HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Toutle River Summer Steelhead Program
Species or Hatchery Stock:	Steelhead (*Onchorynchus mykiss*) Skamania
Agency/Operator:	Washington Department of Fish and Wildlife
Watershed and Region:	Toutle River (trib to Cowlitz River) Lower Columbia River
Date Submitted:	July 18, 2001
Date Last Updated:	July 13, 2001

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Toutle River Summer Steelhead Program

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

Skamania Summer Steelhead (*Onchorynchus mykiss*)

1.3) Responsible organization and individuals

Name (and title):	Chuck Johnson, Region 5 Operations Manager Don Peterson, Complex Manager	
Agency or Tribe:	Washington Department of Fish and Wildlife	
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

National Marine Fisheries Service (funding source); Wolf Dammers and Dan Nemi (WDFW), adult handling from Sediment Retention Structure (SRS) and fish collection facility; Cowlitz Game & Anglers Cooperative (Dick Miller) at South Fork Toutle release site.

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

Funding source: National Marine Fisheries Service (annual operating costs: $275,000).

Staffing Level: 4 permanant staff, 3 man months of Scientific Technician time.

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

North Toutle Hatchery:	Located on the Green River (26.0323), a tributary to the Toutle River (26.0227), at RM 0.5. The Toutle River is a tributary to the Cowlitz River (26.0002).
Skamania Hatchery:	Located on the North Fork Washougal River (28.0232) at RM ~0.5.

Cowlitz Game & Anglers:	South Fork Toutle River (26.0248) rearing/release site at RM 10.

1.6) Type of program.

Isolated harvest

1.7) Purpose (Goal) of program.

Augmentation & Mitigation

To provide 50,000 summer run steelhead smolts for harvest as adults. A program (Mitchel Act) to mitigate for fishery losses caused by hydroelectric system development (IHOT).

1.8) Justification for the program.

This program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished in the following manner:

1. Hatchery fish will be released as smolts at a time and size to minimize or eliminate adverse interactions with listed fish.

2. Hatchery fish will be externally marked to distinguish them from wild fish.

3. Fish will be acclimated before release when possible.

4. Hatchery fish will be propagated using appropriate fish culture methods and consistent with the Co-Managers' Disease Policy, spawning and genetic guidelines and state and federal water quality standards.

5. These hatchery fish will be harvested at a rate that does not adversely effect wild fish.

6. Juvenile fish produced in excess to production goals will be dealt with appropriately.

1.9) List of program "Performance Standards".

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

Performance Standards and Indicators for lower Columbia River **Isolated Harvest** Steelhead programs.

Performance Standard	Performance Indicator	Monitoring and Evaluation Plan
Produce adult fish for harvest	Survival and contribution rates	Monitor catch
Meet hatchery production goals	Number of juvenile fish released	Future Brood Document (FBD) and hatchery records
Manage for adequate escapement where applicable	Hatchery return rates	Hatchery return records
Minimize interactions with listed fish through proper broodstock management and mass marking. Maximize hatchery adult capture effectiveness. Use only hatchery fish	Number of broodstock collected	Rack counts
	Stray Rates	Spawning guidelines
	Sex ratios	Hatchery records
	Age structure	Hatchery records
	Timing of adult collection/spawning	Spawning guidelines
	Total number of wild adults passed upstream	
	Adherence to spawning guidelines	
Minimize interactions with listed fish through proper rearing and release strategies	Juveniles released as smolts	FBD and hatchery records
	Out-migration timing of listed fish / hatchery fish	FBD and historic natural outmigration times
	Size and time of release	FBD and hatchery records
	Hatchery stray rates	Hatchery records (marked vs unmarked)
Maintain stock integrity and genetic diversity	Effective population size	Spawning guidelines
	HOR spawners	Spawning ground surveys

Maximize in-hatchery survival of broodstock and their progeny; and Limit the impact of pathogens associated with hatchery stocks, on listed fish	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Co-Managers Disease Policy Fish health monitoring records
	Fish pathologists will diagnose fish health problems and minimize their impact	
	Vaccines will be administered when appropriate to protect fish health	
	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	
	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	
Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES records

1.11) Expected size of program.

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

No broodstock collected at this facility.

