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GRANDE RONDE BASIN FISH HABITAT ENHANCEMENT PROJECT

Annual Report 2000

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GRANDE RONDE BASIN FISH HABITAT

ENHANCEMENT PROJECT:

2000 ANNUAL REPORT
Project No. 8402500

By

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ABSTRACT

On July 1, 1984 the Bonneville Power Administration and the Oregon Department of Fish and Wildlife entered into an agreement to initiate fish habitat enhancement work in the Joseph Creek subbasin of the Grande Ronde River Basin in northeast Oregon. In July of 1985 the Upper and Middle Grande Ronde River, and Catherine Creek subbasins were included in the intergovernmental contract, and on March 1, 1996 the Wallowa River subbasin was added. The primary goal of ***"The Grande Ronde Basin Fish Habitat Enhancement Project"*** is to access, create, improve, protect, and restore riparian and instream habitat for anadromous salmonids, thereby maximizing opportunities for natural fish production within the basin. This project provided for implementation of Program Measure 703 (C)(1), Action Item 4.2 of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program (NPPC, 1987), and continues to be implemented as offsite mitigation for mainstem fishery losses caused by the Columbia River hydro-electric system.

All work conducted by the Oregon Department of Fish and Wildlife is on private lands and therefore requires that considerable time be spent developing rapport with landowners to gain acceptance of, and continued cooperation with this program throughout 10-15 year lease periods. This project calls for passive regeneration of habitat, using riparian exclosure fencing as the primary method to restore degraded streams to a normative condition. Active remediation techniques using plantings, off-site water developments, site-specific instream structures, or whole channel alterations are also utilized where applicable. Individual projects contribute to and complement ecosystem and basin-wide watershed restoration efforts that are underway by state, federal, and tribal agencies, and local watershed councils.

Work undertaken during 2000 included: 1) Implementing 2 new projects in the Grande Ronde drainage, and retrofitting one old project that will protect an additional 1.3 miles of stream and 298.3 acres of habitat; 2) Conducting instream work activities in 3 streams to enhance habitat and/or restore natural channel dimensions, patterns or profiles; 3) Improving fish passage in Bear Creek to restore tributary and mainstem access; 4) Planting and seeding 6.7 stream miles with 7,100 plants and 365 lbs. of seed; 5) Establishing 18 new photopoints and retaking 229 existing photopoint pictures; 6) Monitoring stream temperatures at 12 locations on 6 streams; 7) completing riparian fence, water gap and other maintenance on 98.7 miles of project fences. Since initiation of the project in 1984 over 62 miles of anadromous fish bearing streams and 1,910 acres of habitat have been protected, enhanced and maintained.

INTRODUCTION

Background:

It is widely recognized that wild and naturally spawning populations of salmon and steelhead are at low levels throughout the Columbia River Basin as a result of impaired fish mainstem passage, blocked habitat, habitat degradation, fishing, predation and other factors. Habitat degradation and its causes within the Grande Ronde Basin have been well documented (Anderson and others, 1992; CTUIR, 1984; Henjum and others, 1994; Huntington, 1993; McIntosh and others, 1994; Sedell and Everest, 1991). Listings of Snake River salmonid populations through the Endangered Species Act led to increased efforts to implement ecosystem or watershed based approaches to species recovery within individual subbasins (Anderson and others, 1992; Huntington, 1994; Mobrand and Lestelle, 1997; NMFS, 1997; Wallowa Co.-Nez Perce, 1993). The intent of this project is to work within this framework by providing offsite mitigation for mainstem losses of habitat and fish productivity caused by the construction and operation of eight dams on the Columbia River. This is achieved through coordinated efforts to protect and improve spawning and rearing habitat, and improve fish passage.

Prior to implementation of this project, streams within the Grande Ronde River basin were examined as part of a study funded by Bonneville Power Administration (BPA), and undertaken by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Oregon Department of Fish and Wildlife (ODFW). The study compiled the basic information necessary to identify, evaluate, prioritize, and recommend site-specific solutions to major problems impacting the anadromous salmonid resources and fisheries, and prepared an integrated overall plan for the study area (CTUIR, 1984). The identification, priority, and implementation of habitat work within these drainages represented a consensus among staff from ODFW, Tribal, and Federal entities (Appendices 1 and 2), and established an initial template from which to pursue fish habitat enhancement projects. In 1996 project areas on private lands were re-prioritized based on several factors, including: 1) review of work completed in the basin; 2) review of more recent watershed assessments such as those produced through the Grande Ronde Model Watershed Program or local watershed groups; 3) and input from local district fisheries biologists.

Fisheries Status:

Historically the Joseph Creek subbasin has been an excellent producer of summer steelhead, and continues to be managed as a wild fishery. Wild summer steelhead spawning ground counts on ODFW index streams (stream reaches that were selected for consistent annual monitoring) began in the 1960's. Redds/mile in this subbasin from 1970 through 1984 indicated severe reductions of returning spawning adults (Figure 1). This downward trend showed signs of improvement from 1985 to 1989, and have fluctuated considerably since then.

Summer steelhead escapement over Lower Granite Dam (which includes all wild and hatchery stocks entering Oregon and Idaho) has fluctuated a great deal but showed substantial improvements after 1981 when fish passage improvements were initiated (Figure 1). Total escapement over Lower Granite have remained in excess of 65,000 fish since 1995, however, counts of the wild portion of the run which began in 1994, remain low, averaging only 14.0% of the total run in the last 7 years.

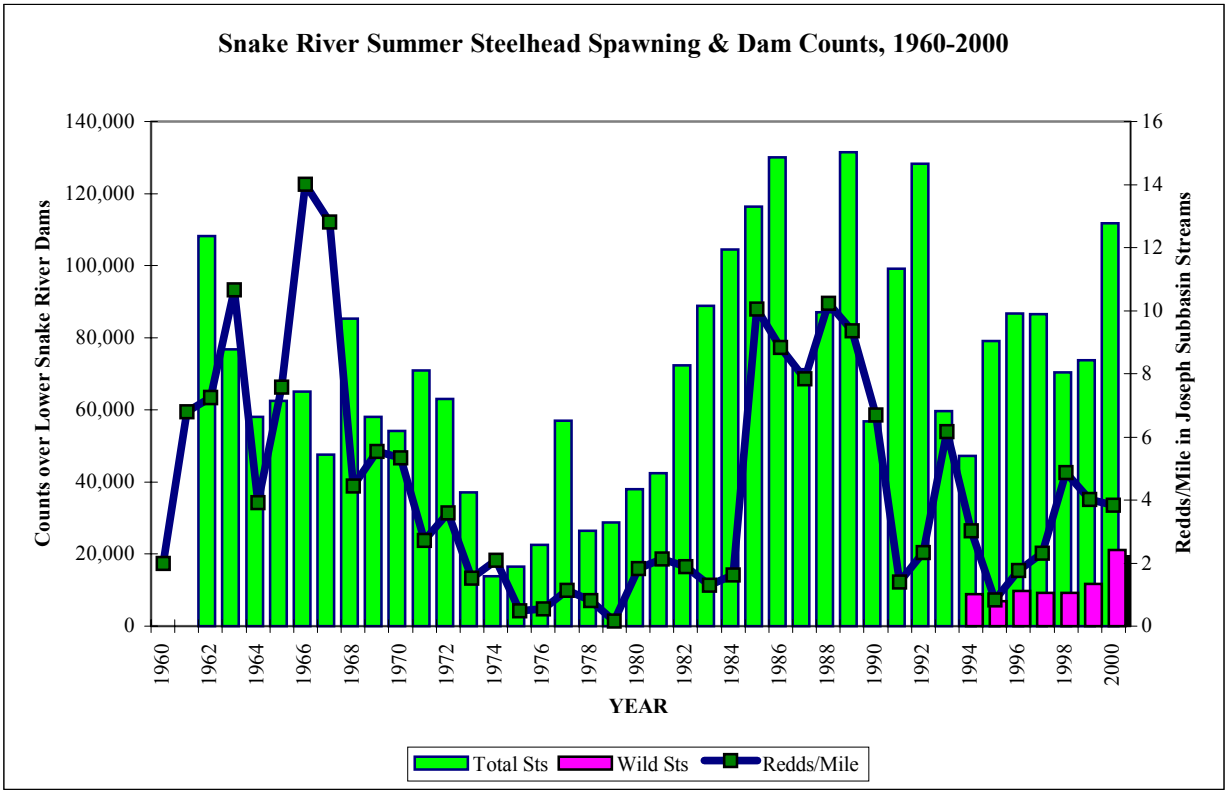


Figure 1. Snake River Summer Steelhead adult counts over Lower Snake River dams, and spawning ground counts in index Joseph subbasin streams, 1960-2000.

SOURCES: Columbia River Fish Runs and Fisheries, 1938-1999, Status Report. ODFW Wallowa District Fisheries Biologists.

NOTES: The 1962-1974 dam counts are at Ice harbour and Little Goose, the 1975-1996 counts are at Lower Granite dam. Counting of wild steelhead separately from hatchery origin began in 1994. Joseph Creek subbasin index steelhead spawning ground counts include Butte, Chesnimnus, Crow, Devil's Run, Elk, McCarty Gulch, Peavine, Swamp, Summit and TNT Gulch Creeks. Joseph Creek steelhead counts consist solely of wild fish and are considered to be representative of other wild runs in the Grande Ronde Basin.

The Wallowa River subbasin historically supported sockeye, coho, and fall chinook in addition to strong runs of steelhead and spring chinook. However, sockeye and coho are now extinct, and only small numbers of fall chinook remain, which generally spawn lower in the basin.

In the Upper Grande Ronde River drainage historical records also indicate excellent production of both summer steelhead and spring chinook, but chinook spawning redd counts in the last 10 years indicate that returns to the Upper Grande Ronde River drainage remain well below those observed in the late 1960's and early 1970's (Figure 2). The 1994 and 1995 redd counts were the lowest on record since extensive surveys were initiated in 1986 (Carmichael, 1994). Spring chinook escapement over Lower Granite dam (which includes hatchery and wild fish) follow the

same general pattern, with 1995 being the lowest run count on record (Figure 1). Although runs over Lower Granite increased to a record high of 62,523 adults and jacks in 2000, redd counts in Upper Grande Ronde streams remained much lower than hoped for at 2.2 redds/mile, with the vast majority of those redds from the Minam River which is in unmanaged wilderness. The wild fish component of the run has averaged 42% through most of the plotted time period (Swartz, 1996).

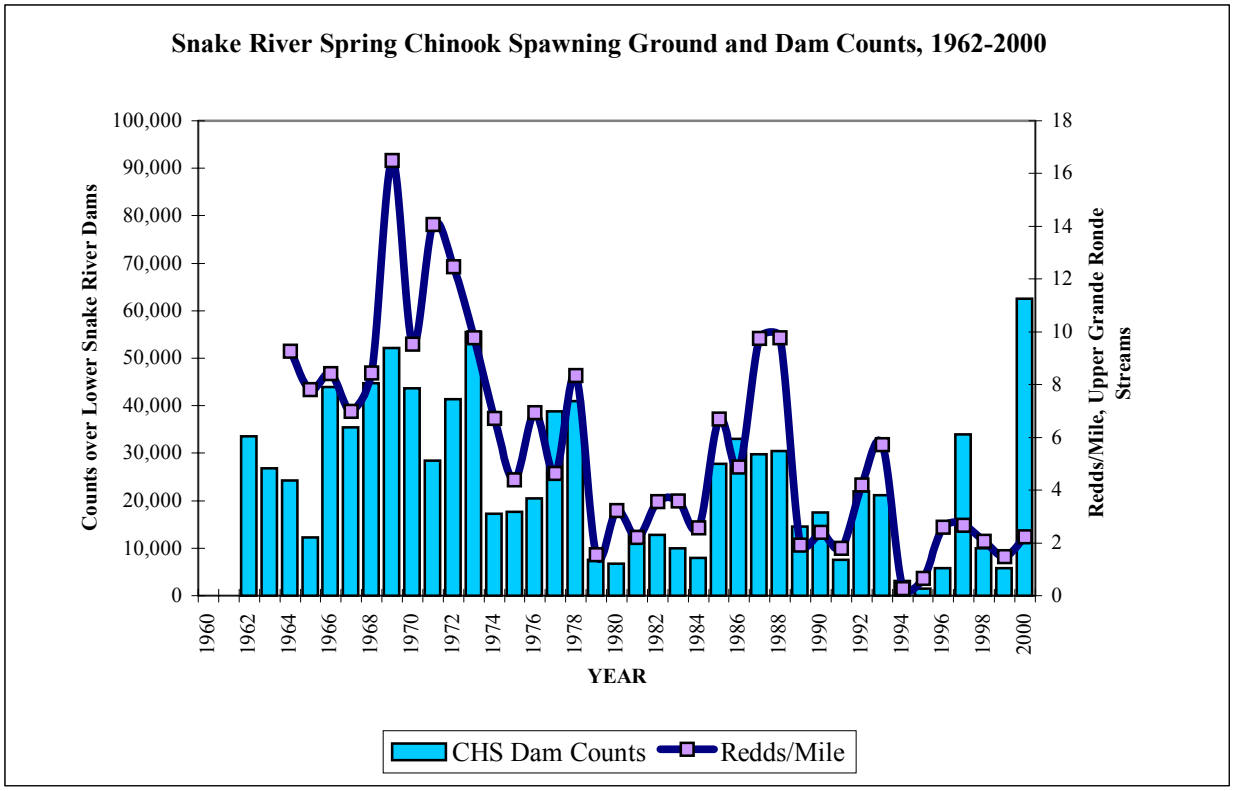


Figure 2. Snake River Spring Chinook adult and jack counts over Lower Snake River dams, and spawning ground counts in index Upper Grande Ronde subbasin streams, 1960-2000.

SOURCES: Columbia River Fish Runs and Fisheries, 1938-1999, Status Report. ODFW La Grande District & Research Fisheries Biologists.

NOTES: Spring chinook dam counts include adults and jacks. Fish passage improvements and smolt transports began after 1981. Streams in this graph include ODFW index spawning ground counts of wild fish in Catherine Creek, the Upper Grande Ronde River, Sheep Creek, Minam and the Little Minam River.

Causes and Consequences of Declines:

There are many reasons for declines of anadromous fish in the Grande Ronde River Basin since the mid-1970's, including: 1) problems with adult and juvenile passage that occurred following construction of 8 Columbia and Snake River dams between 1938-1975 (ODFW/WDF, 1997), 2) Commercial, sport and Tribal demands for the fishery resource, 3) Degradation of spawning and

rearing habitat throughout the basin, and 4) A major forest fire, followed by a flash flood event in the Upper Grande Ronde headwaters during peak migration and spawning in August of 1989 resulted in decimation of the adult chinook run and their progeny (Boehne and others, 1989).

Observations in the Grande Ronde River basin indicate optimum spawning and rearing areas for summer steelhead and spring chinook are limited in large portions of these drainages by degradation of riparian and instream habitats (Noll, 1987; Anderson & others, 1992; Huntington, 1994). For example, approximately 70% of the large pool habitat in the mainstem Upper Grande Ronde River and 26% in Meadow Creek have been lost since 1941 (Sedell and Everest, 1991). The average percent shade cover over low gradient constrained, and low gradient unconstrained streams in the Grande Ronde Basin are 33% and 24%, respectively (Huntington, 1994).

