auger. Planting strategies for rooted-stock often include the installation of plastic mesh tubes for protection against wildlife browse, and/or sod mats to reduce competition from established plants (tall, annual grasses), and maximize plant survival. Only native species are selected for site revegetation and, whenever possible, local genetic stock is used (Appendix B).

Irrigation and herbicide treatments are also developed as part of the revegetation plan. Irrigation efforts are aimed at ensuring planting success and protection from summer drought conditions, while herbicide treatments are intended to reduce species competition from undesirable, invasive species.

4.2.3 Fence Construction

Six-strand high tensile, or three- or four-strand barbed wire fencing is installed at pre-determined locations, for the purposes of excluding livestock and halting grazing related impacts on riparian vegetation, stream banks, steam channels and water quality (Appendix C).

Properly designed and installed fences must be located far enough away from the active stream channel and flood prone areas to ensure that fences are not washed out or undermined, during high flow events. Stream crossings and/or water gaps are often incorporated into the riparian fence construction, in order to meet livestock watering requirements, as identified by the property owner.

4.2.4 Offsite Water Developments

Where feasible, off site water developments are used to eliminate the need for water gaps in riparian fences. Offsite water developments allow livestock access to drinking water while reducing the significant maintenance requirements (funds and manpower) normally associated with water gaps. Communication and coordination with landowners is essential to ensure that both restoration and livestock needs are met.

Water troughs are installed outside the perimeter fence of the leased riparian areas. Troughs are supplied from a variety of sources including existing water lines, wells and springs. Troughs range in volume from 125 to 525 gallons; the capacity of the trough is selected based on the capabilities of the water supply, and the number of livestock using the development. Troughs fed by water lines or wells are simply plumbed into the existing water supply, and may require an electrical pump system to fill the trough. In certain cases, an electrical supply is also required to power heated troughs, that keep livestock drinking water ice-free, year round. Spring improvements include excavating at the source of ground water and installing a receptacle to collect and deliver water to a nearby trough (Appendix D).

4.3 OPERATIONS AND MAINTENANCE

Operations and Maintenance (O&M) activities normally begin the first year following project implementation. O&M activities are aimed at identifying and addressing concerns associated with existing projects, to ensure their continued success. During project O&M, Program staff also seek opportunities to improve on existing treatments, thereby maximizing benefits to fish habitat.

Once long-term agreements have expired, landowners are responsible for the general maintenance of Habitat Improvement Projects implemented on their properties. The Program may offer landowners advice, technical support, and possibly additional funds to support larger scale maintenance activities within expired project areas, if the work is deemed crucial to the continued success of a project. Permission must be granted by the landowner, in writing, before the Program can initiate maintenance activities on lands no longer under lease/easement.

4.3.1 Landowner Coordination

Contact and coordination with landowners, is maintained for the duration of the lease agreement. Landowners are kept informed of plans to conduct O&M activities within lease areas.

4.3.2 Fence Maintenance

Fencing projects are inspected as early as possible in the spring, prior to arrival of livestock on a property. The entire perimeter of a riparian fence boundary is inspected to identify failures or gaps created by snow pack, falling trees, livestock, wildlife, etc. Instances of fence damage, water gap damage, stream cross-fence damage, and intrusion of livestock into riparian areas, are also reported to

Program staff by the landowners. Fences are repaired as required to ensure the protection of riparian habitat and Program investments.

Inspections of fencing projects may also include an evaluation of fence location, following major flood events. Fences that are deemed too close to the active stream channel or normal flood prone area may need to be re-located. Re-location of a riparian fence might constitute a change in the lease area boundaries and may therefore require consultation with the landowner and an amendment to the lease agreement.

4.3.3 Instream Maintenance

Inspections of instream habitat structures and stable channel design projects are conducted annually, in the spring and following major flood events. An informal assessment and evaluation of project effectiveness is made, relative to site-specific objectives. Requirements for maintenance are identified based on the function of each structure/site, relative to its desired objective.

Once maintenance sites have been identified, necessary surveys are conducted and all necessary permits are obtained. A maintenance plan is prepared which outlines the type of maintenance activities required, along with a rationale for maintenance works.

4.3.4 Revegetation

For the duration of the lease agreement, planting sites are inspected annually and following major flood events. A determination of planting success is made, and maintenance areas are identified, based on pre-determined, site-specific objectives. Plant survival, plant vigor, rate of growth and intensity of wildlife browse, are taken into consideration when identifying sites for supplemental planting or replanting. Maintenance efforts may also include modifying irrigation and/or herbicide treatments to control invasive, noxious weeds.

Re-vegetation may also be required following instream maintenance activities, where previously planted sites have been affected and/or exposed soils have resulted from mechanical disturbance.

4.3.5 Noxious Weed Control

Project lease areas are inspected for the presence of noxious weed species. Program staff identify areas in need of treatment, as well as the type and intensity of treatment required. Treatment may include manual removal, mechanical removal, and/or herbicide applications. Herbicide application methods include backpack and ATV-mounted spot spraying, and/or ATV-mounted boom spraying for small to moderate sized treatment areas. Larger treatment areas, normally associated with newer projects having relatively large sections of exposed soil (which are more susceptible to invasion by weeds), are contracted out. Treatments normally consist of two separate applications (in the spring and fall), to effectively control sub-annual species. Herbicide products and application methods follow state and federal regulatory standards. The herbicide most frequently employed by the Program is *Transline* (Clopyralid 40.9%).

4.3.6 Off Site Water Developments

Spring developments are inspected annually to ensure proper function. Spring water receptacles are inspected for sediment blockages and troughs are inspected for damaged pipes, fittings and pumps.

4.3.7 Miscellaneous Operations & Maintenance Activities

Activities such as vehicle/ATV maintenance, equipment maintenance and calibration, and inventory of program supplies, are included in this activity phase.

4.4 MONITORING AND EVALUATION

Project-specific Monitoring and Evaluation (M&E) Plans are normally developed at the design stage of each project. The M&E plan should describe existing and desired conditions for a given project site, as well as outline measurable parameters by which project effectiveness can be evaluated. The effectiveness of individual projects can then be measured against the pre-determined, site-specific objectives.

4.4.1 Photopoint Establishment

Permanent photopoint sites have been established for select Habitat Improvement Projects. Photopoints are identified in the field using a permanent reference point (often an old fence post or rebar pin) and numbered metal tag. Photopoints enable Program staff to obtain a visual documentation of a specific treatment site, over time, from the same vantage point. Photo documentation allows a visual assessment of site recovery, and is particularly useful for documenting vegetation recovery within fenced riparian corridors.

4.4.2 Photo Documentation

Photographs (3.5" x 5" prints and/or 35 mm slides) were taken annually (up until 2000) from approximately 125 permanent photopoints, to document site conditions prior to, during, and subsequent to, implementation of passive and active Habitat Improvement Projects. Project photos are catalogued in photopoint notebooks. Notebooks are arranged by area and also contain maps depicting photopoint locations and a standardized methodology for taking photographs. A sequential view of the project site helps Program staff monitor and evaluate the success of selected treatments.

Recently, certain projects have reached the stage where rates of growth over a single year are no longer discernable. For these projects, the repetition of photo documentation has been reduced to a once-in-five-year frequency.

4.4.3 Thermograph Data Collection

Thermograph data were collected at 11 permanently established stream temperature, gauging stations (Figure 3). Temperature data were recorded during the summer months (May through November) using *Onset* brand, HOBO model and STOWAWAY model, thermographs. Thermograph sites have been selected based on their location relative to (upstream and downstream of) existing Habitat Improvement Projects, and/or at locations that will allow the collection of control or pre-treatment data for future projects.

