PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Protect And Enhance Anadromous Fish Habitat In The Umatilla River Subbasin

BPA project number: 8710002
Contract renewal date (mm/yyyy): 3/2000 ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Oregon Department of Fish & Wildlife

Business acronym (if appropriate) ODFW

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
2.1, 7.6A.2, 7.6B.1, 7.6B.3, 7.6B.4, 7.6B.5, 7.6B.6, 7.6C, 7.6D, 7.7, 7.8D.1, 7.8E.1, 7.10

FWS/NMFS Biological Opinion Number(s) which this project addresses
N/A

Other planning document references
1)CTUIR. 1994. Wildlife Mitigation Plan (Draft) May 1996, Columbia Basin Salmon Policy. 1995 pg 9-10, and Water Assessment Report; 2) NMFS - Salmon & Steelhead Enhancement Plan for the Washington and Columbia River Conservation areas.Vol 1. chpt 4, 37pgs; 3)Reeve, R. 1988. Umatilla River Drainage Anadromous Fish Habitat Improvement Plan; 4)CTUIR/ODFW. 1990. Umatilla Hatchery Master Plan; 5)OWRD. 1988. Umatilla Basin Report; 6)BOR. 1988. Umatilla basin Project Planning Report, 7)Umatilla County - Comprehensive Plan. 1983, chpt 8; 8)USNF - Umatilla National Forest Land & Resource Management Plan. 1990, chpt 2, pg 13. and Final EIS. 1990, chpt III, pgs 59-62; 9)CTUIR/ODFW. 1990. Umatilla River Subbasin Salmon and Steelhead Production Plan; 10)Boyce, R. 1986. A Comprehensive Plan for Rehabilitation of Anadromous Fish Stocks in the Umatilla River Basin; 11)USFWS & NMFS. 1982. Umatilla R. Planning Aid Report.

Short description
Protect and enhance coldwater fish habitat on private lands in the Umatilla River basin in a manner that achieves self-sustaining salmonid populations and their associated habitat by utilizing natural stream functions to the fullest extent.

Target species
Summer Steelhead

Section 2. Sorting and evaluation

Subbasin
Umatilla

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☒ Multi-year (milestone-based evaluation) ☒ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☒ Operation & maintenance ☐ New construction ☐ Research & monitoring ☒ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1998	Protected 11 miles of stream by installing 16 miles of fence and retrofitting existing projects with bioengineering treatments.	Many miles of stream remain to be treated.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Restore riparian vegetation species diversity and community structure so the positive interaction of the stream, riparian zone and floodplain perpetuate and maintain normative ecological and physical processes.	a	Work cooperatively with two private landowners (Erwin and Brogiotti) to procure long term riparian lease agreements/conservation easments that protect habitat in the highest priority areas.
1		b	Walk streams to identify work areas, plan work, layout and mark specific sites where riparian fencing, offsite water developments and plantings will be implemented.
1		c	Conduct onsite activities on two projects (surveying, staking, etc.), prepare contracts, and obtain any permits needed to gain access and complete onsite work .
1		d	Construct 12 miles of livestock exclosure fences and associated stream crossings on streams impacted by grazing including: 10 miles of fence protecting 13 miles of stream on the Westgate Canyon/Erwin project and 2 miles of fence protecting one mile
1		e	Construct 4 off-site water developments to encourage livestock

			utilization of uplands and divert grazing pressure away from the streams and riparian areas.
2	Create naturally stable channels along stream reaches that have been destabilized by reach specific and watershed-wide impacts through the use of bioengineering techniques.	a	Work cooperatively with one private landowner (Brogiotti) to procure a long term riparian lease agreement that protect habitat in the highest priority areas.
2		b	Conduct reach assessments and project designs for proposed FY2001 projects.
2		c	Develop construction schedules, engineer project specifications, advertise for construction bids, select contractors and obtain permits for implementation activities.
2		d	Purchase construction materials and supplies necessary to construct planned habitat improvements.
2		e	Layout and mark specific work sites.
2		f	Implement bioengineering techniques to create naturally stable channel forms on one mile of the East Birch Creek/Brogiotti property.
3	Insure maximum program benefits within leased areas by conducting operations and maintenance activities on all existing riparian exclosure fences, plantings and instream structures. These activities are conducted year around.	a	Inspect and maintain 16 miles of riparian fence which currently protects 11 miles of stream and 280 acres of riparian habitat. This includes 20 livestock watering gaps and 5 off-site water developments.
3		b	Inspect all leased areas for revegetation success. Plant native trees and shrubs (such as willow & cottonwood cuttings, conifers) where needed to reduce bank erosion, and to improve degraded overstory & understory components of riparian plant communities.
3		c	Inspect all leased areas for noxious weeds and work with county weed agencies to control listed species on 280 acres of leased habitat.
3		d	Inspect streambank stability and

			instream structures in 11 miles of stream and perform necessary maintenance on a case by case basis. Cost share these activities with FEMA funds when available.
3		e	Coordinate the above O&M activities with 26 landowners to insure project goals and landowner needs are both met, and with minimal disturbance to landowner operations.
4	Monitor and evaluate Umatilla Basin fish habitat enhancement projects to determine if project goals and objectives are being met. Prepare reports of the results, and apply adaptive management based the information gathered.	a	Annually take 65 photopoint pictures to document changes in vegetation and channel morphology attributable to habitat projects.
4		b	Continue year around monitoring of hourly stream temperatures at ten project sites, on 2 streams. Annually summarize and analyze the results of data collected from ten permanent thermographs.
4		c	Take 30 riparian habitat transects on Birch and Meacham creeks to assess stream channel and vegetative responses to habitat restoration projects.
4		d	Conduct biological surveys (spawning ground counts, fish population estimates, bird nesting) in selected study areas to determine if improvements in habitat result in increases in fish/wildlife populations.
4		e	Report the results of all project M&E activities in quarterly, annual and special reports. Distribute to ODFW fish districts, BPA, and other interested parties, and identify adaptive management implications.
5	Insure maximum communication, education and coordination of habitat enhancement activities by	a	Work cooperatively with the Umatilla Basin Watershed Council and other local groups involved with

	actively pursuing opportunities to work with, educate and learn from personnel involved with other agencies, organizations, and programs.		stream habitat restoration to identify and prioritize projects and activities beneficial to the protection and restoration of basin watershed lands.
5		b	Coordinate field activities with other agencies, organizations, and programs to insure maximum technology transfer, program consistency and coordination of habitat enhancement efforts.
5		c	Answer correspondence, respond to information needs, and make presentations to other agencies, private organizations, school/youth groups and the news media.
5		d	Work cooperatively with private landowners to promote management activities that protect and restore instream and riparian habitat and watersheds on private lands. Update individual landowners of the progress of their projects using the information gathe

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	3/2000	2/2001			35.00%
2	3/2000	2/2001			40.00%
3	3/2000	2/2001			15.00%
4	3/2000	2/2001			5.00%
5	3/2000	2/2001			5.00%
				Total	100.00%

Schedule constraints
Catastrophic events such as flooding, wildfire, etc.

Completion date
2015

Section 5. Budget

FY99 project budget (BPA obligated): $481,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	full time bio, Tech 2, Tech 1 and 1-2 seasonals, Prgm Ma., Office specialist, ODFW engineers	%28	128,804
Fringe benefits	38% of personnel	%11	48,946
Supplies, materials, non-expendable property	New Implementation	%12	54,200
Operations & maintenance	This includes only materials, vehicles, mileage, office supplies, tools & equipment	%7	34,337
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Equipment Trailer and Utility Trailer	%3	15,000
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags:	%0	
Travel	Vehicle Mileage and Training Perdiem	%2	9,918
Indirect costs	Admin. Overhead @ 35.5%, excluding capital and subcontracts	%21	98,053
Subcontractor	Fence construction, instream construction, weed control	%16	75,900
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			$465,158

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
U. S. Army Corps of Engineers (seeking)	instream materials and construction	%21	150,000
Governor's Watershed Enhancement Board (seeking)	Fencing materials	%4	27,750
ODFW Restoration & Enhancement Board (seeking)	Fence construction	%3	18,750

Landowner (secured)	Fence materials fence construction and fence line surveying	%7	50,000
ODFW - Wildlife (secured)	Fence materials	%1	3,900
		Total project cost (including BPA portion)	$715,558

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$450,000	$450,000	$468,000	$468,000

Section 6. References

Watershed?	Reference
☐	Anderson, J.W., and others. 1992. Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration, and Monitoring Plan. USFS, PNWFRS, ODFW, CRITF, CTUIR, NPT, OSU.
☐	Armour, C.L., D.A. Duff, and W. Elmore. 1991. The effects of livestock grazing on riparian and stream ecosystems. Fisheries 16(9):7-11.
☒	Agua Tierra Environmental Consulting. 1998. Birch Creek restoration. Supplemental narrative report. For the Oregon Department of Fish & Wildlife. Pendleton, Oregon.
☐	Beschta, R.L., 1994. Restoration of riparian/aquatic ecosystems in Eastern Oregon: Turning back the clock to understand the future. Department of Forest Engineering, Oregon State University. Presented at the Annual Meeting of the Oregon Chapter of the
☐	Beschta, R. L., W.S. Platts, and B. Kaufmann., 1991. Field review of fish habitat improvement projects in the Grande Ronde and John Day River basins of Eastern Oregon. 53 pgs.
☐	Beschta, R.L. 1978. Long-term patterns of sediment production following road construction and logging in the Oregon coast range. Water Resources Research 14:1011-1016.
☐	Bilby, R. E., and G. E. Likens. 1980. Importance of organic debris dams in the structure and function of stream ecosystems. Ecology 61(5): 1107-1113.
☐	Bisson, P.A., B.E. Bilby, M. Bryant, C. Dollof, G. Grette, R. House, M. Murphy, K. Koski, and J. Sedell. 1987. Large Woody Debirs in Forested Streams in the pacific Northwest. In Cundy, T; Salo, E., eds. Proceedings of a symposium streamside management -
☐	Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. W.R. Mehan ed., Influences of Forest and Rangeland Mangement on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication 19: 83-138.
☒	Boyce, R. 1986. A Comprehensive Plan for Rehabilitation of Anadromous

