# HATCHERY AND GENETIC MANAGEMENT PLAN RESIDENT FISH VERSION (HGMP-RF)

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Hatchery Program: Coeur d'Alene Tribe

Species or Hatchery Population/Strain:
Westslope cutthroat trout, Rainbow Trout

Agency/Operator: Coeur d'Alene Tribe
Ronald L. Peters

Watershed and Region:
Coeur d'Alene Subbasin

Date Submitted: September 29, 2000

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## SECTION 1. GENERAL PROGRAM DESCRIPTION

**1.1) Name of hatchery or program.**
Coeur d'Alene Tribe Trout Production Facility

**1.2) Species and population (or strain) under propagation, ESA/population status.**
Westslope cutthroat trout (Oncorhynchus clarki lewisi),
Rainbow trout (Oncorhynchus mykiss)

**1.3) Responsible organization and individuals**
*Indicate lead contact and on-site operations staff lead.*
**Name (and title):** Ronald L. Peters Fisheries Program Manager
**Agency or Tribe:** Coeur d'Alene Tribe
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**Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:**
JUB Engineering – Facility design engineers
BPA – Funding agency

**1.4) Funding source, staffing level, and annual hatchery program operational costs.**
Funding Source – BPA

**1.5) Location(s) of hatchery and associated facilities.**
*Include name of stream, river kilometer, location, basin name, and state. Also include watershed code (e.g. WRIA number), or sufficient information for GIS entry. See "Instruction E" for guidance in responding.*

The location of the sites are given in Universal Transverse Mercators (UTM) units and all sites are in the Northern Hemisphere and in zone 11, with the specific approximate coordinates following the site name. Coeur d' Alene Tribal Fish culture facility is adjacent to Rock creek, in Hangman Creek watershed, Idaho, UTM coordinates of 509,387.07 meters east and 5,246,809.70 meters north and drains into WRIA 56.
There are also four satellite acclimation facilities and four put-and-take fishponds.
The acclimation facilities locations are; Alder creek, UTM coordinates of 521,489.02 meters east and 5,227,465.50 meters north: Benewah creek, UTM coordinates of 518,485.66 meters east and 5,233,122.10 meters north: Evans creek, UTM coordinates of 533,587.56 meters east and 5,253,969.84 meters north: and Lake creek, UTM coordinates of 500,174.00 meters east and 5,259,356.08 meters north.
The put-and-take fishponds locations are: Worley, UTM coordinates of 506,975.97meters east and 5,249,083.37 meters north; Old Agency, UTM coordinates of 503,471.79 meter east and 5,239,966.64 meters north; DeSmet, UTM coordinates of 502,031.71 meters east

and 5,221,471.10 meters north; and Mission creek, UTM coordinates of 504,634.13 meters east and 5,216,583.79 meters north.

**1.6) Type of program(s).**

*Define as either: Integrated Recovery; Integrated Harvest; Isolated Recovery; or Isolated Harvest (see Attachment 1 - Definitions" section for guidance).*

Integrated Recovery and Harvest

**1.7) Purpose (Goal) of program(s).**

*Define as either: Augmentation, Mitigation, Restoration, Preservation/Conservation, or Research (for Columbia Basin programs, use NPPC document 99-15 for guidance in providing these definitions of "Purpose"). Provide a one sentence statement of the goal of the program, consistent with the term selected and the response to Section 1.6. Example: "The goal of this program is the restoration of white sturgeon in the Kootenai River using the indigenous population."*

Augmentation and Mitigation

The goal of this program is to use mitigation and restoration efforts to increase the abundance of naturally reproducing fish populations and therefore, is oriented toward maintaining the natural biological characteristics of the population and reliance on the rearing capabilities of the natural habitat.

**1.8) Justification for the program.**

*Indicate why the hatchery program is needed and how it will enhance or benefit the survival of the listed population (integrated or isolated recovery programs), or how the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish (integrated or isolated harvest programs).*

In 1987, the Northwest Power Planning Council amended the Columbia River Basin Fish and Wildlife Program and recommended that the Bonneville Power Administration (BPA) fund a baseline stream survey of tributaries located on the Coeur d' Alene Indian Reservation and provide recommendations on ways to improve the fisheries for the Coeur d'Alene Tribe. These recommendations were based on the Northwest Power Planning Council adoption of a "substitution policy" which mitigated for losses attributable to anadromous fish losses the Coeur d'Alene Tribe suffered due to the construction and operation of Grand Coulee and Chief Joseph dams.

In 1994, the Northwest Power Planning Council adopted the recommendations set forth by the Coeur d'Alene Tribe to improve the Reservation fishery. These actions included: 1.) Implement habitat restoration and enhancement measures in Lake, Benewah, Evans and Alder creeks; 2.) Purchase critical watershed areas for protection of fisheries habitat; 3.) Conduct an educational/outreach program for the general public within the CDA Reservation to develop a "holistic" watershed protection process; 4.) Develop an interim fishery for tribal and non-tribal members of the reservation through construction, operation and maintenance of trout ponds; 5.) Design, construct, operate, and maintain a trout production facility; and 6) Implement a five-year monitoring program to evaluate the effectiveness of the hatchery and habitat improvement projects.

These recommendations were based on baseline evaluations the Coeur d'Alene Tribe completed between 1991 and 1994, in which twenty tributaries on the Reservations were analyzed and identified as having habitat potentially suitable for trout species. The Missouri method of evaluating stream reaches was subsequently utilized to rank these tributaries, resulting in the identification of four watersheds as having the best potential for enhancing and or restoring cutthroat and bull trout habitat.

The Coeur d'Alene Tribe Trout Production Facility is intended to rear and release westslope cutthroat trout into rivers and streams with the express purpose of increasing the numbers of fish spawning, incubating and rearing in the natural environment. It will use the modern technology that hatcheries offer to overcome the mortality resulting from habitat degradation in lakes, rivers, and streams after eggs are laid in the gravel. Supplementation of native fish stocks in conjunction with effective habitat restoration will be the primary means of achieving these biological goals. In addition to meeting these biological goals it is the intent of this program to provide a harvestable surplus of fish for the Reservation community.

### 1.9) List of program "Performance Standards."

*"Performance Standards" are designed to achieve the program goal/purpose, and are generally measurable, realistic, and time specific. The NPPC "Artificial Production Review" document attached with the instructions for completing the HGMP presents a list of draft "Performance Standards" as examples of standards that could be applied for a hatchery program. If a subbasin plan including your hatchery program is available, use the performance standard list already compiled.*

This is a summary of the goals, policies and recommendations composed of ideas from several regional studies and reports as well as from regional workshops on this topic. . Primary among these sources was the Draft NPPC *Artificial Production Review Vol. I Report and Recommendations of the Northwest Power Planning Council* (1999), *Return to the River* Independent Scientific Group (1996), Report of the National Fish Hatchery Review Panel (1994), *Upstream: salmon and society in the Pacific Northwest* National Academy of Science (1996), and the *Supplementation in the Columbia Basin* Regional Assessment of Supplementation Project (RASP) Bonneville Power Administration (1992).

Excerpt from Draft NPPC *Artificial Production Review Vol. I Report and Recommendations of the Northwest Power Planning Council* (1999)

**Policies to Guide the Use of Artificial Production**

The scientific principles, legal mandates, and purposes provide the backdrop for policies on the use of artificial production. Decisions to use the tool of artificial production, and how to use it, need to be made in a scientifically sound manner to achieve management objectives by addressing specific biological problems. The following policies are intended for that purpose — to be applied to allow for a detailed understanding and evaluation of artificial production in the basin.

These policies need to be considered in the context of the natural conditions of the Columbia River Basin as it now exists. In most places, this ecosystem is significantly altered from the time when Europeans began inhabiting the basin more than 150 years ago. This means that fish populations adapted to the original "natural" conditions of the Columbia basin may not be the same as those that are now or could be naturally produced. This does not mean that habitat will not be improved to be more productive for native fish populations and species, but only that the original habitat conditions are not achievable in the foreseeable future. Therefore, when these policies speak of natural conditions, they are referring to current or foreseeable improvements in the existing, altered ecosystem. Production for harvest is a legitimate management objective of artificial production within this context. However, to minimize the particular adverse impacts on natural populations associated with harvest management of hatchery populations, harvest rates and practices must reflect or be dictated by the requirements to sustain naturally spawning populations.

1. **The manner of use and the value of artificial production must be considered in the context of the environment in which it will be used.**

   Artificial production must be used consistent with an ecologically based scientific foundation for fish and wildlife recovery. A number of considerations are embedded in this policy, including:

- The success of artificial production depends on the quality of the environment in which the fish are released, reared, migrate and return.
- Artificial production provides protection for a limited portion of the life cycle of fish that exist for the rest of their lives in a larger ecological system, albeit altered, that may include riverine, reservoir, lake, estuarine and marine systems that are subject to environmental factors and variation that we can only partially understand.
- The success of artificial production must be evaluated with regard to sustained benefits over the entire life cycle of the produced species in the face of natural environmental conditions, and not evaluated by the number of juveniles produced.
- Domestication selection is the process whereby an artificially propagated population diverges in survival traits from the natural population. This divergence is not avoidable entirely, but it can be limited by careful hatchery protocols such as those required by policies in this report.
- For actions that mitigate for losses in severely altered areas, such as irrevocably blocked areas where salmon once existed, the production of non-native species may

be appropriate in situations where the altered habitat or species assemblages are inconsistent with feasible attainment of management objectives using endemic species.

2. **Artificial production must be implemented within an experimental, adaptive management design that includes an aggressive program to evaluate benefits and address scientific uncertainties.**

   The ability of artificial production to provide sustained management and biological benefits over the entire life cycle and throughout the ecosystem, and to minimize adverse effects to naturally spawning populations, remains a topic of debate.

3. **Hatcheries must be operated in a manner that recognizes that they exist within ecological systems whose behavior is constrained by larger-scale basin, regional and global factors.[1]**

   The performance of hatcheries should mirror the dynamics and behavior of the larger system. Expectations of constancy in either returns or management are unrealistic.

- Management of artificial production, and the expectations of that management, should be flexible to reflect the dynamics of the natural environment. Production and harvest managers should anticipate large variation in hatchery returns similar to that in natural production.
- The management and performance of individual facilities cannot be considered in isolation but must be coordinated at watershed, subbasin, basin and regional levels, and must be integrated with efforts to improve habitat characteristics and natural production where appropriate.

4. **A diversity of life history types and species needs to be maintained in order to sustain a system of populations in the face of environmental variation.[2]**

   Recent scientific reviews have indicated that effective restoration of fish populations to the Columbia River may depend far more on protecting and restoring biological diversity and habitat than simply increasing abundance. A central management consideration in all artificial production should be to minimize adverse effects on biological diversity and, to the extent possible, to use the artificial production tool to help reverse declines in biological diversity.

5. **Naturally selected populations should provide the model for successful artificially reared populations, in regard to population structure, mating protocol, behavior, growth, morphology, nutrient cycling, and other biological characteristics.[3]**

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[1] This policy should be implemented in a manner that addresses SRT guidelines 1-2 and 4-13.
[2] This policy should be implemented in a manner that addresses SRT guidelines 1-2 and 4-15.
[3] This policy should be implemented in a manner that addresses SRT guidelines 1-2 and 4-13.

Natural selection hones the characteristics of fish populations against the template of the natural environment. These dynamics shape natural populations so that they collectively have the characteristics necessary to sustain the species in the face of environmental variation. These naturally selected populations thus provide a model that should at least guide the efforts to sustain successful artificially reared populations, even if replicating all natural conditions is not feasible. The use of locally adapted or compatible broodstocks, and a corresponding reduction in the use of population transfers and non-endemic populations, is a significant part of this policy.

