
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Northeast Oregon Hatchery Master Plan

BPA project number: 8805301

Contract renewal date (mm/yyyy): 01/2000 **Multiple actions?**

Business name of agency, institution or organization requesting funding

Nez Perce Tribe

Business acronym (if appropriate) NPT

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NPPC Program Measure Number(s) which this project addresses

7.4L.1, 7.3B, 7.4A, 7.4A.2, 7.4C.1, 7.4O, 7.4O.1

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

Other planning document references

Master plan for Imnaha and Grande Ronde River spring chinook (NPT, in prep.), Proposed Recovery Plan for Snake River Salmon (NMFS 1995), Wy-Kan-Ush-Mi Wa-Kish-Wit (CRITFC 1995), Wallowa County/Nez Perce Tribe Recovery Plan, Imnaha and Grande Ronde subbasin plans, final siting reports (Montgomery Watson 1992a, 1995b), conceptual design reports (Montgomery Watson (1992b, 1995a), genetic risk assessments (Neeley et al. 1993 and Neeley et al. 1994).

Short description

Plan and develop conservation production facilities in the Imnaha and Grande Ronde rivers necessary to implement salmon recovery programs for native, ESA listed, steelhead, spring and fall chinook and reintroduction of coho and sockeye salmon.

Target species

spring and fall chinook, steelhead, coho and sockeye salmon

Section 2. Sorting and evaluation

Subbasin

Imnaha and Grande Ronde rivers

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 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 type="checkbox"/> Operation & maintenance <input checked="" 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
20556	Grande Ronde Endemic Spring Chinook Supplementation Program
9801001	Grande Ronde Basin Spring Chinook Captive Broodstock O&M/M&E/Fish Health
9800702	Grande Ronde Supplementation - O&M/M&E - NPT
9800703	Facility O & M/Program M & E for Grande Ronde Spring Chinook Salmon - CTUIR
9800704	Grande Ronde River O&M/M&E/ODFW
9801007	Captive Broodstock Artificial Propagation - NPT
8805301	Northeast Oregon Hatchery Master Plan - NPT

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9801001	Grande Ronde Basin Spring Chinook Captive Broodstock O&M/M&E/Fish Health	8805301 will provide facilities to meet incubation/rearing needs for F1 generation fish from this program.
9800702	Grande Ronde Supplementation - O&M/M&E - NPT	Adult trapping and juvenile acclimation facilities will be satellites to incubation/rearing facilities provided under 8805301.
0	LSRCP Grande Ronde spring chinook supplementation	8805301 will provide facilities to meet incubation/rearing needs for this program.
0	LSRCP Imnaha spring chinook supplementation program	8805301 will provide facilities to meet incubation/rearing needs for this program.
0	LSRCP Grande Ronde steelhead supplementation program	8805301 will provide facilities to refocus this program to address conservation needs.
0	LSRCP Imnaha steelhead supplementation program	8805301 will provide facilities to meet conservation/supplementation needs for this program.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1997	Reintiated project following seven year hiatus. Hired project leader and assistant project leader.	

1997	Participated in planning, design, development, and NEPA analysis of Lostine River adult trapping and acclimation facilities.	
1997	Initiated development of Imnaha River spring chinook fisheries management plan with Dr. Phillip R. Mundy.	
1998	Cooperatively developed management plan with ODFW and CTUIR for Imnaha and Lostine River spring chinook programs. Development of the sliding scale tool for broodstock allocation.	
1998	Completed well testing at proposed incubation and rearing facility site on the Imnaha River.	
1998	Completed cultural resource surveys of proposed facility sites.	
1998	Hired lead writer for master planning.	
1998	Finalized feasibility study on reintroduction of coho and sockeye salmon in the Grande Ronde River (Cramer and Witty 1998).	
1998	Completed Imnaha River spring chinook fisheries management plan (Mundy and Witty 1998).	
1998	Initiated Independent Review of Lookingglass Hatchery to meet needs of currently permitted and programmed spring chinook production.	

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Continue planning and development of conservation facilities necessary for implementation of spring chinook restoration programs in the Imnaha and Grande Ronde rivers.	a	Participate in Preliminary Design and finalization of NEPA document for proposed facilities.
		b	Submit Preliminary Design and NEPA documents to NPPC for review.
		c	Participate in NPPC 3-Step Review Process of Preliminary Design, NEPA analysis, and Final Design.
		d	Participate in Final Design and development of cost estimates for proposed facilities.
2	Continue planning and development of facilities to implement coho salmon reintroduction program in lower Grande Ronde and Wallowa rivers.	a	Participate in NPPC 3-Step Review Process for review and approval of master plan document.
		b	Participate in Preliminary Design and NEPA (EIS) analysis of proposed facilities.
		c	Develop a comprehensive monitoring and evaluation plan that is integrated with ongoing research and other monitoring and evaluation programs in the subbasin.
3	Continue planning and development of conservation facilities necessary to implement fall chinook restoration programs in the Imnaha and Grande	a	Participate in NPPC 3-Step Review Process for review and approval of master plan document.

	Ronde rivers.		
		b	Participate in Preliminary Design and NEPA (EIS) analysis of proposed facilities.
4	Evaluate existing steelhead supplementation programs and identify options for development of conservation facilities required to implement a restoration program.	a	Develop a plan for collection of baseline data from natural origin steelhead in appropriate subbasin tributaries.
		b	Determine critical uncertainties regarding the condition of steelhead populations in the Grande Ronde and Imnaha subbasins.
		c	Initiate review of existing production facilities and the potential for modification to meet restoration program needs.
		d	Identify potential options for new supplementation programs and/or modification of existing LSRCP supplementation programs to implement restoration program.
		e	Identify potential site locations for adult trapping facilities, incubation and rearing facilities, stream-side incubators, acclimation and release facilities.
5	Develop a master plan to implement sockeye salmon reintroduction program in Wallowa Lake (Grande Ronde River).	a	Evaluate potential donor stocks (life history traits, availability, etc.) for reintroduction.
		b	Address critical uncertainties and constraints to reintroduction identified in the feasibility study.
6	Coordinate planning and development of NEOH facilities with appropriate entities.	a	Facilitate and participate in the NEOH Planning and Coordination Team which meets regularly to guide the project.
		b	Cooperatively develop appropriate permit applications and biological assessments for proposed facilities
		c	Coordinate with landowners of facility sites.
		d	Coordinate with other co-managers, regarding relevant management issues, through U.S. v. Oregon Production Advisory Committee and Technical Advisory Committee forums
		e	Consult with NMFS regarding the consistency of various aspects of this project with regard to recovery planning for chinook salmon in the Imnaha and Grande Ronde subbasins.
		f	Facilitate the use of collected data with co-managers.
		g	Prepare project budgets, statement of work, project prioritization process, project review documents.
		h	Prepare necessary subcontracts for work to be accomplished by subcontractors.
7	Collect and analyze baseline	a	Deploy and maintain thermographs at

	environmental data at proposed facility site locations.		facility site locations to collect water temperature information.
		b	Collect water flow and discharge data from USGS gauge stations and established transects near proposed facility sites.
8	Transfer of technology	a	Prepare and provide quarterly reports summarizing activities accomplished during the quarter. Report will be submitted 15 days after the end of the quarter.
		b	Present reports on project activities and findings at Annual BPA/CBFWA Project Review and other appropriate forums.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/2000	12/2000			50.00%
2	1/2000	12/2000			20.00%
3	1/2000	12/2000			10.00%
4	1/2000	12/2000			8.00%
5	1/2000	12/2000			1.00%
6	1/2000	12/2000			10.00%
7	1/2000	12/2000			1.00%
				Total	100.00%

Schedule constraints

Timely review and approval through NPPC 3-Step Review Process, land acquisition process, design and engineering delays, NEPA constraints, construction delays, co-manager agreement on management plans.

