

**Bonneville Power Administration Administration
Fish and Wildlife Program FY99 Proposal Form**

Section 1. General administrative information

**Monitor and Evaluate Yearling Snake River Fall
Chinook Released Upstream of Lower Granite
Dam**

Bonneville project number, if an ongoing project 9801004

Business name of agency, institution or organization requesting funding
Nez Perce Tribe Department of Fisheries Resources Management

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

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Subcontractors. List one subcontractor per row; to add more rows, press Alt-Insert from within this table

Organization	Mailing Address	City, ST Zip	Contact Name
U.S. Fish and Wildlife Service	P.O. Box 18	Ahsahka, ID 83520	William Conner
Washington Dept. Of Fish and Wildlife	401 South Cottonwood St.	Dayton, WA 99328	Glen Mendel
SkyRunners Inc.	Route 4, Box 177S	Walla Walla, WA 99362	Steve Reed

NPPC Program Measure Number(s) which this project addresses.
3.2, 7.0A, 7.7A.1, 7.1C.3, 7.1D.2, 7.3B.2, 7.4C.1, 7.5B.1, 7.5B.2

NMFS Biological Opinion Number(s) which this project addresses.

Section X. Conservation Recommendations A. 1,2,3 NMFS Biological Opinion for 1995

to 1998 Hatchery Operations in the Columbia River Basin.

Endangered Species Act, Section 7

Other planning document references.

Proposed Recovery Plan for Snake River Salmon (March, 1995), 4.1.d. “To determine if supplementation can assist in fall chinook recovery, the management plan for Lyons Ferry Hatchery should call for supplementation and be carefully evaluated in areas above Lower Granite Dam.”

In relation to the *Wy-Kan-Ush-Mi Wa-Kish-Wit* (June, 1995 p. 3-20), the plan states that “fish utilized in supplementation and reintroduction efforts will be selected to best match the natural population of the stream in question” and “the increase in survival and reproduction capacity gained through the use of artificial propagation in supplementation and reintroduction programs is necessary to recover stocks in a timely fashion” and P.5B-25 recommends to: develop experimental and monitoring programs in association with these projects to study the relationships between natural and supplemented components of the populations. Page 98-99 recommends to “Begin a fall chinook supplementation program using Lyons Ferry stock”, “Develop adult capture and juvenile acclimation/release facilities in the Asotin Creek and Pittsburg Landing areas on the Snake River...” and “Monitor and evaluate all artificial production actions.”

Subbasin.

Snake River, Clearwater River

Short description.

Monitor and evaluate fish health, movement patterns, migration timing, travel times, juvenile emigration survival and adult returns through supplementation of Lyons Ferry Hatchery fall chinook salmon in the Snake and Clearwater Rivers

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
	Resident fish		O & M		Biodiversity/genetics
	Wildlife	*	Production		Population dynamics
	Oceans/estuaries		Research		Ecosystems
	Climate	X	Monitoring/eval.	*	Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.	X	Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
9403400	Assessing Summer/Fall Chinook Restoration in the Snake River Basin	Depends on Project 9403400 for conducting adult fall chinook spawning ground surveys and carcass recovery to determine hatchery fish spawning contribution and for use of a jet boat for juvenile chinook telemetry in the Snake River and tributaries.
9801003	Monitor and Evaluate Yearling Snake River Fall Chinook Released Upstream of Lower Granite Dam	Depends on Project 9801003 for radio tagging adult fall chinook at Lower Granite Dam and conducting adult fall chinook spawning ground surveys, carcass recovery, and fall chinook adult mobile and fixed telemetry in Snake River and tributaries.

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2, 3	Objective	Task a,b,c	Task
1	Monitor, evaluate and compare pre-release and release health conditions of yearling Lyons Ferry Hatchery fall chinook acclimated and released at Pittsburg Landing and Captain Johns Rapid on the Snake River and at Big Canyon Creek on the Clearwater River.	a	Conduct weekly health assessments of 100 fish/wk for six weeks in cooperation with the USFWS and document fish size and condition factor at each acclimation facility before release into the Snake and Clearwater Rivers. Sample sizes were evaluated and coordinated with the WDFW and USFWS to detect a disease outbreak in the acclimated fish.