Management practices that have contributed to habitat degradation within project areas include beaver trapping, livestock overgrazing, irrigation diversions and cropland agriculture, timber harvest, road construction, mining, stream channelization, and introduction of exotic species. Several limiting factors associated with instream and riparian habitat degradation have led to reductions in natural production of salmonids in the Grande Ronde River basin, including:

- High summer water temperatures
- Low summer flows
- Loss of riparian vegetation
- Poor instream habitat diversity
- Loss of floodplain connectivity
- Unstable stream channels and sedimentation
- Winter icing
- Loss of fish passage

Considerable effort and money have been invested in trying to resolve mainstem dam passage problems. Tighter restrictions on ocean and river harvest of these stocks have also been implemented, and tribal salmon fishing in the basin ceased almost entirely since 1983. Despite these efforts, salmonid populations continued to decline. The National Marine Fisheries Service listed the Snake River portion of the Columbia River sockeye salmon run as an endangered species in December 1991. The Snake River wild portion of the summer and spring chinook runs were combined and listed as threatened in May 1992, along with the fall chinook. Bull trout and summer steelhead listings followed in 1997 and 1998.

Solutions:

The Grande Ronde Basin Fish Habitat Enhancement Project is a logical and integral part of the species recovery process by implementing projects that establish long term riparian and instream habitat protection, and tributary passage improvement on private lands through riparian lease agreements. Planning for implementation of these projects includes the participation and involvement of private landowners, state and federal agencies, tribes, model watersheds, and watershed councils. Individual projects contribute to ecosystem and basin-wide watershed restoration and management efforts that are underway by these groups.

Out of basin variables (such as mainstem passage and harvest) are beyond the scope of this project, but the in-basin limiting factors mentioned above can be adequately addressed if proper habitat enhancement techniques are utilized. Drake (1999) concluded that seasonal maximum temperatures and variables related to it explained the distribution and abundance of trout in Upper Grande Ronde streams, and that management and restoration activities should focus on reducing stream temperatures. Streams in the John Day basin with greater than 75% shade maintained acceptable stream temperatures for rainbow trout and chinook salmon (Maloney and others, 1999), and the lowest temperatures were observed in streams from ungrazed watersheds. This program primarily relies on restoring natural riparian vegetative recovery, floodplain connectivity and groundwater interactions, using riparian fencing in streams that have been impacted by livestock grazing. This method has proven to be effective in protecting and restoring streams (Beschta and others, 1991; Chaney and others, 1993; Owens and others, 1996).

In more severely degraded areas, fencing, in combination with placement of instream structures and riparian plantings, can accelerate the natural recovery process (Chaney and others, 1993; ISG, 1996; Huntington, 1994; NMFS, 1997, Roper and others, 1998). In channelized or severely entrenched streams more aggressive action including whole channel alterations or relocations of streams may be required (Rosgen, 1996; Federal Interagency Stream Restoration Group, 1998). The Grande Ronde Basin Fish Habitat Enhancement Project incorporates both passive and active techniques that provide optimum habitats for returning adults and their progeny, and helps achieve the overall goal of maximizing natural anadromous fish production in the Grande Ronde River basin.

DESCRIPTION OF PROJECT AREAS

Five of the ten subbasins within the Grande Ronde Basin are included in the project areas. Not included are the Minam, Lower Grande Ronde, Wenaha, Imnaha, and Inner Snake subbasins. Those subbasins are comprised mostly of Forest Service, National Recreation Area, or Wilderness lands (Figure 1).

JOSEPH CREEK SUBBASIN:

The Joseph Creek subbasin (part of Federal Hydrologic Unit Number 17060106) constitutes a major drainage within the Grande Ronde Basin of northeast Oregon. It drains approximately 635 square miles of the 5,299 square mile Grande Ronde Basin. It contains an estimated 225 miles of anadromous fish habitat, and is managed for wild summer steelhead. It empties into the Grande Ronde River 4.3 miles above the confluence of the Grande Ronde and Snake rivers (Figure 3). Approximately 75 percent of the Joseph Creek subbasin is within the project area. Not included in the project area are lower Joseph Creek in Washington State, and the Cottonwood Creek drainage, which enters Joseph Creek 4.4 miles above Joseph Creek's confluence with the Grande Ronde River (Figure 3).

Within the project area 120.5 miles of stream were identified as in need of habitat enhancement; 75 miles on private land and 45.5 miles on public lands (Appendix 1).

WALLOWA RIVER SUBBASIN:

The Wallowa River subbasin (part of Federal Hydrologic Unit Number 17060105) drains approximately 721 square miles and includes approximately 168 miles of streams used by spring chinook and summer steelhead. It starts at the confluence of the Grande Ronde and Wallowa rivers; 81.4 miles upstream from the confluence of the Grande Ronde and Snake rivers (Figure 3). A large portion of the drainage originates in the northern half of the Eagle Cap Wilderness.

Within the project area 43.0 miles of stream were identified as in need of habitat enhancement, all within private lands (Appendix 1).

UPPER GRANDE RONDE RIVER DRAINAGE:

The Upper Grande Ronde River drainage (Federal Hydrologic Unit Number 17060104) includes the Upper Grande Ronde, Middle Grande Ronde and Catherine Creek subbasins. It drains approximately 1,650 square miles of the 5,299 square mile Grande Ronde Basin, and contains an estimated 660 miles of anadromous fish habitat. It also starts at the confluence of the Grande Ronde and Wallowa rivers at Rondowa (Figure 3), draining the western half of the Eagle Cap Wilderness and the northern portion of the Elkhorn Mountain range.

Within the project area 211.8 miles of stream were identified as in need of habitat enhancement; 116.8 miles on private lands and 95.0 miles on public lands (Appendix 2).

Figure 3. Grande Ronde Basin ODFW/BPA Fish Habitat Restoration Projects, 1985-2000

Project Locations

Project Locations

GRMWP Project Location Points and IDs

Land Management

- Forest Service
- Wilderness Area
- National Recreation Area
- Bureau of Land Management
- Indian Reservation Lands
- State Lands
- Private, Unknown or Other

County Boundaries

Base Data Derived From 1:100,000 Scale Sources

N W E S

0 5 10 Miles

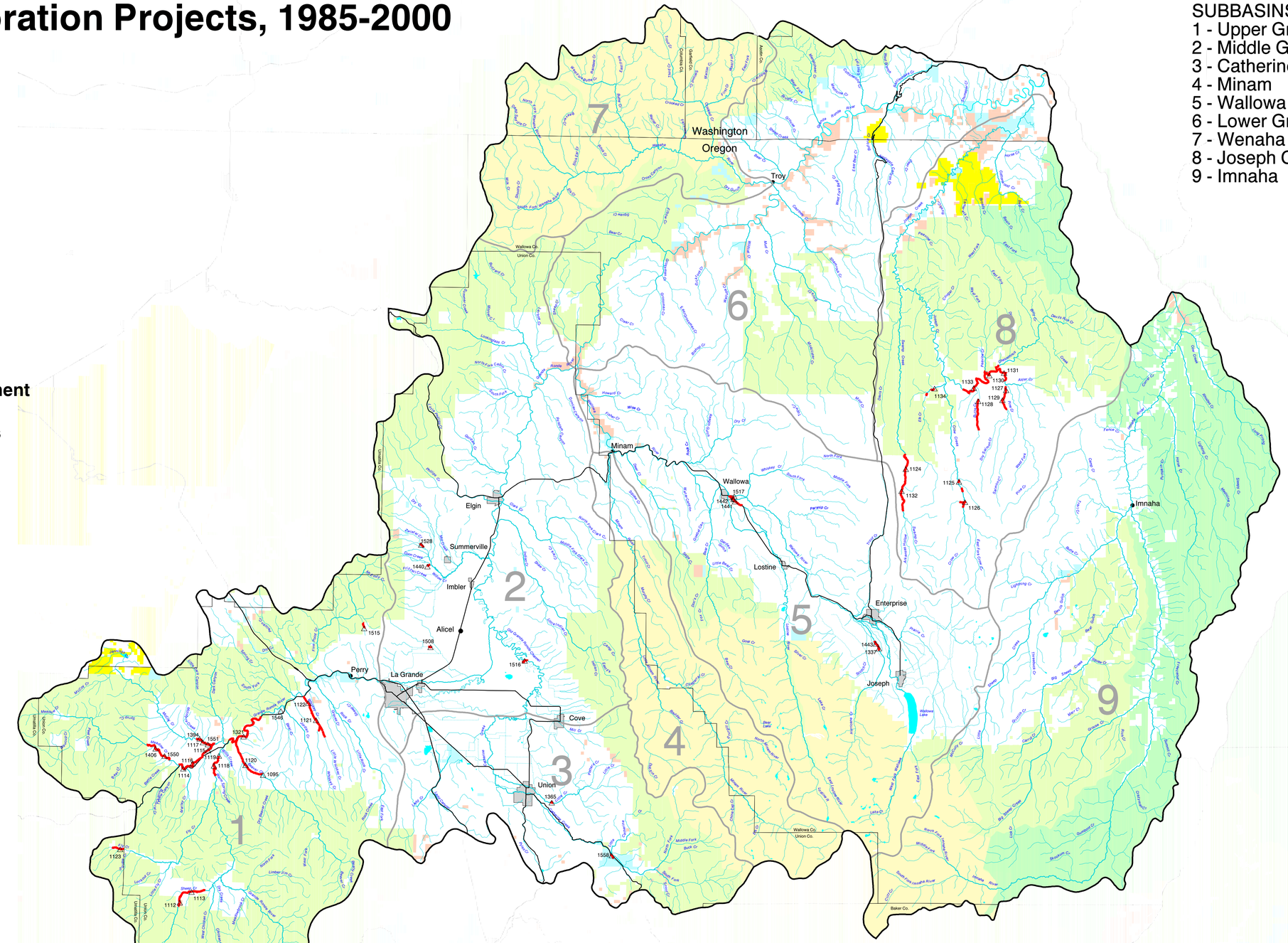
OREGON Fish & Wildlife

BONNEVILLE POWER ADMINISTRATION

OREGON

Grande Ronde Basin Location

SUBBASINS
1 - Upper Grande Ronde
2 - Middle Grande Ronde
3 - Catherine Creek
4 - Minam
5 - Wallowa
6 - Lower Grande Ronde
7 - Wenaha
8 - Joseph Creek
9 - Imnaha



Grande Ronde Model Watershed Program - 5/16/01

METHODS AND MATERIALS

The goal of this program is to optimize spring/summer chinook and summer steelhead smolt production and survival within the Grande Ronde River Basin using habitat enhancement measures. To accomplish this goal, work will progress in the following phases:

1. IMPLEMENTATION - Prework
2. IMPLEMENTATION - Onsite
3. OPERATIONS and MAINTENANCE
4. MONITORING and EVALUATION

IMPLEMENTATION - Prework:

This is one of the most time-consuming and important phases of the program, in which landowner relations and goals of the project are established, and work activities scheduled. Prior to project construction the following activities are conducted:

Project Planning

Project planning includes design, layout and mapping of all work to be done onsite, landowner coordination, development of contracts and contract specifications, and obtaining necessary work permits.

Project Preparation

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

Riparian Lease Development and Procurement

Riparian lease development and procurement includes meeting with landowners and/or their legal representatives specifically for the purpose of developing an acceptable lease or cooperative agreement text. Lease documents must be signed, notarized, and filed in the county courthouse.

Field Inventories

These may include prework stream surveys, and photographic documentation to provide baseline information on habitat condition and potential for improvement prior to any onsite implementation.

IMPLEMENTATION - Onsite:

Onsite implementation encompasses the actual on-the-ground work phase of the program and may include any or all of the following:

Instream Structures

During late summer and early fall when stream flows are lowest, instream structures may be installed in streams at locations pre-selected by fishery biologists and/or hydrologists. Instream structures will be installed to specifically address the factors limiting fish production in each stream reach. Structures of various types may be used to provide optimum pool/riffle ratios, raise stream water tables, collect spawning gravels, and increase the amount of large woody debris, thereby increasing quantity and quality of spawning and rearing habitats. Hard rock structures may be necessary under some circumstances, but bioengineered or other "soft" structures will be the primary methods used to stabilize stream banks. Boulders may be used to create small rearing pools and hiding cover, and may be used as anchor points for cabling large woody debris.

In some cases, such as in artificially channelized reaches, more intensive work may be needed to restore rivers back into a channel functioning at full potential. Work in these reaches will be conducted based on Rosgen (1996) natural channel design to restore a stream back into its natural dimension, pattern and profile.

Planting

During the early spring, shrub and/or tree species may be planted at pre-selected locations along streams within project areas. Since high summer water temperatures are a major limiting factor, plantings will be made to provide stream shade, thereby reducing summer water temperatures and increasing salmonid utilization of streams. The maximum shade attainable for most streams in project areas is estimated at about 80 percent.

Plantings may also be done in areas of poor bank stability as a preferred alternative to the more costly rock structures. Plantings will be done only after riparian fences have been installed to ensure their protection. During the fall, areas disturbed during implementation activities will be seeded to stabilize soils and discourage weed growth.

Fencing

Degradation of streamside vegetation by domestic livestock has been a major problem within project areas. To provide protection from livestock, and thereby promote rapid recovery of existing and planted vegetation, fences will be constructed along riparian zones within project areas. When negotiating fence locations with landowners, preference will be given to projects where fences are located well outside the normal flood-prone area.

Offsite Water Developments

In an attempt to reduce the number of watering gaps in riparian fences (thereby reducing fence construction and maintenance costs), and to encourage livestock utilization of vegetation away from riparian areas, offsite water sources will be developed.

Miscellaneous Implementation Activities
Cooperator signboards denoting riparian enhancement projects as cooperative efforts between BPA, ODFW and private landowners will be installed at high visibility sites along completed riparian enhancement project areas. Other activities may be required to complete a fish habitat enhancement project and meet landowner needs.

OPERATIONS AND MAINTENANCE:

Operations and maintenance activities will begin the year following implementation and include:

Landowner Coordination
Ongoing coordination and cooperation between the landowners and ODFW is a vital element to ensure long-term project success after the initial implementation is completed.

Fence Maintenance
Biannual inspections of all project areas will be made. Following these inspections all fence maintenance will be done. Stream cross fences and/or water gap cross fences may be installed or removed during these inspections, or at any time during the year to meet landowner needs and to ensure maximum recovery within the projects.

Instream Maintenance
Annual inspections of all instream structures will be done, usually in combination with fence maintenance inspections. Instream structures are generally expected to provide long lasting benefits with low maintenance. Instream structure maintenance will be done on a case-by-case basis, depending on impact of the structure failure on riparian recovery, streambank stability and/or landowner needs.

Revegetation
Replanting and/or seeding of project areas may be necessary to produce adequate stream shading, bank stability, or cover within the 15-year lease period. Events such as severe flooding and bank erosion, or when recovery is unacceptably slow due to lack of parent stock may result in a decision to replant an area.

