

Pacific Coastal Salmon Recovery Fund

FY 2000-2005

**Nez Perce Tribe
Clearwater River Coho Salmon
Monitoring and Evaluation (M&E) Project III**

Project Name: Nez Perce Tribe Clearwater River Coho Salmon Monitoring and Evaluation Project III

PCSRF Project Number: Contract Number: T05-11, P.O. Number: 0501110

Project Status: Ongoing

PCSRF Fiscal Year: 2005

PCSRF Budget Update: The following budget (Table 1) covers expenditures for Coho Salmon Reintroduction Project for the period of October 1, 2005 to Dec 31, 2007.

Table 1. Itemized budget for 2005 to 2007 for the Coho Salmon M&E Project.

Budget Line Item	Requested/Appropriated	Expended (April 30, 2006)	Remaining
Salary & Fringe	\$ 40,372.00	\$ 24,122.67	\$ 16,249.33
Travel	\$ 776.00	\$ 0.00	\$ 776.00
Supplies	\$ 59,356.00	\$ 39,737.71	\$ 19,618.29
Indirect	\$ 17,362.00	\$ 7,276.00	\$ 10,086.00
Total	\$ 117,866.00	\$ 71,136.38	\$ 46,729.62

Date: October 1, 2005

Project Proposed End Date: December 31, 2007

Geographic Area Name/Watershed: Clearwater River Watershed

Geospatial reference/Location/GPS Point: 46N25'39", 117W25'44"

Project Manager:

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PCSRF Objective: D: Salmon Research, Monitoring, and Evaluation.

Project Description:

The goal of the project is to restore coho salmon in the Clearwater River. Restoration of coho stocks upriver of Bonneville Dam has been a priority for the four Columbia River Tribes. The Nez Perce Tribe (NPT) initiated coho salmon restoration in 1995 by releasing 630,000 coho salmon parr in five streams. These were the first coho salmon released in the Snake River Basin in 30 years. Coho were extirpated in the Snake River Basin until 1997 when 92 adults from the Nez Perce Tribe's program were recognized at Lower Granite Dam.

Broodstock from Lower Columbia River hatcheries and returning Clearwater River broodstock, have been used to stock eyed eggs, fry, parr, and smolts into tributaries of the lower main stem Clearwater, Middle Fork Clearwater and South Fork Clearwater Rivers. Primary reintroduction efforts have been focused in Lapwai Creek, Potlatch River, Clear Creek, Eldorado/Lolo Creek, Meadow Creek (SF Clearwater River) and Meadow Creek (Selway River).

Target Salmon Species Affected/Benefits to Salmon:

The intended benefit of the program is that coho salmon will be restored to sufficient numbers in the Clearwater River subbasin to support natural production, and tribal and non-tribal harvest. Initially, we estimate the population needs to be at least 2,358 adults for both hatchery and natural spawning and additional adults to provide meaningful harvest. This level of production would provide for a Clearwater broodstock to be self-sustaining and provide all the eggs for both the in-basin and the out-of-basin production. Our long-term adult return goal for the Clearwater River is 14,000 coho salmon, as identified in Wy-Kan-Ush-Mi-Wa-Kish-Wit (CRITFC 1996).

Project Objectives:

The objectives, tasks, and activities of the Nez Perce Tribe Clearwater River Coho Salmon Reintroduction Project M&E plan have been formulated to insure that operations can be adaptively managed to optimize hatchery and natural production, sustain harvest, and minimize ecological impacts.

Objective 1. Determine if program targets for contribution rate of hatchery fish are being achieved and can be improved.

Task 1.1. Monitor fish culture and hatchery operational practices at each of the facilities utilized for the project.

Activity 1.1.1. Assist in the development of a Nez Perce Tribe coho salmon annual operation plan.

Activity 1.1.2. Quantify adult returns to each weir/broodstock collection site.

Task 1.2. Estimate the number of smolts and adults produced from each hatchery by treatment and rearing strategy.

Activity 1.2.1. Mark a portion of the hatchery-reared coho salmon with a unique mark so they can be detected as smolts and as adults (Table 2).

Table 2. Proposed coho salmon production, mark and tag totals for 2006.