2	Monitor, evaluate, and compare post-release behavior, migration timing, and survival of yearling fall chinook released at Pittsburg Landing, Captain Johns Rapid, and Big Canyon Creek.	a	PIT tag a representative sample of 10,000 fish at each acclimation facility a week prior to release, quantify elastomer tag retention, and calculate fish condition factors prior to release.
2		b	Radio tag a up to 200 yearlings at acclimation facilities on the Snake and Clearwater Rivers and follow their movements through the free flowing river sections, Lower Granite Reservoir and dam.
3	Monitor and compare contribution and distribution of adult returns and smolt-to-adult survivals of yearling fall chinook released from Pittsburg Landing, Captain Johns Rapid, and Big Canyon Creek.	a	Assist the USFWS in subsampling adult fall chinook at Lower Granite Dam and radio tag a representative sample from each acclimated release group and follow their movements to their spawning destination.
3		b	Collect adult fall chinook carcasses in all spawning areas above Lower Granite Dam and determine the contribution of supplemented fish to the natural spawning population.
4	Prepare a cooperative annual report with the USFWS and WDFW that evaluates the success of supplementation of yearling fall chinook above Lower Granite Dam.	a	Coordinate with the USFWS and WDFW on supplementation results and writing annual reports for the monitoring and evaluation work.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	03/1996	12/2005	1
2	04/1996	05/2005	50
3	08/1997	12/2011	13
4	01/1997	06/2011	36

Schedule constraints.

Obtaining enough fall chinook yearlings from Lyons Ferry Hatchery to continue

supplementation at each of the three acclimation facilities above Lower Granite Dam for at least ten consecutive years.

Completion date.

2011

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel		82,067.00
Fringe benefits		15,916.00
Supplies, materials, non-expendable property		1,800.00
Operations & maintenance		10,800.00
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		75,000.00
PIT tags	# of tags: 20,000	58,000.00
Travel		6,590.00
Indirect costs		34,216.00
Subcontracts		16,650.00
Other		
TOTAL		301,039.00

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	260,000.00	265,000.00	270,000.00	275,000.00
O&M as % of total	96	96	96	96

Section 6. Abstract

Fall chinook supplementation above Lower Granite Dam consists of acclimating and releasing 150,000 Lyons Ferry yearling fall chinook at facilities at Pittsburg Landing, Big Canyon Creek, and Captain John Rapids. This proposal will continue the cooperative study to monitor and evaluate fall chinook released above Lower Granite Dam as recommended in the *FWP, NMFS Proposed Recovery Plan* and *Wy-Kan-Ush-Mi Wa-Kish-Wit*.

We will monitor, evaluate, and compare pre-release and release conditions, post-release behavior, migration timing, survival to Lower Snake River dams, contribution and distribution of adult returns and smolt-to-adult survivals of yearling hatchery fall chinook released at the acclimation facilities with each other and with releases at Lyons Ferry

Hatchery (LFH).

A cooperative annual report with the FWS and WDFW and quarterly progress reports that evaluate the success of fall chinook supplementation above Lower Granite Dam will be prepared.

A representative sample of all release groups will be PIT tagged and radio tagged at each acclimation facility and released at similar sizes and times as releases at LFH. Size and condition of PIT tagged fish will be evaluated during migration for fish recaptured through beach seining in the Snake and Clearwater Rivers. Outmigration survival will be estimated from PIT tag interrogations at mainstem dams using the Survival Under Proportional Hazards (SURPH) model. Post-release dispersal and outmigration behavior will be assessed using radio telemetry. We will assist the LFH program in their evaluation of Snake River Basin fall chinook smolt-to-adult survivals and adult contributions and distribution by monitoring the supplementation yearlings.

Section 7. Project description

a. Technical and/or scientific background.

The primary historical spawning range of fall chinook salmon extended into the uppermost accessible reaches of the Snake River basin. The Hells Canyon hydroproject complex limited spawning range to the areas below Hells Canyon dam.

Historical estimates of Snake River fall chinook abundance averaged 72,000 annually between 1938 and 1949 and declined to 29,000 from 1950 through 1959. The decline continued to 12,700 annually at Ice Harbor Dam from 1964 through 1968, 3,400 at Lower Granite Dam from 1969 through 1974, and only 600 at Lower Granite Dam from 1975 through 1980 (*NMFS Proposed Recovery Plan*). Recent abundance at Lower Granite Dam has ranged from a low of 78 fish in 1990 to a high of 958 in 1996 (SRSRT 1994).

The FWP goal is “a healthy Columbia River Basin”, in part, through ecological health assessment, support of native species in native habitat, assessment of program measures, and learning from implementation. The *NMFS Proposed Recovery Plan* recommends to “implement, with careful monitoring and evaluation, those actions that are necessary for the immediate conservation and recovery of the species...”, in part, through improvements in downstream survival through flow and spill management, modification of dams and operations for juvenile and adult salmon passage, and controlled propagation to preserve stocks.

Lyons Ferry Hatchery was built in 1982 below Little Goose Dam on the Snake River as part of the Lower Snake River Compensation Plan. Lyons Ferry Hatchery fall chinook salmon stock was originally of Snake River origin and is currently the only hatchery program for Snake River fall chinook. The goal of the hatchery program is to "restore dam-related losses of wild steelhead and chinook salmon." The *NMFS Proposed*

Recovery Plan, Wy-Kan-Ush-Mi Wa-Kish-Wit, and FWP specifically call for fall chinook supplementation with monitoring and evaluation above Lower Granite Dam.

