HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Rainbow Trout Stocking
Species or Hatchery Stock:	Rainbow Trout *Oncorhynchus mykiss.*
Agency/Operator:	Idaho Department of Fish and Game
Watershed and Region:	Lower Clearwater and Salmon Rivers, Idaho.
Date Submitted:	September 30, 2002
Date Last Updated:	September 30, 2002

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Hatchery: Washington Department of Fish and Wildlife Lyons Ferry Fish Hatchery.
Program: Rainbow Trout.

1.2) Species and population (or stock) under propagation, and ESA status.

Rainbow Trout *Oncorhynchus mykiss*.
Not ESA-listed.

1.3) Responsible organization and individuals

Lead Contact
Name (and title): Sharon W. Kiefer, Anadromous Fish Manager.
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On-site Operations Lead
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

U.S. Fish and Wildlife Service – Lower Snake River Compensation Plan Office: Administers the Lower Snake River Compensation Plan as authorized by the Water Resources Development Act of 1976.

Washington Department of Fish and Wildlife – Lyons Ferry Fish Hatchery incubates rainbow trout eggs and rears fish through release size.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

U.S. Fish and Wildlife Service – Lower Snake River Compensation Plan funded.
Staffing level: 0.25 FTE
Annual budget: $40,000.

1.5) Location(s) of hatchery and associated facilities.

Lyons Ferry Fish Hatchery – Along the Snake River in Franklin Co. Washington (River mile 58). Post Office Box 278, Starbuck Washington, 99359.

1.6) Type of program.

The LSRCP rainbow trout program is mitigation for the loss of angler days brought about by the fact that the four lower Snake River dams inundated about 140 miles of spawning habitat.

1.7) Purpose (Goal) of program.

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 spring chinook salmon in the White River using the indigenous stock".

Mitigation - The mitigation goal for this program is to produce approximately 50,000 fingerling rainbow trout (approximately 3,333 pounds or 1,512 kg) for planting in the lower 100 miles (161 km) of the Salmon River and the lower 70 miles (113 km) of the Clearwater River in Idaho.

1.8) Justification for the program.

Congress authorized the LSRCP as part of the Water Resources Development Act of 1976 (Public Law 94-587). The LSRCP is funded by the USFWS through a direct funding agreement with the BPA. The IDFG administers and implements the Idaho component of the program.

The rainbow trout program provides recreational harvest fisheries in the lower portions of the Salmon and Clearwater rivers in Idaho. Fish for this program are reared at the Washington Department of Fish and Wildlife's Lyons Ferry Fish Hatchery to release size (approximately 16 fish per pound). The IDFG is responsible for the transportation and release of fish. Measures taken to minimize adverse effects on listed species include

1) Reducing the annual total release of LSRCP fingerling rainbow trout by 12 percent from the 1990 – 1993 average.

2) Moving a portion of the release to the lower Salmon River to contribute to a fishery in the lower Salmon River and to reduce the number of fingerlings released in fall chinook salmon spawning and rearing areas of the lower Clearwater River.

3) Spreading out releases over a number of miles to reduce single site densities of

rainbow trout.

4) Continuing to only stock fingerling rainbow trout from Lyons Ferry Fish Hatchery that have been certified to be free of major bacterial and viral pathogens.

5) Continuing to collect fish from the lower Clearwater and Salmon rivers for growth and diet analysis.

6) Continuing to uniquely mark fingerlings (ventral fin clip) to facilitate identification.

1.9) List of program "Performance Standards".

3.1 Legal Mandates.
3.2 Harvest.
3.3 Conservation of natural spawning populations.
3.4 Life History Characteristics.
3.5 Genetic Characteristics.
3.6 Research Activities.
3.7 Operation of Artificial Production Facilities.

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

Note: Performance Standards and Indicators used to develop Sections 1.10.1 and 1.10.2 were taken from the final January 17, 2001 version of Performance Standards and Indicators for the Use of Artificial Production for Anadromous and Resident Fish Populations in the Pacific Northwest. Numbers referenced below correspond to numbers used in the above document.

3.1.2 Standard: Program contributes to mitigation requirements.

Indicator 1: Number of fish released by program as applicable to mitigation requirements documented.

3.1.3 Standard: Program addresses ESA responsibilities.

Indicator 1: ESA Section 7 Consultation completed. ESA Section 10 permit reapplication submitted September, 1998.

3.2.1 Standard: Fish are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding over harvest of not-target species.

Indicator 1: Fishery sampled annually to determine presence/absence of target species .

3.2.2 Standard: Release groups sufficiently marked in a manner consistent with

information needs and protocols to enable determination of impacts to natural- and hatchery-origin fish in fisheries.

Indicator 1: Marking rate by type in each release group documented. All fish released are uniquely marked (ventral fin clip).
Indicator 2: Sampling rate by mark type for each fishery estimated.
Indicator 3: Number of marks by type observed in fishery documented.

1.10.2) "Performance Indicators" addressing risks.

3.4.4 Standard: Annual release numbers do not exceed estimated basin-wide and local habitat capacity.

Indicator 1: Annual release numbers, life-stage, and size at release documented.
Indicator 2: Location of releases documented.
Indicator 3: Timing of hatchery releases documented.

3.5.1 Standard: Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.

Indicator 1: Genetic profiles of naturally-produced and hatchery-produced adults developed.

3.5.2 Standard: Collection of broodstock does not adversely impact the genetic diversity of the naturally spawning population.

Indicator 1: Broodstock are not collected from natural trout populations.

