PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Salmon River Production Program

BPA project number: 9705700
Contract renewal date (mm/yyyy): 5/2000 ☒ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Shoshone-Bannock Tribes

Business acronym (if appropriate) SBT

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
7.0A, 7.4O

FWS/NMFS Biological Opinion Number(s) which this project addresses
Concurrence Letters and Addendum to LSRCP BiOp for Steelhead Sidestream Incubation Activities 1994-98; BiOp for Chinook Sidestream Incubation in the South Fork Salmon R. 1997 and Modification to IDFG Section 10 Permit #1010 in 1998.

Other planning document references
US v Oregon PAC 15 High Priority Supplementation Projects; Appendix B of US v Oregon CRFMP; Snake River Recovery Plan Chpt. 7 (esp. at pp 109-110 and 114-115); Chapter 5 in CRITFC Wy-Kan0Ush-Mi Wa-Kish-Wit; Feasibility Plan for Yankee Fork Salmon River; Salmon River Subbasin Plan; Integrated System Plan; ISG Return to the River Report; Remedial Measures from IHOT audits.

Short description
Use instream, sidestream, and in-lake incubation and on-site rearing methods that provide increased natural adaptation to the environment and higher quality smolts than traditional production techniques to increase natural production.

Target species
Snake River spring/summer chinook, sockeye, coho salmon and steelhead

Section 2. Sorting and evaluation

Subbasin
Salmon River and Lower Snake River

Evaluation Process Sort

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

Section 3. Relationships to other Bonneville projects

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

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9604300	Johnson Cr. Artificial Production	Small-scale supplementation
9700100	Captive Rearing Initiative for Salmon River Chinook	Provides donor broodstock through captive rearing
9606700	Manchester Spring Chinook Captive Broodstock	Donor broodstock, optional rearing strategies, and captive brood research
9801002	Captive Rearing Initiative for Salmon River Chinook	Donor broodstock through captive rearing
9703800	Listed Chinook Gamete Preservation	Potential Donor broodstock through cyropreservation
9703000	Monitor Listed Adult Salmon	Supplementation evaluation

	Escapement	
8909800	Salmon Supplementation Studies (& 8909801, 802, and 803)	Supplementation evaluation
9005500	Steelhead Supplementation Studies	Supplementation evaluation
9107300	Idaho Natural Production M&E	Baseline Monitoring and Supplementation evaluation
9107200	Redfish Lk. Sockeye Captive Broodstock Program (& 9204000)	Develop alternative broodstock

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1995	Sidestream Incubation Pilot Study	Yes, successfully hatched eggs and released fry; adult returns to be determined starting 1999
1996	Steelhead Sidestream Incubation	Yes, successful incubation and release; adult returns to be determined starting 1999
1997	Steelhead and Chinook Sidestream Incubation	Yes, successful incubation and release with steelhead; identified correct techniques for chinook
1998	Steelhead and Chinook Sidestream Incubation	Yes, successful incubation for steelhead - chinook eggs presently being incubated successfully.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Continue development and implementation of the Master Plan (construct low cost streamside incubation, acclimation, volitional release and broodstock holding facilities).	a	Continue evaluation of existing and potential incubation, rearing and release sites and facilities.
		b	Define fry and parr presence, relative abundance and density at production sites.
		c	Identify and acquire suitable donor broodstocks including appropriate use of biological and genetic risk assessments.
		d	Monitor and estimate success of

			outplants including hatch rates, species interactions, fry emergence timing and survival rates, distribution and adult returns.
		e	Monitor and evaluate effectiveness of incubation units and placement and design of water supply systems.
		f	Prepare required permits (ESA, NEPA, NPPC, and engineering feasibility and design) and continue coordination with relevant co-managers.
2	Improve/reform existing hatchery programs and facilities.	a	Explore feasibility of utilizing existing fish production facilities (e.g., for central incubation).
		b	Coordinate with managers to identify reform of existing production facilities and programs to improve smolt quality and increase adult returns to natural production areas.
3	Continue fish culture education and Tribal intern programs	a	Educate tribal members in academic and technical training related to fish production and aquatic resources through a cooperative education program.
		b	Employ tribal members in existing fish culture and research facilities and programs as interns.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/1999	10/2006	# Eggs hatched; # Fish released; Survival at various life stages; Adult returns and resultant natural production.	X	75.00%
2	1/1999	10/2006	Meet natural production and hatchery broodstock capacities, while providing harvest opportunities.	X	15.00%
3	1/1999	12/2001	NA	X	10.00%

				Total	100.00%

Schedule constraints
Disagreement on availability of broodstock; Mainstem passage conditions

