DRAFT

HATCHERYAND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Skokomish Hatchery Fall Chum
Species or Hatchery Stock:	Fall chum salmon, *Oncorhynchus keta*, Little Boston Creek stock (originally Quilcene stock)
Agency/Operator:	Skokomish Tribe
Watershed and Region:	Enetai Creek (WRIA 16.0217), Hood Canal, Washington State
Date Submitted:	March 17, 2003
Date Last Updated:	

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.
Skokomish Tribal Hatchery

1.2) Species and population (or stock) under propagation, and ESA status.
Fall chum salmon, *Oncorhynchus keta*, Enetai Creek stock (originally Quilcene stock).
ESA status: Not listed.

1.3) Responsible organization and individuals

Agency lead contact:

Name (and title):	Dave Herrera, Fisheries Manager
Agency or Tribe:	Skokomish Tribe
Address:	N. 541 Tribal Center Road, Shelton, WA 98584
Telephone:	(360) 877-5213
Fax:	(360) 877-5418
Email:	davidh@hctc.com

On-site operations staff lead:

Name (and title):	Lloyd Wilbur Jr., Hatchery Manager
Agency or Tribe:	Skokomish Tribe
Address:	N. 541 Tribal Center Road, Shelton, WA 98584
Telephone:	(360) 877-5213
Fax:	(360) 877-5418
Email:	

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:
Point No Point Treaty Council: technical assistance since the hatchery operations began in late 1976. Northwest Indian Fisheries Commission: Fish health services.

1.4) Funding source, staffing level, and annual hatchery program operational costs.
Source: Bureau of Indian Affairs through Skokomish Tribe
Staffing: Lloyd Wilbur Jr.: Hatchery Manager
Operational costs:

1.5) Location(s) of hatchery and associated facilities.
Hatchery is located at mouth of Enetai Creek (WRIA 16.0217) just north of the Skokomish River in southern Hood Canal. Facilities include a fish weir and adult collection pond at the mouth of the creek, fish incubation and rearing facilities just upstream on the west side of Highway 101, and a water intake and supply system with the intake located in Enetai Creek approximately 200 yards upstream.

1.6) Type of program.

Isolated Harvest

1.7) Purpose (Goal) of program.

Fisheries augmentation. The goal of the program is to provide local fall chum salmon fishing opportunity, promoting the stability and viability of treaty and non-treaty fisheries.

1.8) Justification for the program.

The Skokomish Tribal Hatchery fall chum program has produced a return of adult salmon to Enetai Creek since its first release of fall chum fry in 1977 (initial return of three year old adults in 1979). The returning fall chum salmon have provided opportunities for treaty and non-treaty harvest in pre-terminal areas as well as Hood Canal. The program began by importing eyed eggs of Quilcene stock, but beginning with the first adult returns in 1979, quickly established a broodstock returning to Enetai Creek. The hatchery returns have been contributing to fall chum fishery opportunities for twenty one years.

The Skokomish Hatchery fall chum program releases fed fry into Enetai Creek in southern Hood Canal. There are no listed species in Enetai Creek and impacts of the fall chum on either the ESA listed, threatened Hood Canal summer chum salmon or the ESA listed, threatened Puget Sound chinook salmon would be expected to be minimal. Returning adults could possibly stray into nearby summer chum streams and utilize spawning areas of summer chum, potentially disturbing existing summer chum spawning redds. However, such effects are believed to be of minimal risk to summer chum as discussed in Section 3.3 of the Summer Chum Salmon Conservation Initiative (SCSCI)(WDFW and PNPT Tribes 2000).

Because fall chum have similarities in life history to summer chum and potential interactions may occur in the estuary, applicable risk avoidance measures described in the SCSCI will be followed by the Skokomish Hatchery fall chum program. These measures, addressing potential effects from early life history competition and behavioral modification, and fish disease, are included in the performance standards described below in section 1.9 and are described in more detail in sections 2.2.1 and 3.5. The risk aversion measures pertaining to fish disease may also apply to Puget Sound chinook; however, because of differences in fish size (fall chum smaller than chinook) and life history, the Skokomish Hatchery fall chum otherwise are not expected to pose a risk to Puget Sound chinook.

1.9) List of program "Performance Standards" and

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

The following performance standards and associated performance indicators apply to the Port Gamble Hatchery fall chum program.

Categories	Performance Standards	Performance Indicators
Hatchery Fish Production	1) Broodstock escapement goal of 2,250 spawners. Assumes 1:1 male to female ratio.	1) Records of all hatchery adult returns and their distribution (spawned, surplused, etc.). ("benefits")
	2) Egg collection goal of 3.15 million eggs. Assumes approximately 2,800 eggs per female	2) Inventories of live and dead eggs. ("benefits")
	3) Release goal of 1,500,000 fed fry at 400 fish per pound and 1,000,000 unfed (or partially fed) fry. Assumes green egg to release survival of .80.	3) Estimates of fish numbers and size, and records of fish culture (e.g., mortalities, growth, feeding, disease incidents, etc.) - ("benefits")
	4) Return rate goal of 0.005 or better (for fed fry), potentially contributing 5,000 or more adult fall chum to fisheries.	4) Biological data record collected from returning adults including age from scale samples. Reconstruction of runs based on hatchery escapement, age and catch data. ("benefits")
	5) Production goals consistent with the provisions of the Puget Sound Salmon Management Plan, the Hood Canal Salmon Management Plan and all other management agreements of the Co-managers.	5) Hatchery spawning and release records consistent on average with future brood document and other provisions of co-managers' agreed upon management plans and policies. ("benefits")
Hatchery Fish spawning	6) Collect broodstock proportional to returns throughout adult return period.	6) Records of adult returns, fish spawned and egg takes by day. ("benefits")
	7) Spawn at ratio of one male to one female.	7) Records of mating (procedures and results, including male to female ratios) by day. ("benefits")
Hatchery Fish Rearing	8) Goal is to rear fish in a relatively stress-free environment that promotes good growth and survival so that when released, the fish will be healthy and in good condition.	8) Estimates of fish numbers and size, fish mortalities, water flows, fish loading, water quality measurements (temperature and oxygen), in-hatchery transfers (e.g. from incubation trays to raceways), feeding and growth rates. ("benefits")