Miscellaneous Operations & Maintenance Activities
These activities may include vehicle, ATV, and equipment maintenance and repair. Other activities include installing or replacing project signs, and efforts to control wildlife damage.

MONITORING AND EVALUATION:

Whenever possible, some level of monitoring will be established prior to project implementation, and will continue beyond the term of the lease agreement if the landowner is willing. Individual projects will be monitored using one or more of the following methods:

Photopoint Establishment

Photopoint establishment will include locating and placing permanent markers at sites from which photographs can be taken at regular intervals. These photographs are a primary means of documenting physical and biological changes along streams. Also associated with photopoint establishment is development of a photopoint notebook for each project area. These notebooks contain maps of all photopoint locations, instructions on taking the photographs, and labeled slides and prints.

Photopoint Picture Taking

Standardized pictures will be taken from pre-selected photopoints prior to implementation on any project area and then for the next two years immediately following completion of a project. Once these initial photos are obtained the frequency of photopoint picture taking may diminish to once every two to three years.

Habitat Monitoring Transect Establishment

Within selected project areas permanent habitat monitoring transects will be established. Specific measurements will then be taken along each transect to record channel morphology, and vegetative characteristics. These measurements will be repeated at regular intervals and compared with original measurements as a means of quantitatively measuring environmental changes through time.

Habitat Monitoring Transect Data

Immediately after establishing habitat monitoring transects, baseline data will be collected. Data collection will be done on the first year following completion of implementation activities and thereafter at approximately 3 to 5 year intervals.

Thermograph Data Collection and Summarization

Thermographs will be installed at various locations throughout the project area. Thermograph data will be recorded, collected, summarized, and graphed on a regular basis. The purpose of this type of monitoring is to detect changes in stream water temperatures that may occur over the years within fenced-off, recovering riparian areas.

Miscellaneous Monitoring and Evaluation

Miscellaneous monitoring and evaluation activities may include chinook salmon and steelhead redds counts, juvenile fish population surveys, streambank stability surveys, and evaluating riparian vegetative recovery and/or planting success.

RESULTS AND DISCUSSION: FIELD ACTIVITIES

The following field activities were completed in 2000:

IMPLEMENTATION - Prework:

Project Planning

Design and Layout

Identification of property boundaries for privately owned lands along priority streams in the Joseph Creek and Upper Grande Ronde drainages was the first step in the planning habitat enhancement work. The majority of mapping for private lands was completed in 1988, and aerial photographs (8 inches/mile) were taken by BPA on many project streams in 1987. Additional mapping in 2000 included purchasing landownership maps at county courthouses. Ordering additional aerial photographs of potential projects from the ASCS Aerial Photography Field Office included photos of potential projects on Bear, Milk, McCoy, Jordan and Meadow Creeks.

Lease maps for the McCoy Creek/Alta Cunha Ranches project were completed and copies sent to the landowner.

The Design Report for the McCoy Meadows Channel Relocation Project was completed by NRCS and reviewed by project participants. In addition, Williams & Associates completed an independent review of the Design Report.

Meadow Creek aerial photos were scanned and copied. Instream work sites for the Habberstad project were mapped on the photos.

Reference Reach data for the Milk Creek/Hall Ranch project was summarized. The data was used for new channel designs, based on the Rosgen stream classification system. The 1937 aerial photographs were obtained to examine evidence of old channels. Final channel designs for the project included calculating stream channel dimensions, pattern and profile, stream velocities, shear stress, sediment sizes and cut/fill quantities of a 1,300 ft. section of new channel. Oregon Department of Transportation (ODOT) personnel completed topographic site maps of the project. ODOT will also be responsible for the highway culvert replacement portion of the project, which will improve juvenile chinook and steelhead passage. A 36-inch cement culvert will be replaced with a 5' x 8' bottomless culvert.

The biologist participated in planning of the Ladd Creek/Tule Lake project. The project includes expanding the City of La Grande's sewage system and incorporating this into new wetland areas, relocation of Ladd Creek, removing or relocating old dykes and flood control structures, and installing adjustable fishways. ODFW completed preliminary designs for relocating 1.7 miles of the creek from its existing irrigation ditch into approximately 2.2 miles of natural stream channel. ODFW personnel will use Rosgen training to provide specifications and assist in construction of the new stream channel.

Landowner Coordination

A great deal of time was spent in communication with landowners throughout the project area to develop riparian leases or coop agreements, and plan onsite work:

Mark Tipperman was contacted to coordinate fence removal and relocation, and location of new gates on the McCoy Meadows project. Mr. Tipperman expressed concern about wire heights and making sure fences would not harm resident elk herds. We modified the fence specifications to make them more wildlife friendly.

Meetings were held with Hall Ranch and project cooperators to review stream relocation designs and determine appropriate grazing management following project implementation.

Developing Contracts and Contract Specifications

A Professional Services Contract was written for conducting an independent field review of the McCoy Meadows project designs.

An instream work proposal and contract was completed for the Meadow Creek/Habberstad project to place whole trees and install other structures.

The biologist wrote a proposal and fence contract for realignment of 2.1 miles of fence, 0.9 miles of fence removal, and installing 8 gates on Meadow and McCoy creeks/Tipperman project. A pre-bid tour of the project was conducted on September 12, 2000 and the contract was later awarded to Straightline fence for the total cost of $12,091. ODFW personnel delivered fence materials to the project and inspected the fence construction, while the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) administered the contract using Grande Ronde Model Watershed Program (GRMWP) and Natural Resource Conservation Service (NRCS) funds.

Obtaining Work Permits

Instream work permits for the McCoy/Cunha, Meadow Creek/Habberstad and McCoy/Tipperman projects were submitted to the Division of State Lands (DSL) and the U.S. Army Corps of Engineers (USACE). Biological assessments for both of these projects were written and submitted to the National Marine Fisheries Service (NMFS). Jim Morrow and Rick Edwards of NMFS and were later contacted to determine status of proposed instream work permits. In June they visited the proposed projects on Meadow and McCoy creeks, and looked at large wood placements and other instream/riparian improvements completed on projects the year before. Information on the Meadow Creek/Habberstad project was provided to BPA in order to complete a National Environmental Protection Act (NEPA) compliance checklist.

The newly revised USACE Regional General Permit for placement of large wood and boulders was reviewed. Under the new rules instream work activities such as installing grade control or other hard structures must now go through the more intensive 404 permit process.

The biologist assisted Oregon Department of Forestry (ODF) personnel with writing and submitting a joint USACE/DSL 404 permit for the Milk Creek project. Jim Anderson of the USACE visited the Milk Creek site to look at proposed instream work on this project. It was

later determined that construction in the upland areas may proceed this winter without going through complete consultation, but this will still need to be done prior to actually rerouting the stream in 2001. Background fisheries data and channel designs were provided to ODOT for inclusion in the biological technical report.

Project Preparation

Staking of 1.1 miles of new fence was completed on the McCoy Creek/Alta Cunha Ranches project. An additional 6.9 miles of existing fence was inventoried and mapped to determine maintenance needs.

Proposals for fencing Jordan and Bear creeks on the Alta Cunha ranches property were submitted in January to the Grande Ronde Model Watershed but not in time to meet funding deadlines for 2000 projects. The information was later used by the CTUIR in another GRMWP proposal for the Longley Meadows project that will include 1.7 miles of Bear Creek, 1.4 miles of Jordan Creek and 1.4 miles of the mainstem Grande Ronde River. The projects will be initiated in 2001.

Whole live trees were marked, and instream work sites were staked out on the Meadow Creek/Habberstad property for large wood placements.

Fence relocation was staked out on the McCoy Meadows project. Fences will be removed from the existing stream sides near the channelized reach and placed on the hill slopes, incorporating the entire meadow and wetland habitat in the lower meadow.

ODFW personnel and Rick Wagner of ODF completed a preliminary staking of the Milk Creek channel. A longitudinal profile of the new channel was surveyed in, and adjustments to the original layout were made in order to stay within design criteria for slope, meander lengths, belt widths and other parameters. Locations of pools and riffles were staked out, and cut/fill depths plotted out.

Riparian Lease Development and Procurement

Considerable time was spent contacting several prospective landowners:

ODFW, CTUIR and NRCS staff met with Ms. Shauna Mosgrove to discuss future projects on Bear, Jordan, and McCoy creeks. Ms. Mosgrove has been weighing the various options available to her (BPA lease, Conservation Reserve Enhancement Program, Wetland Reserve Program, etc.). A draft lease agreement and map was sent to Ms. Shauna Mosgrove for the McCoy Creek property. However, the project has been held up due to possible sale of the property.

Mr. Jerry McKague was contacted to discuss potential fish habitat enhancement work on upper McCoy Creek just below the National Forest boundary.

Mr. John Habberstad has delayed lease negotiations on Meadow and Campbell creeks due to potential land acquisitions/exchanges. However, he indicated in writing that he still intends on signing a lease once final property boundaries are established. In the meantime he asked that we maintain the existing old boundary fences at a minimum level to prevent neighboring cattle from entering the property. He did not bring in any livestock of his own. He also suggested we carry

on with plans for instream habitat improvement, which we did.

Mr. Paul Pagliarulio contacted us regarding a potential riparian fencing project on Little Creek. We will visit the site next spring.

The biologist spoke with Mr. Wylie Frei of Buckhorn Ranches regarding their purchase of part of the Crow Creek/Buhler project. They were unaware of the existing lease agreement, therefore copies of the lease were sent to them for review.

Mr. Gary Maffei of Murlough Ranches called us to discuss the lease agreement on the Grande Ronde River/Crown Pacific property. They recently purchased the property and are considering their options regarding the lease transfer.

Field Inventories

Several project areas were inspected to assess pre-project conditions (identify limiting factors), or to determine success/failure of previous implementation activities:

A pre-project survey of large wood (>12 inch dia. x 35 ft. long) was conducted on the Meadow Creek/Habberstad project. Only 9 pieces of LW were found within the bankfull area in the 1.1-mile reach, and 5 of these were old bridge members. High summer water temperatures and lack of large pools (which are often created by large wood) are key limiting factors that will be addressed in this project. Streambank stability, overhanging vegetation and undercut banks were also monitored on this project before implementation. Only 66.5% of the banks were classified as covered and stable (Table 6). We expect that by excluding livestock along with other improvements in management that over time the percentage of stable banks will increase.

A Rosgen level II stream analysis (longitudinal profile, 6 cross sections, pebble counts) was completed on 630 ft. of Milk Creek to help in planning the construction of 1,300 feet of new channel in the area immediately downstream.

A Rosgen Level II stream survey was completed on a 1,436 ft. reach of Ladd Creek. The information will be used to help plan the relocation/conversion of 1.7 miles of existing irrigation ditch into approximately 2.2 miles of natural stream channel.

Log weirs previously installed by NRCS and the GRMWP on the Bear Creek/Alta Cunha Ranches property were reviewed to assess fish passage problems during low summer flow. ODFW requirements for a 6-inch maximum jump height for juveniles were not being met on any of the 21 weirs, none of these had jump pools on the downstream sides to facilitate jumping, and most of the weirs were completely de-watered by late June (Figure 12). A longitudinal profile from the highway to the mouth (0.5 miles total) was taken to help identify other headcut areas below the weirs that were also inhibiting fish passage. ODFW and the CTUIR conducted repair work in October.

IMPLEMENTATION - Onsite:

Instream Structures

Meadow Creek Instream:

Instream work on the 1.1-mile reach of Meadow Creek (Habberstad property) was completed during the last two weeks of July. A total of 56 pieces of large wood were placed at 13 sites (Table 1). The large "key" pieces consisted of live, whole conifers with root wads. These trees averaged 19 inches in diameter and 52 ft. long, with 5 ft. rootwads attached. Generally, the size of trees selected wood met or exceeded the ODF/ODFW minimum size guidelines for large wood placements (i.e. trees with root wads attached should be a minimum length of 1½ times the active channel width). In addition, 3 pieces of medium and 237 pieces of small wood were placed, with much of this wood coming from unburned slash piles from previous logging operations. Wood was placed in a variety of configurations depending on individual site conditions. Observations of wood stability/movement from the 1999 large wood project on the Cunha Ranches property immediately upstream guided us in determining site-specific designs.

Whole trees were uprooted from nearby hillslopes and transported using a tracked excavator. In pool deficient areas wood was placed with root wads in the thalweg and scour pools excavated around the roots; in other areas structures were designed to aggrade the channel and reactivate the floodplain where the stream had cut down to bedrock or became disconnected. In many cases, several pieces of wood were used together to mimic natural debris-collecting structures. At two sites it was determined that engineered logjams (ELJ's) were appropriate (Figures 1-3). A minimal amount of cabling was done, securing key members at a few main joints. It is anticipated that some movement or shifting will occur during high flows.

An ODFW dump truck was used to haul some of the small wood to the work sites, and trackhoes were used to distribute it. Small wood was not cabled, and was placed both within and outside the wetted channel. This strategy will allow the small wood to move freely and hang up on the larger key pieces, creating complex debris jams. Some of it was placed in high water channels and on point bars where it will help collect sediments and create seedbeds where native riparian vegetation might become established.

A total of 202 boulders were also used. The majority of these were used around wood structures to help pin or anchor the wood, or were placed in areas to inhibit anchor ice formation or facilitate break up of ice accumulations. Scars on several trees indicate that ice flows have inhibited growth of riparian plants in this reach. Three rock weirs were constructed to reduce stream gradient (from 1.4% to 0.8%) and encourage deposition in a high flow channel. Approximately 60 feet of old railroad grade was obliterated in the vicinity of old bridge sites to restore floodplain interaction. One side channel pool was constructed, providing fish access and cover to cold water at a floodplain tail seep. Bank shaping and coir fabric was added at one revetment site on a vertical cut bank to reconnect the floodplain and channel, and speed vegetative recovery.

John Habberstad donated all of the wood and boulders. A total of 71.5 hours of tracked excavator time were used to complete the job, and 5 hours of ODFW dump truck time.

TABLE 1. Instream work completed on a 1.1-mile reach of Meadow Creek (Habberstad property), July 2000.

	WOOD PLACED:						
	Large	Medium	Small				
SITE	>20" x 35'	>12" x 35'	>6" x 10'	Boulders	Other Structures/ Comments	Pools Created	Joints Cabled
1	6	0	17	7	ELJ encourages recharging of old meander	1	11
2	5	1	22	1	Revetment style	1	4
3	3	0	0	0	At coldwater seep	2	1
4	3	0	2	2	Enhance existing pool	1	4
5	11	0	33	31	3 Boulder U-weirs for grade control, floodplain wood	2	7
6	2	0	0	1	Revetment style	1	6
7	5	0	10	7	Pool enhancement, Bank stabilization	1	1
8	3	0	0	2	Revetment style, 60 ft. bank shaping, coir fabric	1	0
9	3	0	12	41	At mouth Campbell Ck	2	3
10	4	0	22	25	Ice retarding ELJ, 60 ft RR grade removal, 30 ft. dyke removal	0	5
11	6	0	18	23	Pool enhancement, Bank stabilization	1	6
12	3	2	4	21	Ice retarding, cold seep	0	12
13	2	0	12	41	30 ft. RR grade removed to recharge FP	1	4
1-5	0	0	85	0	Scattered at upper end of project	0	0
Total	**56**	**3**	**237**	**202**		**14**	**64**

Note: Wood size classes are based on a combination of those used in the Upper Grande Ronde Anadromous Fish Habitat Protection, Restoration and Monitoring Plan, 1991, and ODFW Aquatic Inventory Project guidelines.