Supplementation with 122,000 yearlings in the Snake River above Lower Granite Dam at Pittsburg Landing began in the spring of 1996. Agreements were reached through *U.S. v. Oregon* to release 150,000 yearlings at each of three acclimation facilities (450,000 total) above Lower Granite Dam in future years. The acclimation facility at Big Canyon Creek on the Clearwater River came on line in 1997 and a third facility at Captain John Rapid is expected on line in 1998.

The purpose of this proposal is to continue the cooperative study to monitor and evaluate Lyons Ferry Hatchery fall chinook released above Lower Granite Dam as recommended in the *FWP, NMFS Proposed Recovery Plan* and *Wy-Kan-Ush-Mi Wa-Kish-Wit*.

b. Proposal objectives.

The critical assumption of this project is that limiting factors affecting survival of Snake River chinook salmon would be addressed in the near future.

Objective 1: Monitor, evaluate, and compare pre-release and release conditions of yearling hatchery fall chinook released at the Pittsburg Landing, Big Canyon Creek, and Captain John Rapids (on-line in spring 1998) acclimation facilities with on-station releases at Lyons Ferry Hatchery (LFH).

Ho1: Pre-release and release conditions will be the same for yearling hatchery fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery. Corollary: A detectable difference in pre-release and release conditions will be observed between yearling fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery.

Objective 2: Monitor, evaluate, and compare post-release behavior, migration timing, and survival of yearling fall chinook released at Pittsburg Landing, Big Canyon Creek, Captain John Rapids, and LFH.

Ho2: Adult return rates, juvenile survival, and/or juvenile travel times will be the same for yearling fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery. Corollary: A detectable difference in adult return rates, juvenile survival and/or juvenile travel times will be observed between yearling fall chinook released from Pittsburg Landing, Captain John Rapid, Big Canyon Creek, and Lyons Ferry Hatchery.

Assumptions: PIT tagged fish survive, travel, and return the same as fish without PIT tags. Radio-tagged fish behave and travel the same as PIT tagged or non-tagged fish.

Objective 3: Monitor and compare contribution and distribution of adult returns and smolt-to-adult survivals of yearling fall chinook released from Pittsburg Landing, Captain John Rapids, Big Canyon Creek, and LFH.

Ho3: Adult return rates to the stream of release will be the same for both the Snake and Clearwater release groups. Corollary: A detectable difference in adult returns to the origin of release will be observed between the Snake And Clearwater Rivers.

Assumptions: PIT tagged fish survive smolt-to-adult and behave the same as fish without PIT tags.

Objective 4: Prepare a cooperative annual report with the FWS and WDFW and provide quarterly progress reports that evaluate the success of supplementation of yearling fall chinook salmon above Lower Granite Dam.

c. Rationale and significance to Regional Programs.

Suitable spawning habitat is available, and partially utilized, in the Clearwater and Snake Rivers above Lower Granite Dam (Arnsberg et al. 1992, Rondorf and Tiffin 1996) and should be considered for natural reproduction development (Arnsberg et al. 1992). Supplementation of fall chinook above Lower Granite Dam was initiated for immediate conservation and future recovery of fall chinook in their native habitat. The project objectives of monitoring fish health, survival, and behavior in relation to various environmental and management conditions relate directly to the FWP objective of “a healthy Columbia River Basin”, in part, through basin ecological health assessment, support of native species in native habitat, assessment of program measures, and learning from implementation (adaptive management).

The FWP calls for an adaptive management approach which involves monitoring and evaluation of implemented programs. This project will evaluate the success of fall chinook supplementation above Lower Granite Dam and facilitate management decisions for the future conservation and perpetuation of naturally spawning populations of fall chinook salmon in the Snake and Clearwater Rivers above Lower Granite Dam.

Cooperation will continue with the WDFW, USGS, and the USFWS in this supplementation monitoring and evaluation effort. Cooperation will include transportation of fish from Lyons Ferry Hatchery to the Snake and Clearwater acclimation facilities, conducting fish health assessments, PIT tagging, monitoring of juvenile performance and evaluation of adult returns over Lower Granite Dam and their contribution to natural production. Radio receivers will be borrowed from the WDFW and the USGS will collect yearling location data in Lower Granite Reservoir and dam through their fixed receiver locations for other studies.

d. Project history

The first two years of this project, 1996 and 1997, were funded through the USFWS Lower Snake River Compensation Plan by BPA. In 1998, funding was direct from BPA. Supplementation of Lyons Ferry Hatchery fall chinook yearlings and monitoring and evaluation studies were initiated on the Snake River at the Pittsburg Landing acclimation facility constructed by the U.S. Army Corps of Engineers in 1996. During 1997, a second acclimation facility was constructed and operated at Big Canyon Creek on the lower Clearwater River. A third acclimation facility at Captain John Rapids on the Snake River is scheduled to be constructed and be in operation to acclimate fall chinook in 1998. Facilities will be sufficient to acclimate a total of 450,000 Lyons Ferry Hatchery fall chinook (150,000 at each of the three facilities).