Hatchery Fish Release	9) Goal is to release fish in a group and at night during high tide to reduce potential predation on newly released fry. 10) Fish released after April 1 to avoid any competition or behavior modification effects on summer chum salmon.	9) &10) Records of date, time, tide and general environmental conditions at release. Also, estimates of fish numbers and size, and assessment of fish condition at release. ("benefits" and "risks" – the "risks" refers to risk aversion measure of releasing fall chum after April 1 to protect summer chum from competition and behavior modification effects.)
Disease Control	11) Hatchery practices implemented consistent with the Co-managers' Washington Salmonid Disease Control Policy's procedures. 12) Fish health monitored by fish health professional of the Northwest Indian Fisheries Commission during broodstock capture, juvenile fish incubation and rearing operations. Measures implemented to prevent and treat fish disease as recommended by the fish health professional. 13) Fish released in healthy condition.	11,12 &13) Reports by fish disease professional on fish disease monitoring, including disease incidents and treatments. Certification by fish disease professional of fish health and condition at release. ("benefits" and "risks" – the "risks" associated with protecting listed species from potential disease transfer.)
Natural Fall Chum	14) Stray rates to fall chum streams outside Enetai Creek at acceptable rates (to be determined). This performance standard is under consideration and would be implemented only as part of a large-scale effort including other hatchery facilities.	14) Mark otoliths of hatchery fall chum. Then perform spawner surveys, estimate escapement and sample otoliths from returning adults of local streams to identify proportion of hatchery fish in escapement. ("risks")

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish). 2,250 adult fall chum salmon (1,125 females and 1,125 males based on male to female sex ratio of 1:1.). The egg take goal is approximately 3,150,000 assuming 2,800 eggs per female.

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	Enetai Creek	1,000,000
Fry	Enetai Creek	1,500,000
Fingerling		
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.
There are no direct estimates of smolt-to-adult survival. The Co-managers have been using the average estimate of fish returns per pound of fish produced for the Skokomish Tribal Hatchery (1976 – 1991 broods) to forecast the hatchery run size (PNPTC and WDFW 1999). The average estimate is 4.2846 fish returns per pound of fish produced. When this estimate is applied to the Skokomish Hatchery release objectives, the results are an adult production level of approximately 16,000 fall chum and a smolt-to-adult survival of 0.01. These estimates are in excess of the goals of at least 5,000 adults and 0.005 survival described above in section 1.9.

Estimates for the years 1988 through 1998 of the Skokomish Hatchery fall chum run sizes entering Puget Sound and of the total escapements are provided in the following table. These estimates are from the Puget Sound run reconstruction records compiled by WDFW (accessed 8/18/99).

Year	Puget Sound Run Size /*	Escapement
1988	21,133	3,373
1989	20,041	3,167
1990	10,899	1,953
1991	13,526	3,655
1992	10,856	3,318
1993	17,776	5,335
1994	39,104	14,767
1995	15,549	5,384
1996	14,294	6,840
1997	19,937	4,823
1998	42,136	17,424

/* Note that the estimates of run size entering Puget Sound are comprised of assumed catches in Puget Sound (including Hood Canal) and total escapement.

The fall chum run size of a given stock (comprised of escapement plus Puget Sound catch) is reconstructed by starting with the escapement and, working up the Hood Canal and through the Strait, consecutively adding portions of catch by catch area until all catch areas are included and a final run size estimate is obtained. The hatchery and wild stocks are treated the same, with each stock proportionately assigned a division of the catch in a catch area. Thus each stock is assumed to have the same harvest rate. However, the Hoodsport Hatchery (Finch Creek) stock has an earlier run timing than the Skokomish Hatchery stock and, because of the relatively large size of Hoodsport Hatchery production, the fisheries have tended to focus on that earlier run. The likely result is that harvest rates are actually higher for the Hoodsport Hatchery stock than for the Skokomish Hatchery stock. Therefore, the equal rates of expansion on escapements to reconstruct the runs may over-estimate the size of the Skokomish Hatchery run. This is to say that the run sizes shown in the above table (and the assumed harvests) may be higher than actually occurred.

1.13) Date program started (years in operation), or is expected to start.
The program began with release of brood 1976 fall chum fry in the spring of 1977 and has been in operation for 24 years.

1.14) Expected duration of program.
No limit on the duration of the program has been set.

1.15) Watersheds targeted by program.
The Skokomish Hatchery is located on Enetai Creek (WRIA 16.0217).