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		
Yearling	N. Toutle Hatchery, Green River RM 0.5 (26.0323)	25,000
	S. Fork Toutle River (26.0248) @ RM 10	25,000

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

Year	Harvest	Escapement
1999	729	729
1998	238	238
1997	442	442
1996	1,684	1,684
1995	520	520
1994	648	648
AVE	710	710

Harvest includes all forks and mainstem Toutle River, data from WDFW punchcards. Escapement assumed to be 50%. With escapement at 50%, survival has averaged 2.84%.

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

Early 1970's.

1.14) Expected duration of program.

Ongoing.

1.15) Watersheds targeted by program.

Cowlitz River (26.0002)
-Toutle River (26.0227)
-Green River (26.0323)
-S. Fork Toutle (26.0248)

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

None.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

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

None.

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

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

The ESA-listed populations in the basin that may be affected by the program are fall chinook, winter steelhead, and possibly chum. Summer steelhead return to the basin from April through September and spawn in December/January.

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

None.

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

Lower Columbia Chinook, Chum and Steelhead, Mid Columbia Steelhead, Upper Columbia Steelhead and Spring Chinook, Snake River Sockeye, Chinook and Steelhead, Upper Willamette Steelhead and Chinook, Columbia River Bull Trout.

2.2.2) Status of 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 (*see definitions in "Attachment 1").*

Critical and viable population thresholds have not been established for the above ESU's and the populations within them. NMFS has formed a Lower Columbia River/Willamette River Technical Review Team to review population status within these ESU's and develop critical and viable population thresholds.

No status was given within the SASSI report (WDFW) whether the stock is "healthy", "depressed", "critical" or "unknown". Summer steelhead in the Toutle River are an introduced stock.
See * below.

- 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 at this time. When the data becomes available, it will be provided.

- 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.

For abundance estimates see tables 3 through 6 in the Lower Columbia River Fisheries Management and Evaluation Plan (FMEP).

- 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 known. However, summer steelhead are a non-indigenous stock and successful natural reproduction is thought to be minimal. There is currently no monitoring being conducted to determine this information.

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

- 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.

All wild steelhead handled at the hatchery during spawning season (for fall chinook and coho) are released upstream of the rack from mid-August through late October.

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

Not known

- 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).

See "take" table

- 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.

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.

Summer "Skamania" steelhead are released for harvest augmentation. The integration of hatchery and harvest programs can be found in the WDFW's Lower Columbia River FMEP , where selective fisheries for hatchery salmon and steelhead are consistent, with wild salmon and steelhead recovery.

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

The program is authorized under the Columbia River Fisheries Development Program, Columbia River Fish Management Plan and U.S. vs. Oregon. The Cowlitz Game and Anglers have an agreement to rear and release summer steelhead from rearing ponds on the South Toutle.

3.3) Relationship to harvest objectives.

Harvest of salmon and steelhead in the Lower Columbia Management Area is managed to meet wild salmon and steelhead escapement objectives and to meet the objectives of artificial propagation programs. To manage harvest to meet these goals, WDFW has developed escapement objectives for all hatchery populations, and some wild populations; interim maximum harvest rates have been established for the remaining wild stocks. Fishing seasons are then established based on a forecast of salmon and steelhead returning to the LCMA. In years where run size to the tributaries is forecast to be below escapement requirements, harvest in tributaries is eliminated, or reduced to limited mortality from wild salmon or steelhead release. Harvest reductions are accomplished by time and area closures, gear restrictions, or changes in the daily catch limits. When forecasts are not made, conservative harvest rates are established. These rates are less than the estimated maximum sustainable yield (MSY) harvest rates under low ocean productivity or Recovery Exploitation Rates established by the National Marine Fisheries Service (NMFS). To the extent possible, WDFW uses selective fisheries to maximize harvest rates on hatchery stocks while setting wild stock harvest rates consistent with wild stock protection and/or rebuilding. Artificial propagation programs within the LCMA have three purposes: 1) rebuild wild populations that are at risk and/or re-establish wild populations that have been extirpated, 2) determine the benefits and risks of artificial propagation programs have on wild populations through research and develop strategies that maximize benefits and minimize risks, and 3) provide for harvest opportunity.

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

Fisheries benefitting from the program will include sport fisheries in the this basin and the lower Columbia mainstem. The proposed harvest levels in the Lower Columbia FMEP occur at a level that, (1) ensures natural escapement, (2) avoids a genetic swamping effect of hatchery fish on wild fish.

3.4) Relationship to habitat protection and recovery strategies.

