
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Umatilla Hatchery Operation And Maintenance

BPA project number: 8903500

Contract renewal date (mm/yyyy): 10/1999 **Multiple actions?**

Business name of agency, institution or organization requesting funding

Oregon Department of Fish and Wildlife

Business acronym (if appropriate) ODFW

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NPPC Program Measure Number(s) which this project addresses

7.2.D.3 and 7.4I

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

Umatilla Hatchery operation is addressed by the NMFS Biological Opinion for 1995-98 Hatchery Operations in the Columbia River Basin, Endangered Species Act Section 7 consultation.

Other planning document references

Wy-Kan-Ush-Me-Wa-Kush-Wit, vol.II.; The Umatilla Hatchery Master Plan (ODFW and CTUIR, 1990); The Umatilla River Subbasin Salmon and Steelhead Plan (ODFW and CTUIR, 1989); and The Umatilla Basin Project-Initial Project Work plan (USBR and BPA 1989).

Short description

Restore Umatilla River Chinook and steelhead fisheries and populations through release of subyearling and yearling smolts produced at Umatilla Hatchery

Target species

Spring Chinook, fall Chinook and 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
<input checked="" type="checkbox"/> Anadromous fish <input type="checkbox"/> Resident fish <input type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Multi-year (milestone-based evaluation) <input type="checkbox"/> Watershed project evaluation	<input type="checkbox"/> Watershed councils/model watersheds <input type="checkbox"/> Information dissemination <input checked="" type="checkbox"/> Operation & maintenance <input type="checkbox"/> New construction <input type="checkbox"/> Research & monitoring <input type="checkbox"/> Implementation & management <input type="checkbox"/> Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

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

Project #	Project title/description
20516	Umatilla Subbasin Umbrella
8903500	Umatilla Hatchery Operation and Maintenance (this proposal)
8343500	Operate and Maintain Umatilla Hatchery Satellite Facilities
8902401	Evaluate Juvenile Salmonid Outmigration and Survival in the Umatilla River.
9000500	Umatilla Hatchery Monitoring and Evaluation
9000501	Umatilla and Walla Walla Basin Natural Production M&E Project.
8802200	Trap and Haul in the Umatilla and Walla Walla Basins

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?
1991	First year of operation	Yes
1992	Released 2.68M subyearling fall Chinook, 267k fry and 1.06 subyearling spring Chinook, and 204k smolt summer steelhead	Yes, production less than anticipated due to lower than projected well supply, in-hatchery survival above projected, comprehensive smolt-to-adult survival unavailable at this time
1993	Released 2.66M subyearling fall Chinook, 1.13 subyearling and 208k smolt spring Chinook, and 159k smolt summer steelhead	same
1994	Released 2.85M subyearling fall Chinook, 840k subyearling and 594k smolt spring Chinook, and 156k smolt summer steelhead	same
1995	Released 2.47M subyearling fall Chinook, 277k smolt spring Chinook, and 148k smolt summer	same

	steelhead	
1996	Released 2.97M subyearling and 144k smolt fall Chinook, 381k smolt spring Chinook, and 149k smolt summer steelhead	same
1997	Released 2.83M subyearling and 260k smolt fall Chinook, 227k smolt spring Chinook, and 140k summer steelhead	same
1998	Released 2.78 subyearling fall Chinook, 383 smolt spring Chinook, and 138k smolt summer steelhead	same

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Coordinate Umatilla Hatchery operations with co-managers	a	Develop Annual Operating Plan (AOP) directing Umatilla Hatchery operation and co-manager activities
		b	Participate in periodic Umatilla Hatchery operations reviews, Umatilla Research reviews and quarterly basin oversight meetings with co-managers to coordinate activities.
2	Produce 150k smolt Umatilla stock summer steelhead	a	Collect broodstock at Three Mile and transport to holding area
		b	Spawn at holding area and transport eggs to Umatilla Hatchery for incubation
		c	Trough and pond fry and juvenile per production schedule
		d	Fin clip and CWT
		e	Transport to acclimation facilities for release
		f	Perform fish health (i.e. inspection, treatment, etc.), culture (i.e. feeding, pond cleaning, etc.) and facility maintenance on a scheduled and as needed basis.
3	Produce 360k smolt spring Chinook	a	Collect broodstock at Three Mile and transport to holding area
		b	Spawn at holding area and transport eggs to Umatilla Hatchery for incubation
		c	Trough and pond fry and juvenile per production schedule
		d	Fin clip and CWT
		e	Transport to acclimation facilities for release
		f	Perform fish health (i.e. inspection, treatment, etc.), culture (i.e. feeding, pond cleaning, etc.) and facility maintenance on a scheduled and as needed basis.
4	Produce 2.68M subyearling fall Chinook	a	Collect broodstock and hold at remote sites
		b	Spawn at holding area and transport eggs to Umatilla Hatchery for incubation
		c	Trough and pond fry and juvenile per production schedule

		d	Fin clip and CWT
		e	Transport to acclimation facilities for release
		f	Perform fish health (i.e. inspection, treatment, etc.), culture (i.e. feeding, pond cleaning, etc.) and facility maintenance on a scheduled and as needed basis.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	10/1999	9/2000	N/A	AOP development	10.00%
2	10/1999	9/2000	Produce 150k smolt Umatilla stock summer steelhead	Release of acclimated smolts	22.00%
3	10/1999	9/2000	Produce 360k smolt spring Chinook	Release of acclimated smolts	36.00%
4	10/1999	9/2000	Produce 2.68M subyearling fall Chinook	Release of acclimated subyearlings	32.00%
				Total	100.00%

Schedule constraints

Umatilla Hatchery is operated below design capacity because its wells do not reach design volume. Current production goals reflect these constraints. It is unclear when or if this constraint can be resolved.