The implications of this policy may differ somewhat depending on whether the focus is to improve hatchery survival, avoid adverse impacts on natural populations, or use artificial production to try to restore naturally spawning populations. How this policy applies in any particular situation should be tested using the following three working hypotheses:

- With regard to increasing the survival of the hatchery population itself, the working hypothesis is that mimicking the incubation, rearing and release conditions of naturally spawning populations will increase survival rates after release into the natural environment. Some efforts to mimic natural rearing processes, such as the use of shading, are generally accepted as appropriate practices. Uncertainty lies in how far managers should go in mimicking natural rearing conditions in an effort to improve survival, especially considering the increasing cost, the difficulty of some measures, and the possibility of declining benefits. In addition, there are certain situations in which the survival of hatchery fish appears to be enhanced by *not* mimicking natural release size or migration times. Decisions to deviate from the biological characteristics of the naturally spawning population should be documented through an explicitly stated biological rationale and carefully evaluated. In addition, the efficacy of programs that mimic natural populations should continue to be tested to reduce uncertainty.

- With regard to the possibility of adverse impacts of artificial production on naturally spawning fish, much of the recent literature suggests that using local broodstocks and mimicking natural rearing conditions will reduce the impacts of hatchery populations on naturally spawning populations and the ecosystem. There is a counter-hypothesis that, at least in some situations, it is best for artificial production managers to avoid mimicking the release times, places, and conditions of natural populations to avoid harmful competition, predation and other adverse interactions. Again, any decisions to deviate from the biological characteristics of the naturally spawning population should be documented through an explicitly stated biological rationale and carefully evaluated.

- The final working hypothesis, which applies to hatchery production for the *restoration* purpose, is that through the use of locally adapted or compatible broodstocks and natural rearing and release conditions, hatchery production can benefit or assist naturally spawning populations. This is the least established hypothesis of the three, and the one most in need of experimental treatment and evaluation.

6. **The entities authorizing or managing a hatchery facility or program should explicitly identify whether the artificial propagation product is intended for the purpose of augmentation, mitigation, restoration, preservation, research, or some combination of those purposes for each population of fish addressed.[4]**

   Existing determinations of the purpose(s) for all hatchery facilities and programs should be revisited within the next three years, and periodically thereafter. These evaluations should take place *only* in the larger context of decisions on fish and wildlife goals and objectives for the Basin, provinces and subbasins (*see*, XXXX the next part of the report for more detail). Also, a decision to build or continue a hatchery for a specified purpose must include an explicit identification of the underlying biological problem, an explicit determination that the assumptions or conditions relating to that hatchery purpose do exist, and an explicit expectation of the duration of the program:

   - A decision identifying a hatchery as a "permanent" *mitigation* hatchery should be accompanied, for example, by an explicit identification of the permanently lost habitat that it replaces.
   - A decision identifying a *restoration* hatchery should include, for example, an explicit determination that suitable restored habitat exists or will soon exist for re-seeding. It should also include a statement of the expected duration of the program, by which it is expected the natural population will be rebuilt and the facility withdrawn (or continued with a different identified purpose).
   - Similarly, a decision identifying a *preservation/conservation* hatchery should include, for example, an explicit determination that the underlying habitat decline or other problem-threatening extirpation will be addressed and how. This decision should also include a statement of the expected duration of the program, the time by which the program will be evaluated to determine if it is a success (meaning the time by which it is expected that natural processes can once again sustain the population, and the facility withdrawn or converted to another identified purpose) or a failure (meaning that it is time to end or reorient the program).

7. **Decisions on the use of the artificial production tool need to be made in the context of deciding on fish and wildlife goals, objectives and strategies at the subbasin and province levels.**

   While decisions on the use of artificial production are best made in the subbasin context, these decisions also need to be consistent with basinwide and regional considerations and objectives. The monitoring and evaluation framework for

[4] This policy should be implemented in a manner that addresses SRT guidelines 3, 9 and 14.

artificial production facilities and programs should also have a regional/basinwide aspect as well as specific subbasin elements.

8. **Appropriate risk management needs to be maintained in using the tool of artificial propagation.**[5]

   As critically important as monitoring and evaluation are, it is most difficult, and in some cases still impossible, to monitor and evaluate the effects we most care about, such as complex ecological interactions, ocean effects and interactions, and the relationship between changes in hatchery practices and ultimate adult returns. The same is true of other aspects of the complex biological problem of fish and wildlife recovery, so the risk management strategies applied to artificial production should be generally consistent with those applied to other stages of the life-cycle and to other factors affecting the status of populations.

9. **Production for harvest is a legitimate management objective of artificial production, but to minimize adverse impacts on natural populations associated with harvest management of hatchery populations, harvest rates and practices must reflect or be dictated by the requirements to sustain naturally spawning populations.**[6]

10. **Federal and other legal mandates and obligations for fish protection, mitigation, and enhancement must be fully addressed.**

    Efforts to address these mandates and obligations have historically been unsuccessful, at least in large part. The principles, policies and purposes identified here are not intended to diminish or otherwise affect these mandates and obligations. At the same time, it is recognized that these mandates and obligations can be, and might be, altered, by the appropriate authorities in response to this document or other events.

## E. Performance Standards[7]

Hatchery operations can be evaluated against the set of general policies described above. But more can be gained by translating the general policies into more specific and detailed performance standards and then evaluating hatchery operations against those standards. For example, the general policy calling for the biological characteristics of natural populations to be the model for artificial production can be further developed into a number of more specific operational standards.

Over the last few years, a number of agencies, inter-agency teams or scientific panels have developed partial or comprehensive sets of guidelines and standards

[5] This policy should be implemented in a manner that addresses SRT guidelines 16-17.

[6] This policy should be implemented in a manner that addresses SRT guideline 17.

to be used to evaluate artificial production. The guidelines in the Science Review Team's final report are but one example; the most comprehensive effort is the Integrated Hatchery Operations Team's (IHOT) *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* from 1995. All of these efforts have been sensitive to the modern concerns for minimizing harm to natural populations. At the same time, it is possible that some of the standards developed even in the recent past are not consistent with the principles and policy statements that the Council recommends in this report.

For this reason, participants in the Artificial Production Review, working with Council staff and facilitators, organized an ad hoc workgroup to pull together a set of consistent performance standards that can be used to evaluate to hatchery operations in the future. Attached to this report is a draft of the performance standards that the group developed, using the policies and purposes in this report, the guidelines in the Science Review Team's report, and the IHOT policies as a foundation for these draft standards. The performance standards are still draft form, as the Council intends to seek peer and public review before making a final recommendation.

End of excerpt.

Goals, policies and recommendations for operation of artificial production facilities in the Columbia Basin summarized from the other documents listed.

- Facility production programs and supplementation activities will be evaluated relative to their objectives and their impacts on natural ecosystems.
- The success of the program is directly tied to the quality and quantity of the environment into which the fish are released, therefore, the use of artificial production and supplementation will be directly linked to watershed conditions and habitat improvements.
- The success of the facility will depend on the ability to maintain physical and behavior attributes of the fish that enhance survival in the natural environment, and to avoid domestication. Therefore, genetic considerations will be addressed in the use of artificial production.
- Technology resembling natural incubation and rearing conditions will be used for artificial production of fish including:
    a. incubation in substrate and darkness
    b. incubation at lower densities
    c. rearing at lower densities
    d. rearing with shade cover available
    e. exposure to in-pond, natural-like habitat
    f. rearing in variable, higher velocity habitat
    g. non-demand food distribution during rearing
    h. exposure to predator training
    i. minimize fish-human interaction

j. acclimation ponds at release sites
k. volitional emigration from release sites
l. artificial production incubation and rearing will use the natal stream water source whenever possible

- The facility will be designed and engineered to represent natural incubation and rearing habitat in order to simulate incubation and rearing experiences complementary with those of naturally produced fish in natural habitat.
    - Genetic and breeding protocols consistent with local stock structure will be developed and applied to minimize potential negative effects of artificial production on naturally producing populations and to maximize the positive benefits of artificial production.
- We will use large breeding populations to minimize inbreeding effects and maintain what genetic diversity is present within the population.
- Artificial production strategies will mimic natural population parameters in size, maturation and timing of migrating juveniles so to synchronize with environmental selective forces.
- Artificial production will use ambient natal stream habitat temperatures to reinforce compatibility with local environments.
    - Release of artificially produced fish will consider the numerical limits of the biological limits of the receiving stream, including consideration of members of the release population that do not migrate. Considerations will include impacts on the naturally producing fish residing in the system as well as life history requirements of the cultured stock.
    - The program will avoid using strays in breeding operations to avoid stock hybridization.
    - Restoration of extirpated or weak populations will follow genetic guidelines to maximize the potential for re-establishing self-sustaining populations. Once restored, subsequent effort will concentrate on allowing selection to work, by discontinuing introductions.
    - Introductions of non-native species in areas where the non-native species currently does not occur will not be allowed.
    - Recent scientific reviews have indicated that effective restoration of salmonids to the Columbia River may depend far more on protecting and restoring biological diversity than simply increasing abundance. A diversity of life-history types and species of salmonids is necessary to sustain a system of populations in the face of environmental variation. A central management consideration for the facility will be to minimize adverse effects on biological diversity and, to the extent possible, use the artificial production tool to help reverse declines in biological diversity.
    - Natural selection hones the characteristics of fish populations against the template of the environment. This dynamic principle shapes natural populations to collectively have the characteristics necessary to sustain the species in the face of environmental variation. The use of locally adapted or compatible broodstocks, and a corresponding reduction in the use of stock transfers and non-endemic stocks is a part of this policy.

- Production for harvest is a management objective of the facility. However, to minimize the particular adverse impacts on wild populations associated with harvest management of hatchery populations, harvest rates and practices will reflect or be dictated by the requirements to sustain naturally spawning populations.
- Risk management strategies applied to facility operations will be consistent with those applied to other stages of the life cycle and to other factors affecting the status of populations.

### 1.10) List of program "Performance Indicators", designated by "benefits" and "risks."

*"Performance Indicators" determine the degree that program standards have been achieved, and indicate the specific parameters to be monitored and evaluated. Adequate monitoring and evaluation must exist to detect and evaluate the success of the hatchery program and any risks to or impairment of recovery of affected, listed fish populations.*

*The NPPC "Artificial Production Review" document referenced above presents a list of draft "Performance Indicators" that, when linked with the appropriate performance standard, stand as examples of indicators that could be applied for the hatchery program. If a subbasin plan is available, use the performance indicator list already compiled. Essential 'Performance Indicators" that should be included are monitoring and evaluation of overall fishery contribution and survival rates, stray rates, and divergence of hatchery fish morphological and behavioral characteristics from natural populations.*

*The list of "Performance Indicators" should be separated into two categories: "benefits" that the hatchery program will provide to the listed resident fish species, or in meeting harvest objectives while protecting listed resident fish species; and "risks" to listed resident fish species that may be posed by the hatchery program, including indicators that respond to uncertainties regarding program effects associated with a lack of data.*

#### 1.10.1) "Performance Indicators"addressing benefits.

(e.g., "*Evaluate fingerling-to-adult return rates for program fish to harvest, hatchery broodstock, and natural spawning.*")

Expected benefits from the Coeur d'Alene Tribal Trout Facility include:

Production of up to 10,000 catchable sized rainbow trout for stocking in Tribal trout ponds.
Provide over 20,000 angler hours of opportunity with a catch rate of 0.5 fish/hour at the Tribal catch-out ponds annually.
(Conduct creel census at catch-out ponds to determine catch rates and plant to creel ratios.)

Increases in the current distribution of westslope cutthroat trout on the Reservation and in Coeur d'Alene Lake. Using habitat restoration in conjunction with supplementation to

increase the abundance of westslope cutthroat trout on the Reservation and in Coeur d'Alene Lake.
(Conduct R,M&E to include:

*Enumerate the number of naturally produced migrating juveniles vs. hatchery produced juveniles.*

1. Operate outmigrant traps to monitor outmigration of wild and hatchery adfluvial fish. Fish captured will be sub-sampled to collect data on length, weight and origin (hatchery or natural). Trap efficiency will be determined through mark and recapture of known numbers of juvenile trout.
2. Monitor resident fish species composition through snorkel count and/or electrofishing in index areas.

