HATCHERY AND GENETICS MANAGEMENT PLAN

SECTION 1. GENERAL PROGRAM DESCRIPTION.

1.1 Name of Hatchery or Program

Kalispel Tribal Hatchery

1.2 Species and Population (strain) under propagation, ESA/population status.

Largemouth bass, *Micropterus salmoides*

1.3 Responsible Organization and Individuals

Stanley Bluff, jr. Hatchery Manager
Kalispel tribe
P.O. Box 39
Usk, WA 99180
Phone: (509) 445-0298
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1.4 Funding Source, Staffing Level, and Annual Hatchery Program Operational Costs.

Funding Source: Bonneville Power Administration
Staffing Level: 2 (Hatchery Mgr., Hatchery technician)
Average Operational Cost:

96/97	188,178.00
97/98	183,565.00
98/99	130,007.00
99/00	152,308.00
Average:	163,514.50

1.5 Location of Hatchery and Associated Facilities.

Hatchery location:	Kalispel Reservation 9171 LeClerc road
Stream:	Pend Oreille River, Box Canyon Reservoir 90 river kilometers
Watershed code:	WRIA 62 Box Canyon Reservoir Washington

1.6 Type of Program.

Integrated Harvest: *Project in which artificially propagated fish produced primarily for harvest are intended to spawn in the wild and are fully reproductively integrated with a particular natural population.*

1.7 Purpose or Goal of the Program.

Mitigation. "Facilitate the production and rearing of juvenile largemouth bass for supplementation and thereby increase the production of harvestable bass." The hatchery is designed to supplement the current largemouth bass population within the Box Canyon Reservoir.

1.8 Justification for the Program.

In 1987, the Northwest Power Planning Council (NPPC) amended its Columbia River Basin Fish and Wildlife Program to include a resident fish substitution policy. This policy called for substitution of resident fish in areas where anadromous fish historically occurred, but were blocked with the construction of the Chief Joseph and Grand Coulee Dams. One of the first projects adopted by NPPC was the "Assessment of fishery improvement opportunities in the Pend Oreille river within the boundaries of the Kalispel Indian Reservation" (Ashe, *et al*. 1992). The purpose of this three-year study was to establish baseline information of existing fish populations and habitat; and identify possible methods of improving fisheries within the reservoir. Recommendations from this study are proposed as resident fish substitution under the Northwest Power Planning Council's 1987 Resident Fish Substitution Policy.

The assessment identified several factors within the reservoir that limited the fisheries opportunities within the Box Canyon Reservoir. Some of these factors included water elevation fluctuations, lack of overwinter cover for age 0+ bass, and inadequate recruitment of largemouth bass into the system. The University of Idaho also performed a study during this time (Bennett, Liter, 1991) and concurred with the above factors and proposed similar recommendations of the assessment study published by Ashe.

Ashe, *et al* (1991) indicated that growth rates of largemouth bass during the first four years in the Box Canyon Reservoir were lower than bass from other locations of the northern United States, and conversely growth rates after the fourth year were comparable or even higher than other locations. The slower growth combined with a high rate of juvenile mortality associated with overwintering have reduced the potential for the bass population within the reservoir. Largemouth bass density estimates are approximately 6 pounds per surface acre in the Box Canyon Reservoir.

In 1991, Ashe and Bennett suggested the possibility of an off-site rearing facility to supplement the number of juvenile largemouth bass within the Box Canyon Reservoir. Supplemental stocking of yearling largemouth bass has been proven successful in other reservoirs. In Chatfield Reservoir, Colorado, largemouth bass were hatchery-reared to one year of age using intensive and extensive culture from 1978 to 1981.

Subsequent samples of age 2 bass in the reservoir composed 12%, 59%, and 59% of the population, during sample years 1980, 1981 and 1982, respectively (Kreiger and Puttman 1986). Increases in the age 2 class fish were directly attributed to hatchery supplementation.