The only acclimation facility on line in 1996 was Pittsburg Landing. Monitoring and evaluation funding was minimal. The only funding consisted of LSRCP provided PIT tags. Labor for tagging was cost shared by NPT and FWS. The Big Canyon facility came on line in 1997 and monitoring and evaluation received funding of \$138,500. This budget included biologist and technician salaries for six months, but did not include any PIT tag costs.

Results from the 1996 and 1997 monitoring and evaluation of yearling fall chinook released at Pittsburg Landing on the Snake River were encouraging. Fish health assessments were favorable for fish releases, mortality during the six week acclimation period was low, and survival rates from PIT tagged fish were higher than expected to the Snake and Columbia River dams.

This project promotes adaptive management by evaluating fall chinook survival and behavior during various environmental conditions and management regimes (controlled flows, etc.).

We are currently working with the USFWS and WDFW on a cooperative annual report on monitoring and evaluation of yearling fall chinook acclimated and released in 1996 and 1997. A poster of 1997 results will be presented at the LSRCP Status Review Symposium in February, 1998.

e. Methods.

Objective 1.

Approach 1: Rear all fall chinook similarly at LFH at least until they are marked (September). Document rearing conditions, fish sizes, mark retention, and health at LFH, Pittsburg Landing and Captain John Rapids on the Snake River, and at Big Canyon Creek on the Clearwater River after transferring the acclimation release groups.

Task 1.1. Assist the Dworshak Hatchery Fish Health Lab in conducting weekly health assessments on a sample of 100 fish at each the Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities.

Task 1.2. Document fish size and condition factor on fish sampled in Task 1.1 and

during PIT tagging (Task 2.8).

Task 1.3. Using data from Tasks 1.1 and 1.2 compare fish size and condition of fish reared at Big Canyon, Pittsburg Landing, Captain John Rapids, and LFH.

Task 1.4. Check a representative sample of 1,500 fish for elastomer tag retention at Big Canyon Creek and Captain John Rapids while PIT tagging (Task 2.2) and assist the FWS in checking elastomer tag retention while PIT tagging at Pittsburg Landing.

Objective 2.

Approach 2: All fall chinook acclimated at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek will be tagged with coded wire and elastomer tags. A representative sample of all release groups will be PIT tagged and radio tagged at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek, and released at similar sizes and times as releases at LFH (approximately mid-April). Size and condition of PIT tagged fish will be evaluated during migration for fish recaptured through beach seining in the Snake and Clearwater Rivers. Outmigration survival will be estimated from PIT tag interrogations at mainstem dams using the Survival Under Proportional Hazards (SURPH) model (Skalski et al. 1994). Post-release dispersal and outmigration behavior will be assessed through the use of radio tags.

Task 2.1. Radio tag 50 fall chinook yearlings (non-PIT tagged fish) each at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities a few days prior to release and monitor post-release dispersal and movement patterns to Lower Granite and Little Goose dams.

Task 2.2. Place fixed radio receivers at the downstream end of the free-flowing stretch of the Snake and Clearwater Rivers and at Lower Granite and Little Goose dams and monitor movement patterns and migration rates in the free-flowing and impounded reaches of these systems.

Task 2.3. Coordinate with the Nez Perce Tribe, United States Geological Survey (USGS), University of Idaho and Washington Department of Fish and Wildlife on radio telemetry equipment and data collection positions that may be shared for this study.

Task 2.4. Monitor individual fish locations by fixed-wing flights and boat and/or mobile tracking every three days (for three weeks) after release at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek to Little Goose Dam and plot locations using the Global Positioning System.

Task 2.5. Coordinate with USGS on obtaining yearling fall chinook radio locations at Lower Granite and Little Goose dams through their existing radio telemetry study.

Task 2.6. Compile temperature and discharge data in the Snake and Clearwater Rivers, and in Lower Granite Reservoir and supplement thermographs where needed.

Task 2.7. Evaluate fish distribution and travel times in relation to environmental variables (water temperature, discharge, etc.).

Task 2.8. PIT tag up to 10,000 fall chinook yearlings (2,500 X 4 replicate groups) acclimated at Big Canyon Creek and Captain John Rapids and assist the FWS in PIT tagging comparable numbers at the Pittsburg Landing facility.

Task 2.9. Compile and analyze PIT tag detection data at all mainstem dams and compare arrival timing, mean detections dates and travel times for the fish released at Big Canyon Creek, Pittsburg Landing, Captain John Rapids and PIT tag releases at LFH.

Task 2.10. Evaluate the effect of fish size on travel time from Big Canyon Creek and Captain John Rapids to Lower Granite Dam by partitioning release fork lengths in 5 mm increments and analyze using analysis of variance (ANOVA).

