HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Quilcene National Fish Hatchery Yearling coho salmon production
Species or Hatchery Stock:	Coho salmon, *Oncorhynchus kisutch*, Quilcene Stock
Agency/Operator:	U.S. Fish and Wildlife Service
Watershed and Region:	Hood Canal, Puget Sound WRIA 17 Big Quilcene River
Date Submitted:	1/31/2005
Date Last Updated:	1/31/2005

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Quilcene National Fish Hatchery

Big Quilcene River coho salmon production, yearling smolts

Quilcene Bay Netpen coho salmon production, transferred as yearling pre-smolts

Port Gamble Bay Netpen coho salmon production, transferred as eyed eggs.

Further responses in this HGMP will reference only the hatchery on-station yearling smolt production. Responses concerning the netpen transfers are expected to be provided by the agencies releasing those fish.

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

Coho salmon, *Oncorhynchus kisutch,* Quilcene Stock - not listed

1.3) Responsible organization and individuals

Name (and title): Ron Wong, Hatchery Manager
Agency or Tribe: U.S. Fish and Wildlife Service
Address: 281 Fish Hatchery Road
Telephone: 360-765-3334 or 3330
Fax: 360-765-3398
Email: ron_wong@fws.gov

Other agencies, Tribes, co-operators, or organizations involved, including contractors:

Washington Department of Fish and Wildlife
Skokomish Tribe
Port Gamble S'Klallam Tribe
Point-No-Point Treaty Council
Lower Elwha Tribe
City of Port Townsend,
Jefferson County Conservation District
Port Townsend paper mill
Long Live the Kings
Hood Canal Salmon Enhancement
NOAA-Fisheries

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

Source – US Fish and Wildlife Service base funding
6 full-time staff
$422,000 fiscal year 2004, US Fish and Wildlife Service base funding

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

Quilcene NFH, on-station: Washington, Hood Canal, Jefferson County,

rivermile 2.8 of Big Quilcene River
3F10412 170012 H – PSC database location code
122.8610°N 47.8189°W

Quilcene Bay netpens: Washington, Hood Canal, Quilcene Bay, Jefferson County
3M10412 888402 H – PSC database location code

George Adams State Fish Hatchery, Hood Canal, Purdy Creek, Mason County**,**
3F10412 160005 H - PSC database location code

Port Gamble Bay Netpens, Port Gamble Bay, Kitsap County
3M10409 888401 H - PSC database location code

1.6) Type of program.

Isolated Harvest

1.7) Purpose (Goal) of program.

The goal of this program is to augment coho harvest opportunities coastwide and in northern Hood Canal waters using the Quilcene stock.

1.8) Justification for the program.

Quilcene NFH - release 400,000 smolts per year, making over 16,000 fish available to the coastwide harvest.
On-station releases will be of actively migrating smolts, released after April 15 to avoid interactions with summer chum salmon (ESA listed, threatened) in the river and Quilcene Bay.

Quilcene Bay Netpens **–** provide up to 200,000 pre-smolts per year to the Skokomish tribe for subsequent rearing to smolt.

Port Gamble/George Adams SFH - provide 500,000 Quilcene stock eyed eggs for incubation & rearing for marine netpen production.

1.9) List of program "Performance Standards".

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

1.10.1) "Performance Indicators" addressing benefits.

1.10.2) "Performance Indicators" addressing risks.

Performance Standard	Performance Indicator		Monitoring and Evaluation Plan
		Addresses "risk" or "benefit"	
Produce adult fish for harvest	Survival rate, contribution rate	Benefit	Monitor catch and CWT recoveries
Meet hatchery smolt production goal	Release 400,000 smolts annually	Benefit	FBD, CWT release database, FRED database

Allow upstream passage above hatchery weir	Pass 300 coho pairs annually	Benefit	Hatchery records, FRED database
Minimize interactions with listed fish through proper broodstock management. Maximize hatchery adult capture effectiveness.	Number of broodstock collected – 1,200	Benefit	Hatchery records, FRED database
	Stray rates	Risk	
	Sex ratios		Hatchery records, FRED database
	Age structure		Hatchery records, FRED database
	Timing of adult collection and spawning	Benefit	Hatchery records, FRED database
	Adhere to spawning guidelines (sec. 8.3)	Benefit	
Minimize interactions with listed fish through proper rearing and release strategies	Release juveniles as smolts	Benefit & risk	Hatchery records, FRED database
	Outmigration timing of listed fish – summer chum, Feb-Mar hatchery fish - after April 15	Risk	Hatchery records, FRED database
	Size and time of release – average 17 fpp (27g), usually in mid-May	Benefit & Risk	Hatchery records, FRED database, CWT releases database
Maintain stock integrity and genetic diversity	Effective population size > 500	Risk	Hatchery records, FRED database
	Maintain stock without out-of-basin transfers	Risk	Hatchery records, FRED database
Maximize in-hatchery survival of broodstock and their progeny; and Limit the impact of pathogens associated with hatchery stocks on listed fish.	Fish health specialists will monitor the health of the hatchery populations regularly and recommend preventive measures to maintain fish health.	Benefit & risk	FWS Fish Health Policy, Co-Managers' Disease Policy
	All hatchery populations will be inspected before release to ensure adherence to relevant fish health policies.	Benefit & risk	FWS Fish Health Policy, Co-Managers' Disease Policy

Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Risk	Monthly NPDES records and reports
Operate hatchery water intakes in compliance with WADOE water rights permits	DOE compliance	Risk	Hatchery records, reports to DOE

FBD – Future Brood Document
FRED – Fisheries Resources Evaluation Database
DOE – Washington Department of Ecology

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish). 1,200 adults to achieve on-station goal and egg and pre-smolt transfer goals.