Completion date
2025

Section 5. Budget

FY99 project budget (BPA obligated): $180,000

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	5 FTE (director, biologist technician, 2 interns)	%15	140,000
Fringe benefits	@34% FTEs	%5	47,600
Supplies, materials, non-expendable property	Office supplies, field supplies, field equipment	%3	30,000
Operations & maintenance	Incubation sheds, rearing ponds	%2	20,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Incubation sheds, rearing facilities, water supply development, vehicles	%43	400,000
NEPA costs	Finalize NEPA	%1	5,000
Construction-related support	Labor	%11	100,000
PIT tags	# of tags: 0	%0	0
Travel	Meetings in Portland, Boise, Field work	%4	40,000
Indirect costs	@ 26% FTEs and Fringe	%5	48,776
Subcontractor	Includes Education/trainee program (tuition, supplies, etc.); and final facility designs	%11	100,000
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			$931,376

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
		%0	

		%0	
		%0	
		%0	
Total project cost (including BPA portion)			$931,376

Outyear costs

	FY2001	**FY02**	**FY03**	**FY04**
Total budget	$350,000	$385,000	$423,500	$465,000

Section 6. References

Watershed?	**Reference**
☐	CRITFC (Columbia River Inter-Tribal Fish Commission). 1996. 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. Vols. I and II. Portland, OR.
☐	CBFWA (Columbia Basin Fish and Wildlife Authority). 1990. Integrated System Plan. 449 pp.
☐	Hanes, R.C. 1995. Treaties, Spirituality, and Ecosystems: American Indian interests in the northern intermountain region of western North America. Walla Walla, Washington: Interior Columbia Basin Ecosystem Management Project; August 1995: 374 [iv], 99,
☐	IHOT (Integrated Hatchery Operations Team). 1996. Hatchery Audits. (available from CBFWA or NPPC, Portland, OR).
☐	ISG (independent Scientific Group). 1996. Return to the River: restoration of salmonid fishes in the Columbia River ecosystem. Development of an alternative conceptual foundation, review and synthesis underlying the FWP of the NPPC. Portland, OR.
☐	Kiefer, S.A., P.K. Cowley, and M. Rowe. 1990. Salmon River Subbasin Plan: report to the NPPC. Portland, OR.
☐	NMFS. 1997. Snake River Salmon Recovery Plan. Pre-release Draft. USDOC NOAA NMFS August 8, 1997. Portland, OR.
☐	PAC (Production Advisory Committee). 1996. US v Oregon. 15 High Priority Production Projects. Project #10: Salmon River Production Program.
☐	Parties to US v Oregon. 1988. Columbia River Fish Management Plan. October 7, 1988. Columbia River Inter-Tribal Fish Commission. Portland, OR.

PART II - NARRATIVE

Section 7. Abstract

As part of the Shoshone-Bannock Tribes' active co-management responsibility, the SRPP was approved for initial BPA funding in FY1998. Currently the planning phases and deliverables of this project are being completed. The overall goal of the project is to use more effective artificial production techniques to reintroduce and recover naturally producing anadromous fish runs in vacant and under-seeded habitats of the Snake and Salmon rivers. This goal is supported and mandated by NPPC Fish and Wildlife Program (FWP) measures 7.0A and 7.4O and the basic intent and policy of the 1994 FWP. Based upon scientific principles and theory for recovery of naturally producing native fish species, proposed methods involve reforming and redirecting existing hatchery programs and practices in conjunction with the addition of small, relatively inexpensive (streamside and satellite) facilities to incubate eggs and provide volitional releases of naturally acclimated juvenile fish. Expected outcomes include redirecting production efforts to recover declining wild populations. A monitoring and evaluation plan will be implemented to measure increased natural production. Specific parameters to be monitored include survival at various life stages and natural reproduction success.

Section 8. Project description

a. Technical and/or scientific background

The Salmon River once produced 40-50 percent of the chinook salmon in the Columbia River basin (CBFWA 1990; Kiefer et al. 1990). The Salmon River subbasin is the heart of the Shoshone-Bannock Tribes (Tribes) aboriginal territory. The Tribes' reliance on anadromous fish returning to this region is well documented (Hanes, 1995). Runs of these fish into the Snake and Salmon subbasins are now only a fraction of their histroical abundance. Once numbering in the millions of adult returns now number less than 40,000 and are listed under the federal Endangered Species Act as threatened or endangered. These declines are due to a variety of factors, including mainstem passage impediments, habitat degradation, and traditional hatchery operations. As part of the Tribes' overall recovery strategy, the Tribes intent is to use "low-tech" fish culture strategies such as stream-side incubation to produce a higher quality smolt than those produced in traditional production hatcheries while providing increased survival during early life stages by utilizing more natural rearing environments.