Completion date

Ongoing

Section 5. Budget

FY99 project budget (BPA obligated): \$797,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	Salaries	%29	263,260
Fringe benefits	OPE @ 36% permanent, 45% Seasonal	%11	100,038
Supplies, materials, non-expendable property		%8	72,405
Operations & maintenance		%25	223,743
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		%3	27,500
NEPA costs		%0	0
Construction-related support		%0	0
PIT tags	# of tags:	%0	0
Travel		%0	0
Indirect costs	@ 35.5%	%23	208,400
Subcontractor		%0	0
Other		%0	0

TOTAL BPA FY2000 BUDGET REQUEST	\$895,346
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Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
		%0	
		%0	
		%0	
		%0	
Total project cost (including BPA portion)			\$895,346

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$881,562	\$917,559	\$944,335	\$971,915

Section 6. References

Watershed?	Reference
<input checked="" type="checkbox"/>	Boyce, R.R. 1986. A Comprehensive plan for rehabilitation of anadromous fish stocks in the Umatilla River Basin. Report DOE/BP-18008-1, BPA, Portland, Oregon.
<input type="checkbox"/>	Carmichael, R.W. In press. Straying of Umatilla River hatchery origin fall chinook salmon into the Snake River. In Genetic effects of Straying of Non-Native Hatchery Fish into Natural Populations (R.S. Waples, convenor). National Oceanic and Atmospheri
<input type="checkbox"/>	Contor, C.R., E. Hoverson, and P. Kissner. 1995. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1993-1994 sent to BPA, Portland Oregon.
<input type="checkbox"/>	Contor, C.R., E. Hoverson, and P. Kissner. 1996. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1994-1995 sent to BPA, Portland Oregon.
<input type="checkbox"/>	Contor, C.R., E. Hoverson, and P. Kissner. 1997. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1995-1996 sent to BPA, Portland Oregon.
<input checked="" type="checkbox"/>	CRITFC, 1996, WY-KAN-USH-MI-WA- KISH-WIT. The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakima Tribes. Portland, Oregon.
<input checked="" type="checkbox"/>	CTUIR & ODFW 1989. Umatilla Hatchery Master Plan. Prepared for the NPPC, Portland, Oregon.
<input checked="" type="checkbox"/>	CTUIR & ODFW 1990. Umatilla River Subbasin – Salmon and Steelhead plan. Prepared for the NPPC, Portland, Oregon.
<input type="checkbox"/>	CTUIR & ODFW 1994. Umatilla Basin Natural Production Monitoring and Evaluation. Annual Progress Report 1992-1993 sent to the BPA, Portland, Oregon.
<input type="checkbox"/>	Focher, S.M., R.W. Carmichael, M.C. Hayes, and R.W. Stonecypher, Jr. 1997. Umatilla hatchery monitoring and evaluation. 1996 annual progress report to Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Groberg, W.J., Jr., N.L. Hurtado, S.T. Onjukka, and K. Waln. 1996a. Report B: Fish Health Monitoring and Evaluation in Umatilla Hatchery Monitoring and Evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Groberg, W.J., Jr., S.T. Onjukka, and K. Waln. 1996b. Report B: Fish Health Monitoring and Evaluation in Umatilla Hatchery Monitoring and Evaluation. Annual progress report to

	Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Hayes, M.C., S.M. Knapp, and A.A. Nigro. 1992. Evaluation of juvenile fish bypass and adult fish passage facilities at water diversions in the Umatilla River. Annual and interim progress reports. DOE/BP-10385-2, B
<input type="checkbox"/>	Hayes, M.C., R.W. Carmichael, S.M. Focher, N.L. Hurtado, M.L. Keefe, G.W. Love, W.J. Groberg, Jr., S.T. Onjukka, and K. Waln. 1996a. Umatilla Hatchery Monitoring and Evaluation. Annual progress report to Bonneville Power Administration, Portland, Orego
<input type="checkbox"/>	Hayes, M.C., R.W. Carmichael, S.M. Focher, W.J. Groberg, Jr., S.T. Onjukka, R.W. Stonecypher, Jr., and K. Waln. 1996b. Umatilla Hatchery Monitoring and Evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Hayes, M.C., R.W. Carmichael, M.L. Keefe, and T.A. Whitesel. (1997). Accuracy of length estimates for chinook salmon and steelhead in compartmented and standard hatchery raceways. Progressive Fish Culturist 59:285-292
<input type="checkbox"/>	Hayes, M. and G. Rowan. 1998. Is there a difference in survival and health between different rearing and release strategies. Umatilla Basin Research and Management Review January 27 and 28, 1998. Mission, Oregon.
<input type="checkbox"/>	IHOT, 1995. Operation Plans for Anadromous Fish Production Facilities in the Columbia River Basin. Vol. II, Oregon.
<input type="checkbox"/>	Keefe, M.L., R.W. Carmichael, R.A. French, W.J. Groberg, and M.C. Hayes. 1993. Umatilla hatchery monitoring and evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Keefe, M.L., R.W. Carmichael, S.M. Focher, W.J. Groberg, and M.C. Hayes. 1994. Umatilla hatchery monitoring and evaluation. Annual progress report to Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Knapp, S.M., J.C. Kern, W.A. Cameron, S.M. Snedaker, and R.W. Carmichael. 1997. Evaluation of juvenile salmonid outmigration and survival in the lower Umatilla River basin. Annual progress report to Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	NPPC (Northwest Power Planning Council). 1987. Columbia River basin fish and wildlife program (as amended). Northwest Power Planning Council, Portland, Oregon.
<input type="checkbox"/>	NPPC (Northwest Power Planning Council). 1989. Staff Issue Paper. Umatilla Hatchery Master Plan. Northwest Power Planning Council, Portland, Oregon.
<input type="checkbox"/>	NPPC (Northwest Power Planning Council). 1994. Columbia River basin fish and wildlife program. Northwest Power Planning Council, Portland, Oregon.
<input type="checkbox"/>	ODFW and CTUIR. 1998. Umatilla Hatchery and Basin Annual Operating Plan for the period of October 1, 1998 - September 30, 1999. ODFW, La Grande, Oregon
<input checked="" type="checkbox"/>	USBR (U.S. Bureau of Reclamation) and BPA (Bonneville Power Administration). 1989. Umatilla basin project. Initial project workplan presented to the Northwest Power Planning Council, May 1989.

PART II - NARRATIVE

Section 7. Abstract

This proposal funds operation and maintenance of Umatilla Hatchery. This is one of a collection of projects intended to restore Umatilla fisheries and populations (Umatilla Subbasin Umbrella).

Development of the Umatilla basin extirpated salmon in the early 1900's and depressed steelhead populations. ODFW, Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and others identified 6 strategies to restore Umatilla anadromous fish production including reestablishing salmon production through hatchery releases and supplementing steelhead populations using endemic broodstock (Umatilla Subbasin Umbrella). To implement these two strategies ODFW and CTUIR developed the Umatilla Hatchery Master Plan (Master Plan, CTUIR and ODFW 1989). The Northwest Power Planning

Council (NPPC) adopted the Master Plan in 1989 as part of its Fish and Wildlife Program (FWP) and Umatilla Hatchery began operating in 1991.

Master Plan goals anticipate production of 9.7k adult summer steelhead 11.0k adult spring Chinook, 21.0k adult upriver bright fall Chinook, and 6.0k adult coho in 15 years. These goals include both natural and hatchery production expectations. Since Umatilla salmon were extirpated non-indigenous stock were used to initiate this program. Steelhead supplementation uses endemic stock.

Initial planning focused on release of 210k endemic summer steelhead smolts, 2.23M Carson spring Chinook, 7.0M upriver bright fall Chinook, and 1.0M Tanner Creek coho to meet these goals. Umatilla Hatchery goals were established based on an anticipated well capacity of 15k gpm and were 210k steelhead, 1.29M spring Chinook and 5.94M fall Chinook. Production from other Columbia Basin hatcheries would produce the remainder. The Three Mile, Thornhollow, Imeques C-mem-ini-kem (Imeques), Bonifer and Minthorn satellite facilities were planned for the Umatilla basin to support these efforts.

Some adjustments to this initial program have been made as a result of program experience and facility limitations. The most notable of these limitations is that Umatilla Hatchery well capacity proved out at only 5k gpm.

FY 2000 Umatilla Hatchery production will be 150k summer steelhead, 360k spring Chinook, and 2.68M fall Chinook. This will be 100 percent of steelhead, 45 percent of spring Chinook and 80 percent of fall Chinook releases to the Umatilla basin. Umatilla Hatchery is operated by ODFW and Umatilla satellite facilities by CTUIR in a coordinated manner under an Annual Operating Plan (AOP) developed each spring.

ODFW and CTUIR developed harvest-sharing guidelines for the Umatilla program as part of the planning process. As a result of Master Plan implementation Umatilla spring Chinook fisheries have occurred in five of the last eight years, and fall Chinook and steelhead fisheries have occurred continuously through this period. This is the only tributary spring Chinook fishery in Oregon east of the Deschutes River. It is too early to tell whether the natural production supplementation goals for this program can be met.

Section 8. Project description

a. Technical and/or scientific background

The Umatilla River in northeast Oregon originates on the west slope of the Blue Mountains east of Pendleton. The river flows northwesterly across the Umatilla Plateau for about 115 miles to its confluence with the Columbia River at River Mile (RM) 289. Virtually all of the 2,290-square-mile Umatilla River drainage is in Umatilla County, OR. The basin spans two major physiographic regions: the relatively low elevation, arid Deschutes-Umatilla Plateau and the higher elevation, wetter and colder Blue Mountains.