Based on these findings, biological objectives for largemouth bass (*Micropterus salmoides*) were identified and incorporated into the NPPC's program. The largemouth bass biological objectives are as follows.

- Increase the biomass of harvestable largemouth bass in the Box Canyon Reservoir from the current 6 pounds/acre to an interim target of 8 pounds/acre by 2003 and a final target of 12 pounds/acre by the year 2008.
- Increase age 0+ largemouth bass overwinter survival from current levels of 0.4-3.9 percent to approximately 15-20 percent.

1.9 List of Program Performance Standards.

- Increase the biomass of harvestable largemouth bass in the Box Canyon Reservoir from the current 6 pounds/acre to an interim target of 8 pounds/acre by 2003 and a final target of 12 pounds/acre by the year 2008.
- Increase age 0+ largemouth bass overwinter survival from current levels of 0.4-3.9 percent to approximately 15-20 percent.

1.10 List of Program Performance Indicators designated by "benefits" and "risks".

1.10.1 Performance Indicators addressing benefits.

The supplementation of largemouth bass in the reservoir will help the natural occurring population re-establish itself in the overall fish population. Currently, largemouth bass account for approximately 8 percent of the total population in the reservoir. Recruitment is just one of the obstacles facing the largemouth bass population.

The overwinter survival of largemouth bass in the reservoir is estimated at 0.4-3.9 percent. Predation and lack of overwinter cover in the reservoir make the first year of survival very hard. Hatchery operations along with habitat improvements are geared to resolve these issues.

1.10.2 Performance Indicators addressing risks.

Not applicable.

1.11 Expected Size of Program.

1.11.1 Proposed Annual broodstock need (maximum # of fish).

The operation currently requires a minimum of 32 brood fish (16 male, 16 female). Ideally, we would like to have at least twice that much just in case something goes wrong during the year. Currently there is no extra space for any additional brood fish.

1.11.2 Proposed Annual Fish Release levels (Max.#) by life stage and location.

Life Stage	Release Location	Annual Release Level
Eyed eggs	Hatchery troughs	200,000
Unfed fry	N/S slough	200,000
Fry	Pend Oreille river	100,000
Fingerling	Pend Oreille river	50,000
Yearling		0

1.12 Current program performance, including estimated survival rates, adult production levels, and escapement levels. Indicate the source of this data.

Survival rates: Bennett *et al* (1991) estimated the overwinter survival of age 0+ largemouth bass in the Pend Oreille river ranged from 0.4 – 3.9 % in 1989 and 1990. Our goal is to increase the age 0+ largemouth bass overwinter survival from current levels of 0.4 – 3.9 percent to approximately 15-20 percent.

Adult Production levels: largemouth bass 13,000 eggs per pound (Fish Hatchery Mgmt.)

1.13 Date program started (years of operation).

Construction began in 1996. The hatchery was completed in the fall of 1997. Brood fish were immediately collected to overwinter in the hatchery. In the spring of 1998 no spawning occurred but most of the procedures were tested. The following year (1999) was our first year with spawning activity. About 75% of the operation was tested and revised.

1.14 Expected duration of program

The hatchery is funded for a five-year performance period from December 19, 1996 through December 19, 2001. We are now in the fourth year. The total program is intended to last approximately 50 years.

1.15 Watersheds targeted for program.

Box Canyon Reservoir.

1.16 Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

No other alternative has been attempted. All efforts have been focused on developing raceway spawning techniques and procedures for the current operation. The Kalispel Tribal Natural Resource Department has decided to work with the locally adapted largemouth bass population.

SECTION 2. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES.

2.1 Describe alignment of the hatchery program with other hatchery plans and policies (e.g., the NPPC *Annual Production Review* report and recommendations – NPPC document 99-15). Explain any proposed deviations from the plan or policies.

Currently, the Kalispel tribe is the only entity performing largemouth bass supplementation efforts in the Box Canyon Reservoir. All hatchery operations are described in the Kalispel Tribal Hatchery-Production Procedures. These procedures reflect the original proposal presented to the NPPC for review and BPA for funding.