Location	Stage	# Release	PIT	CWT	Adult Collect	Screw Trap
Lolo Creek	Pre-smolt	270,000	30500	120,000	Yes	Yes
Lapwai Creek	Smolt	275,000	1,000	100,000	Yes	No
Potlatch River	Smolt	275,000	1,000	100,000	Yes	No
Clear Creek	Smolt	280,000	1,500	120,000	Yes	No
Dworshak	-	-	-	-	Yes	-

Activity 1.2.2. Estimate abundance of hatchery fish departing as smolts equivalents from selected treatment streams.

Activity 1.2.3. Estimate total hatchery adults produced from each release in each stream.

Task 1.3. Estimate survival from egg-to-smolt, release-to-smolt, mainstem passage survival, and smolt-to-adult survival for various treatments in each release stream.

Activity 1.3.1. Estimate release-to-smolt, and egg-to-smolt survival for each treatment based on eggs taken, number of fish released, and number of total smolts estimated in Activity 1.2.2.

Activity 1.3.2. Estimate smolt-to-adult survival for each treatment based on smolt abundance from Activity 1.2.2 and adult abundance in Activity 1.2.3.

Task 1.4. Determine the effects of rearing and release treatments on the dispersal of juveniles and returning adults to occupy available habitat in the target streams.

Activity 1.4.1. Determine effects of treatments on proportion of juvenile emigrants moving in fall or spring by fishing screw traps. Cost sharing with BPA is ongoing.

Activity 1.4.2. Determine the effects of treatments on spawning distribution by

conducting spawner surveys.

Task 1.5. Estimate the continuing stocking rates needed in each stream to establish sustainable natural production.

Activity 1.5.1. Use monitoring and evaluation results to revise parameters in the life-history simulation model used to predict stocking rates.

Activity 1.5.2. Predict stocking rates needed for the present brood, based on percentage of spawner capacity achieved and hatchery:natural ratios among spawners.

Objective 2. Document natural production that results from supplementation, and relate them to limiting factors.

Task 2.1. Measure life history traits that may reflect limitations to natural production.

Activity 2.1.1. Monitor the timing, size and abundance of juvenile coho salmon emigrating from each target stream.

Activity 2.1.2. Estimate growth, migration timing, and survival of coho salmon.

Activity 2.1.3. Estimate age at maturity, time of river entry and spawning, and pre-spawning survival of natural and hatchery adults.

Task 2.2. Determine the influence of environmental variation on natural production.

Activity 2.2.1. Monitor environmental variables affecting fish in the treatment and reference streams.

Activity 2.2.2. Determine correlation of environmental variation to variation in coho salmon population parameters.

Task 2.3. Determine the spatial and temporal distribution of coho salmon in the Clearwater River Subbasin.

The potential exists for a great deal of cost sharing through coordination of effort with existing research in the Snake and Clearwater rivers. Personnel from other studies may be available to assist with fish handling and tagging at the Lower Granite Adult Facility.

Activity 2.3.1. Provide sampling protocol for use in the separation system at the Lower Granite Dam Adult Fish Facility.

Activity 2.3.2. Provide radio tags and data sheets for NMFS personnel at Lower Granite Dam.

Activity 2.3.3. Capture and tag at least 50 adult coho salmon at Lower Granite Dam.

Activity 2.3.4. Establish fixed monitoring.

Activity 2.3.5. Monitor tagged fish movement via vehicle, boat and aircraft.

Activity 2.3.6. Coordinate with NMFS, the US Army Corps of Engineers, the USFWS, the University of Idaho and other agencies with existing telemetry studies for additional radio tracking assistance and data sharing from fixed monitoring sites.

Objective 3. Monitor genetic profile of introduced coho salmon stock, broodstock developed from adult hatchery returns and naturally returning coho salmon adults.

Task 3.1. Collect samples to determine if there is evidence of genetic change in coho salmon.

Activity 3.1.1. Collect representative baseline genetic samples from hatchery-reared coho smolts released in Clearwater River streams. The analysis of these samples is pending future funding.

Activity 3.1.2. Initiate the development of a genetic monitoring plan.

Objective 4. Monitor the ecological interactions.

Task 4.1. Monitor the ecological interactions of residual coho salmon, hatchery reared coho parr, and naturally produced coho juveniles with other fish species.