Completion date

2005 for planning and development - O&M and M&E for proposed facilities is anticipated to be ongoing

Section 5. Budget

FY99 project budget (BPA obligated): \$2,300,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel		%18	220,954
Fringe benefits		%3	30,958
Supplies, materials, non-expendable property		%0	5,960
Operations & maintenance	Telephone, office rent, computer lease, thermograph maintenance, 2 GSA vehicles and maintenance	%3	41,607
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		%0	0
NEPA costs	EIS for coho and fall chinook (BPA)	%25	300,000

Construction-related support	Final design - spring chinook - preliminary design/siting coho & fall chinook (Montgomery Watson)	%41	500,000
PIT tags	# of tags:	%0	
Travel	Airfare/perdiem to Portland/Boise	%1	15,690
Indirect costs	22.9	%4	52,848
Subcontractor	Consultants	%4	49,000
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			\$1,217,017

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
		%0	
		%0	
		%0	
		%0	
Total project cost (including BPA portion)			\$1,217,017

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$3,000,000	\$5,000,000	\$3,000,000	\$3,000,000

Section 6. References

Watershed?	Reference
<input type="checkbox"/>	Ashe, B.L. 1998. Letter to Mark Fritsch, NPPC, September 3, 1998.
<input type="checkbox"/>	Bryson, D. 1990. Northeast Oregon Salmon and Steelhead Draft Master Plan, Grande Ronde River. Nez Perce Tribe, Lapwai, ID.
<input type="checkbox"/>	Bryson, D. 1993. Northeast Oregon Hatchery Project, Grande Ronde River Master Plan Final Report. Nez Perce Tribe, Lapwai, ID.
<input type="checkbox"/>	Carmichael, R.W., S.J. Parker, and T.A. Whitesel. 1998. Status review of the chinook salmon hatchery program in the Imnaha River Basin, Oregon. In Lower Snake River Compensation Plan Status Review Symposium, February 1998. USFWS LSRCP, Boise, Idaho.
<input type="checkbox"/>	CRITFC (Columbia River Intertribal Fish Commission). 1995. Wy-Kan-Ush-Mi Wa-Kish-Wit, Spirit of the Salmon. The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama Tribes. CRITFC, Portland, Oregon.
<input type="checkbox"/>	CRITFC (Columbia River Inter Tribal Fish Commission). 1998. Application for a permit to enhance the propagation or survival of endangered Grande Ronde River subbasin (Lostine River component) spring chinook salmon under the ESA of 1973. NMFS, Oregon.
<input type="checkbox"/>	Cramer, S.P. and K. Witty. 1990. Feasibility for Reintroducing Sockeye & Coho Salmon in the Grande Ronde River and Coho and Chum in the Walla Walla
<input type="checkbox"/>	Larson, R.E. 1990. Northeast Oregon Salmon and Steelhead Draft Master Plan, Imnaha River. Nez Perce Tribe, Lapwai, ID.
<input type="checkbox"/>	Lyon, J. 1998. Cultural resource of proposed Northeast Oregon Hatchery facility sites. Nez Perce Tribe Cultural Resource Department, Lapwai, Idaho.
<input type="checkbox"/>	Maynard, D.J., T.A. Flagg, and C.V.W. Mahnken. 1996. Development of a natural rearing system to improve supplemental fish quality, 1994-1995. DOE/BP-20651-1. Bonneville

	Power Administration, Portland, Oregon.
<input type="checkbox"/>	Montgomery Watson. 1992a. Draft Siting Report for Northeast Oregon Hatchery Project. Montgomery Watson, Bellevue, Washington.
<input type="checkbox"/>	Montgomery Watson. 1992b. Draft Conceptual Design Report for Northeast Oregon Hatchery Project. Montgomery Watson, Bellevue, Washington.
<input type="checkbox"/>	Montgomery Watson. 1992c. Preliminary report of test well drilling Northeast Oregon Project. Montgomery Watson, Bellevue, Washington.
<input type="checkbox"/>	Montgomery Watson. 1995a. Northeast Oregon Hatchery Project Conceptual Design Final Report. DOE/BP-11466-1, Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Montgomery Watson. 1995b. Northeast Oregon Hatchery Project Final Siting Report. DOE/BP-11466-2, Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Montgomery Watson. 1998. Imnaha well drilling report. Montgomery Watson, Bellevue, Washington.
<input type="checkbox"/>	Mundy, P.R. and K. Witty. (1998). Imnaha River Spring Chinook Fisheries Management Plan. Nez Perce Tribe, Lapwai, Idaho.
<input type="checkbox"/>	Neeley, D., K. Witty, and S.P. Cramer. 1993. Genetic Risk Assessment of the Imnaha Master Plan, Nez Perce Tribe, Lapwai, Idaho.
<input type="checkbox"/>	Neeley, D., K. Witty, and S.P. Cramer. 1994. Genetic Risk Assessment of the Grande Ronde River Master Plan, Nez Perce Tribe, Lapwai, ID.
<input type="checkbox"/>	NPT (Nez Perce Tribe). In prep. Master plan for Imnaha and Grande Ronde River spring chinook salmon. Nez Perce Tribe, Lapwai, Idaho.
<input type="checkbox"/>	Nez Perce Tribe of Idaho, Confederated Tribes of the Umatilla Indian Reservation, and Oregon Department of Fish and Wildlife. 1990. Imnaha River Subbasin Salmon and Steelhead Plan. Columbia Basin System Planning. Northwest Power Planning Council, OR.
<input type="checkbox"/>	NMFS. 1995. Proposed Recovery Plan for Snake River Salmon. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Seattle, Washington. March, 1995.
<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 (Oregon Department of Fish and Wildlife). 1998a. Application for a permit for scientific research and to enhance the propagation or survival of Imnaha River chinook salmon under the Endangered Species Act. Submitted by ODFW to NMFS January 1998.
<input type="checkbox"/>	ODFW (Oregon Department of Fish and Wildlife). 1998b. Request for modification of Permit Number 1011 for scientific purposes and to enhance ... Grande Ronde River Basin Spring Chinook under the Endangered Species Act. Submitted by ODFW to NMFS March 1998.
<input type="checkbox"/>	Oregon Department of Fish and Wildlife, Nez Perce Tribe of Idaho and Confederated Tribes of the Umatilla Indian Reservation. 1990. Grande Ronde River Subbasin Salmon and Steelhead Plan. Northwest Power Planning Council, Portland, Oregon.
<input type="checkbox"/>	RASP (Regional Assessment of Supplementation Projects). 1992. RASP summary report series. December 1992, Parts I-IV. Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	SRSRT (Snake River Salmon Recovery Team). 1994. Final recommendations to the National Marine Fisheries Service, Portland, Oregon.
<input type="checkbox"/>	SRT (Scientific Review Team Independent Scientific Advisory Board). 1998. Review of Salmonid Artificial Production in the Columbia River Basin as a scientific basis for Columbia River production programs. Northwest Power Planning Council, Portland
<input type="checkbox"/>	Steward, C.R. 1996. Monitoring and evaluation plan for the Nez Perce Tribal Hatchery. Nez Perce Tribe Department of Fisheries Resource Management, Lapwai, ID. Prepared for the U.S. Department of Energy, Bonneville Power Administration.
<input type="checkbox"/>	USACE (U.S. Army Corps of Engineers). 1975. Lower Snake River fish and wildlife compensation plan. USACE Special Report, Walla Walla, Washington.
<input type="checkbox"/>	Wallowa County and NPT. 1993. Wallowa County and Nez Perce Tribe Salmon Recovery Plan. Nez Perce Tribe, Lapwai, ID.
<input type="checkbox"/>	Whitesel, T.A., R.W. Carmichael, M.W. Flesher, and D.L. Eddy. 1998a. Summer steelhead in the Imnaha River basin, Oregon. In Lower Snake River Compensation Plan Status Review

	Symposium, February 1998. USFWS LSRCP, Boise, Idaho.
<input type="checkbox"/>	Whitesel, T.A., R.W. Carmichael, M.W. Flesher, and D.L. Eddy. 1998b. Summer steelhead in the Grande Ronde River basin, Oregon. In Lower Snake River Compensation Plan Status Review Symposium, February 1998. USFWS LSRCP, Boise, Idaho.