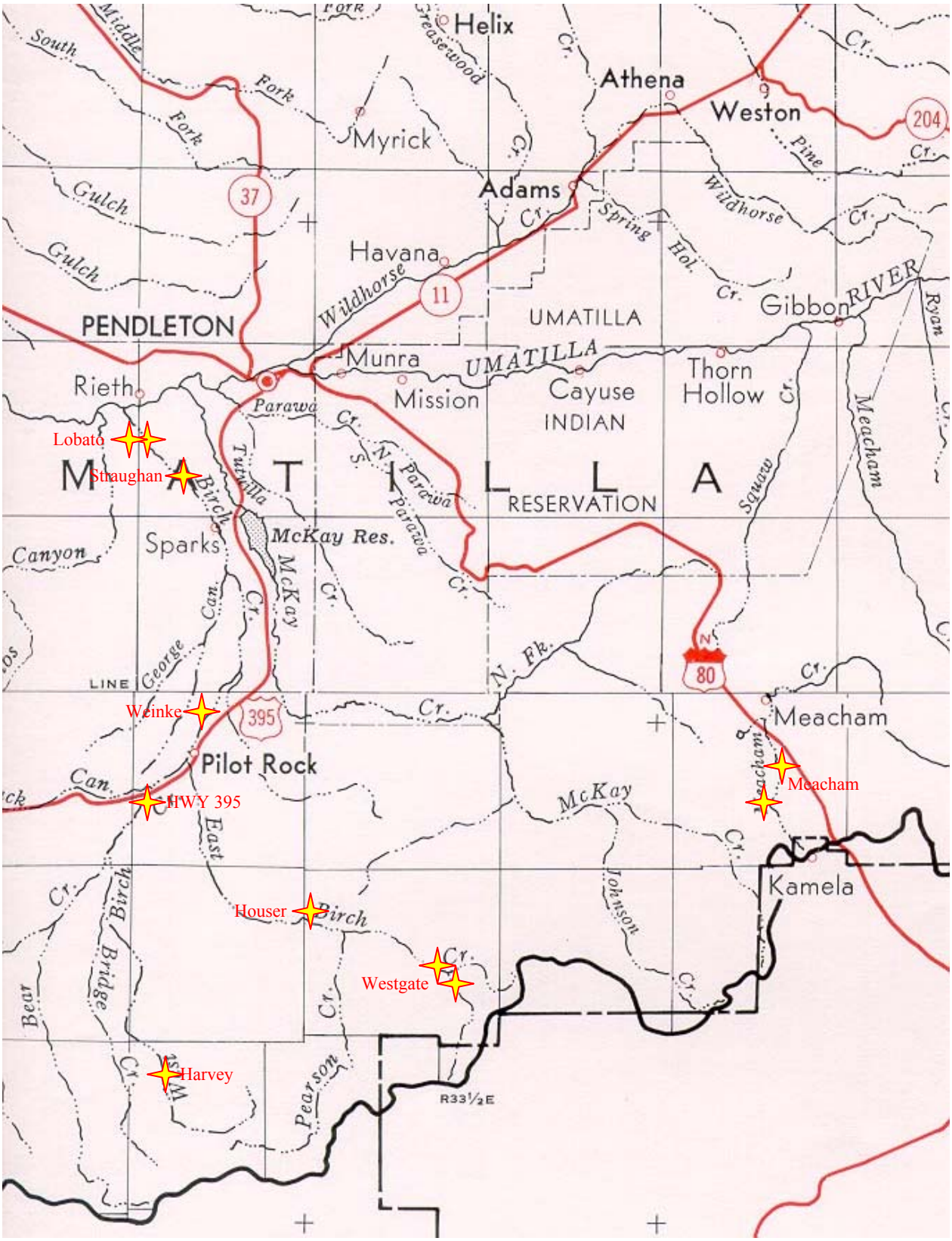

Figure 3. Umatilla Subbasin Fish Habitat Improvement Program Temperature Monitoring Sites

4.4.4 Spawning Ground Surveys

Steelhead redds counts are conducted annually during the spring of the year to provide an indication of spawning habitat use. Attempts are made to conduct surveys near the end of peak spawning activity, to obtain a more accurate count. Counts are conducted within areas under lease by the Program (East Birch Creek), as well as in areas targeted for potential future projects. Two counts are normally conducted within each survey area, roughly 10 days apart. The number and approximate location of observed redds is recorded. Flagging ribbon is used to denote redd locations in the field and eliminate duplicate counts of redds during follow-up surveys. Completion of redd count surveys is dependant on stream flow conditions.

5.0 RESULTS AND DISCUSSION

This section describes past projects, conducted during the years 1996 to 2002, as well as projects conducted in 2003. Table 1 provides a complete summary of Program accomplishments to date.

Table 1. Summary of the Umatilla Subbasin Fish Habitat Improvement Program Accomplishments.

Property	Lease Term	Impl. Year	Fence Miles	Acres Leased	Steam Crossings	Water Gaps	Stream Miles	Instream Structures	Water Developments
Mainstem Birch Creek									
F. Straughan	1989-2004	89	0.69	5.8	4	2	0.31	21	1
J. Straughan	1990-2005	90	0.84	17.2	2		1.00	3	
McDaniel	1989-2004	89	1.75	20.3	2	2	0.90	42	
Rhinhart	1989-2004	89		22.1			0.63	40	
B. Weinke	1990-2005	90	0.50	5.8	3		0.50	4	1
Hoeft	1990-2005	90	0.50	21.0	2		1.00	1	2
Hemphill	1989-2004	89	0.38	10.0	1		0.25		
Gambill	1990-2005	90&98	1.25	12.9	2	2	0.70	21	
W. Weinke	1989-2004	89&98	0.65	17.9	4	2	0.44	14	
Lobato	1996-2011	95	0.40	13.0			0.30	11	1
Birch Creek Sub-Total			**6.96**	**146.0**	**20**	**8**	**6.03**	**157**	**6**
East Birch Creek									
Magic Mile[1]	1989-2004	89	1.75	21.2	12	6	0.70	27	
Rugg	1988-2003	89&96	0.45	10.4	1		0.31	8	1
Houser	1999-2014	88&01	2.51	42.6	1		1.53	46	2
Brogoitti	2001-2026	01	2.06	31.0	3		1.20	58	4
Baker (Westgate)	1988-2003	89-98		11.4	6	2	0.7	22	
East Birch Creek Sub-Total			**6.77**	**116.6**	**23**	**8**	**4.44**	**161**	**7**
Meacham Creek									
L. Pacific	1990-2005	89	0.90	15.4	4	1	0.65		1
L. Pacific	1989-2004	91	0.50	23.5	4	1	0.60	32	
Forest Recovery	1992-2007	92	1.70	18.3	4	3	0.94		2
Meacham Creek Sub-Total			**3.10**	**57.2**	**12**	**7**	**2.19**	**32**	**3**
PROGRAM TOTAL			**16.48**	**319.8**	**57**	**23**	**12.56**	**350**	**15**

[1] The Magic Mile is a section of lower East Birch Creek that includes 10 different land ownerships.

5.1 FISH HABITAT IMPROVEMENT PROJECTS - 1996 TO 2002

A summary of projects conducted under the Fish Habitat Improvement Program during the years 1996 to 2002, is provided in Table 2. The table outlines the project related activities, by year, lease property, and project phase (Implementation, O&M or M&E). Shaded cells represent the more extensive projects

carried out during this time period. A text narrative of these projects is provided in the following sections.

Table 2. Summary of Fish Habitat Improvement Projects (1996-2002), by Year and Lease Area.