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

Life Stage	Release Location	Annual Release Level
Eyed Eggs	-	0
Unfed Fry	-	0
Fry	-	0
Fingerling	-	0
Yearling	Big Quilcene River, at hatchery	400,000

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

Quilcene NFH coho adults (3 year), from CWT recoveries

Broodyear	smolt:adult survival	total adults produced	escapement to hatchery rack	harvested adults
1989	2.57%	9,071	2,066	7,005
1990	4.03%	20,178	7,511	12,667
1991	9.39%	37,338	13,055	24,283
1992	5.32%	21,322	12,183	9,139
1993	3.60%	15,300	6,248	9,052

1994	4.74%	24,834	19,072	5,762
1995	2.83%	12,050	7,898	4,152
1996	1.04%	4,804	4,253	551
1997	3.89%	16,580	11,312	5,268
1998	4.40%	16,971	10,448	6,523
1999	4.50%	19,166	15,436	3,730
2000	3.70%	16,480	10,777	5,703
mean	4.17%	17,841	10,022	7,820

Source: hatchery records, FRED database, CWT coastwide database

1.13) Date program started (years in operation), or is expected to start.
On-station releases - 1912
Quilcene Bay netpens - 1994
Port Gamble netpens - 1993

1.14) Expected duration of program.
continuous

1.15) Watersheds targeted by program.
Big Quilcene River, WRIA 17

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

2.1) List all ESA permits or authorizations in hand for the hatchery program.
Section 7 Endangered Species Act Consultation No. F/NWR/1999/01863; Biological Opinion on Artificial Propagation in the Hood Canal and Eastern Strait of Juan de Fuca Regions of Washington State, dated March 4, 2002.

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

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

Reference the Summer chum salmon Conservation Initiative and subsequent supplemental reports as detailed at: http://www.wdfw.wa.gov/fish/chum/chum.htm

The primary historic spawning area for summer chum in the Big Quilcene River is from

the mouth to RM 1.5.

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

none

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

  Hood Canal summer chum salmon
  Puget Sound Chinook salmon – potential impacts in the estuary and Puget Sound.

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

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

Reference the Summer chum salmon Conservation Initiative and subsequent supplemental reports as detailed at: http://www.wdfw.wa.gov/fish/chum/chum.htm

- 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.

Reference the Summer chum salmon Conservation Initiative and subsequent supplemental reports as detailed at: http://www.wdfw.wa.gov/fish/chum/chum.htm

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

Reference the Summer chum salmon Conservation Initiative and subsequent supplemental reports as detailed at: http://www.wdfw.wa.gov/fish/chum/chum.htm

- **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.**

Reference the Summer chum salmon Conservation Initiative and subsequent supplemental reports as detailed at: http://www.wdfw.wa.gov/fish/chum/chum.htm

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of NMFS listed fish in the

target area, and provide estimated annual levels of take

- 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.

Operation of the hatchery weir and fish ladder may result in the entry of summer chum into the hatchery. This event is avoided by setting the height of first jump to be greater than the jumping capability of summer chum but within the jumping capability of coho (> 23 inches). Chinook have not been encountered.

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

No known past take due to conduct of the coho production program. Authorized take occurred during conduct of the hatchery summer chum supplementation program, which was discontinued following the 2003 brood – in accordance with the Summer Chum Salmon Conservation Initiative.

- **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.

Any listed fish that might enter the hatchery are returned to the river alive.

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.

The Quilcene NFH coho production program is consistent with Summer Chum Salmon Conservation Initiative (WDFW and PNPTT 2000) and the described protocols for hatchery releases.

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 Quilcene NFH coho production program is operated as an element of the Hood Canal Salmon Management Plan, which is a part of the Puget Sound Salmon Management Plan – both resulting from the settlement of US v. Washington.

Secretarial Order #3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act

Quilcene NFH Authorization 35 Stat. 589, dated June 29, 1909

US Fish and Wildlife Service – Fisheries Strategic Plan
http://pacific.fws.gov/Fisheries/Docs/Pacific%20Region%20Step%20Down%20Plan.pdf

1982 Cooperative Agreement between the FWS and the Bureau of Indian Affairs for distribution of excess adults to tribes.

1991 Memorandum of Understanding between the FWS and the U.S. Department of Justice for processing of excess adults for inmate food programs.

3.3) Relationship to harvest objectives.

Tribal and non-Indian commercial and recreational fisheries directed at coho and other species produced through FWS hatchery releases will be managed to minimize incidental effects to listed chinook salmon and summer chum salmon. Time and area, gear-type restrictions, and chinook and summer chum release requirements will be applied to reduce takes of listed salmon in the Hood Canal mainstem, extreme terminal marine area, and river areas where these fisheries directed at other hatchery species occur. Compliance with the fisheries management strategy defined in the SCSCI will lead to fisheries on hatchery-origin stocks that are not likely to adversely affect listed chinook or listed summer chum.

Each year, state, federal and tribal fishery managers plan the Northwest's recreational and commercial salmon fisheries. This pre-season planning process is generally known as the North of Falcon process, which involves a series of public meetings between federal, state, tribal and industry representatives and other concerned citizens. The North of Falcon planning process coincides with meetings of the Pacific Fishery Management Council, which sets the ocean salmon seasons at these meetings.

The PFMC/North of Falcon process is conducted for management of salmon-directed marine and freshwater fisheries. Each year, preseason forecasts are made of the abundance of individual fish stocks. These forecasts can be based on a number of factors, such as juvenile outmigration abundance, spawning escapement, hatchery returns, terminal area fishery samples, and historic returns. Taken together, these numbers provide an indication of the strength of the upcoming season's populations. The forecast is added to a base of information on the historic run-size strength and fishery impacts for the fish populations. The primary tool used to develop this base of

information for chinook salmon is CWTs.