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.
The Skokomish Hatchery is a tribal facility. Location of the hatchery on the Skokomish Indian Reservation along with expected fall chum adult returns to southern Hood Canal (providing tribal members with access to the fish) were primary considerations for initiating the program. The current site was determined to be the best alternative for an on-reservation facility at the time of its construction.

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

2.1) List all ESA permits or authorizations in hand for the hatchery program.
None in hand; ESA listings are new in this area.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.
No natural populations of listed species occur in Enetai Creek and there are no direct takes of listed species by the program. The possibility of hatchery fall chum interacting with the listed species exists; however, potential interactions can be minimized with

implementation of appropriate risk aversion measures (see below, section 3.5).

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

Two listed species may be subject to indirect effects from the program. The Hood Canal and Strait of Juan de Fuca summer chum salmon and Puget Sound chinook are listed as threatened species. Both of these species are found in streams of Hood Canal. The closest summer chum stream is Lilliwaup Creek, on the west side of Hood Canal approximately eight miles north. Chinook occur in the Skokomish River, immediately adjacent and south of Enetai Creek. Juvenile and adult summer chum and chinook are found in the Hood Canal estuary during their migrations to and from the ocean. Detailed descriptions of the listed species, including life histories are contained in the Summer Chum Salmon Conservation Initiative (WDFW and Point No Point Treaty Tribes 2000), the Status Review of Chum Salmon from Washington, Oregon, and California (Johnson et al. 1997) and the Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California (Myers et al. 1998).

- 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.

Puget Sound chinook, originating from Hood Canal, and Hood Canal summer chum, while migrating to the ocean, pass through the Hood Canal estuary where interactions with Skokomish Hatchery fall chum could occur. The Skokomish Hatchery fall chum program may incidentally affect the listed chinook by providing additional prey for the chinook juveniles and by potentially serving as a vector for disease transfer. The program may incidentally affect the listed summer chum by competition, behavior modification or disease transfer.

Returning adults of the listed species are not likely to be incidentally affected by the program. The earlier run timing of the listed species (August to early October) does not overlap with that of the late-timed Skokomish Hatchery fall chum (late November to January). Also, the fall chum release site in Enetai Creek has no natural populations of summer chum or chinook. Therefore, interactions between the fishes are not likely and fisheries directed at the later fall chum would not impact the chinook or summer chum. However, it is possible that fall chum returning to the Skokomish hatchery could stray into a summer chum stream and spawn in the same location that a summer chum has already spawned, disturbing the eggs in the summer chum spawning redd. However, the likelihood of such an event appears small (section 3.3 of SCSCI).

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.
The Co-managers have recently identified chinook in Hood Canal as falling into two categories. Chinook of the Skokomish, Lilliwaup, Hamma Hamma, Duckabush and Dosewallips rivers are in Category 2, where the existing population is not indigenous but where historical information indicates a sustainable population did at one time exist. These populations are each being managed to recover a locally adapted, naturally sustaining population over the long term. The existing chinook populations in streams of the west Kitsap peninsula are in Category 3, where it has been determined that historically a sustainable population did not exist. The existing populations are the result of hatchery outplanting or straying and are not being managed as sustainable populations.

The SCSCI provides two assessments of summer chum salmon stock status. The first is a reevaluation of the 1992 Salmon and Steelhead Stock Inventory (SASSI) (WDF et al. 1993). The results of that reevaluation show the status of 16 Hood Canal and Strait of Juan de Fuca stocks distributed as follows: seven extinct, two critical, five depressed, one healthy and one unknown. The second assessment considers stock extinction risk following a procedure described by Allendorf et al. (1997); its results showed the nine existing stocks' current status to be distributed as follows: four at low risk, two at moderate risk, two at high risk, and one of special concern.

- 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. The Skokomish Hatchery does not produce a listed species. There are no direct effects on any specific listed population(s) by the Skokomish Hatchery fall chum program.

- 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.

- 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.

2.2.3) <u>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</u>.

- 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.
There is no direct take of listed species. The release of fall chum from Skokomish Hatchery may lead to interactions with listed species associated with competition, behavioral modification and disease transfer. See below section 3.5.

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.
There is no direct take and no information exists upon which to base quantified estimates of possible indirect take. The risk of indirect take is low. Table 1 is not applicable.

- 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).
There appears to be low risk of any take (see above and section 3.5).

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 is fully consistent with the guidelines, protocols, and implementation of the Co-manager's Summer Chum Salmon Conservation Initiative (SCSCI) (WDFW et al. 2000). The applicable part of the SCSCI addressing potential interaction of the summer chum with hatchery fish is section 3.3.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.
This HGMP is consistent with all relevant standing orders and agreements. The Puget Sound Salmon Management Plan (PSSMP) and the Hood Canal Salmon Management Plan (HCSMP) are federal court orders that currently control both the harvest management rules and production schedules for salmon in Hood Canal under the *U.S. v. Washington* management framework.

3.3) Relationship to harvest objectives.

The fishery production goal of the Skokomish Hatchery fall chum program is consistent with the fisheries management objectives and measures defined in 3.5 of the Summer Chum Salmon Conservation Initiative (WDFW and PNPT Tribes 2000) to protect Hood Canal summer chum. The "base conservation regime" for managing harvest includes no fisheries directed at summer chum. The total incidental fishery harvest rate expected under the Summer Chum Salmon Conservation Initiative is 10.8% (with a range of 3.3% to 15.3%). These rates reflect the incidental fishery harvest levels of all Canadian and U.S. fisheries. Because the Skokomish Hatchery fall chum has a substantially later run timing than the summer chum, there is no risk of incidentally harvesting summer chum in fisheries directed at the fall chum.