**Product:** Report containing information from migration traps including migration timing, number of hatchery vs. wild, habitat use by hatchery and wild fish.
**Completion date:** Ongoing for duration of project

*Task Enumerate the number of migrating adults returning to spawn in Reservation waters.*

1. Install and monitor upstream traps to enumerate returns.
2. Radio tag adult fish destined for return to treatment streams. As adult fish are detected and trapped at the weirs, radio tag and tack fish to determine movement pattern and length of time prior to spawning.
3. Conduct cutthroat trout redd count surveys in spawning areas to determine spawner distribution. Collect biological information from population, as well as, determine origin.
4. Collect and analyze the creel census data obtained from tributaries and Coeur d'Alene Lake.

**Product:** Report containing migration timing, spawning locations, numbers returning, trapping efficiency, hatchery vs. wild, habitat use by wild and hatchery adults. **Completion date:** Ongoing for duration of project first release in FY2001and first adult returns expected FY2004.

Conduct Run size assessments on non-target streams to determine amount of straying from target tributaries.

**1.10.2) "Performance Indicators" addressing risks**.
(*e.g., "Evaluate predation effects on listed fish resulting from hatchery fish releases."*)

No listed fish species will be negatively affected by the hatchery operation. Bull trout do reside in the system however, only positive effects are expected from release of cutthroat trout, a typical pray species of bull trout.

*Assess impacts of exotic species interactions with supplemented fish stocks in both Coeur d'Alene Lake and the target watersheds.*

1. Monitor interactions between resident trout and outplanted fish, as well as, interactions with other biota and other species of concern where applicable, by outmigrant traps, snorkel surveys, and electrofishing in watersheds where fish populations have been supplemented.
2. Monitor interactions between outplanted fish and exotic species in Coeur d'Alene Lake. Conduct predator-pray analysis in littoral zones of Coeur d'Alene Lake affected by hydropower operations.

**1.11) Expected size of program.**

*In responding to the two elements below, take into account the potential for increased fish production that may result from increased fish survival rates effected by improvements in hatchery rearing methods, or in the productivity of fish habitat.*

**1.11.1) Proposed annual broodstock need (maximum number of fish).**

Broodstock collection will range from fifty (50) to two hundred (200) emigrating juveniles Westslope Cutthroat trout per target tributary per year, with the total number required per tributary being approximately two hundred and fifty (250), full production broodstock numbers being onr thousand (1000). Broodstock will be supplemented as needed from respected tributaries.

**1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.** (*Use standardized life stage definitions by species presented in* Attachment 2.)

Westslope Cutthroat Trout (CTT) and Rainbow Trout (RBT) Cultured

| Life Stage | Release Location | Annual Release Level |
|---|---|---|
| **Eyed Eggs** | | |
| **Unfed Fry** | | |
| **Fry** | | |
| **Fingerling (CTT)** | Alder, Benewah, Evans & Lake creeks | 25 K per creek, total release of 100 K |
| **Yearling (Rainbow)** | Put-and –Take ponds (4) | 2.5 K per pond, total 10 K |

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

*Provide data (e.g., CPUE, condition factors) available for the most recent twelve years), or for the number of years of available and dependable information. Indicate program goals for these parameters.*

Only current data exists for rainbow trout as the hatchery program for westslope cutthroat trout is not schedule to begin until 2002.

**Program goals for rainbow trout:**

The Rainbow trout component (catch-out trout ponds) of the facility is expected to provide a subsistence fishery of 0.5 fish/hour and a creel condition factor of $K>152x10^{-7}$. Creel returns indicate that over 90% of the fish released into the catch-out ponds are caught within 8 weeks after release.

**Program goals for westslope cutthroat trout:**

Biological objectives for wild adfluvial cutthroat trout in tributaries of the Coeur d'Alene Reservation include rebuilding adult populations to 75-100 percent of the optimum level. This will be accomplished by achieving interim biological objectives (25 percent and 50 percent of optimum level) by the dates noted in the following table.

Biological and harvest objectives for wild adfluvial cutthroat trout in tributaries of the Coeur d'Alene Reservation

| Tributary | Target Level[a] (%) | Escapement[b] Target | Harvest Target[c] | Biological[d] Objective | Year |
|---|---|---|---|---|---|
| Alder Creek | 25 | 1,708 | 920 | 2,628 | 2007 |
| | 50 | 3,416 | 1,840 | 5,256 | 2012 |
| | 75 | 5,123 | 2,759 | 7,882 | 2016 |
| | 100 | 6,831 | 3,679 | 10,510 | Beyond |
| Benewah Creek | 25 | 2,179 | 1,174 | 3,353 | 2007 |
| | 50 | 4,357 | 2,347 | 6,704 | 2012 |
| | 75 | 6,534 | 3,519 | 10,053 | 2016 |
| | 100 | 8,713 | 4,692 | 13,405 | Beyond |
| Evans Creek | 25 | 984 | 530 | 1,514 | 2007 |
| | 50 | 1,968 | 1,060 | 3,028 | 2012 |
| | 75 | 2,951 | 1,589 | 4,540 | 2016 |
| | 100 | 3,935 | 2,119 | 6,054 | Beyond |
| Lake Creek | 25 | 2,002 | 1,078 | 3,080 | 2007 |
| | 50 | 4,004 | 2,156 | 6,160 | 2012 |
| | 75 | 6,006 | 3,234 | 9,240 | 2016 |
| | 100 | 8,008 | 4,312 | 12,320 | Beyond |

These numbers include expected return of both naturally and hatchery produced cutthroat trout in the four target tributaries.

**1.13) Date program started (years in operation), or is expected to start.**

The construction of the facility expected to start in the spring of 2001 and broodstock collection expected to start in spring of 2002.

**1.14) Expected duration of program.**

Duration must be consistent with stated purpose. Refer to Table 1 in the APR for guidance.

Permanent - The program will exist until self sustaining harvestable populations of westslope cutthroat trout exist in the target tributaries

**1.15) Watersheds targeted by program.**

*Include HUC field for desired watershed.*

Westslope Cutthroat trout watersheds targeted: Lake and Evans Creeks located in HUC 17010303; Alder and Benewah Creeks located in HUC 17010304.

All four (4) of the put-and-take Rainbow trout ponds located in HUC 17010306.

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

Alternatives: 1) No action, meaning not constructing the fish culture facility and relying on habitat restoration efforts to satisfy production needs. & 2) Reduction of/Eliminating the construction of the Rainbow trout portion of the fish culture facility.

Justification: 1) The first no action alternative would assume that the targeted species would fully seed the targeted tributaries without artificial prorogation. This action was not selected based on the information from "Supplementation feasibility report on the Coeur d'Alene Indian Reservation, (Peters et.al. 1999) which stated that cutthroat trout populations would not be harvestable for over 20 years unless stocks were supplemented. And, 2) The second no action alternative would reduce the capitol of construction of holding/rearing ponds and reduce the overall O&M, although, the interim fishery fish would then have to be purchased from other facilities and trucked to put-and-take ponds. We have modified our original plans based on this alternative. Rainbow trout will be purchased from other facilities and then held in this facility for distribution.

## 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.**

*(e.g. "The hatchery program will be operated consistent with the subbasin e plan, with the exception of age class at release. Fish will be released as age-1 rather than as fingerlings as specified in the subbasin plan, to maximize survival rates given extremely low recruitment rates the past four years.")*

The operation of this facility is consistent with the Artificial Production Review.

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

*Indicate whether this HGMP is consistent with these plans and commitments, and explain any discrepancies.*

At this time no other management plans except the Hatchery Master Plan exist. No other cooperative agreements are necessary. The master plan was reviewed through section 7 of the ESA and no biological opinion was necessary. A section 10 incidental take permit for bull trout was issued by the USFWS for this facility and any related actions conducted by the Coeur d'Alene Tribe.

**2.3) Relationship to harvest objectives.**

*Explain whether artificial production and harvest management have been integrated to provide as many benefits and as few biological risks. For example, reference any harvest plan that describes measures applied to integrate the program with harvest management.*

Impacts to native trout may result from activities or management actions that are legal according to present laws and regulations. Ongoing fishery management activities that may threaten native trout include a limited harvest fishery on westslope cutthroat trout in the St. Joe and Coeur d'Alene Rivers and Coeur d'Alene Lake as well as maintaining year around fishing seasons for exotic Chinook salmon in the lake which can result in incidental catch. Even in cases where an angler releases the fish, incidental mortality of 4% has been documented (Schill and Scarpella 1997). Spawning native trout are particularly vulnerable to illegal harvest since the fish are easily observed in the small tributaries located on the Reservation. Historically, broodstock collection, another form of harvest, also impacted native fish populations. In particular, successive year broodstock collection by Idaho Fish and Game of westslope cutthroat trout in Evans Creek, a tributary to the Coeur d'Alene River, eliminated the adfluvial life history form from that watershed.

The Coeur d'Alene Tribe Fisheries Program has integrated harvest management and artificial production to provide both long and short-term benefits. The program intends to alleviate fishing pressure on the target tributaries by closing the streams to harvest and providing alternative harvest resources in several catch-out ponds located on the reservation. Results from a pilot project in 1997 showed this to be very effective. At such time as the target tributary populations recover harvest will be allowed. This will be closely monitored by Coeur d'Alene Tribe fisheries personnel. It is the Tribes goal to one day have self-sustaining harvestable populations of cutthroat trout in the tributaries and Coeur d'Alene Lake.

**2.3.1) Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last 12 years (1988-99), if available.**

*Also provide estimated future harvest rates on fish propagated by the program, and on listed fish that may be taken while harvesting program fish.*

Not Applicable at this time. It is the intent of the program to provide harvest fisheries in the target tributaries and Coeur d'Alene Lake. The overall harvest goal is 35% of the returning adults based on predicted carrying capacity for juveniles in each of the target tributaries.

**2.4) Relationship to habitat protection and purposes of artificial production.**

*Describe the major factors affecting natural production (if known). Describe any habitat protection efforts, and expected natural production benefits over the short- and long-term. For Columbia Basin programs, use NPPC document 99-15, section II.C. as guidance in indicating program linkage with assumptions regarding habitat conditions.*

There are four major factors affecting native aquatic species defined in this report: habitat degradation, passage barriers, hybridization and competition with exotics, and harvest. Any number or combinations of factors are present in the Coeur d'Alene Lake. The information presented is summarized from the following documents: *Forest Service Biological Assessment of the St. Joe River and North Fork Clearwater River Basin* (1998), *Draft Coeur d'Alene Basin Problem Assessment* prepared by the Panhandle Bull Trout Technical Advisory Team (1998*), Conservation Assessment for inland cutthroat trout* prepared by the Forest Service (1995), and the *Stock Assessment of westslope cutthroat trout on the Coeur d'Alene Indian Reservation* prepared by Peters and Vitale (1999) and does not represent an original literature review as such.

Habitat Degradation

Fire

Recent evidence suggests that successful fire suppression since the 1930's may be currently resulting in more intense, catastrophic fires. Past management activities and successful wildfire control have caused a shift in forest species composition and stocking levels, predisposing forests to large scale mortality. Drought conditions can further dispose these forests to increased wildfire incidence and intensity, with the potential for significant negative impacts on water quality and fish habitat. Large wildfires (during 1910 and the 1930's), and numerous smaller fires, have burned in the Coeur d'Alene Lake basin in this century. Large fires have often left riparian vegetation intact along larger streams, but accounts of the 1910 fire from the St. Joe watershed documented significant burning of riparian areas along some streams. Intense fires may increase natural sediment delivery to streams, when hydrophobic soils are created. At the same time, fires can significantly increase recruitment of large woody debris to stream channels. Where post-fire salvage operations have removed woody debris from streamside areas, or created other disturbances such as roads and fire breaks impacts to fish may be increased (Rieman and Clayton 1997). Large stand replacing fires burned through a considerable portion of the upper St. Joe watershed, including riparian areas, yet this area is the largest remaining stronghold for native trout in the Coeur d'Alene Lake basin.