Activity 4.1.1. Conduct a literature review of coho salmon ecological interactions with other salmonid species and identify key food and space related parameters for monitoring.

Activity 4.1.2. Determine emigration timing of PIT tagged coho parr and smolts to describe the overlap with juvenile fall chinook salmon rearing in the lower Clearwater River.

Objective 5. Effectively communicate monitoring and evaluation program approach and findings to resource managers.

Task 5.1. Facilitate effective data management and dissemination.

Activity 5.1.1. Provide data summary to StreamNet.

Activity 5.1.2. Send PIT tag files to the PIT Tag Information System (PTAGIS).

Activity 5.1.3. Report Coded-Wire Tagging summary reports to the Coded-Wire Tag (CWT) database.

Task 5.2. Communication of results and transfer of technology.

Activity 5.2.1. Develop Annual Statement of Work.

Activity 5.2.2. Develop summary reports.

Activity 5.2.3. Develop Endangered Species Act Section 7 and 10 Summary Reports.

Activity 5.2.5. Develop annual reports.

Activity 5.2.6. Develop Peer Reviewed Journal Publications

Activity 5.2.7. Participate in regional conferences and workshops.

Task 5.3. Develop and maintain open communications with all resource managers.

Activity 5.3.1. Facilitate Nez Perce Tribe Coho Salmon Reintroduction Project annual review and operating plan modification.

Activity 5.3.2. Attend research and production coordination meetings.

Project Summary:

WY-KAN-USH-MI WA-KISH-WIT: THE COLUMBIA RIVER ANADROMOUS FISH RESTORATION PLAN OF THE NEZ PERCE TRIBE, UMATILLA, WARM SPRINGS AND YAKAMA TRIBES

This Tribal Restoration Plan (CRITFC 1995) focuses on restoring salmon runs to the rivers and streams of the Columbia River system and embodies the tribal management philosophy of gravel-to-gravel management. This approach differs from many of the existing state and federal plans that are focused more on providing fish for sport and commercial harvest and returning fish to concrete hatcheries. The plan recognizes the need to ensure that salmon throughout the life cycle from the freshwater to the ocean are protected, managed or restored.

A key element in the restoration is the use of hatchery technology to supplement the natural runs rather than supplant the natural runs as with state and federal hatchery programs. Supplementation as defined in the Tribal Restoration Plan is the act of releasing young, artificially propagated fish into natural spawning and rearing habitat. As adults, these fish will return to spawn naturally in the stream where they were released rather than returning to the propagation facility. Wy-Kan-Ush-Mi Wa-Kush-Wit: Volume I: 5B-14-22; Volume II: 2-118-127. "Implement supplementation projects that have met the screening criteria of RASP (1992) and Cuenco et al. (1993), establish additional programs for each of the subbasin tributary systems to monitor adult escapement and resulting smolt production, and to evaluate (by

measuring the number of adults returning) the ability of managers to meet goals set by the Columbia River Management Plan.” The Nez Perce Tribe Coho Salmon Reintroduction Project as described in the Nez Perce Tribe coho salmon management plan for the Clearwater River is consistent with basin-wide Columbia River restoration plans found in WY-KAN-USH-MI WA-KISH-WIT, The Spirit of the Salmon (CRITFC 1995).

NEZ PERCE TRIBE COHO SALMON MANAGEMENT PLAN FOR THE CLEARWATER RIVER SUBBASIN

The Nez Perce Tribe has a vision of restoring all fish species native to the Nez Perce ICC Treaty. To that end, the Nez Perce Tribe has initiated a comprehensive management plan for all fish species- both resident and anadromous- for all streams, lakes and watersheds within their management authority. The Nez Perce Tribe began coho salmon restoration in 1995 and has developed a long-term coho salmon management plan for the Clearwater River Subbasin (NPT 2004). Coho salmon production in the Clearwater River Subbasin will be authorized under the Nez Perce Tribal Hatchery program, the Mitchell Act and U.S. vs. Oregon proceedings. Pursuant to this vision, the research data collection and analysis for the project intends to: 1) provide science-based recommendations for management and policy consideration, 2) demonstrate when the reintroduction program meets its recovery, restoration and mitigation goals and 3) assist in the re-establishment of tribal and recreational fisheries.