Management measures to protect Puget Sound chinook are being addressed in the Comprehensive Chinook Planning process initiated by the Co-managers and working with the National Marine Fisheries Service's staff. The NMFS issued a Section 7 permit for the 1999 chinook fishing season. Currently, work is progressing on a Fisheries Management and Evaluation Plan to apply for a take exemption under the 4(d) rule. The Skokomish Hatchery fall chum program is consistent with current management objectives and practices to protect Puget Sound chinook. As with summer chum, the late run timing of fall chum eliminates the risk of chinook interception during fisheries directed at the fall chum.

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.

The fisheries benefiting from the program primarily include commercial treaty and non-treaty net fisheries. Low levels of sport harvest also occur, though chum salmon are not commonly taken in recreational fisheries. The following table provides estimates of catches and harvest rates from 1988 through 1998.

Return Year	Puget Sound Harvest /1	Harvest Rate /2
1988	17,760	.84
1989	16,874	.84
1990	8,946	.82
1991	9,871	.73
1992	7,538	.69
1993	12,441	.70
1994	24,337	.62
1995	10,165	.65
1996	7,454	.52
1997	15,114	.76
1998	24,712	.59

/1 Based on Puget Sound run reconstruction records compiled by WDFW (accessed on 8/18/99). Estimated Puget Sound harvest is Puget Sound run size minus escapement (see table in section 1.2).

/2 Harvest rates have been calculated based on the following equation:

Harvest Rate = P.S. Harvest + P.S. Run size

See table showing P.S. run sizes and discussion in section 1.12.

3.4) Relationship to habitat protection and recovery strategies.

The Skokomish Hatchery fall chum program is not related to any habitat protection and recovery strategies for Hood Canal summer chum salmon or Puget Sound chinook.

3.5) Ecological interactions.

The release of fall chum and their entry into Hood Canal estuarine areas may lead to interactions with the listed species. Potential effects on the listed summer chum would be through competition for food and shelter in the estuaries, modification of behavior (including changes in summer chum feeding behavior, in predator avoidance behavior and in use of preferred migration areas), and disease transfer (assuming any infected hatchery fall chum could transfer disease to summer chum in the estuary). Specifically where, when and if such effects may occur is unknown. The potential risk of a take would appear low (see section 3.3 of SCSCI), especially with implementation of the risk aversion measures described below in sections 9.2.10, 10.11 and 11.2. Returning adults could possibly stray into nearby summer chum streams and spawn in areas where summer chum have already spawned, potentially disturbing summer chum eggs. However, the likelihood of such effects is believed to be minimal as discussed in Section 3.3 of the SCSCI.

Fall chum fry released by the program may be subject to predation by listed fall chinook in the estuary and potentially could be a source of disease infection to the chinook. The risk of a listed chinook take appears to be low, particularly given the risk aversion measures taken with respect to disease control (sections 9.2.10, 10.11 and 11.2).

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.

The source of water for the Skokomish Hatchery fall chum program is Enetai Creek, a spring fed stream that empties directly into Hood Canal. The water is diverted into a pipeline at a concrete intake structure located in the streambed approximately 0.20 mile upstream of the mouth of the creek. Water flows are fairly consistent throughout the period of hatchery operations in the winter and spring (1,000 – 1,200 gpm). However, occasionally flows have been observed to

drop to lower levels (as low as 600 gpm during the 1992-1993 season) following a prolonged period of low rainfall, but this is a relatively rare occurrence. Water temperatures during hatchery operation are fairly stable, in the mid-40s Fahrenheit. After passing through the hatchery incubation and rearing facilities, the diverted water is returned to the stream. Production at the hatchery is currently limited to fall chum and, with the goals of 1,500,000 fish released at 400 fish per pound (approx. 3,750 lbs) and 1,000,000 fish released at 900 – 1250 fish per pound (800 to 1,100 lbs), the production totals well below the minimum 20,000 pound annual production level requirement for a National Pollution Discharge Elimination System (NPDES) permit.

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.

Not applicable to listed fish, since none occur in Enetai Creek.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Fall chum broodstock return to the Skokomish Hatchery through a fish weir at the mouth of Enetai Creek. The fish enter a concrete adult collection pond measuring approximately 30' long x 8' wide by 6' deep. Once or twice per week, the fish are crowded to one end of the pond, so that they may be netted, counted and sorted by sex and ripeness. Ripe fish are removed from the pond to be spawned or surplused. Fish not yet ready to be spawned are returned to the pond.

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

Not applicable. No fish are transported off station

5.3) Broodstock holding and spawning facilities.

See description under 5.1. Fish are spawned in a covered area directly adjacent to the collection pond.

5.4) Incubation facilities.

The incubation facilities consist of 16 plastic boxes (each approximately 3'x 3'x 3') with upwelling flows and seven Netarts-style incubators (each 40'x 4'x 1.5'). Each incubation box has a capacity of 100,000 eggs providing a total egg capacity of 1.6 million. Each of the seven Netarts-style incubators has a capacity of 400,000 eggs for a combined capacity 2.8 million eggs.

The green eggs destined for release as fed fry are placed in the plastic boxes on trays. Once these eggs become eyed they are moved from the plastic boxes to four Netarts-style incubators (40'x 4'x 1.5') and placed on trays above a gravel substrate where they hatch. The resulting alevins absorb their yolk sacs before being transferred to the rearing ponds.