Roads

Road development in the basin is considerable, and includes Interstate 90, five state highways, numerous county and municipal roads, and an extensive road network constructed for forest product removal. Roads and railroads have had significant impacts on stream habitats in the Coeur d'Alene Basin through channelization of streams, encroachment on floodplains, destruction of riparian zones, creation of migration barriers for fish, through sediment delivery associated with construction and failures, and altered runoff patterns. Those areas with the highest density of roads occur in areas managed primarily for timber production. Some roads initially constructed for timber harvest are now used mainly for recreational access, some are regularly used for land management purposes, and still others have been abandoned and/or no longer maintained. On slopes, roads intercept the downward movement of subsurface water and cause it to flow rapidly on the surface. Road location and construction has created erosion rates far beyond those under which the watersheds and streams evolved. Furthermore, this road system has been constructed in many of the most sensitive locations (floodplains, and unstable land types) within the watersheds. The density of unimproved roads exceeds 2.5-miles/mile$^2$ in most of the subbasin watersheds (Vitale personal comm.).

Land management and access roads paralleling tributary streams are common and are typically more prone to failure and sediment delivery to streams. These roads tend to constrain channel meanders, reduce floodplain capacity, reduce or eliminate riparian areas and limit large woody debris recruitment. Streamside roads are vulnerable to failure during high flows and are significant sources of sediment to stream channels. Stream crossings may result in channel constrictions and impede water movement through floodplains, and can increase deposition on the upstream side and erosion on the downstream side of a crossing. Over 50% of the tributaries (second order and larger) to the St. Joe, St. Maries, and Coeur d'Alene rivers have significant reaches which are significantly affected by roads in floodplains or adjacent to stream channels.

Timber Harvest

Timber harvesting activities in the Coeur d'Alene Lake basin have included clear cutting, partial cutting, thinning, fertilization and prescribed burning. The yarding or skidding of trees varies from ground-based operations and cable systems to aerial approaches with helicopters. Impacts from timber harvest include streams with decreased large woody debris (from log skidding directly in streams and riparian harvest), and lack of recruitable large woody debris and increased temperatures (from harvest of riparian forests). Splash dams were used in several streams (most notably Marble Creek in the St. Joe watershed) and created significant changes to stream channels and fish habitat by creating migration barriers and scouring channels with regular releases of large flows of water and logs. Current impacts of timber harvest on native trout have been reduced with implementation of forest practice rules requiring leave trees in riparian areas, prohibiting equipment in or near streams, and controlling erosion from roads, trails and landings. However, the current leave tree requirement does not adequately protect temperature in all cases (Zaroban 1996). Other impacts of timber harvesting include decreased slope stability and hydrologic alteration.

Mining

Placer mining in streams and valley bottoms has had serious negative effects on native trout in the Coeur d'Alene Basin. This type of mining is associated with increased sediment load, substrate disturbances, resuspension of fine sediments, channelization, bank destabilization, and removal of large woody debris. Streams that have been mined usually lack habitat complexity, large woody debris, and suitable spawning and wintering habitat (Nelson et al. 1991). Revegetation of dredge piles may be slow and sparse, creating a long-term potential for sedimentation (Levell et al. 1987, Nelson et al. 1991). Placer mining has significantly impacted streams in the Beaver and Pritchard Creek drainages in the North Fork Coeur d'Alene watershed, and the Emerald and Carpenter in the St. Maries watershed. Some placer mining has occurred in upper St. Joe tributaries, including Heller and Sherlock creeks, but impacts appear to be less severe in those streams.

Mine tailing dams, waste dumps and diversions can provide barriers to native trout migratory corridors and spawning sites. Toxic constituents (such as heavy metals) arising from historical activities can block migratory corridors or kill life stages of native trout. Prior to establishment of the Clean Water Act, the entire South Fork of the Coeur d'Alene River from Wallace downstream to the mainstem Coeur d'Alene River, and the mainstem downstream to Coeur d'Alene Lake, were so polluted from mining and other wastes that resident fish were unable to survive (Ellis 1932). Portions of the South Fork still do not support coldwater biota due to metals contamination, and the Bunker Hill Superfund Site centered at Kellogg is one of the largest in the nation. Clean-up projects and the cessation of much of the mining and all of the smelting operations have allowed some recovery in several stream reaches to the point where at least some fish and other coldwater biota are supported.

<u>Agriculture</u>

Agriculture activities such as livestock grazing and crop production can result in increased nutrient levels and increased sediment delivery to the streams from bank and channel alteration, and riparian damage. Establishment of drainage districts along the lower St. Joe and Coeur d'Alene rivers has resulted in reduced floodplain capacity, channel alterations, and migration barriers. In the Coeur d'Alene Lake basin livestock grazing is generally confined to the lower river valley bottoms, and livestock grazing is generally not considered to be a significant factor affecting native trout distribution. Livestock grazing along the St. Maries River and some of its tributaries is likely interfering with successional processes which would lead to more shade (which tends to lower water temperatures) and stream bank stability.

Row crop agriculture is most common on the Palouse area, where streams drain into Coeur d'Alene Lake, and along the lower river valleys. Historically, large amounts of fine sediment were delivered to streams from row crop agriculture. Changing practices, implementation of BMPs, and changes in crops and field cover have helped to reduce fine sediment delivery however, it is still major problem in the Lower Coeur d'Alene River and smaller west side tributaries of Coeur d'Alene Lake. High percentages of fine sediment in spawning reaches resulting from agriculture activities probably greatly reduce spawning success of native trout in tributary streams located on the Reservation.

Passage Barriers

Barriers caused by human activities limit population interactions and may eliminate life history forms of native trout. Where isolation has occurred, the risk of local extinction due to natural stochastic events increases (Horowitz 1978). Restoring and maintaining connectivity between remaining populations of native trout is believed to be important for the persistence of many of the native fish species especially in the Coeur d'Alene Basin. Native trout that migrate downstream of fish passage barriers are unable to contribute to the trout population upstream. In systems with dams, this loss can be quite significant. The only known dams affecting fish migration in the Coeur d'Alene Lake basin are the remnant splash dams on Marble creek in the St. Joe watershed.

Improperly placed or poorly maintained culverts can be barriers to fish movement. These culverts tend to negatively impact native trout by limiting distribution or preventing access to high quality spawning and rearing areas. Where culverts prevent invasion of exotic fishes, they may have a positive effect on native trout populations. Barriers should be evaluated for their effect to native fishes and amphibians in the drainage before they are placed or removed. Migration barriers created by culverts are common in the Coeur d'Alene Lake basin.

**HYBRIDIZATION, COMPETITION, AND PREDATION**

Chinook salmon feed on kokanee salmon (both introduced species) in Coeur d'Alene Lake. Kokanee are likely an important forage item for adfluvial native trout. Kokanee are relatively abundant in the lake, and it is unknown whether there is enough predation on kokanee by chinook to result in competition with native trout. Chinook salmon likely feed on westslope cutthroat trout as well.

Northern pike are found throughout the Coeur d'Alene basin and are known to consume large numbers of migratory cutthroat trout, but it is unknown how much of a threat they pose for other native trout species migrating into the lake. Northern pike have been in the Coeur d'Alene system since at least the 1970's. Native northern pike-minnows (formerly known as northern squawfish) also prey on juvenile trout migrants in the lower St. Joe and Coeur d'Alene River and Coeur d'Alene Lake.

**HARVEST AND FISHING MORTALITY**

Impacts to native trout may result from activities or management actions that are legal according to present laws and regulations. Ongoing fishery management activities that may threaten native trout include a limited harvest fishery on westslope cutthroat trout in the St. Joe and Coeur d'Alene Rivers and Coeur d'Alene Lake as well as maintaining year around fishing seasons for exotic chinook salmon in the lake which can result in incidental catch. Even in cases where an angler releases the fish, incidental mortality of 4% has been documented (Schill and Scarpella 1997). Spawning native trout are particularly vulnerable to illegal harvest since the fish are easily observed in the small tributaries located on the Reservation. Historically, broodstock collection, another form of harvest, also impacted native fish populations. In particular, successive year broodstock collection by Idaho Fish and Game of westslope cutthroat trout in Evans Creek, a tributary to the Coeur d'Alene River, eliminated the adfluvial life history form from that watershed.

## LIMITING FACTORS FOR WESTSLOPE CUTTHROAT TROUT

Range wide causes of decline include competition with and predation by non-native species, genetic introgression, overfishing, habitat loss and fragmentation, and habitat degradation (Liknes 1984; Liknes and Graham 1988; Rieman and Apperson 1989; McIntyre and Rieman 1995). In Idaho, habitat loss was identified as the primary cause of decline in streams supporting depressed populations (Rieman and Apperson 1989). Peters et. al. (1999) determined that due to the persistence of adverse conditions in natal streams and Coeur d’Alene Lake, cutthroat trout populations are thought to be at least moderately damaged (i.e. average spawning escapements fall between the minimum viable population and the number of adults needed to produce 50% of the carrying capacity of the stream environment) for the following reasons:

- Stochastic events that result in increased mortality of embryo, fry, and juvenile lifestages (e.g. peak and extreme low flow events ) have been exacerbated by land use practices during the last 60 years;
- Competition for limited space and food during base flow conditions cause displacement of juveniles into water quality limited stream reaches;
- Competitive interactions with introduced salmonids may result in replacement of native trout in Alder Creek and Benewah Creek;
- Water temperatures in the upper ten meters of the water column in Coeur d’Alene Lake exceed the optimum as described in the HSI for cutthroat trout;
- Sediment loading from tributaries in combination with large quantities of aquatic macrophyte growth and low dissolved oxygen concentrations in the hypolimnion promote conditions more favorable for introduced fish species in Coeur d'Alene Lake; and
- Competitive interactions with introduced species for food, living space, and through predation limit cutthroat trout in both the littoral and limnetic zones of Coeur d’Alene Lake.

Peak flows in Lake Creek and Benewah Creek have been identified in previous reports as a potential limiting factor for trout production (Lillengreen 1996). Generally, increased flows during egg incubation will be favorable until they reach the point when scouring and other flood damage may take place (Allen 1969). Spikes in stream discharge during the early spring, as is characteristic of the Lake Creek and Benewah Creek watersheds, may cause redd scouring and egg damage, although no attempt has been made to quantify this source of mortality. For example, stream flows in upper Lake Creek during spring of 1997 exceeded the sheer stress of spawning gravels (5 cm geometric mean particle diameter) for 4 consecutive days during the incubation period. It is conceivable that flow events of this magnitude could scour trout redds and result in complete year class failures. Although flood damage is a natural source of mortality, canopy reduction in each of the target watersheds has probably contributed to higher storm runoff peaks. Scouring of trout redds is certainly a more frequent occurrence than in the recent past.

Typical base flow conditions in the target watersheds force juvenile trout into small pools where competition for limited space and food may occur. Other authors have suggested that at high densities, competition for space among juveniles may lead to dispersal, downstream displacement or mortality in salmonids (Chapman 1962; Mason and Chapman 1965; Everest 1971; Erman and Leidy 1975; LeCren 1973). In water quality limited systems, such as Lake Creek, Benewah Creek, and Alder Creek, dispersal to downstream areas exposes juvenile cutthroat to suboptimal temperature conditions that increase stress, weaken individuals and may result in mortality.