Property	1996	1997	1998	1999	2000	2001	2002
MAINSTEM BIRCH CREEK							
F. Straughan					*O&M*: Relocated riparian fence to increase buffer width	*Impl.*: Water development	
J. Straughan	*O&M*: Fence Maintenance						
McDaniel	*O&M*: Fence Maintenance						
B. Weinke		*Impl.*: Water development	*O&M*: Fence Maintenance				
Hoeft		*Impl.*: Water development	*O&M*: Fence Maintenance				
Hemphill	*O&M*: Fence Maintenance						
Gambill		*Impl.*: Survey/Designs (ATEC)	*Impl.*: Channel reconstruction, root wad revetment, willow plantings	*Impl.*: Riparian Fencing *O&M:* Weed control, irrigation	*O&M:* Weed control, irrigation		
W. Weinke							
D. Lobato	Lease Signed *Impl.* Phase II: bioengineering, riparian fencing, planting, *Impl.* Phase III: Kiosk	*Impl.* Phase II: Water development *Impl.*: Phase III: Kiosk Completion	*O&M*: Weed control, fence maintenance, browse repellant application, water development maintenance, kiosk upkeep				
EAST BIRCH CREEK							
T. Rugg				*O&M*: Relocated riparian fence to increase buffer width	*Impl.*: Water development		
Houser (Upper/Lower)	*Impl.*: Bioengineering and erosion control	*Impl.*: Survey/Designs (ATEC)	*Impl.*: Channel reconstruction, root wad revetment, willow plantings	*Impl.*: Riparian fencing *O&M:* Weed control, irrigation	*O&M:* Weed control, irrigation, fencing		*O&M:* Additional planting, weed control, irrigation, fencing
Houser (Middle)				Lease Agreement Renewed (incl. Middle Section)		*Impl.*: Stable Channel design, Planting, Bridge abutments constructed	*Impl.*: Bridge Approach completed, Fencing *O&M:* Additional planting, weed control
C. Baker (Westgate)			*Impl.*: Instream (weirs), riparian fence removed				
Brogoitti						Easement Signed *Impl.*: Stable Channel Design	*Impl.*: Fencing, water devel. *O&M*: Instream, Weed control
MEACHAM CREEK							
L. Pacific	O&M: Fence maintenance						
L. Pacific	O&M: Fence maintenance						
FR: Twomile	O&M: Fence maintenance						

Impl. = Implementation, O&M = Operations and Maintenance

5.1.1 Lobato Property - Birch Creek Mainstem

The riparian lease agreement for the Lobato property was signed in 1996 for a term of 15 years. The Lobato project (Birch Creek Mainstem, RM 1.5) was developed cooperatively by ODFW, the Umatilla County Soil and Water Conservation District (UCSWCD) and Agua Tierra Environmental Consultants (ATEC), as a demonstration restoration site, intended to showcase the most current bioengineering treatments. The initial project received joint funding from OWEB and BPA, while subsequent O&M activities have been funded solely with BPA dollars.

The project was implemented in four phases, beginning with the removal of an abandoned diversion dam in 1995. Phase 2 (1996), involved streambank bioengineering, construction of livestock exclusion fencing, riparian planting, and implementation of water developments (Photos 1 and 2). Phase 3 (1997), involved completion of instream habitat improvements, as well as the construction of an instructional kiosk. Ongoing project O&M and M&E activities constitute Phase 4 of the project. The project was aimed at restoring fish passage, improving fish habitat and educating the public regarding bioengineered alternatives to conventional bank protection techniques (i.e., rip rap armoring). The informational portion of the project also included a day long Stream Stabilization Workshop, held in Pendleton, Oregon (1995), which attracted over 300 participants (Laws 2001).

A wide variety of bioengineering techniques were employed within the 0.3 mile section of lower Birch Creek including, brush layers, brush mats, branch packing, joint planting, joint planted fascines, live fascines, live posts, live stakes, vegetated geogrids and root wad revetments. Boulders were used in conjunction with vegetative treatments, to help stabilize and channel banks and improve steelhead summer rearing habitat. Boulders were also employed in the construction of instream grade control structures.

Project O&M activities have been ongoing since 1997 and have included, weed control, fence repair, browse control (beaver/deer browse repellants, trapping and transport), livestock water development (general maintenance) and kiosk maintenance and upkeep. As part of the continued commitment to education, several tours of the site have also been conducted. Tour groups have included restoration biologists, landowners and various local interest organizations.

Project M&E has involved annual, visual assessments of project success, along with the collection of empirical, stream temperature data (not yet analyzed). A 2001 Project Completion Report (Laws 2001) revealed that rates of establishment and growth of riparian vegetation had surpassed expectations. Reported project benefits also included changes in channel width-to-depth ratios (suggesting a trend towards channel stabilization), a halt to streambank erosion, a decrease in the abundance of noxious weeds, and the elimination of fish passage concerns. Bed elevation adjustments around one of the grade control structures was observed and identified as a possible site for future maintenance.

5.1.2 Gambill/Weinke Properties - Birch Creek Mainstem

The Gambill and Weinke lease agreements were signed in 1990 and 1989, respectively. In 1997, ATEC was retained to assess and develop treatment prescriptions for the section of Birch Creek on each of these adjoining properties to retrofit and improve upon prior implementation actions. These treatment actions were developed and implemented because Program personnel determined that prior implementation actions were not being successful in accomplishing project/Program objectives. The

Photo 1. Upstream view of the Lobato channel re-construction/bioengineering project, (March 1996).

Photo 2. Upstream view of the Lobato channel re-construction/bioengineering project, (October 200, same vantage point).

ATEC design included a combination meander re-configuration and root wad revetment treatment (root wads and logs keyed into channel banks and cabled to boulders). Program staff implemented the ATEC design in 1998 within a 0.75 mile section of channel. The 1998 treatment also included willow stake plantings amongst the bank stabilization structures, and grass seeding within areas disturbed during project implementation. In 1999, a riparian fence was constructed to exclude livestock from within the lease areas. The same year, additional willow planting and rooted stock planting was conducted, as part of project O&M activities. Irrigation of planting projects began in 1999. Weed control activities have been conducted annually on the properties, within the fenced riparian areas (Photos 3 and 4).

The project was successful in achieving greater channel stability, as well as a more natural channel sinuosity pattern. Root wad revetments appear to be providing quality refuge habitat for juvenile salmonids.

5.1.3 Houser Property - East Birch Creek

Originally signed in 1988 (for a term of 15 years) the lease agreement on the Houser property included only the upper and lower sections of the property. In 1999, the existing lease was extended for an additional term of 15 years and was amended to include the middle section of the property.

In 1997, ATEC was retained to assess and develop treatment prescriptions for East Birch Creek on the upper and lower sections of the property to retrofit or improve upon prior implementation actions. These treatment actions were developed and implemented because Program personnel determined that prior implementation actions were not being successful in accomplishing project/Program objectives. The ATEC design included a combination meander re-configuration and root wad revetment treatment (Photo 5). ODFW Program staff implemented the ATEC design in 1998 within a 1.0 mile section of channel. In 1999, willow stake plantings amongst bank stabilization structures were installed and the riparian fence was constructed to exclude livestock from within the upper and lower lease areas. The same year, additional willow planting and rooted stock planting was conducted, as part of project O&M activities. Irrigation of planting projects began in 1999.

In 2001, implementation work began within the middle section of the Houser property. A stable channel reconstruction, using design criteria developed by Rosgen (1994, 1996 and 1998), was implemented within a 0.15 mile section of stream. Channel improvements included the installation of 9 J-Hook and Cross Vane structures (Rosgen 2001), along with the re-establishment of a stable channel meander pattern and construction of point bars to achieve the appropriate channel dimension, pattern and profile

(Photo 6). J-Hook and Cross Vane structures are designed to reduce sheer stress along vulnerable banks, focus flow within the channel thalweg, and create scour pool habitat. Project objectives included the restoration of stable channel function and re-establishment of a naturally functioning floodplain.