The green eggs destined for release as unfed (or partially fed) fry are placed directly in three Netarts-style incubators where they are allowed to hatch. The resulting alevins, after absorbing their yolk sacs, are briefly fed before being released.

5.5) Rearing facilities.

The swim-up fry, after initial feeding in the Netarts-style incubators, are moved to seven fiberglass circular ponds (24'diameter, 5' height). The ponds have center drains and the water heights are controlled by external stand-pipes. The fall chum are reared in these ponds until release.

5.6) Acclimation/release facilities.

Fry are released on station.

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

This facility has had few operational difficulties over the years. Early in the program history, bacterial gill disease led to higher than expected mortalities. The problem was determined to be due to high pond loading; the group of fish had not been split at the appropriate time. The hatchery rearing protocol was modified and there has been no recurrence of the problem.

Reduction in hatchery water flows associated with prolonged periods of lower than normal rainfall may occur but it is a relatively rare occurrence (see description of water source, section 4.1). Under reduced flow conditions, fish may need to be released at less than the target size to avoid exceeding loading limits. Historically, virtually all releases of fall chum fry have been after April 1, even in 1993 when reduced flow conditions last occurred. The few exceptions are releases of unfed fry in late March and those releases occurred before the post-April 1 release criterion was developed. It is unlikely that any flow reductions that may occur will lead to releases earlier than April 1 in future years.

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.

Listed fish are not expected to be directly and negatively affected by hatchery failure since there are no listed fish in Enetai Creek or the hatchery.

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.

The source of the broodstock is Quilcene fall chum from Quilcene National Fish Hatchery. A fall chum run to Enetai Creek has been established and now serves as the operational broodstock.

6.2) Supporting information.

6.2.1) History.

When hatchery operations began (brood year 1976 released in 1977), the source of broodstock was Quilcene fall chum obtained through the USFWS. This source continued into 1980, when the Enetai broodstock (adults returning to Skokomish Hatchery) first contributed to the egg take. In subsequent years, the Enetai broodstock has been the source of eggs for the Skokomish Hatchery fall chum program.

6.2.2) Annual size.

Recent hatchery broodstock returns (1994-1999) have annually averaged 6,692 with a male to female sex ratio of 1.43. The range of annual returns to the hatchery in the same period has been 803 to 14,620.

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

No historic records exist of natural fall chum in Enetai Creek. The assumption is that there has been little to no incorporation of natural fall chum into the broodstock.

6.2.4) Genetic or ecological differences.

No natural fall chum stock exists in Enetai Creek.

6.2.5) Reasons for choosing.

The Quilcene broodstock was chosen because of its availability.

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.

No listed natural fish are affected by the broodstock selection practices and no risk aversion measures are necessary.

SECTION 7. BROODSTOCK COLLECTION

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

Adults.

7.2) Collection or sampling design.

Fall chum are collected in late November, December and early January at the hatchery facilities. The facilities include a fish weir, through which the returning adults voluntarily pass, and an adult collection pond. At least once per week, the

fish are subject to collection for spawning and possibly to be surplused. A movable screen is used to crowd the fish so that they may be captured and sorted at one end of the long narrow pond. The fish are removed to be spawned or surplused. Some fish not yet ripe may be retained in the pond until the next collection. The collections are spread throughout the period of returning fish. Timing and amount of spawning throughout the collection period are representative of the spawning goal and historical timing

7.3) Identity.

One population of hatchery fall chum is present during the collection period.

7.4) Proposed number to be collected:

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

The broodstocking goal is 2,250 spawners.

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

Brood Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1988	1,305	1,128			
1989	1,230	1,763			
1990	896	967			
1991	1,311	2,135			
1992	1,297	1,827			
1993	1,300	345			
1994	1,330	328			
1995	1,420	284			
1996	1,597	320			
1997	1,603	321			
1998	1,320	264			
1999	213	42			

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

The above table shows a male to female spawning ratio of close to 1.0 for the years 1988 through 1992 (average is approximately 1.3). However, beginning in 1993 the ratio has changed and since that time averages 4.6. Proper spawning protocol will be established

to meet the target ratio of 1.0 in the future (see section 8.3).

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.
The goal of broodstock collection is to take only enough spawners to meet fish production needs. Surplus fish and carcasses are disposed of by distributing to tribal members for personal use, by selling surplus fish and by burying surplus fish on the reservation.

7.6) Fish transportation and holding methods.
No live fish are transported away from the hatchery. Adult fish may be held in the adult pond for brief periods until ripe or until provisions for surplusing can be arranged.

7.7) Describe fish health maintenance and sanitation procedures applied.
Professional fish pathologists of the NWIFC Fish Health Services program perform the fish health monitoring associated with adult fish collected during broodstocking. The fish are sampled for regulated pathogens at the time of spawning in accordance with procedures set forth in the Co-Managers of Washington Salmonid Disease Control Policy (NWIFC and WDFW 1998). Ovarian fluid, kidney, and spleen samples are collected from all fish spawned for evaluation and testing by the pathologists for disease certification purposes.

7.8) Disposition of carcasses.
See 7.5 above.

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.
Broodstock collection for the Skokomish Hatchery fall chum program does not have any adverse genetic or ecological effects on listed natural fish and no risk aversion measures are necessary. The risk of fish disease amplification is minimized by following the Co-manager's Salmonid Disease Control Policy guidelines for sanitation, fish health maintenance and monitoring.