2.2 List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which the program operates.

The Kalispel Tribe Natural Resource Department has co-management authority (MOU) with the Washington Department of Fish and Wildlife Service on the Pend Oreille River and it's tributaries.

2.3 Relationship to harvest objectives.

2.3.1 Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last 12 years, if available.

Increased harvest and subsistence for Kalispel tribal members as well as the local non-tribal community members and bass clubs.

2.4 Relationship to habitat protection and purposes of artificial production.

Some of the factors found to affect natural production in the reservoir include water elevation fluctuations, lack of overwinter cover for age 0+ bass, and inadequate recruitment of largemouth bass into the system. The Kalispel Natural Resource Department is currently placing artificial structures in the reservoir to help provide overwinter cover. They are currently monitoring and evaluating the effectiveness of specific artificial structures. The hatchery is designed to supplement the natural recruitment of new largemouth bass fry. Monitoring and evaluation efforts will commence once largemouth bass fry are released into the reservoir.

2.5 Ecological interactions.

The species that negatively impact the supplementation efforts of largemouth bass are limited to the predators such as yellow perch, pumkinseed, northern squawfish, and adult largemouth bass. Other predators such as bald eagles, ospey, and blue herons are positively impacted by the creation of a supplemental forage base. Once largemouth bass reach a certain age (1-2 years) they will start to consume the other predators. Currently the largemouth bass population is estimated to be around 8 percent of the total fish population in the reservoir.

SECTION 3. WATER SOURCE.

3.1 Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

The water source for the Kalispel Hatchery is surface water from the Pend Oreille river. The intake screen for the hatchery is approximately 420 feet out from the pump station and is approximately 15 feet deep. The intake line feeds the sump located in the pump station (the water in the sump is the river elevation, no water is pumped into the sump). The water in the sump is then lifted to the pump station floor by 1 or 2 sumps rated at 150 gallons per minute each. The water is then pumped to the hatchery via three pumps.

Most problems associated with the water source is related to water quality. In the spring when the spawn is gearing up is when the runoff is the greatest. The incoming water has suspended silt and clay and poses problems with treatment. Other problems include total dissolved gas in the river. In the spring, the river is high and dams are spilling water. This increased mixing super-saturates the water with TDG which is harmful to the fish in the hatchery.

Another factor involved with the surface water intake includes high river elevations. The elevation of the pump station is 2040 ft. The river can rise higher than this every year. We have been in operation for three years and the river elevation has been above the floor twice. When this happens, the hatchery staff has to constantly monitor the situation and keep the pumps on so the pump station stays dry and water still flows up to the hatchery.

Power outages in Pend Oreille County are very frequent in the spring. The pumps in the pump station do not automatically reset after an outage or power surge. We may not know about the outage until the alarm calls us. Sometimes when a power surge happens, we may not get a call but the pumps may be off.

3.2 Indicate any appropriate risk aversion measures that will be applied to minimize the likelihood for the take of listed species as a result of hatchery water withdrawal, screening, or effluent discharge.

Not applicable to this project.

SECTION 4. FACILITIES.

4.1 Broodstock collection, holding, and spawning facilities.

Brood stock is currently gathered in the Box Canyon through electro-fishing. A minimum of 32 brood fish is needed for the operation. These fish are gathered in areas similar to the designated outplanting locations. Once operational, we hope to replenish 20 percent of the brood fish each year with new stock. Currently, the brood fish are held in the covered raceway and treated with formalin to help keep parasites in check. All spawning activity also takes place in this raceway.

4.2 Fish transportation equipment (description of pen, tank truck, or container used).

A 300 gallon portable insulated fiberglass tank is used for transporting fish. The tank is equipped with oxygen and aeration devices and has excellent temperature retention. The main use of the tank includes the transfer of brood fish from the river to the hatchery and the delivery of fry/fingerlings from the hatchery to the designated outplanting location. Maximum loading rate of the tank is 150 pounds per haul.