Task 2.11. Use the PIT tag database compiled for Task 2.9. and the SURPH survival model to estimate fish survival from the Big Canyon Creek and Captain John Rapids releases to the Snake and Columbia River (McNary) dams. Coordinate with the FWS and NMFS on running the SURPH model and compare survival estimates to the Pittsburg Landing and LFH releases.

Assumptions: PIT tagged fish survive, travel, and return the same as fish without PIT tags. Radio-tagged fish behave and travel the same as PIT tagged or non-tagged fish.

Objective 3.

Approach 3: The LFH program in the past has evaluated smolt-to-adult survivals and adult contributions and distribution in the Snake River Basin. We will contribute to this effort by comparing smolt-to-adult survivals, adult distribution, and spawning contributions from yearlings acclimated and released at Pittsburg Landing, Captain John Rapids and Big Canyon Creek. We want to determine if LFH yearlings released at acclimation facilities return to the same river and general location to spawn and if they contribute to natural reproduction to help recover the species. Yearling fall chinook released at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek will have elastomer tags that are distinguishable from one another and also from yearlings released at LFH. Adults returning from the acclimated releases and trapped at Lower Granite Dam will be allowed to continue upstream of the dam to spawn naturally. Spawning surveys and carcass recovery information will provide an indication of spawning locations in relation to the acclimation release sites. Radio tagging a portion of the hatchery adult fall chinook returns to Lower Granite Dam from acclimated releases in the Snake and Clearwater Rivers will provide a better description of spawning contribution, distribution,

and timing of hatchery fish and to evaluate the contribution of supplemented fish to assist in the recovery of the Snake River fall chinook. This will be a cooperative effort between the Nez Perce Tribe, U.S. Fish and Wildlife Service and Washington Department of Fish and Wildlife.

Task 3.1. Collect adult carcasses in spawning areas on the Clearwater, Salmon, and Grande Ronde Rivers to recover CWT and elastomer data from supplementation or hatchery released fish and to gather percent spawned information to estimate spawning success.

Task 3.2. Assist the FWS in radio tagging adult fall chinook at Lower Granite and monitor adult movements in Lower Granite and Little Goose Reservoirs weekly by fixed wing flights from September 1 through the first week in December and provide locations to the FWS for data analysis.

Task 3.3. Document adult movements and locations of radio tagged fish through aerial spawning surveys on the Clearwater, Salmon, and Grande Ronde Rivers (through existing BPA study) and provide locations to the FWS for data analysis.

Task 3.4. Based on the above activities, estimate the total redd contribution in the Clearwater, Grande Ronde, and Salmon Rivers by supplemented fall chinook released at Pittsburg Landing, Captain John Rapids, and Big Canyon Creek acclimation facilities and those released at LFH.

Task 3.5. Coordinate with the WDFW and FWS in compiling the adult recovery information to estimate and compare smolt-to-adult survivals from yearling releases at Pittsburg Landing, Captain John Rapids, Big Canyon Creek, and releases at LFH.

Assumptions: PIT tagged fish survive to adult and behave the same as fish without PIT tags.

Objective 4.

Task 4.1 Provide project status reports on a quarterly basis. Quarterly reporting requirements are detailed in the BPA Terms and Conditions (Reports are due 15 days after the quarter ending March 31, June 30, September 30, and December 31).

Task 4.2. Write an annual report on the results of all objectives and tasks outlined in this statement of work and coordinate and review reports with the FWS and WDFW to combine into a comprehensive annual report.

Task 4.3. Evaluate the success of the supplementation of LFH yearlings above Lower Granite Dam to increase natural production and assess potential impacts to natural fall chinook populations and productivity.

Sample sizes for PIT tagging are based on expected detection rates at Lower Monumental and McNary Dams from similar previous PIT tagging studies. Enough detections at these dams are essential to obtain acceptable survival estimates from the SURPH Model. Sample sizes for radio tagging are limited by our resource availability (equipment and personnel) to track fish by boat. The NPT-DFRM believes a sample size of 50 fish per release acclimation facility is minimal and that 100 fish per site is more appropriate. Presently, we barely have enough equipment and personnel to adequately track 150 fish. The funding required to cover the additional costs (boats, GPS units, laptop computers, personnel, etc.) necessary to tag and track up to 300 fish has been unavailable to this point.

Project risks include exposure to gasoline and MS-222, PIT tag syringe needles, normal boating hazards, risks associated with fixed wing aircraft flight. Risks to the study fish include anaesthetization, various tags affecting survival, behavior, and predation vulnerability. Risks to other organisms include the effects on a predator of eating tagged prey.

f. Facilities and equipment.

Office space suitable for project leader and technician is located, and currently utilized, in the NPT Fisheries Orofino Field Office.