As part of the 2001 stable channel design, willow cuttings were planted (in mechanically excavated trenches, perpendicular to the channel), to help accelerate riparian recovery and improve stream bank and point bar stability. Areas disturbed during instream implementation were also sewn with native grass seed. In 2001 the Program was also involved in a cost share project with the landowner to replace an unstable bridge crossing on East Birch Creek. The landowner provided funds for the bridge materials and construction, while the program supplied funds to complete the bridge approaches. In 2002, the majority of the middle section was fenced to exclude livestock, with the exception of the areas

Photo 3. Upstream view of riparian fencing and re-vegetation efforts on the Gambill property.

Photo 4. Upstream view of riparian fencing and re-vegetation efforts on the Gambill property (same vantage point), following 5 years of recovery.

Photo 5. Upstream view (2002) of ATEC designed root wad revetments and willow plantings implemented on the lower Houser property in 1998.

Photo 6. Upstream view (2002) of J-Hooks, reconstructed point bars and rooted stock plantings, implemented on the middle Houser property in 2001.

immediately upstream and downstream of the bridge crossing (0.1 stream miles). The landowner chose not to fence this section for aesthetic reasons, but agreed to forego any grazing or agricultural activities within the area, to minimize land use impacts on the channel. Rooted stock plantings and additional willow cuttings (trenches) were added in 2002 as part of project O&M activities, to increase species diversity and accelerate riparian recovery. Irrigation of planting projects began that same year.

Weed control activities have been conducted annually on the Houser property, within the fenced riparian areas. Due to the size of the property, herbicide applications have been contracted out, beginning in 2002. Supplemental (spot spraying) treatments have also been applied by Program staff, as required.

The project was successful in achieving greater channel stability, as well as a more natural channel sinuosity pattern. However, original treatments (particularly within the lower section) did not fully address issues of channel connectivity with the floodplain. The treated reach, therefore, still consists of a moderately entrenched stream channel. Nonetheless, root wad revetments appear to be providing quality refuge habitat for juvenile salmonids.

5.1.4 Brogoitti Property - East Birch Creek

The Brogoitti property was acquired as a 25-year easement in 2001. That same year, a joint (cost share) Instream Habitat Improvement Project was undertaken by the US Army Corps of Engineers (USACE) and ODFW under authority of Section 206 (Aquatic Ecosystem Restoration) of the Water Resources Development Act of 1996. The project involved the design and reconstruction of a 1.2 mile section of stream channel, using stable channel design techniques developed by Rosgen (1994, 1996 and 1998).

Reconstruction of the channel involved the re-establishment of a stable channel meander pattern, the grading of channel point bars to achieve the appropriate channel dimension, pattern and profile, and the installation of 67 instream structures, including J-Hooks and Cross Vanes (Rosgen 2001) (Photos 7 and 8). Project objectives included the restoration of stable channel function and re-establishment of a functioning floodplain. Revegetation efforts (grass seeding, willow whip plantings and rooted stock plantings) were carried out in conjunction with the original project, as well as in subsequent year's O&M activities. In 2002, the Program implemented construction of livestock exclusion fencing throughout the entire lease area, as well as three off-site water developments.

The USACE, acting as the lead proponent and primary funding source for the project, was responsible for the 2001 channel re-construction. ODFW Program staff provided design input and technical assistance during construction. The contract agreement identified the USACE as the proprietary entity of the project, until its acceptable completion (as agreed upon jointly by the USACE and ODFW). Upon completion of the project, responsibility for project O&M and M&E will revert to ODFW, for the remainder of the easement term. The USACE will develop and provide ODFW with standards and specifications for Operation and Maintenance of the project.

In the first year following instream implementation (2002) the USACE conducted maintenance of instream structures and channel features, within the entire 1.2 miles of the project area. Channel adjustments were deemed necessary to address concerns regarding the correct application of Rosgen design methodologies. Changes to the elevation, angle and slope of a majority of the structures was required to obtain the correct channel dimension, pattern and profile, per design specifications and reference reach data. Similar O&M activities were completed in 2003 by ODFW, using 100% BPA funds (refer to Section 5.2.3.2).

Photo 7. Upstream view (2003) of Cross Vane and reconstructed point bar, implemented on the Brogoitti property in 2001.

Photo 8. Downstream view (2002) of J-Hook structure and reconstructed point bar, implemented on the Brogoitti property in 2001.

O&M activities have also included noxious weed control and supplemental plantings (willow whips, willow bundles and rooted stock) to accelerate riparian recovery. The success of planting projects has varied by site. Competition from native annual grasses and invasive weeds, drought conditions and irrigation requirements, along with connectivity of the planting site to the floodplain, all appear to influence planting success. Due to the expanse of the Brogoitti property, annual herbicide treatments have been contracted out.

Despite required maintenance, the project has been beneficial to steelhead spawning and rearing habitat through the generation of increased pool frequency, depth and complexity, improved sorting of substrate particles, and a reduction of bank erosion and channel aggradation.

5.1.5 Baker Property - Westgate Creek (East Birch Creek Tributary)

The Westgate property lease agreement was signed in 1988 for a term of 15 years. Ownership of the property has changed twice during the term of the lease. Originally owned by Harris Pine, the property was sold to Louisiana Pacific, who in turn sold it to Mr. Curtis Baker in 1997.

Riparian fencing was constructed along a 0.75 mile section of Westgate Creek and East Birch Creek in 1988 (Photos 9 and 10). In 1998, the riparian fence was removed, following a decision by the new owner to eliminate livestock grazing on the property. That same year, implementation of instream work was carried out, that involved construction of 39 instream structures aimed at maintaining channel stability and improving fish habitat. The project included the construction of 13 log cross berms, 10 rock weirs, 9 rock cross berms, 3 log weirs, 3 log deflectors and 1 rock barb.

5.2 2003 Fish Habitat Improvement Projects

This section describes Habitat Improvement Projects undertaken in 2003, by project Phase. This section also summarizes Program duties related to Administration, and Interagency Coordination and Education

5.2.1 Implementation - Prework

5.2.1.1 Project Development

Contacts were made with the Oregon Water Resources Department, US Bureau of Reclamation, and the City of Pilot Rock to discuss the installation of stream flow gauge stations on East and West Birch creeks, near their confluence with mainstem Birch Creek. Data from these gauges would assist in the design of future stream restoration projects, and the Monitoring and Evaluation of existing projects.

Steve McClellan of Boise Cascade was contacted to discuss additional fencing projects along upper Meacham Creek. An on-site meeting was held with Mr. McClellan and the Habitat Technician to discuss possible implementation of passive restoration efforts in the summer of 2004.

The Fish Habitat Technician (acting as interim Fish Habitat Biologist) initiated communication and coordinated activities amongst parties involved with the Gambill/Weinke Diversion Dam Removal Project. The Technician acted as liaison between parties (landowners, ODFW, etc.) and provided initial consultation and technical support for the conception/design portion of the project. The project will be completed under a separate ODFW proposal, with funds provided by OWEB. The project will be carried

Photo 9. Downstream view (1992) of the Baker property, Westgate Creek.

Photo 10. Downstream view (2000) of the Baker property, Westgate Creek (same vantage point).

out beginning in 2004 using a two-tiered approach. The initial phase of the project will involve the installation of pump irrigation systems on properties owned by Mr. Don Weinke and Mrs. Yvonne Gambill, located on the Birch Creek Mainstem downstream of the City of Pilot Rock. The upgraded systems will render obsolete a diversion dam, which currently supplies a gravity-fed irrigation canal. The second phase of the project will entail removal of the diversion dam to restore unimpeded fish passage at the site.

5.2.1.1.1 Landowner Coordination

West Birch Creek Landowners were contacted to request permission to conduct a fish population survey and to discuss potential stream restoration projects on their property.

The Habitat Technician, along with Kal Garton (landowner), conducted a visit of potential spring development sites along West Birch Creek. The possibility of developing springs for livestock watering was discussed as a first step to implementing a livestock exclusion fencing project on the property. The possibility of developing and signing a long-term lease agreement was also discussed; no formal agreement was reached.