3.6.2. Standard: The artificial production program is monitored and evaluated on an appropriate schedule and scale to address progress toward achieving the experimental objectives.

Indicator 1: Monitoring and evaluation framework including detailed time line.
Indicator 2: Annual and final reports.

3.7.4 Standard: Releases do not introduce pathogens not already existing in the local populations and do not significantly increase the levels of existing pathogens.

Indicator 1: Certification of juvenile fish health documented prior to release.

3.7.8 Standard: Predation by artificially produced fish on naturally produced fish does not significantly reduce numbers of natural fish.

Indicator 1: Size and time of release of juvenile fish documented.
Indicator 2: Stomach content analysis conducted annually from fish harvested in release sections of both rivers..

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

Not applicable. See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry		
Fingerling	Lower Salmon River Lower Clearwater River	25,000 25,000
Yearling		

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

Not applicable for rainbow trout.

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

Releases of Lyons Ferry Hatchery rainbow trout to the lower Salmon and Clearwater rivers was initiated in 1989.

1.14) Expected duration of program.

This program is expected to continue indefinitely to provide mitigation under the Lower Snake River Compensation Plan.

1.15) Watersheds targeted by program.

Listed by hydrologic unit code –

Salmon River: 1706020303400

Clearwater River 1706030608200

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

The Idaho Department of Fish and Game has not considered alternative actions for obtaining program goals.

SECTION 2. PROGRAM EFFECTS ON NMFS ESA-LISTED SALMONID POPULATIONS. (USFWS ESA-Listed Salmonid Species and Non-Salmonid Species are addressed in Addendum A)

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

Section 7 Consultation with U.S. Fish and Wildlife Service (April 2, 1999) resulting in NMFS Biological Opinion for the Lower Snake River Compensation Program.

Section 10 Permit Number 1188 for IDFG trout stocking (reapplied for 9/98).

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

2.2.1) Description of NMFS ESA-listed salmonid population(s) affected by the program.

Four ESA-listed species: sockeye salmon - *Oncorhynchus nerka*, chinook salmon - *Oncorhynchus tshawytscha*, steelhead trout - *Oncorhynchus mykiss*, and bull trout *Oncorhynchus confluentus* occur or migrate through areas where fingerling rainbow trout are released in conjunction with this program. The IDFG believes that the release of 50,000 fingerling rainbow trout will not jeopardize the existence or recovery of these listed species.

- Identify the NMFS ESA-listed population(s) that will be directly affected by the program

The program is expected to have no direct effect on ESA-listed species.

- Identify the NMFS ESA-listed population(s) that may be incidentally affected by the program.

Snake River Fall-run chinook salmon ESU (T – 4/92)

Snake River Spring/Summer-run chinook salmon ESU (T – 4/92)

Snake River Basin steelhead ESU (T – 8/97)

Bull trout (T – 6/98)

2.2.2) Status of NMFS ESA-listed salmonid population(s) affected by the program.

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

For status reviews of listed Snake River steelhead and spring/summer chinook salmon, readers are referred to IDFG HGMPs prepared for Clearwater River B-run steelhead, Salmon River A-run steelhead, Clearwater River spring chinook salmon, and Salmon River spring and summer chinook salmon.

- 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.

Not applicable for rainbow trout.

- 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.

Not applicable for rainbow trout.

- 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.

Not applicable for rainbow trout.

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of NMFS listed fish in the target area, and provide estimated annual levels of take.

See below.

- Describe hatchery activities that may lead to the take of listed salmonid populations 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.

Annual hook-and-line monitoring is conducted in the lower Clearwater and Salmon rivers to determine the relative contribution of program fish to the creel and to collect stomachs for subsequent diet analysis. Sampling generally occurs during the month of August. Juvenile steelhead could be incidentally collected during this sampling.

- Provide information regarding past takes associated with the hatchery program,

(if known) including numbers taken, and observed injury or mortality levels for listed fish

Past take levels are not available.

- Provide projected annual take levels for listed fish 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).

Projected take estimates are not available. The IDFG believes that the release of 50,000 fingerling rainbow trout will not jeopardize the existence or recovery of listed species.

- 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.

Contingency plans to address situations where take levels are exceeded have not been developed as the IDFG feels that the release of fingerling trout from this program will not jeopardize the existence or recovery of listed species. However, the IDFG recognizes that any contingency plan should include a provision to consult with NMFS Sustainable Fisheries Division or Protected Resource Division staff and agree to an action plan.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

This program conforms with the plans and policies of the Lower Snake River Compensation Program administered by the U.S. Fish and Wildlife Service and conforms to Section 10(a)(1b) permit language for this activity. This program has had ESA authorization since the 1992 chinook salmon listing.

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

Cooperative Agreement between the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game, USFWS Agreement No.: 141102J010 (for Lower Snake River Compensation Plan monitoring and evaluation studies).

Cooperative Agreement between the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game, USFWS Agreement No.: 141102J009 (for Lower Snake River Compensation Plan hatchery operations).

3.3) Relationship to harvest objectives.

This program satisfies mitigation goals as outlined under the LSRCP.

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

Sport fishery information specific to this activity is not available. Annually, the lower Salmon and Clearwater rivers are sampled to determine presence/absence of program fish and to determine the relative proportion of program fish in the sample. Creel information collected during a 1991 survey on the lower Clearwater River indicated that anglers fished an estimated 203.75 hours to catch an estimated 44 rainbow trout for a catch rate of 0.216 fish per hour. Of the 34 rainbow trout kept, nine originated from the fall fingerling plant program.