One 24' jet boat and one other jet boat (to be purchased in spring, 1998) with trailers are currently available to the project from BPA project 9403400. At least two operational boats are required for telemetry on the Lower Snake River reservoirs. The future availability of these boats is unknown, therefore a boat needs to be purchased directly from 1999 project funds to have as a primary boat with the two boats from BPA project 9403400 serving as primary and backup boats.

The project currently has one personal computer and one laptop computer with another laptop currently available from BPA project 9403400. The project needs access to two laptop computers to operate the GPS units for boat telemetry. The project currently has one GPS unit and BPA project 9403400 supplies another.

The project currently has two data logging and one non-logging (to be purchased in 1998) Lotek telemetry receivers used at the fixed site on the Clearwater and Snake Rivers. Receivers for aerial and boat telemetry are currently borrowed from WDFW. Future availability of borrowed receivers is unknown. The project needs to purchase another data logging receiver for aerial and boat telemetry and as a backup for the fixed site data logging receivers.

The project has one leased GSA fleet pickup truck capable of pulling the boats and BPA project 9403400 supplies a similar leased GSA fleet truck.

Computerized PIT tagging data collection stations are utilized from other projects within

NPT Fisheries. All PIT tagging equipment and fish processing/recovery equipment is provided by BPA project 9403400.

g. References.

Rondorf, D.W., and K.F. Tiffan. 1996. Identification of the spawning, rearing and migratory requirements of fall chinook salmon in the Columbia River Basin. Annual Report 1994. DOE/BP-21078-4, Bonneville Power Administration, Portland, Oregon.

Arnsberg, B.D., Connor, W.P., and Connor, E.J. 1992. Mainstem Clearwater River study: Assessment for salmonid spawning, incubating, and rearing. Final Report. DOE/BP-37474-3, Bonneville Power Administration, Portland, Oregon.

Skalski, J.R., S.G. Smith, J.R., J.W. Schlechte, A. Hoffmann, and V. Cassen. 1994. Statistical survival analysis for fish and wildlife tagging studies. Manual submitted by Center for Quantitative Science, School of Fisheries, University of Washington to the U.S. Department of Energy, Bonneville Power Administration, Portland.

Section 8. Relationships to other projects

This project complements and collaborates with several other FWP projects. Foremost is the FWS/LSRCP Acclimation/Release Facility project for fall chinook above Lower Granite Dam. This project conducts monitoring and evaluation on the supplementation yearling fall chinook which are acclimated at and released from these facilities. Close cooperation is required between the projects for PIT and radio tagging efforts.

This project works in close collaboration with the NPT project assessing summer/fall chinook restoration in the Snake River Basin. These projects share personnel, equipment, and vehicles.

The FWS assists this project by PIT tagging the fish acclimated at the Pittsburg Landing facility on the Snake River. The FWS also complements this project by studying fall chinook life histories in the Columbia river Basin.

This project collaborates with USGS Biological Resources Division (BRD). The BRD operates many fixed telemetry antennas and receivers at Lower Granite Dam. The BRD collects and provides telemetry data at Lower Granite Dam on radio-tagged fish from this project.

This project collaborates with FWS, WDFW, University of Idaho, and the NPT fall chinook assessment project to monitor adult fall chinook escapement and spawning distribution. The WDFW complements this project by monitoring and evaluation of fall chinook released at Lyons Ferry Hatchery. Each project conducts a portion of the

monitoring effort. This project performs aerial telemetry on the Lower Snake reservoirs, the UI operates mobile and fixed site telemetry on the upstream of Lower Granite reservoir, WDFW performs mobile telemetry, and FWS and NPT perform aerial telemetry, spawning ground surveys, and carcass collection upstream in the Snake and Clearwater Rivers.

Section 9. Key personnel

Billy D. Arnsberg is the Project Leader (Upper Clearwater Studies) with Stephen J. Rocklage as Project Biologist. Duties include planning and conducting field activities, keeping accounting records and monitoring of expenditures, equipment preparation and operation, reporting of field data, and supervising office and field work and employees. Jay Hesse is the Fisheries Research Coordinator and will provide technical assistance and coordination.

Billy D. Arnsberg is currently responsible for: assessing summer and fall chinook salmon spawning, incubation, outmigration timing, and survival in the Clearwater and upper tributaries, lower Salmon, Grande Ronde, and Imnaha rivers. The Project Leader coordinates summer and fall chinook salmon research with the Bonneville Power Administration, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service, Washington Department of Fisheries, Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game and other agencies as required. The Project Leader works closely with the Nez Perce Tribal Hatchery Monitoring and Evaluation studies and oversee Project 9801004 Monitoring and Evaluation of Lyons Ferry Hatchery Fall Chinook released upstream of Lower Granite Dam. The Project Leader is responsible for administrating Bonneville Power Administration contracts and conducting evaluation studies for the Nez Perce Tribe including development of budgets, plan of operation, monitoring expenditures, statements of work, reporting and coordinating office and field work with management staff. The Project Leader is also responsible for maintaining written records of interactions with funding agencies, reviewing agencies and co-management agencies, write and publish meeting, progress and annual reports, maintain a data base, correspond orally and in writing with supervisory staff and co-management agencies. The Project Leader provides management, training and supervision of full time and temporary personnel for conducting an evaluation of summer and/or fall chinook salmon restoration potential in mainstem rivers, and yearling fall chinook monitoring and evaluation studies. The Project Leader acts as a technical representative of the Nez Perce Tribe on multi-agency committees for coordination and planning of chinook salmon assessment and restoration in mainstem rivers, including hatchery management, supplementation and natural production.