b. Rationale and significance to Regional Programs

During continued declines in wild anadromous salmonid populations large production hatcheries have been viewed as technological solutions to the continued loss of habitat and disruption of migratory corridors. Recently, these highly technical production strategies have not successfully mitigated losses of natural production. The wisdom of

artificially maintaining anadromous fish populations using these methods in lieu of maintaining habitat and migration corridors has come under question. Fish propagation should not be eliminated, but must be altered to aid in the recovery of naturally producing populations. In general, the critical need and base methods to be researched and implemented can be both artificial production problems that should be corrected and new production activities that should be pursued. The SRPP is designed to evaluate and implement programs using existing hatcheries and if necessary construct facilities to aid in species recovery. This project is in-place and in-kind mitigation to aid in the recovery of listed Snake River salmon. The co-managers have agreed to supplement with appropriate anadromous fish in the Snake and Salmon River subbasins using stock-specific escapement criteria to maintain sustainable naturally producing populations and harvest opportunities.

c. Relationships to other projects

A variety of specific actions have been agreed to by the Salmon River co-managers to address the critical problems in the subbasin. Specifically related to this production project are production actions including BPA-funded project # 9604300 which is a small-scale supplementation project designed to increase survival of a weak but recoverable stock of summer chinook in Johnson Creek on the South Fork Salmon River. Projects 9700100 and 9606700 investigate and implement chinook salmon captive broodstock technologies, which provides a possible source of gametes by collecting juvenile listed spring/summer chinook and raising them to the adult life-stage so that the adults' eggs can be used for donor broodstock for the Tribes' low-tech production program. Monitoring of the captive rearing program is also provided by project 9801002. Project 9703800 preserves chinook salmon gametes by cryo-preservation in an attempt to preserve the opportunity to maintain genetic diversity in small populations. Project 9703000 uses passive underwater video to compare adult chinook returns to supplemented and unsupplemented streams to assist the evaluation of supplementation methods. Projects 8909800, 8909801, 8909802, 8909803, and 9005500 are designed to evaluate the usefulness of supplementation as recovery, restoration, and reintroduction measures for depressed stocks of spring/summer chinook and steelhead in the Salmon and Clearwater subbasin streams. Project 9107300 funds continuing monitoring of natural production throughout the Salmon and Clearwater subbasins.

Project 9107100 is funded to determine the sockeye carrying capacity for nursery lakes in the Salmon River basin and to improve the lake habitat. Projects 9107200 and 9204000 are captive rearing projects to aid in the recovery of Stanley basin sockeye. Lower Snake River Compensation Program and Idaho Power Company mitigation has been funding efforts to release hatchery-produced juvenile anadromous fish to provide hatchery broodstock, supplementation of natural production, and to provide harvest opportunities.

Habitat improvement projects are funded in order to provide improved conditions for the release of juvenile anadromous fish and natural production. These projects work to provide rearing and spawning habitat that are essential for modifying artificial production actions to take advantage of natural conditions. Project 9202603 supports the Lemhi

Model Watershed administration and coordination; and project 9401700 implements habitat restoration in the Lemhi, Pahsimeroi and East Fork Salmon River drainages. Project 9405000 is a habitat enhancement project on the Bear Valley Creek, the Yankee Fork and East Fork Salmon River that includes implementing habitat restoration and conducts monitoring and evaluation of major past investments. Project 9202408 would fund tribal law enforcement activities to protect the fishery resource from man-caused habitat degradation. Project 9401500 is responsible for the construction and maintenance of juvenile fish bypass screens, concolidation of diversions and replacement of diversions with pumps, construction of fish ladders, and conducting pump and diversion surveys. Project 9600700 is in the process of eliminating three major diversions in the main Salmon River through consolidations and installing a pump on the Salmon River to replace lemhi River water during times of critical fish passage needs on the Lemhi River. Projects 9306200 and 9401700 are habitat enhancement projects on the Lemhi, Pahsimeroi, and East Fork Salmon River designed to increase flow, reduce physical barriers to migration and restore riparian vegetation.

d. Project history (for ongoing projects)

This project was first proposed in 1990 under the Early Implementation Process, as three different proposals (development of low-tech facilities in the Lemhi, Yankee Fork, and Johnson Creek tributaries to the Salmon River). The three proposals were consolidated into one SRPP proposal for the FY 1996 project proposal evaluation process. Although the SRPP proposal ranked high in the prioritization process, limited funding (primarily due to large capital expenditures for the Yakima/Klickitat, Hood River/Pelton Ladder, Umatilla Hatchery program and the Nez Perce Tribal Hatchery) precluded project initiation. The Shoshone-Bannock Tribes initiated a pilot demonstration low-technology streamside incubation project in 1995 under their general fisheries management program to test the technology while pursuing development of a full-scale program. Since 1995, approximately 3 million steelhead eggs have been incubated streamside by the Tribes in the upper Salmon River tributaries. The adult returns from these releases are expected to begin in 1999. The Tribes have also initiated streamside incubation of chinook salmon in the South Fork Salmon River in 1997 and in the upper Salmon River in 1998.