Figure 4. Meadow Creek, Habberstad property, instream work Site 1, from the right bank looking downstream, 7-24-2000. A typical wide, shallow stream channel with very little shade or instream cover. An old meander scar is evident on the far side of the creek.

Figure 5. Meadow Creek, Habberstad property, instream work Site 1, 7-25-2000. An Engineered Log Jam (ELJ) was installed to create complex pool habitat and encourage reestablishment of the former meander.

Figure 6. Meadow Creek, detail of the completed structure from the left bank looking downstream, 7-25-2000. Large rootwads facing upstream will encourage scour during high flows and maintain the depth of the excavated pools. Cross members have been cabled together to maintain integrety of the structure and will recruit additional small floating wood. Deposition will occur on the downstream (background) side, and eventually the channel thalweg will move to the left and recharge the old meander.

Camas Creek Instream:

Two sites were treated with lodgepole riprap and toe boulders on the Camas Creek/Pendleton Ranches project. The primary objective was to stabilize eroding banks near the highway using a soft structure approach, but the trees will also provide good habitat for salmonids (Figures 4 & 5). A total of 515 feet of streambank was treated using 48 boulders and 94 trees. Banks were sloped back using the ODFW tractor with backhoe attachment. Trees were cabled both to the toe rocks and to recycled wooden fence posts driven into the banks. All work was completed using ODFW equipment and personnel. Pendleton Ranches donated the trees for the project.

Figure 7. A vertical (6 ft.) eroding streambank on Camas Creek, 8-6-2000. This area was providing poor habitat and producing sediment downstream; if left unattended it would eventually damage Highway 244 in the background.

Figure 8. Installation of lodgepole "riprap" at the same site, 8-8-2000. This soft approach will provide both habitat enhancement as well as bank stability, and is a better alternative than rock riprap which would likely have been installed if erosion continued. ODFW personnel cabled or wired trees and toe boulders together for stability during flooding. In the short term the whole trees and boulders provide valuable instream cover for salmonids. Over the years the "riprap" will collect fine sediments and establish seedbeds, allowing new vegetation or planted willow cuttings to become established. The landowner donated all of the trees for this work.

Milk Creek Instream--

Phase I work of the Milk Creek channel relocation project was completed in November, 2000. Work consisted of excavating 925 feet of new channel (into a Rosgen E4 stream type) using a tracked excavator, and hauling spoils with an ODFW supplied dump truck (Figures 9-11). Pools, riffles, point bars and other geomorphic features were constructed in order to build a channel that will handle all flow extremes. Sedge/rush transplants were placed within bankfull areas. Water will not be diverted until July 2001 in order to give the channel a chance to become fully saturated and partially vegetated which will reduce the chances of erosion. Excavated materials were stockpiled and surrounded by silt fence. The soils will be used to construct earth plugs to divert the channel and fill the highway ditch in 2001.

Bear Creek Instream--

ODFW Fish Habitat personnel coordinated with the CTUIR to modify log weirs on Bear Creek in October. The weirs were originally installed by NRCS and were set to 9-inch heights, however, they were not in compliance with the ODFW 6-inch standard for juvenile passage. More importantly, of the 21 original weirs, 17 of these were not sealed, which created a series of stagnant overheated pools, or sections that had become completely de-watered by October (Figures 12-13). Instream work included:

1. Completely chain sawing through or removing 5 of the log weirs, and increasing weir notch depths on several other weirs in order to reduce jump heights.

2. Excavating 2-ft. jump pools on the downstream sides of the weir notches and rearranging existing boulders to create additional steps to reduce gradient (Figure 4).

3. Adding deeper layers of coir fabric or geotextile cloth on the upstream faces of the weirs to seal them better (Figure 5). Originally only a 6-ft. deep layer of cloth was installed that was inadequate to prevent subsurface flow from occurring from June to December. In some cases bentonite was distributed on upstream faces of the weirs to speed up the sealing process.

4. Several hundred feet of vertical cut banks were sloped at 2:1 to improve water to soil contact and enable riparian vegetation to become established. The areas on the upstream faces of the weirs in particular were reshaped to allow dissipation of high flows and allow accumulation of fine clays and soils to further reduce subsurface flows.

5. Two additional log weirs and four rock weirs were placed downstream of existing structures to address other headcut areas that were restricting fish migration at critical times.

6. A water gap was permanently relocated from a sensitive area near the mouth of the creek upstream near the highway. The stream bottom was rocked with 6" minus to improve access and prevent erosion. The area near the mouth is known to hold overwintering juvenile spring chinook.

It should be noted that this work only provides a temporary solution to problems that exist on Bear Creek, and that additional future work will include restoring the stream back to a natural meandering channel.

Figure 9. Milk Creek/Hall Ranch project area, October, 16, 2000. This pre-project photo is taken from the upstream end looking northwest. The existing stream channel (not visible) is to the right of the photo and runs in a ditch next to Highway 203. In addition to inadequate fish passage due to an undersized culvert, the current stream channel is artificially steepened, has no meanders and very little pool habitat. Stakes and flags indicate locations of pools and riffles of the new channel. Channel design was based on a Reference Reach section immediately upstream of the project.

Figure 10. Milk Creek, November 14, 2000. ODFW crews survey in thalweg and bankful indicators near Pool #7 during construction. Ken Coe of Mitrac Construction excavates the initial rough cut and loads spoils into an ODFW dump truck. During the excavation cobbles and gravels are separated from silt/loams and placed into riffle sections where needed. These will act as natural grade control areas and help prevent channel degradation (downcutting).

Figure 11. Milk Creek, November 15, 2000. Final shaping is completed and resurveying of the new channel in progress. The photo is taken at Pool #4 looking downstream. Points bars have been sloped back at about a 10:1 ratio and are ready to receive sedge/rush transplants from excavated wetland soils. An artesian well was plumbed in that supplied 12 gpm to begin wetting the channel and help establish riparian plants prior to the first winter floods that will occur in 2001-01.

Figure 12. Bear Creek/Cunha Ranches, October 18, 2000. Jump pools were excavated behind log weirs to improve fish jumping ability. Coir fabric or geotextile cloth was trenched into the upstream faces of the structures to improve sealing/trapping of water.

Figure 13. Bear Creek/Cunha Ranches, October 20, 2000. A completed set of weirs that has sealed up and is now running water over the tops. Banks have been sloped which will allow riparian vegetation to become established. However, this work is only a temporary fix, and in 2001 and beyond additional work will include reestablishment of a natural stream channel with constructed meanders, pools and riffles.

Planting

A total of 1,700 cottonwood and willow cuttings and poles were collected and stored in coolers and conditioned in late winter. Ponderosa pine, Douglas fir, and western larch were ordered and stored in the Private Lands Forest Network cooler. Table 2 shows year 2000 plantings by species and site. CTUIR personnel purchased and planted the trees on the Alta Cunha Ranches project, and watered these plants several times during the summer. Watering the plants appears to be improving survival of these trees. Lodgepole pine trees on the Sheep Creek/Vey property were fertilized. See also "Operations & Maintenance-Revegetation".

In addition, constructed point bars and other areas within the bankfull zones on 925 ft. of Milk Creek were planted with native sedge/rush plants. The plant materials were taken from existing wetland areas by pealing off 8-inch layers using the tracked excavator, and hauling them in the ODFW dump truck. The excavator was used again to redistribute the materials on the streambanks. A total of 50 cu. yd. of plant materials were utilized.

Scarred areas on the Meadow Creek/Habberstad project were seeded with 25 lbs. of road and 15 lbs. of riparian seed mixes. The Bear Creek/Cunha Ranches project and the Camas Creek project were seeded with 35 lbs. and 10 lbs. of riparian mix respectively. ODFW purchased the seed and CTUIR personnel seeded the McCoy Meadows project with 300 lbs. of riparian mix. Approximately 10 pounds of seed were applied to disturbed ground on the Meadow Creek/Tipperman project along access roads near spring development sites.

TABLE 2. Riparian Plantings in Grande Ronde Basin Streams, 2000.

		Plant Species				
Stream	**Landowner**	Ponderosa Pine	Tamarack	Cottonwood cuttings/poles	Willow cuttings/poles	**Site Totals**
Camas Ck.	Pendleton Ranches			10	200/40	**250**
Meadow Ck	A. Cunha Ranches	1,400	4,000			**5,400**
Pine Ck.	McDaniel				300/100	**400**
Salmon Ck.	McDaniel				300/100	**400**
Sheep Ck.	Vey/BLM				85/66	**151**
Swamp Ck.	Boise Cascade				130/15	**145**
Whiskey Ck.	Courtney			10/12	250/82	**354**
	Species Totals:	**1,400**	**4,000**	**32**	**1,668**	**7,100**

Fencing

ODFW personnel removed approximately 2 miles of existing high tensile fence on the McCoy and Meadow creek/Tipperman projects. Most of the fence materials were recycled; unusable scrap materials were hauled off the property. Wiring and stays were left intact and moved to the proposed new locations at the edge of hill slopes. Rebuilding the fence began in the fall after funds were secured through the GRMWP and NRCS Wetland Reserve Program. Work was approximately 30% completed but was halted in December due to weather conditions. A total of 2,400 ft. of new fence was constructed, 2,425 ft. of old fence removed, and 2 gates were installed.

ODFW and CTUIR personnel removed approximately 0.5 miles of old barbed wire fence along Bear Creek.

A summary of all Grande Ronde Basin Fish Habitat Enhancement Projects is listed in Table 3, which shows a total of 105.9 miles of riparian fences constructed that protect 62.2 miles of stream and 1911 acres of habitat. Individual projects may be located on Figure 3 by cross-referencing using the GRMWP Project Number.

Offsite Water Developments

Two solar powered spring developments were constructed by ODFW personnel on the Tipperman property. Material costs for the pumps and electrical accessories were $3690. The Kubota tractor was used for the majority of the construction, and a trencher was rented to bury water lines from culvert to troughs.

A second water trough was installed on the existing Whiskey Creek/Courtney spring development.

Miscellaneous Implementation Activities

Replacement signboards for identifying fish habitat projects were constructed and installed.

Rock weirs that were installed on McCoy Creek were inspected to ensure that they provide adequate fish passage. Other work such as new channel and pond excavation was also inspected.

TABLE 3. Summary of Projects Completed or in progress by the ODFW/BPA Grande Ronde Basin Fish Habitat Enhancement Project, 1985 – 2000.

UPPER GRANDE RONDE:		GRMWP	Year	Stream	Acres	Fence	Spring
Stream	Landowner	Project #	Built	Miles	Protected	Miles	Devel.
Beaver Creek	Clark/Crown Pacific	1095,1120	1993-94	6.0	243.6	11.5	0
Coon Ck. Tributary	Warren*	1440	1998	0.25	2.1	0.5	0
Dobbin Creek	Rynearson*	1508	1999	0.4	4.4	0.4	0
Eaton Creek	Sunderman*	1515	1999	0.5	160	0.5	0
Fir Creek	Wyland*	1528	1997	0.4	3.0	0.8	0
Fly Cr.	Smith	1123	1987	1.2	14.8	1.7	0
Grande Ronde R.	Smidtt*	1516	1999	0.5	6.0	0.2	0
Little Cr.	Kerr*	1365	1998	0.25	5.0	0.4	0
McCoy Cr.	Misener/Tipperman	1117	1988	1.9	231.9	3.35	3
Meadow Cr.	Alta Cunha Ranches	1406	1998-99	1.8	149.8	3.5	0
Meadow Cr.	B.M.C.B.A.	1114	1990	0.4	6.6	1.1	0
Meadow Cr.	Habberstad	1550	2000	1.1	0.0	0.0	0
Meadow Cr.	Misener/Tipperman	1115	1988	2.7	256.5	5.3	3
Meadow Cr.	Waite	1116	1989	1.2	19.7	2.6	1
Milk Creek	Hall Ranch*	1558	2000	0.23	0.0	0.0	0
Sheep Cr.	BLM	1112	1988	0.7	12.8	0.8	0
Sheep Cr.	Vey	1113	1987-88	4.3	54.7	6.0	4
U.G.R. River	Bowman/Hoeft	1118	1991	1.5	37.8	3.2	1
U.G.R. River	Crown Pacific	1321	1997	5.2	179.7	5.1	2
U.G.R. River	Delve	1119	1991	0.5	7.0	0.9	2
Whiskey Cr.	Courtney	1121	1991-92	3.3	35.0	5.6	3
Whiskey Cr.	Hampton	1122	1990-91	1.5	15.2	3.0	0
			Subtotals:	**35.8**	**1,445.6**	**56.5**	**19**
JOSEPH CREEK SUBBASIN:							
Butte Cr.	McDaniel	1128	1990-91	2.7	29.7	5.3	1
Chesnimnus Cr.	McDaniel	1130	1992	3.8	130.1	8.1	0
Chesnimnus Cr.	Yost	1133	1986-87	3.0	41.8	5.6	0
Crow Cr.	Buhler/Buckhorn Rchs	1125	1989	0.8	7.4	1.5	0
Crow Cr.	Fleshman	1126	1988	1.2	10.5	2.4	2
Elk Cr.	Birkmaier (expired)	1134	1986	0.6	7.7	1.4	0
Pine Cr.	McDaniel	1131	1991	1.5	43.5	3.2	0
Salmon Cr.	McClaran	1127	1989	0.7	7.0	1.4	0
Salmon Cr.	McDaniel	1129	1990	1.6	45.5	3.2	0
Swamp Cr.	Boise Cascade	1124	1987	2.6	48.6	5.0	5
Swamp Cr.	Olsen (expired)	1132	1985	2.4	16.2	4.4	0
			Subtotals:	**20.9**	**388.0**	**41.5**	**8**
WALLOWA SUBBASIN:			Year	Stream	Acres	Fence	Spring
Stream	Landowner		Built	Miles	Protected	Miles	Devel.
Hurricane Cr.	Irby	1443	1998	0.7	20.3	0.6	0
Hurricane & tribs.	Jones	1337	1997	0.8	9.0	1.3	2
Wallowa River	Burrows*	1442	1998	0.06	0.3	0.06	0
Wallowa River	Cox	1442	1998	0.4	4.7	0.4	0
Wallowa River	Johnson	1442	1998	0.1	1.3	0.1	1
Wallowa River	McCrae	1442	1998	0.2	2.8	0.2	0
Wallowa River	Wiseman	1441	1998	0.7	8.1	0.7	2
Whiskey Cr.	Cox	1517	1999	0.2	3.6	0.4	0
			Subtotals:	**3.2**	**50.1**	**3.8**	**4**
NORTH FORK JOHN DAY:							
Camas Creek	Pendleton Ranches	N/A	1995	**2.3**	**27.3**	**4.1**	**0**
		GRAND TOTALS:		**62.2**	**1,911.0**	**105.9**	**32**

* Indicates a 10-15 year cooperative agreement, landowner does project maintenance.
GRMWP Project Numbers are cross-referenced on Figure 3 map.

