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## PART I - ADMINISTRATIVE

### Section 1. General administrative information

#### Title of project

Colville Tribal Fish Hatchery

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**BPA project number:** 8503800  
**Contract renewal date (mm/yyyy):** 10/1999  **Multiple actions?**

**Business name of agency, institution or organization requesting funding**  
Colville Confederated Tribes

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**Business acronym (if appropriate)** CCT

#### Proposal contact person or principal investigator:

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**NPPC Program Measure Number(s) which this project addresses**  
Colville Confederated Tribes

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

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#### Other planning document references

Columbia Basin Fish and Wildlife Authority (CBFWA) 1998 Multi-Year Implementation Plan (MYIP).

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#### Short description

Produce 22,679 kg (50,000 lbs ) of resident salmonids for distribution to reservation waters in an effort to provide a successful subsistence/ recreational fishery as partial mitigation for anadromous fish losses above Chief Joseph and Grand Coulee Dams.

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#### Target species

Brook trout, lahontan cutthroat trout and rainbow trout.

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## Section 2. Sorting and evaluation

### Subbasin

Upper Columbia Mainstem.

### ***Evaluation Process Sort***

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

## Section 3. Relationships to other Bonneville projects

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

<b>Project #</b>	<b>Project title/description</b>

### ***Other dependent or critically-related projects***

<b>Project #</b>	<b>Project title/description</b>	<b>Nature of relationship</b>

## Section 4. Objectives, tasks and schedules

### ***Past accomplishments***

<b>Year</b>	<b>Accomplishment</b>	<b>Met biological objectives?</b>
1991	Reared and stocked 20,687 lbs. of legal size rainbow trout (Mt. Whitney Stock).	Yes. 20,687 lbs represents 177% of the legal rainbow trout production objective of 16,000 lbs.

1991	Reared and stocked 17,123 lbs of subcatchable size rainbow trout (Goldendale stock).	Yes. 17,123 lbs represents 177% of the subcatchable rainbow trout production objective of 13,200 lbs.
1991	Reared and stocked 8,679 lbs of fingerling size rainbow trout (Goldendale stock).	Yes. 8,679 lbs represents 462% of the fingerling rainbow trout production objective of 1,878 lbs.
1991	Reared and stocked 18,089 lbs of subcatchable size eastern brook trout (Owhi Lk. Stock).	Yes. 18,089 lbs represents 137% of the sub-catchable brook trout production objective of 13,200 lbs.
1991	Reared and stocked 1,659 lbs of fingerling size eastern brook trout (Owhi Lk. Stock).	Partially. 1,659 lbs represents 88% of the fingerling brook trout production objective of 1,878 lbs.
1991	Reared and stocked 5,812 lbs of subcatchable size lahontan cutthroat trout (Omak Lk. stock).	Yes 5,812 lbs represents 145% of the lahontan cutthroat trout production objective of 4000 lbs.
1992	Reared and stocked 14,052 lbs.of legal size rainbow trout (Eagle Lake stock).	Partially. 14,052 lbs represents 88% of the legal rainbow trout production objective. The production objective of 16,000 lbs was not met because the fish were 5.6 fish/lb rather than 5.0 fish/lb.
1992	Reared and stocked 10,076 lbs of subcatchable size rainbow trout (Goldendale stock).	Partially. 10,076 lbs represents 76% of the sub-catchable rainbow trout production objective. The objective of 13,200 lbs was not achieved because fewer fish survived to distribution size than expected.
1992	Reared and stocked 2,413 lbs of fingerling size rainbow trout (Goldendale stock).	Yes. 2,413 lbs represents 128% of the fingerling rainbow trout production objective of 1,878 lbs.
1992	Reared and stocked 11,003 lbs of subcatchable size eastern brook trout (Owhi Lk. Stock).	Partially. 11,003 lbs represents 83% of the sub-catchable brook trout production objective of 13,200 lbs. Error in the fingerling/subcatchable split prevented the fully complement of subcatchable production.
1992	Reared and stocked 2,292 lbs of fingerling size eastern brook trout (Owhi Lk. Stock).	Yes, 2,292 lbs represents 122% of the fingerling brook trout production objective of 1,878 lbs.
1992	Reared and stocked 4,554 lbs of subcatchable size lahontan cutthroat trout (Omak Lk. stock).	Yes 4,554 lbs represents 114% of the lahontan cutthroat trout production objective of 4000 lbs.
1993	Stocking data unavailable	
1994	Reared and stocked 14,482 lbs.of legal size rainbow trout (Mt. Whitney stock).	Partially. 14,482 lbs represents 91% of the legal rainbow trout production objective. The production objective

		of 16,000 lbs was not met because the fish were 5.3 fish/lb rather than 5.0.
1994	Reared and stocked 12,223 lbs of subcatchable size rainbow trout (Goldendale stock).	Partially. 12,223 lbs represents 93% of the sub-catchable rainbow trout production objective. The objective of 13,200 lbs was not achieved because internat gut fungus reduced stocking numbers to 278,753 fish rather than 330,000
	Reared and stocked 934 lbs of fingerling size rainbow trout (Goldendale stock).	No. 934 lbs represents 47% of the fingerling rainbow trout production objective of 1,875 lbs. This lot of fish suffered from internal gut fungus and chronic mortality throughout the entire rearing period.
	Reared and stocked 14,695 lbs of subcatchable size eastern brook trout (Owhi Lk. Stock).	Yes. 14,695 lbs represents 111% of the sub-catchable brook trout production objective of 13,200 lbs.
	Reared and stocked 832 lbs of fingerling size eastern brook trout (Owhi Lk. Stock).	Partially. 832 lbs represents 71% of the fingerling brook trout production objective of 1,187 lbs. The objective was not achieved because fish were smaller at release than desired due to early ponding into outside raceways.
	Reared and stocked 5,065 lbs of subcatchable size lahontan cutthroat trout (Omak Lk. stock).	Yes, 5,065 lbs represents 119% of the lahontan cutthroat trout production objective of 4000 lbs.
1995	Reared and stocked 11,789 lbs of subcatchable size rainbow trout (Goldendale stock).	Partially. 11,789 lbs represents 89% of the sub-catchable rainbow trout production objective. The production objective of 13,200 lbs was not achieved because the fish averaged 30 fish/lb rather than 25 fish/lb.
1995	Reared and stocked 14,500 lbs.of legal size (5 fish/lb) rainbow trout (Mt. Whitney stock).	Partially. 14,500 lbs represents 91% of the legal rainbow trout production objective. The production objective of 16,000 lbs was not met because the fish were 5.4 fish/lb rather than 5.0.
1995	Reared and stocked 1,758 lbs of fingerling size (155 fish/lb) rainbow trout (Goldendale stock).	Yes. 1,758 lbs represents 95% of the fingerling rainbow trout production objective (1,875 lbs).
1995	Reared and stocked 8,878 lbs of subcatchable size (31 fish/lb) eastern	Partially. 8,878 lbs represents 67% of the sub-catchable brook trout