PART II - NARRATIVE

Section 7. Abstract

The focus of this project is to develop conservation facilities necessary for implementation of salmon recovery programs in the Imnaha and Grande Ronde River subbasins. These supplementation programs are aimed at preventing extinction, reintroducing and restoring anadromous salmonid species native to the subbasins. Actions authorizing and directing this project are found in the Columbia Basin Fish and Wildlife Program (NPPC 1994) Measure 7.4.

Species identified by co-managers for restoration/supplementation programs include spring and fall chinook, steelhead (Grande Ronde and Imnaha), coho, and sockeye salmon (Grande Ronde only). Proposed facilities include adult trapping, incubation and rearing, and juvenile acclimation and release. Facilities are intended to be small-scale, low-cost, temporary/portable in nature and located in the natal watershed of the population being supplemented. We propose to use the Natural Rearing Enhancement System (NATURES) developed and researched by NMFS (Maynard et al. 1996) to incubate and rear fish under conditions that mimic the natural environment. The overall goal is to produce a hatchery-reared fish that mimics similar life history characteristics as its wild counterpart in an attempt to avoid domestication effects and increase post-release survival. Production from these facilities will be integrated and/or authorized under the Lower Snake River Compensation Plan (LSRCP).

Monitoring and evaluation of all supplementation activities will be integrated with ongoing research in the subbasins (e.g., LSRCP and BPA projects) and will include data collection on life history, ecological interactions, genetics, fish health, and adult returns. In addition, juvenile releases, juvenile emigration and survival, and spawning distribution and timing will be monitored.

Section 8. Project description

a. Technical and/or scientific background

Spring, summer and fall chinook and steelhead salmon populations in the Snake River basin have declined precipitously during the past three decades resulting in their listing under the Endangered Species Act. Sockeye are the most imperiled Snake River stock and coho salmon in the Snake River basin are already extinct. The focus of this project is to develop conservation facilities necessary to implement restoration programs for ESA listed salmon species native to the Imnaha and Grande Ronde River subbasins. Actions authorizing and directing this project are found in the Columbia Basin Fish and Wildlife Program (NPPC 1994) Measure 7.4.

Spring chinook

Returns of spring chinook to the Imnaha River subbasin have declined precipitously during the past three decades. Peak escapement of spring chinook to the Imnaha River was estimated at 3,459 adults in 1957 compared to recent years when returns of natural origin fish have declined to levels below 150 individuals (ODFW 1998a). Population declines are principally attributed to decreased production resulting from

juvenile and adult mortality that occurs at Snake and Columbia River mainstem dams and reservoirs. It was estimated that the four lower Snake River dams alone resulted in a 48% reduction in annual production of chinook salmon above Lower Granite Dam (USACE 1975).

In 1982, the Imnaha spring chinook production program was initiated under the Lower Snake River Compensation Plan (LSRCP). The program was originally conceived as a conventional hatchery mitigation program with its primary objective to provide surplus hatchery fish for harvest. However, the program has shifted to emphasize supplementation, and its primary objectives include enhancing natural production while maintaining life history and genetic characteristics of the natural population. Carmichael et al. (1998) conducted an evaluation of the effectiveness of the Imnaha supplementation program using two methods, 1) progeny-to-parent (recruit-per-spawner) ratios and 2) a simulation model evaluating the natural population without the effect of the hatchery supplementation. Carmichael et al. (1998) report that progeny-to-parent ratios for the natural spawning population in the Imnaha have been well below 1.0 (replacement) since 1983 and have been as poor as 0.2. In contrast, hatchery progeny-to-parent ratios have been above 1.0 for all broodyears except 1990-1992. Average progeny-to-parent for hatchery origin fish is near 4.0, while the average for the natural spawning population is less than 0.5 (Carmichael et al. 1998). The simulation model indicated there are far more fish returning to the basin and contributing to the number of natural spawners with the hatchery program than there would have been without the hatchery (Carmichael et al. 1998). Co-managers believe continuing this program is important to decrease demographic risk of extirpation for Imnaha spring chinook. This program was authorized by NMFS under ESA Section 10 Permit 847, which expired March 31, 1998. ODFW submitted an application for a new permit January 23, 1998 (ODFW 1998a), which contains a cooperatively developed management plan for the supplementation program that will cover activities for the next five years. Incubation and rearing of Imnaha spring chinook currently occurs solely at Lookingglass Hatchery in the Grande Ronde River subbasin, 120 miles from the Imnaha River.

Historically, the Grande Ronde River supported large runs of spring chinook salmon, but present escapement levels and recent trends indicate that Grande Ronde basin spring chinook are in imminent danger of extinction. Progeny-to-parent ratios have been below 1.0 (replacement) for the past eight completed broodyears (Carmichael et al. 1998). The NMFS draft recovery plan (1995) recommends, “captive broodstock and supplementation programs should be initiated and/or continued for populations identified as being at imminent risk of extinction, facing severe inbreeding depression or facing demographic risks” and “considering the critical low abundance of Grande Ronde spring chinook salmon, impacts to listed fish should be avoided and Lookingglass Hatchery should be operated to prevent extinction of local populations.”

In 1995, fisheries co-managers, ODFW, NPT, CTUIR, and USFWS implemented the Grande Ronde Basin Endemic Spring Chinook Supplementation Program (GRESB) which is detailed in the GRESB Umbrella proposal. The goal of this program is to prevent extinction of spring chinook in three Grande Ronde tributaries, provide a future basis to reverse the decline in stock abundance, and ensure a high probability of population persistence. The GRESB proposes to increase the survival of spring chinook salmon in the Grande Ronde River by increasing egg to smolt survival through hatchery incubation and rearing (80% survival as compared to 12% survival for natural origin fish). Enhancement to listed spring chinook is expected by providing the benefits of increasing adult returns through the use of acclimated juvenile releases, similar to the Imnaha spring chinook program. Artificial production under this program is through conventional and captive broodstocks. This program is authorized by NMFS through ESA Section 10 Permits (973, 1011, 1164) and Permit Modifications (1011). Incubation and rearing of conventional and captive brood produced offspring is programmed to occur at Lookingglass Hatchery. Due to facility constraints incubation of F1 individuals from captive broodstock is currently occurring at Irrigon Hatchery, a facility designed for steelhead production, some 150 miles from Lookingglass Hatchery.