Program staff met with John Brogoitti to discuss additional fence construction, as well as repair and installation of a pump to provide water for his lawn, as per a prior agreement

Don Weinke was contacted and apprised of new information regarding the diversion dam removal project on his property.

Tom Rugg contacted Program staff to request cost share assistance for the construction of a riparian fence and the purchase of grass seed, for a riparian improvement project on his property.

The City of Pilot Rock (Steve Draper, Publics works Director) was contacted to discuss the installation of two, flow gauging stations in city owned buildings, adjacent to both West and East Birch Creeks.

5.2.1.1.2 Project Preparation

The design, and preparation of the Gambill/Weinke Dam removal project was completed separately from Umatilla Subbasin Fish Habitat Improvement Program activities.

Materials and supplies were purchased for the completion of the Brogoitti fence construction and pump installation projects.

Maintenance requirements associated with the stable channel design project implemented on the Brogoitti property, East Birch Creek were identified. An amendment to the existing removal/fill permit was obtained, allowing work to proceed.

5.2.1.1.3 Riparian Lease Development

Steve McClellan of Boise Cascade was contacted to discuss the possibility of incorporating additional miles of upper Meacham Creek into an existing lease agreement. Mr. McClellan expressed interest in a cooperative fence construction project to exclude cattle from upper Meacham Creek and Beaver Creek.

Fencing upper Meacham Creek would protect approximately 5 additional miles of stream while fencing Beaver Creek would protect approximately 4 miles.

Follow-up communications with Mr. McClelland were initiated to verify the status of the project and to request maps of the area. Program staff learned that Boise Cascade had put the Meacham property up for sale, thus delaying implementation of additional fencing projects indefinitely. Arrangements were made to discuss the project again in June of 2004. The status of the property and the project will be re-evaluated at that time.

Program personnel continued to communicate with landowners on West Birch Creek regarding potential stream restoration projects. Before projects can proceed, a preliminary habitat improvement plan will need to be drafted and additional surveys conducted (permission to access to private property will be required). A preliminary plan and project implementation strategy can then be presented to the landowners for review and discussion.

5.2.1.1.4 Field Inventories

Spring steelhead redd counts were scheduled for East Birch Creek (Houser and Brogoitti properties), Pearson Creek (East Birch tributary), and upper West Birch Creek. Landowner permission was obtained to access private property not under lease agreement.

A survey of the Westgate Creek grade control structures, revealed the need for instream maintenance. Aggradation upstream of 9 vortex weir structures, along with downstream degradation, has created potential passage impediments for juvenile fish. Select boulders will have to be removed from the structures in order to restore channel stability and fish passage. Work is scheduled to proceed in 2004.

Contract specifications were written and bids were solicited to conduct fish population sampling on the Brogoitti project on East Birch Creek and for the proposed project area on West Birch Creek. The contract was awarded to *Bio-Surveys, LLC* of Alsea OR. Contract specifications required that the field data collection to be completed by October 1 2003, with data analysis and reporting to be completed by May 2004.

A contract was prepared to conduct FLIR (Forward Looking Infrared) flights on East and West Birch Creeks. A cooperative agreement was prepared between the Oregon Department of Environmental Quality (DEQ) and ODFW that enabled the work to be added to a contract already in place between DEQ and *Watershed Sciences Inc.* (the consultant under contract). This action prevented incurring additional significant mobilization costs.

A contract was prepared and invitations to bid were solicited for a weed control contract to be conducted on the Houser and Brogoitti properties.

5.2.2 Implementation - On Site

5.2.2.1 Offsite Livestock Water Developments

The individual, who leases grazing rights on the Forest Recovery property at Two Mile Creek near Meacham, contacted Program staff to report that, due to drought conditions, water gaps on the property were not providing water for his cattle. The individual requested that the livestock be provided access to the lease area. A compromise was reached whereby, the Program agreed to improve, and repair, an

existing spring development and implement two additional spring improvement projects. Repairs to the existing spring development were completed, and water collection devices, water troughs, and necessary pipes and fittings were installed at two additional sites.

An offsite water development (heated water trough), initiated in 2002 on the Brogoitti property, was completed in March of 2003 (Photo 11).

5.2.2.2 Livestock Exclusion Fencing

Program staff completed fence construction activities associated with the Brogoitti Easement project. Construction involved 600 feet of 4- and 5-strand, barbed wire fence, connecting the existing riparian easement fence to the recently constructed bridge crossing. This section of fence was completed to prevent livestock from entering the fenced riparian corridor while being herded across the bridge. In addition, 250 feet of 5-strand, high tensile fence was completed to enclose the portion of the easement land adjacent to the residence on site (Photo 12). Fence completion included the installation of 3, 4-foot wide (ATV) access gates.

5.2.2.3 Weed Control

McClain Spraying applied noxious weed control treatments on the Houser and Brogoitti properties (totaling 73.6 acres), East Birch Creek. Treatments were applied twice during the year, once in the spring and again in the fall.

Program staff conducted spot spraying of all other areas under riparian lease agreement (totaling 246.2 acres), to control noxious weeds, as required.

5.2.2.4 Field Inventories

BIO-Surveys, LLC, of Alsea OR, conducted a Post-Project Monitoring Fish Species Habitat Utilization and Population Assessment for the Houser/Brogoitti stable channel design project, as well as Pre-Project Monitoring Fish Species Habitat Utilization and Population Assessment in West Birch Creek. The data generated will show species composition and age class distribution within the project areas. Data analysis will be completed and reports will be prepared by *BIO-Surveys,* in 2004.

Watershed Sciences Inc., of Corvalis OR, completed forward Looking Infrared (FLIR) flights of the Birch Creek watershed (mainstem and east and west forks). Data analysis will be completed and reports will be prepared in 2004. The data generated will help prioritize future work and will provide a basis for Monitoring and Evaluation activities.

Program staff conducted steelhead redd counts on East Birch Creek (Houser and Brogoitti properties), Pearson Creek (East Birch tributary), and upper West Birch Creek (from the gorge upstream to the falls).

Photo 11. View of the heated water trough completed on the Brogoitti property in 2003.

Photo 12. View of the riparian fence, including section tying in to the bridge, completed on the Brogoitti property in 2003.

5.2.3 Operations and Maintenance

5.2.3.1 Landowner Coordination

Landowners were routinely contacted (often through informal communication), to keep them informed of O&M activities being carried out within lease areas on their respective properties.

5.2.3.2 Instream Maintenance

An O&M plan was developed to address maintenance concerns on the Brogoitti Property, East Birch Creek. An on site visit was conducted by Program staff and USACE personnel, to identify sites in need of maintenance and develop specific maintenance strategies. Maintenance work was carried out by Program staff and included the modification of instream structures (angle, slope and height) and channel features, to promote channel stability and achieve desired objectives. Select structures within the entire 1.2 mile project area were modified to achieve correct channel dimension, pattern and profile. A total of 26 J-Hook structures and Cross Vane structures were modified.

5.2.3.3 Offsite Livestock Water Developments

Following a request by Mr. John Brogoitti, a pump was installed and repairs were made to an irrigation system used to provide water for his lawn, per a previous agreement. Genes Electric was contracted to assist with installation and repair. In addition, repairs were made to one of the livestock watering systems previously installed on his property.

5.2.3.4 Revegetation

In April of 2003, program staff planted a total of 3,400 rooted stock seedlings on the Houser and Brogoitti properties (see Photo 6). Sites selected for planting consisted of new locations that had not been included in original revegetation efforts. A variety of species were planted, in fairly even proportions, including cottonwood, snowberry, oceanspray, elderberry, alder, woods rose, choke cherry, mock orange and currant. All species consisted of tublings, with the exception of alder, which were bare-root stock.