	brook trout (Owhi Lk. Stock).	production objective (13,200 lbs). The production objective was not met due to increased mortality during initial ponding and fish were 31 fish/lb rather than 25 fish/lb.
1995	Reared and stocked 1,043 lbs of fingerling size eastern brook trout (Owhi Lk. Stock).	Partially. 1,043 lbs represents 88% of the fingerling brook trout production objective (1,187 lbs). The production objective was not achieved because fish were smaller at release than expected.
1995	Reared and stocked 4,747 lbs of subcatchable size lahontan cutthroat trout (Omak Lk. stock).	Yes. 4,747 lbs represents 119% of the lahontan cutthroat trout production objective of 4000 lbs.
1995	Obtained 841,138 eastern brook trout eggs from Owhi Lk. broodstock.	Yes. 841,000 eggs represents 99% of the egg-take objective (850,000 eggs).
1995	Obtained 200,070 lahontan cutthroat trout eggs from Omak Lk. Broodstock.	Yes. 200,070 eggs represents 100% of the egg-take objective (200,000 eggs).
1995	Provided a tribal subsistence fishery on the Colville Reservation of .86 fish/hr CPUE.	Partially. the observed CPUE represents 86% of the CPUE objective (1.0 fish.hr).
1995	Provided a recreational fishery on the Colville Reservation of .29 fish/hr. CPUE	No. The observed CPUE for recreational anglers represents only 29% of the identified CPUE objective. Reasons why the objective was not met are unknown. Potentially the identified objective is too ambitious.
1995	Brook trout observed in the creel averaged 352mm with a condition factor of $126 \times 10^{-7}$	Partially. The observed average length of brook trout during 1995 exceeded the fishery objective of 343 mm. The condition factor of $152 \times 10^{-7}$ was not achieved. Condition factors may be difficult to maintain as the fish length increases.
1995	Rainbow trout observed in the creel averaged 283mm with a condition factor of $130 \times 10^{-7}$	No. The observed average length of rainbow trout and condition factor in the fishery during 1995 was less than the identified objectives of 343 mm and $152 \times 10^{-7}$ . It appears as if the harvest of legal size (5 fish/lb) negatively affects fish size.
1995	Prevented bacterial/viral outbreaks and minimize fin erosion during hatchery	Partially. No bacterial or viral outbreaks were observed during

	rearing.	1995, however fin erosion continues to be problematic with rainbow trout.
1995	35,000 sub-catchable brook trout and 100,000 lahontan cutthroat trout were stocked into Owhi lake and Omak Lake respectively during 1995. Bacterial/viral sampling continued during spawning operations to access broodstock health and results were negative.	Yes. Annual stocking and bacterial/viral assessment of broodstock sources are necessary to achieve the program objective of Maintaining existing free-ranging brood stocks of brook trout and lahontan cutthroat trout
1995	Monitored and enumerated adult escapement of adfluvial rainbow trout in the SanPoil River Basin and stocked spring spawning Mt. Whitney Rainbow Trout into Round Lk., South Twin Lk. and North Twin Lk. (5,000, 23,122 and 23,118 fish respectively).	Yes. annual stocking of spring spawning rainbow stocks into potential broodstock lakes and monitoring of existing spring spawning populations is necessary to achieve development of an appropriate rainbow trout broodstock source.
1995	Participated in the CBFWA and Northwest Power Planning Council process for implementation of three projects funded through the NWPPC Fish and Wildlife Program.	Although this is not associated with a specific biological objective, the achievement of active, meaningful participation in the current processes is necessary to implement projects in the NWPPC program.
1996	Reared and stocked 16,404 lbs (7,441 kg) of catchable size rainbow trout (Mt. Whitney stock).	Yes. 16,404 lbs represents 102% of the catchable rainbow trout production objective. The production objective.
1996	Reared and stocked 15,719 lbs of subcatchable size rainbow trout (Goldendale stock).	Yes. 15,719 lbs represents 119% of the sub-catchable rainbow trout production objective of 13,200 lbs.
1996	Reared and stocked 10,152 lbs (4,605 kg) of subcatchable size eastern brook trout (Owhi Lk. Stock).	Partially. 8,878 lbs represents 77% of the sub-catchable brook trout production objective (13,200 lbs). The production objective was not met due to mortality related to improper fish culture practices during the late incubation period.
1996	Reared and stocked 5,668 lbs of subcatchable size lahontan cutthroat trout (Omak Lk. stock).	Yes. 5,668 lbs represents 142% of the lahontan cutthroat trout production objective of 4,000 lbs.
1996	Obtained 783,363 eastern brook trout eggs from Owhi Lk. broodstock.	Partially. 78,363 eggs represents 92% of the egg-take objective (850,000 eggs). The egg inventory at the hatchery indicated that the objective had been achieved. This

		inventory was in error slightly, therefore the egg-take objective was not achieved.
1996	Obtained 265,160 lahontan cutthroat trout eggs from Omak Lk. Broodstock.	Yes. 265,160 eggs represents 133% of the egg-take objective of 200,000 eggs).
1996	Provided a tribal subsistence fishery on the Colville Reservation of 1.14 fish/hr CPUE.	Yes. The observed CPUE exceeds the CPUE objective of 1.0 fish/hr.
1996	Provided a recreational fishery on the Colville Reservation of .28 fish/hr CPUE	No. The observed CPUE for recreational anglers represents only 28% of the identified CPUE objective. Reasons why the objective was not met are unknown. Potentially the identified objective is too ambitious.
1996	Brook trout observed in the creel averaged 354mm with average condition factor of $123 \times 10^{-7}$	Partially. The observed average length of brook trout during 1996 exceeded the fishery objective of 343 mm. The condition factor of $152 \times 10^{-7}$ was not achieved. Condition factors may be difficult to maintain as the fish length increases.
1996	Rainbow trout observed in the creel averaged 317mm with condition factor of $129 \times 10^{-7}$	No. The observed average length and condition of rainbow trout in the fishery was less than the identified objective of 343 mm and $152 \times 10^{-7}$ . The "legal size" harvest component may negatively effect average fish size and condition factor.
1996	Prevented bacterial/viral outbreaks and minimize fin erosion during hatchery rearing.	Partially. No bacterial or viral outbreaks were observed during 1996 with the exception of fungus outbreak in the brook trout incubation period. Fin erosion continues to be problematic with rainbow trout.
1996	Stocked 29,938 sub-catchable brook trout and 177,356 lahontan cutthroat trout into Owhi lake and Omak Lake respectively. Broodstock bacterial/viral sampling continued during spawning operations and results were negative.	Yes. Annual stocking and bacterial/viral assessment of broodstock sources are necessary to monitor broodstock health. Healthy broodstock populations are necessary to achieve fishery program objectives.
1996	Monitored and enumerated adult escapement of adfluvial rainbow trout in	Yes. annual stocking of spring spawning rainbow stocks into