Lookingglass Hatchery is currently programmed to serve as the primary facility for four different programs and essentially eight different groups of fish although it was originally designed and constructed as a mitigation facility for two stocks of fish. Given the multiple management edicts, the increasing demand for adequate monitoring and evaluation of hatchery programs, and the extreme decline in Snake River chinook runs, this hatchery has evolved to produce:

1. Mitigation production of Rapid River fish, as required in its original LSRCP authorization;
2. Conservation production of three separate ESA programs:
 - Innaha stock conventional production;
 - Grande Ronde captive brood (consisting of Upper Grande Ronde, Catherine Creek and Lostine populations);
 - Grande Ronde conventional brood (likewise with Upper Grande Ronde, Catherine Creek and Lostine populations);
3. Lookingglass Creek natural production study;
4. M&E studies requiring partitioning of rearing areas within the existing raceways.

The co-managers have known for several years that Lookingglass has limited space for expansion and a limited clean water supply. A preliminary review of rearing capacity estimates that the facility should only rear 900,000 smolts at the Piper density index recommended by NMFS for ESA listed fish (0.13 wt/ln x ft³). Yet at full program (not accounting for segregation of different groups or to meet fish health requirements) the facility must crowd approximately two times as many fish into its available space and water. The Nez Perce Tribe has argued that the increased incidence in disease witnessed over the past five years is evidence that the facility has been exceeding its production limit. ODFW has applied to the USACE to develop an ozonation system to provide a cleaner water supply, yet the lack of space and lack of additional water source will not be alleviated. In the meantime, fish critical to the success of salmon recovery programs and development of captive broodstock technology are being incubated and reared at Irrigon Hatchery near Pendleton, OR along the mainstem Columbia River. Irrigon Hatchery is designed for steelhead production and is located approximately 150 miles from the Grande Ronde subbasin and 200 miles from the Innaha subbasin.

Steelhead

Historically, the Innaha River supported a vital run of steelhead. In the mid 1960's biologists estimated that Camp Creek, a small Innaha tributary, had between five and 11 redds per kilometer of stream (Whitesel et al. 1998a). From the late 1960's through the mid-1970's redd numbers per kilometer of stream ranged from six to fewer than one. A supplementation program was established for Innaha steelhead under the LSRCP in 1983 with objectives primarily focused on providing surplus hatchery fish for harvest. Final incubation and rearing of Innaha steelhead occurs at Irrigon Hatchery near Pendleton, OR, approximately 200 miles from the Innaha River subbasin. Typically, 330,000 smolts are acclimated and released from a facility on Little Sheep Creek. Despite meeting smolt production goals, the Innaha steelhead supplementation program has not been able to achieve its mitigation goal with any regularity nor restore and maintain the natural spawning population (Whitesel et al. 1998a). With the 1998 listing of Snake River steelhead under the Endangered Species Act, the LSRCP program has the opportunity to assume an important role in restoration of Innaha River steelhead. However, in refocusing the program, we must address several factors identified by Whitesel et al. (1998a) as limiting current program success. These include a lack of understanding of how to supplement natural production without affecting genetic and life history characteristics of the wild population and the lack of information on population dynamics in other areas (outside Little Sheep Creek) of the Innaha River subbasin.

Steelhead were also historically abundant in the Grande Ronde River subbasin. However, the precipitous decline of adult returns and low spawner abundance witnessed in the past three decades has resulted in the ESA listing of natural origin fish returning to the Grande Ronde subbasin. The LSRCP hatchery program for steelhead in the Grande Ronde was implemented in 1978 with a broodstock developed from adults collected at Snake River dams and Pahsimeroi Hatchery, ID. Final incubation and rearing of Wallowa stock steelhead occurs at Irrigon Hatchery near Pendleton, OR, approximately 150 miles from the subbasin. A total of 1.1 million smolts occurs at two acclimation facilities and 300,000 are direct released in the Grande Ronde River subbasin. The hatchery program was for harvest augmentation and not designed to enhance or supplement the natural population. Although the hatchery program has not been able to achieve its compensation goal it has allowed for reestablishment of a sport fishery in the Grande Ronde River

which receives tremendous sports fishermen support (Whitesel et al. 1998b). However, it is unclear whether the stock of fish that supports this fishery is compatible with the concerns of the ESA.

The LSRCP program has the opportunity to assume an important role in restoration of naturally spawning Grande Ronde River steelhead, however, resolution on the appropriate broodstock for supplementation and the lack of facilities in the basin are limiting factors. Co-managers have discussed the option of changing to a locally-adapted broodstock. This would require baseline data collection on population dynamics of natural steelhead populations, identification of the appropriate stock unit in the basin, determining how to collect sufficient numbers of fish for broodstock, and deciding whether harvest would be permitted (Whitesel et al. 1998b).

Fall chinook

Snake River fall chinook salmon numbered over 72,000 fifty years ago, but only 400 adults were counted at Lower Granite Dam in 1994 (NMFS 1995). Snake River fall chinook salmon are listed as threatened under the Endangered Species Act. The LSRCP program mitigates for lost fall chinook production with production at Lyons Ferry Hatchery on the Snake River. However, until 1996, all releases of Lyons Ferry fall chinook were released below Lower Granite Dam. Fall chinook have never been supplemented in the Imnaha and Grande Ronde rivers.

Coho salmon

Historically, the Grande Ronde River subbasin was the largest producer of coho salmon in the Snake River. Estimated returns to the Columbia River at the turn of the century were 20,000 fish (Cramer and Witty 1998). Coho were eliminated from the Grande Ronde River system due to overharvest in the Columbia River mainstem and ocean, passage mortality at mainstem dams and habitat degradation within historic spawning and rearing areas (Bryson 1990, Cramer and Witty 1998, Wallowa County and Nez Perce Tribe 1993). Coho were declared extinct in the Snake River in 1986. Coho were not included in the LSRCP program and the loss of this population has never been mitigated for. A report evaluating the feasibility of reintroducing coho salmon to the Grande Ronde river concludes the prospect for successful introduction are good, however, passage mortality and harvest rates under current conditions are too high for natural production to be self-sustaining without supplementation (Cramer and Witty 1998).

Sockeye salmon

Peak production of adult sockeye salmon from Wallowa Lake was estimated between 24,000 and 30,000 fish prior to 1900 (Cramer and Witty 1998). Sockeye salmon became extinct in the Wallowa Lake/River (tributary to Grande Ronde River) system in the early 1900's as a result of unscreened irrigation diversions, overharvest, and a poorly operated fish culture program (Bryson 1990, Cramer and Witty 1998, Wallowa County and Nez Perce Tribe 1993). A dam built at the outlet of Wallowa Lake in 1916 has precluded the establishment of sockeye runs. The loss of this population has never been mitigated for. A report evaluating the feasibility of reintroducing sockeye salmon to Wallowa Lake determines the prospects for successful introduction are fair, but expensive (Cramer and Witty 1998).

b. Rationale and significance to Regional Programs

This project is authorized by Columbia Basin FWP (NPPC 1994) Measure 7.4L1 which directs the BPA to fund planning, design, construction, operation, maintenance and evaluation of artificial production facilities to raise chinook salmon and steelhead for enhancement in the ...Grande Ronde and Imnaha rivers.

Implementation of facilities proposed under this project will further development of FWP (NPPC 1994) Measures 7.4D (Captive Brood Stocks), 7.4F (Portable Facilities for Adult Salmon Collection and Holding, and for Juvenile Salmon Acclimation), and 7.4O (Small-Scale Production Projects). This project is similar to other supplementation projects authorized by the FWP Measures 7.4K(Yakama Production Facilities) and 7.4M (Nez Perce Tribal Hatchery).