In 1995 a comprehensive program was approved under emergency terms by the Northwest Power Planning Council (NPPC) to initiate, low-cost, low-tech alternatives and improvements to existing hatchery programs. This program had also been reviewed and supported by the U.S. v Oregon Production Advisory Committee – both on an annual basis for the demonstration project; and, as part of the 15 High Priority Production Projects that were reported to congress (PAC, 1996). Further, in 1997 Congress requested the NPPC to comprehensively review artificial production activities in the Columbia River Basin, and the SRPP provides an example of hatchery reform that is needed.

Currently, the Tribes have contracted a statement of work with the BPA for the SRPP for FY 1998, and funds have been obligated for FY 1999. Primary work for 1998 and 1999

involves the research, development, and approval of a master plan, ESA compliance, engineering feasibility and designs, and NEPA documents for construction and implementation of low-tech facilities (for incubation, rearing, and volitional release). The SRPP also provides resources for tribal participation in production reviews and regional planning for reforms to existing hatchery programs.

e. Proposal objectives

Objective 1. Continue development and implementation of the Salmon River Production Program Master Plan to construct low cost streamside incubation, acclimation, volitional release and broodstock holding facilities for chinook, coho, and sockeye salmon and steelhead. Specific objectives that the Tribes have been testing with streamside incubation technologies also include: Test the technology for successful hatching; Increase egg-to-fry survival; Determine optimum hatch densities and configurations; Increase community education and involvement; Provide incentives for habitat improvements; Minimize cost; Minimize process; Minimize handling of fish; Maximize the successful use of gametes from captive broodstock techniques; Fulfill requirements of Lower Snake River Compenmsation Act, US v Oregon, and NPPC Salmon Subbasin Anadromous Fish Production Plan (Kiefer et al., 1990); and Determine if significant adult returns and successful natural reproduction to the natural environment occur by using this technology.

Overall, the project aims to test whether low-tech artificial production methods can increase egg-to-fry survival over natural in-gravel incubation and increase production from the fry-to-adult from current hatchery strategies. The following table demonstrates this theory:

Expected life history survival for different production strategies, starting with 20 adult females and 20 adult male anadromous fish in the upper Salmon River:

STRATEGY	EGGS	EYED EGGS	FRY	SMOLTS	ADULTS
Hatchery	100,000	95,000	90,250	85,750	258
Wild	100,000		10,000	3,800	23
Incubator	100,000	95,000	90,250	34,300	206

Objective 2. Improve/reform existing hatchery programs and facilities. The latest congressionally-directed review of artificial production indicates the concerns about traditional hatchery operations and policies. Traditionally, hatcheries have primarily been directed to produce fish that return to the hatchery and to harvest, with little direction to return fish to successfully spawn in the natural environment. The intent of the Tribes' SRPP is to utilize hatcheries to return fish to the natural environment, while maintaining harvest opportunities. The Tribes intend to participate fully in regional activities that are aimed at reforming hatchery actions and policies, including specific modifications to Salmon River facilities to achieve these goals.

Objective 3. Continue fish culture education and Tribal intern programs. As part of the federal government fiduciary trust responsibility to Treaty Tribes, this objective is aimed

at providing opportunities to tribal members to assume management of their trust assests in the modern age. Although the Tribes have managed these resources since time immemorial, the advent of anglo interference requires new methods for effective management of these resources. The objective is intended to provide the tribal members with the skills and knowledge to perform traditional anglo fish culture techniques, thus allowing the tribal members to incorporate their own science, knowledge, and skills to perfect techniques that produce fish in a more natural way.

f. Methods

A variety of methods will be used to implement restoration and reintroduction of wild anadromous salmonids including chinook, sockeye, steelhead, and coho into suitable habitat throughout the upper Snake and Salmon River basins. The methods include, but are not limited to instream, streamside, and in-lake incubation units. These methods, referred to as "low-tech" fish culture, are designed to more closely mimic natural production. Low-tech incubation units will be utilized in areas which presently have little or no natural reproduction. We will utilize either hatchery or wild brood sources for these incubation units. The use of on-site incubation strategies will provide an efficient use of scarce gametes and provide much higher egg-to-fry survival rates than those spawned naturally. Also, juvenile fish would be more naturaly acclimated to their rearing environment as a result of volitional releases. By providing a more natural rearing environment it is believed that survivals of smolt-to-adult will be increased relative to fish incubated, hatched and reared in a traditional hatchery and transported to release sites.