Project Progress Summary:

Objective 1. Determine if program targets for contribution rate of hatchery fish are being achieved and can be improved.

We coded wire tagged a portion of the hatchery release groups, so they can be detected wherever they are recovered. We also PIT tagged fish from each of the release groups of smolts and pre-smolts, so that survival to Lower Granite Dam could be estimated (Table 2).

Temporary picket-style weirs were installed to collect adult coho in Lapwai Creek and the Potlatch River. In addition, adult coho were collected from two permanent collection sites operated by the US Fish and Wildlife Service (USFWS). The first is the weir on Clear Creek managed by the KNFH and the second was the fish ladder on the North Fork of the Clearwater River managed by the DNFH. We documented adult returns to each weir/broodstock collection site. Adult fish weirs and traps were opened on or before October 1, 2005 and removed or closed on or before December 15, 2005. A total of 551 coho salmon were trapped at the Nez Perce Tribe weir sites and at other trap locations (Table 3). Coho salmon captured were interrogated for tags, and kept for broodstock or passed at the Potlatch River, Lolo Creek, or returned to the mainstem Clearwater River, depending on capture location. Fish with CWT's were sacrificed for M&E data.

Table 3. The weekly and total number of adult coho salmon captured at Lapwai Creek weir, Potlatch River weir, Clear Creek weir, Dworshak Hatchery, and Lyons Ferry Hatchery in 2005.

Period	Lapwai Creek	Potlatch River	Dworshak Hatchery	Clear Creek	Lyons Ferry Hatchery
9/30-10/7	0	1	NA ¹	NA ¹	NA ¹
10/7-10/13	0	0	5	0	20
10/14-10/20	3	1	17	0	15
10/21-10/27	50	15	18	5	23
10/28-11/3	21	57	18	41	14
11/4-11/10	17	7	13	11	15
11/11-11/17	11	15	15	0	15
11/18-11/24	43	4	14	NA ²	1
11/25-12/1	15	4	NA ³	1	NA ¹
12/2-12/8	25 ⁵	1 ⁴	NA ³	NA ³	NA ¹
Total	185	105	100	58	103

¹Fish were not sorted

²A board blew in blocking the entrance to the weir

³Trap closed

⁴A recap from the previous days release due to the weir being temporarily breached

⁵One male coho was recaptured in the Lapwai Creek weir after being released in the Potlatch River

We assembled PIT tag detections throughout the Columbia basin for fish tagged in NPT coho reintroduction streams, and estimated abundance passing Lower Granite Dam (LGR) and smolt-to-adult survival for various treatments. For brood year 2003 (migration year 2004), the SURPH survival estimate was 61.0% for acclimated smolts, 15.2% for direct release smolts and 7.1% for parr (Table 4). Survival of the acclimated smolts from KNFH was nearly four times higher than direct releases to the Potlatch River and Lapwai Creek, and over eight times higher than parr releases.

In order to calculate SAR's for each treatment stream, the stray rate was calculated for each collection facility based on known origin fish from CWT and PIT tag returns. This was applied to the total number of fish intercepted at each collection site. Next, the proportion of fish returning to each treatment stream was calculated and applied to the total number of adults counted at Lower Granite Dam. This resulted in a mean SAR for acclimated smolt releases nine times higher than parr releases (Table 5).

Objective 2. Document natural production that results from supplementation, and relate them to limiting factors.

Aerial and ground redd surveys conducted during the fall of 2005 resulted in observing 182 redds (Table 6). The helicopter was limited to surveying the Potlatch River below river km 25 due to the steep and narrow canyon terrain.

Table 6. Number of coho salmon redds observed during aerial and ground surveys during the fall of 2005.

Location	Redds
Potlatch River	54
Lapwai Creek	115
Cottonwood Creek	0
Big Canyon Creek	0
Lolo Creek	4
Clear Creek	7
Meadow Creek (Selway R.)	0
S.F. Clearwater R	2
Meadow Creek (S.F. Clearwater R.)	0
Asotin Creek	0
Total	182

A total of 55 adult coho salmon were radio tagged in 2005. Final fate was determined for 22 of these 55 fish (Table 7). Fish were collected at the adult trap at Lower Granite Dam, tagged by Corps of Engineer biologists and released above the dam. A total of 50 fish were tracked after release above the dam. The majority of these were located within Lower Granite Reservoir; only 19 were tracked above the confluence of the Clearwater and Snake Rivers (Table 8). Two tags were returned by anglers.