	Fish Stocks in the Umatilla River Basin. pgs. 40-43 and 115.
☐	Cacek, C.C. 1989. The relationship of mass wasting to timber harvest activities in the Lightning Creek basin, Idaho and Montana. Master's of Science Thesis. Eastern Washington State University, Cheney, Washington.
☐	CBFWA. 1997. Multi-Year Implementation Plan for the Protection, Restoration & Enhancement of Columbia River Basin Fish & Wildlife Resources.
☐	Chaney, E., W. Elmore, and W.S. Platts. 1993. Managing change - livestock grazing on western riparian areas. US EPA report. 32 pgs.
☒	CTUIR, and ODFW. 1990a. Umatilla River Subbasin Salmon and Steelhead Production Plan. Northwest Power Planning Council. Portland, Oregon.
☒	CTUIR, and ODFW. 1990b. Umatilla Hatchery Master Plan. Northwest Power Planning Council. Portland, Oregon.
☐	Cummins, K. W., G. W. Minshall, J. R. Sedell, C. E. Cushing and R. C. Peterson. 1984. Stream ecosystem theory. Verh. Internat. Verein. Limnol. 22: 1818-1827.
☐	Elmore, W., and R. L. Beschta. 1987. Riparian areas: perceptions in management. Rangelands 9(6): 250-265.
☐	
☐	Hammer, T.R. 1972. Stream channel enlargement due to urbanization. Water Resources Research 8:1530-1540.
☐	House, R. A. and P. L. Boehne. 1985. Evaluation of instream enhancement structures for salmonid spawning and rearing in a coastal Oregon stream. N. Amer. J. Fish. Mgmt. 5: 283-295.
☐	Jones, J.A., and G.E. Grant. 1996. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. Water Resources Research 32:959-974.
☐	Karr, J.R., and I.J. Schlosser. 1978. Water resources and the land water interface. Science 201:229-234.
☐	Keller E.A., and F. J. Swanson. 1979. Effects of large organic material on channel form and fluvial processes. Earth Surface Processes vol. 4: 361-380.
☐	Lowrance, R., R. Todd, J. Fail, O. Hendrickson, R. Leonard, and L. Asmussen. 1984. Riparian forests as nutrient filters in agricultural watersheds. BioScience 34:374-377.
☐	Meehan, W. R., editor. 1991. Influences of forest and Rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19. pp. 419-420 fences, washed protection 525, instream 544,
☐	Meehan, W. R., and W. S. Platts. 1978. Livestock grazing and the aquatic environment. Journal of Soil and Water Conservation 33:274-278.
☐	Nagel, G., 1997. Historical changes in riparian areas of the Umatilla Basin: preliminary findings, draft. USFS Forest Sciences Lab, Corvallis Oregon. 11pgs.
☐	NMFS. 1997. Snake River Salmon Recovery Plan. August 1997 Draft.
☐	NPPC. 1994. Columbia River Basin Fish and Wildlife Plan. Portland Oregon.

☐	ODFW/CTUIR. 1990. Umatilla Hatchery Master Plan.
☐	Oregon State Game Commission. 1963. The fish and wildlife resources of the Umatilla basin, Oregon, and their water use requirements. Report to the State Water Resources Board. Portland
☒	Reeve, R., S. Williams, J. Sanchez and J. Neal. 1988. Umatilla River Drainage Anadromous Fish Habitat Improvement Plan. 37pgs.
☐	Reeves, G.H., J. D. Hall, T. D. Roelofs, T. L. Hickman, and C. O. Baker. 1991. Rehabilitating and modifying stream habitats. W.R. Meehan ed., Influences of Forest and Rangeland Mangement on Salmonid Fishes and Their Habitats. American Fisheries Society
☐	Reeves, G. H., D. B. Hohler, B. E. Hansen, F. H. Everest, J.R. Sedell, T. L. Hickman, and D. Shively. 1996. Fish habitat restoration in the pacific northwest: Fish Creek of Oregon. Pages 335-358 in J. E. Williams, C. A. Wood, and M. P. Dombeck ed. Wa
☐	Roper, B. R., D. Konnof, D. Heller and K. Wieman. 1998. Durability of pacific northwest instream structures following floods. North Amer. J. Fish. Mgmt. 18:686-693.
☐	Rosgen, D.R., 1996 Applied river morphology. Wildland Hydrology, Pagosa Springs, Colorado.
☐	Sedell, J.R., P.A. Bisson, F. J. Swanson, and S.V. Gregory. 1988. What we know about large trees that fall into streams and rivers. U.S. Forest Service General Technical Report PNW-GTR-229:47-81.
☐	Soloazzi, M. F., J. D. Rodgers, and S. L. Johnson. 1992. Annaul Progress Report. Oregon Department of Fish and Wildlife. Portland, OR.
☐	Thompson, R. N. and J. B. Haas. 1960. Environmental survey report pertaining to salmon and steelhead in certain rivers of eastern Oregon and the Willamette River ant its tributaries. Part I. Survey reports of eastern Oregon rivers. Fish Commission of
☐	USFWS. 1982. Umatilla River Planning Aide Report. Apr. 1982, pgs 24-37.
☐	White, R. J. 1975. In-stream management for wild trout. Pages 48-58 in W. King ed. Proceedings, wild trout management symposium. Trout Unlimited, Vienna, Virginia.

PART II - NARRATIVE

Section 7. Abstract

Initiated in 1987, the "Umatilla Subbasin Fish Habitat Improvement Project" protects and enhances coldwater fish habitat on private lands using both passive and active restoration techniques. Riparian exclosure fencing is a primary tool for this work. Where applicable, active remediation techniques are as used such as soil bioengineering techniques, stable channel designs (Rosgen 1996) native vegetative plantings, off-site water developments, and site specific instream structures. Long term riparian leases, cooperative agreements, and easements are developed with private landowners to protect project investments. Individual projects contribute to

ecosystem/basin wide watershed restoration/management efforts that are underway by state, federal and tribal agencies. Project planning includes the participation/involvement of private landowners, state/federal agencies, tribes, stakeholders, and watershed council(s) as called for in measure 7.7 of the 1994 CBFWA Program.

The Umatilla program goal is to rehabilitate and improve anadromous fish spawning, rearing habitat, and tributary passage as outlined in Program Measure 7.6 & 7.10 to contribute to the NPPC's interim goal of doubling anadromous fish runs in the Columbia River basin. While the focus of this project is on summer steelhead, spring chinook, coho, resident fishes, and many species of wildlife also benefit. In FY2000 the Umatilla program will implement two restoration projects and continue maintenance of existing projects.

Long term monitoring and evaluation is an ongoing and vital element of this program. Monitoring includes stream temperature data, physical & biological stream surveys, photopoints, and habitat transects.

In FY 2000 we propose implementing two restoration projects. The Westgate Canyon project includes fencing and excluding livestock from a 4,700 acre subwatershed of East Birch Creek. This is a true ridge-top to ridge-top project. The East Birch Creek project will protect one mile of stream from livestock grazing and restore naturally stable channel forms (Rosgen 1996).

Section 8. Project description

a. Technical and/or scientific background

The Umatilla River, located in northeast Oregon, originates on the western slopes of the Blue Mountains. It flows about 115 miles northwesterly to the Columbia River and covers approximately 2,290 square miles. The confluence of the Umatilla with the Columbia River is located at River Mile (RM) 289 near the town of Umatilla, Oregon. The subbasin consists of the high relief Blue Mountains region with elevations from 3,000 to 6,000 feet, and the Deschutes-Umatilla Plateau, a broad upland plain that slopes northward from the Blue Mountains to the Columbia River.

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

The indigenous anadromous fish species in the basin are summer steelhead, spring and fall chinook (extirpated and reintroduced), coho, and pacific lamprey. Historically, the Umatilla River basin supported large runs of spring and fall chinook and coho salmon. Native salmon populations had become extinct by the mid-1900's (OGC 1963; Thompson and Haas 1960), while populations of native steelhead, redband and bull trout continue to persist, although at depressed levels. The actual historic run size of steelhead in the basin is not known, but based on the amount of habitat lost to steelhead production (both McKay and Butter Creek drainages are no longer accessible by anadromous fish) and the degradation of the existing habitat (CTUIR 1983), current run sizes are thought to be a fraction of historical (CTUIR and ODFW 1990; Umatilla Subbasin Umbrella). In recent times, runs have ranged from a low of 768 in 1982 and a high of 3,080 in

1978 (Umatilla Subbasin Umbrella).