Other methods by which survivals may be increased include providing high quality rearing areas. Such methods may be simply selecting incubation sites adjacent to high quality rearing habitat, or the artificial manipulation, creation, or restoration of high quality rearing habitat adjacent to incubation sites. These artificial rearing areas may be ponds, side-channels, or other suitable areas developed to provide high quality rearing and holding areas.

The Tribes use of low-tech fish culture strategies are intended to provide higher quality smolts than those produced in traditional production hatcheries and do so by increased survival. These survival increase are expected to result from a more natural incubation and early rearing environement.

Monitoring methods include counting unhatched eggs during and at the end of incubation to estimate hatching success rate. Visual observations of juvenile fish in the area of streamside incubation will provide an estimate of rearing success and relative abundance. Other methods may also include active sampling with traps and seines. Outmigration abundance will be monitored with visual observations and may include outmigration trapping (screw traps). Mainstem passage may be monitored by marking outmigrants with PIT tags or other suitable methods (e.g., thermal marking). Adult returns will be monitored with visual observations, including weir counts, redd counts, and harvest.

Evaluation methods will include comparisons of base-line abundance and distribution (pre-treatment) with abundances and distributions upon treatment. This method is appropriate because most of the production actions will be in areas that have little or no presence of anadromous fish at this time.

g. Facilities and equipment

Facilties include office space, warehouse, storage and shop areas, laboratory space, field housing. Equipment includes vehicles, snow machines, ATVs, office equipment (computers, desks, phones, work tables, etc.). Field and laboratory equipment will include microscope, water analysis and monitoring equipment, egg incubation units, thermographs, waders, field clothes, etc.

The low-tech incubations units may require small enclosures for winter operation, and may include suitable incubation units (e.g., Heath trays) depending on the operation and availability of eggs. Central incubation facilities, if needed, may require modifications to existing hatcheries (Sawtooth, Pahsimeroi, East Fork Salmon River). Side stream rearing may require low-tech facilities such as portable circular tanks, earthen ponds with regulatable water supplies, and fish totes.

h. Budget

The FY 2000 budget presented in Section 5 (approximately $930,000) anticipates completion of the Master Plan and NEPA/ESA documents so that construction will occur during the construction window (May – October, 2000). The construction budget is anticipated to primarily occur during one season, and outyear costs are for continuing operations, maintenance, monitoring and evaluation.

Section 9. Key personnel

1) Keith Kutchins, Project Director.

Education:
Masters Degree, Fisheries, Humboldt State University, Arcata, California, 1986.
Bachelors Degree, Wildlife Conservation and Management, Aquatic Option, University of Wyoming, Laramie, Wyoming, 1981.

Work Experience:
12 years in fisheries biology and mangement. Includes 2 years with an oceanographic consulting firm; 8 years with Columbia River Indian Tribes; and 2 years with the Columbia Basin Fish and Wildlife Authority.

Duties:

Responsible for coordination with co-managers, permit acquisition and compliance, reports.

2) Michael Haddix, Project Biologist.

Masters Degree, Biology/Aquatic Ecology, University of Nebraska, Omaha, 1970.
Bachelors Degree, Biology, University of Nebraska, Omaha, 1968.

Work Experience:
28 years in fisheries and aquatic sciences. Includes 21 years with Alaska Department of Fish and Game; 5 years with Montana Department of Fish and Game; 1 year with Montana Department of Environmental Sciences; and 2 years with the Omaha Metropolitan Area Planning Agency.

Past Co-chair of the Pacific Salmon Commission, US/Canada Transboundary Enhancement Technical Subcommittee. Board Member, Southern Southeast Alaska Aquaculture Association.

Duties:
Responsible for field, laboratory and administrative activities, technical oversight, coordination with project co-operators, facility development, production techniques, operations, maintenance and monitoring and evaluation, and supervision of technicians.

Section 10. Information/technology transfer

Quarterly and annual reports will be submitted to BPA. Reporting will also include ESA compliance reports. Also, due to the extensive cooperation and coordination with other entities and agencies (e.g., USFS, BLM, state agencies, landowners, watershed groups, industry, municipalities, schools, Salmon Corps, etc.), reporting will also include workshops and other public information forums.

Congratulations!