HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Hoodsport Hatchery Fall Chinook Program (Segregated)
Species or Hatchery Stock:	Finch Creek Fall Chinook (*Oncorhynchus tshawytscha*)
Agency/Operator:	Washington Department of Fish and Wildlife
Watershed and Region:	Hood Canal / Puget Sound
Date Submitted:	
Date Last Updated:	May 6, 2014

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Executive Summary

ESA Permit Status:
In 2004 the Washington Department of Fish and Wildlife (WDFW) and the Puget Sound Treaty Tribes submitted a Hatchery Genetic Management Plan (HGMP) for the Hoodsport Hatchery Chinook sub-yearling and yearling programs under Limit 6 of the 4(d) rule. In a letter from NOAA Fisheries dated August 4, 2004, the co-managers were informed that NOAA Fisheries anticipated completing a draft Environmental Impact Statement (EIS) by the summer of 2005. NOAA noted that "A final EIS may then be completed by winter 2005-2006, after which time NOAA Fisheries will release ESA 4(d) Rule determinations for the hatchery plans." The letter concluded by stating that "Your work on these hatchery plans is important, and will substantially contribute to on-going salmon recovery efforts within the region." The WDFW provided updated HGMPs to NOAA Fisheries in August 2005.

The co-managers are now re-submitting an HGMP for the Hoodsport Hatchery Chinook sub-yearling and yearling programs to further update the description of the program and incorporate new information and analyses.

The Puget Sound Chinook ESU is listed as "Threatened" under the ESA, however, Hoodsport Hatchery Chinook are not included in the ESA-listing. In the Hood Canal region, the Technical Recovery Team (TRT) has identified two demographically independent Chinook populations (DIPs); the Skokomish and Mid-Hood Canal Rivers (Dosewalips, Duckabush and Hamma Hamma) (Ruckelshaus et al. 2006).

Hoodsport Hatchery Chinook Program:
The purpose of the program is to produce fall Chinook for sustainable recreational and tribal fisheries. Juvenile fish will be produced at the Hoodsport Hatchery (located on the mouth of Finch Creek, on Hood Canal). The program will release 3.0M sub-yearling and 120,000 yearling smolts into Hood Canal annually.

The program will be operated as a "segregated" program with the intent for the hatchery population to represent a distinct population that is reproductively isolated from naturally-spawning populations. Segregation will be achieved operationally by using only adult hatchery Chinook (distinguished by an adipose fin-clip) returning to the Hoodsport Hatchery trap and the Purdy Creek trap at George Adams, and by operating the program in a manner to limit gene flow to the wild Mid Hood Canal fall Chinook population.

Risk control measures are also in place to address other potential hazards including ecological interactions with ESA-listed species, disease transmission, and facility effects.

Harvest:
The program produces salmon for harvest in regional recreational fisheries that are of high value to the State of Washington. Adult fish produced also help meet tribal fishery harvest allocations that are guaranteed through treaties, as affirmed in *U.S. v. Washington* (1974). Program-origin salmon also help meet Pacific Salmon Treaty harvest sharing agreements with Canada. These harvest objectives are met in a manner that minimizes diverse effects on listed fish. Returning fall Chinook adults provide for tribal commercial and subsistence use and provide a localized recreational sport fishery, mostly from July through October each year. Puget Sound Recreational Enhancement Funding provides the funding to produce the yearling portion of the program to support recreational fisheries in Hood Canal and Puget Sound.

Monitoring, Evaluation, and Adaptive Management:
WDFW and the Co-managers conduct annual spawning ground surveys throughout the Hood Canal Watershed. Coded wire tags recovered from Hoodsport releases on natural spawning grounds in adjacent basins are used to evaluate stray risks of this program to the listed Mid Hood Canal Chinook ESU.

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SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Hoodsport Hatchery Fall Chinook Program.

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

Hoodsport Hatchery/Finch Creek fall Chinook (*Oncorhynchus tshawytscha*) are not included in the ESA-listed Puget Sound Chinook ESU.