OPERATIONS AND MAINTENANCE:

Landowner Coordination

Various landowners were contacted throughout the year to discuss maintenance needs and related items such as timing of cattle movements, water gap needs, fence realignments, weed control and protection of riparian plantings:

Several landowners were contacted and permission was granted to conduct spawning ground surveys. Mark Tipperman was contacted regarding future fencing needs and to discuss problems occurring within our interagency planning team.

Rex Christensen was contacted to discuss why access into Beaver Creek had been denied. Summarized temperature data and before/after photopoints were sent to him.

A letter was written to Marcus Carpenter and the board of directors of the Meadow Creek/Camp Elkanah project concerning inadequate fish passage (due to construction of a dam in the creek), filling of wetlands, mowing too close to the creek, tree removal and other activities harmful to the riparian area.

Randy Hampton was contacted to determine why escape gates had been opened and cattle allowed to graze inside the riparian exclosures. Jim Baremore, the rancher leasing the property, was also contacted to discuss potential solutions during low water years. Mr. Hampton complained that there was not enough water in the water gaps. ODFW personnel used the tractor with backhoe attachment to deepen the water gaps, providing more water at some of these sites, but at other sites the water table was too low (>5 ft. below the streambed).

Instream Maintenance

An inspection of structures was completed while repairing fences and water gaps. Most structures were functioning within specifications and very little maintenance was needed. Minor work included:

Additional layers of coir fabric were added to 2 streambanks on the Meadow Creek/Alta Cunha ranches project. The technician inspected eroding streambanks on the Chesnimnus Creek/Yost property that may require maintenance next year.

Revegetation

Table 1 summarizes revegetation and new project planting activities undertaken in 2000. Selection of revegetation sites was based on the need to improve bank stability, accelerate shade recovery, or to provide future large woody debris. A total of 1,700 willow and cottonwood trees were planted on 6 projects to revegetate several streams where recovery did not occur as anticipated. Maps of planting sites were completed to aid with future monitoring of plant survival.

Fence Maintenance

Routine maintenance inspections of a total of 98.7 miles of project fence were completed in the spring, that included: 53.7 miles in the Upper Grande Ronde River drainage; 37.1 miles in the

Joseph Creek subbasin; 3.8 miles in the Wallowa subbasin; and 4.1 miles in the Camas Creek drainage. A total of 315 stream cross fences and 141 watering gaps were inspected and maintained in the spring and fall.

Maintenance of stream cross fences included removal of these structures in the fall to prevent damage from icing and high flows, and reinstallation and repair in the spring after flows subside. Maintenance of water gaps consisted of ensuring that all entry gates, escape gates and fence structures were functioning properly. Routine maintenance of the main fence lines included removing fallen trees, repairing and tightening wires, and repairing structures. Aerial surveys may be conducted to help quickly identify cattle trespass problems throughout the project area.

No significant flooding occurred this year, so maintenance was below average this year. Project personnel converted several water gaps to electric fences where appropriate. Water gaps and solar pumps were removed from all projects for the winter as needed. Cattle trespass problems were unusually high this year due to the extremely dry summer. Approximately 200 water gap cross fences were removed from projects in November and December (much later than usual). Many of these had to be chipped out of several inches of ice since landowners held cattle later into the season than usual, and implementation of new projects extended into the winter months. Projects that required significant amounts of labor and materials in 2000 included:

Upper Grande Ronde subbasin

Seventy-six downed trees were removed from the Beaver Creek fence and 3 broken wires were repaired. Twelve trees were removed from the Upper Grande Ronde River/Crown Pacific fence, and several vandalized wires repaired. Three cows were chased out of the Upper Grande Ronde River/Bowman-Hoeft property, one electric water gaps was widened, and one downed tree removed. Boundary cross fences were installed on McCoy and Meadow creeks. Seventy head of cattle were chased out of the Meadow Creek/Habberstad property and existing boundary fences mended to eliminate the problem. Trespass cattle were also removed from the Meadow Creek/Waite property, and one rock jack was repaired. Trespass cattle were chased out of the Sheep Creek exclosure fences, one water gap was repaired, all stays were straightened and several sets of strainers were replaced. Trespass cattle were also removed from the Fly Creek/Smith, and the Whiskey Creek/Hampton and Courtney properties. Fourteen trees on Whiskey Creek were sawed off the fence lines and placed into the creek for instream habitat. Broken wires, one gate and several high spots were also repaired on Whiskey Creek.

Joseph Creek and Wallowa subbasins

Two water gaps were modified on Butte Creek. Twelve trees were cut off the Swamp Creek fence and several broken wires repaired. Trespass cattle were removed from the Crow Creek/Buhler, Chesnimnus Creek/Yost, and the Swamp Creek/Boise Cascade properties. Fences and water gaps were maintained periodically on Chesnimnus, Crow and Swamp creeks. The technician later flew over project sites in late August and early September; no problems were observed except on Crow Creek, where several bulls were chased out of the Buhler exclosure fence.

Camas Creek Drainage

All fences were inspected and had minimal damage.

Miscellaneous Operations & Maintenance Activities

Weed control was completed on the McDaniel properties (Butte, Chesnimnus Pine and Salmon creeks) by the landowner for the cost of $1,260. Arrangements were made with Dan Sherwin of the Wallowa County Weed Control to spray the primary noxious weeds on other leased areas for the cost of $2,086. The spraying was done to eliminate the primary noxious weeds as identified by the Oregon Department of Agriculture.

Routine maintenance was performed on the Kubota tractor, ATV's and pickup trucks. Utility trailer fenders and sideboards were repaired or replaced. Electrical outlets and lights were installed in the metal storage shed. Both cameras were sent in for repair and cleaning.

Solar pumps were reinstalled, maintained and later winterized. A gravity-fed spring development on the Courtney property was also maintained. Project signboards were replaced on Sheep Creek.

MONITORING AND EVALUATION:

Photopoint Establishment

Eleven new photopoints were established on the Meadow Creek/Habberstad project and 7 established on the Milk Creek/Hall Ranch project. Photopoint descriptions were written for these new projects. Prework and post-work photopoints were taken of all instream work sites on Meadow, Bear, Milk and Camas creeks, using the digital camera.

Photopoint Picture Taking

Two hundred twenty nine photopoints of a total of 261 were retaken in 2000. All photopoint pictures were processed, labeled, and filed in permanent notebooks. Before/After photopoint pictures of Beaver, Chesnimnus, Pine, Salmon and Whiskey Creek were scanned or reproduced and given to their respective landowners, or included in quarterly and annual reports.

Habitat Monitoring Transect Establishment and Data Summarization

In the Upper Grande Ronde drainage 40 habitat monitoring transects were established on Sheep Creek and 40 on McCoy Creek in 1988. In the Joseph Creek drainage 30 transects were established on Elk Creek and 30 on Chesnimnus Creek in 1988. All data sets from the original measurements were entered into a summarization program on Dbase III Plus in 1993, but data has yet to be summarized. Habitat Monitoring data collection was repeated on 40 transects on McCoy Creek and 40 transects on Sheep Creek in 2000.

Thermograph Data Collection and Summarization

Hourly temperature data have been recorded, collected, summarized and graphed from thermographs in Sheep and McCoy creeks since 1988; from Salmon Creek since 1991; Beaver and Camas creeks beginning in 1994; and Meadow Creek starting in 2000. New lock boxes were constructed for all thermographs. New Starlogger thermographs were set up and installed on

Sheep, Salmon and McCoy creeks. These replaced the Ryan Tempmentors, which have performed poorly in the past. Instructions for deployment and summarization were updated in Excel format. All 12 thermographs were checked in July and all but one (upper Beaver Creek) were functioning normally.

Thermograph Data Analysis

It is important to keep in mind tolerances of salmonids to changes in water temperatures as we analyze the data. The upper lethal limit for chinook salmon has been reported as 26.2°C, and the lower lethal limit at 0.8°C. Upper and lower lethal limits for steelhead are 23.9°C and 0.0°C (Meehan, 1991). The Independent Scientific Group (ISG, 1996) also reviewed available information and concluded that the thermal requirements for chinook salmon are approximately as follows:

	TEMPERATURE			
LIFE STAGE	Optimum	Range	Stressful	Lethal*
Adult migration and spawning	50 °F (10 °C)	46.4 -55.4 °F (8 –13 °C)	>60 °F (>15.6 °C)	>70 °F (>21 °C)
Incubation	<50 °F (<10 °C)	46.4 -53.6 °F (8-12 °C)	>56 °F (>13.3 °C)	>60 °F (>15.6 °C)
Juvenile rearing	59 °F (15 °C)	53.6-62.6 °F (12-17 °C)	>65 °F (>18.3 °C)	>77 °F (>25 °C)

* *Lethal is for 1-week exposures, higher temperatures may be tolerated for shorter exposure times.*

The ISG also concluded that other salmonid species are not markedly different. Salmonid populations are able to respond to temperature changes by moving upstream or downstream to find thermal refuges. Warming of streams, however, may concentrate salmonids into small areas where they may be more susceptible to predation (see 1998 Annual, Appx 3), or lead to invasion of non-native species (Ebersole and others, 1994). In 1996 the Oregon Department of Environmental Quality (ODEQ), in accordance with an Environmental Protection Agency mandate, listed water quality limited streams in the state. The "303(d)" list included guidelines for stream temperatures; streams whose 7-day average of the daily maximum temperatures exceeded 17.8° Celsius (64° Fahrenheit) were listed as being thermally polluted, and are considered to have sub-lethal temperatures for salmonids and other cold-water species.

Analysis of summer stream temperature data by site are summarized below:

Salmon Creek:

Thermographs were installed at two sites in 1991. The upper site is located at the upstream end of the McDaniel property at RM 2.4. The lower site is near the mouth at RM 0.1, on the McClaran property. Riparian fencing at the upper site was completed in 1990; the lower site was fenced in 1989.

Salmon Creek has consistently shown cooling of stream temperatures as water travels downstream through the riparian corridor. In 1992, comparison of upper and lower summer

mean weekly maximum temperatures showed an average cooling of 1.69°C at the lower (downstream) thermograph. In the summer of 2000 the average was 3.77°C cooler at the lower end (Figure 14). Temperature fluctuations averaged 6.7 °C at the lower site compared to 11.2 °C at the upper site, indicating cooler, stable, and more favorable conditions in the lower reaches. Salmon Creek is a small mid-elevation stream, and despite some recent heavy flooding, the vegetation is now in better condition to prevent damage from high flows, and there has been a considerable increase in the amount of shade along this reach. The stream channel has narrowed and deepened, reducing the stream water surface area and amount of solar radiation reaching the creek. There are also inputs of ground water from some springs that were also fenced off in 1990 which are also becoming more shaded.

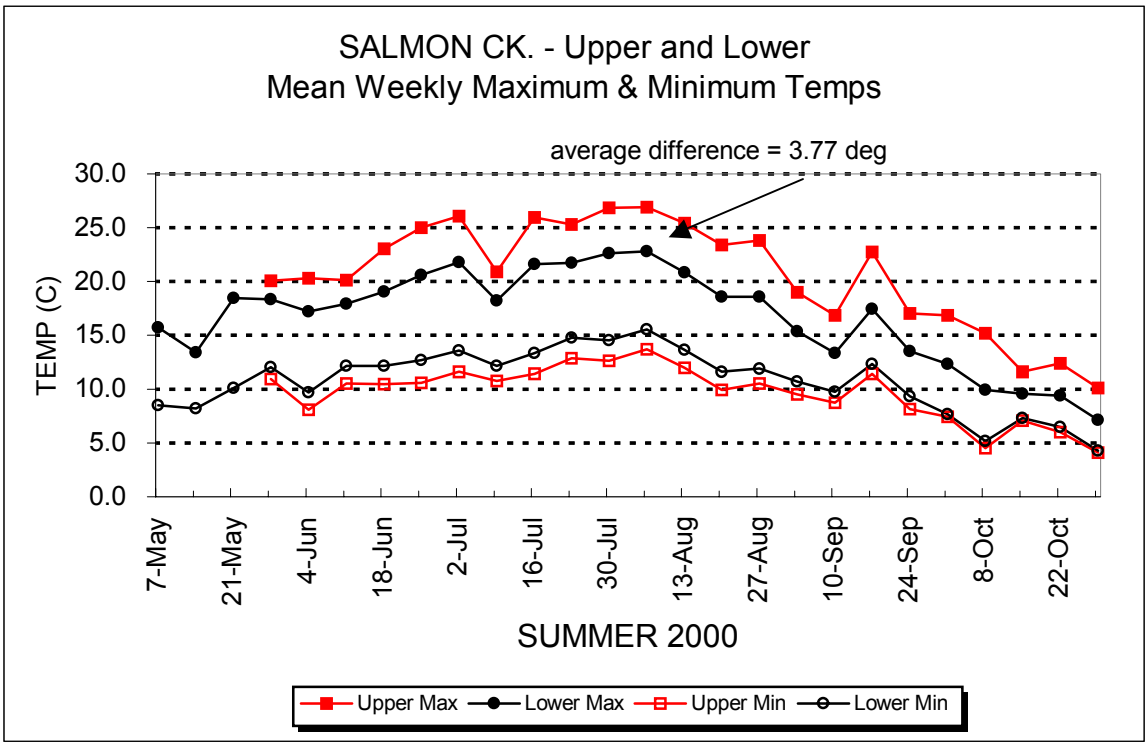


Figure 14. Mean weekly summer temperature data on Salmon Creek in 2000, at RM 2.4 (Upper) and RM 0.1 (Lower).

McCoy Creek:

Two thermographs were installed in 1988 on the Misener/Tipperman property; riparian fencing was constructed in the same year. The lower site is located near the mouth of McCoy Creek, and the upper site is about 1.6 miles upstream, at the head of a canyon. In 1997 the McCoy Meadows channel relocation project was implemented in the upper meadow (RM 0.8 to RM 1.5), which diverted the channel into one of the pre-1970 channels.

In 1988, the first year of data collection, summer mean weekly maximum temperatures at the lower (downstream) site averaged 3.70°C warmer than the upper site. In 2000 the average was 2.05 °C warmer (Figure 15). Temperatures at the lower site continue to be very warm and show

large daily fluctuations, but data collected during the 13-year period suggests a cooling trend may now be developing. It is too early to tell if the pattern will continue.