Research Director: Paul Kucera, Director of Biological Services, 160 hrs
Nez Perce Tribe Department of Fisheries Resources Management

EDUCATION: Bachelor of Science. 1975.
Utah State University.

Major: Fisheries Management.

1990

Completed MS studies at the University of Idaho

Major: Fisheries Management.

PROFESSIONAL EXPERIENCE:

- 1991-present Director of Biological Services with the Nez Perce Tribe Department of Fisheries Resources Management. Responsible for technical program direction and administration of the Fisheries Research Division.
- 1988-1991 Senior Fisheries Biologist with the Nez Perce Tribe Fisheries Department.
- 1987-1988 Acting Fisheries Program Manager with the Nez Perce Tribe Fisheries Department. Responsible for fisheries program management and direction.
- 1984-1986 Senior Fisheries Biologist with the Nez Perce Tribe Fisheries Department. Conducted research on juvenile steelhead trout life history characteristics and abundance in relation to physical habitat parameters on five streams.
- 1982-1983 Project fisheries biologist with the Nez Perce Tribe Fisheries Department. Responsible for conduct of a physical and biological inventory of streams on the reservation proper with emphasis on anadromous salmonids.
- 1978-1980 Fisheries biologist with the Colville Confederated Tribes Fish and Wildlife Department. Developed fishery management programs for the Colville Tribe on their 1.3 million acre reservation and the 1.7 million acre ceded area.
- 1975-1978 Fisheries research biologist with W.F. Sigler and Associates, Environmental Consulting Firm. Ecological and fish life history research on 110,000 acre Pyramid Lake, Nevada.

Unique Abilities:

Certified Fisheries Scientist - AFS

Experienced with Endangered Species Act and management of listed fish species.

Experience in program development and procuring project funding.

Research and management experience with resident and anadromous species.

Familiar with Tribal government and management approaches.

Trained in CPR and First Aid.

Certified SCUBA diver - NAUI

Publications

Kucera, P.A. and J.L. Kennedy. 1977. Evaluation of a sphere volume method for estimating fish fecundity. *The Progressive Fish Culturist*. 39(3):115-117.

Kucera, P.A. 1978. Reproductive biology of the tui chub, Gila bicolor, in Pyramid Lake, Nevada. *Great Basin Naturalist*. 38(2): 203-207.

Kennedy, J.L. and P.A. Kucera. 1978. The reproductive ecology of the Tahoe sucker, Catostomus tahoensis, in Pyramid Lake, Nevada. *Great Basin Naturalist* 38(2): 181-186.

Vigg, S., P. A. Kucera. 1981. Contributions to the life history of Sacramento perch, Archoplites interruptus, in Pyramid Lake, Nevada. *Great Basin Naturalist* 41(3): 278-289.

Sigler, W.F., W.T. Helm, P. A. Kucera, S. Vigg and G. W. Workman. 1983. Life history of the Lahontan cutthroat trout, Salmo clarki henshawi, in Pyramid Lake, Nevada. *Great Basin Naturalist* 43(1): 1-29.

Kucera, P.A., D.L. Koch and G.F. Marco. 1985. Introductions of Lahontan cutthroat trout into Omak Lake, Washington. *North Amer. Jrnl. Of Fish. Mngt.* 5(2): 296-301.

Johnson, J.H. and P.A. Kucera. 1985. Summer-autumn habitat utilization of subyearling steelhead trout in tributaries of the Clearwater River, Idaho. *Can. Jrnl. Zool.* Vol, 63:2283-2290.

Kucera, P.A. 1989. Nez Perce Tribal review of the Imnaha River Lower Snake River Compensation Plan. AFF1/LSR-89-08, Tech. Rep. 89-7. Annual project report to the U.S. Fish and Wildlife Service. Nez Perce

Tribe Fisheries Dept., Lapwai, ID. 49 pp.

Kucera, P.A. and M.L. Blenden. 1996. Summary report of 1996 project activities relating to endangered chinook salmon populations listed under the Endangered Species Act. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai, Idaho. 60 pp.

Project Leader: Billy D. Arnsberg

EDUCATION:

UNIVERSITY OF IDAHO, MOSCOW, ID. 1987-1990. M.S. coursework in Fisheries Science. Thesis entitled: Food Availability and Diet of Fish in Little Payette Lake Before and After Rotenone Treatment.