	<p>the SanPoil River Basin and Round Lk.</p> <p>Stocked spring spawning Mt. Whitney Rainbow Trout into Round Lk., South Twin Lk. and North Twin Lk. (5,000, 23,122 and 23,118 fish respectively).</p>	<p>potential broodstock lakes and monitoring of existing spring spawning populations is necessary to achieve development of an appropriate broodstock source.</p>
1996	<p>Participated in the CBFWA and Northwest Power Planning Council process for implementation of three projects funded through the NWPPC Fish and Wildlife Program.</p>	<p>Although this is not associated with a specific biological objective, the achievement of active, meaningful participation in the current processes is necessary to implement projects in the NWPPC program.</p>
1997	<p>Reared and stocked 12,637 lbs of catchable size rainbow trout (Mt. Whitney stock).</p>	<p>Partially. 12,637 lbs represents 79% of the catchable rainbow trout production objective. The production objective was not achieved due to a gut fungus outbreak that resulted in a 36% mortality of the legal rainbow component.</p>
1997	<p>Reared and stocked 13,038 lbs of subcatchable size rainbow trout (Goldendale stock).</p>	<p>Yes. 13,038 lbs represents 99% of the sub-catchable rainbow trout production objective of 13,200 lbs.</p>
1997	<p>Reared and stocked 608 lbs of fingerling size rainbow trout (Goldendale stock).</p>	<p>No. 608 lbs represents 33% of the fingerling rainbow production objective of 1,857 lbs. The objective was not achieved because mortality during early feeding reduced over-all numbers and fish were 155/lb rather than 90 fish/lb.</p>
1997	<p>Reared and stocked 12,403 lbs of subcatchable size eastern brook trout (Owhi Lk. Stock).</p>	<p>Partially. 12,403 lbs represents 94% of the 13,200 lb subcatchable brook trout production objective. of. The objective was not achieved because 317,578 fish were stocked rather than 330,000.</p>
1997	<p>Reared and stocked 802 lbs of fingerling size eastern brook trout (Owhi Lk. Stock).</p>	<p>Partially. 802 lbs represents 68% of the 1,187 lb fingerling brook trout production objective. The objective was not achieved due to unexpected mortality at first feeding and the fish were smaller at release than expected.</p>
1997	<p>Obtained 875,121 eastern brook trout eggs from Owhi Lk. broodstock.</p>	<p>Yes. 875,212 eggs exceeds the egg-take objective (850,000 eggs).</p>

1997	Obtained 265,000 lahontan cutthroat trout eggs from Omak Lk. Broodstock.	Yes. 265,000 eggs exceeds the egg requirements of 200,000
1997	Provided a tribal subsistence fishery on the Colville Reservation of .76 fish/hr CPUE.	Partially. The observed CPUE represents 76% of the 1.0 fish/hr CPUE objective. Potential reasons why the objective was not achieved include angler efficiencies, fishing effort, weather effects and fish population densities.
1997	Provided a recreational fishery on the Colville Reservation of .31 fish/hr. CPUE	Partially. The observed CPUE represents 39% of the .8-1.0 fish/hr CPUE objective. Potential reasons why the objective was not achieved include angler efficiencies, fishing effort, weather effects, creel census bias * and fish population densities.
1997	Brook trout observed in the creel averaged 358mm with a condition factor of $126 \times 10^{-7}$ .	Partially. The observed average length of brook trout during 1996 exceeded the fishery objective of 343 mm. The condition factor of $152 \times 10^{-7}$ was not achieved. Condition factors may be difficult to maintain as the fish length increases.
1997	Rainbow trout observed in the creel averaged 308mm with a condition factor of $123 \times 10^{-7}$	No. The observed average length and condition of rainbow trout in the fishery was less than the identified objective of 343 mm and $152 \times 10^{-7}$ . Causative factor is unknown.
1997	Reared all species components without bacterial/viral outbreaks with the exception of internal gut fungus in the legal rainbow trout component.	Partially. No bacterial or viral outbreaks were observed during 1997 with the exception of internal gut fungus outbreak in the legal rainbow component. Approximately 36% mortality occurred related to this occurrence.
1997	Experimented with auto/demand and hand feeding techniques in an attempt to reduce fin erosion in rainbow trout.	No. A visual comparison of the two differentially fed groups of subcatchable rainbow trout did not indicate any positive relationship between feeding technique and improved fin condition.
1997	Experimented with auto/demand and hand feeding techniques in an attempt minimize domestication (behavioral responses).	Yes. Overhead disturbance elicited a negative response (flight) from the auto-fed groups of subcatchable rainbow trout. Hand-fed groups responded with a positive

		feeding behavior to any overhead disturbance.
1997	Stocked 34,929 sub-catchable brook trout and 0 lahontan cutthroat trout into Owhi lake and Omak Lake respectively (broodstock lakes). Bacterial/viral sampling continued and were negative.	Partially. Annual stocking of spring spawning rainbow stocks into potential broodstock lakes occurred. However monitoring of existing spring spawning populations in round Lk. did not occur due to personnel and equipment shortages.
1997	Successfully marked all broodyear 97 legal size rainbow trout to be stocked in the spring of 1998	Yes. Identifiable marks are required to determine fisheries contribution of different hatchery components including the legal size distribution.
1997	Participated in the CBFWA and Northwest Power Planning Council process for implementation of three projects funded through the NWPPC Fish and Wildlife Program.	Although this is not associated with a specific biological objective, the achievement of active, meaningful participation in the current processes is necessary to implement projects in the NWPPC program.
1998	Production and fishery related 1998 data currently in the process of analysis.	

**Objectives and tasks**

<b>Obj 1,2,3</b>	<b>Objective</b>	<b>Task a,b,c</b>	<b>Task</b>
1	Annually produce and stock 22,679 kg (50,000 lbs) of resident salmonid production into reservation waters.	a	Rear and stock 16,000 lbs.of legal size (5 fish/lb) rainbow trout (Mt. Whitney stock).
		b	Rear and stock 13,200 lbs of subcatchable size (25 fish/lb) rainbow trout (Goldendale stock).
		c	Rear and stock 1,857 lbs of fingerling size (90 fish/lb) rainbow trout (Goldendale stock).
		d	Rear and stock 13,200 lbs of subcatchable size (25 fish/lb) eastern brook trout (Owhi Lk. Stock).
		e	Rear and stock 1,178 lbs of fingerling size (90 fish/lb) eastern brook trout (Owhi Lk. Stock).