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

Intensive land uses within Umatilla subbasin flood plains and upslope habitats have led to dramatic changes in waterway characteristics since arrival of Euro-American pioneers to the area during the middle 1800's (Nagel 1997, unpublished; Beschta 1994). Primary factors influencing fish habitat in the Umatilla subbasin are Grazing, Agriculture, Forest Harvest, Roads, and Urbanization (CTUIR and ODFW 1990; Boyce 1986). Logging and associated road building in riparian and floodplain forests eliminates sources of large wood, reduces shade and bank stability, and increases erosion (Beschta 1978; Cacek 1989; Jones and Grant 1996; Maser 1988; Meehan 1991). Overgrazing by domestic livestock can change riparian and stream channel characteristics to the detriment of salmonids (Armour et al. 1991; Bauer and Burton 1993; Kauffman and Krueger 1984; Platts 1990; Lichatowich and Mobrand 1995; Wissmar et al. 1994). Agricultural practices can lead to polluted runoff into streams, removal of riparian vegetation and modification of channel characteristics (Lowerance et al. 1984; Karr and Schlosser 1978). Urbanization can impact streams by producing polluted runoff, removing riparian vegetation and by changing channel characteristics (Hammer 1972). Stream alterations resulting from these activities include channel straightening, diking, loss of floodplain/wetland habitats, deforestation of the upper watershed, etc. These alterations have resulted in the following habitat limiting factors to the production of anadromous salmonids in the Umatilla Basin: low stream flow, high water temperature, restricted adult passage at diversion dams, inadequate screening in irrigation canals, loss of riparian habitat, and lack of instream habitat (Reeve et al. 1988; Boyce 1986).

A BPA funded study (A Comprehensive Study for Rehabilitation for Anadromous Fish Stocks in the Umatilla River Basin, 1986) clearly showed that the habitat improvements proposed in the plan would play an important role in the restoration of summer steelhead and spring chinook in the basin. There is currently a comprehensive effort underway by the Oregon Department of Fish & Wildlife (ODFW) and Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to restore anadromous fish runs in the Umatilla River Basin (CTUIR & ODFW 1990a; CTUIR & ODFWb; Boyce 1986; Umatilla Subbasin Umbrella). This comprehensive restoration effort includes a multifaceted approach of addressing passage problems, enhancing streamflows (the Umatilla Basin Water Exchange Project), habitat improvement and hatchery supplementation (CTUIR & ODFW 1990a; Umatilla Subbasin Umbrella).

Initiated in 1987, the ***"Umatilla Subbasin Fish Habitat Enhancement Project"*** is a logical and integral part of the Umatilla basin anadromous fish restoration effort by implementing and maintaining projects that establish long term riparian and instream habitat protection and enhancement on private lands through riparian lease agreements. It fits well within the conceptual foundation or framework proposed by the Independent Scientific Group and the Fish and Wildlife Managers (ISSG 1996; CBFWA 1997). The intent of the project is to provide offsite mitigation for mainstem losses of habitat and fish productivity caused by the construction

and operation of eight dams on the Columbia River, and is to be achieved through coordinated efforts to protect and improve spawning and rearing habitat, and improve fish passage (NPPC 1994). The specific program objective is to mitigate habitat losses to increase natural salmonid production (summer steelhead) in the Umatilla River basin by reducing sediment loading, decreasing un-natural high water temperatures, improving riparian habitat, increasing instream habitat diversity, and improving salmonid access to historical/preferred habitats (Boyce 1986; Reeve et al. 1988; CTUIR and ODFW 1990).

By a joint effort of the ODFW, CTUIR, and the Umatilla National Forest in 1987-88, a plan/assessment for the implementation of fish habitat projects was developed (Reeve et al. 1988). The development of this plan involved a comprehensive habitat survey of known anadromous fish production streams. From these surveys and existing information on habitat conditions (Boyce 1986) habitat limiting factors were developed. The surveys were the basis for determining where habitat improvement work was needed. A prioritized list of streams needing habitat improvement was created based on habitat condition (those areas most likely to recover in a cost-effective manner), fish use, fish species present, and logistical constraints (accessibility, technical feasibility, etc.). Each agency was designated specific stream reaches to treat. The ODFW was identified to treat upper Meacham Creek and East and West Birch creeks.

The primary approach of this project is to address the impacts to riparian vegetation communities and fisheries habitat caused by the inappropriate management of domestic livestock. The preferred method of addressing this problem is by excluding domestic livestock from riparian zones by constructing exclosure fences. Other types of fish habitat improvements such as instream structures and large wood debris (LWD) placement are implemented after grazing problems are addressed if such problems exist on a treatment reach. Because the riparian zone is the primary control of biotic factors within the stream environment, there is an inseparable link between them (Cummins et al. 1984). The negative effects of livestock grazing on the structure and function of riparian communities and aquatic habitats is well documented (Elmore and Beschta 1987; Meehan and Platts 1978; Platts 1991; Chaney et al. 1993). The most widespread factor affecting riparian communities and fish habitat in northeastern Oregon is the inappropriate management of grazing livestock. Passive regeneration techniques using exclosure fencing to exclude livestock from riparian zones is the primary method used to restore degraded habitat, and has proven to be an effective means of improving riverine/riparian habitats along grazed streams (Chaney et al. 1993; Platts 1990; NMFS 1997). In a field review of BPA projects Beschta et al. (1991) stated that **"Corridor fencing resulted in the most successful examples observed of vegetation recovery, diversity of channel morphology, and improved fish and wildlife habitat."** Active remediation techniques using plantings (Chaney et al. 1993; ISG 1996), bioengineered, or other instream structures may also improve habitat, and may be required when natural processes are dysfunctional or unlikely to result in recovery within a desired time frame (NMFS 1997).

Riparian corridor fencing to exclude livestock accomplishes both protection and enhancement of riparian communities. Fencing provides the tool for natural vegetation restoration, and protects the riparian zone from further impacts from livestock. Protection of habitat is by far the most productive method of maintaining quality fish habitat (Reeves et al 1991).

Site specific instream structures and/or LWD placements are installed as a secondary treatment approach where instream habitat diversity is a limiting factor. Our intent is to provide needed instream cover in treatment reaches lacking such in order to provide some immediate instream benefit. Riparian recovery will eventually perpetuate the habitat characteristic for which the naturally functioning stream is capable. Roper et al. (1998) supports this approach of

treating instream needs as a secondary treatment while riparian and watershed problems are being addressed.

It is well documented that large wood debris is a key component quality fish habitat (Bisson et al. 1987), greatly influences the structure and function of stream ecosystems (Sedell et al. 1988; Bilby and Likens 1980), and greatly influences stream channel form and fluvial processes (Keller and Swanson 1979).

Scientific literature supports the carefully evaluated installation of instream structures Roper et al. (1998). The addition of structures or large boulders to create pools or cover can increase fish populations in cases where these attributes are lacking (Bjornn and Reiser 1991). House and Boehne (1985) found that the installation of instream structures into the altered habitats of the East Fork of Lobster Creek, Oregon led to increased spawning and rearing use by coho salmon and steelhead at the improvement sites. Solazzi et al. (1992) found that instream habitat improvements including the installation of channel spanning log structures to create dammed pools and alcoves led to a significant increase in overwinter survival of coho salmon in Lobster Creek, Oregon. Reeves et al (1996) observed an apparent increase in 1+ age steelhead (although not statistically significant) in Fish Creek, Oregon, after the installation of instream structures. Two one hundred-year storm events hit the watershed in 1995 and 1996 that led to the loss of 50% of the structures installed. However, post event surveys indicated that overall changes in habitat types were moderate. The authors suggested that the instream structures played a role in maintaining the habitat.

Reeves et al (1991) provides an overview of management evaluations of several habitat modification projects in the Midwestern and eastern North America by measurements of trout abundance as adapted from White (1975). Of the 11 studies summarized, 10 showed increased abundance/biomass of trout ranging from increases of 10-15% to 400-500%.

Measures in the form of preproject evaluation are made to determine if instream structure placement is appropriate, and if so, what the most appropriate treatment types are. Rosgen (1996) describes an assessment process for determining the stable channel form of a subject stream. This assessment process includes comparing a series of measurements between an unstable treatment stream and a stream reach of similar classification in a stable condition. The author indicates that the use of such an assessment process, and implementation based on the assessment results, will lead to a high success rate of applying improvements for fish enhancement. Altering the natural stable channel forms through the installation of fish habitat improvements or the installation of these improvements into unnaturally unstable stream channels is inappropriate.

Anthropogenically caused changes to streams in the Umatilla basin and their relative intensity, have created a tremendous challenge for implementing functional stream habitat improvement projects (ATEC 1998). Challenges facing the successful implementation of habitat restoration projects include meeting landowner/landuse constraints, cumulative effects from upstream land uses, physical/biological constraints of the soils, vegetation, and geomorphic characteristics within the affected treatment reach. Because of these challenges, implementation of restoration approaches listed in the Umatilla Basin Anadromous Fish Habitat implementation Plan (riparian vegetation restoration,) have not in all cases successfully met the desired objectives. Therefore, alternative implementation strategies have been developed through adaptive management to better meet objectives.

More specifically, fairly narrowly fenced riparian corridors, and hard approaches to achieving stable streambanks were implemented on many projects on Birch Creek. In 1996, exacerbated by

almost annual flow events (25-50 flood recurrence interval in magnitude) eleven projects were in need of significant repairs. In an attempt to change our approach to better meet project objectives and reduce maintenance costs, the Birch Creek watershed and 11 projects were assessed based on Rosgen (1996) (ATEC 1998). ATEC also developed site specific plans for returning the historically highly manipulated stream channels of Birch Creek and East Birch Creek into naturally stable forms as determined from reference reaches throughout the drainage (Rosgen 1996).