Table 7. Summary of radio tag recoveries of coho salmon.

Dworshak NFH	Kooskia NFH	Potlatch River	Lapwai Creek	Angler Return	Other	Unknown	Total
7	3	4	3	2	3	33	55

Table 8. Summary of last known location of radio tagged coho salmon, 2005.

Location Description	Rkm	Number of distinct fish located
Snake River: Lower Granite Dam to Clearwater River confluence	174-207	31
Snake River: Clearwater River confluence to Salmon River	207- 271	1
Clearwater River: mouth to the Potlatch River	0-24	6
Clearwater River: Potlatch River to Orofino, ID	24-74	3
Clearwater River: Orofino to Kooskia, ID	74-118	1

Due to funding constraints, no screw trap is operated on the Potlatch River; therefore, juvenile emigration is not currently monitored. Lolo Creek and Meadow Creek have been used as secondary streams to monitor natural production. These streams have rotary screw traps operated by the Nez Perce Tribal Hatchery (NPTH) Monitoring and Evaluation project. However, the lack of adult returns at Lolo Creek and Meadow Creek has precluded subsequent monitoring of natural production. Screw trap data will be used to estimate growth, migration timing, and survival of coho salmon from Lolo Creek and Meadow Creek. Scale samples were taken from parr, smolts and adults. Regressions of circuli number on Julian Day for each stream each year will enable estimation of dates corresponding to a distinct change in scale patterns, like spring growth or ocean entry. In addition, this will provide an estimate of size at ocean entry. We will estimate age at maturity, time of river entry and spawning, and pre-spawning survival of natural and hatchery adults. Daily flows and temperatures were collected at selected reintroduction streams to determine the influence of environmental variation on natural production. More specifically, to identify any correlation of environmental variation to variation in coho salmon population parameters, multiple regressions or analyses of covariance for various life history parameters, with environmental variables included, as independent variables will be employed.

Objective 3. Monitor genetic profile of introduced coho salmon stock, broodstock developed from adult hatchery returns and naturally returning coho salmon adults.

Tissue samples were taken from returning coho salmon. Samples are currently being stored until funding is secured to run the necessary genetic analysis. Preliminary study protocols have been developed and the CRITFC/University of Idaho Hagerman Laboratory has been approached about conducting the analysis.

Objective 4. Monitor the ecological interactions.

The emigration timing of PIT tagged coho parr and smolts will be determined to describe the overlap with juvenile fall chinook rearing in the lower Clearwater River. Sampling for this activity will be conducted under objective 1 and data will be coordinated with the NPT hatchery M&E project and the NPT fall chinook project. Data for brood year 2003 will be available later this year.

Over the past several years, new information has become available about coho salmon interactions with other species. Much of the previous work on coho salmon interactions was conducted on coastal streams. More recently, the Yakama Nation fisheries program has studied interactions with chinook salmon, sockeye salmon and steelhead in the Yakima River subbasin. Much of their research coincides with proposed research for the Clearwater River coho salmon reintroduction project.

Objective 5. Effectively communicate monitoring and evaluation program approach and findings to resource managers.

The NPT has provided data summaries of fish population status and select environmental and habitat conditions (adult escapement, juvenile density, stream temperature) to StreamNet on an annual basis. The NPT database will be structured to be compatible with StreamNet.

All PIT tag files have been validated and electronically submitted to the Pacific States Marine Fisheries Commission (PSMFC). PTAGIS has been used to organize tagging and interrogation data from fish marked with PIT tags. Interrogation summary reports will be downloaded and utilized in NPT data analysis. We have provided fish marking summaries and CWT tag information to the Columbia River Intertribal Fish Commission staff for incorporation into the CWT database.

Adult escapement has been communicated through summary reports (weir/ladder capture and redd counts). Weir reports included totals of natural and hatchery fish captured by sex and the numbers and makeup of fish keep for broodstock and released for natural production. Redd counts summaries have been produced.