The number of fish released from this program and subsequently sampled during summer surveys designed to examine presence/absence and to determine the relative proportion of program fish in the sample is presented in the following table.

Release Year	# of Fish Released to Clearwater R.	# of Fish Released to Salmon R.	Sample Year	# of Program Fish Caught in Clearwater R.	# of Program Fish Caught in Salmon R.
1989	28,290	34,890	1991	3	not sampled
1990	36,490	35,033	1992	not sampled	1
1991	48,200	0	1993	not sampled	0
1992	57,280	0	1994	0	not sampled
1993	28,000	29,400	1995	1	not sampled
1994	30,536	30,536	1996	not sampled	4
1995	25,945	25,945	1997	0	0
1996	0	0	1998	0	0
1997	0	0	1999	not sampled	not sampled
1998	23,450	23,450	2000	0	14
1999	27,000	26,990	2001	not sampled	0
2000	25,245	25,245	2002	n/a	n/a

Stomach contents from 23 rainbow trout associated with this program have been examined to date. No fish or bony fish parts have been identified.

3.4) Relationship to habitat protection and recovery strategies.

Hatchery production for harvest mitigation is influenced but not linked to habitat protection strategies in the Salmon and Clearwater subbasins and other areas. The LSRCP rainbow trout program is operated consistent with existing Biological Opinions.

3.5) Ecological interactions. [Please review Addendum A before completing this section. If it is necessary to complete Addendum A, then limit this section to NMFS jurisdictional species. Otherwise complete this section as is.]

Disease Transmission- Fish for this program are produced at Washington Department of Fish and Wildlife's Lyons Ferry Fish Hatchery. Prior to release, fish undergo screening for typical bacterial and viral pathogens. Pathogens can be transmitted from resident to anadromous fish. However, in a review of the literature, Steward and Bjornn (1990) stated that there was little evidence to suggest that horizontal transmission from hatchery smolts to naturally-produced fish is widespread in production areas or in the free-flowing migration corridor. The IDFG does not have information that suggest that horizontal transmission occurs or has an adverse effect on listed species.

Fish for this program are not released if they do not conform with guidelines established by the IDFG and others (e.g., IHOT). The release of fish to Idaho waters (via IDFG transport vehicles) complies with all interstate transport permit requirements established by both states.

Predation- The IDFG has no reason to believe predation of listed, anadromous salmonid fry or fingerlings by hatchery rainbow trout will occur at any appreciable or meaningful level that would jeopardize the existence or recovery potential of listed species. Marrin and Erman (1982) found that stocked rainbow trout do not switch to a fish diet until they reach 30 cm. Ersbak and Haase (1983) suggested that hatchery-reared trout have difficulty switching to alternate food items as they become available. Hatchery rainbow trout have also failed to eat forage fish even when they are present and utilized by other salmonids (Jeppson 1975). Predation on other game fish is not common for hatchery-reared fish in general (Marnell 1986). Viola and Schuck (1991) examined stomachs of hatchery rainbow trout stocked in a chinook salmon rearing stream in Washington. Two unidentified salmonids were found in 15 stomachs collect in August and one in nine stomachs collected in October.

The IDFG has collected stomachs from Spokane-strain rainbow trout stocked to the lower Clearwater and Salmon rivers as part of this program since the inception of stocking in 1990. To date, of the 23 fish stomachs examined, no fish or fish parts have been identified (Barrett, 1991 – 2001). Fish for this program are typically stocked at approximately 13 to 18 cm in size. Fish sampled during subsequent monitoring investigations are typically 35 to 50 cm. Studies conducted by the IDFG in response to chinook and sockeye salmon listings revealed minimal predation on chinook and sockeye fry by hatchery rainbow or steelhead trout in the upper Salmon River (Cannamela 1992,

IDFG 1993b, IDFG1996b) and Stanley Basin Lakes (IDFG 1998); no steelhead fry were retrieved from stomachs of hatchery steelhead smolts sampled from the Salmon River (IDFG 1993b, 1996b) and no sockeye were found in stomachs of rainbow trout sampled from Redfish Lake. Monitoring requirements of ESA Section 10 Permit #1188 (formerly #908) for the upper Salmon River were discontinued because impacts of the resident fish stocking program (on listed chinook salmon) were deemed negligible and not worthy of further evaluation. Although steelhead fry emerge later than chinook fry in the Salmon River, and could be present at the time rainbow trout are stocked, most steelhead production and early rearing occurs in tributaries, while rainbow trout are stocked in the main Salmon River; the situation is similar in the lower Salmon and Clearwater river drainages.

Fall chinook salmon fry generally emerge in the lower Clearwater River in May (IFRO 1993). Juvenile fall chinook salmon rear in shallow areas of the main river and begin their emigration to the ocean in June and July. Few if any fall chinook salmon would remain in the lower Clearwater River into October (when fish from this program are stocked). As such, there is no overlap of fingerling rainbow trout stocked for this program and fall chinook salmon fry at the time of stocking. However, there could be spatial and temporal overlap the following year. There could also be overlap of chinook salmon parr and rainbow trout in the lower Salmon River. However, even with sampling efforts directed at holdover rainbow trout, few are encountered during summer monitoring events (see below). Wiley et al. (1993) suggest high post-stocking mortality for hatchery trout following planting events.

The threat of predation from rainbow trout may have an effect on habitat use and abundance of fall chinook and spring/summer salmon juveniles (Bugert and Bjornn 1991). Emigration to areas less than optimum for growth may occur. Growth depression due to intimidation or displacement may reduce fitness, survival, and ultimately prey stock. However, the IDFG does not believe that this response occurs in the lower Clearwater and Salmon rivers because of the extremely low density of both ESA-listed salmon and hatchery-produced rainbow trout. Likely, differences in habitat selection would further minimize this type of behavioral interaction between rainbow trout and salmon juveniles.