1.3) Responsible organization and individuals

Hatchery Operations Staff Lead Contact

Name (and title): Jim Jenkins, Region 6 Hatchery Reform and Operations Manager
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Fish Management Staff Lead Contact

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Email: Mark.Downen@dfw.wa.gov

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

The Skokomish Tribe

The Lower Elwha Klallam Tribe

The Point No Point Treaty Council (PNPTC), Port Gamble S'Klallam Tribe, and Jamestown S'Klallam Tribe

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

Funding Sources	Operational Information (for FY 2013)
General Fund – State	Full time equivalent staff – 1.96
DJ - Fed	Annual operating cost (dollars) - $249,713
PSRFE Fund	

The above information for annual operating cost applies cumulatively to all species produced from this facility.

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

Broodstock collection, holding, spawning, incubation, rearing, release:

Hoodsport Hatchery: Located at the mouth of Finch Creek (WRIA 16.0222) near Hoodsport WA. Finch Creek drains directly into Hood Canal.

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Figure 1. Photo of the Hoodsport Hatchery.

Source: WDFW Hatchery Records.

1.6) Type of program.

Segregated harvest.

1.7) Purpose (Goal) of program.

Harvest augmentation/ mitigation. Hatchery Chinook production has been developed to augment harvest opportunities in the Puget Sound and Hood Canal commercial and recreational fisheries (SSHAG 2003).

1.8) Justification for the program.

The program produces salmon for harvest in regional recreational fisheries that are of high value to the State of Washington. Adult fish produced also help meet tribal fishery harvest allocations that are guaranteed through treaties, as affirmed in *U.S. v. Washington* (1974). Program-origin salmon also help meet Pacific Salmon Treaty harvest sharing agreements with Canada. These harvest objectives are met in a manner that minimizes diverse effects on listed fish. Interactions with listed salmon populations in Puget Sound are reduced by relying on localized broodstock, by fully imprinting juveniles through rearing at the release site (to minimize straying) and by releasing fish as smolts (to minimize marine area ecological interactions), as programmed in the Future Brood Document.

The yearling portion of this program is implemented in accordance with the legislatively-mandated Puget Sound Recreational Fisheries Enhancement (PSRFE) program. The purpose of the Hoodsport Hatchery program is to provide localized hatchery-origin adult Chinook salmon for harvest, primarily in the Puget Sound and Hood Canal recreational fisheries. Yearlings reared for a prolonged 18 month period generally have a higher propensity to residualize in Puget Sound and Hood Canal after release, thus enhancing their year-around availability for harvest in "inside" Puget Sound and Hood Canal fisheries.

To minimize impacts on listed fish by WDFW facilities operation and the Hoodsport fall Chinook program, the following Risk Aversions are included in this HGMP:

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Table 1.8.1: Summary of risk aversion measures for the Hoodsport fall Chinook program.

Potential Hazard	HGMP Reference	Risk Aversion Measures
Water Withdrawal	4.1	Surface water rights are formalized through trust water right permit # S2-20588. Monitoring and measurement of water usage is reported in monthly NPDES reports.
Intake Screening	4.2	The hatchery water intake (Finch Creek) structure at Hoodsport Hatchery has screens that are in compliance with state and federal guidelines (NMFS 1995, 1996), but do not meet the current Anadromous Salmonid Passage Facility Design criteria (NMFS 2011a).
Effluent Discharge	4.2	This hatchery operates under the "Upland Fin-Fish Hatching and Rearing" National Pollution Discharge Elimination System administered by the Washington Department of Ecology (DOE) - (# WAG13-1011).
Broodstock Collection & Adult Passage	2.2.3,5.1, 7.2	Capture of adult Chinook takes place at the trap on Finch Creek from August through mid-September.
Disease Transmission	9.2.7	*The Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006) details hatchery practices and operations designed to stop the introduction and/or spread of any diseases.
Competition & Predation	2.2.3, 10.11	Fish are released at a time, size, and life-history stage (smolts) to foster rapid migration out of Hood Canal.