Summary reports have been developed and distributed to fisheries co-managers in the Clearwater River subbasin and interested parties. These reports will be posted electronically. Coordination of the Nez Perce Tribe Coho Salmon Reintroduction Project M&E program activities is a continual process within the NPT and with co-managers in the Columbia River basin. We have attended meetings with co-managers in the Clearwater subbasin. We have coordinated production and research activities between IDFG, USFWS that plan the production management and outplanting of the CFH, DNFH and KNFH and research within the Clearwater River subbasin.

Monitoring and Evaluation Plan:

N/A- Component of the project that is being reported.

ESA, NEPA and other Regulatory Compliance Plan if appropriate:

Activities under the NPT Clearwater River Subbasin coho salmon reintroduction program have been reviewed for Endangered Species Act (ESA) compliance. In 1995 and 1998 the Nez Perce Tribe requested consultation from the NMFS on the coho salmon release strategies. In 1995 the NMFS determined that the proposed actions would have no more than a negligible effect on listed salmon (Stelle 1995). In 1998, the NMFS determined that coho salmon releases did not jeopardize the continued existence of Snake and Columbia River salmon (NMFS 1999). The NPT is currently updating their HGMP for coho salmon production.

Partners and Cost Share:

Memorandums of Agreement are established with the U.S. Fish and Wildlife Service (USFWS), and the Idaho Department of Fish and Game (IDFG) for coho salmon production at

fish hatchery facilities. The Nez Perce Tribe is allotted specific incubation, early rearing, and final rearing space at Dworshak and Kooskia NFH and Clearwater Fish Hatchery for coho salmon production. The USFWS provides fish health monitoring for the program. Activities associated with rearing fish at Eagle Creek National Fish Hatchery are covered by Mitchell Act funding.

The USFWS operates a fish ladder on the North Fork of the Clearwater River at Dworshak National Fish Hatchery and an adult weir and ladder at Kooskia National Fish Hatchery to trap adult coho salmon. In addition, the Nez Perce Tribal Hatchery Monitoring and Evaluation Project operates the juvenile fish.

Project Products:

We will develop summary semi-annual and annual progress reports. We have participated and assisted with the development AOP's with cooperating hatcheries. We have updated the CWT and PIT tag databases. Trap and release end-of-season summary reports and monthly production reports have been produced and distributed.

D. Salmon Research, Monitoring, and Evaluation Projects

Projects for conducting salmon research and monitoring to: 1) assess watershed health and salmon status; 2) monitor and evaluate PCSRF projects; 3) validate the effectiveness of protection and restoration projects; and 4) implement data requirements of the 1999 Pacific Salmon Treaty agreement.

State whether or not the project is directly related to key salmon management questions regarding salmon recovery and/or sustainability of healthy salmon stocks?

Yes

List names of the organizations cooperating on the Research, Monitoring and Evaluation Project:

Nez Perce Tribe, US Fish and Wildlife Service, US Army Corps of Engineers, US Forest Service, Bureau of Land Management, Bureau of Indian Affairs, Idaho Dept of fish and Game, Washington Dept of Fish and Wildlife, and the University of Idaho.

Number of organizations cooperating on the Research, Monitoring and Evaluation Project:

9

Report the number of research findings related to Pacific Salmon Treaty incorporated into abundance-based management regimes:

- 1) Estimates of harvest using double index marking.
- 2) Estimates of abundance to mainstem dams and some tributaries.

Describe the Research Monitoring and Evaluation findings utilized in adaptive changes to salmon and watershed programs and policies:

Three release strategies or alternatives have been considered. Alternative 1 (status quo) proposes to continue the current 2005 and 2006 release strategies. Alternative 2 proposes the construction of low-tech acclimation facilities in Lapwai and Lolo Creeks to capitalize on the higher observed survival of acclimated releases. Under this alternative, Lower Columbia River (LCR) smolt releases would cease in the Potlatch River, and:

- 280,000 Clearwater Localize Stock (CLS) smolts from DNFH would be acclimated and released from KNFH on Clear Creek,
- 270,000 CLS psmolts would be transferred from CFH to the NPTH Site 1705 facility, reared over winter to the smolt stage, transported to the Musselshell acclimation site, and released into Musselshell Creek in the spring, and
- 550,000 LCR smolts would be acclimated at the proposed North Lapwai Valley (NLV) facility and volitionally released into Lapwai Creek.