		f	Rear and stock 4,000 lbs of subcatchable size (25 fish/lb) lahontan cutthroat trout (Omak Lk. stock).
		g	Obtain 850,000 eastern brook trout eggs from Owhi Lk. brood stock annually.
		h	Obtain 200,000 lahontan cutthroat trout eggs from Omak Lk. Brood stock annually.
2	Support a tribal subsistence fishery of 1.0 fish/hr CPUE.	a	Provide hatchery production and spawning activities detailed in tasks 1a-1h.
		b	Analyze and creel census data obtained from Owhi Lk., North and south Twin Lakes.
3	Support a recreational fishery on the Colville Reservation of .8-1.0 fish/hr. CPUE	a	Provide hatchery Production and spawning activities detailed in tasks 1a-1h.
		b	Analyze creel census data obtained from Buffalo Lk., Omak Lk., and North and South Twin Lakes fisheries.
4	Average length Brook trout observed in the creel (343mm) and condition factors of $152 \times 10^{-7}$	a	Tasks 1d, 1e, 2b and 3b
		b	Provide gill netting surveys on Owhi Lk, North and south Twin lakes and Buffalo Lk., three times per year (spring, summer and fall)
5	Average length of rainbow trout observed in the creel (343mm) with condition factors of $152 \times 10^{-7}$	a	Tasks 1a-1c, 2b, 3b and 4b
6	Average lahontan cutthroat trout lengths observed in the creel (508mm) with condition factors of $125 \times 10^{-7}$	a	Tasks 1f, 1h, 3b and 4b
7	Increase natural production of brook trout 15% by the year 2010.	a	Increase natural production of brook trout 15% by the year 2010.
		b	Assess existing and potential shoreline spawning success of brook trout in North Twin Lakes, South Twin lakes Owhi Lake and Simpson lake.
8	Increase natural production of	a	Task 1a

	rainbow trout 10% by the year 2010.		
9	Determine contribution to subsistence and recreational fisheries of natural production fisheries component and fingerling, subcatchable, legal size hatchery fish.	a	Develop/implement marking program for hatchery origin fish.
		b	Tasks 2b, 3b, and 4b
10	Maintain current free-ranging brood stocks of brook trout and lahontan cutthroat trout.	a	Stock 35,000 sub-catchable brook trout into Owhi Lake annually.
		b	Stock 100,000 lahontan cutthroat trout into Omak Lake annually.
		c	Continue bacterial and viral sampling of adults during spawning operations.
11	Prevent bacterial and viral outbreaks and minimize fin erosion during hatchery rearing.	a	Continue proper fish culture techniques.
		b	Reduce loading rate of rainbow trout through rearing
		c	Experiment with feeding regimes and feed types to reduce fin erosion in rainbow trout.
12	Develop a free-ranging rainbow trout brood stock on the Colville Reservation.	a	Monitor and enumerate adult escapement of adfluvial rainbow trout in the SanPoil River Basin
		b	Monitor and enumerate gravid adult rainbow trout in North Twin Lk., South Twin Lk. And Round Lk.
		c	Investigate other reservation waters for potential to sustain rainbow trout brood stock populations.
13	Provide administrative and technical over-sight of Colville Tribal fisheries projects funded by BPA and coordinate fisheries management approaches within the reservation and affected areas within the Upper Columbia river Subbasin and Columbia River Basin	a	Participate in the CBFWA and Northwest Power Planning Council process; specifically Resident Fish Managers group (RFM), Prioritization process, development of a Multi-Year Implementation Plan, Comprehensive Hatchery review and watershed project selection

**Objective schedules and costs**

<b>Obj #</b>	<b>Start date mm/yyyy</b>	<b>End date mm/yyyy</b>	<b>Measureable biological objective(s)</b>	<b>Milestone</b>	<b>FY2000 Cost %</b>
1	10/1999	9/2000	yes		75.00%
2	10/1999	9/2000	yes		2.00%
3	10/1999	9/2000	yes		2.00%
4	10/1999	9/2000	yes		3.00%
5	10/1999	9/2000	yes		4.00%
6	10/1999	9/2000	yes		1.00%
7	10/1999	9/2010	yes		1.00%
8	10/1999	9/2010	yes		0.00%
9	10/1999	9/2000			0.00%
10	10/1999	9/2000	yes		1.00%
11	10/1999	9/2000	yes		1.00%
12	10/1999	9/2000	yes		3.00%
13	10/1999	9/2000			7.00%
				<b>Total</b>	<b>100.00%</b>

**Schedule constraints**

(1) The percent cost per objective is based upon current cooperation with other BPA funded projects implemented by the Tribe, Project personnel from BIA and Tribal funded Programs, if cooperation ceases to some objectives may not be met.

**Completion date**

2039

**Section 5. Budget**

**FY99 project budget (BPA obligated):** \$360,287

**FY2000 budget by line item**

<b>Item</b>	<b>Note</b>	<b>% of total</b>	<b>FY2000</b>
Personnel		%36	\$130,674
Fringe benefits		%9	\$33,975
Supplies, materials, non-expendable property		%5	\$17,500
Operations & maintenance	Actual O&M cost will include major portions of Line-Items for	%26	\$95,400

	Personnel, Fringe Benefits, Indirect.		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Pesculator	%7	\$25,000
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags:	%0	
Travel		%2	7,200
Indirect costs		%14	\$51,224
Subcontractor		%0	
Other		%0	
<b>TOTAL BPA FY2000 BUDGET REQUEST</b>			<b>\$360,973</b>

### ***Cost sharing***

<b>Organization</b>	<b>Item or service provided</b>	<b>% total project cost (incl. BPA)</b>	<b>Amount (\$)</b>
		%0	
		%0	
		%0	
		%0	
<b>Total project cost (including BPA portion)</b>			<b>\$360,973</b>

### ***Outyear costs***

	<b>FY2001</b>	<b>FY02</b>	<b>FY03</b>	<b>FY04</b>
<b>Total budget</b>	\$365,000	\$370,000	\$375,000	\$380,000

## **Section 6. References**

<b>Watershed?</b>	<b>Reference</b>
<input type="checkbox"/>	Bilby, R.E., B.R. Fransen, and P.A. Bisson. 1996. Incorporation of Nitrogen and Carbon from Spawning Coho Salmon into the trophic System of Small Streams: Evidence from Stable Isotopes. Can. J. Fish Aquat. Sci. 53: 164-173.
<input type="checkbox"/>	Halfmoon, F.L. 1978. Fisheries Management Compendium Lakes and Streams Colville Indian Reservation. U.S. Fish and Wildlife Service, Fisheries Assistance Office, Coulee Dam, Washington.
<input type="checkbox"/>	Johnston, N.T., J.S. MacDonald, K.J. Hall, and P.J. Tschaplinski. 1997. A Preliminary study of the role of Sockeye Salmon ( <i>Oncorhynchus nerka</i> ) Carcasses as carbon and nitrogen sources for henthic insects and fishes in the "Early Stuart" stock spawning s