UNIVERSITY OF MISSOURI, COLUMBIA, MO. 1982-1984. B.S. Degree in Fisheries and Wildlife Management.

SOUTHEAST MISSOURI STATE UNIVERSITY, CAPE GIRARDEAU, MO. 1980-1982.

EXPERIENCE:

NEZ PERCE TRIBE, LAPWAI, ID. 1989-Present. Fisheries Research Project Leader. Researcher and primary author of the Mainstem Clearwater River Study: Assessment for Salmonid Spawning, Incubation, and Rearing, BPA Project 88-15. Project Leader for two years on Salmon Supplementation Studies in Idaho Rivers, BPA Project 8909802. Currently Project Leader for Assessing Summer and Fall Chinook Salmon Restoration in the Snake River Basin (BPA Project 9403400).

IDAHO DEPARTMENT OF FISH AND GAME, McCALL, ID. 4/86-9/88. Fisheries Research Technician.

DWORSHAK NATIONAL FISH HATCHERY, AHSAHKA, ID. 12/86-4/87. Fisheries Biological Aid.

McCALL FISH HATCHERY, McCALL, ID. 10/86-12/86. Fisheries Biological Aid.

MISSOURI DEPARTMENT OF CONSERVATION, COLUMBIA, MO. 1/85-12/85 and 9/85-12/85. Wildlife Research Technician.

U.S. FISH AND WILDLIFE SERVICE, SASKATCHEWAN, CANADA.
7/85-9/85. Wildlife Research Technician.

U.S. FISH AND WILDLIFE SERVICE, SASKATCHEWAN, CANADA.
4/85-7/85. Wildlife Research Technician.

MISSOURI DEPARTMENT OF NATURAL RESOURCES, COLUMBIA, MO.
5/84-10/84. State Park Ranger.

UNIVERSITY OF MISSOURI, COLUMBIA, MO. 5/82-5/84. Fisheries Research
Technician.

PUBLICATIONS:

Muir, W.D., S.G. Smith, E.E. Hockersmith, M.B. Eppard, W.P. Connor, and B.D. Arnsberg. REVIEW DRAFT. 1998. Passage survival of hatchery subyearling fall chinook salmon to Lower Granite, Little Goose, and Lower Monumental Dams, 1996. Prepared for Bonneville Power Administration.

Arnsberg, B.D and D.P. Statler. 1995. Assessing summer and fall chinook salmon restoration in the upper Clearwater River and principal tributaries. Annual Report 1994 prepared for the U.S. Department of Energy, Bonneville Power Administration, Contract No. DE-BI79-87BI12872, Project No. 94-034.).

Arnsberg, B.D., W.P. Connor, and E. Connor. 1992. Mainstem Clearwater River study: assessment for salmonid spawning, incubation, and rearing. Project 88-15. Final Report to Bonneville Power Administration, Portland, OR.

Connor, W.P., B.D. Arnsberg, and E. Connor. 1990. Mainstem Clearwater River study: assessment for salmonid spawning, incubation, and rearing. Project 88-15. Annual Report to Bonneville Power Administration, Portland, OR.

Anderson, D., D. Scully, J.H. Griswold, and B. Arnsberg. 1987. Idaho Department of Fish and Game Federal Aid in Fish Restoration, Job Performance Report, Project F-71-R-11.

Technical Advisor: Jay A. Hesse, Research Coordinator, no funding associated
Nez Perce Tribe Department of Fisheries Resources Management

Education: M.S. in Fisheries, Michigan State University, 1994
B.S. in Fisheries and Wildlife, Michigan State University, 1992

Duties: Technical direction and supervision of fisheries research projects, research coordination, Nez Perce Tribe LSRCF project implementation, report writing, monitoring and evaluation plan and proposal development, tribal fisheries research representation at federal and state meetings, budget preparation, personnel supervision.

Experience: Project Leader, Idaho Salmon Supplementation Study. Nez Perce Tribe. July 1994 - October 1997.

Publications: Hesse, J. 1997. A-run steelhead status in tributaries of the lower Clearwater River, Idaho. In Interactions of hatchery and wild steelhead in the Clearwater River of Idaho. 1995 Progress Report, Fisheries Stewardship Project, USFWS Report. November 1997.

Hesse, J.A., P.J. Cleary, and B.D. Arnsberg. 1995. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1994. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Hesse, J.A. and B.D. Arnsberg 1994. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1993. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Hesse, J.A. 1994. Contribution of hatchery and natural chinook salmon to the eastern Lake Michigan fishery, 1992-1993. Masters Thesis, Michigan State University.

Section 10. Information/technology transfer

We will write an annual report on the results of all objectives and tasks outlined above and coordinate and review reports with the FWS and WDFW to combine into a comprehensive annual report which will be submitted to BPA and published. Oral and/or poster presentations will be delivered when appropriate.