In addition to focussing on reintroducing naturally stable channel formations, this project has re-focused its efforts to the development of wider riparian buffers, and installation of large quantities of native vegetation (soil bioengineering techniques). Based on our investigation and experience, soil bioengineering techniques will provide the best opportunity for achieving the program's desired future condition in the Birch Creek watershed. To substantiate this approach, in 1995/96, the program installed a model demonstration bioengineering project to test the effectiveness of these "non-traditional" streambank restoration treatments for long term habitat improvement and resiliency to flood damages. Based on the success of this project and the techniques we learned from working with private consultants, the program has committed to implementing this approach on future projects where appropriate for addressing fisheries limiting factors.

b. Rationale and significance to Regional Programs

Habitat degradation, caused by overgrazing, road construction, stream channelization, timber harvest and other landuse/management activities has adversely affected instream and streambank/floodplain riparian areas and their effective hydrologic function. Low summer stream flows and associated high water temperatures, poor streambank stability, winter icing, excessive sedimentation, and a lack of instream and riparian habitat diversity has occurred, reducing production of salmonids throughout much of the Umatilla subbasin. Degradation of riparian areas and their effective hydrologic function has contributed significantly to these flow/temperature problems. In 1982, 74 miles of degraded stream habitat on private lands within the Umatilla subbasin were identified as in need of habitat restoration (USFWS and NMFS 1982). In 1988, ODFW identified 30 miles of priority habitat to focus their initial efforts (Reeve et al. 1988). After ten years of intensive efforts, ODFW has effectively treated 12.5 miles of stream habitat on these same lands. **Recent adaptations of our Birch Creek projects to recreate naturally stable channel forms and the use of aggressive bioengineering techniques are showing significant promise to restore normative ecological/physical processes.** Contingent on securing funding to restore flood damages to existing projects and future funding for implementation of new projects, the Umatilla program will strive to address the remainder of the untreated stream miles situated within the areas of known "key" salmonid habitat.

Habitat improvements implemented under this program will result in the following benefits: 1) increased water table saturation zones and in-stream flow levels during summer months, 2) slower water velocities and narrower stream channels, 3) more diverse riparian vegetation communities to stabilize streambanks, 4) provide recruitable wood for instream cover, 5) increase shading, 6) increase insect drop and 7) filter sediments. These combined benefits will aid anadromous salmonids by improving overall water quality, increasing and diversifying fisheries habitat and increasing potential food sources.

The project establishes long term riparian, fish habitat and tributary passage improvements on private lands through riparian leases, cooperative agreements and easements of 15 years in length. Individual projects contribute to ecosystem and basin wide watershed restoration and management efforts underway by state, federal and tribal agencies. The project provides off-site

mitigation for mainstem fisheries losses caused by Columbia River hydroelectric dams. The project goal is to rehabilitate and improve anadromous fish spawning and rearing habitat as outlined in program measure 7.6 of the Fish and Wildlife Program (FWP, NPPC 1994). This project is an integral part of meeting biological objectives for spring chinook and summer steelhead in the Umatilla Subbasin. Planning for project implementation is coordinated on a comprehensive watershed basis that includes the participation of private landowners, state and federal agencies, tribes and watershed councils as called for in measure 7.6 and 7.7 of the 1994 FWP. Individual projects also incorporate "Best Management Practices" as outlined in measure 7.8B of the FWP; riparian easements with private landowners as specified in Program Measure 7.8E; and fish passage is established or improved as outlined in measure 7.10 of the FWP. Adaptation of project approaches to better accomplish objectives of restoring normative ecological processes clearly supports the Fish and Wildlife Program goal of a healthy Columbia Basin. These projects contribute to the Northwest Power Planning Council's interim goal of doubling anadromous fish runs in the Columbia River Basin by providing offsite mitigation for mainstem fisheries losses caused by the eight dams along the Columbia River hydroelectric system.

This habitat restoration project is a necessary measure to accomplish natural productions goals as outlined in the Comprehensive Plan for Rehabilitation of Anadromous Fish Stocks in the Umatilla Basin (ODFW 1986) Umatilla River Subbasin Salmon and Steelhead Production Plan (CTUIR 1990), and Umatilla Hatchery Master Plan (ODFW and CTUIR 1990). Failure to meet biological objectives in the Umatilla subbasin will impact the Northwest Power Planning Council in realizing its interim goal of doubling anadromous fish runs in the Columbia River basin by providing offsite mitigation for mainstem fisheries losses caused by the dams that constitute the Columbia River hydroelectric system.

Additionally, failure to fund maintenance of existing projects will lead to significant losses in recovery gained. This would occur mainly through livestock entering exclosure fences that are not maintained. Without maintenance cattle will enter these exclosures and rapidly destroy riparian vegetation that has been restored over the past 11 years. Accomplishment of maintenance activities by landowners would be variable.

c. Relationships to other projects

In Eastern Oregon, the Umatilla Habitat Improvement project (8710002), Mainstem, Middle Fork, and North Fork, John Day River project (8402100), Grande Ronde River Enhancement project (8402500), Fifteen Mile Creek Habitat Improvement, project (9304000), and Trout Creek project (9404200) are closely tied. These projects use similar methods, focusing on watershed health and riparian/instream habitat enhancement within anadromous fish streams as a means of protecting and improving the quantity and quality of salmonid spawning and rearing habitat. The Umatilla, Grande Ronde, and John Day habitat projects communicate on a frequent basis and regularly share equipment, funding, technology and personnel. For example, two projects in the Birch Creek drainage received personnel assistance extensively on two bioengineered O&M treatments in 1996.

Specifically within the Umatilla River Basin there are several FWP funded projects that complement this project. Examples include:

- CTUIR Habitat Enhancement project (8710001), counterpart to the Umatilla Habitat Improvement Project (8710002) that addresses identical parameters on Tribal Land.

- CTUIR Natural Production Monitoring and Evaluation (9000501), Assesses natural fish production within the Umatilla River basin.

- CTUIR/ODFW Trap and Haul Program (8802200), addresses fish passage issues around Umatilla River water diversions and dams.

- Oregon Screens project (9306600) sponsored by ODFW installs fish screens to protect migrating salmonids from instream water diversions.

On a broader scale, there are several agencies and programs this project collaborates with. In addition to the projects listed above, the USDA Forest Service - Umatilla National Forest, along with the Bureau of Land Management, Baker District have many non-FWP funded habitat policies, programs, and projects (such as PACFISH) on federal lands within the basin.

The ODFW Fish Restoration and Enhancement Program has funded several riparian and instream enhancement cooperative projects in the region, focusing primarily on resident native fishes. The R&E program utilizes many of the techniques (i.e. leases, cooperative agreements, fence specifications, etc.) we have developed over the years from this project, including the sharing facilities and equipment occasionally to help them accomplish similar goals.

d. **Project history** (for ongoing projects)

The Umatilla Habitat Improvement project (Project 8710002) was initiated in 1987 and is comprised of numerous smaller projects that comprise portions of "key" anadromous tributaries of the Umatilla River subbasin. Individual projects are located exclusively on private lands, and have been implemented only in cases where long term riparian lease or cooperative agreements could be signed with landowners. The Oregon Department of Fish and Wildlife is implementing fish habitat improvement projects to help fulfill its mission statement: "To protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations".

Past Costs: This project has been in existence since 1987 (eleven years). Project budgets have ranged from a high of $592,540 in 1998 to a low of $124,168 in 1993 -- the year in which new project implementation with BPA funds ceased and the program took on a O&M and M&E mode of operation. Prior to FY 1993, the Umatilla program was 100% funded by BPA. In FY 1993, ODFW began supplementing BPA funds with outside funds (i.e. GWEB, R&E, TU, UPRR, FEMA, etc.) in order to continue some level of new project implementation and to address flood damages (five floods) that have arisen since a drought cycle ended during the early 1990's. The uncertainty of supplemental outside funding however has made it extremely difficult to plan and implement new projects within this program in an efficient manner.

Major Results Achieved: Habitat achievements to date using BPA funds include: 15.5 miles of riparian fencing, 11 miles of stream restoration with varying quantities of instream fish habitat structures, 20 livestock water gaps, 5 off-channel water developments, removal of two man-made fish passage barriers (flood irrigation dams) and modification of another, implementation of four bioengineered streambank restoration projects (one a model demonstration project), planting of tens-of-thousand native deciduous plants and shrubs in severely degraded areas where recovery of native vegetation was not occurring at an acceptable rate, and 280 acres of fenced riparian areas that are now lush with riparian vegetation and are inspected and treated for noxious weeds as needed.

We have objectively assessed each existing project based on their progress toward meeting our riparian restoration objective of "Restoring riparian vegetation species diversity and community structure so the positive interaction of the stream, riparian zone and floodplain perpetuate and maintain normative ecological and physical processes". Of the thirteen projects in the Birch Creek Watershed three are improving towards the objective, five are static and five are degrading. At the time of writing, the "degrading" and "static" projects are being retrofitted to better meet our riparian recovery objective. These projects are being plaaced into naturally stable channel forms through the use of soft engineering. See additional discussion in section a, and below under "adaptive management implications". Projects implemented within the Meacham creek drainage have been implemented in the upper water shed using predominantly passive restoration techniques in the from of livestock exclosure fencing. Some projects have received placements of large wood debris. All of the Meacham Creek Projects are improving towards meeting our riparian restoration objective.

The Umatilla Fish Habitat Enhancement program has benefited the primary target species (summer steelhead) in addition to other resident fish and wildlife in this basin by re-establishing key riparian habitat features inside the corridors that have been leased from private landowners. In addition, these projects have stabilized eroding streambanks, improved floodplain function, and have begun to provide overhead shading of the stream reaches that have been treated. For example: Our photopoint records today show cottonwood and willow trees up to 25 feet tall inside some of our leases, where our initial photopoints of these same areas show the absence of these species under pre-project/lease conditions. This is quite remarkable recovery when you consider our oldest projects are only ten years old.

Each project is designed or redesigned to restore degraded instream, riparian, and floodplain habitats in addition to fish passage improvement. All elements of these projects are beneficial to improving/increasing natural production of summer steelhead (our target species) and are also beneficial to other coldwater fish species such as chinook, coho, redband trout, bull trout, and margined sculpin that inhabit various portions of the Umatilla basin.