This information is then input into computer models, which estimates potential catches for each stock under various fishing regulation options. Results from these computer simulations are then compared to conservation goals, obligations under U.S.-Canada treaties, treaty tribe and non-treaty allocations, and protection requirements for some wild fish populations under the ESA. Conservation goals are set jointly by state and tribal co-managers, and are based on the best available scientific information on the number of fish a given stream is capable of supporting and the number of recruits that can be produced by each pair of spawning adults. Conservation goals are designed to ensure that enough fish survive harvest in order to spawn and perpetuate the long-term health and existence of the run.

Fishing season options are developed each year in the late winter and early spring, and are set by the end of April. Because state fishing activities affect species that migrate over thousands of miles, co-managers participate in three separate harvest management panels:
! The Pacific Salmon Commission, which consists of representatives Alaska, Washington, Oregon, Canada, the treaty tribes of Washington and the Columbia River, and the federal government. Panels and technical committees within the commission address specific ocean fisheries. ! The Pacific Fisheries Management Council (PFMC), which includes the principal fisheries officials from Alaska, Washington, Oregon, California, the regional director of NMFS, and eight private citizens appointed by the U.S. Secretary of Commerce. The Council jointly manages coastal fisheries, including salmon and groundfish, from three to 200 miles off shore. The season-setting process occurs in a series of public meetings. ! The North of Falcon public planning forum, in which state, tribal, and federal fish managers meet with commercial and recreational fishing industry representatives and other concerned citizens, in tandem with PFMC deliberations on ocean seasons, to set salmon fisheries for Puget Sound and waters within three miles of the Washington and northern Oregon coasts. The season setting process occurs following a series of public meetings each spring.

Except where specifically authorized, according to the management framework developed within the annual PFMC/North of Falcon agreements, salmon fisheries are closed. The PFMC/North of Falcon process includes the analysis of impacts to salmon stocks of concern, including those to ESA-listed salmon ESUs.

For example, during 2000 as an outcome of the North of Falcon process, the state/tribal Puget Sound Chinook Harvest Management Plan (enclosed in letter from Billy Frank, Jr., NWIFC and Jeff Koenings, WDFW to Will Stelle, NMFS, dated February 15, 2000) contained proposals for the 2000/2001 fishing season.

For the 2003/2004 season, the co-manager's have prepared a Harvest Management Plan for Puget Sound Chinook Salmon.. The Plan states specific objectives for harvest of the 15 Puget Sound management units, the technical bases for these objectives, and procedures for their implementation. The Plan assures that the survival and recovery of

the Puget Sound ESU will not be impeded by fisheries-related moratlity. The Plan was submitted with the expectation that NMFS will reach a finding, based on the conditions stated in the 4(d) rule, that fisheries-related take in Washington waters is exempt from prohibition under Section 9 of the ESA. NMFS reviewed and approved the Plan.

Forecasts and management recommendations for Hood Canal hatchery and wild coho are prepared and reported annually by State and Tribal co-managers (for example, see PNPTC and WDFW 2004).

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.

Quilcene NFH coho adult (3 year old) harvest, derived from CWT recoveries

Broodyear	harvested adults	US Sport	US net & troll	Canada sport	Canada net & troll	Overall harvest rate
1989	7,005	1,945	476	613	3,970	77.2%
1990	12,667	3,827	560	510	7,762	62.8%
1991	24,283	40	6,567	1,878	15,798	62.0%
1992	9,139	309	1,934	381	6,514	42.9%
1993	9,052	1,452	1,028	1,559	5,014	59.2%
1994	5,762	3,142	1,218	1,380	23	23.2%
1995	4,152	2,179	1,973	0	0	34.5%
1996	551	345	206	0	0	11.5%
1997	5,268	1,478	3,790	0	0	31.8%
1998	6,523	5,020	1,410	93	1	38.4%
1999	3,730	1,446	2,285	0	0	19.5%
2000	5,703	4,763	940	0	0	34.6%
mean	7,819	2,162	1,866	534	3,257	41.7%

Source: hatchery records, FRED database, CWT coastwide database

Cumulative incidental harvest rates to listed summer chum in all fisheries (Canadian and US) are targetted to remain below 10.9%

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

3.5) Ecological interactions. [Please review Addendum A before completing this section. If it is necessary to complete Addendum A, then limit this section to NMFS jurisdictional species. Otherwise complete this section as is.]
Describe salmonid and non-salmonid fishes or other species that could (1) negatively impact program; (2) be negatively impacted by program; (3) positively impact program;

and (4) be positively impacted by program. Give most attention to interactions between listed and "candidate" salmonids and program fish.
Summer chum produced naturally in the Quilcene River serve as prey for resident fishes in the local freshwater and estuarine systems. Predators likely include cutthroat trout, juvenile coho, and sculpin. Juvenile coho are released from the hatchery in mid-May, well after the emigration period for summer chum juveniles.

Competition for food resources in the estuary may occur between summer chum and pink salmon fry, and summer chum and hatchery fall chum released from other Hood Canal sources.

Coho and fall chum spawn in the Quilcene River after summer chum have spawned. The extent and areas of natural coho spawning are undocumented and need examination, but are likely very limited. Fall chum spawn in large numbers, in November and December, when flows are greatly increased over the flows during the summer chum spawning period. Under these high flow conditions, fall chum have spawning areas available that were dry during the summer chum spawning period, reducing the level of redd superimposition. The race of fall chum in the Big Quilcene River generally emerges from the gravel and migrates to the estuary after the period of summer chum emigration.

Harbor seals may be significant predators on returning summer chum adults.

No direct or indirect take of listed summer chum or listed chinook salmon is anticipated due to the conduct of this hatchery program.

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.
For integrated programs, identify any differences between hatchery water and source, and "natal" water used by the naturally spawning population. Also, describe any methods applied in the hatchery that affect water temperature regimes or quality. Include information on water withdrawal permits, National Pollutant Discharge Elimination System (NPDES) permits, and compliance with NMFS screening criteria.