Artificial propagation facilities proposed under this project are consistent with those recommended by the Independent Scientific Advisory Board Scientific Review Team (SRT 1998). Proposed facilities are intended to be small-scale, low-cost,

temporary/portable in nature, and located in the natal watershed of the population being supplemented. We propose to use the Natural Rearing Enhancement System (NATURES) developed and researched by NMFS (Maynard et al. 1996) to incubate and rear fish. The NATURES concept modifies standard hatchery aquaculture practices in an attempt to mimic natural conditions. For example, water temperature, photo period, density, and/or rearing containers during each life history stage can be modified or managed to mimic natural conditions. The overall goal is to produce a fish that mimics similar life history characteristics as its wild counterpart in an attempt to avoid domestication effects and increase post-release survival.

Proposed facilities for spring chinook, fall chinook and steelhead will be integrated and operated in conjunction with, and in some cases, authorized by LSRCP programs. Planning, design, and development of facilities is accomplished cooperatively between co-managers NPT, ODFW, CTUIR, and USFWS.

The supplementation programs which will be implemented through the construction of proposed facilities are supported by recommendations in the Snake River Recovery Team's report (SRSRT 1994), *Wy-Kan-Ush-Mi-Wa-Kish-Wit* (CRITFC 1995), the NMFS draft recovery plan (NMFS 1995), and the Columbia Basin Fish and Wildlife Program (NPPC 1994).

c. Relationships to other projects

Artificial propagation facilities being planned under this project are necessary to implement salmon recovery for Imnaha and Grande Ronde (see GRESP Umbrella Proposal) spring chinook. These facilities will be utilized in conjunction with LSRCP facilities to meet program objectives. New facilities will provide the necessary additional incubation and rearing space (with sufficient segregation capability for monitoring and evaluation and fish health requirements) for conventional and captive brood production. In addition, these facilities will be in natal watersheds and will utilize ambient water for rearing. New facilities proposed by this project are integral to the success of the following BPA funded projects: 9801001 (ODFW Captive Brood), 9801007 (NPT Captive Brood), 9800702 (NPT O&M/M&E), 9800703 (CTUIR O&M/M&E), 9800704 (ODFW O&M/M&E).

This project is closely allied with other NPT supplementation projects (Nez Perce Tribal Hatchery – 8335000, Johnson Creek Artificial Propagation Enhancement - 9604300, and Pittsburg Landing, Capt. John Rapids, Big Canyon Acclimation Facilities – 9801005). These projects will share knowledge on development of NATURES incubation and rearing techniques, production operations, and results from monitoring and evaluation studies. The M&E Plan for NPTH (Steward 1996) has already been useful to planning for these supplementation projects by providing a template for similar M&E studies. Technology developed from the Yakama Klickitat Fisheries Project will also be integrated into Northeast Oregon facilities.

Other BPA funded projects that will be involved with the proposed facilities and fish produced in them are:

- 9202604 - Early Life History of Spring Chinook. This project's trapping data will be used to evaluate the success of the Program and provides habitat use information.
- 8712703 - Smolt Monitoring Project - Imnaha River Smolt Monitoring Project. These studies focus on emigration survival, timing, and life history characteristics and intensively monitor emigration of hatchery and natural steelhead from the Imnaha River system.
- 8909600 - Genetic Monitoring and Evaluation of Snake River Salmon and Steelhead.
- 9403300 - Fish Passage Center's Smolt Monitoring Project. Juvenile and natural salmon produced in relation to these facilities will provide release and migration data for in-river information on migration timing and survival.

- 9600800 - PATH (Plan for Analyzing and Testing Hypotheses). Naturally-produced juveniles from targeted streams will provide data for life cycle model

Habitat improvement projects identified in the FWP that will enhance survival of fish produced under this proposal are:

- 8402500 - Grande Ronde Habitat Enhancement (ODFW). Improvement in habitat will increase likelihood of program success.
- 9608300 - Grande Ronde Habitat Enhancement (CTUIR). Improvement in habitat will increase likelihood of program success.
- 9402700 - Grande Ronde Model Watershed. Juveniles produced by these facilities will provide information on habitat utilization and juvenile production.
- 9403900 Wallowa Basin Project Planning. Improvement in habitat will increase likelihood of program success.
- 9702500 Wallowa/Nez Perce Salmon Habitat. Improvement in habitat will increase likelihood of program success.

d. Project history (for ongoing projects)

The Imnaha and Grande Ronde subbasins are located in northeastern Oregon, encompass more than 300 miles of tributaries and empty into the Snake River approximately 500 miles from the Pacific Ocean. In 1987, the Northwest Power Planning Council (NPPC 1994) authorized planning, design and construction of propagation facilities for the Grande Ronde, Imnaha, Walla Walla, Umatilla and Hood River basins with the intent of doubling adult salmon returns to the mouth of the Columbia. This project became known as Northeast Oregon Hatchery (NEOH). The Nez Perce Tribe was contracted to develop NEOH master plans for the Grande Ronde and Imnaha River subbasins in coordination with the Oregon Department of Fish and Wildlife (ODFW) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

Draft master plans for spring and fall chinook (Bryson 1990 and Larson 1990) in the Imnaha and Grande Ronde subbasin were developed in 1990. However, these plans were never finalized and the project was postponed due to management issues associated with the listing of Snake River chinook and sockeye salmon under the Endangered Species Act.

This project was reinitiated in 1997 but with a shift in emphasis from attempting to meet the NPPC's doubling goal to preventing extinction and addressing recovery of ESA listed fish. The original concept for the NEOH master plans called for "new" production that would be additional to the Lower Snake River Compensation Plan (LSRCP) production currently occurring at Lookingglass Hatchery. However, the continuing decline of spring chinook salmon runs and the subsequent overload this caused on Lookingglass Hatchery to forestall extinction of Northeast Oregon chinook has caused us to refocus our planning efforts.

We have determined that the priority of the NEOH program should be to reshape and modify existing hatchery programs and develop new facilities to implement salmon restoration programs (Ashe 1998). Co-managers have been concerned for several years about limited space and clean water supply at Lookingglass Hatchery. The Nez Perce Tribe has argued that the increased incidence in disease witnessed over the past five years is evidence that the facility is showing symptoms of a chronically ill patient. As described above in Section 8a, fish restoration programs are being constrained by limitations of this facility. Additionally, despite the importance of supplementation activities in restoring Snake River salmon populations there is currently no facility that exists in the Snake River basin specifically designed as a conservation facility to produce fish that mimic their wild counterparts. Recommendations on artificial production by the Scientific Review Team (1998) emphasize the use of NATURES incubation and rearing and small facilities located in natal watersheds.

In order to support our focus we initiated an independent review of Lookingglass Hatchery in 1998 to determine facility capacity and ability produce the programs currently permitted (ESA Section 10) and programmed for production. Preliminary results indicate it would take four hatcheries the size of Lookingglass to accomplish production currently programmed there (Bill Blaylock, Montgomery Watson, pers. comm.). We also investigated water sources for developing a facilities in natal watersheds. Well testing was initiated at proposed spring chinook incubation and rearing facility sites on the Imnaha and Lostine rivers. For planning purposes, we must establish that a water source is available that meets quality and quantity requirements for pathogen free incubation at the proposed sites.