Annually, the IDFG conducts hook-and-line sampling on resident fish populations in the lower Salmon and Clearwater rivers where fish from this program are released. A summary of the number of fish sampled to date by location and year is presented in Section 3.3.1 above. Fish collected during these surveys are sacrificed and stomachs removed for diet analysis. Of the 23 fish sampled to date, not fish parts or whole fish

have been identified in stomachs.

Competition- Competition is most likely to occur between juveniles of the same size in the same immediate location when fish densities are high. The IDFG believes that rearing habitat and food are not limiting factors in the main Salmon and Clearwater river sections where fingerling rainbow trout are released in conjunction with this program. Densities of stocked rainbow trout and ESA-listed, anadromous salmonids are typically low in main river sections relative to the amount of available habitat. However, at the time of planting, limited dispersal of hatchery rainbow trout could result in temporarily high densities. The IDFG does not have specific information on habitat utilization by hatchery-produced rainbow trout in the lower Salmon and Clearwater rivers. Arnsberg et al. (1992) described the preferred habitat of chinook salmon fry in the Clearwater River as having depths ranging from 12 to 60 cm, water velocity of < 1.0 cm/s, and a substrate consisting of small cobble and smaller sediment size classes. The IDFG believes that rainbow trout would require habitat with substantially higher water velocity.

Competition between stocked rainbow trout and ESA-listed salmonid smolts is unlikely because the majority of migratory salmon and steelhead have migrated out of the system prior to the fall when rainbow trout associated with this program are stocked.

SECTION 4. WATER SOURCE

4.1) 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.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

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

Rainbow trout for this program are transferred from the Lyons Ferry Fish Hatchery to lower Salmon and Clearwater river plant sites in IDFG transport vehicles operated by

IDFG drivers. Trucks are typically equipped with 2,300 to 2,500 gallon transport tanks. All vehicles are equipped with oxygen systems and fresh flow agitators.

5.3) Broodstock holding and spawning facilities.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

5.4) Incubation facilities.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

5.5) Rearing facilities.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

5.6) Acclimation/release facilities.

Fingerling rainbow trout are released directly into the Salmon and Clearwater rivers. If water temperature tempering is required, it is carried out on the transport vehicle prior to releasing fish.

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

No significant mortality associated with this program has occurred.

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

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Spokane rainbow trout stock – not ESA-listed.

6.2) Supporting information.

6.2.1) History.

The Spokane Rainbow Stock steelhead was originally started by receiving eggs from Cape Cod Hatchery in Massachusetts. The Cape Cod Stock was itself originally derived from the McCloud River in northern California in the late 1800's. Genetic characterization has verified that the Spokane Stock is similar or identical to West Coast rainbow populations of current day.

6.2.2) Annual size.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

6.2.3) Past and proposed level of natural fish in broodstock.

Not applicable.

6.2.4) Genetic or ecological differences.

Not applicable.

6.2.5) Reasons for choosing.

The Spokane Stock rainbow trout have been successfully reared for many generations at WDFW facilities. The Stock performance indicates that it is highly successful in producing harvestable fish for the program.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

Not applicable.

SECTION 7. BROODSTOCK COLLECTION

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

Not applicable.

7.2) Collection or sampling design.

Not applicable.

7.3) Identity.

Not applicable.

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

Not applicable.

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

Not applicable.

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

Not applicable.

7.6) Fish transportation and holding methods.

Not applicable.

7.7) Describe fish health maintenance and sanitation procedures applied.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

7.8) Disposition of carcasses.

Not applicable.

7.9) 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 broodstock collection program.

Not applicable.

SECTION 8. MATING

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

See the Washington Department of Fish and Wildlife's Spokane Hatchery HGMP for Section 8 (Mating) information.

8.1) Selection method.

8.2) Males.

8.3) Fertilization.

8.4) Cryopreserved gametes.

8.5) 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.

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. "egg to smolt survival") that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife for information related to Section 9. Incubation and Rearing.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

9.1.2) Cause for, and disposition of surplus egg takes.

9.1.3) Loading densities applied during incubation.

9.1.4) Incubation conditions.

9.1.5) Ponding.

9.1.6) Fish health maintenance and monitoring.

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

9.2) Rearing:

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

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

9.2.3) Fish rearing conditions

9.2.4) Indicate biweekly or monthly fish growth information (*average program*

***performance*), including length, weight, and condition factor data collected during rearing, if available.**

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

9.2.6) 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*).

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

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

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

SECTION 10. RELEASE

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

10.1) Proposed fish release levels.

The following release levels are proposed for release year 2003.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling	25,000 25,000	30 30	October October	Salmon River Clearwater River
Yearling				

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

Stream, river, or watercourse:

Release point: (*river kilometer location, or latitude/longitude*)
Major watershed: (e.g. "Skagit River")
Basin or Region: *(e.g. "Puget Sound")*

Stream: Salmon River
Release Point (EPA Number): 1706020303400
Major Watershed: Salmon River
Basin or Region: Snake River

Stream: Clearwater River
Release Point (EPA Number): 1706030608200
Major Watershed: Clearwater River
Basin or Region: Snake River

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

Salmon River planting history.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1989					34,890	n/a		
1990					35,033	17.8		
1991					0			
1992					0			
1993					29,400	10.5		
1994					30,536	19.6		
1995					25,945	14.7		
1996					0			
1997					0			
1998					23,450	13.4		
1999					26,990	10.0		
2000					25,245	18.7		
Average					19,290	14.9		

Clearwater River planting history.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1989					28,290	n/a		

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1990					36,490	n/a		
1991					48,200	16.6		
1992					57,280	15.3		
1993					28,000	10.5		
1994					30,536	19.6		
1995					25,945	14.7		
1996					0			
1997					0			
1998					23,450	13.4		
1999					27,000	10.0		
2000					25,245	18.7		
Average					27,536	14.9		

10.4) Actual dates of release and description of release protocols.