Alternative 3 seeks to increase rearing and acclimation facilities available for coho salmon in the Clearwater River Subbasin. Alternative 3 would expand hatchery facilities at NPTH to spawn 1,404 adults and rear approximately 687,700 coho salmon smolts for use in a rotating supplementation schedule. Initially, broodstock for the expanded NPTH facility would be obtained from adults returning from the release of 550,000 LCR smolts in Lapwai Creek. The resulting CLS progeny would be reared to the smolt stage and released in natural production areas. This strategy was selected to maximize the potential for natural selection to act on first generation LCR smolts and adults prior to their introduction to natural spawning areas. Additionally, this strategy slowly severs reliance on LCR coho salmon transfers such that genetic drift should be minimized, and the full compliment of useful genetic variation present in LCR hatchery broodstocks should be present in the CLS broodstock and Clearwater River Subbasin natural spawning aggregates.

This alternative would follow the release strategies above with the addition of:

- 729,000 CLS smolts would be divided into three release groups (243,000 per group) for release into the three Clearwater tributaries to be identified later, for a duration of three years, at which time these releases would cease, and releases would occur in three alternative tributaries for a period of three years.

Production estimates for localized coho salmon in the hatchery environment were calculated assuming 2,100 eggs per female and 70% survival from egg to smolt in the hatchery environment (observed at DNFH). Egg to psmolt survival was assumed to be 75%. Prespawning mortality

was assumed to be 10%. Based on recent coho escapement within the Clearwater River Subbasin, we assumed that females constitute an average of 37% of the adult return (including jacks).

Utilizing a stochastic model, total adult return, potential presmolt and smolt hatchery production from the estimated adult return, and the juvenile to juvenile replacement rate for each alternative (calculated as potential juvenile production in generation two divided by the number of juveniles released in generation one) were estimated (Tables 9 to 11).

Table 9. Estimated adult return and juvenile production for the currently planned 2005 and 2006 coho salmon releases in the Clearwater River Subbasin.

Stream	Stock	Number Released	Adult Return (95% CI)	Potential Production ¹	Replacement Rate
Clear Creek	CC	280,000 Smolt	578 (464, 593)	282,817	1.01
Lolo Creek	CC	270,000 Presmolt	115 (90, 140)	60,260	0.22
Lapwai Creek ²	LCR	275,000 Smolt	323 (6, 882)	157,950	0.57
Potlatch River ²	LCR	275,000 Smolt	323 (6, 882)	157,950	0.57
				Mean Replacement	0.73
¹ Potential production refers to the number of smolts (presmolts in Lolo Creek) that could be produced by spawning all returning adults in hatchery facilities.					
² Return rates based on direct stream release.					

Table 10. Estimated adult return and juvenile production following implementation of Alternative 2.

Stream	Stock	Number Released	Adult Return (95% CI)	Potential Production	Replacement Rate
Clear Creek	CC	280,000 Smolt	578 (464, 693)	282,817	1.01
Lolo Creek	CC	270,000 Smolt	557 (447, 668)	272,716	1.01
Lapwai Creek ¹	LCR	550,000 Smolt	1,404 (88, 3,186)	687,653	1.25
				Mean Replacement	1.14
¹ Return rate based on acclimated release.					

Table 11. Estimated adult return and juvenile production following implementation of Alternative 3.