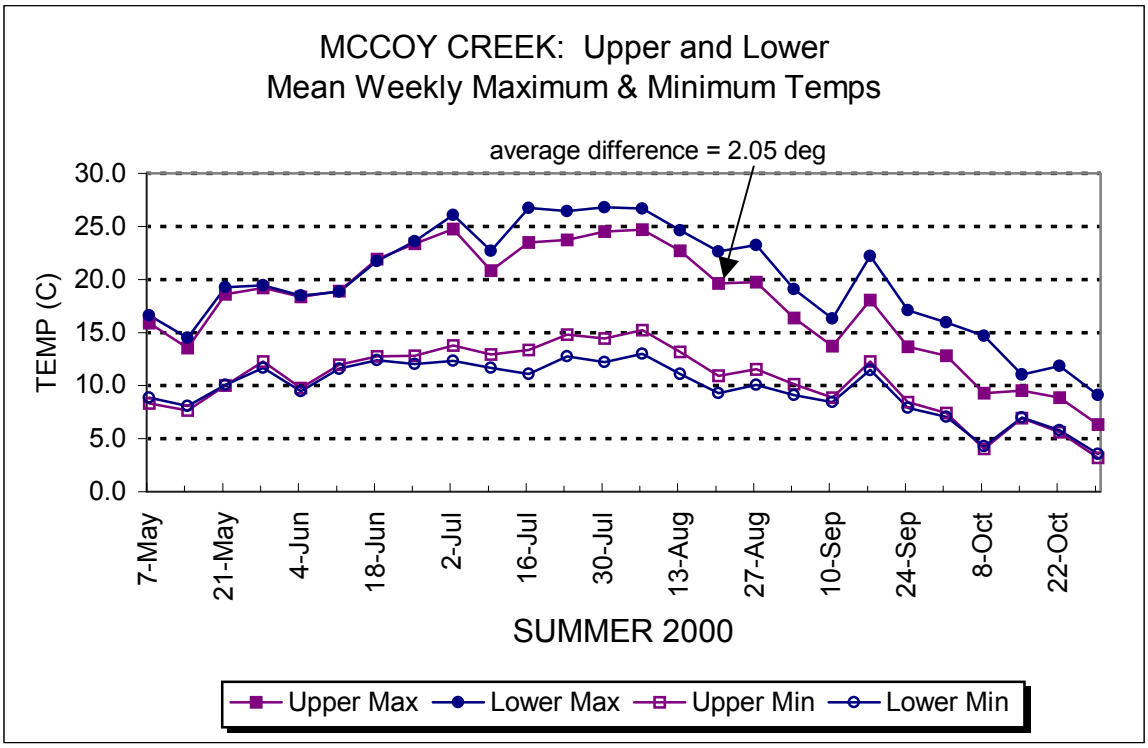


Figure 15. Summer temperature data on McCoy Creek in 2000, at RM 1.6 (Upper) and RM 0.0 (Lower).

Sheep Creek:

Thermographs were installed in 1988 on the Vey property and fencing was completed the same year. The upper site is located at RM 6.7 near the U.S. Forest property boundary. The lower site is located 4.3 miles downstream at RM 2.4 and about 100 feet upstream from the bridge along F.S. Road 51.

Comparison of summer mean weekly maximum temperatures shows that lower Sheep Creek averaged 1.46^{o}C warmer than the upper site in 1988 and 0.82 ^{o}C warmer in 2000 (Figure 16). Data for the month of October, however, has not yet been included. Data collected over the 13-year period continues to show moderate and consistent warming of 1 to 3^{o}C at the lower thermograph, with no apparent trends developing to date. Daily fluctuations at both sights are moderate compared to other sites.

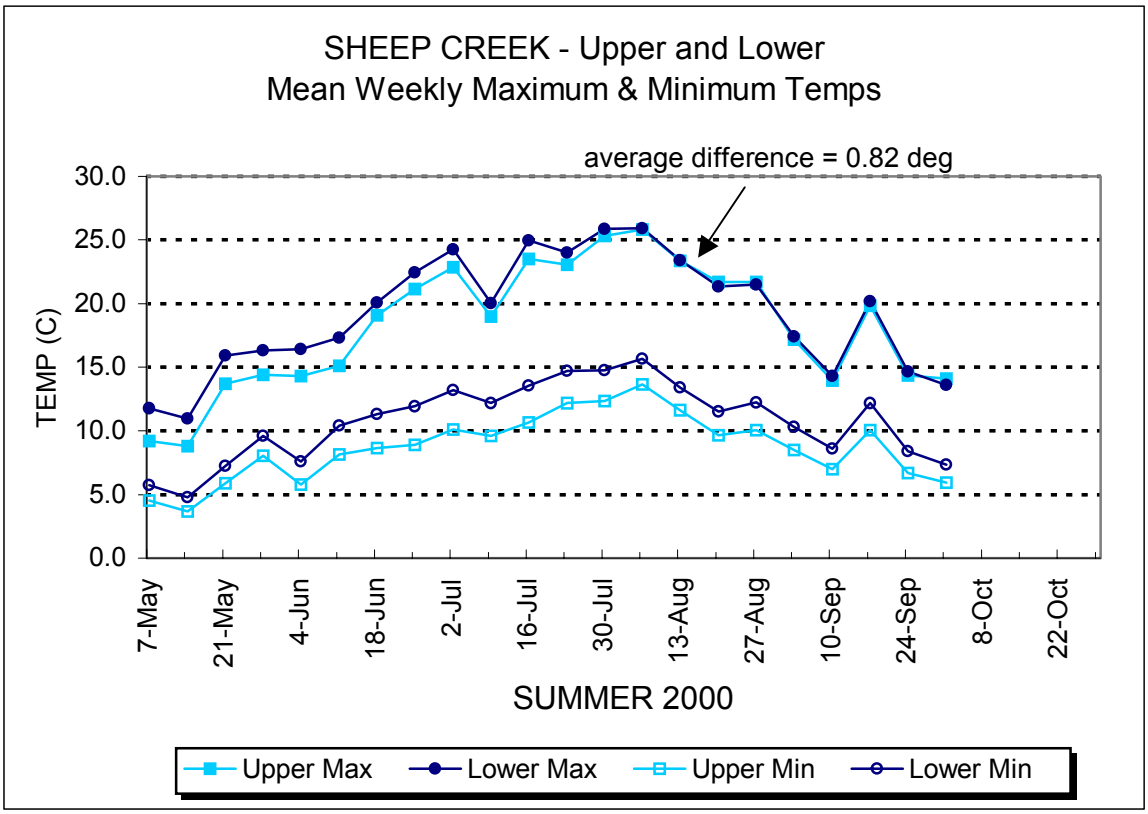


Figure 16. Summer temperatures on Sheep Creek in 2000 at RM 6.7 (Upper) and RM 2.4 (Lower).

Beaver Creek:

ODFW installed Hobo Temp thermographs at the mouth of Beaver Creek, and at the Crown-Pacific/ U.S. Forest Service property boundary at RM 5.9 in July 1994. These were replaced in November 1994 with Unidata Starlogger thermographs that also recorded ambient air temperature. Riparian fencing was completed on the lower half of the study area in 1993, and on the upper half in 1994.

Comparison of Beaver Creek mean weekly maximum water temperatures in 2000 showed continued warming of water moving downstream as has been observed in past years (Figure 17). The thermistor at the upper site was out of the water for three weeks so data could not be compared to past years. Stream temperatures at the Upper Beaver Creek site, however, are one of the few places we have monitored that generally stay within the ODEQ water quality standards 17.8^{o}C. The standard was only exceeded in 5 weeks of the 26 week period, in what was a warmer than average summer. A large portion of the upper drainage is within the protected La Grande City Watershed.

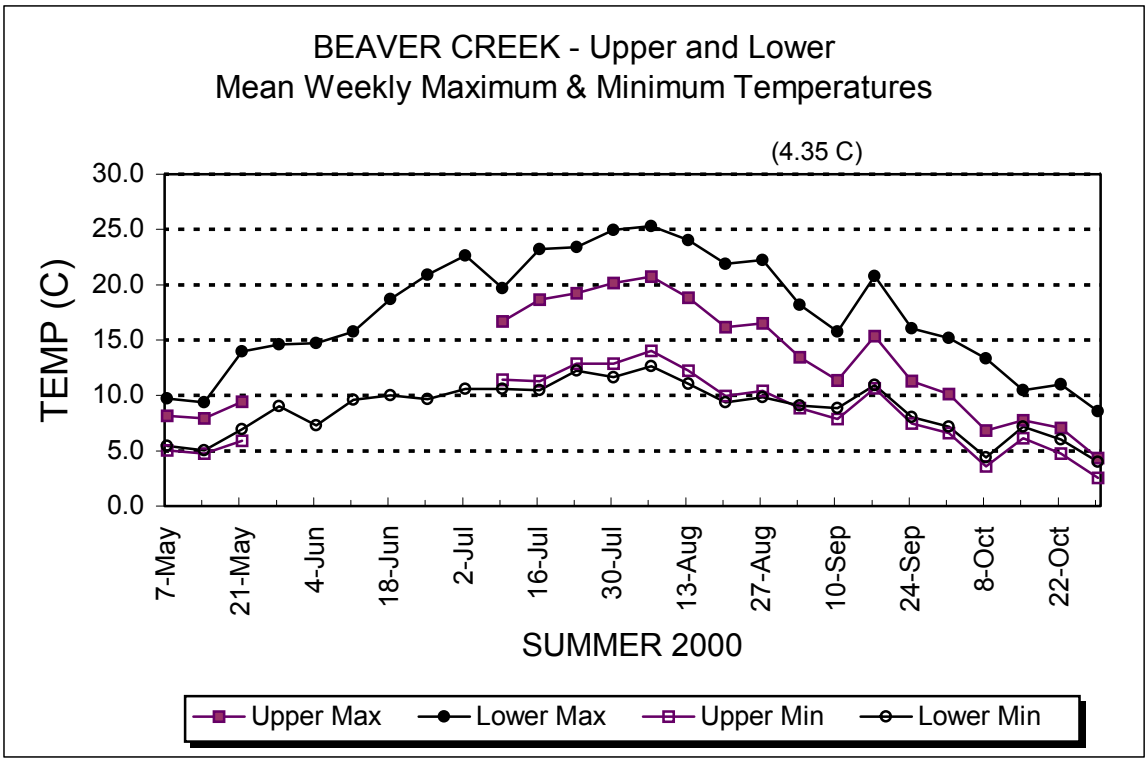


Figure 17. Summer temperature data on Beaver Creek in 2000, at RM 5.9 (Upper) and RM 0.0 (Lower).

Camas Creek:

Permanent Unidata Starlogger thermographs were placed at the upper and lower ends of the project area in May of 1995, recording stream and ambient air temperatures. Riparian corridor fencing was completed in 1995. The upper site is located about 0.3 miles downstream of Lehman Hot Springs Road at RM 29.6; the lower site is about 2.8 miles downstream at RM 26.8 at the Pendleton Ranches/Forest Service property boundary. Comparison of summer mean weekly maximum temperatures showed that the lower Camas Creek site in 2000 averaged 2.03^{o}C warmer than the upper (Figure 18). However, the data for the month of October has not yet been entered. In 1998 and 1999 temperatures at the lower site averaged slightly cooler (0.10^{o}C and 0.45^{o}C respectively) than the upper site, indicating that no consistent pattern of either cooling or warming has developed.

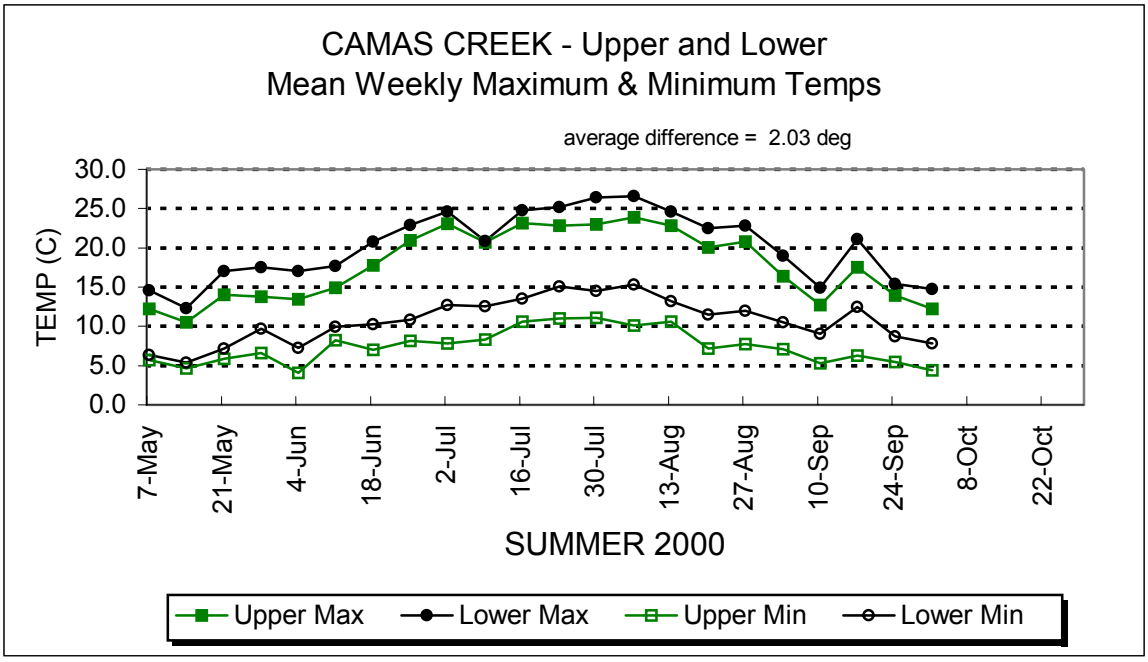


Figure 18. Summer temperature data on Camas Creek in 2000, at RM 29.6 (Upper) and RM 26.8 (Lower).

Meadow Creek

Permanent Unidata Starlogger thermographs were installed at the upper and lower ends of the Alta Cunha Ranches projects at river miles 10.3 and 8.7 in May of 1999. Both units were set up to record water and ambient air temperatures. This was the first year of complete data collection, and indicated slightly (0.20 ^{o}C) cooler water at the downstream end of the project (Figure 19).

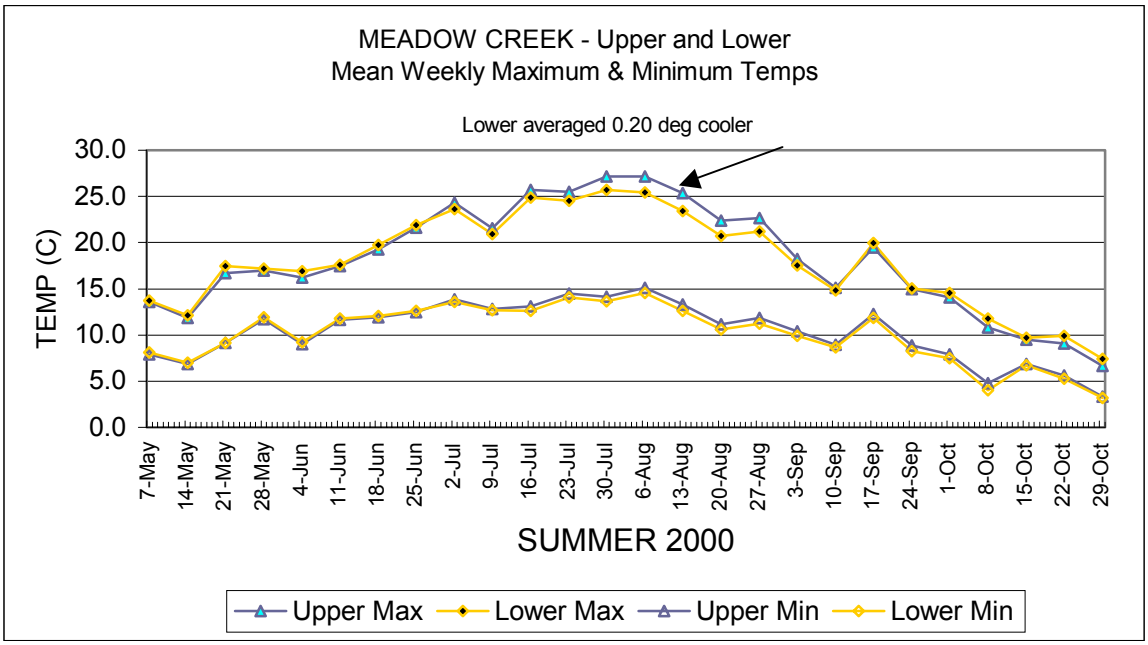


Figure 19. . Summer temperature data on Meadow Creek in 2000, at RM 10.3 (Upper) and RM 8.7 (Lower).