Adaptive Management Implications: At the onset of this program we operated on the premise that enhanced instream and riparian habitat will result in improved water quality and quantity, and therefore an increase in the carrying capacity for salmonid populations within the system will result. In addition, modification/removal of fish passage barriers will allow adult and juvenile salmonids better access to preferred habitat at critical times of the year and during critical life stages within the species lifecycle. A few of the things we have learned over the years that influence and enhanced our approach to stream restoration are:

- Upon initiation of the project a variety of riparian enhancement strategies were considered (such as intensive pasture management, total protection of riparian zones using exclosure fencing, intensive planting and/or installation of instream/streambank structures, etc.) Based on our experience over the last fourteen years (Projects 8402500 & 8402100, {eleven years for 8710002}) it seems clear that on Eastern Oregon streams, riparian exclusion, along with some limited instream work or planting, most often will achieve the quickest recovery with the least amount of cost and effort, and in most cases fits best with the most commonly used cattle management strategies where livestock grazing occurs. Our experience has also shown that different streams have shown different rates of recovery. Many factors such as stream order, landuse constraints, flood plain interventions, location of the stream, climate, elevation, geology, topography, soil profile, hydrograph, condition of the upper watershed, and past management practices to name a few, largely influence how quickly streams respond

to recovery. This depicts the likelihood for success on many projects. For example: high elevation sites typically require much longer recovery periods than lower elevation areas because of extreme climate changes and shorter growing seasons; and multiple landownerships within a relatively short stream reach can make for an almost impossible restoration project unless all landowners can agree to a single/holistic restoration plan.

- The use of active remediation techniques such as use of instream structures alone for improving habitat is variable and in order to be successful they must be installed to address specific limiting factors and be in harmony with the surrounding environment. In planning habitat improvement projects we have focused on achieving proper floodplain function first and foremost. Instream structures are installed only on a case by case basis where they address specific problems. Given a particular floodplain problem, there are a number of different approaches that may be utilized. We believe (in most situations) riparian fencing, planting, and using bioengineering techniques to solve streambank erosion problems will achieve better results than most traditional "hard" structural techniques such as channelization and rip-rap structures that are so commonly used by others, even yet today.
- We have used a wide variety of bioengineering and planting techniques since the program was initiated. For example, local and distant plant stocks, native and exotic plants, cuttings and rooted stocks have all been tried. Bioengineering and riparian planting success is largely dependent on donor plant selection and/or brood source. Our experience has shown that local indigenous stocks are most likely to succeed. Success is also increased when individual plants or species of plants are placed in areas where they would seed/root naturally; therefore site selection is critical. In addition, we have learned timing of, irrigation of the treatment sites, implementation of a noxious weed control program, and plant protection from animals for the first year or two after implementation will increase a projects chance for success immensely.
- As originally designed, riparian fences were thought to be relatively maintenance free. Our experience has shown that a successful program is dependent on a project design that includes consideration of geomorphology and hydraulics of the stream. Fences should be placed outside of the flood prone area and consider the stream channel meander. A modest yet continuous level of maintenance of the fence throughout the life of the project will ensure "best" overall success for the program.
- Fairly narrowly fenced riparian corridors and hard approaches to achieving stable streambanks were implemented on many projects on Birch Creek. In 1996, exacerbated by almost annual flow events (25-50 year flood recurrence interval in magnitude) eleven projects were in need of significant repairs. In an attempt to change our approach to better meet project objectives and reduce maintenance costs, an assessment of the Birch Creek watershed and 11 projects were assessed based on Rosgen (1996). We also developed site specific plans for returning the historically highly manipulated stream channels of Birch Creek and East Birch Creek into naturally stable forms as determined from reference reaches throughout the drainage (Rosgen 1996).
- In addition to focussing on reintroducing naturally stable channle formations, this project has re-focused its efforts to the development of wider riparian buffers, and installation of copious amounts of native vegetation (soil bioengineering techniques). Wide buffers will provide the stream a better opportunity to establish normative ecological and physical processes.

- Modification/removal of fish passage barriers allows adult and juvenile salmonids better "unimpeded" access to preferred habitat at critical times of the year and during critical life stages for the organism.

Reporting: Results such as those listed above are reported regularly in quarterly, annual, or special reports and distributed to interested parties.

e. Proposal objectives

The overall program goal is to increase natural production of wild anadromous salmonids in the Umatilla basin. Habitat restoration objectives include: 1) reduce sediment loading and summertime high water temperatures, 2) protect and enhance riparian/floodplain habitat, 3) restore proper stream functions, 4) improve instream habitat diversity, and 5) enhance salmonid access to preferred/historical habitat(s) (Reeve et al. 1988).

Objective 1: Restore riparian vegetation species diversity and community structure so the positive interaction of the stream, riparian zone and floodplain perpetuate and maintain normative ecological and physical processes.

Task 1a: Work cooperatively with two private landowners (Erwin and Brogiotti) to procure long term riparian lease agreements/conservation easements that protect habitat in the highest priority areas.

Task 1b: Walk streams to identify work areas, plan work, layout and mark specific sites where riparian fencing, offsite water developments and plantings will be implemented.

Task 1c: Conduct onsite activities on two projects (surveying, staking, etc.), prepare contracts, and obtain any permits needed to gain access and complete onsite work.

Task 1d: Construct 12 miles of livestock exclosure fences and associated stream crossings on streams impacted by grazing including: 10 miles of fence protecting 13 miles of stream and 4,700 acres within the subwatershed on the Westgate Canyon/Erwin project and 2 miles of fence protecting one mile of stream on the East Birch Creek/Brogiotti project.

Task 1e: Construct 4 off-site water developments to encourage livestock utilization of uplands and divert grazing pressure away from the streams and riparian areas.

Objective 2: Create naturally stable channels along stream reaches that have been destabilized by reach specific and watershed-wide impacts through the use of bioengineering techniques.

Task 2a: Work cooperatively with one private landowner (Brogiotti) to procure a long term riparian lease agreement that protect habitat in the highest priority areas.

Task 2b: Conduct reach assessments and project designs for proposed FY2001 projects.

Task 2c: Develop construction schedules, engineer project specifications, advertise for construction bids, select contractors and obtain permits for implementation activities.

Task 2d: Purchase construction materials and supplies necessary to construct planned habitat improvements.

Task 2e: Layout and mark specific work sites

Task 2f: Implement bioengineering techniques to create naturally stable channel forms on one mile of the East Birch Creek/Brogiotti property.

Objective 3: Insure maximum program benefits within leased areas by conducting operations and maintenance activities on all existing riparian exclosure fences, plantings and instream structures. These activities are conducted year around.

Task 3a: Inspect and maintain 16 miles of riparian fence which currently protects 11 miles of stream and 280 acres of riparian habitat. This includes 20 livestock watering gaps and 5 off-site water developments.

Task 3b: Inspect all leased areas for revegetation success. Plant native trees and shrubs (such as willow & cottonwood cuttings, conifers) where needed to reduce bank erosion, and to improve degraded overstory & understory components of riparian plant communities.

Task 3c: Inspect all leased areas for noxious weeds and work with county weed agencies to control listed species on 280 acres of leased habitat.

Task 3d: Inspect streambank stability and instream structures in 11 miles of stream and perform necessary maintenance on a case by case basis. Cost share these activities with FEMA funds when available.

Task 3e: Coordinate the above O&M activities with 26 landowners to insure project goals and landowner needs are both met, and with minimal disturbance to landowner operations.

Objective 4: Monitor and evaluate Umatilla Basin fish habitat enhancement projects to determine if project goals and objectives are being met. Prepare reports of the results, and apply adaptive management based the information gathered.

Task 4a: Annually take 65 photopoint pictures to visually document changes in vegetation and channel morphology attributable to habitat projects.

Task 4b: Continue year around monitoring of hourly stream temperatures at ten project sites, on 2 streams. Annually summarize and analyze the results of data collected from ten permanent thermographs.

Task 4c: Take 30 riparian habitat transects on Birch and Meacham creeks to assess stream channel and vegetative responses to habitat restoration projects.

Task 4d: Conduct biological surveys (spawning ground counts, fish population estimates, bird nesting) in selected study areas to determine if improvements in habitat result in increases in fish/wildlife populations.

Task 4e: Report the results of all project M&E activities in quarterly, annual and special reports. Distribute to ODFW fish districts, BPA, and other interested parties, and identify adaptive management implications.

Objective 5: Insure maximum communication, education and coordination of habitat enhancement activities by actively pursuing opportunities to work with, educate and learn from personnel involved with other agencies, organizations, and programs.

Task 5a: Work cooperatively with the Umatilla Basin Watershed Council and other local groups involved with stream habitat restoration to identify and prioritize projects and activities beneficial to the protection and restoration of basin watershed lands.

Task 5b: Coordinate field activities with other agencies, organizations, and programs to insure maximum technology transfer, program consistency and coordination of habitat enhancement efforts.

Task 5c: Answer correspondence, respond to information needs, and make presentations to other agencies, private organizations, school/youth groups and the news media.

Task 5d: Work cooperatively with private landowners to promote management activities that protect and restore instream and riparian habitat and watersheds on private lands. Update individual landowners of the progress of their projects using the information gathered in Objective 4 above.

The following administrative activities are inherent within each of the above project objectives.

- Coordinate project activities with ODFW fiscal, realty, regional and district staff; with the BPA contracting officer, and NPPC staff to insure that program operations are consistent with ODFW and BPA policies.

- Maintain habitat program databases, records and files.

- Hire, train and supervise the activities of project technicians.

- Prepare annual work statements and budgets; write quarterly, annual and other reports; write and administer contracts; and purchase necessary equipment, materials and supplies.

- Pursue cost share opportunities with other programs and agencies (model watershed, GWEB, ODFW Fish Restoration & Enhancement, FEMA, etc.) and private landowners. Track and administer additional funding.

f. Methods

The overall program objective is to increase natural production of "wild" anadromous salmonids by reducing sediment loading, improving water quality and quantity, and improving riparian habitat and instream habitat diversity.