Our master planning progress was severely impeded in 1998 by lack of timely funding. We submitted our budgets to BPA by October of 1997 but did not actually receive a signed contract until half a year later in March 1998. Progress by our consultants on completing subcontracts for the master plans had to be halted and we were not able to hire the lead writer until we received our contract. Despite the schedule deviation, our efforts under this program were successful at reaching an agreement with our co-managers on a broodstock management strategy for spring chinook in the Imnaha and Grande Ronde. The NEOH project is a cooperative endeavor, and differences in management philosophies had caused the NPT and ODFW to be in dispute on this fundamental aspect of fisheries production for Imnaha spring chinook since 1993. In 1998, a broodstock management strategy (sliding scale) was cooperatively developed after both parties reviewed a document (funded under this project) produced to resolve the dispute. The management strategy developed for the Imnaha spring chinook was then used as a template for developing a management plan for the Grande Ronde Endemic Spring Chinook Supplementation Project (GRESPP). To obtain a section 10 permit to operate the program in 1998 NMFS required the co-managers develop a management plan that integrated captive and conventional broodstock production. Section 10 permit applications that included the broodstock management plan were developed cooperatively for the Imnaha (ODFW 1998a) and Grande Ronde (CRITFC 1998, ODFW 1998b) and filed with NMFS who then authorized collection of spring chinook and propagation of this listed species. We also used these agreements and management plans to guide us in proceeding with production planning.

Major results achieved can be summarized from reports produced from this project. They are:

- Draft Master Plans – Imnaha and Grande Ronde spring and fall chinook salmon (Larson 1990 and Bryson 1990).
- Siting Reports (Montgomery Watson 1992a and 1995b).
- Conceptual Design Reports (Montgomery Watson 1992b and 1995a).
- Test Well Drilling Reports - (Montgomery Watson 1992c and 1998).
- Genetic Risk Assessments - (Neeley et al. 1993 and Neeley et al. 1994).
- Feasibility for Reintroducing Sockeye & Coho Salmon in the Grande Ronde River, Final Report (Cramer and Witty 1998). Precursor document to master planning.
- Imnaha River Spring Chinook Fisheries Management Plan (Mundy and Witty 1998).
- Cultural Resource Survey Reports (Lyon 1998).

e. **Proposal objectives**

Objective 1. Continue planning and development of conservation facilities necessary for implementation of spring chinook restoration programs in the Imnaha and Grande Ronde rivers.

We anticipate submittal of the Imnaha and Grande Ronde River Spring Chinook Master Plan and draft NEPA document to the NPPC in April 1999. This submittal date is contingent upon timely completion the Independent review of Lookingglass Hatchery to determine the size of new incubation and rearing facilities. This will initiate Step 1 of the NPPC 3-Step Review Process. Following approval of the master plan in August 1999 we would initiate Preliminary Design and finalizing NEPA analysis. In 2000, we anticipate completion of Preliminary Design and NEPA analysis for incubation and rearing facilities in the Imnaha and Lostine rivers. Following NPPC approval, we will initiate Final Design for these facilities. Final design and cost estimates for the Imnaha facility is scheduled to be submitted to the NPPC in October 2000, which will initiate the nine week Step 3 of the Review Process. Potentially a decision could be made approving construction before the end of 2000.

Objective 2. Continue planning and development of facilities to implement coho salmon reintroduction program in lower Grande Ronde and Willowa rivers.

Co-managers are still finalizing the reintroduction plan for coho and therefore facilities necessary to implement it are undecided. However, we anticipate at least one incubation and rearing facility, several side channel rearing/acclimation facilities, and several temporary/portable adult collection facilities. All facilities will be designed with the NATURES approach. In 2000, we anticipate Step 1 review of the coho master plan, and following NPPC approval, initiating Preliminary Design and NEPA analysis of proposed facilities. We will also develop a comprehensive monitoring and evaluation plan that is integrated with ongoing research and other monitoring and evaluation programs in the subbasin.

Objective 3. Continue planning and development of conservation facilities necessary to implement fall chinook restoration programs in the Imnaha and Grande Ronde rivers.

Co-managers are developing a management plan for Snake River fall chinook through the U.S. v. Oregon Columbia River Fish Management Plan process which is scheduled for completion in July 1999 so new facility requirements are pending. However, we anticipate the necessity for at least three acclimation and release facilities: modification of the Cottonwood Creek Steelhead Acclimation Pond and development of a side channel (Grande Ronde) and a temporary/portable acclimation facility (Imnaha). We anticipate submittal of the Imnaha and Grande Ronde River Fall Chinook Master Plan to the NPPC in October 1999. In 2000, we anticipate Step 1 review of the master plan, and following NPPC approval, initiating Preliminary Design and NEPA analysis of proposed facilities.

Objective 4. Evaluate existing steelhead supplementation programs and identify options for development of conservation facilities required to implement a restoration program.

Co-managers plan to use the planning process to 1) Develop a plan for collection of baseline data from natural origin steelhead in appropriate subbasin tributaries, 2) Determine critical uncertainties regarding the condition of steelhead populations in the Grande Ronde and Imnaha subbasins, 3) Initiate review of existing production facilities and the potential for modification to meet restoration program needs, 4) Identify potential options for new supplementation programs and/or modification of existing LSRCP supplementation programs to implement restoration program, and 5) Identify potential site locations for adult trapping facilities, incubation and rearing facilities, stream-side incubators, acclimation and release facilities.

Objective 5. Develop a master plan to implement sockeye salmon reintroduction program in Willowa Lake (Grande Ronde River).

Planning efforts in 2000 will focus on evaluating potential donor stocks to implement a reintroduction program. Completion of the sockeye master plan is not anticipated until 2001, however, proposed facilities will most likely include a small incubation facility, net pen rearing in Willowa Lake and some alternative strategies for accommodating fish passage through the thermal blocks in the Grande Ronde River and over Willowa Lake Dam.

Objective 6. Coordinate planning and development of NEOH facilities with appropriate entities.

An extensive amount of effort is involved in coordinating this project. An NEOH Planning and Coordination Team formed of representatives from NPT, ODFW, CTUIR, USFWS, BPA, NPPC, and Montgomery Watson meets regularly to guide development of this project. Additional coordination will be required in all phases of planning and development of proposed facilities with many different entities (ODFW, CTUIR, WDFW, USFWS, LSRCP, NMFS, NPPC, CRITFC, CBFWA, USFS, COE, private landowners, etc.).

Objective 7. Collect and analyze baseline environmental data at proposed facility site locations.

This primarily involves collection of water temperature and flow data using thermographs and gauging station information which will be used for facility engineering and design.

Objective 8. Transfer of technology.

Communication of results is essential for practical adaptive management of artificial production facilities in the Columbia River Basin. Technology developed from this project will be distributed through reports, presentations, and publications.

f. Methods

Objective 1 – 5: Methods utilized to plan and develop artificial propagation facilities under this project are consistent with the NPPC 3-Step Review Process of new production initiatives which involves: Step 1- conceptual planning and master plan development; Step 2 – preliminary design and cost estimation, as well as environmental (NEPA and ESA) review; and Step 3 – final design review prior to construction and operation.

Step 1: Development of a master plan document in accordance with Measure 7.4B of the FWP (NPPC 1994) which lists 22 items that must be addressed (project goals, critical uncertainties, ecological assessment, benefit:risk assessments, monitoring and evaluation plan, conceptual design and cost estimates of proposed facilities, etc.). This document is essentially a comprehensive management plan. Prior to completion of master plans for some species additional other issues must be addressed:

- Development of feasibility reports for reintroducing species that have been extirpated (coho and sockeye) prior to master planning.
- Evaluation of donor stock requirements and availability for reintroduction programs.
- Siting of proposed facilities in each subbasin – an example of considerations include water quantity and quality, land ownership, relation to spawning habitat, etc.
- Evaluation of existing facilities to meet program needs and objectives.
- Cultural resource surveys of proposed facility sites.
- Development of integrated monitoring and evaluation programs utilizing ongoing research under LSRCP and other BPA funded projects.
- Developing a plan to establish baseline data on a population prior to supplementation.
- Conceptual design and cost estimates for proposed facilities. This work is subcontracted to the engineering firm Montgomery Watson.