Although once abundant in the Umatilla River basin, spring and fall Chinook were extirpated in the early 1900's. Construction of water diversions (both power and irrigation), dewatering of the mainstem Umatilla, degradation of headwater habitat and loss at mainstem Columbia River dams eventually exterminated Umatilla Chinook (Umatilla Subbasin Umbrella, ODFW and CTUIR 1989).

Umatilla summer steelhead once supported important tribal and non-tribal fisheries. Steelhead return to the Umatilla is now a fraction of historical size (CTUIR and ODFW 1990). This decline is, as with Chinook, largely the result of development of the Umatilla and construction and operation of mainstem Columbia River hydroelectric projects.

Coho salmon are reported to have occurred in the Umatilla basin, although clear documentation does not exist. If they had existed, it is reasonable to assume their decline and extirpation from the same causes listed above for other species.

ODFW, CTUIR and others had discussed rehabilitating Umatilla salmon and steelhead fisheries and populations for years. Unfortunately, until Congress passed the Northwest Power Planning and Conservation Act of 1980 (Regional Act) a clear mechanism to meet this goal did not exist. Umatilla restoration planning began in earnest after adoption of the first FWP (NPPC 1987 and 1994) called for by the Regional Act. This led to development of a number of planning documents (Boyce 1986, CTUIR and ODFW 1989 and 1990, USBR and BPA 1989).

Restoration planning identified 6 strategies to restore Umatilla basin anadromous fisheries and fish production (Umatilla Subbasin Umbrella, Boyce, R.R. 1986, CRITFC, 1996, CTUIR and ODFW 1990, USBR and BPA 1989). These strategies include: 1) Improving stream flow; 2) Improving passage at diversions; 3) Improving riparian communities and instream habitat; 4) Reestablishing salmon production through hatchery releases; 5) Supplementing steelhead populations using endemic broodstock; and, 6) Monitoring and evaluation.

To implement the fourth and fifth strategies ODFW and CTUIR developed the Master Plan (CTUIR and ODFW 1989). The Master Plan considered the basin specific goal of reestablishing fisheries and, if possible, extirpated natural populations as well as the NPPC's "doubling the run size" goal outlined in the FWP.

Development of the Master Plan considered a number of alternatives based on prevailing fisheries science and policies (Boyce 1986, CTUIR and ODFW 1989 and 1990). After public review ODFW and CTUIR proposed the program that essentially exists today.

The NPPC adopted the Master Plan in 1989 as part of its FWP after public review and considering cost and technical merit (NPPC 1989, Letter from T. Truelove, Chairman, NPPC, October 25, 1989). Umatilla Hatchery and satellite facilities for broodstock collection and acclimation were built pursuant to the approved Master Plan. Construction of Umatilla Hatchery was completed in 1991 and operations began that fall, although juvenile and smolt releases began in the mid-1980's in anticipation of Master Plan approval. The hatchery is operated by ODFW while satellite facilities are operated by CTUIR under an AOP (ODFW and CTUIR 1998) developed each spring.

b. Rationale and significance to Regional Programs

The composite of Umatilla basin restoration activities contributes to a number of FWP elements (see Umatilla Subbasin Umbrella). Most of this work should be considered offsite mitigation for mainstem Columbia River losses.

Operation of Umatilla Hatchery and associated satellite facilities are a key element of this contribution. The existing Umatilla Hatchery program as implemented is outlined in Section 7.4I of the FWP.

Below is a discussion of other important FWP measures Umatilla Hatchery operations contribute to:

- Section 2.2B Systemwide Policies: Support Native Species in Native Habitat

An important consideration in planning Umatilla Hatchery production was protecting fish populations that existed. Umatilla summer steelhead had not been extirpated although they occurred at reduced levels. The Master Plan recognized protecting this stock was an important consideration in Umatilla basin restoration. As a result, an endemic broodstock program was established in an effort to bolster harvestable

steelhead numbers and natural production. This program relies on proportionally collecting wild broodstock throughout the run.

As noted above, salmon were extirpated from the Umatilla basin. In planning Umatilla basin restoration Carson spring Chinook, upriver bright fall Chinook and Tanner Creek coho stocks were chosen. These stocks were selected because they were available, could be successfully propagated and, it was hoped, would successfully reproduce in the wild if suitable habitat were available.

Measure 2.2B recognizes that in some cases natural environments may be altered to the point that native fishes may not be able to survive. This fact was recognized in the NPPC's review of the Master Plan (NPPC 1989). In this case fishery benefits were thought to be significant enough and the potential for establishing some natural production intriguing enough that the Master Plan was approved.

- Section 3.1B Coordinated Implementation, Research, Monitoring and Evaluation: Implementation and Monitoring

The Master Plan recognized there were a number of in the areas of hatchery effectiveness and natural production and supplementation potential and proposed an experimental approach to test these uncertainties. Projects 8902401, 9000500 and 9000501 incorporate the research, monitoring and evaluation necessary to address these concerns (Contor et.al.1995, 1996, and 1997, Focher et.al. 1997, Hayes et.al. 1992,1996a, and 1996b, Keefe et.al. 1993, 1994, and 1997)

Activities across program elements and co-mangers are coordinated through a number of forums. Included is the development of an AOP by the co-managers each spring to direct activities, quarterly Umatilla Monitoring and Oversight Committee (UMEOC) meetings to coordinate in-season activities, periodic research reviews and informal meetings to address immediate needs.