Scope: This project addresses habitat degradation in the Umatilla River subbasin by:

1) Implementing projects through lease agreements with private landowners on selected streams;
2) Maintaining project investments over the terms and duration of the lease by providing project O&M;
3) Monitoring and evaluating the projects and applying adaptive management as

necessary; and
4) Coordinating with other agencies, Tribes, Umatilla Basin Watershed Council, Volunteer organizations, school/youth groups, etc.

Critical Assumptions: Overgrazing of riparian areas, timber harvest, road construction along streams and other management practices has led to habitat degradation in the basin. Encouraging recovery of riparian vegetation, improving streambank stability and instream habitat diversity will result in an overall increase in water quality and quantity. As a result, these habitat improvements will increase salmonid production.

Specific Tasks: In FY 2000 we will continue working cooperatively with landowners to protect riparian and instream habitat on selected streams. This will be accomplished through lease or cooperative agreements that restrict human use (i.e. eliminates grazing, road construction, timber harvest, errant lawn mowing, mining, burning, etc.). We expect to begin implementing new projects in FY 2000 at the rate of 2-3 new leases annually. Fish access to preferred habitat will be improved or modified by removing fish passage barriers where applicable.

Control of livestock utilization within riparian areas will be done through:

- fencing riparian areas (where appropriate) to exclude grazing; and
- developing off-site/channel water sources to encourage livestock to focus their attention away from streams and to eliminate high maintenance watergaps.

Degraded riparian areas will be revegetated (if necessary) by:

- planting native shrubs and trees;
- seeding grasses and legumes; and
- controlling noxious weeds.

Streambank stability and instream habitat diversity will be improved (if necessary) on a site-specific basis by:

- using bioengineering techniques to create naturally stable channel forms;
- installing large wood and/or boulders in stream channels to increase habitat diversity;
- installing other site-specific instream structures or modifications of existing site conditions to address factors limiting salmonid production or floodplain function.
- creating naturally stable channels where anthropogenic impacts have resulted in unstable channel forms (Rosgen 1996).

In order to protect program investments, inspections and maintenance will be completed at least once annually on the following:

- 16 miles of riparian fencing, 11 miles of stream restoration with varying quantities of instream fish habitat structures, 20 livestock water gaps, 5 off-channel water developments, four bioengineered streambank restoration projects, and 280 acres of fenced riparian areas treated for noxious weeds as needed. *(Note: it may be determined that some instream structures should <u>not</u> be maintained if they are not achieving desired results)* Coordinate frequently with individual landowners and other stakeholders. Additional maintenance will occur following any catastrophic

natural events (e.g. floods, wind storms, ice flows etc.).

New Implementation for FY 2000

In FY2000 we propose to implement two new projects, one will be an expansion of an existing project on Westgate Canyon Creek (East Birch Creek tributary) and the other will involve fencing and stable channel design on approximately 1 mile of East Birch Creek (Rosgen 1996). Target species for both projects are summer steelhead and redband trout.

Westgate Canyon Project: The existing Westgate Canyon project includes about one-half mile of Westgate Canyon and one-quarter mile of East Birch Creek. In 1988 a cooperative lease was signed with the landowner and the project reach was fenced to exclude livestock. Since the initial treatment the reach has been impacted by excessive logging and recurrent flood events. In 1998 the reach was treated to recreate a stable channel situation to allow riparian and instream recovery. The target species for this project is summer steelhead. Limiting factors addressed by this project include poor riparian vegetation and lack of instream habitat diversity.

The 4,700 acre property that is encompassed by this project has a new owner. The new owner (Erwin) would like to exclude all livestock grazing from the property. We believe exclusion of livestock from this block of land will provide significant benefits to fish habitat on streams within the property and provide for improved function of the East Birch Creek Watershed. Following is our rationale for this presumption:

- This property encompasses 4.75 miles of fish bearing streams and 8.25 miles of influential non-fish-bearing streams. Fish bearing stream segments include East Birch Creek, Westgate Canyon and South Canyon. It is an important spawning and rearing stream for summer steelhead and redband trout.

- Westgate canyon is an important supplier of cool water to the East Birch Creek drainage. Thermographs placed throughout the watershed document this.

- Removal of grazing from the Westgate canyon drainage will allow uplands, floodplains and riparian zones to recover from years of use. This will allow the recovery of natural hydrologic and geomorphic processes to recover.

- Removal of livestock grazing will allow reforestation efforts now underway on the property to progress without being set back by domestic livestock grazing. Regrowth of timber harvested lands will allow the recovery of natural hydrologic and geomorphic processes.

- Typical forestland management activities such as road maintenance and vegetation control will be controlled through the conservation easement. This will also lead to recovery of natural hydrologic and geomorphic processes.

- Westgate Canyon is the uppermost significant tributary of East Birch Creek and the second largest tributary overall. Upper basin problems including excessive timber harvest and grazing are partly responsible for the unstable conditions downstream in East Birch and Birch Creeks where we have had to recreate stable channel forms (ATEC 1998). Positive improvements to the Westgate Canyon subwatershed will concomitantly lead to improved physical and biological conditions downstream.

- In recent times the need for ridge top to ridge top management to realize improvements in watershed conditions has been recognized (Anderson et al. 1992; CBFWA 1997; NMFS 1997; Frissell 1997). Through this project we propose to implement this type of strategy.

In order to accomplish this, we propose to cooperatively build and maintain a fence around the perimeter of the property to keep off neighboring cattle. The landowner will survey the fence line and construct approximately five miles of boundary fence, and ODFW will construct 10 miles. We will use significant cost shares to construct the fence. A long term conservation easement will be developed and conditions will include total exclusion of livestock and general land management restrictions. The existing corridor fence along three fourths of a mile of stream would be removed.

East Birch Creek Project: On this project we propose to create an naturally stable channel form through the implementation of soft engineering techniques and construct a riparian exclosure fence along one mile of East Birch Creek. Through the implementation of this project we will address the following limiting factors: high summer water temperatures, poor riparian vegetation, and poor instream habitat diversity. Following are the rationale supporting implementation of this project:

- This project abuts an existing project on the Houser property. Combined the two projects will encompass approximately 2.5 contiguous miles of East Birch Creek.
- This project lies within important spawning and rearing habitat for summer steelhead and redband trout. The Birch Creek watershed supports 30 percent of the summer steelhead production in the Umatilla Basin.
- Control of livestock grazing in riparian zones is a necessary element of restoring riparian vegetation communities where grazing is a practice.
- Past experience of implementing projects in the Birch Creek watershed has shown that unstable channel situations must be addressed in order to achieve long-term riparian recovery.

A complete assessment using Rosgen (1996) methodologies will be completed and a stable channel designed based on this assessment. Bioengineering methods using installation of native vegetation will be used. Where necessary meander will be reintroduced in channellized areas to create stable channel forms. The project approach will be similar to those we are currently successfully implementing in the watershed.

Monitoring and Evaluation: There are several ways in which individual projects are monitored and data evaluated. The Umatilla Fish Habitat Enhancement Project has been monitoring the following throughout the duration of the projects:

- Stream Temperatures: Ten permanent thermographs have been installed at the upper and lower ends of selected project reaches to measure long term changes in stream temperatures. These thermographs record water and in some cases air temperatures on an hourly basis, 24 hours/day, year around. Other thermographs have been deployed in other specific stream reaches to record summer temperatures only.

- Habitat Monitoring Transects: These transect studies measure specific physical and biological characteristics (i.e. channel substrate, channel width, bank height, flow features, ground cover type, stream shading, etc.) in selected study areas. They are designed to measure long term changes in riparian vegetation density/growth and stream channel morphology. Approximately 35 habitat monitoring transects remain in our program (several were lost over

the past few years as a result of channel migration during severe flooding). Following establishment of these transects and the initial data collection (baseline measurements have been achieved) measurements are retaken at 3 to 5 year intervals.

- Photopoints: Due to the size and complexity of the overall habitat program, the easiest and least costly way to monitor results from individual projects is through photographic documentation. The purpose of these photographs is to show changes in riparian vegetation (such as increased canopy and shading, improved bank stability, etc.), and changes in stream channel morphology (such as narrowing and deepening of the channel). Several photopoints are established on each individual project prior to implementation. Pictures are then retaken (annually) during the fall from most of these sites. In the Umatilla Habitat Improvement Program there have been 65 photopoints established on our projects. "Before/After" photographs and slides are used for presentations, educational tools, and are provided to the respective landowners to demonstrate project benefits that have transpired from implementation of the project.

- Other Biological Surveys: On selected streams--salmon or steelhead spawning ground counts, presence absence surveys, and Physical/Biological stream habitat surveys are conducted when time and stream conditions permit.

The results of all monitoring efforts have been included in quarterly, annual and/or other special reports, and are shared with other agencies or interested parties. In addition, other information frequently used/collected by this or other programs include: adult salmonid redd counts conducted throughout the basin, physical stream habitat surveys, aerial photographs, and research information on salmonid life histories. This information is available from respective ODFW fish districts, research groups, and other agencies or programs.

Expected Results: This project ensures that streams and associated native plant communities are allowed to evolve through natural stages of succession. Important riparian plant communities such as cottonwood and aspen groves are protected from harvest or other human related damage. In general, near term changes (1-5 years) in the affected streams include:

- increases in sedges, grasses, forbs and shrubs; narrowing and deepening of the stream channel; and improved overall habitat diversity.
- Long term changes (> 5 years) include: increased shading from development of tree canopy overstory, reduced summer temperatures; increased summer flows; reduced sedimentation; less bank erosion; increased instream and riparian habitat diversity; and reduced winter icing.