<input type="checkbox"/>	Larkin, G.A., and P.A. Slancy. 1997. Implications of trends in Marine derived nutrient influx to South Coastal British Columbia Salmon Production. Fisheries, American Fisheries Society, 22: 16-24.
<input type="checkbox"/>	Jones and Stokes Associates. 1986. Environmental Assessment of the Resident Trout Hatchery on the Colville Reservation. Report, DOE/EA-0307. Bonneville Power Administration, Portland, Oregon.
<input type="checkbox"/>	Malvestuto, S.P., W.D. Davies and W.L. Shelton. 1978. An evaluation of the roving creel survey with non-uniform probability sampling. Transaction of the American Fisheries Society, 107: 255-262.
<input type="checkbox"/>	Piper et al. 1982. Fish Hatchery Management. United States Department of Interior, Fish and Wildlife Service, Washington, D.C.
<input type="checkbox"/>	R.W. Beck & Associates. 1988. Colville Hatchery Conceptual Design. R.W. Beck & Associates, Seattle, Washington.
<input type="checkbox"/>	R.W. Beck & Associates. 1988. Hatchery Construct Document, Volumes 1 and 2. R.W. Beck & Associates, Seattle, Washington.
<input type="checkbox"/>	Scholz et al. 1985. Complication of Information on salmon and steelhead total run size, catch and hydropower related losses in the Upper Columbia River Basin, above Grand Coulee Dam. Fisheries Technical Report No. 2. Upper Columbia United Tribes Fishes
<input type="checkbox"/>	Sweet, Edwards and Associates. 1987. Colville Tribes Well field analysis report. Sweet, Edwards and Associates, Kelso, Washington.
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## **PART II - NARRATIVE**

### **Section 7. Abstract**

# Colville Tribal Fish Hatchery

(Project No. 8503800)

## ABSTRACT

The Colville Tribal Fish Hatchery is a project within the North West Power Planning Council's Fish and Wildlife Program that partially mitigates for anadromous fish losses in the "blocked areas" of the Columbia River Basin. The hatchery project was adopted into the Council's fish and wildlife Program in 1984 as resident fish substitution for anadromous fish losses. The goal of the project is to provide artificial production of fish that will help support and enhance tribal subsistence fisheries and non-tribal recreational sport fisheries within the Colville reservation including its boundary waters. The fish provided by the facility are intended to be capable of not only direct creel contribution, but to contribute to the natural production component of the reservation fisheries in areas compatible with native fish conservation. The majority of the hatchery production provides a "carry-over" fishery rather than a "put-and-take" fishery. Specific hatchery objectives include: (1) 22,679 kg to include: 160,000 fingerling rainbow trout, 330,000 subcatchable rainbow trout, 80,000 legal size rainbow trout, 196,000 fingerling brook trout, 330,000 subcatchable brook trout and 100,000 lahontan cutthroat trout, (2) Fishery Catch Per Unit Effort (CPUE): Subsistence fishery of 1.0 fish/hr and recreational/sport fishery of .8-1.0 fish/hr, (3) creel fish condition factors: Brook trout ( $K > 152 \times 10^{-7}$ ), rainbow trout ( $K > 152 \times 10^{-7}$ ) and lahontan cutthroat trout ( $K > 152 \times 10^{-7}$ ), (4) increase natural production of brook and rainbow trout (10% and 15% respectively) by the year 2010, (5) brood stock objectives: maintain current free-ranging brood stock sources, develop a free-ranging rainbow trout brood stock source, (6) Fish culture objectives: provide rearing conditions that prevent the manifestation of bacterial and viral diseases and minimize fin erosion; (7) fishery monitoring objectives: Access the fishery contribution of natural and hatchery production; (8) Maintain coordinated fisheries management within the reservation and other affected areas within the Columbia River Basin.

## Section 8. Project description

### a. Technical and/or scientific background

This project location is in the Upper Columbia Sub-Region above the "blocked area" created by the construction of Chief Joseph and Grand Coulee Dams; specifically the project enhances resident fisheries within the Colville Reservation and associated boundary waters. The project mitigates for anadromous fish losses through protection/enhancement of resident fish populations (i.e. in-place, out-of-kind mitigation).

The project goal of providing/contributing to a successful tribal subsistence fishery and a non-member recreational sport fishery is consistent with the Council's 1994 Fish and wildlife System Goal of "a healthy Columbia River Basin, one that supports both human

settlement and the long-term sustain ability of native fish and wildlife species in native habitats where possible, while recognizing that where impacts have irrevocably changed the ecosystem, we must protect and enhance the ecosystems that remains. To implement this goal the program will deal with the Columbia River as a system; will protect mitigate and enhance fish and wildlife while assuring an adequate, efficient, economical and reliable power supply; and will be consistent with the activities of the fish agencies and tribes.”

The construction of Chief Joseph and Grand Coulee Dams completely and irrevocably blocked anadromous fish migrations to the Upper Columbia River Sub-Region (area above Chief Joseph Dam). Prior to hydropower development the areas above the current “blocked area” supported a large diverse fish population, including eleven salmonid stocks (Scholz et al. 1985). The complete extirpation of anadromous fish stocks from this area reduced the native salmonid species assemblage by approximately 64 percent. Resident fish species were also impacted through habitat alteration (inundation) lost productivity (absence of nutrient component attributable to anadromous fish) and habitat degradation relating to land-use practices (agriculture, grazing, logging and municipal development) largely made possible by hydropower development in the region.

The current salmonid species composition of inland waters contained within the Colville Reservation boundaries (including Lake Roosevelt) is exclusively resident fish and contains little if any native species assemblage. Fisheries surveys of reservation waters have identified only two possible native salmonid stocks present that includes, adfluvial rainbow trout and natural production kokanee, both residing in Lake Roosevelt and the SanPoil River Basin (Jerry Marco, Tribal Fisheries Biologist, personal communication). Definitive stock status of these two populations is currently unknown, however research is currently being conducted to determine stock origin and status of these two salmonid Populations (Chief Joseph Kokanee Enhancement Project and Lake Roosevelt Rainbow Trout Tributary Habitat/Passage Improvement Project). The remainder of the salmonid stock assemblage consists of native species comprised of non-native stocks and non-native species.

The species/stock assemblages present in reservation waters are adapted to survive in marginal salmonid habitat and have been present for many years. Typically interior reservation lacustrine habitats exhibit extensive macrophyte communities, decreased hypolimnion during summer stratification and high surface water temperatures (Brock et al. 1995). Riverine habitats exhibit unstable banks, poor riparian communities, high summer temperatures, substantial fines component in the substrates and intermittent flows. The potential for natural production (native or non-native species/stock) has been reducing in many of the associated watersheds through poor land use practices and elimination of the anadromous fish nutrient component which has been linked to salmon production potential in many watersheds (Bilby et al. 1996, Larkin 1997 and Johnson et al. 1997). Species such as lahontan cutthroat trout are utilized in special situations where water quality parameters (alkalinity) prevent production of native salmonids.

Historical stocking data indicates non-native species/stocks have been utilized to supplement depressed fisheries within the reservation since the early 1930's (Thiessen 1965 and Halfmoon 1978). Species utilized has included rainbow trout (various non-native stocks), eastern brook trout, westslope cutthroat trout and lahontan cutthroat trout. Currently this hatchery program stocks 22 different water bodies within the reservation (16 lakes and 6 streams). One hundred percent the water bodies currently being stocked have received hatchery origin fish since 1974 and seventy-seven percent of those have received stocking since 1960. A large proportion (90%) of the lakes stocked through this project are closed lake systems and are not inhabited by native salmonids.