Penny Creek, a tributary to the Big Quilcene River, is used for incubation and early rearing. The water temperature is slightly higher than Big Quilcene River, but exhibits a naturally varying seasonal and diurnal temperature profile. Later hatchery rearing stages, are completed on mixed Big Quilcene/Penny Creek water, Big Quilcene River is the primary component of rearing water at the final stage of hatchery rearing.

Quilcene NFH holds the following certificates for appropriation of surface waters:

Penny Creek – S2-01218C – 10 cfs
Penny Creek – S2-10233 – 15 cfs

Big Quilcene River – S2-07466C – 15 cfs
Big Quilcene River – S2-28179 – 25 cfs, with seasonal provisions to maintain flow in the reach bypassed between the hatchery intake and the hatchery discharge (50 cfs from July 1 – January 31 and 83 cfs from February 1 – June 30)
Durdle Creek – S2-10232C – 0.2 cfs

Quilcene NFH holds the following certificates for appropriation of ground waters:

G2-04876C – 320 gpm
G2-07275C – 19 gpm, 4.0 acre feet per year

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.

Listed fish, summer chum salmon or Chinook salmon, do not occur above the hatchery weir, thus are not subject to take through the hatchery intake system. Water withdrawn from the Big Quilcene River is pre-settled in a concrete basin to reduce sediments entering the raceways. A rotating drum screen system prevents naturally produced fish from entering the rearing system and shunts them to piping that returns them to the river.

Hatchery effluent is settled in a retention pond and discharged in accordance with NPDES permit # WA-000187-2. Effluent is monitored weekly for settleable and suspended solids and reported monthly to the Environmental Protection Agency. Quilcene NFH routinely complies with the limits of its existing NPDES permit.

SECTION 5. FACILITIES

Provide descriptions of the hatchery facilities that are to be included in this plan (see "Guidelines for Providing Responses" Item E), including dimensions of trapping, holding incubation, and rearing facilities. Indicate the fish life stage held or reared in each. Also describe any instance where operation of the hatchery facilities, or new construction, results in destruction or adverse modification of critical habitat designated for listed salmonid species.

5.1) Broodstock collection facilities (or methods).
Broodfish enter the hatchery via a fish ladder associated with a graduated-field electric weir that spans the river. Adults ascend the ladder and enter a collection channel, which is the outflow channel for the lowermost bank of raceways. Two of these raceways are used for adult holding of segregated males and females.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).
Adult coho that are passed upstream to spawn naturally are transported in a large plastic tote (~250 gals.) in the back of a pickup. The trip lasts less than 15 minutes, so no supplemental oxygen is used.

5.3) Broodstock holding and spawning facilities.

Broodfish enter the hatchery via a fish ladder associated with a graduated-field electric weir that spans the river. Adults ascend the ladder and enter a collection channel, which is the outflow channel for the lowermost bank of raceways. Two of these raceways are used for adult holding of segregated males and females. Spawning is conducted under a portable garage – frame-and-cover structure.

5.4) Incubation facilities.

Basket/trough incubation sytems are used to incubate fertilized eggs to the eyed stage. Heath style vertical stack incubators are used to hatch eyed eggs. A separate egg isolation building is available to incubate eggs brought in from other watersheds.

5.5) Rearing facilities.

The main hatchery facilities consist of 39 - 8'x 80' concrete raceways, three water intake structures, a pre-settling pond, a pollution abatement pond, a hatchery building (containing the office, laboratory, and tank room), an egg isolation building, a service/shop building, a domestic water tank, three residences, and one temporary residence ("little cabin").

5.6) Acclimation/release facilities.

Fish are released directly to the river through the discharge piping, open channel, and fish ladder.

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

In recent history a debris torrent in Penny Creek interrupted flow to the incubation water supply, resulting in the loss of many eggs.

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 has an alarm system that uses a computer to control, with notification through dedicated radio frequency; audible horns, lights, and a telephone dialer. There are numerous redundant low water alarms that can signal problems (this will eliminate fish loss due to a single faulty sensor). The alarm system is connected to a UPS (uninterrupted power supply) to operate during power outages.

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 original source population is local coho returning to the Big Quilcene River and Little Quilcene River, beginning in 1911.

6.2) Supporting information.

6.2.1) History.

Provide a brief narrative history of the broodstock sources. For listed natural populations, specify its status relative to critical and viable population thresholds (use section 2.2.2 if appropriate). For existing hatchery stocks, include information on how and when they were founded, sources of broodstock since founding, and any purposeful or inadvertent selection applied that changed characteristics of the founding broodstock.

Known importation of outside stocks, by broodyear:

1922, 1924 - Skykomish
1923 – Skagit
1925 - unspecified WA Dept. Fisheries
1927-1930 – Quinault
(The production program from 1911 through 1934 broods focused on fry and sub-yearling releases, with limited success. Beginning with the 1935 brood, production focused on yearling releases)
1965, 1968 - Quinault
1962 - Dungeness SFH
1959 - Eagle Creek (OR)
1942 - unspecified WA Dept. Fisheries
1973 - George Adams SFH

There may have been inadvertent selection in past years that has resulted in advanced return timing for Quilcene stock coho adults. While this affords a unique harvest opportunity, it does create an overlap of returning coho adults with returning summer chum salmon adults in Quilcene Bay. Harvest methods in Quilcene Bay have been modified to address and limit any incidental harvest impacts to summer chum. Recent questions raised in the Hatchery Scientific Review forum have led to the consideration of stock replacement at Quilcene NFH, which could – depending on the replacement stock chosen – reduce the run-timing overlap. The run-timing overlap may also be addressed through intentional selection for later-returning components if the current Quilcene stock is maintained.

6.2.2) Annual size.

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

This is an isolated harvest program. The limited spawning that occurs below the hatchery is comprised of returning hatchery fish. Hatchery adults are passed upstream to provide increased fish for augmentation, not to create an integrated natural population.

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

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

6.2.4) Genetic or ecological differences.