Miscellaneous Monitoring & Evaluation Activities

ODFW personnel repeated steelhead spawning surveys on Whiskey and Little Whiskey creeks in April and May 2000. Four live fish and 16 redds were found. The redd counts were the highest observed since counts began in 1993 (Figure 19). McCoy and Meadow creeks were also surveyed (Table 4). In addition to surveying the Index reaches, several miles of non-index streams were checked this year that had not been done in many years. Streams were surveyed 4 separate times at approximately 2 week intervals to identify peak spawning times and determine how long a redd remains visible after initial spawning. Redds sizes, locations in the channel, water depths and visibility were measured during each survey. The results are summarized below.

TABLE 4. Summary of Repeat Steelhead Spawning Surveys in Upper Grande Ronde Basin Streams, 2000.

STREAM	REACH	Location (River Miles)	No. Redds	Miles Surveyed	Redds/mile	Live Fish
McCoy Cr	F.S to Cunha (index plus)	7.0-10.0	0	3.0	0.0	0
McCoy Cr	Cunha to Snow	3.0-7.0	7	4.0	1.8	0
McCoy Cr	Snow to upper Tipperman	2.0-3.0	1	1.0	1.0	0
McCoy Cr	Upper Tipperman to Mouth	0.0-2.0	6	2.0	3.0	1
Meadow Cr	F.S. index to Cunha	10.3-17.5	4	7.2	0.6	3
Meadow Cr	Cunha to Taylor	7.0-10.3	1	3.3	0.3	0
Meadow Cr	Taylor to Dark Canyon	1.5-7.0	1	5.5	0.2	0
Little Whiskey Cr	Upper Courtney to mouth	0.0-1.0	3	1.0	3.0	0
Whiskey	Upper Courtney to mouth	0.0-3.6	13	3.6	3.6	4
		TOTALS:	**36**	**30.6**	**1.2**	**8**

Spawning was generally completed by mid-May, and redd visibility deteriorated rapidly after two weeks. Overall, redd counts in these streams were low at 1.2 redds/mile, and were particularly low in the index survey areas. However, in the McCoy Creek- Upper Tipperman to Mouth reach we found 6 redds where none had been observed in many years.

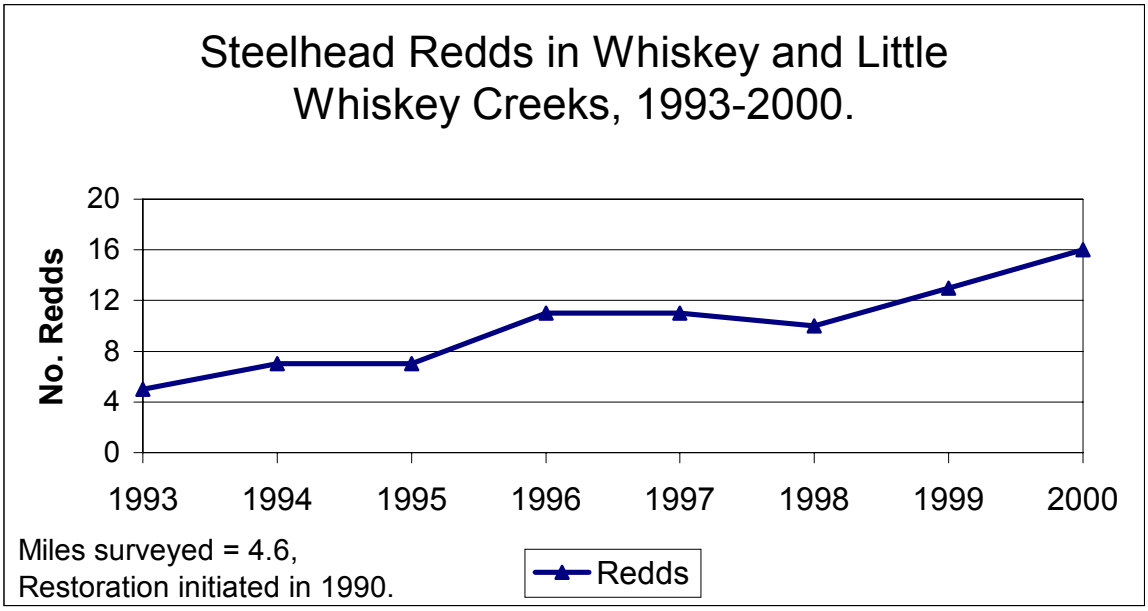


Figure 19. Redd counts on Whiskey Creek and Little Whiskey Creek, 1993-2000.

A spring chinook spawning survey was conducted on 6.2 miles of Sheep Creek on September 7, 2000. No redds or adult fish were observed. It was noted during the survey that juvenile Rb/St were abundant, and several juvenile chinook were observed.

The technician assisted ODFW John Day district personnel with spring chinook spawning counts on Camas Creek. Six live fish were observed downstream of the project area, but no redds or fish were found in the Pendleton Ranches project reach.

Stream flows in McCoy Creek in the old and restored channels were calculated at 402 cfs on March 29th, and showed that 75% of the flow is now going into the restored channel and 25% into the abandoned channel. Additional electroshocking was conducted in the abandoned channel to determine the extent of stranding that occurred during receding flows, and because instream work activities were conducted in this section this summer. A total of 27 age-0 and 10 age-1 steelhead were removed and transported into the restored channel.

Instream wood placed in 1999 on the Meadow Creek/Alta Cunha ranches project was monitored for stability during near-bankfull flow (370 cfs) events. Over 70% of the key structures showed no significant movement following an above average flow year. Of the 30% that did move, most of the shifting was minor, for example, a tree tip swinging from across the stream channel to parallel to the channel. Structures were also checked to determine if the larger key pieces were effective at trapping smaller wood. Over 60% of the structures trapped additional wood, up to 40 individual pieces in one case. Site schematics and an inventory of the number of pieces of wood and individual sizes were completed on the Meadow Creek/Habberstad instream project. These sites will be monitored in a similar manner in 2001.

Electroshocking surveys were repeated in McCoy Creek on June 30, 2000 (Table 5). One of the four stations was not sampled in 2000 due to low water conditions in the former channel. Juvenile Rb/St densities were 0.11 fish/m2 in 2000, up somewhat from the 1999 counts. Overall abundance of other fish species was also higher than the last 2 years, but remained below the 1997 counts (Figure 20).

TABLE 5. Fish Population Estimates in three 50 meter ODFW Monitoring Stations of McCoy Creek, June 30, 2000.

	SAMPLE SECTION			COMBINED TOTALS		
SPECIES	FS-1 (RM 0.7)	FS-2 (RM 0.2)	F-1 (RM 1.4)	Total Number Of Fish	DENSITY FISH/m^2	SPECIES COMP.
Rb/St	33	23	22	78	0.11	5.6%
Sculpin	97	9	14	120	0.17	8.7%
Dace	118	344	75	537	0.77	38.8%
Shiner	91	153	250	494	0.71	35.7%
Sucker	13	120	5	138	0.20	10.0%
Pikeminnow	5	5	3	13	0.02	1.0%
Bullhead	0	0	0	0	0.00	0.0%
Chiselmouth	1	1	0	2	0.00	0.1%
Totals:	358	655	369	1,382	1.99	100.0%

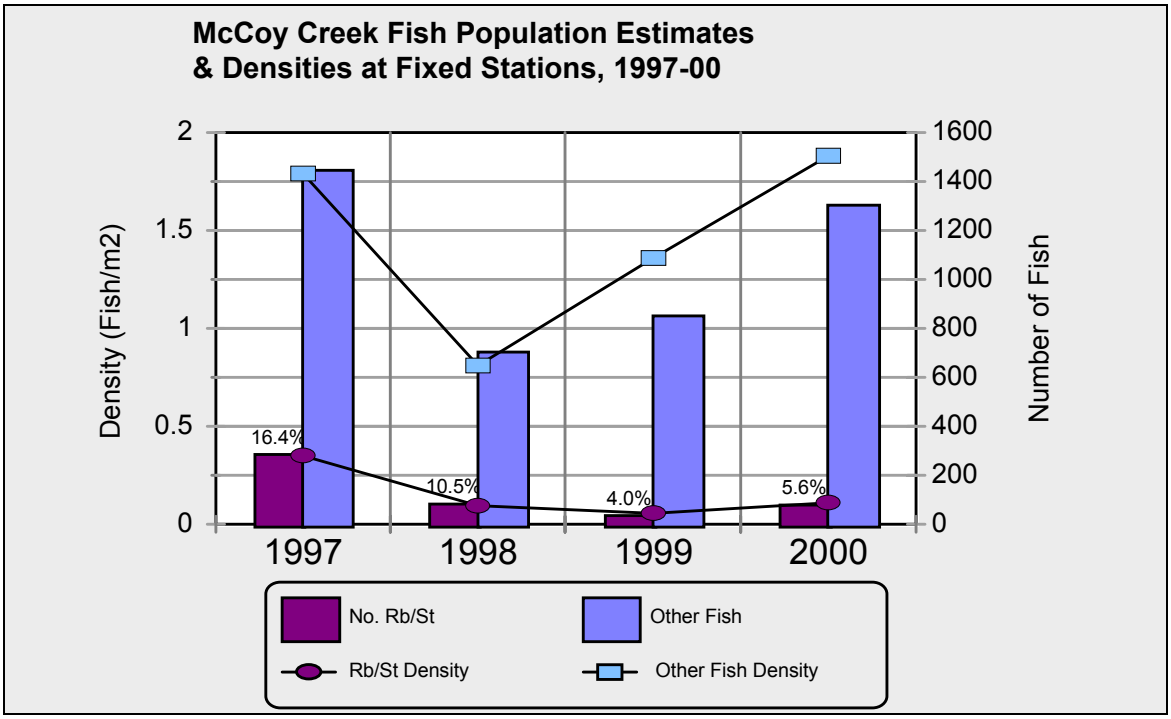


Figure 20. Fish population estimates and densities (fish/m2) of Rb/St and other fishes in McCoy Creek, 1997-2000.

Snorkel counts of fish in Milk Creek were conducted to determine general fish composition and distribution prior to project implementation. Very few fish were observed above the existing highway culvert, which appears to be acting as a barrier to juvenile fish movement during summer flows. Sample sites were also set up on Beaver, Meadow, and Sheep creeks. Snorkel counts were conducted to monitor fish species general composition and abundance.

The technician inspected an eroding bank on Catherine Creek where a landowner complained of excessive flood damage. No work is necessary at this time, but rebar pins were installed to monitor streambank and bed erosion. The erosion pins will help us determine if bank protection will be necessary. Three toe pins were installed and surveyed in at the confluence of McCoy and Meadow creeks to monitor changes in channel bed elevation.

Pre-project surveys of streambank stability, overhanging vegetation and undercut banks using EPA (1993) protocol were conducted on 4.05 miles of the McCoy Creek/Alta Cunha Ranches project, and on 1.1 miles of the Meadow Creek/Habberstad project. The results are summarized below:

TABLE 6. Pre-Project Inventories of Streambank Stability, Undercut Banks and Overhanging Vegetation on McCoy and Meadow Creeks, 2000.

	Percent of Total Stream Length					
STREAM	Covered & Stable	Covered & Unstable	Uncovered & Stable	Uncovered & Unstable	Undercut Banks	Overhanging Vegetation
McCoy Cr.	59.89%	20.73%	6.66%	12.73%	1.46%	0.48%
Meadow Cr.	66.46%	24.42%	4.49%	4.62%	2.28%	1.63%

Both streams appear to be below potential for the given stream and valley types, and we believe 70% or better in the "Covered & Stable" category are attainable under improved management practices. Even though the McCoy Creek section had been rested from grazing for 2 years there was still a high proportion of unstable banks and a poor shrub component indicated by the low percentage of overhanging vegetation.

Bird boxes were cleaned and inventoried on Camas Creek. Bluebirds or wrens had utilized twenty-five of the 32 boxes (78%). Bird boxes were cleaned and inventoried on Meadow and McCoy creeks by the landowner. Bluebirds utilized 20.2% of the boxes, Tree Swallows 15.2%, House Wrens 30.9%, other birds used 9.4%, and 24.2% were empty.

RESULTS AND DISCUSSION: PROGRAM ADMINISTRATION

Administrative activities during 2000 included preparation of reports and data summaries, budget preparation and purchases, program development, and personnel hiring and supervision.

Reports and Data Summaries

Quarterly and annual progress reports for the Grande Ronde Basin Fish Habitat Enhancement program were prepared and submitted to BPA and others. The 1999 Annual was posted on the BPA web site.

Project implementation, maintenance and monitoring summaries by subbasin and stream were completed and entered into the program database.

Oregon Plan reporting forms were submitted to the Oregon Watershed Enhancement Board and the Grande Ronde Model Watershed Program.

A project summary report was written for the Meadow Creek/Alta Cunha Ranches project and submitted to the Grande Ronde Model Watershed.

Budgets/Purchases

Considerable time was spent obtaining quotes for construction materials, purchasing supplies, receiving material shipments, working on the Statement of Work and Budget, and tracking project expenditures from three different sources of funds (BPA, Grande Ronde Model Watershed Program, and ODFW Fish Restoration & Enhancement).

The FY 2001 Budget was written and submitted to the Columbia Basin Fish & Wildlife Authority (CBFWA). The requested funding of $325,958 was trimmed to $287,500 by the Columbia Basin Fish & Wildlife Authority CBFWA, and later cut even further to $272,649 by the Northwest Power Planning Council (NPPC). Program O&M costs were estimated and submitted to the BPA contracting officer.

Major purchases this year included: fence materials and field supplies; tree seedlings and seed mixes; digital camera, color printer, scanner, and ReWriteable CD player; and a new chain saw. Geotextile cloth, rock and bentonite were purchased to complete instream work on Bear Creek. The remaining $25,000 leftover from 1997 FEMA flood dollars were used to purchase a Trimble GPS total station.

Program Development

Program personnel met with ODFW region staff to discuss future program supervision.