Artificial supplementation (stocking) of resident fish species/stocks that are compatible with the available habitats seems to be a logical approach to mitigating/enhancing fisheries impacts in the blocked area, particularly considering the extensive habitat alterations, degradation and historical artificial stocking of resident fish that have occurred over the past 60 years. The Tribe is currently implementing habitat restoration and native salmonid research programs in locations where native salmonids exist and in areas with potential/feasible for native fish recovery. Management approaches that concentrates it's sole objective as native fish recovery in reservation waters would require extensive habitat restoration, drastically altered land-use activities, extirpation of non-native species and stocks and re-introduction of anadromous fish in the blocked area. It is doubtful that implementation of the aforementioned activities would occur at a large enough scale to substantially improve stock status of native fish or support Tribal subsistence and recreational fisheries. A hatchery program that supports tribal and recreational fisheries while habitat restoration occurs in feasible locations to support native salmonid recover/enhancement represents a rational approach to fisheries management in the blocked area.

**b. Rationale and significance to Regional Programs**

The project goal of providing/contributing to a successful tribal subsistence fishery and a non-member recreational sport fishery is consistent with the Council's 1994 Fish and wildlife System Goal of "A healthy Columbia River Basin, one that supports both human settlement and the long-term sustain ability of native fish and wildlife species in native habitats where possible, while recognizing that where impacts have irrevocably changed the ecosystem, we must protect and enhance the ecosystems that remains. To implement this goal the program will deal with the Columbia River as a system; will protect mitigate and enhance fish and wildlife while assuring an adequate, efficient, economical and reliable power supply; and will be consistent with the activities of the fish agencies and tribes."

The project partially **mitigates** for anadromous fish losses in areas permanently blocked by Chief Joseph and Grand Coulee Dams by utilizing artificial production of resident salmonids, rather than providing substantially more expensive anadromous fish passage (adult and juvenile) at Chief Joseph and Grand Coulee Dams, and extensive habitat restoration efforts for anadromous fish. This method of mitigation is consistent with mitigating for hydropower-related impacts to fish and wildlife while assuring an

adequate, efficient, economical and reliable power supply. In addition the development of a successful subsistence and recreational fishery is consistent with the goal of the Colville Tribe to provide subsistence fisheries for its tribal members. The project is also consistent with the principles, priorities and biological objectives stated in the Council's resident fish section of the 1994 Fish and Wildlife Program (Sections 10.1A, 10.1B, 10.1C and 10.8B respectively).

Specifically this project concentrates its effort in the "blocked Area" above Chief Joseph and Grand Coulee Dam which is consistent with the Council's priority to substitution measures (section 10.1B), satisfies principles of substitution where in-kind mitigation is not possible, occurs in the vicinity of the salmon and steelhead losses, complements the activities of the area agencies and tribes (i.e. promotes improved fishery opportunities while utilizing the best available science), utilizes traditionally defined resident fish species (i.e. Brook trout, rainbow trout and cutthroat trout (section 10.1A). Further more the project has accepted/approved biological objectives (section 10.1C and 10.8B) and is specifically detailed as program measure 10.8B.6.

Specific project objectives detailing production objectives, hatchery rearing conditions, fishery quality (CPUE, average fish length and fish condition factors of fish observed in the fishery) and monitoring and evaluation (fish marking and recovery) all provide for assessment of the projects contribution to a fishery, rather than just concentrating on the number of pounds of fish produced at a hatchery facility. The aforementioned objectives relate directly to the NPPC resident fish goal of Aprotecting, mitigating and enhancing the health and viability of resident fish populations to meet consumptive and non-consumptive needs in the Columbia River Basin (section 10.1; 1994 NPPC fish and wildlife Program). Objectives detailing increases in natural production of hatchery origin fish (natural supplementation) and development of free-ranging brood stocks all address the long-term viability of artificial production programs as well as natural production utilization of available habitats. Objectives addressing administrative functions (secure funding for all BPA funded projects implemented by the tribe and providing administrative and technical over-sight for all BPA funded fisheries projects implemented by the tribe). This allows the project to function in a coordinated fashion with other fisheries enhancement projects in the "blocked area", specifically the Lake Roosevelt Rainbow Trout Habitat/Passage Improvement project (proj.# 9001800), Chief Joseph Kokanee Enhancement Project (Proj# 9501100), Lake Roosevelt Fisheries Monitoring Program (Proj. # 944300) Spokane Tribal Hatchery (Proj.# 9104600), Sherman Creek Hatchery (Proj.# 9104700) Lake Roosevelt Rainbow Trout Net Pens (Proj.# 9500900) and Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams (proj.# 9700400).

**c. Relationships to other projects**

Currently the Colville Tribal Trout Hatchery Program shares personnel and equipment with the Lake Roosevelt Rainbow Trout Habitat/Passage Improvement project and the Chief Joseph Kokanee Enhancement Project. The cooperative projects rely upon shared personnel and equipment for activities such as adult and juvenile trapping, spawning operations, fish distribution and administrative activities.

**d. Project history (for ongoing projects)**

The Colville Tribal Fish Hatchery Project was amended into the Northwest Power Planning Councils Fish and Wildlife Program in 1984, to provide funding for the design, construction and operation and maintenance of a resident trout hatchery program on the Colville Reservation. The resident trout hatchery program partially satisfies Bonneville Power Administrations fish and wildlife responsibilities pursuant to Section 4(b)(10)(a) of the Pacific Northwest Electric Power Planning and Conservation Act and other legislation.

The project has been in existence for 14 years, beginning with feasibility studies, NEPA compliance documentation and design work all occurring between 1984 and 1988. Construction of the hatchery occurred between 1988 and 1990, including an Operations and Maintenance Agreement (O&M) between BPA and the Colville Confederated Tribes. The O&M Agreement is a 25 year legal obligation with a 25 year renewal option to provide appropriate funding to satisfy program goals and objectives and for the program to operate within industry standards and accepted methods (for more detailed information see Colville Tribal Hatchery Operations and Maintenance Agreement). Reports and technical papers developed during this period include: Environmental Assessment Report (Jones & Stokes Associates, Inc. 1986), Well Field Construction Report (Sweet, Edwards/EMCON 1987), Well Field Analysis Report (Sweet, Edwards and Associates 1987), Water Quality Report (Truscott 1987), Pre-design report (R. W. Beck and Associates 1986), Design Report (R.W. Beck and Associates 1988) and Hatchery Construction Documents, including design drawings (R.W. Beck and Associates 1988).

Operations began at the hatchery in the fall of 1990 and have continued to the present time. Originally the project was only production goal orientated (1990-1994). Beginning in the operating year 1995 more fishery related goals and objectives were developed for the program to access the programs impact on subsistence and recreational fisheries (Truscott 1995) Objectives include both short-term (annual production objectives and administrative objectives) and long-term (fishery related objectives such as average creel size fish, catch per unit efforts, average fish condition factor in creel, increases in natural production fishery component, maintenance and development of free-ranging brood stock sources, monitoring and evaluation and development of comprehensive fishery management plans. Reports and technical papers developed during this period include: Annual operating plans (Truscott 1990-1999), and annual operating reports (Truscott 1990-1997).