Eventually, these changes will lead to a climax plant community characterized by an overstory of deciduous hardwood tree species and/or conifers, accompanied with a functional mid- and understory plant/shrub community. Increases in large woody debris input and associated pool habitat will occur naturally as late succession/climax plant communities develop.

Improvement of the quantity and quality of spawning and rearing habitat for spring/summer chinook, summer steelhead and resident fishes such as bull trout and redband trout will result from this passive regeneration approach (NFMS, 1997), and increases in natural fish production should occur. We believe this project will also provide multiple wildlife benefits, since approximately 75-80% of all wildlife species utilize riparian habitats for at least some portion(s) of their life cycle. There are many benefits to participating landowners as well (i.e. reduced soil loss, improved water quality/property aesthetics, increased property value(s), and better

pasture/livestock management).

Risks: Factors that may limit success of this project include: catastrophic natural events (i.e. floods, fires), changes in upslope management practices and/or changes in land use laws, and continued mainstem fish passage problems. However, regardless of the outcome of targeted species, we expect that project outcomes will be generally beneficial to all other stream and riparian dependent native species.

g. Facilities and equipment

Umatilla Fish Habitat Improvement project personnel are stationed at the ODFW Pendleton District office in Pendleton, Oregon. Facilities include an office, office equipment (phones, fax, copier, desktop/laptop computer, Internet access, slide projector, overhead, VCR, etc.), and limited storage areas for materials and equipment. The district office also has a combination wood and metal shop that is accessible to the project.

Two vehicles (4x4 pick-ups) are leased from the state motor pool. Utility or heavy equipment owned by the project include: a caterpillar 416 backhoe, hydraulic fence post driver, and one 2-wd ATV. Occasionally this project has access to two 2.5 ton trucks, two JD farm tractors with cultivation implements, a D-4 cat, and a 5yd dump truck located at our Regional office in LaGrande OR. (60 miles away).

Field equipment owned by this project includes: specialized fence construction tools, (wire stretchers, spoolers, chainsaws, etc.); instream work tools (rock drills, cable cutters, glue guns, etc.); planting augers/stingers; pick-up racks, bumper winches, and tool boxes, cameras; survey equipment (autolevel, stadia rod, tapes, compasses, survey vests, handheld radios; and ten permanent stream temperature monitoring thermographs.

h. Budget

Personnel

This project has been criticized recently for the high costs associated with operations and maintenance. It should be clearly understood by the reviewers that the current format of the project was a requirement by BPA when the project was established. It was believed at the time that securing 15 year lease agreements controlling management activities within the riparian corridor and by providing most of the maintenance support of the improvements installed would be the most effective means of achieving improvements to fish habitat. This project currently holds 30 lease agreements of which ODFW, with BPA funding, will be responsible for most project maintenance. Failure to meet the obligations of these lease agreements would result in alienation of landowners that would quickly be communicated throughout the region. ODFW believes that it has an obligation to fulfill the terms of the lease agreements until they expire. Not only do we believe we have this obligation, but after developing projects with 93 landowners in northeastern Oregon we believe that the project format as originally developed has been an effective approach.

As the program matures landowners have observed the benefits of the completed projects, have become more responsive toward developing cooperative projects, and have shown greater interest in taking on the maintenance responsibilities of the project. Cooperation is the key to making

significant habitat improvements on private lands. We are making constant progress in gaining increased landowner buy-in to our projects.

As a program we have observed many projects that have turned all the maintenance responsibilities to the landowner severely fail. Generally landowners enter into such a maintenance agreement with good intentions. However, the landowners highest priority is to make a living. When choices have to be made the landowners operations take priority over that of the habitat project. A frequent result is that the habitat project (fences in particular) are not adequately maintained and the project fails. ODFW's top priority is improvement of fish habitat. We feel that the methodology of implementing the projects that we have used has been effective as cooperation gains momentum. We are now getting more commitment from landowners to do project maintenance. We will continue to seek increased commitment from landowners at a level "the market will bear".

We commend project implementers who develop successful projects in which all maintenance is handled by the landowner. However, with the clientele in the geographic areas that we work, such a situation is the exception rather than the rule. In order to make significant habitat improvements that lead to increased production we need to treat relatively large portions of habitat.

We have investigated other ways of maintaining and implementing projects and find the current staffing the most effective. We have tried subcontracting fence maintenance and found it to be an ineffective method. We currently have project staff build short reaches of fence because we can do them for a better cost, but we contract out most fence construction because on a larger scale contractors can do the job for less considering that we would have to hire more staff to complete all project tasks.

We have refined designs of riparian exclosure fence over the past thirteen years and have a good understanding of how to fit different designs/styles into the most appropriate situations (geography, substrate, livestock characteristics, wildlife usage and landowner needs). High-tensile smooth wire fence is the style most commonly used, but barbed wire is also used in certain situations.

Fringe Benefits

Same as FY1999.

Supplies, materials, non-expendable property

Supplies include material for twelve miles of fence, materials needed for the bioengineering work (plant materials, large wood, coir fabric, rock) and the installation of four solar powered off-site watering to reduce costs associated with maitaining stream watering sites for livestock. A heavy equipment trailer (to haul the projects backhoe) and utility trailer (for hauling fence materials, etc.) are included as capital items. Other costs are associated with maintaining existing fences and office equipment/supplies. There is no charge for office space.

Operations and maintenance

See discussion above

Travel

Travel includes vehicle mileage costs and perdiem for traveling to training activities.

Indirect Cost

The indirect rate increased in 1998 from 22.9 to 35.5. The rate increase reflects increased costs to administer the departments programs.

Subcontracts

Subcontract costs include bioenginerring work, construction of riparian fence and weed control. These cost estimates are based on eleven years of implementing such work.

Section 9. Key personnel

SUMMARY OF KEY PERSONNEL:

NAME	TITLE	FTE/Hours
Troy Laws	Fisheries Habitat Biologist	Permanent, Full time
Temporarily Vacant	Fish Habitat Technician	Permanent, Full time
Mike Montgomery	Experimental Biology Aid	Seasonal, 12 months
Tim Bailey	Regional Program Coordinator (Acting)	Permanent, 2 months

Troy S. Laws
P.O. Box 711
Despain Gulch Rd.
Pendleton, OR 97801
home (541) 276-9028
work (541) 276-2344

EDUCATION Bachelor of Science in Fisheries, 1986
Oregon State University, Corvallis, OR 97424

PROFESSIONAL EXPERIENCE

1993 to Present Fisheries Habitat Biologist, Umatilla River Basin
Oregon Department of Fish and Wildlife, Pendleton, OR 97801

Project Leader for the Umatilla Fish Habitat Enhancement Project. Management responsibilities include: planning, design, implementation, maintenance, and monitoring of 28 fish habitat projects on private lands in the Umatilla River Basin. Specific duties include: working with private landowners to develop and implement fish habitat enhancement projects in anadromous fish streams; conduct stream habitat inventories; prepare riparian easements or leases and construction contracts for fish habitat projects; develop biological and physical monitoring and evaluation plans; provide program oversight and direction for collection, analysis and interpretation of data; inspect and assess project maintenance needs; provide technical assistance, make presentations and coordinate with various public agencies, private landowners and tribal agencies; prepare reports on program activities; develop and track program budgeting; and provide supervision of one permanent technician, one to three seasonal employee(s), and numerous volunteers.

1992 to 1993 **Assistant Fish Biologist**, Prineville (Ochoco) Fish District
Oregon Department of Fish and Wildlife, Prineville, OR 97754

Management responsibilities included: planning and conducting physical and biological surveys of various fish species and other aquatic organisms to estimate population trends, species composition and distribution, sex and age, production and mortality and other factors; planning and conducting fish habitat enhancement projects; conducting periodic creel census; reviewing and commenting on land-use activities (including BLM range allotment plans) proposed by federal, state, county, city and private entities that may affect fish populations and their habitat; preparing monthly and special reports; and answering public requests for information including oral presentations at clubs, schools, civic groups and public meetings.

1987 to 1992 **Experimental Biological Aid**, Various Fish District, Fish Research, STEP, Fish Screening, and Fish Liberation Programs. Oregon Department of Fish and Wildlife, Southwest Region

Major responsibilities included: planning and conducting physical and biological surveys of various fish species and other aquatic organisms to estimate population trends, species composition and distribution, sex and age, production/mortality and other factors; planning and conducting fish habitat enhancement projects; conducting periodic creel census; angler pressure counts; heavy equipment operation; fish screens construction and maintenance; fish passage improvement projects; adult fish broodstock collection projects; dam pre-impoundment studies; fish liberation activities; fish habitat enhancement projects; volunteer programs; public education and outreach activities; spawning surveys; pre-spawning mortality surveys; salmon carcass counts; fish disease studies; fish passage studies; employee/volunteer training; and report writing.

1987 **U.S Foreign Fishery Observer**, Atlantic and Pacific Oceans.
Oregon State University, Corvallis OR, 97424
Contracted to the U.S. National Marine Fisheries Service, East and West Coast

Compliance Inspector on board foreign fishing ships at sea for adherence to U.S. fisheries regulations; collected biological data from target and non-target fish species; summarized data; and wrote trip reports at the end of each deployment.

1986 **Experimental Biological Aid**, Rogue Seining Project (Fish Research)
Oregon Department of Fish and Wildlife, Gold Beach, OR 97444

Collected biological data from adult salmonids returning to the lower Rogue River and from juvenile salmonid populations in other South Coast District streams; assisted with the planning and supervision of Salmon and Trout Enhancement Program (STEP) projects; summarized data; wrote monthly reports; trained project crew members and volunteers; maintained, purchased, and constructed project equipment.