Step 2:

- NEPA analysis. BPA is the lead on conducting Environmental Assessments or Environmental Impact Statements of proposed facilities.
- ESA Consultation. We will work with our co-managers to develop appropriate permit applications and consultations for proposed facilities and programs. For the spring chinook programs these are already in place.
- Preliminary design and cost estimates. Montgomery Watson will prepare design documents and cost estimates in coordination with co-managers.

Step 3:

- Final design. We anticipate the final design process will proceed similarly to Nez Perce Tribal Hatchery. An engineering firm will be selected and work closely with a NATURES design team to develop final design and cost estimates.

We have been concentrating on spring chinook planning as the priority species because they are still present in the subbasins, they are at high risk of extirpation, and we have a co-manager approved management agreement. Therefore the planning process is the most advanced for this species. The anticipated timeline for completion of this planning process follows.

April 1999	NPPC Step 1 Review of spring chinook master plan – 18 weeks
August 1999	NPPC Approval of master plan Initiate Preliminary Design (30%) and finalize NEPA document for Imnaha facilities – 16 weeks
January 2000	Submit Imnaha Design and NEPA documents for NPPC Step 2 Review – 9 weeks

	Initiate Preliminary Design (30%) and finalize NEPA document for Lostine facility – 16 weeks
March 2000	NPPC Approval of Imnaha Preliminary Design and NEPA analysis.
	Initiate Imnaha Final Design – 24 weeks
June 2000	Submit Lostine Design and NEPA documents for NPPC Step 2 Review – 9 weeks
August 2000	NPPC Approval of Lostine Preliminary Design and NEPA analysis.
	Initiate Lostine Final Design – 24 weeks
October 2000	Submit Imnaha Final Design for NPPC Step 3 Review – 9 weeks
December 2000	NPPC Approval of Imnaha Final Design and Construction.
January 2001	Begin land acquisition and construction of Imnaha facilities.
March 2001	Submit Lostine Final Design for NPPC Step 3 Review – 9 weeks
May 2001	NPPC Approval of Lostine Final Design and Construction Begin land acquisition and construction of Lostine facilities.

Objective 6: Project coordination and development is facilitated through an NEOH Planning and Coordination Team formed of representatives from NPT, ODFW, CTUIR, USFWS, BPA, NPPC, and Montgomery Watson which meets regularly to guide this project. The project leader and coordinator represent this project in appropriate technical and management forums with various entities. Additional coordination activities include:

- Cooperatively develop appropriate permit applications and biological assessments proposed facilities.
- Coordinate with landowners of facility sites.
- Coordinate with other co-managers, regarding relevant management issues, through *U.S. v. Oregon* Production Advisory Committee and Technical Advisory Committee forums.
- Consult with NMFS regarding the consistency of various aspects of this project with regard to recovery planning for chinook salmon in the Imnaha and Grande Ronde subbasins.
- Facilitate the use of collected data with co-managers.

Objective 7: Water temperature information is monitored by Hobo thermographs that are deployed in several locations near proposed facility sites. A fisheries technician is responsible for monitoring, maintenance and downloading data from the thermographs. Flow information is obtained from USGS stream gages and data collection at specified transects.

Objective 8: Communication of results is essential for practical adaptive management of artificial production facilities in the Columbia River Basin. Technology developed from this project could be instrumental in modifying hatchery programs to restore listed salmon species.

- Prepare and provide quarterly reports summarizing activities accomplished during the quarter. Report will be submitted 15 days after the end of the quarter.
- Present reports on project activities and findings at Annual BPA/CBFWA Project Review and other forums (i.e., AFS, NAFWS, LSRCP Annual Review).

Critical Assumptions: We assume that documents submitted in the NPPC 3-Step Review Process will be approved and the project will advance to the next step. Development of supplementation facilities for restoration assumes that limiting factors affecting survival of Snake River salmon will be addressed in the near future. Our efforts will be negated if improvements in smolt to adult survival to allow net replacement are not forthcoming.

Potential Risks: If proposed facilities are not constructed in a timely fashion some components of existing supplementation projects may have to be terminated or moved to other facilities (e.g., captive broodstock) and reintroduction of extirpated species will likely not proceed. Development of these facilities is on the premise that artificial production plays a vital role in preventing extinction and restoration of ESA listed salmon. Risks associated with any supplementation project include, but are not limited to, decreases in

genetic variability, increased incident of disease transmission, loss of animals because of stress, lack of water supply or other mishaps, change in the age composition of the spawning cohort.

Expected Results: Operation of conservation hatcheries and supplementation will provide a refuge from severe environmental disturbance, provide a buffer against extipation, minimize loss in genetic variability, and restore the role of salmon in effected ecosystems.

g. Facilities and equipment

The Northeast Oregon Hatchery master plan project is conducted out of the Nez Perce Tribe's office in Lapwai, ID and Enterprise, OR. Office facilities, computers, and vehicles are considered adequate for all administrative and personnel needs.

h. Budget

Personnel – This project requires a project leader (0.9 FTE), an assistant project leader (0.25 FTE), a lead writer (1 FTE), and a monitoring and evaluation program coordinator/planner. Administrative support is necessary from the program director, contract administrator, production director and coordinator and research director and coordinator.

Fringe benefits – Fringe benefits are provided to full time employees at 24% and to non-taxable employees at 14%.

Operations and Maintenance – This category includes office rent and utilities, telephone expenses, equipment (thermograph) maintenance, and office supply items.

NEPA costs – These cost estimates were provided by BPA. We anticipate an EIS for coho and fall chinook facilities in 2000 at a cost of \$150,000 each.

Construction related expenses – Cost estimates were provided by Montgomery Watson. We anticipate final design for two incubation and rearing facilities and an acclimation facility in 2000.

Travel – The bulk of expense is airfare and perdiem for regular trips to Portland associated with project coordination and development. Also included are expenses for two GSA vehicles and training for project personnel.

Indirect costs – The Nez Perce Tribe indirect rate is 22.9%.

Subcontracts – Consultant support for steelhead planning and facilitation of master plans development, preliminary and final design, NEPA analysis, and NPPC 3-Step Review Process.

Section 9. Key personnel

Becky Ashe, NEOH Project Leader (0.9 FTE)

Project implementation, management and coordination, budget preparation and management, contract and subcontract preparation and management, development of required plans and reports, personnel supervision, coordinator of NEOH Planning and Coordination Team.

EDUCATION:

M.S. in Biology with Fisheries emphasis, Eastern Washington University, 1991

B.S. in Biology, EWU, 1989

PROFESSIONAL EXPERIENCE:

- Project Leader, Nez Perce Tribe, Lapwai, ID, Jan. 1997 - Present
Northeast Oregon Hatchery Master Plan
Lostine Supplementation Project
Imnaha Steelhead Supplementation
- Project Leader, Nez Perce Tribe, Lapwai, ID, May 1994 - Present
Integrated Hatchery Operations Team
- Assistant Project Leader, Columbia River Inter-Tribal Fish Commission, Lewiston, ID, July 1991 - Feb. 1993
Managed CRITFC field office, manage and coordinate northern squawfish predation project on Snake and Columbia River mainstem dams.
- Project Director/Research Associate, Upper Columbia United Tribes, Cheney, WA
Sept. 1990 - Feb. 1992

Developed Nez Perce Tribe Fish Health Policy and Kalispel Tribe Fisheries Management Plan, co-authored over 10 other publications regarding Integrated Hatchery Operations Team Policies and Procedures Manual, reintroduction of coho salmon in the Clearwater River, predation by northern squawfish, assessment of thermomechanical pulp mill, and baseline fisheries investigations.