- Section 4.1 Salmon Goal and Framework: Salmon and Steelhead Goal; Double Salmon and Steelhead Runs Without Loss of Biological Diversity

Upon approving the Master Plan the NPPC found that "Hatchery production should reestablish natural runs of salmon and rebuild steelhead runs in the Umatilla and contribute significantly to the Council's goal to double Columbia Basin salmon and steelhead populations."

As a result of Master Plan implementation Umatilla spring Chinook fisheries have occurred in five of the last eight years, and fall Chinook and steelhead fisheries continuously through this period. Escapement to the Umatilla counted at Threemile Dam has averaged 1867 steelhead, 1304 spring Chinook and 954 fall Chinook (1990 through 1997, pers. com. W. Cameron, ODFW). Approximately one-third of the steelhead and all of the Chinook returns are hatchery fish resulting from Master Plan implementation. These levels of return are somewhat less than those anticipated at the time of Master Plan development, but consistent with the generally lower level of productivity (smolt-to-adult) experienced by other Columbia River programs over the last 5 years

It is unknown what level of natural production may be resulting from this program at this time.

Umatilla River sport angler catch averaged 234 steelhead and 185 fall Chinook (1992 through 1997). Umatilla River anglers harvested approximately 20 spring Chinook during the 1990, 91, 93, and 97 fisheries, and 206 in the 1996 fishery. Level of Tribal tributary harvest is similar to tributary sport catch.

Fish produced as part of the Master Plan also contribute to ocean and mainstem Columbia fisheries. CWT recoveries suggest 25 percent of adult steelhead, 20 percent of adult spring Chinook and 80 percent of adult fall Chinook production from the Umatilla is taken in ocean and mainstem harvest (pers. com. W. Cameron, ODFW).

This is the only tributary Chinook fishery in Oregon east of the Deschutes River.

- Section 7.2.D.3. Improved Propagation at Existing Facilities

An important aspect of Umatilla Hatchery operation is evaluating production in oxygen supplemented Michigan raceways. At the time Umatilla Hatchery was planned available information suggested considerable production benefit using this strategy. See project 9000500 for details.

c. Relationships to other projects

This project both relies upon and supports the following Umatilla basin projects. These projects are coordinated through development of AOPs, quarterly UMEOC meetings, periodic research reviews and project specific meetings.

Project 8343500 (CTUIR, Operate and Maintain Umatilla Hatchery Satellite Facilities) funds broodstock collection and acclimation facilities supported by this project. This project also includes some migration monitoring, pathology support and CWT retrieval associated with monitoring progress.

Project 9000500 (ODFW, Umatilla Hatchery Monitoring and Evaluation) supports research, monitoring and evaluation activities to resolve uncertainties associated with Umatilla Hatchery operations. This project monitors Umatilla Hatchery production and subsequent adult returns across a range of production and release strategies. Fish health monitoring and tagging are supported by this project. An important aspect of this work is assessments of the relative production benefits of using oxygen-supplemented Michigan over traditional Oregon raceways. If successful, this rearing system may have systemwide application.

Project 9000501 (CTUIR, Umatilla and Walla Walla Natural Production Monitoring and Evaluation) supports monitoring and evaluation of efforts to reestablish natural salmon production and supplement steelhead populations. This work is important to tracking the potential of reaching these goals.

Project 8802200 (CTUIR, Trap and Haul in the Umatilla and Walla Walla Basins) supports coordination and activities to facilitate fish migration around Umatilla basin irrigation diversions. Initially this project physically trapped fish at collector facilities and trucked them to the lower river when irrigation reduced stream flow below safe migration thresholds. More recently, this project schedules flow stored by the USBR to facilitate instream migration and only occasionally trucks migrants.

Project 8902401 (ODFW, Evaluate Salmonid Outmigration and Survival in the Lower Umatilla) monitors the migration of hatchery and wild salmonids through and out of the lower Umatilla. This area has traditionally been the biggest production blockage in the basin. This work is evaluating changes made to the system and the response of salmonids using it as a migration corridor. Results of this work influence hatchery release strategies and contributes to our understanding of program effectiveness.

d. Project history (for ongoing projects)

Salmon were extirpated from the Umatilla basin in the early 1900's. An effort was made to restore fisheries through release of hatchery produced coho and steelhead in the 1960's (Boyce 1986). These efforts, apparently, did not result in continuing natural production. It is unclear to what extent they contributed to fisheries.

Reintroduction efforts were begun again in the early 1980's prompted by passage of the Regional Act and development of the first FWP. As part of this effort ODFW and CTUIR began a major planning effort, propagation of Umatilla summer steelhead at Oak Springs Hatchery, reintroduction of spring Chinook using Carson stock and reintroduction of fall Chinook using Bonneville Hatchery tule and upriver bright stocks.

Early planning efforts identified the need for a new hatchery and tributary acclimation facilities. In response the Bonifer acclimation facility was built in 1983, and Minthorn Springs acclimation and adult collection facility in 1985 under the FWP.