Due to limited supplies, only cottonwood seedlings were protected with plastic mesh cones. Cottonwood were considered the species most susceptible to wildlife browse, and the establishment of cottonwoods is considered vital to channel stabilization and increased stream shade. At select sites *Soilmoist*, slow release polymer crystals were also used to hydrate plants. Irrigation began in June of 2003.

5.2.3.5 Fence Maintenance

Fence maintenance activities were conducted by Program staff on all lease areas, per lease agreement obligations. Inspection and maintenance of Program lease areas includes 16.32 miles of perimeter fencing. Fence maintenance involved mending and repairing fence, and rebuilding fence corner braces (stretch points) as required, to maintain structural integrity and exclude livestock.

One water gap gate was opened on Don Weinke's property to allow livestock access to drinking water. 100 feet of 3- and 4-strand electric fence was installed within the water gap, using T-post stakes, to prevent livestock from entering the riparian area.
180 feet of 3- and 4-strand electric fence was installed on the McDaniel property as part of stream crossing maintenance efforts.

Maintenance was conducted at one water gap on the Gambill property, along with inspection and maintenance of 1.25 miles of fence.

5.2.3.6 Miscellaneous Operations & Maintenance Activities

The irrigation equipment was dismantled, retrieved from the field, and stored for the winter. Irrigation pumps were delivered to Cycle Town Honda for repair.

Scheduled maintenance was conducted on program vehicles, including five thousand mile maintenance service on program vehicle # E-216835.

The lumber rack and toolboxes were removed from program vehicle # E-220948 in preparation for body damage repair work, and the work was completed.

Studded snow tires were installed in the spring and removed in the fall, at Les Schwab Tire Center.

5.2.4 Monitoring and Evaluation

5.2.4.1 Instream Monitoring

Inspections of instream Habitat Improvement structures and stable channel design projects were completed at the Houser and Brogoitti properties, East Birch Creek. Preliminary assessments of project success were made and maintenance requirements were identified. Findings steered instream maintenance activities carried out in the fall of 2003.

5.2.4.2 Thermograph Data Collection

Stream temperature monitoring and recording devices (HOBO and STOWAWAY thermograph units), were deployed in early May and retrieved/downloaded in early November. During their period of deployment, thermographs were verified for proper function. Thermographs were downloaded upon retrieval. Historical thermograph data is currently being stored (digitally) for future analysis and use as a Monitoring and Evaluation tool.

5.2.4.3 Spawning Ground Surveys

Steelhead redd count surveys were conducted by Program staff in April and May of 2003. Surveys were carried out on the Brogoitti and Houser properties and on Pearson creek, in the East Birch Creek watershed, as well as in the upper portion of West Birch Creek. These surveys provided information on the presence of steelhead spawners within the respective reaches.

5.2.4.4 Miscellaneous Monitoring Activities

Steve Trask of Bio-Surveys, LLC was contacted regarding data analysis and summary of the fish population inventory conducted on the East and West Forks of Birch Creek. Bio Surveys LLC, was tasked with completion of data analyses and reporting. Results will be used to determine the level of success of past projects and will aid in the evaluation of future projects by providing baseline data.

Russ Faux of Watershed Sciences contacted program personnel to request stream temperature data that was recorded on the day of the flight with our stream temperature monitors to assist them with calibrating the FLIR data. The requested temperature data was provided in digital format.

5.2.5 Program Administration

5.2.5.1 Program Budget

The acting Habitat Biologist completed a five-month program extension budget (May to September 2003) and Statement of Work (SOW). The five-month extension was required to align the Program budget with the BPA fiscal year.

The acting Habitat Biologist completed the program Statement of Work (SOW) and Master Budget for the 2004 Fiscal Year (October 2003 to September 2004).

5.2.5.2 Contract Administration

Contracts specifications were developed, contracts were prepared, and bid notifications were sent to prospective bidders to conduct fish population assessments on East and West Birch Creeks.

Contract specifications were completed to hire an excavator for instream structure maintenance on the Brogoitti project. Bid notifications/packets were sent to prospective contractors.

5.2.5.3 Reports and Data Summaries

The 2003 herbicide application form was completed for BPA.

National Marine Fisheries Service (NMFS) ESA rule 4d permits were renewed for 2004.

An ESA monitoring form for the steam restoration project on the Brogoitti and Houser projects was completed and sent to the ODFW, ESA specialist in Salem.

5.2.5.4 Price Quotes and Purchases

Livestock water troughs for off-channel water developments were purchased from Back Woods Water Troughs.

Irrigation pipe was purchased from Pendleton Grain Growers to enable irrigation of the native plants installed on the Brogoitti project.

Price quotes for the purchase of a new ATV were solicited, and the vehicle was purchased from Oregon Power Sports.

Specifications were developed and price quotes were solicited for the purchase of a utility trailer. Purchase documents were completed and delivery of the trailer was completed in late September.

Purchase documents for miscellaneous field supplies and monthly expenditures were completed.

5.2.5.5 Program Development

Program staff attended the Regional Meeting in La Grande, Oregon.

Program staff attended monthly safety meetings at the John Day Watershed District Office.

5.2.5.6 Personnel

The Fish Habitat Biologist (Troy Laws) accepted a position with ODFW in Astoria OR, and left the Umatilla Subbasin Fish Habitat Improvement Program, effective May 31, 2003. The Fish Habitat Technician (Mike Montgomery) assumed responsibilities as interim program leader (acting Fish Habitat Biologist) from June to December, 2003. Staff of the ODFW John Day Watershed District office posted the vacant Fish Habitat Biologist position. Potential candidates were selected and qualified applicants were interviewed.

A temporary employee (Travis Malin) was hired through *Barret Business Services Inc*., a local temporary service employment provider. The employee refueled pumps to irrigate planting projects and applied weed control treatments on the Brogoitti and Houser properties.

5.2.5.7 Miscellaneous Administrative Activities

Mileage reports for program vehicles were completed.

Small Purchase Order Transactions System (SPOTS) VISA card statements were completed and reconciled with purchase receipts, on a monthly basis.

5.2.6 Interagency Coordination and Education

5.2.6.1 Interagency Coordination

A field tour of the Brogoitti project was conducted with the acting Habitat Biologist and USACE staff, to discuss proposed maintenance of the stable channel design project, scheduled for fall of 2003. Communication between Program staff and the USACE is ongoing and

The acting Habitat Biologist met with Ray Denny of the NRCS to provide technical review for a stream restoration project design scheduled for Butter Creek.

Photopoint prints and slides were provided to Tom Straughan of the SWCD, upon request.

Permission was obtained from the Umatilla National Forest to conduct survey activities on the portion of West Birch Creek under their management.

Hal Phillips with the Umatilla County Road Department (UCRD) was contacted to discuss replacing county road bridges on upper West Birch creek. He stated that if ODFW could supply the necessary funds to purchase the building materials, the UCRD would provide the manpower and equipment to replace the bridges.

The acting Habitat Biologist toured the East Birch Creek (Houser and Brogoitti) Habitat Improvement sites with Russ Powell, John Day Fish Habitat Biologist to observe and discuss J-Hook and Cross Vane structures installed as part of a Stable Channel Design project.

5.2.6.2 Education

The acting Fish Habitat Biologist attended a meeting in John Day arranged by the John Day Habitat Program and presented by the Army Corp of Engineers, to discuss fill/removal permit requirements.

The acting Fish Habitat Biologist attended Level 3 Rosgen stream restoration training in Pagosa Springs, Colorado, and Level 4 training in Steamboat Springs, Colorado.