Release data information is presented for the most recent three-year period in the following table.

Release Year	Receiving Water	Release Dates
1998	Salmon River	10/8/98
1998	Clearwater	10/7/98
1999	Salmon River	10/7/99
1999	Clearwater	10/6/99
2000	Salmon River	10/3/00
2000	Clearwater	10/3/00

10.5) Fish transportation procedures, if applicable.

Fish are loaded into transport trucks using dip nets or hydraulic pumps. The loading density guideline for transport vehicles is ½ pound per gallon of water. The transport tanks are insulated to maintain good temperature control. Each tank is fitted with an oxygen system and fresh flow agitators.

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

Fingerling rainbow trout are released directly to the river. Transport vehicles have the ability to temper transport tank water temperature if conditions warrant it.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

Fingerling rainbow trout released for this program receive a ventral fin clip.

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

Not applicable.

10.9) Fish health certification procedures applied pre-release.

Washington Department of Fish and Wildlife fish health professionals provide the IDFG with the results of a pre-release sample taken for common bacterial and viral pathogens.

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

See the rainbow trout (Lyons Ferry Complex) HGMP prepared by the Washington Department of Fish and Wildlife.

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

Actions taken to minimize adverse effects on listed fish include:

1) Reducing the annual total release of LSRCP fingerling rainbow trout by 12 percent from the 1990 – 1993 average.

2) Moving a portion of the release to the lower Salmon River to contribute to a fishery in the lower Salmon River and to reduce the number of fingerlings released in fall chinook salmon spawning and rearing areas of the lower Clearwater River.

3) Spreading out releases over a number of miles to reduce single site densities of rainbow trout.

4) Continuing to only stock fingerling rainbow trout from Lyons Ferry Fish Hatchery that have been certified to be free of major bacterial and viral pathogens.

5) Continuing to collect fish from the lower Clearwater and Salmon rivers for growth and diet analysis.

6) Continuing to uniquely mark fingerlings (ventral fin clip) to facilitate identification.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

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

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

Document the number, size at release, and marks applied for fish released annually into receiving waters.

Performance Standards and Indicators: 3.1.2, 3.1.3, 3.2.1, 3.2.2.

Monitor population through hook-and-line sampling to determine presence/absence and proportion in sample. Conduct stomach content analysis on all program fish collected during sampling to determine presence/absence of fish and fish parts. Continuously monitor fish health information supplied by rearing hatchery.

Performance Standards and Indicators: 3.4.4, 3.5.1, 3.5.2, 3.6.2, 3.7.4, 3.7.8.

Identify factors that are potentially limiting program success and recommend operational modifications, based on the outcome applied studies, to improve overall performance and success.

No factors identified.

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

Yes, funding, staffing and support logistics are dedicated to the existing monitoring and evaluation program through the LSRCP program.

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

Monitoring and evaluation activities are restricted to summer hook-and-line sampling of fish in release sections of the Salmon and Clearwater rivers. All program fish are uniquely marked (ventral fin clip) to facilitate identification. Unmarked, wild/natural salmonids collected during sampling are released unharmed.

SECTION 12. RESEARCH

12.1) Objective or purpose.

The ongoing LSRCP program research is designed to:

1) Determine presence/absence of program fish collected during summer sampling events. Compare and contrast annual information.

2) Determine the proportion of program fish collected during summer sampling events. Compare and contrast annual information.

3) Conduct diet analysis to determine whether program fish are preying on other fish species. Determine, using key bone structures, whether salmonid bony material is present in stomach samples.

12.2) Cooperating and funding agencies.

U.S. Fish and Wildlife Service – Lower Snake River Compensation Plan Office.

12.3) Principle investigator or project supervisor and staff.

Chip Corsi – Resident Fisheries Manager, Idaho Department of Fish and Game.

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

Not applicable.

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

Currently, only hook-and-line sampling is used to collect salmonids in the lower Salmon and Clearwater rivers. If wild/natural fish are collected, they are released unharmed. All hatchery-origin fish collected for subsequent stomach content analysis are sacrificed.

12.6) Dates or time period in which research activity occurs.

Hook-and-line sampling is typically conducted on the Salmon and Clearwater rivers over a one-week period in August.

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

Not applicable.

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

Direct and/or delayed mortality from catching and releasing wild/natural salmonids (primarily steelhead) is possible though unlikely.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by

sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).

See Table 1.

12.10) Alternative methods to achieve project objectives.

Research methods have been modified to emphasize the use of hook-and-line sampling equipment instead of electrofishing equipment. Other alternative methods to achieve research objectives have not been explored.

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

Not applicable.

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

See Section 11.2 above.

SECTION 13. ATTACHMENTS AND CITATIONS

Literature Cited:

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Viola, A.E., and M.L. Schuck. 1991. Estimates of residualism of hatchery reared summer steelhead and catchable-size rainbow trout Oncorhynchus mykiss in the Tucannon river and North Fork Asotin Creek in Southeast Washington, 1991. Washington Department of Wildlife. Olympia, WA.