Initial planning was completed in 1985 with publication of "A Comprehensive Plan for Rehabilitation of Anadromous Fish Stocks in the Umatilla River Basin" (Comprehensive Plan, Boyce 1985). This plan discussed Umatilla fish production constraints, identified rehabilitation projects and estimated costs, and a 5-year implementation plan. Development of the Comprehensive Plan included a public review component and Boyce (1985) includes public comments and responses.

Following completion of the Comprehensive Plan the Master Plan was developed. The Master Plan described facility needs, anticipated operations, and monitoring and evaluation needs.

Umatilla Hatchery was authorized by NPPC in 1989 and began operation in the fall of 1991. The Hatchery is used for egg incubation and rearing of summer steelhead and spring and fall Chinook. In addition to the two previously discussed satellite facilities, the Imeques and Thornhollow acclimation satellites were built and the Three Mile site significantly improved for adult collection and holding. One additional acclimation site is planned for Umatilla RM 56.

Since Umatilla Hatchery began operation releases have averaged 159k smolt summer steelhead, 345k smolt spring Chinook and 2.75M subyearling fall Chinook into the Umatilla River Basin. Umatilla Hatchery production comprises 100 percent of steelhead, 45 percent of spring Chinook and 80 percent of fall Chinook releases to the Umatilla basin. Production from Irrigon, Little White Salmon, Bonneville, Cascade, Lower Herman Creek and Carson hatcheries is also released in an effort to meet Master Plan goals. These releases are largely funded through a combination of Mitchell Act and John Day Mitigation programs.

Umatilla Hatchery production has never reached Master Plan production goals. The primary reason is that planning assumed a well water supply of 15k gpm capable of producing 290k pounds of salmon and steelhead. Actual well supply is only 5k gpm.

Umatilla Hatchery is operated by ODFW and Umatilla satellite facilities by CTUIR (Project 83435000) in a coordinated manner under an AOP developed each spring.

Concurrent with development of Umatilla Hatchery the Umatilla Hatchery Monitoring and Evaluation Project (Project 900500) was initiated (Keefe et al. 1993, 1994; Hayes et al. 1996a, 1996b; Focher et al. 1997; Hayes et al. 1997, Carmichael, in press). Refer to Project 9000500 for a summary description of results observed.

e. Proposal objectives

The following outlines current Umatilla Hatchery objectives and provides commentary on their development:

Objective 1: Coordinate Umatilla Hatchery operations with co-managers.

Each spring ODFW and CTUIR develop an AOP to direct enhancement activities associated with Umatilla Hatchery operations. This document spells out operational specifics, responsibilities and timing. This management framework was one of the elements proposed in the Master Plan to reduce or eliminate duplication of effort.

UMEEOC meets quarterly to coordinate research activities among co-managers. Hatchery and satellite staffs are also included in this forum to facilitate smooth field operations and resolve implementation details.

Objective 2: Produce 150k summer steelhead smolts for acclimation at Bonifer and Minthorn sites.

The Umatilla Hatchery steelhead program focuses on augmenting fisheries and supplementing natural production through use of endemic broodstock. Master Plan goals targeted annual production of 4,000 naturally and 5,670 hatchery produced adult summer steelhead.

Basin planning suggested that 314 miles of summer steelhead spawning and rearing habitat occur in the Umatilla basin. Monitoring 1966 through 1980 estimated an average of 54k Umatilla steelhead smolts produced annually (CTUIR and ODFW 1990). In 1977, however, 107k smolts were captured at a lower Umatilla River trap. This higher value was considered suggestive of the production potential if habitat in the Umatilla basin was improved and was set as the natural smolt production goal.

The natural adult goal was established using 0.038 smolt-to-adult rate reported for the Umatilla by CTUIR and ODFW (1990).

The hatchery adult production goal was based on release of 210k smolts and a 0.027 smolt-to-adult return rate (CTUIR and ODFW 1990). This goal was established based on what was considered an acceptable level of broodstock removal from the natural population and anticipated Umatilla Hatchery capability.

Current Umatilla Hatchery capacity is limited to 150k smolt steelhead due to lower than expected well supply.

Objective 3: Produce 360k smolt spring Chinook for acclimation at the Imeques site.

The Umatilla program focuses on reestablishing spring Chinook fisheries and, if possible, extirpated natural populations. Master Plan goals targeted annual production of 1k naturally and 10k hatchery produced adult spring Chinook.

Spring Chinook had been extirpated from the Umatilla basin early in this century. Basin planning suggested 54 miles of spring Chinook spawning and rearing habitat occur in the Umatilla basin (CTUIR and ODFW 1990). US v. Oregon parties estimated natural production capacity was 44k smolts and 870 adults under habitat conditions that occurred at that time (CTUIR and ODFW 1990).

The Umatilla Hatchery production goal of 1.29M smolts was established based on anticipated well capacity. Almost 940k smolts from other hatcheries were also planned for release to the Umatilla (CTUIR and ODFW 1989 and 1990).

Umatilla Hatchery smolt production has averaged 345k since start up in 1991 due to lower than expected well capacity. An additional 450k smolts are brought in from Little White Salmon and Carson hatcheries funded through other sources.

Objective 4: Produce 2.68M subyearling fall chinook for acclimation at the Thornhollow site.