6.0 LITERATURE CITED

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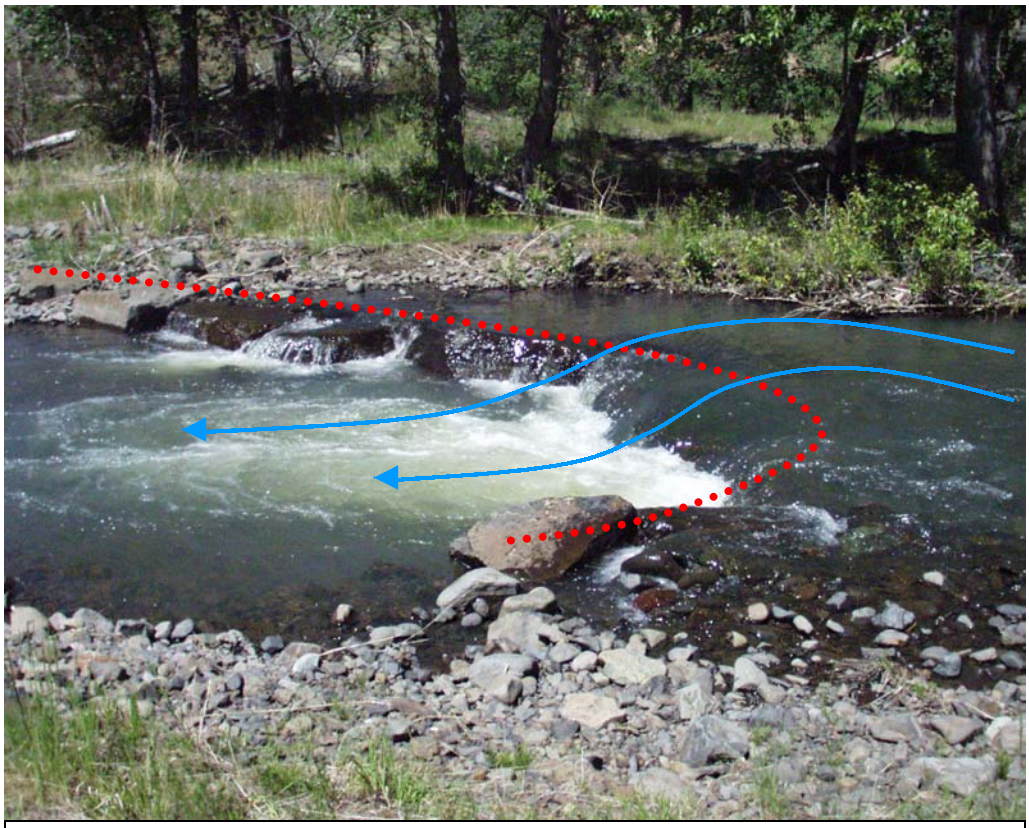
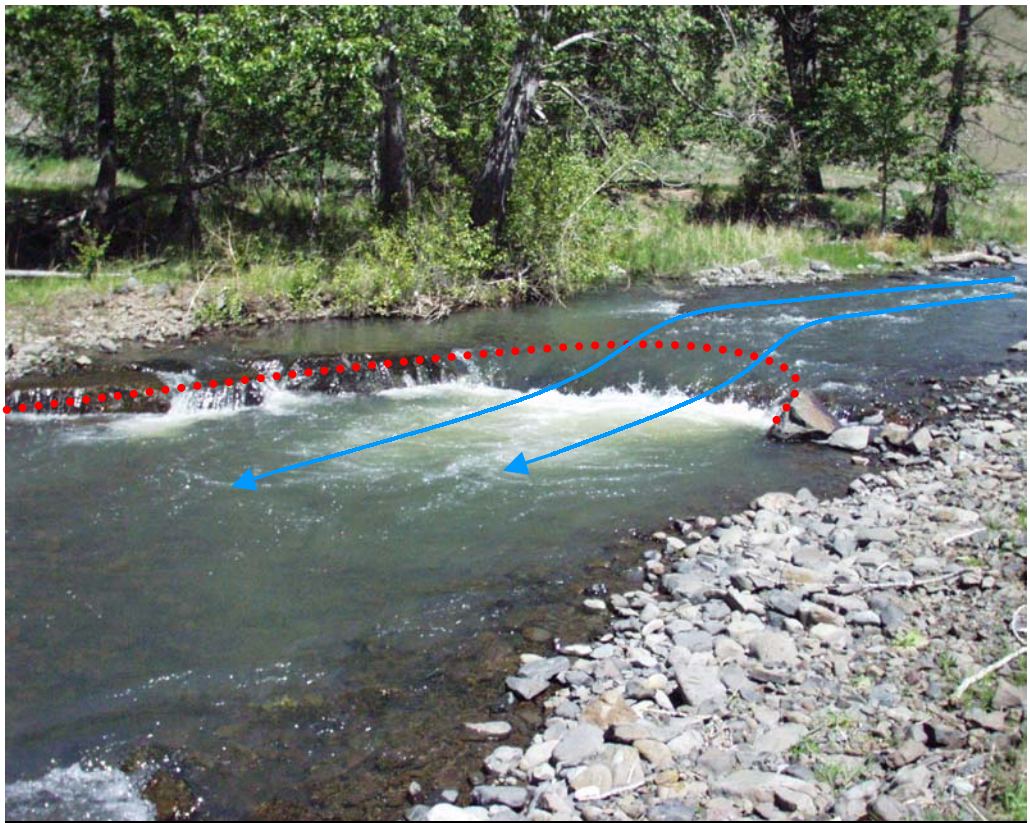
APPENDIX A

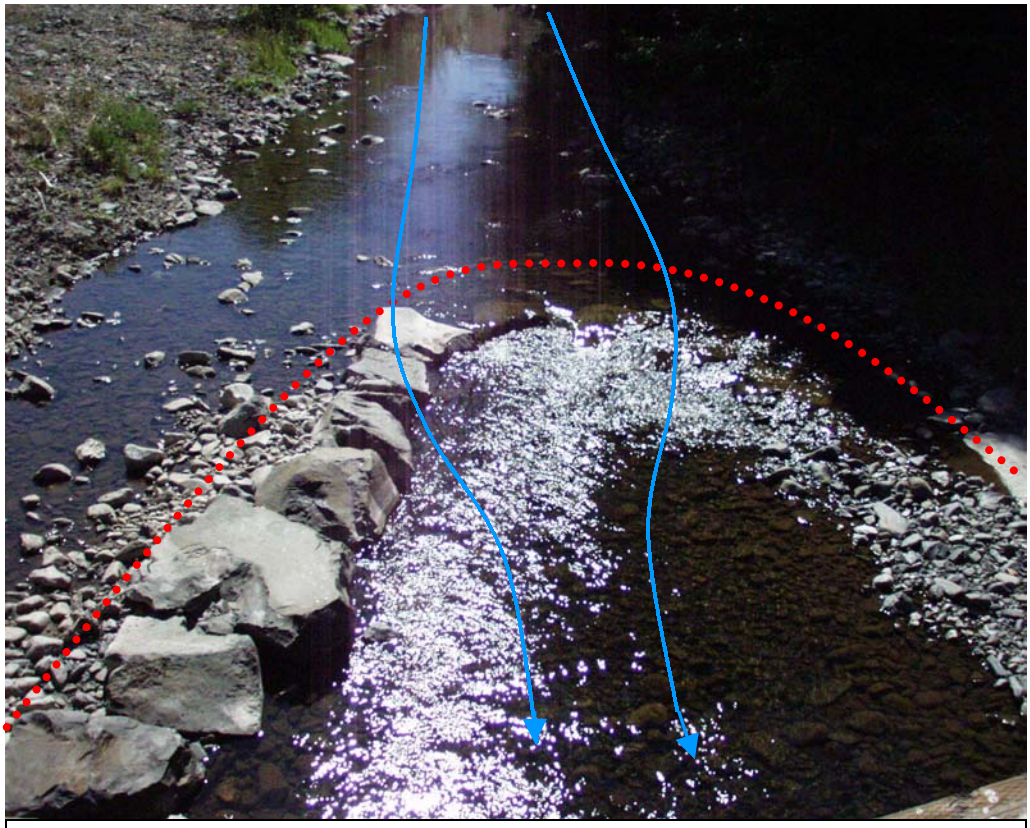
Examples of Typical *J-Hook* and *Cross Vane* Structures
Designed and Installed using Principals and Techniques Developed by Rosgen (2001)