Westslope cutthroat trout hybridize with rainbow trout producing inferior progeny that can significantly alter the genetic composition of the entire population. Westslope cutthroat trout are also negatively impacted by brook trout. Cutthroat trout did not evolve with brook trout in the Coeur d'Alene subbasin. Therefore, mechanisms that promote coexistence and resource partitioning have likely not developed. Griffith (1972) demonstrated that cutthroat trout fry emerge from the gravel later in the year than brook trout and, thus, age-0 cutthroat trout acquire a statistically significant length disadvantage that may continue throughout their lifetime. Such a size discrepancy may enhance resource partitioning, but in times of habitat shortage cutthroat trout may be at a disadvantage if they cannot hold territories against larger competitors. Competitive exclusion is a likely cause of decline for cutthroat trout in some subbasin watersheds. Replacement of this kind, at least in stream environments, may be an irreversible process (Moyle and Vondracek 1985). This was found to be the case in Yellowstone National Park, where the introduction of brook trout has nearly always resulted in the disappearance of the cutthroat trout (Varley and Gresswell 1988). Implications are that cutthroat trout may have a difficult time naturally recovering given continued water quality degradation and the persistence of brook trout.

Based on the water quality HSI’s (Hickman and Raleigh 1982) calculated for cutthroat trout, the upper 10 meters of the water column in Coeur d'Alene Lake generally is not suitable habitat. At only one of thirteen sample locations was the HSI value higher than 0.0. This does not mean that cutthroat trout will not be found there, but they will have trouble sustaining themselves over a long period of time. Furthermore, the euphotic zone rarely drops below 10 meters in Coeur d'Alene Lake so any foraging runs into that zone will take them into unsuitable habitat, which results in added stress. Thus, all areas represented by sample stations less than ten meters in depth would be considered unsuitable cutthroat trout habitat with deeper stations showing limited distribution during certain times of the year.

Increased loading of sediments from agricultural runoff does affect cutthroat suitability, though not directly, in areas near the mouths of streams in and around the lake. Sediment is accumulating at the mouth of Plummer creek in Chatcolet Lake at a rate of 2.4 cm/year (Breithaupt, 1990). This, in turn, increases the surface area where large masses of aquatic macrophytes can grow. These masses of aquatic plants can impair juvenile and adult migrations and serve as the primary foraging areas for larger piscivorous fishes.

Low quantities of dissolved oxygen did occur at some of the sample sites, however, it is not considered limiting for cutthroat trout suitability. Low dissolved oxygen, however, is thought to have indirect affects on cutthroat trout suitability in the southern lakes area. Low dissolved oxygen values most likely are occurring from decomposition of organic matter from allochthonous sources as well as from aquatic macrophytes. Reiman (1980) and Woods (1989) noted hypolimnetic oxygen deficits in Coeur d'Alene Lake in 1979 and 1987 as well.

Of the introduced species the following have been shown to have the ability to actively feed on other fish species including adult and juvenile cutthroat trout: northern pike, largemouth bass, smallmouth bass, chinook salmon, and channel catfish. Historically, bull trout and northern squawfish were the only predators of cutthroat trout in the lake. Electrofishing data shows that these predators are associated primarily with the shoreline littoral zone. The relative abundance data shows that five species of piscivorous fishes (four introduced) have relative abundances higher than cutthroat trout. This would indicate that cutthroat trout are probably being competitively excluded from this littoral zone habitat by these other fishes.

Historically, cutthroat trout in Coeur d'Alene Lake probably utilized the littoral zone of the lake until they were large enough to move offshore and feed, most likely, on mid water prey and fish when available. Nilsson and Northcote (1981) noted that cutthroat trout in allopatry with other salmonids were found throughout the lake and in sympatry, they were located primarily in the littoral zone. It has been shown that introduction of kokanee salmon will also have detrimental effects on the cutthroat trout population (Gerstung, 1988; Marnell, 1988). Marnell (1988) determined that declines in westslope cutthroat trout populations in lakes in Glacier National Park where kokanee were introduced were caused by competition for planktivorous food. Thus, the introduction of non-native species into Coeur d'Alene Lake, at the minimum, altered the normal behavioral pattern of the cutthroat trout in both the littoral and limnetic zones of Coeur d'Alene Lake.

Restoration efforts rectifying many of the habitat concerns will continue to be conducted in each of the target watersheds. However, given the various physical and environmental constraints limiting production it is doubtful that habitat restoration in itself will result in substantial increases in the production of cutthroat trout in the near future. There is little information specific to the target watersheds that can be used to estimate its potential production capacity for cutthroat trout. Based on available data it can be assumed that production is relatively low when compared to other North Idaho cutthroat trout bearing streams. Although habitat restoration work and better resource management will result in improved survival rates for cutthroat trout it is believed that any significant increase in the total run size will require hatchery supplementation.

**2.5) Ecological interactions.**

*Describe all species that could (1) negatively impact program; (2) be negatively impacted by program; (3) positively impact program; and (4) be positively impacted by program.*

One of the main goals of our restoration and supplementation program will be to maintain the genetic integrity of the wild populations as well as, increase the numbers of fish reproducing in the natural environment. The purpose of the supplementation program is to restore the naturally reproducing populations to historic levels commensurate with the carrying capacity of the natural habitat. Thus, the adverse effects of predation, competition for food and living space, and disease should be no more than what was experienced by the population when at historic abundance levels. The supplementation program proposed seeks to minimize or eliminate any differences between the stocked and wild fishes so that they are a single population. Hatchery releases will be proportional to natural production so that the carrying capacity of the stream is not surpassed.

At this point in time limiting factors in the lake stage of the westslope cutthroat trout life cycle are not very well known. We do know that they are hanging on in the lake. It is the intent of the program to exploit the niche that they are currently existing in to see if additional production capabilities exist in the lake. Once mortality rates in the lake have been determined then we will be able to do something about them.

There are several exotic species in the lake that could negatively impact westslope cutthroat trout. They include northern pike, largemouth bass, smallmouth bass and the native northern pikeminnow. There are several species that could also be positively benefited from this program including bull trout, chinook salmon, and northern pike.

## 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.**

*For integrated programs, identify any differences between hatchery water and source, and "natal" water used by the naturally spawning population. Also, describe any methods applied in the hatchery that affect water temperature regimes or quality.*

The main source of water is an intermittent stream that is adjacent to the facility, the stream (Rock creek) flows six-nine months of the year. The facility will also utilize ground water, with up to six wells capable of producing 60 gpm of continuous flow. All water for the facility will be conditioned by a water reuse system that is designed to operate on sixty (60) gallons of water per minute.

Three of the wells have been drilled and tested for quality and quantity. Data for the wells are estimated to be able to supply water in excess of 350 gpm. In addition to the rate of flow available, the sustainability of the supply is of greater importance. To evaluate the sustainability of the groundwater source, a long-term pump test was conducted on the test wells. The results of this analysis showed that there is some potential for the aquifer to serve as the sole groundwater supply source for the proposed hatchery. An examination of the geology and existing hydraulic gradient, in conjunction with recharge values from a nearby basin, has provided an estimate of the sustainable yield. Based on this information, it has been estimated that the sustainable yield for a year around pumping period is 12 gallons per minute for each of the first two wells drilled. This is less than the minimum required groundwater supply for hatchery purposes. The third well drilled has yet to be completely tested however, it appears to be two to three times as strong as the other two. Thus it is expected to be able to produce up to at least 24 GPM and possibly up to 60 GPM.

Because the water will be conditioned in the hatchery there are some differences between the hatchery and natal waters. In light of this broodstock will be quarantined in the facility for one year before being combined with other brood at the facility. As well fish will be isolated in acclimation ponds for three months prior to release into the streams. It is the goal of the program to rear fish in the most natural way possible such that hatchery and naturally produced fish are as close to identical as possible.

**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.**

*(e.g., "Hatchery intake screens conform with NMFS and USFWS screening guidelines to minimize the risk of entrainment of listed species.")*
*Include information on water withdrawal permits, National Pollutant Discharge Elimination System (NPDES) permits, and compliance with NMFS and USFW and screening criteria. Although the USFWS does not have specific screening criteria at this time, research is being conducted at the Abernathy facility that will result in criteria specific for bull trout. In the interim, most USFWS field offices are using NMFS criteria.* To obtain information regarding what, if any, screening criteria are being used by the USFWS in your area, please refer to Attachment 3 for the phone number and address of the nearest field office.

We currently have a biological assessment on file with the local USFWS office in Spokane, WA for all fisheries activities including the hatchery facility. They have reviewed the BA and determined that no biological opinion is necessary and have issued us an incidental take permit for our activities.

## SECTION 4. FACILITIES

*For each item, provide descriptions of the hatchery facilities that are to be included in this plan (see "Guidelines for Providing Responses" Item E), including dimensions of trapping, holding incubation, and rearing facilities. Indicate the fish life stage held or reared in each. Also describe any instance where operation of the hatchery facilities, or new construction, results in adverse effects to habitat for listed species (habitat effects must be considered even if critical habitat is not designated).*

**4.1) Broodstock collection, holding, and spawning facilities .**

Broodstock are collected in modified emigration juvenile downstream traps (Conlin & Tuty 1979), and consisted of a V weir, runway and a holding box. The broodstock captured as fry (2-inch to 4-inch) emigrating juveniles. The broodstock transported to the hatchery are held in 6 foot diameter quarantine tanks (one for each tributary). Quarantine duration, six to twelve months. After quarantine, fish are placed and spawned in concrete broodstock raceways, each raceway will be approximately 5 ft. deep, 12 ft. wide by 45 ft. long, and have rounded ends to promote flow circulation. A wooden dividing baffle and two air lifts will provide a current throughout the raceway. The current could be adjusted by varying the amount of air supplied to each 6-inch airlift. This proposed raceway design will have a maximum density index (D.I.) of 0.10, which is believed conservative. The low pressure air (about 3 psi) required to operate the air lifts will be generated by a duplex air blower system housed in a nearby shed. Each one of the two air blowers will be capable of supporting the maximum air demand of all four broodstock raceways. Emergency power supply will be provided to the shed automatically during power outages.

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

The fish will be transported in a portable insulated fiberglass tank equipped with supplemental oxygen, aeration devices and alarms.

**4.3) Incubation facilities.**

Fertilized eggs will be placed in vertical flow incubators (Heath Trays or equivalent). Water inflow isolated from all other sources within the facility.

**4.4) Rearing facilities.**

Newly hatched fry will be placed in fiberglass troughs that are housed indoors and have the physical dimensions of two (2) feet wide by one point three three (1.33) feet deep and eight (8) feet in length. Each trough having fourteen cubic feet of usable space. Approximately eight (8) months after the newly hatched fry are started on feed they will be transported to outdoor production raceways. Production raceways have physical inside dimensions of six point five (6.5) feet wide by fifty (50) feet in length and two point five (2.5) feet of water depth.

**4.5) Acclimation/release facilities.**

Acclimation facilities are constructed of concrete with the physical dimension of forty (40) feet in length, ten (10) feet wide and a water depth of three point five (3.5) feet. The height of each acclimation pond is variable due to the features found at each site. Each acclimation pond will have a slope of 0.5%, a six (6) inch inlet with a gate valve, a eight (8) inch outlet, a grated cover structure and a solar powered water level and dissolved oxygen content alarm system.

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

**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.**

*(e.g., "The hatchery will be staffed full-time, and equipped with a low-water alarm system to help prevent catastrophic fish loss resulting from water system failure.")*

The hatchery will be staffed full time, equipped with multiple alarms (low water, low DO, pH, etc..) that is wired to audio facility alarms and a paging service. In addition, have supplemental oxygen source, a back-up generator, a thirty thousand gallon (30,000) water storage tank.

**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.**

This facility is located in a watershed with no listed species. This watershed is also devoid of any salmonids at this time. This facility is designed with a water treatment system capable of treating both incoming and out going water for disease and other chemical compounds that minimize the likelihood of take of listed species.

As with any system, new advanced technologies become available on somewhat of a regular basis and if justified the advanced technologies would be requested.

## SECTION 5. BROODSTOCK ORIGIN AND IDENTITY

**5.1) Source.**

*List all original and current sources of broodstock for the program. Be specific (e.g., natural spawners from Bear Creek, etc.).*

Broodstock sources are from the four (4) target tributaries, Alder, Benewah, Evans and Lake Creeks. Each stock having its' own isolation tank for quarantine and its' own brood pond for housing and spawning.