Personnel

Requests to hire were completed for seasonal employees. Scott Stennfeld was rehired as a seasonal Experimental Biology Aide (EBA) for 10 months. David Carroll and Richard Scheele were hired as EBA's for 8 months and 4 months respectively. EBA's spent approximately 80% of their time working on O&M projects.

Tim Bailey's temporary assignment of Fish Habitat Program Leader duties ended in September.

Contract Administration

A Professional Services Contract was written to hire an independent contractor to review the McCoy Meadows Project designs. Hydrologists Owen Williams, Lee Silvey and Steve Belz were hired for this job for the cost of $5,000.

An instream work contract for the Meadow Creek/Habberstad project was awarded to Mitrac Construction. Work was completed for a cost of $7,865. An equipment rental contract was awarded for 20 hours of tracked excavator time on the Bear Creek weir modification project. ODFW paid for $1,800 of the work, while the CTUIR covered the remaining 20 hours.

Oregon Department of Forestry administered an equipment rental contract for excavating the Milk Creek channel. ODFW personnel supervised the work. The cost of the project was $3,250, or about $3.51/lineal ft. of channel constructed, which is considerably less than costs for bioengineered or hard structures at $50-100/lineal ft.

A contract was awarded to Straightline Fence Company to rebuild 2.1 miles of existing fence, remove 0.9 miles of old fence, and install 8 gates.

Miscellaneous Administration

A solid wall was constructed in the office to provide additional sound barrier and shelf space.

INTERAGENCY COORDINATION & EDUCATION

Communication, education, coordination and cost sharing of habitat enhancement activities was completed by actively pursuing opportunities to work with, and learn from personnel involved with other agencies, organizations and programs.

INTERAGENCY COORDINATION:

Information, materials or assistance was provided to members of various agencies or programs, including:

- Oregon Plan project reporting forms were sent to OWEB and the GRMWP.
- The biologist reviewed/provided comments for the biological assessment for the McCoy Meadows/Tipperman project.
- Seeders, trailers and other equipment were loaned to CTUIR personnel.
- The technician conducted a spring chinook survey for ODFW John Day district fish personnel.
- Fence specifications and a list of contractors were sent to the NRCS personnel in Baker City.
- A copy of the ODFW/ODF Guide to Large Wood Placement was sent to Jim Morrow of NMFS, and other local instream work issues were discussed.
- The biologist provided fisheries information on Battle and Campbell creeks to Cliff Curtis who is involved with potential land exchanges between the USFS and private landowners.

Meetings were attended to provide technical input on:

- Planning for Phase II of the McCoy Meadows Restoration project. Construction sequence, channel design, and location in the lower meadow were reviewed. Coordination of fence relocation, fish removal and channel relocation and other design related items continued between ODFW, CTUIR and NRCS on the McCoy Meadows project.
- The biologist attended meetings to plan realignment of Milk Creek (tributary to Catherine Creek) into a historic channel. ODF, ODOT, and Hall Ranch personnel were in attendance. The ODFW Fish Habitat crew will be responsible for design and location of the new channel. Baseline fisheries and habitat information was collected for Melinda Trask of ODOT for inclusion in the biological assessment for the project.
- The biologist field reviewed ODF proposed projects and made recommendations for instream structures, plantings, and fence locations on Little Sheep and Prairie creeks. ODF installed instream structures (wood & boulders) were reviewed on the McCoy Creek/Snow property.
- The biologist attended a meeting of the Grande Ronde Model Watershed technical group to answer questions about two project proposals for McCoy and Meadow creeks.
- The biologist met with John Herbst and Ken McCoy to discuss a potential channel relocation project on Smith Creek.

- The biologist attended a meeting concerning NMFS and USFWS rules & restrictions in light of recent fish ESA listings.
- The biologist attended planning meetings for the Ladd Creek/Tule Lake projects.

Other agencies, organizations, groups or individuals that worked cooperatively, or provided assistance or materials to this project, included:

- CTUIR personnel installed shade cards and watered plantings several times on the Meadow Creek/A. Cunha Ranches project, which increased planting survival on this project.
- NRCS and CTUIR personnel installed discharge gages on McCoy Creek.
- Morgan Smith, a surveyor for Ducks Unlimited, provided guidance on conducting GPS survey work on various projects.

EDUCATION:

The following educational activities were undertaken during 2000:

- Surveying equipment and the solar pathfinder were loaned to Sue Daugherty of Imbler High School for collecting transect data. The high school students have been surveying Spring Creek for several years.
- The technician and EBA's attended the annual meeting of the Oregon Chapter of the American Fisheries Society and the ODFW Northeast Region training session.
- The biologist and technician attended a Hazardous Materials training update. The technician and EBA's completed CPR/1st Aid training.
- The technician attended the Cispus communications workshop.
- The biologist attended a training session on use of the Trimble GPS survey system.
- The biologist attended the Rosgen training courses "River Morphology and Applications" and "River Assessment and Monitoring" in Pagosa Springs, Colorado.
- The biologist attended an international conference on "Wood in World Rivers" in Corvallis.

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APPENDIX 1.

Anadromous fish streams within the Joseph Creek and Wallowa River subbasins with highest priority for habitat improvement.

Joseph Creek:			Stream Miles Needing Work			Miles of Riparian Improvement: Fencing:		Planting:		No. of Instream Structures	
Stream	Species	Priority	Public	Private	Total	Public	Private	Public	Private	Public	Private
Peavine Creek	Stld	1	8.0	0.0	8.0	4.5	0.0	4.5	0.0	43	0
Elk Creek	Stld	2	3.5	5.0	8.5	3.5	5.0	3.5	5.0	25	35
Chesnimnus Creek	Stld	3	12.0	8.0	20.0	12.0	8.0	8.0	4.0	60	40
Crow Creek	Stld	4	1.0	13.0	14.0	1.0	13.0	0.0	10.0	10	50
Swamp Creek	Stld	5	5.0	10.0	15.0	5.0	10.0	2.5	5.0	10	20
Pine Cr. System	Stld	6	2.0	20.0	22.0	2.0	18.0	2.0	18.0	10	40
Devil's Run Creek	Stld	7	5.0	0.0	5.0	2.0	0.0	2.0	0.0	10	10
Davis Creek	Stld	8	7.0	3.0	10.0	7.0	3.0	4.0	3.0	10	0
Butte Creek	Stld	9	0.0	4.0	4.0	0.0	4.0	0.0	3.0	0	10
TNT Gulch	Stld	10	2.0	0.0	2.0	2.0	0.0	2.0	0.0	10	0
Joseph Creek	Stld	11	0.0	12.0	12.0	0.0	12.0	0.0	12.0	0	80
Subbasin Totals			45.0	75.0	120.5	39.0	73.0	28.5	60.0	188	285
Wallowa River:											
Whiskey Creek	Stld	1	0.0	7.0	7.0	0.0	6.5	0.0	5.5	0.0	26
Prairie Creek	Ch, Stld	2	0.0	10.0	10.0	0.0	9.5	0.0	8.0	0.0	37
Trout Creek	Stld	3	0.0	14.0	14.0	0.0	13.5	0.0	11.0	0.0	52
Dry Creek	Stld	4	0.0	8.0	8.0	0.0	7.5	0.0	6.0	0.0	30
Rock Creek	Stld	5	0.0	3.0	3.0	0.0	3.0	0.0	2.5	0.0	11
Parsnip Creek	Stld	6	0.0	1.0	1.0	0.0	1.0	0.0	1.0	0.0	4
Subbasin Totals			0.0	43.0	43.0	0.0	41.0	0.0	34.0	0.0	160

SOURCE: Confederated Tribes of the Umatilla Indian Reservation, 1984. Grande Ronde River Basin: Recommended Salmon and Steelhead Habitat Improvement Measures, 92 pp.

APPENDIX 2.

Anadromous fish streams within the Upper Grande Ronde drainage with highest priority for habitat improvement.

Upper Grande Ronde:			Stream Miles Needing Work			Miles of Riparian Improvement: Fencing:		Planting:		No. of Instream Structures	
Stream	Species	Priority	Public	Private	Total	Public	Private	Public	Private	Public	Private
Grande Ronde River	Ch, Stld	1	6.0	5.0	11.0	2.0	5.0	1.0	4.0	130	175
Sheep Creek	Ch, Stld	2	7.0	5.0	12.0	1.0	5.0	0.5	2.5	210	175
Fly Creek	Stld	3	6.0	6.0	12.0	1.0	5.0	0.5	3.0	180	180
Spring Creek	Stld	4	5.0	0.0	5.0	1.0	0.0	2.5	0.0	150	0
S.F. Spring Creek	Stld	5	3.0	0.0	3.0	1.0	0.0	1.5	0.0	90	0
N.F. Spring Creek	Ch, Stld	6	3.0	0.0	3.0	0.0	0.0	0.0	0.0	90	0
McCoy Creek	Stld	7	4.0	7.0	11.0	1.0	7.0	3.0	4.0	120	210
Rock Creek	Stld	8	0.0	6.0	6.0	0.0	8.0	0.0	3.0	0	90
Dark Canyon Creek	Stld	9	1.0	2.5	3.5	0.0	2.5	0.0	0.0	15	38
Meadow Creek	Stld	10	7.0	7.0	14.0	1.0	7.0	0.5	0.5	210	210
Indian Creek	Ch, Stld	11	1.0	5.0	6.0	0.5	3.5	0.0	0.0	30	150
Chicken Creek	Ch, Stld	12	5.0	2.0	7.0	1.0	1.0	0.0	1.0	75	70
Catherine Creek	Ch, Stld	13	0.0	5.0	5.0	0.0	4.0	0.0	0.0	0	150
Beaver Creek	Stld	14	1.5	5.0	6.5	0.0	3.0	0.0	0.0	45	150
Five Points Creek	Stld	15	5.5	0.5	6.0	0.0	0.5	0.0	0.5	165	15
Clark Creek	Ch, Stld	16	0.0	6.0	6.0	0.0	4.0	0.0	3.0	0	180
Little Catherine Creek	Stld	17	1.0	4.0	5.0	0.0	2.0	0.0	1.5	15	60
Bear Creek	Stld	18	5.0	0.5	5.5	0.0	0.0	0.0	0.0	75	8
Limber Jim Creek	Ch, Stld	19	2.0	0.3	2.3	0.0	0.0	1.0	0.3	30	5
Pelican Creek	Stld	20	3.0	0.5	3.5	0.0	0.0	0.0	0.0	45	8
Peet Creek	Stld	21	2.0	1.0	3.0	0.0	0.0	1.0	0.5	60	30
Little Fly Creek	Stld	22	3.0	2.5	5.5	0.0	0.0	0.0	1.0	90	75
Whiskey Creek	Stld	23	1.0	8.0	9.0	0.0	4.0	0.0	2.0	15	120
Jordan Creek	Stld	24	2.0	8.0	10.0	0.0	4.0	0.0	2.0	30	120
N.F. Limber Jim Cr.	Stld	25	2.0	0.0	2.0	0.0	0.0	0.0	0.0	30	0
McIntyre Creek	Stld	26	2.5	5.0	7.5	1.0	3.0	1.0	5.0	75	150
Waucup Creek	Stld	27	5.0	0.0	5.0	0.0	0.0	1.0	0.0	150	0
Burnt Corral Cr.	Stld	28	6.0	0.2	6.2	0.0	0.0	0.0	0.0	90	4
Lookout Creek	Stld	29	3.5	0.8	4.3	0.0	0.0	0.0	0.0	53	24
Little Dark Canyon Cr.	Stld	30	2.0	0.0	2.0	0.0	0.0	0.0	0.0	60	0
Phillips Creek	Stld	31	0.0	6.0	6.0	0.0	2.0	0.0	0.0	0	180
Gordon Creek	Stld	32	0.0	7.0	7.0	0.0	4.0	0.0	2.0	0	210
Dry Creek	Stld	33	0.0	8.0	8.0	0.0	6.0	0.0	4.0	0	240
Cabin Creek	Stld	34	0.0	3.0	3.0	0.0	2.0	0.0	0.0	0	90
Drainage Totals			95.0	116.8	211.8	10.5	82.5	13.5	39.8	2,328	3,117

APPENDIX 3

Photographs of Recovering Projects

Butte Creek, McDaniel property, Photopoint #5, September 25, 1991. Vertical cut banks and only moderate amounts of riparian vegetation are evident. The newly constructed fence on the right bank appears to have been placed too close to the streambank.

Butte Creek, McDaniel property, Photopoint #5, September 7, 2000. A dense canopy of alder, willow and hawthorns is now shading the stream channel which is no longer visible. Erosion on the right bank has halted even though the stream experienced severe flooding in 1997 and 1998.

Salmon Creek, McClaran property, Photopoint 4a, October 10, 1989. In years past the stream channel had been pushed against the hillslope, and the channel had downcut several feet. Old stream meander scars are evident in the center, right side of the photo.

Salmon Creek, McClaran property, Photopoint 4a, October 17, 2000. A canopy of willows has developed, and the stream has evolved from a Rosgen G→F→C stream type within the entrenched area. Stream temperatures are 3-4 degrees Celsius cooler at this site compared to a monitoring station 2.3 miles upstream.

Chesnimnus Creek, Yost property, Photopoint #5, August 7, 1987. A wide, shallow stream channel with bare gravel bars are evident in this pre-project photogragh. The bare soil on the left is a pond constructed by the landowner.

Chesnimnus Creek, Yost property, Photopoint #5, August 10, 2000. Despite the fact that beavers have constructed dams several times in this area, the riparian vegetation has flourished. The channel has narrowed and deepened, and is more shaded.

Fly Creek, Smith property, Photopoint 7, October 21, 1987. The pre-project photograph shows a stream suffering from intense grazing pressure and timber harvest.

Fly Creek, Smith property, Photopoint 7, August 22, 2000. After 13 years of recovery young lodgepole pine are recolonizing the site. The stream channel (no longer visible) has evolved into a low width/depth ratio Rosgen E type stream due to the establishment of a thriving sedge community.

Upper Grande Ronde River, Delve property, Photopoint 1a, August 24, 1993. High bedload movements occurred during the flooding of May 1991, and this reach has been artificially constricted by the landowner and from highway construction in the areas upstream and downstream of the photo. Note erosion control matting in lower left of the photograph.

Upper Grande Ronde River, Delve property, Photopoint 1a, September 6, 2000. Recovery has been slow, but the channel is beginning to reshape itself as deposition has occurred on the point bar, and young sedges and alders become established. The opposite bank is still cutting, but this is necessary in order for the stream to restore itself into the correct pattern.

Upper Grande Ronde River, Bowman/Hoeft property, Photopoint 6, August 20, 1990. Prior to fencing a series of rock jetties were placed on the right bank to prevent further erosion. A wide, shallow stream channel is evident, and very little streamside vegetation is present.

Upper Grande Ronde River, Bowman/Hoeft property, Photopoint 6, August 17, 1990. Although the jetties are no longer the preferred method of bank stabilization, they quickly trapped sediments during the flooding of 1991 (note deposition below the protruding boulder on the right bank), and the channel has narrowed. Recovery is slow in this reach, but some young alders are becoming established.