The 1980 eruption of Mount St. Helens severely impacted salmonid populations and their habitat. Yet, most stream systems are naturally recovering from the disturbance. The North Fork Toutle is one exception where recovery has lagged behind. TAG members attributed the slow recovery to the Sediment Retention Structure (SRS) that has altered natural recovery processes.

A number of habitat constraints still limit production within the subbasin including; limited floodplain, off-channel, and pool habitat, high width-to-depth ratios and poor riparian conditions that contribute to elevated stream temperatures, lack of instream cover and LWD, and unstable substrate conditions. Hydrologic immaturity and high road densities within the subbasin contribute to increased peak flows and additional channel instability. High road densities and numerous stream adjacent roads also contribute excessive amounts of fine sediment to stream channels.

Recommendations for addressing limiting factors in the Toutle River Subbasin:

- Removal or alteration of the SRS would facilitate natural recovery of the North Fork Toutle and downstream systems.
- Water quantity and water quality problems within the Silver Lake watershed need to be addressed.
- Reduce road densities and the miles of stream adjacent roads within the subbasin, and assess the condition of abandoned roads in the upper Toutle subbasin.
- Replant degraded riparian areas with native conifers.
- Look for opportunities to enhance or restore off-channel rearing habitat.

3.5) Ecological interactions.

Summer steelhead smolts are released from the hatchery as yearlings and most are ready to out-migrate as soon as they are released. Interactions with juveniles of listed species would be limited to encounters during the summer steelhead outmigration. Summer steelhead adults begin entering the basin in March and finish spawning in early January. Winter steelhead are spawning during part of this timeframe (March - June). With the difference in spawn timing, there will be no breeding between the two groups and the summer steelhead should have no effect on the spawning behavior of winter steelhead.

Fall chinook adults will be in the basin during the time that summer steelhead are there, but they will have no effect on the fall chinook.

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.

NPDES # WAG-131010. HPA Control # 00-C-880-02. Surface water for the N. Toutle Hatchery on the Green River is collected at a gravity intake located upstream of a concrete dam with fish passage capabilities. Water rights for the N. Toutle Hatchery total 26,031 gallons per minute (gpm) from the Green River(IHOT).

The S. Fork Toutle rearing site was installed in 1981 by the U.S. Army Corps of Engineers. A gravity intake supplies surface water to a 14' X 40' X 3.5' wooden pond using 3 - 4 cubic feet per second (cfs) of water.

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.

The N. Toutle Hatchery screens are 1/8th inch aluminum slotted screens that minimize the risk of entrainment of juvenile fish.

At the S. Fork Toutle rearing site grants have been obtained to replace the intake and pond screens and to improve fish passage. (For details, contact Dick Miller, 360-274-7564

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

NA (Broodstock/eggs collected at Skamania Hatchery).

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

Juvenile fish are delivered from Skamania in a 1,500 gallon tank truck directly to N. Toutle Hatchery and S. Toutle rearing sites.

5.3) Broodstock holding and spawning facilities.

NA

5.4) Incubation facilities.

NA

5.5) Rearing facilities.

Summer steelhead are reared at N. Toutle Hatchery in three 20' X 80' X 3.5' raceways with 220 gpm per raceway. Rearing period is from January or February through mid-April. Also use a 1/4 acre dirt pond with 3,000 gpm flow.

The S. Fork Toutle rearing site has a 14' X 40' X 3.5' wooden pond using 3 - 4 cubic feet per second (cfs) of water. Rearing period is from January to April.

5.6) Acclimation/release facilities.

Acclimated and released from the raceways/dirt pond at the N. Toutle Hatchery and from the wooden pond at the S. Fork Toutle rearing site.

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

When S. Fork site was not operational due to flood damage, summer steelhead were raised at N. Toutle Hatchery site. Catastrophic diseases have not been troublesome due to low temperatures and good water conditions at time fish are reared at these sites.

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.

The hatchery is equipped with a low-water alarm system to help prevent catastrophic fish loss resulting from water system failure.

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.

Fish returning to the Skamania Hatchery.

6.2) Supporting information.

6.2.1) History.

The first fish captured at the Skamania Hatchery for broodstock occurred in 1956. The first returns of wild fish reared at the hatchery returned in 1959. Lavier (1973) described the Washougal River as originally being a summer steelhead stream. Cowlitz and

Skamania Hatchery stocks were introduced into the system in the late 1950s and are assumed to have interbred with the wild stock (Salmon and Steelhead Production Plan Washougal River Subbasin, 1990).