4.3 Incubation facilities.

All incubation activities are performed in the incubation troughs located in the hatchery building. These 600 gallon troughs have 2" water supplies and the water can be re-circulated or sent directly to the effluent ponds. The fertilized nests are removed from the raceway and placed vertically in the troughs for incubation. The fertilized nests are treated with fungicide and water is allowed to flow through the nest at approximately 5 gpm to aerate the eggs. After 2-3 days the eggs hatch and the newly hatched fry are visible at the bottom of the troughs. The fry will be ready to transfer to the holding slough for growout in 7-10 days. Each fertilized nest can produce approximately 20,000 – 25,000 fry.

4.4 Rearing facilities.

Rearing facilities at the project site include 1 raceway with approximately 1300 ft^3 rearing space and six incubation troughs with 80 ft^3 each). We also have two holding sloughs used for growout of the newly hatched fry. We stock these holding sloughs with approximately 100,000 newly hatched fry. Each slough is about 1 acre in size.

4.5 Acclimation/release facilities.

The newly hatched fry are acclimated in the holding sloughs

4.6 Describe operational difficulties or disasters that led to significant fish mortality.

Increased total dissolved gas in the reservoir killed 22 brood fish in the raceway. Mortality was noticed on May 9,2000 and 22 of the 29 broodfish died in a two day period.

4.6.1 Indicate available back-up systems and risk aversion measures that minimize the likelihood for the take of listed species that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

The hatchery is equipped with a generator for power loss and an alarm system for notifying hatchery staff of any problems. All nets, tools, containers are sanitized rigorously to help minimize and transmission of disease via equipment. Water quality is monitored to minimize any unforeseen changes in water quality in the river.

4.6.2 Indicate needed back-up systems and risk aversion measures that minimize the likelihood for the take of listed species that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality

Daily water quality measurements in the river (intake).

SECTION 5. BROODSTOCK ORIGIN AND IDENTITY

5.1 Source.

All brood fish were collected from the Pend Oreille River (Box Canyon Reservoir).

5.2 Supporting information.

5.2.1 History.

Largemouth bass are not native to Washington and have spread into the Columbia River system after being introduced into Idaho in 1916. Prior to the creation of Box Canyon Reservoir, largemouth bass habitat was limited in area. Even though largemouth bass are less than 10% of the fish assemblage present in the reservoir, they are now the primary sport fish in the reservoir (Bennett and Liter 1991).

5.2.2 Annual size.

In 1990, the largemouth bass population in the reservoir was estimated at 600,000 and comprised approximately 8% of the total population in the reservoir.

5.2.3 Past and proposed level of natural fish in broodstock.
We expect to have at least 32 brood fish on hand at all times and plan to gather 4-8 new brood fish each year.

5.2.4 Genetic or ecological differences.
Currently, all brood fish gathered are from the reservoir.

5.2.5 Reasons for choosing broodstock traits.
All brood fish collected from the Box Canyon Reservoir exhibited traits of survival. The brood fish collected are examined for any external injuries and physiological deficiencies. The overall health of the fish is very important along with its age and size. Older, larger fish are not desirable to the program due to their overall health and the length of time they would need to be in the hatchery. The viability of their eggs/milt would also be questionable.

5.2.6 ESA-Listing status.
Not applicable.

5.3 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects that may occur as a result of using the broodstock source.
Not applicable to the project brood sources.

SECTION 6. BROODSTOCK COLLECTION

6.1 Life-history stage to be collected (eggs, juveniles, or adults).
Adults.

6.2 Collection or sampling design.
A sampling design has been developed to measure the effectiveness of supplementation efforts. See the attached supplementation study for further information.

6.3 Identity.
All hatchery-reared fish released into the reservoir will be coded-wire tagged. During the study all largemouth bass captured will be examined for the presence of these tags. The location of the tag will help the hatchery staff identify the size of the fish at the time of release.