Wiley, R.W., R.A. Whaley, J.B. Satake and M. Fowden. 1993. An evaluation of the potential for training trout in hatcheries increase poststocking survival in streams. No. Am. J. Fish. Mgmt. 13:171-177.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the information provided 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 salmonid take levels of by hatchery activity.

Listed species affected: _Steelhead_____ 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)		100		
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.

SECTION 15. PROGRAM EFFECTS ON OTHER (NON-ANADROMOUS SALMONID) ESA-LISTED POPULATIONS. Species List Attached (Anadromous salmonid effects are addressed in Section 2)

15.1) List all ESA permits or authorizations for all non-anadromous salmonid programs associated with the hatchery program.

Section 10 permits, 4(d) rules, etc. for other programs associated with hatchery program.
Section 7 biological opinions for other programs associated with hatchery program.

ESA Section 6 Cooperative Agreement for take bull trout associated with IDFG research activities.

ESA Section 7 Consultation and Biological Opinion through the U.S. Fish and Wildlife Service Lower Snake Compensation Program for take of bull trout associated with hatchery operations.

15.2) Description of non-anadromous salmonid species and habitat that may be affected by hatchery program.

General species description and habitat requirements (citations).
Local population status and habitat use (citations).
Site-specific inventories, surveys, etc. (citations).

The following passages are from the draft, 2001 Salmon Subbasin Summary (NPPC 2001).

Westslope cutthroat trout *Oncorhynchus clarki lewisi*:

The native westslope cutthroat subspecies occurs in watersheds throughout the Salmon Subbasin. Although the subspecies is still widely distributed and is estimated to occur in 85% of their historical range Rieman and Apperson (1989) contend viable populations exist in only 36% of their historic range. Most strong populations are associated with roadless and wilderness areas. Westslope cutthroat trout are currently listed as federal and state (Idaho) species of concern and sensitive species by the USFS and BLM, and were proposed for listing under the Endangered Species Act (ESA). On April 5, 2000, the United States Fish and Wildlife Service announced their 12-month finding regarding the petition it had received to list the westslope cutthroat trout as threatened throughout its range under ESA. The Service concluded after review of all available scientific and commercial information, that the listing of westslope cutthroat trout was not warranted.

Current distribution and abundance of westslope cutthroat trout are restricted compared to historical conditions (Liknes and Graham 1988, Rieman and Apperson

1989,
Behnke 1992). In Idaho, populations considered strong remain in 11% of historical range
and it has been suggested that genetically pure populations inhabit only 4% of this range
(Rieman and Apperson 1989), although genetic inventories that would support such a low
figure have not been conducted. Many populations have been isolated due to habitat fragmentation from barriers such as dams, diversions, roads, and culverts. Fragmentation
and isolation can lead to loss of persistence of some populations (Rieman and McIntyre 1993). Because of the high risk of these populations to chance events, conservation of the subspecies will likely require the maintenance and restoration of well-distributed, connected habitats. For the last several decades, IDFG has been stocking predominantly westslope cutthroat in their mountain lake program in lieu of non-native trout species. Because many of these lakes did not have trout present naturally, stocking may have resulted in a local range expansion, and possible compromising of genetic purity where subspecies other than westslope were placed. The current state fish management plan (IDFG 2001) notes that sterile fish will be stocked to eliminate potential interbreeding with native fish.

A high proportion of high lakes have received sterile trout in the past year. Westslope cutthroat trout in the Salmon Subbasin have been documented to exhibit fluvial and resident life histories (Bjornn and Mallet 1964, Bjornn, 1971 cited in Behnke
1992), and adfluvial behavior is suspected. Age at maturity ranges from 3-5 years (Simpson and Wallace, 1982). Westslope cutthroat trout are spring tributary spawners with spawning commencing in April and May depending on stream temperatures and elevation. Adult fluvial fish ascend into tributaries in the spring and typically return to mainstem rivers soon after spawning is complete (Behnke, 1992)
Overfishing has been identified by several researchers as a factor in the decline (Behnke 1992) of westslope cutthroat. This subspecies is extremely susceptible to angling pressure. Rieman and Apperson (1989) documented a depensatory effect in fishing (mortality increases as population size decreases) and speculated that uncontrolled harvest could lead to elimination of some populations. However, cutthroat populations have been protected via catch-and-release regulations in large portions of the Salmon Subbasin since the 1970s and no harvest of cutthroat has been permitted in mainstem rivers since 1996. Rieman and Apperson (1989) reported 400 to 1300% increases in westslope cutthroat populations following implementation of special fishing regulations.

Habitat loss and degradation are other important factors in the decline of westslope cutthroat. In an Idaho study, among depressed populations of cutthroat, habitat loss was the main cause of decline in 87% of the stream reaches evaluated based on a qualitative study of biologists' best judgements (Rieman and Apperson 1989). Land

management practices have contributed to disturbance of stream banks and riparian areas as well vegetation loss in upland areas which result in altered stream flows, increased erosion and sediment, and increased temperature.

Brook trout, and introduced rainbow trout, in combination with changes in water quality and quantity appear to have been deleterious to westslope cutthroat. Brook trout are thought to have replaced westslope cutthroat in some headwater streams (Behnke 1992). The mechanism is not known, but it is thought that brook trout may displace westslope cutthroat or take over when cutthroat have declined from some other cause. In drainages occupied by both westslope cutthroat and nonnative rainbow, segregation may occur with cutthroat confined to the upper reaches of the drainage.
Segregation does not always occur however and hybridization has been documented (Rieman and Apperson 1989).