**5.2) Supporting information.**

**5.2.1) History.**

*Provide a brief narrative history of the broodstock sources. For listed natural populations, specify its status relative to critical and viable population thresholds (use section 10.2.2 if appropriate). For existing hatchery stocks, include information on how and when they were founded, sources of broodstock since founding, and any purposeful or inadvertent selection applied that changed characteristics of the founding broodstock.*

Broodstock will be from natural populations found within the basin. A genetic analysis was completed and it was determined that these populations could be combined into one broodstock with no changes in genetic composition or effects on the wild populations.

**5.2.2) Annual size.**

*Provide estimates of the proportion of the natural population that will be collected for broodstock. Specify number of each sex, or total number and sex ratio, if known. For broodstocks originating from natural populations, explain how their use will affect their population status relative to critical and viable thresholds.*

Broodstock collection is to be monitored and evaluated on a yearly basis and collection numbers are to be reflective of total available up to (10%) of the migrating juveniles or 200.

**5.2.3) Past and proposed level of natural fish in broodstock**.

*If using an existing hatchery stock, include specific information on how many natural fish were incorporated into the broodstock annually.*

Broodstock collection efforts will range from fifty to two hundred naturally produced emigrating juveniles per year per target tributary. Full production broodstock numbers being one thousand (1000), two hundred fifty (250) per target tributary. Recruits and replacement broodstock will be collected as needed due to normal mortality and or catastrophic events.

**5.2.4) Genetic or ecological differences**.

*Describe any known genotypic, phenotypic, or behavioral differences between current or proposed hatchery stocks and natural stocks in the target area.*

Native local westslope cutthroat trout stocks are being utilized for tributary supplementation.

Rainbow trout stocks having no specific genetic, phenotypic or behavior traits, although disease issues are considered prior to the purchase of Rainbow trout products (eggs, fish).

**5.2.5) Reasons for choosing Broodstock traits**

*Describe traits or characteristics for which broodstock was choosen.*

Native local strains being cultured for natal tributaries and maintenance of local adapted traits.

**5.2.6) ESA-Listing status**

Westslope cutthroat trout are not listed by the USFWS.

**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.**

(e.g., *"The risk of among population genetic diversity loss will be reduced by selecting the indigenous white sturgeon population for use as broodstock in the supplementation program*.")

Genetic diversity loss is being minimized by utilizing native broodstocks from target tributaries in supplementation efforts. Propagated Westslope Cutthroat trout will be marked for identification, preventing use of first generation hatchery cultured fish as broodstocks, although, second (native-hatchery, hatchery-hatchery matings) and beyond generations fish could be captured for broodstock in the future.

## SECTION 6. BROODSTOCK COLLECTION

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

Broodstock are to be collected as emigrating juveniles.

**6.2) Collection or sampling design.**

*Include information on the location, time, and method of capture (e.g. weir trap, beach seine, etc.) Describe measures to reduce sources of bias that could lead to a non-representative sample of the desired broodstock source.*

Utilization of downstream weir traps placed on the four (4) target tributaries, Alder, Benewah, Evans and Lake Creeks in late April to early May. Due to the young age of the fish little biases can take place and therefore depending on the size of the run of emigrates as many as two hundred (200) fish could be taken from any given tributary.

Genetic analysis indicates one broodstock could be used if necessary. It is our intent to combine fish from Lake Creek and Benewah Creek into one broodstock for release in those streams and have a second broodstock derived from Alder and Evans Creeks for release in those streams.

**6.3) Identity.**

*Describe method for identifying (a) target population if more than one population may be present; and (b) hatchery origin fish from naturally spawned fish.*

Broodstock will be marked with a coded floy tag. Hatchery produced progeny will be marked, although, the method(s) of marking are yet to be determined (most likely adipose fin clip). Target trout species identified visually.

**6.4) Proposed number to be collected:**

**6.4.1) Program goal (assuming 1:1 sex ratio for adults):**

The program goal is to achieve the sex ratio of 1:1, although, juvenile sexual identification being difficult, broodstocks ratios may have to be amended. This could result in releasing excess fish back into the wild once sex determinations are made.

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

Not applicable, broodstock collection efforts are targeted for the spring of 2002.

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

*Describe procedures for remaining within programmed broodstock collection or allowable upstream hatchery fish escapement levels, including culling.*

Numbers of collected broodstock is a relatively small number and rearing/housing densities are low and raceways could rear/house a great deal more. Therefor, excessive numbers of broodstock would be reared/housed with their respected stocks. Excessive broodstock reproductive materials (eggs) not needed for supplementation efforts will be stripped into collection bins and disposed of as necessary. This process is performed to maintain reproductive health of the females.

**6.6) Fish transportation and holding methods.**

*Describe procedures for the transportation (if necessary) and holding of fish, especially if captured unripe or as juveniles. Include length of time in transit and care before and during transit and holding, including application of anesthetics, salves, and antibiotics.*

Emigrating juveniles are trapped in weirs and transported in a portable insulated fiberglass tank equipped with supplemental oxygen, aeration devices and alarms. Newly emigrant recruits are placed in quarantine for a duration of six (6) to twelve (12) months. Quarantine tanks are cylindrical and measure six (6) foot in diameter. Transportation to the hatchery from the target tributaries varies, Alder Creek transport time approximately two (2) hours, Benewah Creek transport time approximately fifty (50) minutes, Evans Creeks transport time approximately one (1) hour and Lake transport time approximately twenty-five (25) minutes. Fish in transport receive no specialized applications of anesthetics, salves or antibiotics.

**6.7) Describe fish health maintenance and sanitation procedures applied.**

Ovarian fluids taken during spawning efforts analyzed by reputable facility for adverse health conditions, observation methods utilized daily for abnormal behavior and or physical appearance. Treatments approved by licensed fish veterinarian or other qualified personnel.

**6.8) Disposition of carcasses.**

*Include information for spawned and unspawned carcasses, sale or other disposal methods, and use for stream reseeding.*

All carcasses are to be disposed of into a modified septic tank collection pit and emptied as required.

**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.**

*(e.g. "The risk of fish disease amplification will be minimized by following Co-manager Fish Health Policy sanitation and fish health maintenance and monitoring guidelines.")*

New recruits are held and raised in isolation/quarantine tanks for a duration of six months to one year.

## SECTION 7. MATING

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

**7.1) Selection method.**

*Specify how spawners are chosen (e.g. randomly over whole run, randomly from ripe fish on a certain day, selectively chosen, or prioritized based on hatchery or natural origin).*
Spawning occurring randomly from sorted ripe fish. Fish are segregated into two categories, spawned and green (unripe) fish. Technique used for each of the two broodstock groups.

**7.2) Fertilization.**

*Describe spawning protocols applied, including the fertilization scheme used (such as equal sex ratios and 1:1 individual matings; equal sex ratios and pooled gametes; or factorial matings). Explain any fish health and sanitation procedures used for disease prevention.*
Fertilization occurs in the brood ponds, which is a covered structure with no walls, if required the walls are covered to prevent ultraviolet (sun light) exposure to the reproductive products. A large cattle trough is utilized for anesthetization. Ripe fish are anesthetized in fresh water (non-brood pond water) with Tricaine Methanesulfonate (MS-222), in addition, approximately one (1) cup of cattle grade rock salt is added. The spawning table consisting of a platform for the anesthetizing trough, four (4) openings to allow the stainless steel bowls to set recessed into the table that are used to accept milt and eggs. Anesthetized fish are dipped into the brood pond to rinse any MS-222 residue from their bodies, furthermore a clean cloth is then used to further remove residue from the fish by gently wiping the reproductive orifices. Males and females are stripped in similar fashions as describe in the Department of the Interior, U.S. Fish and Wildlife Service manuals (Fish Hatchery Management and Inland Salmonid Broodstock Management Handbook). Milt is place in the mixing bowl first which contains a three (3) percent saline solution promoting milt activity and mobility and then eggs are added to the bowl. Fertilized eggs are rinsed with fresh water and placed into a general collection apparatus. The eggs are water hardened and then treated in a iodine solution for approximately ten minutes, the water chemistry is adjusted to a neutral pH. Eggs are then enumerated for placement into incubation apparatuses.

**7.3) Cryopreserved gametes**.

*If used, describe number of donors, year of collection, number of times donors were used in the past, and expected and observed viability.*
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.**

(*e.g.*, *"A factorial mating scheme will be applied to reduce the risk of loss of within population genetic diversity for the westslope cutthroat trout population that is the subject of this supplementation program."*)

Mating will be random within broodstock groups, fish will be coded and no male will be mated with the same female a second time.

## SECTION 8. INCUBATION AND REARING

**8.1) Incubation:**

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

*Provide data for the most recent 12 years (1988-99), or for years dependable data are available.*

Egg collection numbers for Westslope Cutthroat trout are expected to range in the numbers of approximately 200,000. This will enable us to meet our target release number and allow for natural fish mortality.

**8.1.2) Loading densities applied during incubation.**

*Provide egg size data, standard incubator flows, and standard loading per Heath tray (or other incubation density parameters).*

No egg size data is available, incubation flow rate approximately 4-5 gallons per minute and loading densities not to exceed ten thousand eggs per vertical incubation tray or recommended densities by manufacturer.

**8.1.3) Incubation conditions.**

*Describe monitoring methods, temperature regimes, minimum dissolved oxygen criteria (influent/effluent), and silt management procedures (if applicable), and any other parameters monitored.*

Incubating eggs are visually monitored daily. Temperature regimes monitored and maintained to the approximate mean temperature range of $10^0$ C ($50^0$ F, ranges from $7.2^0$- $12.7^0$ C). Criteria for dissolved oxygen levels are 100 % saturation at influent and not allowed to fall below 6 PPM at the effluent. Silt management should not be a concern, although the upper tray/trough of the system not utilized for incubating eggs, but as a silt/debris collection tray and a mixing/entree tray for anti-fungal treatment.

**8.1.4) Ponding**.

*Describe procedures (e.g., dates of ponding, volitional, forced).*

Fish will be ponded after 2 years in the facility. They will be volitionally released after three-four months.

**8.1.5) Fish health maintenance and monitoring.**

*Describe fungus control methods, disease monitoring and treatment procedures, incidence of yolk-sac malformation, and egg mortality removal methods.*

The incoming water in the facility will be Ultra violet and ozone treated. Water will then be discharged from the facility to a settling pond and artificial wetland. Standard anti-fungal treatments will be used as necessary and eggs will be periodically picked to remove dead ones.

**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.**
(*e.g., "Eggs will be incubated using well water only to minimize the risk of catastrophic loss due to siltation.")*
Westslope cutthroat and rainbow trout (if incorporated into the program) eggs will be incubated utilizing exclusively well water to minimize the risk of catastrophic loss due to siltation or other contaminates that may be present in surface water.

**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.**.
Not Applicable

**8.2.2) Density and loading criteria (goals and actual levels).**
*Include density targets (lbs fish/gpm, lbs fish/ft3 rearing volume, etc.).*

Approximately 8 months after the newly hatched cutthroat fry are started on feed in the hatchery they will be transferred to the outdoor raceways, where they will be grown from 1.5-inch to the planting size of 4-inch. Their growth within the hatchery will be controlled through manipulation of water temperature and feeding so as to mimic wild growth rates.

Annual production of 100,000 4-inch cutthroat fingerlings over a 20-22 month period will require 4 separate raceways — two raceways for each year class. Assuming a mortality rate of 1.5 percent per month, about 150,000 0.5-inch fry are needed for the production of 100,000 4-inch year 2 fingerlings. Table 4 below presents information for three fish sizes grown in the raceways. It shows that the cutthroat fingerling production program can be achieved with four raceways without exceeding a density index of 0.40 or a flow index of 0.94.