The Umatilla program focuses on reestablishing fall Chinook fisheries and, if possible, extirpated natural populations. Master Plan goals targeted annual production of 11k naturally produced and 10k hatchery produced adult fall chinook.

Fall Chinook had been extirpated from the Umatilla basin early in this century. Basin planning estimated that 100 miles of fall Chinook spawning and rearing habitat occur in the Umatilla basin (CTUIR and ODFW 1990). CTUIR and ODFW (1990) report natural smolt carrying capacity to be approximately 2.3M.

The Umatilla Hatchery production goal of 5.9M subyearlings was established based on anticipated well capacity. Originally, an additional release of 1.1M subyearlings from Bonneville Hatchery was also anticipated (CTUIR and ODFW 1989 and 1990).

Umatilla Hatchery fall Chinook production has averaged only 2.75M subyearlings since start up in 1991 due to lower than expected water supply. An additional 480k subyearlings are brought in from Bonneville and Little White hatcheries funded through other sources. In 1996 and 1997 CTUIR released 708 and 940 Priest Rapids adults to spawn naturally.

f. Methods

Umatilla Hatchery works in concert with a number of other facilities and programs (Umatilla Subbasin Umbrella). It serves as the incubation and rearing site supplying smolts and subyearlings to 4 acclimation sites in the Umatilla basin. Broodstock supporting Umatilla Hatchery production are collected and spawned off-station and eggs transported to Umatilla hatchery for incubation. ODFW operates Umatilla Hatchery and CTUIR the Umatilla basin satellite facilities (Project 83435000).

Each spring ODFW and CTUIR develop an AOP to direct operation for the following fiscal year (FY).

The following summarizes the methods used to meet Umatilla production goals by objective outlined in the previous section. A more detailed description can be found in IHOT (1995) and ODFW and CTUIR (1998).

Objective 1: Coordinate Umatilla Hatchery operations with co-managers

Development of the AOP occurs over the course of 2 or 3 meetings. Generally, individual sections are re-drafted each year to reflect upcoming activities by the responsible party and edited by others.

UMEOC is a recurring meeting chaired by one of the co-managers.

Objective 2: Produce 150k summer steelhead smolts for acclimation at Bonifer and Minthorn sites.

During this FY 1999 brood year (BY) steelhead will be marked and released and BY 2000 production initiated. All hatchery fish are marked as part of this program.

Adult broodstock for this program is collected at Three Mile Dam from September through May. Collections are made across the run with a target of no more than 10 percent of the unmarked escapement taken per month. One CWT (coded wire tag) marked male can be taken for every 5 unmarked males collected.

Fish not collected for broodstock are released to spawn in the wild.

Broodstock are held and spawned at Minthorn (Umatilla RM 63). A 3x3 spawning matrix is used with wild crosses favored. Males are not reused. The origin of CWT males is determined prior to use and out of basin fish not used.

Eggs are transferred to Umatilla hatchery for incubation. Fry are generally troughed in June and July and ponded in August.

Fish are Ad clipped in September and experimental lots CWTed in November.

Juveniles are transferred to the Bonifer (Meacham Cr. RM 2) and Minthorn satellite facilities in March for acclimation and release.

Objective 3: Produce 360k smolt spring Chinook for acclimation at the Imeques site.

During this FY BY1998 spring Chinook will be released and BY 1999 brood production initiated. Approximately 40 percent of this production are marked for evaluation purposes under US v. Oregon agreement.

Adult broodstock for this program is collected at Three Mile Dam, Little White Salmon Hatchery and Ringold Hatchery. Most broodstock collection for Umatilla Hatchery is anticipated from Three Mile Dam with the remainder from Ringold. Three Mile Dam collections are held and spawned at the South Fork Walla Walla facility while Ringold collections are held and spawned at Little White Salmon. Subject to availability, broodstock and/or eggs taken at Carson Hatchery are used to make up any shortfall.

Up to 50 percent of escapement by week is collected at Three Mile Dam for broodstock. Only marked adults are taken for broodstock. Unmarked and surplus marked adults are released to spawn naturally. The Three Mile brood collection target is 600 adults.

Eggs are transferred to Umatilla hatchery for incubation. Fry are generally troughed in February and ponded in August. CWTing occurs at ponding.

Juveniles are transferred to Imeques (RM 80) in two lots (November and January) for release the following March.

Objective 4: Produce 2.68M subyearling fall chinook for acclimation at Thornhollow site and direct stream release at RM 56.

During this FY BY1998 fall Chinook will be released and BY 1999 brood production initiated. This production is marked using AdCWT for evaluation lots and BWT (blank wire tag) the remainder for adult strays segregation at Snake River dams.

Adult broodstock for this program is collected at Three Mile Dam, Priest Rapids or Bonneville Hatchery. Three Mile broodstock collection occurs at a 100 percent rate up to 400 adults per week. Fish surplus to brood needs are released.

Eggs are transferred to Umatilla Hatchery for incubation. Fry are generally troughed in February and ponded in August. Marking occurs in April.

Juveniles are transferred to Thornhollow (RM 73) in May. Release from Thornhollow and at RM 56 occurs in late May depending on flow. Plans are being developed for construction of a new acclimation facility at RM 56.

Limitations

Operation of Umatilla Hatchery depends on successful operation of a number of other projects. Most notable is the operation of associated hatcheries and satellite facilities.