6.2.2) Annual size.

No natural broodstock are used. Number of hatchery adults needed for programmed egg take levels are approximately 20 males and 20 females.

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

At present no natural or unmarked fish are used for broodstock.

6.2.4) Genetic or ecological differences.

The difference in spawn timing (3 months earlier for Skamania hatchery fish), poor reproductive success for these fish in the wild (Hulett et al. 1998) and spatial separation at spawning have helped to maintain genetic differences between hatchery and wild fish. Fish are released as age-1+ smolts whereas wild steelhead are predominantly age-2+ smolts. Outmigration timing for both life history types is similar but is slightly earlier for hatchery component (Fuss et. al. 1999).

6.2.5) Reasons for choosing.

Since steelhead spawn from January to June, hatchery personnel selected the earliest returning and spawning steelhead to develop this steelhead stock in the 1950's. Hatchery steelhead spawning time is approximately three months earlier than wild steelhead. WDFW views these as management opportunities that reduce mixed stocked fishery impacts and genetic risks to wild fish.

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.

NA

SECTION 7. BROODSTOCK COLLECTION

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

Adults (at Skamania Hatchery).

7.2) Collection or sampling design.

NA

7.3) Identity.

Adipose-fin clipped adults.

7.4) Proposed number to be collected:

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

No broodstock collected at this facility.

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

Year	Adults				
	Females	Males	Jacks	Eggs	Juveniles
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					

Data source: (Link to appended Excel spreadsheet using this structure. Include hyperlink to main database)

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

NA (no adults handled at N. Toutle Hatchery).

7.6) Fish transportation and holding methods.

NA

7.7) Describe fish health maintenance and sanitation procedures applied.

NA

7.8) Disposition of carcasses.

NA

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.

NA

SECTION 8. MATING

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

8.1) Selection method.

NA

8.2) Males.

NA

8.3) Fertilization.

NA

8.4) Cryopreserved gametes.

NA

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.

NA

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.

9.1) Incubation:

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

NA

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

NA

9.1.3) Loading densities applied during incubation.

NA

9.1.4) Incubation conditions.

NA

9.1.5) Ponding.

NA

9.1.6) Fish health maintenance and monitoring.

NA

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.

NA

9.2) <u>Rearing</u>:

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..

Broodyear	Rearing site	Transferred in	Planted	% Survival
1995	N. Toutle	56,292	53,408	95%
1996	N. Toutle	41,400	41,036	99%
	S. F Toutle	23,400	23,000	98%
1997	N. Toutle	51,026	50,767	99%
	S. F. Toutle	25,600	?	?
1998	N. Toutle	50,000	49,783	99%

	S.F. Toutle	24,000	23,900	99%
1999	N. Toutle	29,960	14,735	49%
	S. F. Toutle	none reared	15,000	
2000	N. Toutle	12,000	11,850	99%
	S. F. Toutle	12,000	11,880	99%

Note: All fish transferred in from Skamania or Beaver Creek hatcheries.

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

Typical final loadings targeted at 5 fish per pound (fpp). Examples: (1998 broodyear)

N. Toutle: 12,477 fish in a pond at 8 fpp (1,559 lbs) which is 0.39 lb/cu ft or 7.1 lbs/gpm.

S. F. Toutle: 23,900 fish in pond at 6.6 fpp (3,621 lbs) which is 1.85 lb/cu ft or 2.26 lb/gpm.

9.2.3) Fish rearing conditions

At the N. Toutle Hatchery, water temperatures range between 40-50 degrees Fahrenheit during the January-February through mid-April rearing period.

At the S. Fork Toutle rearing site, water temperatures range between 37- 42 degrees Fahrenheit during the January to April rearing period. (Information from Dick Miller 360-274-7564).

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.

Not available.

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

Not 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*).

Typical feed used is Moore-Clark Trout AB or, occasionally, Rangens at ~ 0.5% B.W./day. Feed conversions are often around 2:1.

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

Prior to stocking, ponds are sanitized with chlorine at 20 parts per million (ppm). Fish are monitored by hatchery staff and WDFW pathologists. Pond equipment is routinely disinfected with WesternQuat (iodine solution).

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

NA

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

None.

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.