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

6.2.5) Reasons for choosing.
Describe any special traits or characteristics for which broodstock was selected.

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.
(e.g. "*The risk of among population genetic diversity loss will be reduced by selecting the indigenous chinook salmon population for use as broodstock in the supplementation program*.").
There may have been inadvertent selection in past years that has resulted in advanced return timing for Quilcene stock coho adults. While this affords a unique harvest opportunity, it does create an overlap of returning coho adults with returning summer chum salmon adults in Quilcene Bay. Harvest methods in Quilcene Bay have been modified to address and limit any incidental harvest impacts to summer chum. Recent questions raised in the Hatchery Scientific Review forum have led to the consideration of stock replacement at Quilcene NFH, which could – depending on the replacement stock chosen – reduce the run-timing overlap. The run-timing overlap may also be addressed through intentional selection for later-returning components if the current Quilcene stock is maintained. Planning for the appropriate courses of action is on-going with the co-managers.

SECTION 7. BROODSTOCK COLLECTION

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

7.2) Collection or sampling design.
Include information on the location, time, and method of capture (e.g. weir trap, beach seine, etc.) Describe capture efficiency and measures to reduce sources of bias that could lead to a non-representative sample of the desired broodstock source.
1,200 adults collected over the breadth of the returning run timing.

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

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):
1,200 adults collected over the breadth of the returning run timing.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:
Numbers reflect fish actually used in spawning.

Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1992	529	527	44	0	0
1993	849	844	19	0	0
1994	628	623	6	0	0
1995	642	610	12	0	0
1996	555	552	7	0	0
1997	683	675	18	0	0
1998	676	644	33	0	0
1999	704	689	15	0	0
2000	550	534	32	0	0
2001	480	471	11	0	0
2002	650	634	19	0	0
2003	568	553	11	0	0

Data source: FRED database – table FISH_REM

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.
Spawned and surplus coho are disposed of in a variety of ways. Adults that were treated with chemicals to control fungus during holding or are otherwise unfit for human consumption are buried on hatchery property. Adults that are surplus to spawning needs and are fit for human consumption are distributed to local tribes for subsistence via a 1982 Cooperative Agreement between the FWS and the Bureau of Indian Affairs, or to the Bureau of Prisons for inmate meals via a 1991 Memorandum of Understanding between the FWS and the U.S. Department of Justice.

7.6) Fish transportation and holding methods.
Adult fish that are passed upstream to spawn naturally are transported in a large plastic tote (~250 gals.) in the back of a pickup. The trip lasts less than 15 minutes, so no supplemental oxygen is used.

7.7) Describe fish health maintenance and sanitation procedures applied.
Adults that are held for spawning are treated with hydrogen peroxide (37% solution) drips three times weekly to control fungus. Fish are treated at 250 ppm during a fifteen minute flow-through treatment. A minimum of 150 ovarian fluids sampled over the

entire run, and at least 60 male kidney/spleen samples taken, *however,* because of the potential for change in the policy we will also sample at a rate consistent with the Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State.

7.8) Disposition of carcasses.

Adults that were treated with chemicals to control fungus growth during holding or are otherwise unfit for human consumption are buried on hatchery property. Adults that are surplus to spawning needs and are fit for human consumption are distributed to local tribes for subsistence via a 1982 Cooperative Agreement between the FWS and the Bureau of Indian Affairs, or to the Bureau of Prisons for inmate meals via a 1991 Memorandum of Understanding between the FWS and the U.S. Department of Justice

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.

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

SECTION 8. MATING

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

8.1) Selection method.

Specify how spawners are chosen (e.g. randomly over whole run, randomly from ripe fish on a certain day, selectively chosen, or prioritized based on hatchery or natural origin).
Coho selected for spawning are removed from the returning fish weekly throughout the return period. The targetted number per week follows an estimated Normal distribution, with the total held meeting the broodstock target. Fish are randomly removed from the returning population with selection occurring only to avoid keeping fish with obvious wounds (seal bites, fishery wounds, lesions) that might compromise the ability of the fish to survive to spawning.

8.2) Males.

Matings occur in separate stainless steel buckets, with each female fertilized with a single male. Jacks are used at a targetted rate of 10% of the spawning population. Backup males are not used, survival rates to eye are high, exceeding 85%.

8.3) Fertilization.

Describe spawning protocols applied, including the fertilization scheme used (such as equal sex ratios and 1:1 individual matings; equal sex ratios and pooled gametes; or factorial matings). Explain any fish health and sanitation procedures used for disease prevention.

After sperm is added to the eggs Penny Creek water is immediately added for fertilization and the eggs are set aside for at least one minute. Fertilized eggs that have set for one minute are pooled (eggs from six females) into one bucket for washing (rinsing), with the

last rinse using the same concentration of iodine used in water hardening. The next thirty 30 minutes of the water-hardening process occurs in a solution of 75ppm povidone iodine to surface-disinfect the eggs. Spawning buckets are washed in strong iodine solution, rinsed, and drained before subsequent use in another mating. Eggs are incubated to the eyed stage in the hatchery builkding in wire baskets containing twelve coho females' eggs per basket.

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.

There is potential for adult run timing overlap of coho salmon and summer chum salmon, which may increase the vulnerability of summer chum to coho harvests in Quilcene Bay. Harvest methods have been modified to reduce incidental harvest of summer chum. Methodologies to address the overlap through coho stock replacement or genetic manipulation of run timing are being investigated.

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.

Broodyear	Eggs taken	Number eyed	% eyed
1991	787,158	684,600	87.0%
1992	824,990	591,361	71.7%
1993	1,421,107	1,243,085	87.5%
1994	1,456,978	1,445,604	99.2%
1995	1,633,461	1,515,250	92.8%
1996	1,365,566	1,238,075	90.7%
1997	1,293,758	1,172,625	90.6%
1998	1,741,222	1,614,994	92.8%
1999	1,842,283	1,725,100	93.6%
2000	1,545,681	1,437,841	93.0%
2001	1,295,653	1,231,905	95.1%
2002	1,805,121	1,638,359	90.8%

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

Describe circumstances where extra eggs may be taken (e.g. as a safeguard against potential incubation losses), and the disposition of surplus fish safely carried through to the eyed eggs or fry stage to prevent exceeding of programmed levels.