Bull trout *Salveninus confluentus*:

All bull trout populations in the Salmon Subbasin were listed as Threatened under the
Endangered Species Act in 1998 (63 FR 31647), and are defined as one recovery unit of
the Columbia River distinct population segment. A recovery plan is under development by the USFWS, assisted by an interagency team (Lohr et al. 2000).

Historical abundance and distribution information throughout most of the subbasin is largely anecdotal. The best long-term population trend data exist for Rapid River, tributary to the Little Salmon River. Additional trend data for large fluvial bull trout are
available from the East Fork Salmon Chinook weir (Lamansky et al. 2001) Schill (1992) reported a declining bull trout density trend in 112 sites snorkeled within the Salmon River Subbasin from 1985 to 1990. However, a longer-term summary of those sites sampled for a longer time period indicated the opposite trend (D. Schill, IDFG, personal communication).

General life history and status information can be found in the Final Rule of the Federal Register and in the State of Idaho Bull Trout Conservation Plan (1996). A thorough discussion of habitat requirements and conservation issues is presented by Rieman and McIntyre (1993); and in respective Problem Assessments referred to for
specific fourth-code hydrologic units (major watersheds).

Rieman et al. (1997) used a basin-wide ecological assessment (Quigley and Arbelbide 1997) and current status knowledge regarding bull trout populations to predict distribution, strength, and future trends of populations in unsurveyed sub-watersheds. Bull trout display wide, yet patchy distribution throughout their range. Within the entire

Columbia Basin, the Central Idaho Mountains (more than half of which falls within the Salmon Subbasin) support the most secure populations of bull trout. Sport harvest of bull trout in the Salmon Subbasin has been prohibited since 1994.

In an effort to better understand the population structure of bull trout within the Salmon Subbasin, tissue samples are being taken for later genetic analysis whenever bull trout are captured by researchers operating adult or juvenile traps targeted on anadromous salmonids.

<u>Upper Salmon River</u>. Upstream migrating bull trout have been monitored in the mainstem Salmon River within this hydrologic unit since 1986, incidental to chinook salmon trapping operations (Lamansky et al. 2001). Numbers of bull trout intercepted annually have ranged from four to 38, with no evident trends. Bull trout have been documented in 54 streams within this unit (T. Curet, IDFG, pers comm.), including the mainstem and multiple tributaries of the East Fork Salmon River (BLM 1998). Upstream migrating bull trout have been partially monitored in the East Fork since 1984, incidental to chinook salmon trapping operations (Lamansky et al. 2001). Number of bull trout intercepted annually in the East Fork have ranged from 2 to 175, with no evident trends.

<u>Pahsimeroi River</u>. Bull trout are present in the Pahsimeroi River from the mouth to above Big Creek and in Little Morgan, Tater, Morse, Falls, Patterson, Big, Ditch, Goldburg, Big Gulch, Burnt, Inyo, and Mahogany creeks (T. Curet, IDFG, pers comm.).

Lemhi River. Bull trout are present in Big Eightmile, Big Timber, Eighteen Mile, Geertson, Hauley, Hayden, Kenney, Bohannon, Kirtley, Little Eightmile, Mill, Pattee, and Texas creeks, their tributaries, and in the Lemhi River. Hybridization with brook trout may occur in some tributary streams.

<u>Middle Salmon River – Panther Creek</u>. Bull trout are known present in 47 streams within this hydrologic unit (T. Curet, IDFG, pers comm.). These streams include Allison, Poison, McKim, Cow, Iron, Twelvemile, Lake, Williams, Carmen, Freeman, Moose Sheep, Twin Boulder, East Boulder, Pine, Spring, Indian, Corral, McConn, Squaw, Owl, multiple streams in the Panther Creek system, and the main Salmon and N.Fk. Salmon rivers.

<u>Middle Fork Salmon River</u>. Bull trout appear well distributed and abundant in all six identified key watersheds of the Middle Fork Salmon River (Middle Fork Salmon River Technical Advisory Team 1998). Key watersheds are: upper and lower Middle Fork Salmon River, Wilson / Camas creeks, Big, Marble, and Loon creeks. Bull trout and brook trout are known to be sympatric only in the headwaters of Big Creek. Bull

trout in the Middle Fork Salmon have been excluded from harvest for over three decades and this drainage is believed to contain one of the strongest bull trout populations in the Pacific Northwest (D Schill, IDFG, personal communication).

<u>Middle Salmon-Chamberlain Creek</u>. Spawning bull trout populations exist in the Chamberlain, Sabe, Bargamin, Warren, and Fall Creek watersheds. Spawning and early rearing is suspected to occur in the Crooked Creek, Sheep Creek, and Wind River watersheds (Clearwater Basin Bull Trout Technical Advisory Team 1998). South Fork Salmon (SFS). The East Fork of the South Fork Salmon River and the Secesh River support the strongest fluvial populations of bull trout in the South Fork watershed (IDFG GPM database). More recent research has documented specific distribution, seasonal migration, and spawn timing and locations of bull trout throughout the lower South Fork and East Fork of the South Fork Salmon River (Hogan 2001, in progress). From 1996 to 2000, bull trout captured incidental to salmon smolt trapping were tagged with PIT tags to gain life history information (K. Apperson, personal communication). Adams (1999) reported occasional sightings of brook trout x bull trout hybrids in tributaries.