SECTION 8. MATING

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

8.1) Selection method.
Spawners are collected as the fish arrive in the pond, proportional to the timing, weekly abundance, and duration of the total return. There is one to several spawning days each week depending on the number of returns (and the corresponding timing and associated abundance of the run). Each spawning day, spawners are collected as non-biased (i.e., with respect to size and appearance of fish) samples of the available population of ripe fish. Fish in excess of spawning needs are surplused.

8.2) Males.

Backup males are retained in the event that one or more males are not ripe or spawned out and a replacement or replacements are needed. The spawning ratio objective of one male to one female is not changed.

8.3) Fertilization.

The fall chum eggs and milt are collected in a covered area adjacent to the holding pond. Twenty females are spawned into a bucket. Milt is collected from lots of five males and placed in plastic bags. The eggs are rinsed in a in a baking soda solution to clean them and then are divided into four buckets of approximately equal volume. The eggs in each bucket are fertilized first with one bag of milt then again with another bag. The eggs are rinsed and then subject to a one-hour immersion in an iodophor solution (during water hardening) as a disease prevention measure before being placed in incubation trays.

The female to male ratio for mating is now 1:1. In past years, that ratio has not always been met. However, at this time the protocol has been established for a mating ratio of 1:1 as described above.

8.4) Cryopreserved gametes.

None used.

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.

The mating of the hatchery fall chum will not have adverse genetic or ecological effects on any natural listed species and therefore no risk aversions measures are necessary to protect them. Unbiased selection of fish throughout the run and mating at a sex ratio of 1:1 are measures taken to reduce the risk of losing within population genetic diversity of the fall chum.

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.

Estimates of egg takes and resulting fry ponded, from broodstock returning to Port Gamble Hatchery, are shown in the following table for the years 1988-1999. Also shown are the calculated survival rates from egg take to ponding (survival rate = fry ponded ÷ egg take). Dependable records for estimates of fry to ponding stage are not available for a number of recent years as shown.

Brood Year	Estimated Egg Take (nearest 100) /1	Estimated Fry to Ponding (nearest 100) /2	Survival Rate
1988	3,132,000	2,252,700	.72
1989	2,952,000	2,422,600	.82
1990	2,150,400	2,057,600	.96
1991	3,146,400	1,288,900	.40
1992	3,069,600	2,399,600	.78
1993	3,120,000	1,463,000	.47
1994	3,192,000	1,794,300	.56
1995	3,408,000	N.A.	-
1996	3,832,800	1,847,800	.48
1997	3,847,200	N.A.	-
1998	3,168,000	N.A.	-
1999	511,200	N.A.	-

/1 Egg take estimate based on assumed fecundity of 2,400 eggs per female spawned.
/2 Estimated fry to ponding includes fry released just before ponding and fry ponded.

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

None anticipated. Egg take goals have been set based on experience with survival of eggs and fish in the hatchery. No significant surpluses are expected.

9.1.3) Loading densities applied during incubation.

Approximately 7,000 to10,000 green eggs (from three female spawners) are loaded in a tray and placed in a plastic incubation box (10 trays per box). Water flow rate to each box is 8 - 10 gpm. After the eggs are eyed, they are transferred to the Netarts-style incubators. Approximately 10,000 eyed eggs are placed on a 4' x 4' tray, supported on 1/8-inch vexar screen, and suspended in the Netarts incubator (up to 40 trays in each). Water flow to each incubator is 20 – 25 gpm. Green eggs placed directly in the Netarts-style incubators (see section 5.4) are loaded the same.

9.1.4) Incubation conditions.

The plastic incubator boxes are covered with lids and the green eggs are incubated in the dark. Eyed eggs are placed in a saltwater solution to float the dead eggs and facilitate picking egg mortalities. The eggs are weighed to inventory live eggs and estimate mortalities. The eyed eggs are then transferred from the plastic boxes to the Netarts incubators, covered to keep out light, and allowed to hatch. Green eggs placed in the

Netarts incubators are also covered to keep out light, are picked after they become eyed and allowed to hatch. The alevin fry are started on feed and are either released or transferred to the rearing ponds (see section 5.4).

Water temperatures are stable in the 40s Fahrenheit. Freezing is not a problem. General incubation operating conditions are monitored, as is the progress in egg development, egg hatching and absorption of yolk sacs by fry ("buttoning–up").

9.1.5) Ponding.
Fry are transferred from the Netarts incubators to the rearing ponds by middle to late March. The fry are non-volitionally transferred through pipes to the ponds (no direct handling).

9.1.6) Fish health maintenance and monitoring.
All fall chum are incubated under the guidance of certified fish health personnel from NWIFC and in accordance with the Co-Manager's Salmonid Disease Control Policy (NWIFC and WDFW 2000). All eggs are water hardened for one hour in an iodophore solution before being placed in incubation trays. Eggs are shocked at eye-up, immersed in saltwater solution and dead eggs (mortalities) are removed.

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.
No adverse genetic or ecological effects on listed species are anticipated from incubation of the fall chum. Implementation of the above-described measures to control disease is expected to minimize risk of fall chum egg loss.

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.