NA

SECTION 10. RELEASE

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

10.1) Proposed fish release levels.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling				
Yearling	25,000	5	April-May	Green River
	25,000	5	April-May	S.F. Toutle

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

Stream, river, or watercourse: S. F. Toutle (26.0248) and Green River (26.0323)
Release point: S. F. Toutle at RM 10 and Green River at RM 0.5
Major watershed: Toutle and Cowlitz River
Basin or Region: Lower Columbia River

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

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								

Data source: (Link to appended Excel spreadsheet using this structure. Include hyperlink to main database)

See section 9.2.1.

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

Steelhead smolts that are reared in raceways are force released. Smolts that are reared in earthen ponds are volitionally released over a period of approximately 1 ½ months. The fish imprinted in the standard rearing ponds are force released. Smolt releases start after April 15th. Fish that do not voluntarily leave the pond are force released. The fish released from the S. Fork rearing site (operated by Cowlitz Game and Anglers co-op) are volitionally released starting after April 15th with the assistance of WDFW (sample at ponding and release).

10.5) Fish transportation procedures, if applicable.

The standard transport time for fish that are trucked is 15 minutes to 1 hour depending on release site. Temperature control is not necessary due to the short transit time and small temperature variation between the water sources they are transferred out of and into. The fish are loaded at 0.8 pounds of fish per gallon of water. They are carefully watched for signs of stress during loading and at release. Desirable oxygen levels in the tanker are maintained using bottled oxygen and air stones in conjunction with electrical aerators.

10.6) Acclimation procedures.

Fish are transferred in from Skamania Hatchery in January for imprinting. Steelhead smolts that are reared in raceways are force released. Smolts that are reared in earthen ponds are volitionally released over a period of approximately 1 ½ months. Smolt releases start after April 15th. Fish that do not voluntarily leave the pond are forced released. The fish released from the S. Fork rearing pond (operated by Cowlitz Game and Anglers co-op) are volitionally released starting after April 15th with the assistance of WDFW (sample at ponding and release).

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

All steelhead are mass marked with an adipose-fin clip.

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

All planted at this time.

10.9) Fish health certification procedures applied pre-release.

Routine pre-release check by WDFW pathologist.

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

Fish would be planted at pond outlets to river or in severe flooding would escape from ponds, especially those located at N. Toutle Hatchery.

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.

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.

See section 1.10

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 fish resulting from monitoring and evaluation activities.

SECTION 12. RESEARCH

12.1) Objective or purpose.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

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

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

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

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

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

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).

12.10) Alternative methods to achieve project objectives.

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

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.

SECTION 13. ATTACHMENTS AND CITATIONS

IHOT (Integrated Hatchery Operations Team). 1995. Operation plans for anadromous fish production facilities in the Columbia River basin. Volume III-Washington. Annual Report 1995. Bonneville Power Administration, Portland Or. Project Number 92-043. 536 pp.

Washington Department of Fisheries (WDF) and Washington Department of Wildlife (WDW). 1993. 1992 Washington State salmon and steelhead stock inventory - Appendix three Columbia River stocks. Washington Dept. Fish and Wildlife, 600 Capitol Way N, Olympia, WA. 98501-1091. 580 pp.

Washington Department of Fisheries (WDF), Washington Department of Wildlife (WDW), and Western Washington Treaty Indian Tribes (WWTIT). 1992. 1992 Washington State salmon and steelhead stock inventory (SASSI). Washington Dept. Fish and Wildlife, 600 Capitol Way N, Olympia, WA. 98501-1091 . 212 pp.

Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes. 1998. Co-managers of Washington fish health policy. Fish Health Division, Hatcheries Program. Washington Dept. Fish and Wildlife, Olympia

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 salmonid take levels of by hatchery activity.

Listed species affected: Chinook ESU/Population: Lower Columbia Activity: Hatchery Rearing Operation				
Location of hatchery activity: N. Toutle Hatchery Dates of activity: January-May Hatchery program operator: WDFW				
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)	Unknown	Unknown		
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.

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: Steelhead ESU/Population: Lower Columbia Activity: Hatchery Rearing Operation				
Location of hatchery activity: N. Toutle Hatchery (Green R.) Dates of activity: January-May Hatchery program operator: WDFW				
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)	Unknown	Unknown		
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.

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: Chum ESU/Population: Columbia River Activity: Hatchery Rearing Operation				
Location of hatchery activity: N. Toutle Hatchery (Green R.) Dates of activity: January-May Hatchery program operator: WDFW				
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)		Unknown		
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.