6.4 Proposed number to be collected:

6.4.1 Program goal (assuming 1:1 sex ratio for adults).
32 adult brood fish.

6.4.2 Broodstock collection levels for the last 12 years (e.g., 1988-99), or for most recent years available.

We lost all of the brood fish collected in the first two years of operation due to fungus and equipment failure. In 2000 we lost 22 brood fish due to total dissolved gas. We currently have 32 brood fish in the hatchery.

	ADULTS	
YEAR	MALES	FEMALES
1996	0	0
1997	10	10
1998	16	16
1999	16	16
2000	12	12

6.5 Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Currently, all brood fish collected will be used in the hatchery operation. We do plan on replenishing the brood fish numbers annually (20%). All surplus brood fish (if any) will be returned to the Pend Oreille River (Box Canyon Reservoir).

6.6 Fish transportation and holding methods.

Brood fish collection procedures are designed to minimize stress to the brood fish. When fish are collected, a target time of 30 minutes from time of capture to placement in the hatchery is desirable. . If more than 6 fish are needed, then successive trips will be needed. A maximum of 6 fish will be transported at once. This will minimize the amount of time the brood fish are exposed to the stress of the live well and transport tank.

6.7 Describe fish health maintenance and sanitation procedures applied.

Stress is the number one factor affecting the health of the brood fish. All brood fish are treated for external parasites with a 100 ppm bath treatment of formalin. These treatments are very important in the spring when water temperatures increase and when the brood fish are initially brought into the hatchery. The main objective of the treatments is to keep the parasites at manageable levels so the brood fish can fight them off themselves.

6.8 Disposition of carcasses.

All brood fish and fry/fingerlings lost to mortality will be disposed of by burial. Lye will also be added to the carcasses to help speed decomposition. The location of the burial site will be away from the hatchery at a place that will not contaminate the hatchery water system.

6.9 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed species resulting from the broodstock collection program.

Not applicable.

SECTION 7. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

7.1 Selection method.

All brood fish collected will be chosen as potential spawners through visual inspection of sex, health and overall appearance. A ratio of 1:1 for females/males will be the goal.

7.2 Fertilization.

Raceway spawning procedures will be used at the hatchery. As the water temperatures begin to increase the largemouth bass naturally begin to spawn. The males locate a suitable nest and then attract a female to lay eggs on the nest. The male then fertilizes the eggs and protects the eggs until they hatch. The hatchery staff removes the nest a day after the male fertilizes the eggs and incubates the eggs in the hatchery building.

7.3 Cryopreserved gametes.

Not applicable.

7.4 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

Not applicable. Largemouth bass are not listed under the Endangered Species Act.

SECTION 8. INCUBATION AND REARING

8.1 Incubation

8.1.1 Number of eggs taken/received and survival rate at stages of egg development.

Our Annual Production Goals at the hatchery is 100,000 largemouth bass fry and 50,000 fingerlings. We expect approximately 13,000 eggs per pound of fish spawned which relates to about 40,000-50,000 eggs per spawn. The hatching rate for the eggs is above 90% with the swimup near 100%. The swimup to outplanting is where the survival is the toughest. Proper acclimation, feed, and protection from predators is vital for survival. No historical data is available at this time.

8.1.2 Loading densities applied during incubation.

Incubation operations take place in 600 gallon fiberglass troughs. One trough is able to incubate at least 150,000 eggs depending on the time of the spawn. No spawns greater than 3 days apart will be placed in one trough. Water flows through the trough at 2-4 gallons per minute.

8.1.3 Incubation conditions.

All incubation troughs are monitored daily to observe the development of the eggs. Water temperature, pH, and dissolved oxygen are all measured during this time.

8.1.4 Ponding.

Once the newly hatched fry "swimup" to the top of the water column they are enumerated and transferred to holding sloughs for growout. The holding sloughs are fertilized and full of the natural zooplankton from the reservoir. These fry remain in the sloughs for 6-8 weeks until they are gathered and tagged for release into the reservoir. Newly hatched fry are socked at approximately 150,000 fry/acre.