Brood Year	Survival Rate Egg Take to Ponding /1	Survival Rate Ponding to Release /2	Survival Rate Egg Take to Release /3
1988	.72	.98	.71
1989	.82	.99	.81
1990	.96	.99	.95
1991	.40	.99	.40
1992	.78	.99	.77
1993	.47	N.A.	N.A.
1994	.56	.99	.55
1995	N.A.	N.A.	N.A.
1996	.48	.99	.48
1997	N.A.	N.A.	N.A.
1998	N.A.	N.A.	N.A.

1999	N.A.	N.A.	N.A.

/1 Estimated survival rate is calculated as estimated fry release divided by estimated egg take. See also table in section 9.1.
/2 Estimated survival rate is calculated as estimated fry release divided by estimated fry ponded.
/3 Estimated survival rate is calculated as estimated fry release divide by estimated egg take.

Dependable data is not available for a number of recent years as shown in the above table suggesting record keeping record keeping be reviewed and improved in future years.

9.2.2) Density and loading criteria (goals and actual levels).
The limited available water flows to the facility is the primary fish loading constraint. Flow is distributed among the rearing pools and fish are split in an effort to not exceed a flow index of 1.5 to 2.0. Generally, fish loading does not exceed 800 pounds per pool.

9.2.3) Fish rearing conditions
The fish are monitored daily for mortalities, aberrations in behavior and morphological changes that may indicate stress, disease or possible other negative impacts. Any problems are addressed immediately. Weight samples to estimate fish size are collected approximately every week or 6 to 8 times during the rearing season. The fish are watched closely as loading increases. Actions are taken as necessary to address increased loading as described above in section 9.2.2.

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.
Weight samples are taken every week, measuring fish per pound (fpp); however, records have not been kept. Generally, the fry are ponded in middle to late March and are reared until release in late April or early May. Over an approximate one and a half month period, the fry grow from approximately 1,250 fpp to approximately 400 fpp.

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.

Feeding of fish begins before ponding using small amounts of dry flake feed, then converting after two or three weeks to feed pellets. The fish are hand fed every half hour initially with decreasing frequency as the fish grow. The feeding frequency just before release is every two hours during the working day. The daily feeding rate is initially 1.5 % B.W./day for the starter feed and up to 4.0 %

B.W./day for the feed pellets. The weekly weight samples of fish are used to determine the daily amounts of food for the week. Direct estimates of food conversion efficiency are not possible because applicable historical data records have not been kept.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures. Fall chum are reared under the guidance of certified fish health personnel from NWIFC and in accordance with the Co-Manager's Salmonid Disease Control Policy (NWIFC and WDFW 1998). Fish are monitored daily by the hatchery crew for signs of disease by observing feeding and swimming behavior, daily mortality trends and general fish appearance. A fish disease professional inspects the fish after ponding, just prior to release, and at any time the hatchery crew detects any disease or unaccountable stress and requests assistance.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.
Not applicable.

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.
No adverse genetic or ecological effects on listed species are anticipated from rearing of the fall chum. Disease prevention and treatment measures (section 9.2.7) are taken to minimize risk of fish disease transfer to listed species of Hood Canal summer chum and Puget Sound chinook.

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	1,000,000	900 - 1250	April	Enetai Creek
Fry	1,500,000	400	April	Enetai Creek

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

10.2) Specific location(s) of proposed release(s).
Stream, river, or watercourse: Enetai Creek, WRIA 16.0217
Release point: Skokomish Tribal Hatchery
Major watershed: Enetai Creek
Basin or Region: Hood Canal

10.3) Actual numbers and sizes of fish released by age class through the program.
The following table shows total Skokomish Tribal Hatchery release of fall chum from 1988 through 1999.

Release year	Eggs/ Unfed Fry /*	Avg size	Fry (nearest 10K)	Avg size (fish/lb)	Fingerling	Avg size	Yearling	Avg size
1988	.80 million	970-1,070	1.43 million	350-510				
1989	1.22 million	990-1,070	1.20 million	360				
1990	0.86 million	1,000	1.20 million	360				
1991	0.89 million	900	1.20 million	380				
1992	0.19 million	900	1.2 million	440				
1993	0.66 million	900-1,000	0.80 million	580				
1994	0.11 million	1,000	1.67 million	400				
1995			2.64 million	390				
1996	0.10 million	1,000	1.84 million	550				
1997	0.20 million	1,200	0.85 million	400				
1998	0.12 million	1,000	1.82 million	460				

Release year	Eggs/ Unfed Fry /*	Avg size	Fry (nearest 10K)	Avg size (fish/lb)	Fingerling	Avg size	Yearling	Avg size
1999	0.40 million	1,000	1.15 million	400				
Average	0.40 million	1,000 (based on total annual lbs)	1.4 million	410 (based on total annual lbs)				

/* Eggs/Unfed fry column applies in this case to fry released after starting on feed but not rearing to a target release size.

The above table shows production has varied over the years. While it has averaged close to the fed fry production goal of 1.5 million, the average has been less than half the unfed fry production goal of 1.0 million. Some of the variation in production levels over the years is the result of attempting to also meet summer/fall chinook production goals on a limited water supply. (The chinook production program was terminated after 1999.) Fall chum production was increased to 2.64 million fed fry in 1995 when 1994 Hood Canal chinook adult returns were low and no chinook eggs were available for the Skokomish Hatchery. A factor that can cause a reduced production level is low number of adult fall chum returns to the hatchery; however, in almost all years the returns have been in excess of broodstock needs (see table in section 1.12).