The project has met or has closely met the production objective of 22,679 kg (50,000 lbs.) of resident salmonid production annually. Most recently The Colville Tribal Fish hatchery distributed 17,912 kilograms and 31,752 kilograms during 1997 and 1998, which is 80% 140% respectively of the annual production goal of 22,679 kilograms (Truscott 1997). Production was down in 1997 primarily due to an out-break of soft-shell disease in the lahontan cutthroat trout which resulted in 100% mortality of the “eyed eggs”. The increase in 1998 is associated with distribution of larger fish (fingerling and legal components).

Rearing densities at the hatchery have been within industry standards with the exception of short durations during inside rearing. Excessive fin erosion has been a continual problem with rainbow trout and is considered to be a space related problem at the hatchery even though the rearing densities are within industry standards. Feeding regimes involving auto-feeders were successful in reducing behavioral responses to overhead disturbance, but unsuccessful in reducing fin erosion in rainbow trout.

The continued development and monitoring of reservation rainbow brood stocks was limited to four streams during 197-98 period. Monitoring activities investigating potential brood source stock included adfluvial rainbow trout stocks in the SanPoil River Basin. Monitoring activities in 1997 recovered 13 gravid adfluvial rainbow in the four identified streams. Extreme high water flows in the spring of 1997 prevented any meaningful trapping/monitoring of the adfluvial rainbow trout population in the SanPoil River Basin. Monitoring activities on North and South Twin Lakes and Round Lake were not implemented due to extended ice-cover and personnel shortages. Continued monitoring of both adfluvial and lacustrine rainbow stocks is warranted at this time, however the apparent unpredictability of year class strength and seasonal difficulty in trapping the adfluvial stock may preclude its utility as a free-ranging broodstock source. Future monitoring activities should concentrate on developing an interior lacustrine rainbow broodstock.

Hatchery monitoring activities relative to fishery contribution included: Creel census surveys on North Twin Lake, South Twin Lake and Owhi Lake and with gill net surveys on North Twin Lake, South Twin Lake and Buffalo Lake. Specific evaluation components of interest included Catch Per Unit Effort (CPUE), average fish length, weight and condition factor as well as relative species abundance.

Creel census data from the Twin lakes and Owhi fishery indicated a resurgence of the brook trout fishery at both locations, while the rainbow fishery in Twin Lakes may have decreased slightly during the 1991-97 period. The 1997 observed values for Owhi Lake and brook trout CPUE (.76 fish/hr) were less than the program objective (1.0 fish/hr) while the average fish lengths (370 mm) were greater than the program objectives. The average condition factor was slightly less than the program objective. Program objectives for CPUE and condition factor were not observed for brook trout in the Twin Lakes fishery (recreational fishery) however, the average fish length objective was satisfied and the average fish weights were the greatest since 1993 (Truscott 1997). The observed values for rainbow trout in 1997-98 did not meet any of the program objectives,

however the CPUE was 16% greater than those observed in 1996 and were comparable to values observed during the period when the fishery was being supplemented with stocking from the Winthrop National Fish Hatchery. Creel census information for Buffalo Lake is unavailable, therefore gill net survey information was used to determine average fish size and condition factor. Rainbow trout observed in the Buffalo Lake gill net catches during the 1997 survey period were few (5 fish), therefore assessment of programs objective for average fish length, and condition factor was a moot consideration in 1997.

It appears as if the operation of the Colville Tribal Hatchery is having a positive affect or at least maintaining the existing recreational and subsistence fisheries on the reservation. Some lakes and species have responded better to the hatchery program than others. Brook trout fisheries in all waters monitored with the exception of Buffalo Lake have shown substantial improvement since the inception of the hatchery program. the hatcheries effect upon the monitored rainbow fisheries doesn=t appear as conclusive as the brook trout fisheries. Continued creel census and increased gill net survey frequencies are warranted in an effort to better determine the hatcheries current contribution to the reservation fishery, potential contribution and define it=s role in fisheries management on the Colville reservation.

**e. Proposal objectives**

Specific measurable objectives for this project include:

- (1) 50,000 pounds of resident trout production.
- (2) Subsistence fishery of 1.0 fish/hr.
- (3) Recreational/sport fishery of .8-1.0 fish/hr.
- (4) Brook trout creel condition factors ( $K > 152 \times 10^{-7}$ ).
- (5) Rainbow trout creel condition factors ( $K > 152 \times 10^{-7}$ ).
- (6) Lahontan cutthroat trout creel condition factors ( $K > 125 \times 10^{-7}$ ).
- (7) Increase natural production of eastern brook trout 10% by the year 2010.
- (8) Increase natural production of rainbow trout 15% by the year 2010.
- (9) Maintain current brood stock sources of brook and lahontan cutthroat.
- (10) Develop an on-reservation rainbow trout brood stock source.
- (11) Provide rearing conditions that prevent the manifestation of bacterial and viral diseases and minimize fin erosion.

- (12) Determine the natural and hatchery origin contribution to reservation fisheries.
- (13) Provide a coordinated fisheries management approach within the Colville Columbia Reservation and other affected areas within the Upper Columbia River Sub-Region and River Basin.

Expected benefits to the FWP include: Increased subsistence fishery opportunity for Colville Tribal members, increased fishery opportunities for non-members, fisheries results orientated hatchery programs rather than production orientated, realize benefits to wildlife species in the affected area (potential forage base) and a coordinated fisheries management approach within the reservation, Upper Columbia River Sub-Region and Columbia River Basin.

## **f. Methods**

### **SCOPE**

The Colville Tribal fish Hatchery will rear and stock 22,679 kg of resident salmonids into reservation lakes and streams in an effort to support a successful subsistence and recreational fishery. The stocking program will utilize eastern brook trout, rainbow trout and lahontan cutthroat trout in reservation waters where these species have been utilized for the past 30-60 years. The fishery will be primarily a Carry-over fishery supported by fingerling and sub-catchable and legal size stocking of the brook trout, lahontan cutthroat trout and rainbow trout. Brood stock sources for brook trout and lahontan cutthroat trout are and will continue to be Free-ranging as will the rainbow trout brood stock once it is developed, in an effort to provide the highest quality product through natural selection. Hatchery fish will contribute to natural spawning populations of hatchery origin fish.