Stream	Stock	Number Released	Adult Return (95% CI)	Potential Production	Replacement Rate
Clear Creek	CC	280,000 Smolt	578 (464, 693)	282,817	1.01
Lolo Creek	CC	270,000 Smolt	557 (447, 668)	272,716	1.01
Lapwai Creek	LCR/CC	550,000 Smolt	1,404 (88, 3,186)	687,653	1.25
American River ¹	CC	243,000 Smolt	500 (402, 601)	Unknown	Unknown
Red River ¹	CC	243,000 Smolt	500 (402, 601)	Unknown	Unknown
Crooked River ¹	CC	243,000 Smolt	500 (402, 601)	Unknown	Unknown
Ohara Creek ²	CC	243,000 Smolt	500 (402, 601)	Unknown	Unknown
Newsome Creek ²	CC	243,000 Smolt	500 (402, 601)	Unknown	Unknown
Mill Creek ²	CC	243,000 Smolt	500 (402, 601)	Unknown	Unknown
				Mean Replacement³	1.14
¹ Streams in group one of the three year rotating supplementation schedule.					
² Streams in group two of the three year rotating supplementation schedule.					
³ Replacement rate calculated only for Clear, Lolo, and Lapwai Creeks.					

Alternatives 1 is unlikely, on average, to yield positive replacement rates, and is therefore considered inappropriate. Alternatives 2 and 3 both yield average smolt to smolt replacement rates of 1.14, suggesting that implementation of either alternative would be appropriate.

Report the stream length assessed/monitored for habitat condition, water quality, salmonid abundance and productivity in accordance with Research Monitoring and Evaluation or watershed monitoring strategy in miles:

We will have monitored 100 miles of stream for radio-tagged coho salmon, and 75 miles for coho salmon redds and carcasses.

Cite the reports prepared by the project on key management or restoration data, information and needs. These reports could be progress reports, or final reports associated with research:

Everett, S.R. 2005. Clearwater River Coho Salmon Monitoring and Evaluation Project III. Pacific Coastal Salmon Recovery Fund. (November) Semi- Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2005. Clearwater River Coho Salmon Production Project III. Pacific Coastal Salmon Recovery Fund. (November) Semi- Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2005. Clearwater River Coho Salmon Reintroduction Project II. Pacific Coastal Salmon Recovery Fund. (November) Semi- Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2005. Clearwater River Coho Salmon Reintroduction Project II. Pacific Coastal Salmon Recovery Fund. (April) Annual Report. P.O. Box 365, Lapwai, ID 83540.

Nez Perce Tribe and FishPro, A Division of HDR Engineering, Inc. 2004. Coho Salmon Master Plan, Clearwater River Basin. Draft submitted to the Bonneville Power Administration. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2004. Clearwater River Coho Salmon Reintroduction Project II. Pacific Coastal Salmon Recovery Fund. (November) Semi-Annual Report. P.O. Box 365, Lapwai, ID 83540.

Nez Perce Tribe and FishPro, A Division of HDR Engineering, Inc. 2004. Coho Salmon Master Plan, Clearwater River Basin. Draft submitted to the Bonneville Power Administration. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2004. Clearwater River Coho Salmon Reintroduction Monitoring and Evaluation Project. Pacific Coastal Salmon Recovery Fund. Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2004. Clearwater River Coho Salmon Reintroduction Project. Pacific Coastal Salmon Recovery Fund Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2003. Clearwater River Coho Salmon Reintroduction Project. Pacific Coastal Salmon Recovery Fund Semi-Annual Report, for the period April 2003-November 2003. P.O. Box 365, Lapwai, ID 83540.

Davenport, C.J. 2003. Clearwater River Coho Salmon Reintroduction Project. Pacific Coastal Salmon Recovery Fund Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2003. Clearwater River Coho Salmon Reintroduction Monitoring and Evaluation Project. Pacific Coastal Salmon Recovery Fund Annual Report. P.O. Box 365, Lapwai, ID 83540.

Davenport, C.J. 2002. Clearwater River Coho Salmon Reintroduction Project. Pacific Coastal Salmon Recovery Fund Semi-Annual Report, for the period April 2002- November 2002. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2002. Clearwater River Coho Salmon Reintroduction Monitoring and Evaluation Project. Pacific Coastal Salmon Recovery Fund Semi-Annual Report, for the period April 2002-November 2002. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. 2001. Clearwater River Coho Salmon Reintroduction Monitoring and Evaluation Project. Pacific Coastal Salmon Recovery Fund Annual Report. P.O. Box 365, Lapwai, ID 83540.

Everett, S.R. and S.C. Sprague. 2001 draft. Nez Perce Tribe Coho Salmon Reintroduction Program Monitoring and Evaluation Plan. Nez Perce Tribe Department of Fisheries Resource Management. Lapwai, ID.