RECENT PUBLICATIONS:

- In prep. Master Plan for Imnaha and Lostine River Spring Chinook Salmon. Bonneville Power Administration, Portland, OR. (Nez Perce Tribe).
1996. Nez Perce Tribe 1994 Annual Production Report, Sweetwater Springs Hatchery, Spring Chinook Salmon. Nez Perce Tribe Department of Fisheries Resource Management, Lapwai, ID. (Ashe, B.L, R.E. Larson, G.W. Walker, and D.B. Johnson.)
1995. Spring outmigration of wild and hatchery chinook salmon and steelhead trout smolts from the Imnaha River, March 1 - June 15, 1994. Bonneville Power Administration, Portland, OR. 76 pp. (Ashe, B.L., A.C. Miller, P.A. Kucera, M.L. Blenden).

Rick Zollman, NEOH Assistant Project Leader (0.25 FTE)

Assists with project implementation, management and coordination, budget preparation and management, development of required plans and reports, personnel supervision, and coordination of NEOH Planning and Coordination Team. Provides fish culture specifications and requirements for facility planning and design, assists with site selection and landowner coordination.

EDUCATION:

A.S. Fisheries Science from Mt. Hood Community College

PROFESSIONAL EXPERIENCE:

- Acting Manager, Eagle Creek National Fish Hatchery,USFWS, 1993-1996
- Acting Assistant Manager, Eagle Creek National Fish Hatchery, USFWS, 1990-1993

- Work Leader, Eagle Creek National Fish Hatchery, USFWS, 1987-1990
- Fish Culturist, Eagle Creek/Dworshak National Fish Hatchery, USFWS, 1981 - 1987

SKILLS:

Management and operation of major anadromous hatchery program (2.5 million smolts), associated structures, and basin co-management. Experience with all life stages of culturing spring chinook salmon, coho salmon, and winter steelhead. Management and training of hatchery staff : four FTE fish culturists, maintenance personnel, and temporary helpers that ranged from 2 to 12 depending on work loads. Experience with communication and coordination involving federal, state, tribal, and private entities.

TRAINING:

Training was implemented by USFWS and included disease short courses, work force management and cross training at other federal hatcheries. The most recently completed training was Fish Genetics in February 1997.

AWARDS:

USFWS Special Achievement Award, several Quality Performance Awards, and Fish Culturist of the Year in 1987.

Roy Edward Larson, Director of Production (.15 FTE)

Provides oversight, supervision and direction for management of the NEOH master plan project.

EDUCATION

M.S. in Veterinary Science, University of Idaho, 1972

B.S. in Agriculture, University of Idaho, 1970

PROFESSIONAL EXPERIENCE

- **Production Director - Nez Perce Tribe Lapwai, ID Oct 1990 - Present.**
Nez Perce Tribal Hatchery, North East Oregon Hatchery, Johnson Creek Supplementation Project, Fall Chinook Acclimation Facilities
- **Production Biologist - Nez Perce Tribe Lapwai, ID Sept 1987 - Sept 1990**
Nez Perce Tribal Hatchery, Imnaha Master Plan, Subbasin Planning
- **Hatchery Manager - Northern Southeast Regional Aquaculture Association, Sitka AK, Sept 1980 - Oct 1984**
Medvedjie Central Incubation and Rearing Facility for spring chinook, chum and coho salmon.
- **Project Leader - Northern Southeast Regional Aquaculture Association, Juneau AK, Apr 1980 - Sept 1980.**
Salmon Creek Central Incubation and Rearing Facility for pink, chum and coho salmon.

Twenty two years of experience managing fish culture, fish health, multiple species and innovative supplementation techniques to restore and recover weak or endangered species. Eleven years experience developing the Nez Perce Tribe anadromous and resident fish production programs and coordinating tribal production activities under the Northwest Power Planning Act. Fifteen years experience developing and overseeing contracts for various funding agencies. Twenty two years of experience supervising technical and professional fisheries staff.

PUBLICATIONS

Larson, R.E. and Moberg, L. 1992. Nez Perce Tribal Hatchery Master Plan and appendices. Bonneville Power Administration. Project No. 83-350. Contract No. DE-AI79BP36809.

Larson R.E. and Jose, J.R. 1988. A report of the 1987 - 88 mid-winter supply survey for the Nez Perce Tribe=s low capital low technology anadromous salmonid hatchery project: 83-350 BPA agreement No. DE-AI79BP36809.

David B. Johnson, Production Coordinator (0.25 FTE)

Provides project coordination in US v. Oregon, NMFS, NPPC, and CBFWA forums and assists in budget development and coordination, contract and subcontract review, report writing, NEPA document preparation, and project technical coordination, oversight, and management direction.

EDUCATION

M.S. in Biology, Northern Arizona University, 1982

B.S. in Biology, Northern Arizona University, 1979

PROFESSIONAL EXPERIENCE

- Production Coordinator - Nez Perce Tribe Lapwai, ID Oct 1997 - Present.
Nez Perce Tribal Hatchery, Northeast Oregon Hatchery, Johnson Creek Supplementation Project
- Senior Monitoring and Evaluation Biologist - Nez Perce Tribe, Lapwai ID Oct 1993 - Oct 1997.
Nez Perce Tribal Hatchery
- District Fish Biologist - North Fork Ranger District, Clearwater National Forest, Orofino, ID. May 90 - Oct 1993
Staff leader for fish, wildlife and watershed programs.
- Assistant to Fisheries Program Manager - US Forest Service, Northern Region, Regional Office, Missoula, MT. Jan 1989 - May 1990.
Snake River Basin Adjudication, technology transfer.
- Area Fisheries Biologist - Bureau of Indian Affairs, Albuquerque Area Office, Albuquerque NM Mar 1987 - Dec 1988.
Technical assistance in fisheries to 14 Indian Tribes
- Fisheries Biologist - Nez Perce Tribe, Lapwai, ID. May 1984 - Mar 1987.
Stream surveys, steelhead ecology, production planning

Skills: Fifteen years of experience conducting field work, and providing management direction on fisheries and watershed projects. Responsible for providing and coordinating analysis of effects, including hatchery production, on aquatic habitat and biota sufficient to meet NEPA and ESA requirements. Responsible for overseeing development and completion of NPTH M&E Plan. Eleven years of experience working in the Snake River basin, specifically in the Clearwater Subbasin, on issues related to hatchery and natural production, interagency coordination, ESA, and Nez Perce Tribal fishing rights.

RECENT PUBLICATIONS

Johnson, D.B. and S. Sprague. 1996. Preliminary monitoring and evaluation results for coho salmon outplanted in the Clearwater River subbasin, Idaho, 1995. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai, Idaho.

Johnson, D.B., R.E. Larson and C. Steward. 1995. Supplement to the Nez Perce Tribal Hatchery master plan. Department of Fisheries Resources Management, Nez Perce Tribe, Lapwai, Idaho.

Section 10. Information/technology transfer

Technical information will be distributed through quarterly and annual reports, master plan documents, Biological Assessments/Biological Opinions, Construction Memorandums, NEPA documents, ESA permits, NPPC 3-Step Review Process, publications in scientific journals, technical presentations (LSRCP program review, CBFWA project review workshops), and public review forums.

Congratulations!