8.1.5 Fish health maintenance and monitoring.

All water entering the hatchery is UV disinfected. This unit treats most of the naturally occurring parasites and bacteria in the water. Parasites and bacteria are always present in the reservoir, we treat the water to keep them in check so the bass can naturally fight them off.

The incubation troughs and raceway are sanitized and disinfected with a fungicide approved for use in hatcheries. All food waste and fecal matter are removed weekly, when possible.

8.1.6 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to fish during incubation.

All eggs are incubated with surface water from the river. This water is cleaned and disinfected but not totally free of parasites, bacteria, or fungus. The water can bee re-circulated if a power outage is to occur. All water quality equipment is connected to the backup generator.

8.2 Rearing

8.2.1 Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to release) for the most recent twelve years (1988-99), or for years dependable data are available.

There is no reliable data on the survival rates of the newly hatched fry-fingerling as of yet. The hatchery would expect a survival rate of 70-80% under the current conditions of the holding sloughs. The estimated survival rates for age 0+ bass in the reservoir (overwinter) is 0.4 – 3.9%.

8.2.2 Density and loading criteria (goals and actual levels).

Rearing densities in the sloughs will be approximately 75,000-100,000 fry/acre. At this level we would expect roughly 70-80% survival. We have two 1-acre holding sloughs which will provide enough area to raise the APG of 150,000 largemouth bass. The fingerlings will be stocked and reared at 50,000-75,000 fish/acre.

8.2.3 Fish rearing conditions

Water inflow required during fry, fingerling and adult rearing will be calculated using a flow index of 1.05 associated with projected lengths and weights in the following formula:

$$I = \frac{W}{L \times 1.05}$$

where: I = total inflow
W = projected weight
L = projected length

Dissolved oxygen (DO) is expected to be near 100% saturation level (10 to 12 mg/l) while nitrogen (N_2) levels are expected to be slightly higher than 100% saturation level. Water flowing into the holding sloughs are able to be treated with hatchery water treatment equipment. DO and N_2 levels will be measured daily. Other parameters monitored by the hatchery staff will include temperature, pH, and conductivity.

8.2.4 Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

No sufficient data has been recorded for newly hatched largemouth bass in the hatchery.

8.2.5 Indicate food type used, daily application schedule, feeding rate range (e.g. %BW/day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Following swimup, the newly hatched fry are transported to the rearing sloughs for grow-out. The fry will remain in the sloughs for 6-8 weeks or until most of the zooplankton is consumed. After 6-8 weeks the fry should be approximately 2” in length and ready for release. The fry will be collected and transported to the hatchery for tagging operations. Approximately 50,000 fish will be held at the

hatchery and trained on artificial feed of Rangen “trout and salmon starter” #1 granules. This feed will be supplemented with freeze dried krill to help with training.

8.2.6 Fish health monitoring, disease treatment, and sanitation procedures.

The rearing troughs will be sanitized and disinfected with 600 parts per million solution of Hyamine 3500 before initial loading. Daily sanitization of fecal matter will be performed when production feeding begins. All waste water will be drained to the settling pond.

This project operates in compliance with Fish Health Policies. Disease treatments include use of Formalin (Parasite-S) and Salt. The Kalispel Tribal Hatchery is equipped with a laboratory capable of performing fish pathology. However, most pathology work is performed by Steve Roberts, certified fish pathologist of WDFW.

8.2.7 Indicate the use of "natural" rearing methods as applied in the program.

Currently, natural rearing methods are limited to the rearing sloughs. The newly-hatched fry are placed in the rearing sloughs for growout which involves naturally occurring zooplankton in the reservoir. Abundant zooplankton is produced through the fertilization of phytoplankton and the removal of all undesirable fish species in the slough.

8.2.8 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to fish under propagation.