<u>Lower Salmon River</u>. Slate, John Day, and Partridge creeks have been identified as key bull trout watersheds for spawning and rearing (Clearwater Basin Bull Trout Technical Advisory Team 1998). Race, Lake, and French creeks support limited bull trout spawning and rearing in their lower reaches. The mainstem Salmon River within this area provides for migration, adult and sub-adult foraging, rearing, and winter habitat. Rapid River and Boulder Creek have been identified as key bull trout watersheds (Clearwater Basin Bull Trout Technical Advisory Team 1998). Upstream migration of bull trout has been monitored in Rapid River since 1973 (Lamansky et al. 2001). Annual runs have ranged from 91 to 461 adult fluvial bull trout, with no evident trends. Radio telemetry studies on potential spawners initiated in 1992 documented timing of spawning migrations, spawning locations, spawning fidelity, spawning mortality, and range of wintering habitat (Schill et al. 1994; Elle and Thurow 1994; Elle 1998). The USFS is continuing to study use of headwater habitats for spawning and rearing (R. Thurow, personal communication). Age information has also been collected and analyzed by Elle (1998). Bull trout and brook trout are sympatric in some headwater reaches of Rapid River and Boulder Creek.

Redband trout *Oncorhynchus mykiss:*

The great majority of steelhead originally ascending the Columbia River are

believed to be descendants of redband trout (Behnke 1992). Redband trout are native to the Salmon Subbasin and continue to be widely distributed across their historical range within the subbasin. However, their population status and genetic connectivity are not well understood across large areas. It could be theorized the current distribution of wild redband trout is related to the historic distribution of summer steelhead. However, in the Middle Salmon-Chamberlain (MSC) and Lower Salmon (LOS) hydrologic units, suspected redband trout have been found above natural barriers in tributaries whose lower reaches are utilized by steelhead. Five populations of redband/rainbow trout have been genetically characterized in the MSC (Bargamin, Sheep, Chamberlain and Fivemile creeks) and LOS (Fish Creek, tributary to Whitebird Creek) hydrologic units. The Fivemile population was genetically distinct from all other rainbow (anadromous and non-anadromous) populations in the upper Columbia River drainage (Reingold 1985). The Fish Creek population was determined to be redband trout with the lowest amount of genetic variation of the five populations. All populations are genetically different among themselves (Letter from Robb Leary to Wayne Paradis, November 1, 2000). Unique populations may also be present in Rice, Little Slate, and French creeks in the Lower Salmon watershed.

To protect resident redband and steelhead trout within the upper portions of the Salmon Subbasin, hatchery catchable rainbow trout are released in only the mainstem Salmon River. Released fish are marked with an adipose fin clip so harvest is targeted only on hatchery stocks. In other areas of the subbasin, catchable hatchery trout are stocked only in areas where there is minimal or no risk to native fish. The Idaho Department of Fish and Game has adopted a policy where sterile resident salmonids will be stocked in waters accessible to wild/native salmonids unless there is a need to supplement the wild populations (IDFG 2001). All wild fish harvest is prohibited in all mainstem rivers in the upper portions of the drainage (MF to headwaters). No differentiation of resident redband trout from juvenile steelhead has been attempted in the Salmon Subbasin. Consequently, the distribution of the former remains poorly understood.

15.3) <u>Analysis of effects.</u>

Identify potential direct, indirect, and cumulative effects of hatchery program on species and habitat (immediate and future effects).
Identify potential level of take (past and projected future).

<u>Hatchery operations</u> – The Washington Department of Fish and Wildlife is responsible for hatchery operations associated with this program. Readers are referred to HGMPs produced for their Lyons Ferry Complex and Spokane Hatchery facilities.

Fish health - pathogen transmission, therapeutics, chemicals.

The Washington Department of Fish and Wildlife is responsible for fish health monitoring and management activities associated with this program. Readers are referred to HGMPs produced for their Lyons Ferry Complex and Spokane Hatchery facilities.

Ecological/biological - competition, behavioral, etc.

Rainbow trout fingerlings released in the lower Salmon and Clearwater rivers could compete with non-anadromous salmonids for space and food and possibly modify the behavior of non-salmonids present in the system.

Predation –

Rainbow trout fingerlings released in the lower Salmon and Clearwater rivers could pose a predation risk to native non-anadromous salmonids. However, the incidence of this is suspected to be minor.

Monitoring and evaluations - surveys (trap, seine, electrofish, snorkel, spawning, carcass, boat, etc.).

Currently, only hook-and-line sampling is used to monitor post-release program fish in the lower Salmon and Clearwater rivers. If wild/natural fish are collected, they are released unharmed. All hatchery-origin fish collected for subsequent stomach content analysis are sacrificed.

Habitat - modifications, impacts, quality, blockage, de-watering, etc.

No adverse affects to habitat are anticipated.

15.4 Actions taken to mitigate for potential effects.

Identify actions taken to mitigate for potential effects to listed species and their habitat.

Actions taken to minimize adverse effects on listed fish include:

1) Reducing the annual total release of LSRCP fingerling rainbow trout by 12 percent from the 1990 – 1993 average.

2) Moving a portion of the release to the lower Salmon River to contribute to a fishery in the lower Salmon River and to reduce the number of fingerlings released in fall chinook salmon spawning and rearing areas of the lower Clearwater River.

3) Spreading out releases over a number of miles to reduce single site densities of rainbow trout.

4) Continuing to only stock fingerling rainbow trout from Lyons Ferry Fish Hatchery that have been certified to be free of major bacterial and viral pathogens.

5) Continuing to collect fish from the lower Clearwater and Salmon rivers for growth and diet analysis.

6) Continuing to uniquely mark fingerlings (ventral fin clip) to facilitate identification.

15.5 References

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