Variable fecundity from year to year can lead to surplus egg takes. Once eggs are eyed, and accurate enumerations are made, surplus eggs are destroyed to minimize over-production of hatched fry.

9.1.3) Loading densities applied during incubation.

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

9.1.4) Incubation conditions.

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

Approximately 30,000 green eggs are incubated per basket, with 10 baskets per trough, making 300,000 eggs per full trough. Normal flow is set at 10 gpm. During formalin treatment (1:6000), flow is reduced to 5 gpm for the fifteen minute treatment. Vertical style Heath incubators, set at 4gpm are used, from the eyed egg stage to hatching. Approximately 4,000 eyed eggs are placed into each of the trays in the Heath incubator with three layers of plastic mesh (vexar). The vexar gives the hatched fry more support in the incubator drawer and produces a larger fry compared to not using the vexar. Use of vexar is also thought to help to reduce coldwater disease.

9.1.5) Ponding.

After hatched fry have absorbed their yolksac (buttoned up), they are placed directly into outdoor 8 ft x 80 ft concrete raceways. Fish remain in these raceways until release.

9.1.6) Fish health maintenance and monitoring.

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

Good fish culture practices are employed to optimize the health of the fish while on station. This starts at spawning with careful handling of adults and eggs and continues through release of the fish. Specifically this includes gentle handling of all life stages, the use of disinfectant agents for articles used in the raceways such as brushes, nets, crowders, and waders, and maintaining detailed records on water flows, temperatures, densities, mortality, and growth. Attention is also given to other environmental conditions which enhance the health of the fish such as cleaning, feed quality, dissolved oxygen, shade/cover, etc.

The Service policy on Fish Health (part 713 of the FWS Manual) is used as a minimal standard for fish health sampling, record keeping, and egg and fish handling for transport into or out of the facility. Diagnostic monitoring is performed by OFHC personnel at least once per month throughout the rearing cycle. The State of Washington Fisheries Co-manager Fish Health Policy (Northwest Indian Fisheries Commission et al. 1997) is also followed as appropriate. Carcasses of adult and juvenile fish are disposed of or released in a manner which minimizes any negative impact on wild fish populations or the aquatic environment.

Operations are conducted to minimize the use of therapeutic drugs and chemicals and to comply with conditions of the National Pollutant Discharge Elimination System (NPDES) permit.

Major handling stresses such as crowding, tagging, clipping, and transport are kept to a minimum

and whenever possible conducted when water temperatures are low and nutritional status is adequate. These actions optimize the ability of the fish to handle stress without causing an adverse reaction such as a disease outbreak.

Fish culture practices such as density and nutrition and environmental conditions, such as raceway cover and water quality, will continue to be assessed and adjusted at Quilcene NFH to increase the health of the fish while in the hatchery and decrease as much as possible the use of therapeutic drugs and chemicals. These practices will provide the highest quality fish and eggs possible to tribal and state programs, as well as high quality smolts that will have a minimal impact on naturally reproducing fish populations in the watershed.

Quilcene NFH partners with the Service's National Investigative New Animal Drug Office in Bozeman, Montana, and the U.S. Geological Survey's (USGS) Upper Mid-West Environmental Science Center in LaCrosse, Wisconsin, regarding the National Aquaculture Drug Registration Project. Together, the hatchery and its partners have conducted three studies that have been recognized by the Federal Food and Drug Administration Center for Veterinary Medicine as Pivotal Studies in support of Investigational New Animal Drug Registrations. These studies are: 1) Efficacy of Chloramine-T in the treatment of Bacterial Gill Disease; 2) Residue depletion time of Oxytetracycline in coho salmon in water temperatures below 9^{o} C; and 3) Efficacy of Oxytetracycline to treat Coldwater Disease in coho salmon.

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. (*e.g. "Eggs will be incubated using well water only to minimize the risk of catastrophic loss due to siltation.")*

The Egg Isolation building uses well water that has a back-up generator for power outages. The effluent is treated (chlorinated/dechlorinated) to minimize the risk of transmission of any potential disease from eggs brought in from other watersheds.

9.2) Rearing:

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

Quilcene NFH coho salmon production.

Broodyear	eyed eggs	pre-smolts transferred or released	smolts released	total production as % of eyed eggs
1991	669,153	195,780	397,701	89%
1992	591,361	182,118	400,700	99%
1993	865,835	218,000	425,334	74%
1994	774,802	54,000	523,988	75%
1995	1,015,250	407,183	425,971	82%
1996	828,450	289,730	452,203	90%
1997	722,631	190,006	437,222	87%
1998	837,429	233,883	368,400	72%
1999	776,100	211,165	428,994	82%
2000	654,814	212,200	411,674	95%

2001	673,663	180,187	388,212	84%
2002	793,437	202,335	404,582	76%

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

Include density targets (lbs fish/gpm, lbs fish/ft3 rearing volume, etc).

Every attempt is made to split raceways in advance of the density index reaching 0.20, in consideration of the total weight of fish in the rearing vessel, the vessel's rearing volume, and oxygen intake of the fish as related to their size (Piper et al. 1982). Availability of water can be a constraint in this regard. Depending on growth, every attempt is made to release the fish before this density limit is reached. Inevitably, a large number of fish must be reared in re-used water for much of their hatchery residence, but regular cleaning, improved feeds, and regular diagnostic checks by the Olympia Fish Health Center prevent or minimize the onset of disease. Target size for coho salmon release is between 15 and 20 fish/lb (23-30g).