### **METHODOLOGY**

#### **Hatchery Operations**

The hatchery currently utilizes single-pass ground water that is essentially pathogen free. Eggs of all species utilized are incubated in vertical hatch trays and treated daily with formalin (1670 ppm) for fungus control (Truscott 1998). Feed training occurs in shallow troughs, while Capalano troughs are utilized for rearing until the fish reach 200-600 fish/pound, at which time they will be moved to outside rearing facilities. Outside rearing facilities consist of eight 100'x10' concrete raceways passing 450 gpm. Fish will be reared to out-planting size in the raceways as described in the 1999 Colville Tribal Hatchery Annual Operating Plan (Truscott 1998). Rearing densities throughout the rearing cycle will not exceed industry standards cited in the Fish Hatchery Management manual (Piper et al. 1992) and will attempt to load at approximately 75% of maximum loading densities cited by Burrows and Combs (1968).

Egg acquisition of brook trout and lahontan cutthroat trout will be derived from free-ranging broodstocks located in Owhi and Omak Lake respectively. Brook trout will be captured with a beach seine on the spawning day and spawned at a 1:1 sex ratio. All fish will be live spawned and returned to the lake. Fertilized eggs will be water-hardened in iodophor (100 ppm) at the spawning site and transported to the hatchery facility in insulated water coolers. Bacterial and viral samples will be obtained from 60 fish during the spawning process and analyzed by the USFWS Fish Health Center in Olympia Washington. Lahontan cutthroat trout will be captured in Omak Lake during April and May utilizing a Lake Merwin Trap. Spawning procedures will be essentially the same as those detailed for brook trout in the 1999 Colville Tribal Hatchery Annual Operating Plan ( Truscott 1998).

Feeding regimes will range from hourly feedings to twice daily, utilizing both hand and auto-feeding. Feed types will include both semi-moist and traditional dry trout feeds. Auto-feeders will be utilized with a portion of the production in an attempt to lessen aggressive behavior to over-head disturbance and lessen fish densities during feeding in efforts to reduce fin nipping in rainbow trout.

Out-planting into reservation lakes consists of 22,679 kg of resident salmonids stocked into 22 waters within the Colville reservation, and will occur during the late winter, spring and fall as detailed in the 1999 Colville Tribal Annual Operating Plan (Truscott 1998). Stocking dates are determined by ice cover, water temperatures, fish size at the hatchery and predatory population status at the stocking locations. Stocking will be accomplished by trucking fish from the hatchery location to the stocking site in two (2) 1200 gallon distribution trucks and one (1) 300 gallon distribution truck. Loading rates will range between .7-1.0 lb/gal. Anti-foaming agents and a .2% salt solution will be utilized during the distribution process. Stocking location and number is determined by available habitat, angler preference and angler effort. Specialized species such as lahontan cutthroat trout will continue to be stocked into only high saline lakes.

## **Monitoring and Evaluation**

Development of an on-reservation egg source for rainbow trout (spring spawning stock) will involve the continued outplanting of Tokul Creek stock into Round Lake, North Twin Lake and South Twin Lakes, trapping and enumerating adult adfluvial rainbow in North and South Nanampkin Creeks, as well as trapping and enumerating adult spring spawning rainbow in North Twin, South Twin and Round Lakes. Monitoring of lake populations will utilize Lake Merwin traps and Apicket-weir traps, while stream populations will be trapped with only Apicket weir type traps. Picket weir design is described in the Lake Roosevelt Rainbow trout Habitat/Passage Improvement Project, Phase III Monitoring and Evaluation, 1997 (Alexis 1997).

Contribution to the fishery of natural production component and that of various sizes of fish stocked from the hatchery will require that hatchery fish receive differential marks to identify them as hatchery origin, broodyear, and size. Ideally fish would be adipose clipped and coded-wire tagged, however BPA has not agreed to this type of marking because of the cost. An adipose clip will be utilized to identify the legal size component to assist in the determination of the legal size component contribution to the fishery.

Recovery of marked fish will be accomplished utilizing a roving creel census survey with non-uniform probability sampling (Malvestuto, 1978) conducted on Owhi Lake, North Twin and South Twin Lakes. Adipose and non-adipose clipped fish will be noted and 10% of non-adipose clipped fish will have otolith samples taken for subsequent examination to determine the natural production component to the fishery and determine the contribution to the fishery of legal size hatchery production. In addition to the creel census data recovery efforts, three gill netting surveys will be conducted on Buffalo lake, Owhi Lake, North Twin Lake and South Twin Lake to better determine (reduce potential bias of angler preference and seasonal variances) the contribution to the fishery of natural production components, brood years, various sizes of fish stocked from the hatchery facility and evaluation of the potential CPUE, average fish length, fish condition factors observed in the reservation fisheries . Gill net surveys will be accomplished using four (4) experimental bottom-set and four (4) vertical gill nets set fished approximately 16 hours each. Fishing period will from approximately 4:00 PM - 8:00 AM. Frequency of netting will be increased from one time per year to three times per year (spring, summer and fall). Analysis of creel and gill netting data will utilize standard statistical analysis (mean, median, mode, standard deviation ect.) The difference between data sets will analyzed using ANOVA analysis of variance.

**g. Facilities and equipment**

The hatchery is a relatively new facility (constructed in 1988-89) and consists of standard heath tray incubation; water chiller; shallow, deep and capalano trough inside rearing; 10'x100concrete raceways for outside rearing; 100% groundwater supplied rearing water; back-up emergency generator; garage, hatchery building, fully equipped shop; on-site residences and equipment and supplies to operate a standard fish culture operation.

Hatchery limitations are primarily seasonal personel shortages and rearing space related. Future operations and budget should address both limiting factors. Potentially better coordination between cooperating projects could remedy the personel issue, however additional funding will be required to remedy the rearing space delema currently being experienced. Field equipment is satisfactory for the most part, with limitations being stream trapping equipment to cope with periodic high flow conditions.

**h. Budget**

The identified items and the associated cost are similar to previous year's operation. The Salaries item amount funds four FTE's and has allowances for position "up-grades" and a cost-of-living increase. The supplies/materials and O&M items are closely related and supply the necessary materials sub-contracts and maintenance requirements for the facility and its operation. These items include large cost items such as fish feed and electrical demand for the facility. The equipment item includes a "fish-lift" to reduce the loading stress on fish and hatchery personnel. Currently the program hand loads (dip net) fish from the raceways into the distribution trucks. The travel item covers travel associated with CBFWA, NWPPC and BPA project prioritization / coordination for all BPA funded projects implemented by the Tribe. The Fringe and Indirect costs are negotiated between the Tribe and the Federal Government and are associated with only the salaries identified in the budget.

## **Section 9. Key personnel**

(Kirk Truscott, Hatchery Biologist  
Rodney Stensgar, Hatchery Manager  
Joseph Carden, Fish Culturist  
Phillip Grunlose, Fish Culturist

The persons involved with this project meet the educational and experience requirements of the Colville Confederated Tribes of the Colville Reservation for these types of positions. The Tribes are the entity charged by law with the responsibility for carrying out these types of activities.

## **Section 10. Information/technology transfer**

(Dispersal of information regarding this project will be primarily through annual reports submitted to Bonneville Power Administration, Resident fish Managers Project Review (CBFWA), periodic meetings with the Spokane Tribe, WDFW, public presentations in the NPPC process and other public venues when requested.

**Congratulations!**