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

Ranges of release dates for a recent five years are as follows:

1995	Fed Fry: 4/21 - 5/4	Unfed Fry: no release
1996	Fed Fry: 4/16 – 5/13	Unfed Fry: late March
1997	Fed Fry: 4/26 – 5/4	Unfed Fry: 4/21 – 4/22
1998	Fed Fry: 4/21 – 5/5	Unfed Fry: April
1999	Fed Fry: 4/20 – 4/28	Unfed Fry: 4/8

Fall chum are force released (non-volitional) on selected dates. Release dates are selected when there is a high tide in the evening, to encourage rapid fry exodus and minimize loss of fry by predation.

10.5) Fish transportation procedures, if applicable.

Not applicable.

10.6) Acclimation procedures

Acclimation is in hatchery. Fish are released from Skokomish Tribal Hatchery directly into Enetai Creek .

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

No marks.

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

or approved levels.
None anticipated. All fish on hand will be released after April 1.

10.9) Fish health certification procedures applied pre-release.
A NWIFC fish pathologist examines and certifies the fall chum prior to release.

10.10) Emergency release procedures in response to flooding or water system failure.
Every attempt will be made to avoid early release of fish but in the event of an emergency, fish at buttoned-up stage or later may be released directly into Enetai Creek to avoid or minimize fish losses. The later timing of the stock (originating from late Quilcene stock) reduces the risk of release before April 1.

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.
Fall chum fry are released after April 1 to reduce risk of potential interactions (competition and behavior modification) with Hood Canal summer chum. Disease prevention and treatment measures are taken to minimize risk of fish disease transfer to the listed species of Hood Canal summer chum and Puget Sound chinook.

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.
Record keeping practices to meet monitoring requirements, described under "Performance Indicators" in Section 1.10, are being reviewed. Monitoring procedures and record keeping will be improved or added where appropriate.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.
Currently available funding, staffing, and support logistics are expected to be adequate to meet the monitoring and evaluation requirements described under "Performance Indicators" in section 1.10, except additional funds would be required to support any fall chum otolith marking, mark recovery and analysis.

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.
It is anticipated that adherence to the monitoring and record keeping described in section 1.10 will contribute to the minimum likelihood of any genetic and ecological effects on listed fish. In this regard, records of particular value will be dates of fish release (to verify fall chum releases after April 1 in order to avoid interactions with summer chum in

the estuary) and the reports of fish disease testing and certification (to minimize the risk of fish disease transfer to listed species).

SECTION 12. RESEARCH

Not applicable to this program.

12.1) Objective or purpose.
Not applicable

12.2) Cooperating and funding agencies.
Not applicable

12.3) Principle investigator or project supervisor and staff.
Not applicable

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.
Not applicable

12.6) Dates or time period in which research activity occurs.
Not applicable

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.
Not applicable

12.8) Expected type and effects of take and potential for injury or mortality.
Not applicable

12.9) Level of take of listed 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).
Not applicable

12.10) Alternative methods to achieve project objectives.
Not applicable

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.
Not applicable

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.
Not applicable

SECTION 13. ATTACHMENTS AND CITATIONS

Allendorf, F.W., D. Bayles, D.L. Bottom, K.P. Currens, C.A. Frissell, D. Hankin, J.A. Lichatowich, W. Nehlsen, P.C. Troter, and T.H. Williams. 1997. Prioritizing Pacific salmon stocks for conservation. Conservation Biology Vol. 11 No. 1 p. 140-152.

Johnson, O.W., W.S. Grant, R.G. Kope, K. Neely, F.W. Waknitz and R.S. Waples. 1997. Status Review of Chum Salmon from Washington, Oregon, and California. NOAA Technical

Memorandum NMFS-NWFSC-32. 255 p., plus Appendix.

Myers, J.M., R.G. Kope, G. J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley and R.S. Waples. 1998. NOAA Technical Memorandum NMFS-NWFSC-35. 443 p.

Northwest Indian Fisheries Commission and Washington Department of Fish and Wildlife. 1998. Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State. Revision effective March 17, 1998. 22 p.

Point No Point Treaty Council and Washington Department of Fish and Wildlife. 1999. 1999 Management Framework Plan and Salmon Run's Status for the Hood Canal Region. 38 p.

Washington Department of Fisheries, Washington Department of Wildlife, and Western Washington Treaty Indian Tribes. 1993. 1992 Washington State Salmon and Steelhead Stock Inventory. Olympia. 212 p.

Washington Department of Fish and Wildlife and Point-No-Point Treaty Tribes. 2000. Summer Chum Salmon Conservation Initiative. An Implementation Plan to Recover Summer Chum salmon in the Hood Canal and Strait of Juan de Fuca. Jim Ames, Gary Graves, Chris Weller editors. 424 p., plus 3 Appendices.

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:
Chris Weller, Fish Biologist, Point No Point Treaty Council

Certified by_____ Date

NOT APPLICABLE. Risk of take is very low and no reasonable quantified estimates of take can be made. See section 2.2.3.

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

Listed species affected: Summer chum salmon ESU/Population: Hood Canal Summer Chum ESU / Union River Activity: Supplementation

Location of hatchery activity: George Adams Hatchery / Union River trap/ Huson Spring facility
Dates of activity: August -May Hatchery program operator: WDFW, Hood Canal Salmon Enhancement Group

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)				
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)				
Other Take (specify) h)				

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

Instructions:

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