The most significant onsite limitation at Umatilla Hatchery is water supply. As noted earlier, facility wells have not met expectations and as a result production goals have been revised in accordance with facility capability.

Experience to date suggests the Umatilla Hatchery water supply is warmer than desirable for spring Chinook production. In general, Umatilla Hatchery reared spring Chinook have a lower return rate than experienced at other stations with more natural temperature regimes (Hayes and Rowan 1998). This situation is currently under review.

g. Facilities and equipment

Umatilla Hatchery is located adjacent to the Columbia River, 3.5 miles west of Irrigon, Oregon. Facility rearing units include 34 raceways and 8 troughs. Water is supplied to the hatchery from four remote wells. The 4 satellite facilities, operated by the CTUIR, located on the Umatilla River (Bonifer Pond, Minthorn Springs, Imeques and Thornhollow) are used for juvenile fish acclimation. Adults are collected, held and distributed from the Threemile Dam facility.

The equipment used at Umatilla Hatchery is in good operational condition.

h. Budget

Umatilla Hatchery is staffed with 8 permanent and one seasonal FTEs. This staffing level is within the range customary for a facility of this type in the region. Personnel cost for FY 2000 has increased slightly (approximately \$10k) over that of FY 1999 largely due to salary increases approved by the 1997 Oregon legislature.

Standard ODFW Other Personnel Expense (OPE) rates are used: 36 and 45 percent for permanent and seasonal staff respectively. These are the same rates used for FY 1999. This cost item increased slightly due to the salary increases noted above.

Supplies and Services and Operation and Maintenance cost has been reduced slightly (approximately \$1k) for FY 2000.

Capital acquisitions anticipated for FY 2000 include a jack hammer attachment for an existing backhoe and a fin-clipper trailer. The jack hammer attachment (\$7.5k) is needed for excavation of buried cable and piping requiring repair. The trailer (\$20k) would be used to support 48 employees hired annually for tagging. Over the last 9 years trailers have been rented at an accumulated cost of \$36k.

The ODFW Indirect Rate has increased from 22.9 percent in FY 1999 to 35.5 percent for FY 2000. This is the largest proportion of the budget increase in this proposal (\$81.3k, 82 percent) over that approved for FY 1999. This rate reflects the State's negotiated rate with the Federal Government.

Section 9. Key personnel

Special Projects Coordinator: Bruce Eddy; 0.17 FTE
Hatchery Manager: Jack Hurst; 1 FTE
Assistant Manager: Ron Rehn; 1 FTE
Trades Maintenance Worker: Wesley Cone; 1 FTE
Trades Maintenance Worker: Michael Pearsall; 1 FTE
Hatchery Technician: Vacant; 1 FTE
Hatchery Technician: Jennifer Mestech; 1 FTE
Hatchery Technician: Jon Gutcher; 1 FTE
Hatchery Technician: Clifford Miller; 1 FTE

Umatilla Fish Hatchery Manager Jack Hurst

Education:

1975 A.S. Fisheries Technology, Mt. Hood Community College, Gresham, Oregon.

Experience:

3/90–Present Hatchery Manager, Umatilla Fish Hatchery, 73959 Riverview Ln, Irrigon, Oregon.

Primary responsibilities include overseeing and implementing hatchery operation plans and programs. This includes coordination with research and evaluation programs assigned to the project, the CTUIR, and the rearing, transferring of spring Chinook, fall Chinook, and summer steelhead to the Umatilla River. Other responsibilities include supervising the work of 8 FTE's and ensuring proper maintenance programs are conducted on buildings, grounds and specialized equipment of the facility.

3/89-3/90 F&W Technician 2, Cole Rivers Fish Hatchery, ODFW.
7/87-3/89 F&W Technician 2, Leaburg Fish Hatchery, ODFW.
6/83-7/87 F&W Technician 2, Fall River Fish Hatchery, ODFW.
11/82-6/83 F&W Technician 1, Marion Forks Fish Hatchery, ODFW.
2/78-11/82 F&W Technician 1, Leaburg Fish Hatchery, ODFW.

Section 10. Information/technology transfer

Refer to projects 8902401, 9000501 and 8802200 ODFW & CTUIR. The project's overall performance will be assessed through completion of the specific measurable objectives, other measures including annual reports, completion of tasks identified in the annual work statements, number of fish tagged/marked and released, numbers of adults returning, commercial and sport fishing benefits provided and the achievement of restoring natural runs of adults into the Umatilla River.

Data will be summarized, analyzed and reported in the reports of the projects listed above and in other special reports. Information is communicated to fish management staff through monthly and quarterly reports, and various research reviews, fish propagation meetings, and the Pacific Northwest Fish Culture

Conference workshops. Adult fish collection and fish production information is entered and maintained on ODFW's Hatchery Management Information System (HMIS) and available for inclusion within the Coordinated Information System (CIS). Relevant information is also shared with co-managers in the Columbia River Management Plan's Production Advisory Committee (PAC) forum. Other interagency coordination and communication is conducted through the Technical Advisory Committee (TAC), Pacific Northwest Fish Health Protection Committee (PNFHPC), In-River Agreements and In-Season Communications.

Congratulations!