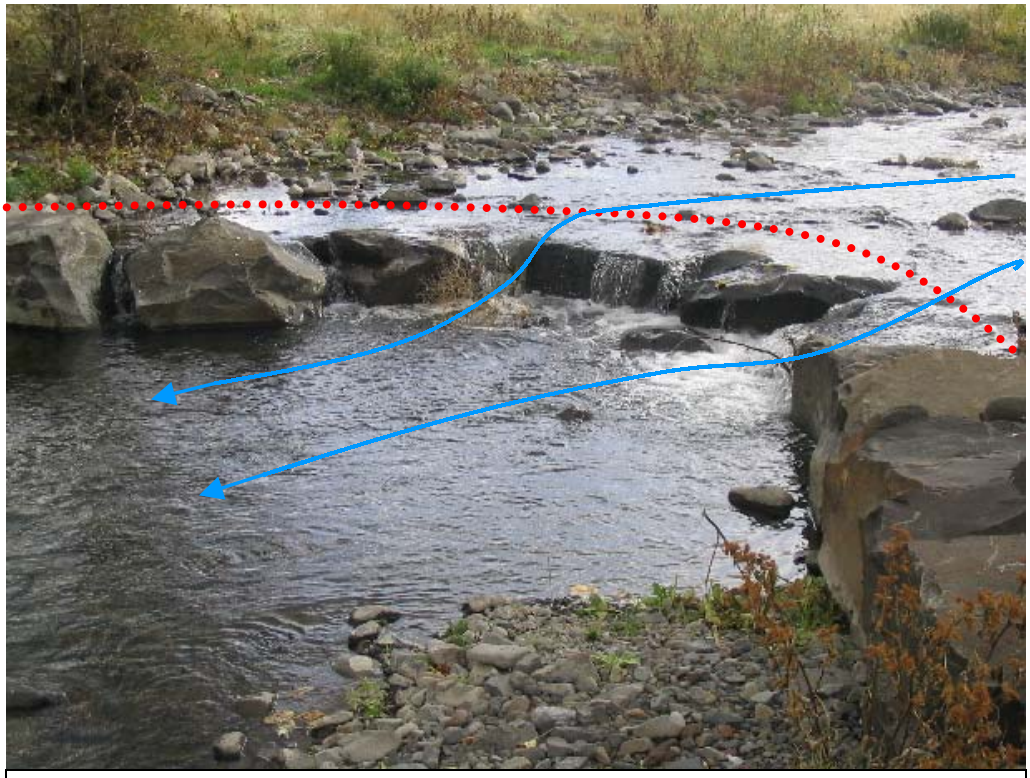
Cross stream view of typical "J-Hook Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.



Upstream view of typical "J-Hook Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.



Upstream view of typical "Cross Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.



Upstream view of typical "Cross Vane" installed on the Brogoitti property (East Birch Creek), using Rosgen design principals and techniques.

APPENDIX B

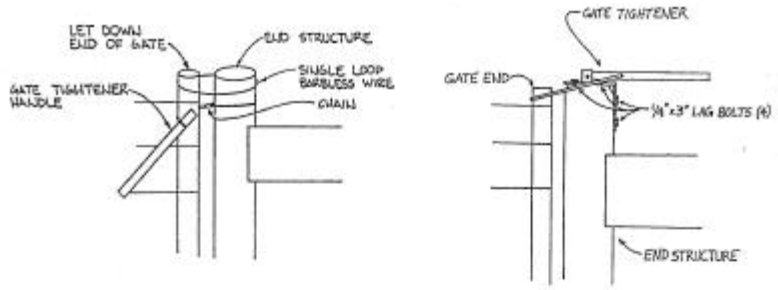
Summary Table of Typical Plant Species
Employed During Rooted Stock Planting Projects

Summary Table of Typical Plant Species Employed During Rooted Stock Planting Projects

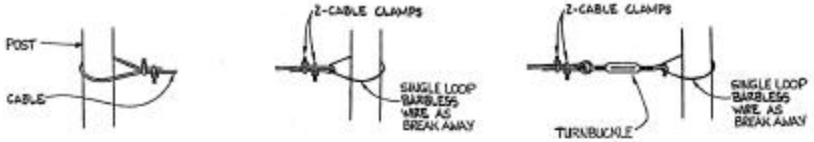
COMMON NAME	SCIENTIFIC NAME
Black Cottonwood	*Populus trichocarpa*
Blue Elderberry	*Sambucus cerulea*
Cascara	*Rhamnus purshiana*
Chokecherry	*Prunus virginiana*
Coyote willow	*Salix exigua*
Mockorange	*Philadelphus lewisii*
Oceanspray	*Holodiscus discolor*
Red Osier Dogwood	*Cornus stolonifera*
Serviceberry	*Amelanchier alnifolia*
Snowberry	*Symphoricarpos albus*
Water Birch	*Betula occidentalis*
Woods Rose	*Rosa woodsii*
Currant	*Ribies spp.*
Ponderosa Pine	*Pinus ponderosa*

APPENDIX C

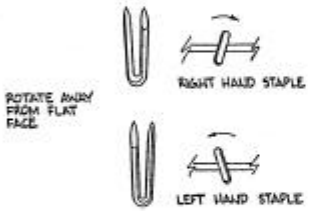
Typical Fence Construction Specifications



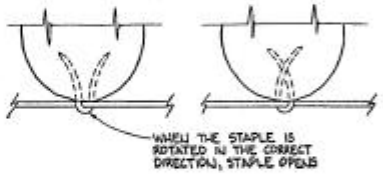
GATE LATCH DETAILS



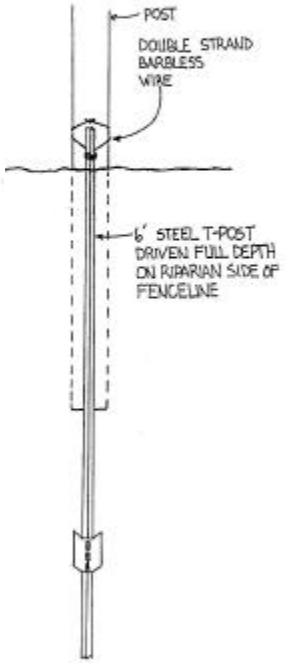
CABLE DETAILS



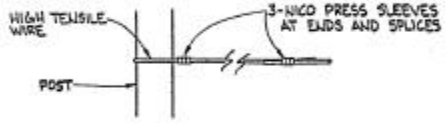
STAPLE ROTATION



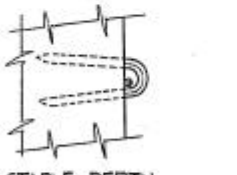
STAPLING



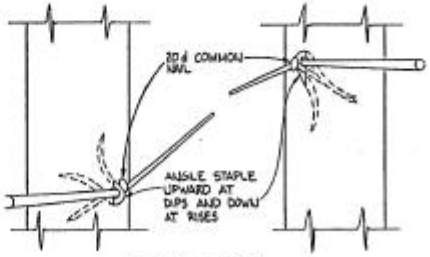
STEEL FOOT



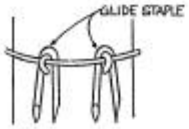
NICO PRESS DETAIL



STAPLE DEPTH



DIPS & RISES



CORNER STAPLING

HIGH TENSILE FENCE DETAILS

APPENDIX D

Typical Spring Development (Schematic Diagram)

Schematic Diagram of a Typical, Off-Site Livestock Watering Development (Gravity Feed, Spring Improvement)