9.2.3) Fish rearing conditions

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

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

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

Contrast fall and spring growth rates for yearling smolt programs. If available, indicate hepatosomatic index (liver weight/body weight) and body moisture content as an estimate of body fat concentration data collected during rearing.

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

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

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

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

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

n/a – listed fish are not under propagation.

SECTION 10. RELEASE

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

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

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs	0			
Unfed Fry	0			
Fry	0			
Fingerling	0			
Yearling	400,000			

10.2) Specific location(s) of proposed release(s).
Stream, river, or watercourse: Big Quilcene River at Penny Creek mouth
Release point: (*river kilometer location, or latitude/longitude*)
Major watershed: Big Quilcene River
Basin or Region: Hood Canal

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

Quilcene NFH coho production; during these years production was programmed for 450,000 on-station yearling smolts, and up to 25,000 upstream fry in lieu of adult passage. Current production calls for 400,000 upstream smolts and upstream passage of up to 500 adults.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size Fish per pound	Fingerling	Avg size Fish per pound	Yearling	Avg size Fish per pound
1993	0		24,500	570	0		397,701	19.7
1994	0		0		0		400,700	20.1
1995	0		0		54,000	30.6	425,334	15.2
1996	0		181,895	858	0		523,988	21.1
1997	0		50,000	357	0		425,971	15.7
1998	0		0		0		452,203	18.6
1999	0		24,975	281	0		437,222	17.7

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size Fish per pound	Fingerling	Avg size Fish per pound	Yearling	Avg size Fish per pound
2000	0		24,974	454	0		368,400	19.0
2001	0		0		0		428,994	19.6
2002	0		0		0		411,674	20.3
2003	0		0		0		388,212	22.3
2004	0		0		0		404,582	21.1
Average	0		25,529	568	4,500	30.6	422,082	19.0

Data source: Hatchery records, FRED database, RMIS database

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

Quilcene NFH coho production release dates for 2000-2004. Smolts are released by forcing from the ponds. Fry are released by trucking upriver to approximately rivermile 4. Release is timed so that most of the smolts will reach the estuary near the height of the tide and under the cover of darkness. The entire release usually takes a couple of hours. The smolts are forced out by repeated flushing of the raceways.

Release year	Fry	Smolts
2000	3/21/2000	4/28-5/10/2000
2001	n/a	5/1/2001
2002	n/a	4/25/2002
2003	n/a	5/2/2003
2004	n/a	4/30/2004

10.5) Fish transportation procedures, if applicable.
Smolt releases are on-station.

10.6) Acclimation procedures (*methods applied and length of time***).**
Smolts are reared on ambient Big Quilcene River water throughout their hatchery life, providing more-than-adequate acclimation.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.
89% (355,000) of the smolts released are adipose-clipped to identify them as hatchery fish, the remaining 11% (45,000) of the smolts are not adipose-clipped but are coded-wire tagged as the unmarked component of a double-index tag (DIT) group. Forty-five thousand of the 355,000 adipose clipped smolts bear coded-wire tags; as the marked

component of the DIT group.

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

10.9) Fish health certification procedures applied pre-release.

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

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.
Coho are released well after the period when summer chum salmon have emigrated from the Big Quilcene River and Quilcene Bay. Coho are released as actively migrating smolts which leave the river system quickly and migrate to coastal waters.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.
reference the table prepared 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.
Hatchery records are collated annually into the FRED database maintained at WWO-Lacey. This database is used to supply production reports, CWT release and recovery data, and regular monitoring and evaluation reports.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.
On-going monitoring and evaluation at Quilcene NFH has been cooperatively accomplished through programs performed by staff at the NFH, USFWS - Olympia Fish Health Center, and USFWS - Hatchery Evaluation branch of the Fisheries Division of the Western Washington Office in Lacey, WA.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.
Monitoring and evaluation activities cause no genetic or ecological effects to listed fish.

SECTION 12. RESEARCH

Section not applicable to this program

12.1) Objective or purpose.
Indicate why the research is needed, its benefit or effect on listed natural fish

populations, and broad significance of the proposed project.

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

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

FRED – Fisheries Resources Evaluation Database, maintained by USFWS, Western Washington Office, Fisheries Division, Lacey WA. (tom_kane@fws.gov)

Point-No-Point Treaty Council and Washington Department of Fish and Wildlife 2004. 2004 Management Framework Plan and Salmon Runs' Status for the Hood Canal Region.

RMIS – Regional Mark Information System, CWT release and recovery data, www.rmis.org maintained by Pacific States Marine Fisheries Commission www.psmfc.org

WDFW and PNPTC. 2000. Summer Chum Salmon Conservation Initiative. and subsequent supplemental reports as detailed at: http://www.wdfw.wa.gov/fish/chum/chum.htm

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

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

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____

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

Listed species affected: _Summer chum salmon_____ ESU/Population:__Hood Canal/Strait of Juan de Fuca Activity:_____				
Location of hatchery activity:_Quilcene Nat. Fish Hatchery_ Dates of activity:__year round_____ Hatchery program operator:_US Fish & Wildlife				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)	0	0	0	0
Collect for transport b)	0	0	0	0
Capture, handle, and release c)	0	0	0	0
Capture, handle, tag/mark/tissue sample, and release d)	0	0	0	0
Removal (e.g. broodstock) e)	0	0	0	0
Intentional lethal take f)	0	0	0	0
Unintentional lethal take g)	0	0	0	0
Other Take (specify) h)	0	0	0	0

Listed species affected: _Chinook salmon_____ ESU/Population:__Puget Sound/Hood Canal Activity:_____				
Location of hatchery activity:_Quilcene Nat. Fish Hatchery_ Dates of activity:__year round_____ Hatchery program operator:_US Fish & Wildlife				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)	0	0	0	0
Collect for transport b)	0	0	0	0
Capture, handle, and release c)	0	0	0	0
Capture, handle, tag/mark/tissue sample, and release d)	0	0	0	0
Removal (e.g. broodstock) e)	0	0	0	0
Intentional lethal take f)	0	0	0	0
Unintentional lethal take g)	0	0	0	0

Listed species affected: _Chinook salmon_____ ESU/Population:__Puget Sound/Hood Canal Activity:_____				
Location of hatchery activity:_Quilcene Nat. Fish Hatchery_ Dates of activity:__year round_____ Hatchery program operator:_US Fish & Wildlife				
Other Take (specify) h)	0	0	0	0

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

Instructions:

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

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

Augmentation - The use of artificial production to increase harvestable numbers of fish in areas where the natural freshwater production capacity is limited, but the capacity of other salmonid habitat areas will support increased production. Also referred to as "fishery enhancement".