At this time there are no measures associated with the genetic and ecological effects to fish under propagation. This has not been identified as a program measure prudent to ongoing hatchery practices.

SECTION 9. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

The Kalispel Tribal Hatchery is designed to produce approximately 150,000 largemouth bass fry/fingerlings for release into the Box Canyon Reservoir. The initial release levels include 100,000 fry and 50,000 fingerlings at three separate locations.

9.1) Proposed fish release levels.

Age Class	Maximum #	Size (fpp)	Release date	Location
Eggs	0	0		
Unfed fry	0	0		
Fry	100,000	500	September 2001	Box Canyon Reservoir
Fingerling	50,000	100	April 2002	Box Canyon Reservoir
Yearling	0	0		

9.2 Specific location(s) of proposed release(s).

Stream, river, or watercourse Pend Oreille River (Box Canyon Reservoir)
Release point: Rednours slough, Dike slough, flying goose slough
Major watershed: Pend Oreille River (WRIA 62)
Basin or Region: Pend Oreille River

9.3 Actual numbers and sizes of fish released by age class through the program.

The hatchery successfully produced 242,000 largemouth bass fry in the 1999 season. These fish were produced in the hatchery and introduced into the reservoir. The fry were not tagged or counted. These fry escaped from the holding sloughs due to high river elevations in the spring of 1999.

9.4 Actual dates of release and description of release protocols.

The actual release date will depend on the water temperatures, growth rates, and tagging operations. The spawn occurs in June/July, incubation of the eggs takes 10-14 day, growout can take 6-8 weeks, and the tagging operation should take 1-2 weeks. Generally, the fry will be released around August/September and the fingerlings the following spring (April).

9.5 Fish transportation procedures, if applicable.

All outplanting operations will be conducted in a manner that minimizes stress and damage to the fish. The hatchery transport tank is equipped with oxygen tank to keep oxygen levels at an optimum. Estimated time of transport is 30 minutes.

9.6 Acclimation procedures.

All largemouth bass fry/fingerlings will be acclimated to the river water environment prior to outplanting. Untreated river water will be slowly introduced to the fish to minimized shock.

9.7 Marks applied, and proportions of the total hatchery population marked, to identify hatchery component.

All largemouth bass fry/fingerlings will be marked with a coded-wire tag prior to release. The placement of the tag will identify the size of the fish at the time of release. To our knowledge, there are no other coded-wire tags in the reservoir.

9.8 Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

Not applicable to this program.

9.9 Fish health certification procedures applied pre-release.

The Kalispel tribe has various cooperative agreements with the Washington State Fish and Wildlife (WDF&W). All fish released into the reservoir will be inspected by the WDF&W Fish Pathologist prior to release.

9.10 Emergency release procedures in response to flooding or water system failure.

The Kalispel Tribal hatchery is equipped with a generator backup in the event of power failure. The hatchery is able to re-circulate the water for up to two-weeks if needed. During flood conditions, nets will be placed above the dams located at the rearing sloughs. The nets will serve to keep the newly-hatched fry in and keep any predators out of the slough.

9.11 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed species resulting from fish releases.

Not applicable to this program.

SECTION 10. PROGRAM EFFECTS ON ALL ESA-LISTED, PROPOSED, AND CANDIDATE SPECIES (FISH AND WILDLIFE)

10.1 List all ESA permits or authorizations in hand for the hatchery program.

Not applicable to this program.

10.2 Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

Direct impacts on aquatic habitat could occur from sediment introduced into the water by ground disturbances from clearing and construction. This could increase silt in spawning gravel and rearing habitat, which could suffocate eggs or fry, or adversely affect habitat for aquatic life important as a food source for fish. Only limited clearing of riparian vegetation is expected and impacts would be short term and minor;

therefore the proposed action would have minor impacts on the fisheries within the reservoir, such as pumpkin seed and perch, the most abundant species in the reservoir. The proposed project is located away from tributaries where bull trout spawn so there would be no impacts from construction on spawning habitats for bull trout.