1978 to 1986 **Construction** (heavy equipment and building**), Farming** (livestock and hay production), **Commercial Fishing** (ocean salmon trolling and buyer/processing), **Commercial Wood Cutting**, **Auto Mechanics/Maintenance**, **Grounds Maintenance**, and **Native Plants Nursery**. Various locations (Private Enterprise) North Oregon Coast and Eastern Oregon.

SKILLS/INTERESTS:

Member: American Fisheries Society & Trout Unlimited. Enjoy: Salmon - Steelhead Angling, Hunting and River Boating. Certified in CPR, First Aid and Hazmat Response. Specialized Training in Bioengineering and Fish Habitat Restoration Techniques.

Mike Montgomery
1306 SW Third Place
Pendleton, OR. 97801
(541) 443-2256

EDUCATION Associate of Arts in Biology, 1994
Blue Mountain Community College, Pendleton, OR 97801

PROFESSIONAL EXPERIENCE

1997 to Present Experimental Biology Aid, Umatilla River Basin
Oregon Department of Fish and Wildlife, Pendleton, OR 97801

Duties: Assist program biologist and technician with technical aspects of project administration by: maintaining fish habitat leases (riparian fences, watergaps, water developments, plantings, fish habitat structures, etc.) and program equipment; monitoring and collecting biological and physical stream data; purchasing field supplies; conducting inventories; and assisting with public education and outreach.

1995 to 1997 Livestock Manager, JV Ranch,
Monument, OR. 97801

Self employed cattle rancher in charge of all aspects of maintenance and operation of ranch and associated equipment.

1994 to 1995 Experimental Biology Aid, Umatilla Fish Habitat Program.
Oregon Department of Fish and Wildlife, Northeast Region

Duties: Assist program biologist with technical aspects of project administration by: maintaining fish habitat leases (riparian fences, watergaps, water developments, plantings, fish habitat structures, etc.) and program equipment; monitoring and collecting biological and physical stream data; purchasing field supplies; conducting inventories; and assisting with public education and outreach.

1993 to 1994 Experimental Biology Aid, Pendleton District Office.
Oregon Department of Fish and Wildlife, Northeast Region

Duties: Conducted Aquatic Inventory of East Birch Creek, a tributary of the Umatilla River. Included identifying all aspects of the habitat and a population survey of the fish species present using electro fishing techniques.

1987 to 1992 Timber Faller, Jim Angel Contracting.
Pendleton Oregon

Duties: Falling and bucking timber on steep, rugged terrain in all types of weather and driving long distances on a daily basis under all types of road conditions. Required accurate measurements and species identification of trees.

SKILLS/INTERESTS: Heavy Equipment Operation including a Cat and Backhoe, Carpentry skills including use of hand and power tools. Interests include Fishing and hunting.

Timothy D. Bailey
44986 Llama Lane
Pendleton, Oregon 97801
home (541) 278-1949
work (541) 276-2344

EDUCATION Bachelor of Science in Fisheries Science, 1986
Oregon State University, Corvallis, Oregon

PROFESSIONAL EXPERIENCE

July 1998 to Present **Acting Fish Habitat Program Leader**
Oregon Department of Fish & Wildlife, Pendleton, Oregon, 97801

Oversee the implementation of FWP funded anadromous fish habitat improvement projects in northeastern Oregon including the John Day, Grande Ronde and Umatilla subbasins. Also oversee FWP funded ODFW involvement in the Umatilla Fish Passage Operations Project. Specific duties include: tracking project expenditures; developing FWP project funding proposals; developing annual budgets and work statements; reviewing/approving proposed projects and landowner agreements; liaison with BPA COTR's; providing direction on overall program activities; and supervising four biologists, three technicians and three to seven seasonal employees. In addition, continue to accomplish some fish district activities as described below.

1993 to 1998 **District Fish Biologist**
Oregon Department of Fish & Wildlife, Pendleton, Oregon, 97801

District Fish Biologist for the Umatilla Fish District. Responsible for the management of fish resources in the Umatilla, Walla Walla (Oregon portion) and Willow Creek basins. Specific duties included: planning, implementing, and analysis of the inventory and census of fish populations and their habitats in standing and flowing waters; setting angling regulations to maximize recreational fisheries and conservation of wild fish populations; reviewing land use activities such as logging activities, water usage, stream alterations, pollution discharges into waterways and provide comments to the regulating agencies; develop and implement hatchery programs to bolster harvest opportunities and supplement natural production; develop various basin and waterbody fisheries management plans; review and comment on activities that occur on public lands (USFS, BLM, etc.); make presentations to the public and constituent groups regarding fish management activities; manage fisheries resources cooperatively with tribal co-managers; prepare reports on district activities; oversee/coordinate with programs operating in the district such as fish habitat improvement, passage operations, etc.; coordinate/educate local interests such as SWCD's, watershed councils and user groups on department/district activities; develop plans for and oversee the protection and enhancement of fish habitat; and provide supervision of two biologists.

1989 to 1993 **Fish Habitat Biologist**
Oregon Department of Fish & Wildlife, Pendleton, Oregon 97801

Project Leader for the Umatilla Basin Fish Habitat Enhancement Project. Management responsibilities included implementation, monitoring, and maintenance of individual fish habitat projects on private lands in Umatilla Basin streams. Specific duties included: working with private landowners to develop and implement fish habitat projects in anadromous fish bearing streams; conducting stream habitat inventories; preparing riparian easements or leases and construction contracts for fish habitat projects; develop biological and physical monitoring and evaluation plans; provide program oversight and direction for collection, analysis and interpretation of data; inspect and assess project maintenance needs; provide technical assistance, make presentations and coordinate with various public agencies, private landowners and tribal agencies; prepare reports on program activities; develop and track program budgeting; and provide supervision of one permanent technician and one to two seasonal personnel.

1988 to 1989 **Fish Habitat Technician 2**
Oregon Department of Fish & Wildlife, La Grande and Pendleton, Oregon

Responsibilities as Fish Habitat Technician 2 were to implement, monitor, and evaluate fish habitat projects in the Grande Ronde and Umatilla river basins. Typical duties included: supervise and conduct the design and layout of instream fish habitat work and riparian fences; conduct biological and physical monitoring of fish habitat projects such as fish population surveys, stream habitat surveys, taking photopoints, collecting riparian and stream habitat transect data, monitor stream temperatures using thermographs; maintaining fish habitat instream structures and riparian fences; preparing reports, data summaries and tracking program expenditures; purchase and maintain equipment and supplies; and supervise one to two seasonal employees.

1986 to 1988 **Experimental Biology Aid**
Oregon Department of Fish & Wildlife, Various positions in LaGrande and Florence

Conducted spawning ground surveys of fall chinook and coho salmon on the central Oregon Coast for two seasons. Identified and counted chinook and coho salmon, collected scale samples from carcasses, measured carcasses and counted redds. Recorded and compiled data.
Worked in La Grande for the Grande Ronde Basin Anadromous Fish Habitat Enhancement Project for two summers. Completed fish habitat stream inventories and summarized data. Assisted with the construction of instream fish habitat structures. Supervises a crew constructing instream structures. Develop project maps from aerial photographs. Repaired and maintained vehicles and equipment.
Worked for the Lower Snake River Compensation Plan Monitoring and Evaluation Project in La Grande. Conducted summer steelhead creel census on the Wallowa and Imnaha rivers and assisted with pre-release sampling of juvenile spring chinook and summer steelhead. Entered spawning and liberation data onto computer files.

1986 **Fisheries Technician**
Parametrix, Inc., Bellevue, WA

Operated hydroacoustic sonar equipment used to monitor downstream smolt passage at Snake River hydroelectric dams. Duties included identifying fish traces on chart recorders, gathering and recording flow data, entering data into microcomputers, and deployment of hydroacoustic equipment.

SKILLS/INTERESTS:

Trained in hazmat response and natural resource damage assessment. Specialized training in fish habitat enhancement techniques and bioengineering. Interests include family, bowhunting with traditional equipment, angling and general outdoor recreation.

Section 10. Information/technology transfer

The success of the project depends upon forming cooperative agreements between private landowners and other entities. Interagency cooperation and education will continue to be a vital component of this project.

The closely tied Umatilla, Grande Ronde, and John Day habitat enhancement projects regularly share information, new techniques, and data summaries (such as stream temperatures, fish or habitat surveys) are distributed to a large number of individuals and agencies including private landowners, ODEQ, ODSL, USFS, BLM, Tribes, and local watershed councils. Ongoing cooperation and technology transfer regularly occurs between these groups.

Efforts to educate private landowners and the public include:

- Signing is placed in visible locations at all projects, identifying them as cooperative habitat restoration efforts between federal/state agencies and private landowners.

- News articles specifically on this project are written in local newspapers, internal/external agency news letters, etc. periodically.

- Photopoint pictures and/or slides illustrating benefits of these restoration projects are displayed to the public regularly, such as at county fair exhibits, local school groups, bird clubs, forestry associations, elected officials, and other groups.

- Watershed or riparian restoration workshops are regularly attended by project personnel. This program sponsored a Bioengineering Workshop in 1995 and displayed/presented a Bioengineering display at the ODFW Oregon State Fair Display in 1997. In addition, we have produced two instructional videos on Bioengineering techniques. All of which have been incorporated into our on the ground projects.

Methods used in this project (i.e. fence specifications, lease or cooperative agreement text, bioengineering design typicals, etc.) have been applied on closely related ODFW Fish Restoration & Enhancement projects to benefit resident fishes (redband trout and bulltrout). Our methodology has also been utilized by many other agencies or groups. For example we are

frequently asked to give demonstrations on planting techniques, streambank treatments, Bioengineering do's and don'ts, etc. Finally, ODFW region and district offices display several project-related riparian restoration and fisheries brochures that are readily available to the public.

Congratulations!