**Table 4 – Cutthroat Trout Raceway Production**

| *Fish Size (inches)* | *Number/Pounds (per 2 raceways)* | *Density Index (D.I.)** | *Flow Index (F.I.)*** |
|---|---|---|---|
| | 130,000/156 | .07 | .17 |
| | 115,000/1,173 | .28 | .65 |
| | 100,000/2,260 | .40 | .94 |

* assumes 706ft$^3$ of useable space per raceway
** assumes 300 gpm per raceway (2-pass)

### 8.2.3) Fish rearing conditions

*(Describe monitoring methods, temperature regimes, minimum dissolved oxygen, carbon dioxide, total gas pressure criteria (influent/effluent if available), and standard pond management procedures applied to rear fish).*

Each raceway will have inside dimensions of 6.5 ft. by 50 ft. and 2.5 ft. water depth, plus a freeboard of 1 ft. A2-pass system will be used in which the water from the upstream raceway can be re-aerated and used in the downstream raceway. The downstream raceway will, nonetheless, be provided with its own independent water supply for those times when the upstream raceway will be emptied. The total flow for all four raceways will be limited to 600 gpm of treated and chilled reuse water.

A screened-off 6.5 foot long settling area on the effluent end of each raceway will be provided to prevent waste and ammonia build-up from accumulating in the downstream raceway or in the water reuse system. This screened-off settling area will be totally accessible by simply removing the screen prior to harvesting the fingerlings. The sole purpose for the screen is to prevent fish from stirring-up the waste and thus allowing it to flow downstream. A separate cleaning waste (CW) pipe will operate by gravity by simply pulling a vertical standpipe that is cast into the bottom of the raceway. This action will sluice the concentrated waste directly to the effluent pond for treatment. The relatively clean raceway overflow (± 99% of all raceway flow) will be piped to the reuse system for treatment, disinfection, and chilling if required.

The final design version of the production raceways will use baffles to create eddies and higher velocity zones, and will result in a superior cutthroat trout growout scheme for the reasons listed below:

1) Ease of cleaning walls and screens (waist-high access along 1 side of each raceway, and easy reach to far wall).
2) Truck access to one side of each raceway unit for transfer or planting operations.
3) Less stressful environment for fish (no staff climbing on raceway walls, grated walkways, or inside of raceways to perform normal cleaning and feeding duties).
4) Reduced contamination potential of raceway water due to the operations listed in 3, above, which can introduce mud or raceway waste debris carried on boots.
5) Shading of raceways will provide a better environment for the fish, and greatly reduce algae growth and cleaning requirements.
6) A safe and comfortable work environment for the staff and reduced raceway maintenance requirements.

**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.**
Not Applicable

**8.2.5) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).**
E.W.O.S. or Moore Clark fish food utilized as training feed and Rangden or equivalent feed there after. Feeding rate calculated from percent body weight and fed from six to eight times in a given day or automatically fed via 12-hour belt type feeder.

**8.2.6) Fish health monitoring, disease treatment, and sanitation procedures**.
Provide condition factor indices

**8.2.7) Indicate the use of "natural" rearing methods as applied in the program.**
Natural rearing methods will be used whenever and whenever possible. At this time the methodology(ies) to be used are not completely determined.

**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.** (*e.g., "Fish will be reared to sub-yearling to minimize the risk of domestication effects that may be imparted through rearing to yearling size.")*

Fish will be reared under conditions that mimic as closely as possible the conditions that wild fish rear in (light, temperature, etc.). They will be acclimated to water within there natal streams and will be volitionally released during the optimum time for migration.

## SECTION 9. RELEASE

**Describe fish release levels, and release practices applied through the hatchery program.**
*Specify any management goals (e.g., number, size or age at release, population uniformity, residualization controls) that the hatchery is operating under for the hatchery stock in the appropriate sections below.*

**9.1) Proposed fish release levels.** *(Use standardized life stage definitions by species presented in **Attachment 2**. "Location" is watershed planted (e.g., "Elwha River").*

| Age Class | Maximum Number | Size (fpp) | Release Date | Location |
|---|---|---|---|---|
| Eggs | | | | |
| Unfed Fry | | | | |
| Fry | | | | |

| Age Class | Maximum Number | Size (fpp) | Release Date | Location |
|---|---|---|---|---|
| **Fingerling** | | | | |
| **Yearling** | | | | |

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

**Stream, river, or watercourse:**
*(include name and watershed code (e.g. WRIA) number)*
Refer to section 1.5

**Release point:**
(*river kilometer location, or latitude/longitude*)

**Major watershed:** Coeur d' Alene subbasin
(e.g., " Kootenai River")

**Basin or Region:** Mountain Columbia Province
*(e.g., " Columbia River Basin/Mountain Columbia Province")*

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

*For existing programs, provide fish release number and size data for the past 12 years, if available. Use standardized life stage definitions by species presented in* ***Attachment 2****. Cite the data source for this information.*

| Release year | Eggs/ Unfed Fry | Avg size | Fry | Avg size | Fingerling | Avg size | Yearling | Avg size |
|---|---|---|---|---|---|---|---|---|
| **1988** | | | | | | | | |
| **1989** | | | | | | | | |
| **1990** | | | | | | | | |
| **1991** | | | | | | | | |
| **1992** | | | | | | | | |
| **1993** | | | | | | | | |
| **1994** | | | | | | | | |
| **1995** | | | | | | | | |
| **1996** | | | | | | | | |
| **1997** | | | | | | | | |
| **1998** | | | | | | | | |
| **1999** | | | | | | | | |
| **Average** | | | | | | | | |

**9.4) Actual dates of release and description of release protocols.**

*Provide the recent five year release date ranges by life stage produced (mo/day/yr). Also indicate the rationale for choosing release dates, how fish are released (volitionally, forced, volitionally then forced).*

Actual release dates not applicable. Fish are to be released into acclimation ponds during the first week of February, held for volitional release beginning in April and then forced out into natal tributaries in late June or early July.

**9.5) Fish transportation procedures, if applicable.**

*Describe fish transportation procedures for off-station release. Include length of time in transit, fish loading densities, and temperature control and oxygenation methods.*

Cultured westslope cutthroat trout will be placed into a portable insulated fiberglass tank equipped with supplemental oxygen, aeration devices and alarms via hand loading or a fish pump. After reaching their destination, fish are then hand loaded off or released through the tanks opening and expelled into the acclimation ponds.

Transportation to the targeted tributaries from the hatchery varies, Alder Creek transport time approximately two (2) hours, Benewah Creek transport time approximately fifty (50) minutes, Evans Creeks transport time approximately one (1) hour and Lake transport time approximately twenty-five (25) minutes. The fish loading destiny will depend on the size of transportation tank, a generalization for a two hundred-gallon tank would have a loading density of approximately 4.2 pounds per gallon. Transportation concerns are minimal due to the time of year, early spring.

**9.6) Acclimation procedures (***methods applied and length of time***).**

Fish placed in the acclimation ponds held volitionally and fed daily for the duration of approximately five months. Acclimation ponds supplied with creek water and monitored by an alarm system directly tied to telephone communication system.

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

Broodstock will be marked with a coded floy tag. Hatchery produced progeny marking method(s) is yet to be determined (most likely adipose fin clip).

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

Surplus numbers utilized in non-targeted historic westslope cutthroat tributaries within the Coeur d' Alene Indian reservation (tributaries yet to be determined).

**9.9) Fish health certification procedures applied pre-release.**

IDF&W Fish Health and other required monitoring report performed before release.

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

All components supplied with individual water supplies and drains, minimizing lose due to flooding and de-watering events. Facility water system failure short term corrected via a thirty thousand-gallon water storage tank and supplemental oxygen. Power failure events corrected via a generator powering required equipment.

**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.**
Released fish numbers less than fifty percent of naturally spawning populations and certified by health officials reducing/eliminating adverse genetic and ecological effects.

## 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.

No biological opinion needed via section 7 consultation, a biological assessment is on file at the USFWS office in Spokane and a section 10 incidental take permit has been issued for all activities conducted by the Coeur d'Alene Tribe Fisheries program.

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

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

*Include information describing: adult age class structure, sex ratio, size range,migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing. Emphasize spatial and temporal distribution relative to hatchery fish release locations and weir sites.*

ESA species not held in facility.

**- Identify the ESA-listed population(s) that will be <u>directly</u> affected by the program.** *(Includes listed fish used in supplementation programs or other programs that involve integration of a listed natural population. Identify the natural population targeted for integration).*
*** To obtain a list of listed species in your area, refer to Attachment 3 for the phone number and address of the nearest ecological field office.***

Only bull trout will be directly affected by our activities. This is expected to be a positive benefit in that westslope cutthroat trout are a prey species for bull trout. No bull trout currently reside in the target tributaries.

**- Identify the ESA-listed population(s) that may be <u>incidentally</u> affected by the program.**
*(Includes ESA-listed fish in target hatchery fish release, adult return, and broodstock collection areas).*

Bull trout may be incidentally taken during R,M, & E activities however, we have obtained an incidental take permit for those activities.

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

We feel that the listed species will benefit from our program.

- **Describe the status of the listed natural population(s) relative to "critical" and "viable" population thresholds** (*see definitions in "Attachment 1")*.

Status of listed species in target tributaries is extirpated. Status of listed species in Coeur d'Alene subbasin is viable but declining.

**- Provide the most recent 12 year (e.g. 1988 - present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.** No data available.

**- Provide the most recent 12 year (e.g. 1988 - 1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.** *(Include estimates of juvenile habitat seeding relative to capacity or natural fish densities, if available).* N/A

- Provide the most recent 12 year (e.g. 1988 - 1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known. **100% natural-origin**

**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.**

**- Describe hatchery activities that may lead to the take of listed species in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take**.

**- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish**.

**- Provide projected annual take levels for listed species by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).**
*Complete the appended "take table" (Table 1) for this purpose. Provide a range of potential take numbers to account for alternate or "worst case" scenarios.*

**- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.**

(*e.g. "The number of days that westslope cutthroat trout are trapped in Lake Creek will be reduced if the total mortality of handled fish is projected inseason to exceed the 1988-99 maximum observed level."*)

The Biological Assessment (BA) on file with the USFWS includes all proposed actions to be completed by the Coeur d'Alene Tribe Fisheries Program within Coeur d'Alene Lake and selected tributaries. These activities have the potential to directly, indirectly, or cumulatively effect bull trout (*Salvelinus confluentus*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*) bald eagle (*Haliaeetus leucocephalus*), canadian lynx (*Lynx canadensis*), ute ladies'-tresses (*Spiranthes diluvialis*), spalding's silene (*Silene spaldingii*) and water howellia (*Howellia aquatilis*). Project activities are directed at supplementation of westslope cutthroat trout into local reservation streams and restoration of degraded habitats. These actions include the construction of a hatchery, four acclimation ponds, four put and take trout fishing ponds. As well as implementation of restoration projects that involve wetland construction, riparian and upland restoration, stream channel stabilization and instream habitat improvement. As a result of these actions, depleted native cutthroat trout populations will be supplemented with hatchery raised cutthroat trout taken from the selected tributaries. Restored sites will provide increased availability of suitable habitats for wild and hatchery reared fish. Acclimation ponds along the selected tributaries will be used prior to release of cutthroat trout into tributaries. The put and take trout fishing ponds are to ease fishing pressure on native salmonid stocks and will be stocked with rainbow trout (*Oncorhynchus mykiss*). This BA is completed in order to meet regulations associated with section7(a)2 and 10 of the Endangered Species Act. The information presented within this document represents the best available data and integrates this data with professional judgement. The USFWS concluded that no biological opinion was necessary for all fisheries activities conducted by the Coeur d'Alene Tribe. They also have issued a section 10 incidental take permit for Coeur d'Alene Tribe fisheries program activities.

## SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

*This section describes how "Performance Indicators" listed in Section 1.10 will be monitored. Results of "Performance Indicator" monitoring will be evaluated annually and used to adaptively manage the hatchery program, as needed, to meet "Performance Standards".*

### 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.

Catch-out trout ponds performances conduct via creel census and beach seining to determine catch rates and plant to creel ratios.

Hatchery westslope cutthroat distributions monitored via migration traps (down and up stream migrations), snorkeling and electro-fishing residence populations, radio tagging returning spawners, redd counts and creel census of reservation tributaries. Data collected analyzed and appropriated changes to production goal(s) modified/altered to meet performance goals.

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

**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.**

## SECTION 12. RESEARCH

*Provide the following information for any research programs conducted in direct association with the hatchery program described in this HGMP. Provide sufficient detail to allow for the independent assessment of the effects of the research program on listed fish. Attach a copy of any formal research proposal addressing activities covered in this section. Include estimated take levels for the research program with take levels provided for the associated hatchery program in Table 1.*

**12.1) Objective or purpose.**

*Indicate why the research is needed, its benefit or effect on listed natural fish populations, and broad significance of the proposed project.*

The program goal is to rear and release westslope cutthroat trout into rivers and streams with the express purpose of increasing the numbers of native westslope cutthroat trout spawning, incubating and rearing in the natural environment.

**12.2) Cooperating and funding agencies**.

Bonneville Power Administration

**12.3) Principle investigator or project supervisor and staff.**

Ronald L. Peters

Jeffery J. Jordan

One full-time and one half-time additional personnel to be named at later date.

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

Same as section 2

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

Westslope cutthroat trout distributions monitored via migration traps (down and up stream migrations), snorkeling and electro-fishing resident/rearing populations, radio tagging returning spawners, redd counts and creel census of reservation tributaries. Fish (adult spawners) fitted with radio tracking tags, anesthetized with a solution of benzocaine and Ethyl alcohol 3 (200%). Westslope cutthroat trout trapped/shocked, sampled for length, weight and age (scale taken for future age analysis). Electro-fishers utilizing pulse direct current.

**12.6) Dates or time period in which research activity occurs.**
Migration trap placement occurs in early spring (depending on runoff) and emigration trap placement occurring before the end of the migrating westslope cutthroat trout in June. Spawners will be fitted with radio tags prior to release from migration traps. Resident /rearing populations will be identified in the summer months (snorkeling and electro-fishing). Redd counts in early spring depending on migration pattern of tributary. Creel surveys are taken throughout the year.

**12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.**
Emigrating juveniles utilized for broodstock, placed in a portable fish tank equipped with aeration and supplemental oxygen and transported to the trout culture facility. New recruits quarantined in isolation tanks, duration, at least six months and a maximum of twelve months.

**12.8) Expected type and effects of take and potential for injury or mortality.**
Westslope cutthroat trout emigrating juveniles taken for broodstock and supplemented as required. Little to no adverse effects expected during takes of broodstock.

**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).**
No take of listed species expected. Full production goals are one thousand westslope cutthroat trout taken from target tributaries (50 - 200 hundred per target tributary), with the total numbers not to exceed two hundred per year, per target tributary (dependent on run size of target tributary).

**12.10) Alternative methods to achieve project objectives.**
If run size is low, no westslope cutthroat trout taken until the following year(s). Utilizing broodstock on hand and amend program goals with broodstock on hand.

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

**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.**
(*e.g., "Listed westslope cutthroat trout sampled for the growth study will be collected in compliance with Federal Guidelines to minimize the risk of injury or immediate mortality.").*
No effect on a listed species is expected

## SECTION 13. ATTACHMENTS AND CITATIONS

*Include all references cited in the HGMP. In particular, indicate hatchery databases used to provide data for each section. Include electronic links to the hatchery databases used (if feasible), or to the staff person responsible for maintaining the hatchery database referenced (indicate email address). Attach or cite (where commonly available) relevant reports that describe the hatchery operation and impacts on the listed species or its critical habitat. Include* *any EISs, EAs, Biological Assessments, benefit/risk assessments, or other analysis or plans that provide pertinent background information to facilitate evaluation of the HGMP*.


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## 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:_____________

Table 1. Estimated listed species take levels by hatchery activity.

| Listed species affected: ________________________ ESU/Population:________________________ Activity:__________________ | | | | |
|---|---|---|---|---|
| Location of hatchery activity:____________________ Dates of activity:__________________ Hatchery program operator:________________ | | | | |
| Type of Take | Annual Take of Listed Fish By Life Stage *(Number of Fish)* | | | |
| | Egg/Fry | Juvenile/Smolt | Adult | Carcass |
| Observe or harass a) | | | | |
| Collect for transport b) | | | | |
| Capture, handle, and release c) | | | | |
| Capture, handle, tag/mark/tissue sample, and release d) | | | | |
| Removal (e.g. broodstock) e) | | | | |
| Intentional lethal take f) | | | | |
| Unintentional lethal take g) | | | | |
| Other Take (specify) h) | | | | |

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.

*Instructions:*
1. *An entry for a fish to be taken should be in the take category that describes the greatest impact.*
2. *Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).*
3. *If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table*

## Attachment 1. Definition of terms referenced in the HGMP template

**Augmentation** - The use of artificial production to increase harvestable numbers of fish in areas where the natural freshwater production capacity is limited, but the capacity of other salmonid habitat areas will support increased production. Also referred to as "fishery enhancement".
**Critical population threshold** - An abundance level for an independent Pacific salmonid population below which: depensatory processes are likely to reduce it below replacement; short-term effects of inbreeding depression or loss of rare alleles cannot be avoided; and productivity variation due to demographic stochasticity becomes a substantial source of risk.
**Direct take** - The intentional take of a listed species. Direct takes may be authorized under the ESA for the purpose of propagation to enhance the species or research.
**Evolutionarily Significant Unit (ESU)** - NMFS definition of a distinct population segment (the smallest biological unit that will be considered to be a species under the Endangered Species Act). A population will be/is considered to be an ESU if 1) it is substantially reproductively isolated from other conspecific population units, and 2) it represents an important component in the evolutionary legacy of the species.
**Harvest project** - Projects designed for the production of fish that are primarily intended to be caught in fisheries.
**Hatchery fish** - A fish that has spent some part of its life-cycle in an artificial environment and whose parents were spawned in an artificial environment.
**Hatchery population** - A population that depends on spawning, incubation, hatching or rearing in a hatchery or other artificial propagation facility.
**Hazard** - Hazards are undesirable events that a hatchery program is attempting to avoid.
**Incidental take** - The unintentional take of a listed species as a result of the conduct of an otherwise lawful activity.
**Integrated harvest program** - 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.
**Integrated recovery program** - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), and fish produced are intended to spawn in the wild or be genetically integrated with the targeted natural population(s). Sometimes referred to as "supplementation".
Isolated harvest program - Project in which artificially propagated fish produced primarily for harvest are not intended to spawn in the wild or be genetically integrated with any specific natural population.
**Isolated recovery program** - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), but the fish produced are not intended to spawn in the wild or be genetically integrated with any specific natural population.
**Mitigation** - The use of artificial propagation to produce fish to replace or compensate for loss of fish or fish production capacity resulting from the permanent blockage or alteration of habitat by human activities.
**Natural fish** - A fish that has spent essentially all of its life-cycle in the wild and whose parents spawned in the wild. Synonymous with natural origin recruit (NOR).
**Natural origin recruit (NOR)** - See natural fish .

**Natural population** - A population that is sustained by natural spawning and rearing in the natural habitat.
**Population** - A group of historically interbreeding salmonids of the same species of hatchery, natural, or unknown parentage that have developed a unique gene pool, that breed in approximately the same place and time, and whose progeny tend to return and breed in approximately the same place and time. They often, but not always, can be separated from another population by genotypic or demographic characteristics. This term is synonymous with stock.
**Preservation (Conservation)** - The use of artificial propagation to conserve genetic resources of a fish population at extremely low population abundance, and potential for extinction, using methods such as captive propagation and cryopreservation.
**Research** - The study of critical uncertainties regarding the application and effectiveness of artificial propagation for augmentation, mitigation, conservation, and restoration purposes, and identification of how to effectively use artificial propagation to address those purposes.
**Restoration** - The use of artificial propagation to hasten rebuilding or reintroduction of a fish population to harvestable levels in areas where there is low, or no natural production, but potential for increase or reintroduction exists because sufficient habitat for sustainable natural production exists or is being restored.
**Stock** - (see "Population").
**Take** - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.
**Viable population threshold** - An abundance level above which an independent Pacific salmonid population has a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over a 100-year time frame.

## Attachment 2. Age class designations by fish species and size (indicate strain if applicable) released from resident fish hatchery facilities

| **SPECIES/AGE CLASS** | **SIZE CRITERIA** | |
|---|---|---|
| | **Number of fish/pound** | **Grams/fish** |
| Rainbow trout/fry | swimup to 100a<br>90c | up to 4.5a<br>5c |
| Rainbow trout/fingerling | 100 to 7a<br>5c<br>40 to 20d | 4.5 to 65a<br>90 c<br>11.4 to 22.4d |
| Rainbow trout/catchable | > 7a<br>5c<br>2.5e | > 65a<br>90c |

Strains cultured at ID facilitiesa: Kamloop, Hayspur, Arlee, Troutlodge Inc., Mt. Lassen
Strains cultured at Spokane Tribal and Sherman Creek facilitiese: Cape Cod

| **SPECIES/AGE CLASS** | **SIZE CRITERIA** | |
|---|---|---|
| | **Number of fish/pound** | **Grams/fish** |
| Kokanee/fry | swimup to 100a | up to 4.5a |

| | | |
|---|---|---|
| Kokanee/fingerling | 100 to 7a | 4.5 to 65a |
| Kokanee/catchable | ≥ 15e | |
| Westslope cutthroat trout/fry | swimup to 100a | up to 4.5a |
| Westslope cutthroat trout/fingerling | 100 to 7a<br>135 to 65d | 4.5 to 65a<br>3.3 to 6.9d |
| Westslope cutthroat trout/catchable | > 7a | > 65a |
| Brook trout/fry | 90c | 5c |
| Brook trout/fingerling | 30c | 15c |
| Largemouth bass/fingerling | 400g | .88g |
| Lahontan cutthroat trout/fry | swimup to 100a | up to 4.5a |
| Lahontan cutthroat trout/fingerling | 100 to 7a<br>30c | 4.5 to 65a<br>15c |
| White sturgeon | 15-24 months of age, 1,000 fish/family<br>4-9 families/yearb | |
| Tiger musky/fingerling | 7 to 4a | 65 to 113a |
| Walleye/fry | 7,000a | .0062a |

**a** Idaho Department of Fish and Game
**b** U.S. Fish and Wildlife Service. 1999. Recovery plan for the Kootenai River population of the White Sturgeon. Region 1, Portland, OR
**c** Colville Confederated Tribes
**d** U.S. Fish and Wildlife Service, Creston National Fish Hatchery
**e** Spokane Tribe of Indians and Washington Department of Fish and Wildlife
**g** Kalispel Tribe

## Attachment 3. U.S. Fish and Wildlife Service Ecological Services Field Offices - Columbia River Basin

Snake River Basin Field Office
1387 S. Vinnell Way
Room 368
Boise, ID 83709
Phone: (208) 378-5243
Fax: (208) 378-5262

Upper Columbia River Field Office
11103 E. Montgomery Drive
Spokane, WA 99206
Phone: (509) 891-6839
Fax: (509) 891-6748

Oregon Fish and Wildlife Office
2600 S.E. 98th Avenue
Suite 100
Portland, OR 97266

Phone: (503) 231-6179
Fax: (503) 231-6195

Western Washington Fish and Wildlife Office
510 Desmond Drive, SE
Suite 102
Lacey, WA 98503
Phone: (360) 753-9440
Fax: (360) 753-9008

Helena Field Office
100 North Park
Suite 320
Helena, MT 59601
Phone: (406) 449-5225
Fax: (406) 449-5339