The increased presence of largemouth bass in Box Canyon Reservoir may affect, but is not likely to adversely affect adfluvial populations of bull trout. Due to the different temperature gradient regimes in which largemouth bass and bull trout dwell, their different spawning habitats and food sources, and the number of bull trout found in the Box Canyon Reservoir, the proposed project may affect, but is not likely to adversely affect bull trout species. Should any changes to the project occur that could affect a listed species, or if any other species known to occur in the project area becomes officially listed before BPA completes this project BPA would reevaluate its responsibilities under the Endangered Species Act.

10.2.1 Description of ESA-listed, proposed, and candidate species affected by the program.

Not applicable to this program.

10.2.2 Status of ESA-listed species affected by the program.

Not applicable to this program.

10.2.3 Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed species in the target area, and provide estimated annual levels of take *(see "Attachment 1" for definition of "take")* **. Provide the rationale for deriving the estimate.**

All monitoring and evaluation efforts performed in the Box Canyon Reservoir will adhere to the Federal Fish and Wildlife permit #TE844478-0.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1 Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

11.1.1 Describe the proposed plans and methods necessary to respond to the appropriate "Performance Indicators" that have been identified for the program.

A supplementation study has been designed to monitor the effectiveness of the hatchery efforts. All hatchery-reared bass will

be coded-wire tagged for later identification. A copy of the supplementation study is attached as Attachment B.

11.1.2 Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

All necessary staffing, funding, and techniques are ready and in place. All remaining is the last phase of the operation: the tag and release of all hatchery-raised bass.

11.2 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed species resulting from monitoring and evaluation activities.

All monitoring and evaluation efforts performed in the Box Canyon Reservoir will adhere to the Federal Fish and Wildlife permit #TE844478-0.

SECTION 12. RESEARCH

Any research related efforts directly related to the hatchery are included in the supplementation study. This supplementation study is designed to monitor and evaluate the effectiveness of the hatchery operation.

Further information for this section may be provided at a later time.

12.1 Objective or purpose.

Not applicable.

12.2 Cooperating and funding agencies.

Not applicable.

12.3 Principal investigator or project supervisor and staff.

Not applicable.

12.4 Status of population, particularly the group affected by project, if different than the population(s) described in Section 2.

Not applicable.

12.5 Techniques: include capture methods, drugs, samples collected, tags applied.

Not applicable.

12.6 Dates or time period in which research activity occurs.

Not applicable.

12.7 Care and maintenance of live fish or eggs, holding duration, transport methods.

Not applicable.

12.8 Expected type and effects of take and potential for injury or mortality.

Not applicable.

12.9 Level of take of listed species: number or range of individuals handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).

Not applicable.

12.10 Alternative methods to achieve project objectives.

Not applicable.

12.11 List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

Not applicable.

12.12 Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed species as a result of the proposed research activities.

Not applicable.

SECTION 13. ATTACHMENTS

Attachment A	Production Procedures
Attachment B	Supplementation Study

SECTION 14. CITATIONS

Ashe, B.L., and A.T. Scholz. 1992. Assessment of the Fishery Improvement Opportunities on the Pend Oreille River. U.S. Bureau of Reclamation. Contact No. WPRS-0-07-10-0216; FWS-14-06-009-904, May 1985. 168 pp.

Bennett, D.H. and M. Liter. 1991. Water quality, fish and wildlife characteristics of Box Canyon Reservoir, Washington. Section 3: Fish, Completion Report 1989-1990. Dept. of Fish and Wildlife. University of Idaho. Moscow, ID.

Piper, R.G., I.B. McElwain, L.E. Orme, J.P. McCraren, L.G. Fowler, and J.R. Leonard. 1982. Fish Hatchery Management. U.S. Fish and Wildlife Service, Washington, D.C.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973."

Name, Title, and Signature of Applicant:

Certified by: _____ Date: _____

Stanley J. Bluff, jr.
Kalispel Tribe
Natural Resource Dept.