Critical population threshold - An abundance level for an independent Pacific salmonid population below which: depensatory processes are likely to reduce it below replacement; short-term effects of inbreeding depression or loss of rare alleles cannot be avoided; and productivity variation due to demographic stochasticity becomes a substantial source of risk.

Direct take - The intentional take of a listed species. Direct takes may be authorized under the ESA for the purpose of propagation to enhance the species or research.

Evolutionarily Significant Unit (ESU) - NMFS definition of a distinct population segment (the smallest biological unit that will be considered to be a species under the Endangered Species Act). A population will be/is considered to be an ESU if 1) it is substantially reproductively isolated from other conspecific population units, and 2) it represents an important component in the evolutionary legacy of the species.

Harvest project - Projects designed for the production of fish that are primarily intended to be caught in fisheries.

Hatchery fish - A fish that has spent some part of its life-cycle in an artificial environment and whose parents were spawned in an artificial environment.

Hatchery population - A population that depends on spawning, incubation, hatching or rearing in a hatchery or other artificial propagation facility.

Hazard - Hazards are undesirable events that a hatchery program is attempting to avoid.

Incidental take - The unintentional take of a listed species as a result of the conduct of an otherwise lawful activity.

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

Integrated recovery program - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), and fish produced are intended to spawn in the wild or be genetically integrated with the targeted natural population(s). Sometimes referred to as "supplementation".

Isolated harvest program - Project in which artificially propagated fish produced primarily for harvest are not intended to spawn in the wild or be genetically integrated with any specific natural population.

Isolated recovery program - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), but the fish produced are not intended to spawn in the wild or be genetically integrated with any specific natural population.

Mitigation - The use of artificial propagation to produce fish to replace or compensate for loss of fish or fish production capacity resulting from the permanent blockage or alteration of habitat by human activities.

Natural fish - A fish that has spent essentially all of its life-cycle in the wild and whose parents spawned in the wild. Synonymous with *natural origin recruit (NOR).*

Natural origin recruit (NOR) - See *natural fish* .

Natural population - A population that is sustained by natural spawning and rearing in the natural habitat.

Population - A group of historically interbreeding salmonids of the same species of hatchery, natural, or unknown parentage that have developed a unique gene pool, that breed in approximately the same place and time, and whose progeny tend to return and breed in approximately the same place and time. They often, but not always, can be separated from another population by genotypic or demographic characteristics. This term is synonymous with stock.

Preservation (Conservation) - The use of artificial propagation to conserve genetic resources of a fish population at extremely low population abundance, and potential for extinction, using methods such as captive propagation and cryopreservation.

Research - The study of critical uncertainties regarding the application and effectiveness of artificial propagation for augmentation, mitigation, conservation, and restoration purposes, and identification of how to effectively use artificial propagation to address those purposes.

Restoration - The use of artificial propagation to hasten rebuilding or reintroduction of a fish population to harvestable levels in areas where there is low, or no natural production, but potential for increase or reintroduction exists because sufficient habitat for sustainable natural production exists or is being restored.

Stock - (see “Population”).

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Viable population threshold - An abundance level above which an independent Pacific salmonid population has a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over a 100-year time frame.

Attachment 2. Age class designations by fish size and species for salmonids released from hatchery facilities.

(generally from Washington Department of Fish and Wildlife, November, 1999).

	SPECIES/AGE CLASS	SIZE CRITERIA Number of fish/pound	SIZE CRITERIA Grams/fish
X	Chinook Yearling	<=20	>=23
X	Chinook (Zero) Fingerling	>20 to 150	3 to <23
X	Chinook Fry	>150 to 900	0.5 to <3
X	Chinook Unfed Fry	>900	<0.5
X	Coho Yearling 1/	<20	>=23
X	Coho Fingerling	>20 to 200	2.3 to <23
X	Coho Fry	>200 to 900	0.5 to <2.3
X	Coho Unfed Fry	>900	<0.5
X	Chum Fed Fry	<=1000	>=0.45
X	Chum Unfed Fry	>1000	<0.45
X	Sockeye Yearling 2/	<=20	>=23
X	Sockeye Fingerling	>20 to 800	0.6 to <23
X	Sockeye Fall Releases	<150	>2.9
X	Sockeye Fry	> 800 to 1500	0.3 to <0.6
X	Sockeye Unfed Fry	>1500	<0.3
X	Pink Fed Fry	<=1000	>=0.45
X	Pink Unfed Fry	>1000	<0.45
X	Steelhead Smolt	<=10	>=45
X	Steelhead Yearling	<=20	>=23
X	Steelhead Fingerling	>20 to 150	3 to <23
X	Steelhead Fry	>150	<3
X	Cutthroat Trout Yearling	<=20	>=23
X	Cutthroat Trout Fingerling	>20 to 150	3 to <23
X	Cutthroat Trout Fry	>150	<3
X	Trout Legals	<=10	>=45
X	Trout Fry	>10	<45

1/ Coho yearlings defined as meeting size criteria and 1 year old at release, and released prior to June 1st.
2/ Sockeye yearlings defined as meeting size criteria and 1 year old.