1.9) List of program "Performance Standards".

See HGMP section 1.10. Standards and indicators are referenced from Northwest Power Planning Council (NPPC) Artificial Production Review (APR) (NPPC 2001).

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

1.10.1) "Performance Indicators" addressing benefits.

Table 1.10.1:"Performance Indicators" addressing benefits.

Benefits		
Performance Standard	**Performance Indicator**	**Monitoring & Evaluation**
3.1.1 Program contributes to fulfilling tribal trust responsibility mandate and treaty rights as described in *U.S. v WA.*	Contributes to co-manager harvest.	Participate in annual coordination between co-managers to identify and report on issues of interest, coordinate management, and review programs: FBD, North of Falcon HAIPs.
3.1.2 Program contributes to mitigation requirements.	This program provides mitigation for lost fish production due to development	Estimate survival and contribution to fisheries for each brood year released.

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	within Puget Sound and contributes to sport, tribal and commercial fisheries.	
3.1.3 Program addresses ESA responsibilities.	Program is allowed to continue harvest under ESA Section 4(d).	HGMP updated and re-submitted to NOAA with significant changes or under permit agreement.
3.2.1 Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species.	Annual number of fish produced by program caught in all fisheries, including estimates of fish released. Externally-marked hatchery fish differentiate hatchery from natural-origin fish and enable mark-selective fisheries, which can reduce directed harvest mortality on natural-origin fish.	Annually mass-mark hatchery releases and record estimates of mark rate. Agencies monitor harvests and hatchery returns to provide up-to-date information. Estimate survival and contribution to fisheries for each brood year released.
3.3.2 Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production, and to evaluate effects of the program on the local natural population.	Percentage of total hatchery releases are mass-marked (adipose-fin clip, tags otolith mark) production fish to allow for their differentiation from naturally-produced fish.	Beginning with the 2003 brood (released in 2004), 200,000-sub-yearling Chinook were adipose-fin clipped/coded-wire tagged (AD+CWT) to allow for evaluation of fishery contribution, survival rates and stray levels to other Puget Sound watersheds while 1.5 million were mass-marked. For the 2004 brood (released in 2005), WDFW mass-marked (adipose-fin-clip only) 2,225,000 and AD+CWT 200,000 Chinook sub-yearlings. As per the Skokomish Mass-marking MOU (2005), all remaining fish not already mass-marked and coded-wire tagged will be adipose-fin clipped each year beginning with the 2007 brood. Agencies monitor harvests and hatchery returns to provide up-to-date information. Annually sample returning fish in fisheries and at the hatchery for CWT recovery; record numbers of estimated hatchery (marked) and natural (unmarked). CWT data reported annually to RMIS.
3.4.1 Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of population from which	Broodstock collection is conducted representatively and systematically throughout the spawning run, in proportion to timing, age and sex composition	Collect annual run timing, age and sex composition and spawning escapement timing data.

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broodstock is taken.	of return. Adhere to WDFW spawning guidelines (Seidel 1983, HSRG 2004).	
3.5.5 Juveniles are released at fully-smolted stage to benefit juvenile-to-adult survival rates, and reduce the likelihood for residualism and negative ecological interactions with natural-origin fish.	Higher survival benefit and reduced residualism -- smoltification (size fpp/mass CV and condition factor) and behavior monitored in the hatchery.	Monitor fish condition in the hatchery throughout all rearing stages. Annually monitor and record size, number, and date of release.in WDFW Hatcheries Headquarters Database.
3.6.1 The hatchery program uses standard scientific procedures to evaluate various aspects of artificial propagation.	Adhere to HSRG (2004) and WDFW spawning guidelines (Seidel 1983). Apply minimal monitoring standards in the hatchery: food conversion rates, growth trajectories, mark/tag rate error, weight distribution (CV).	Collect annual run timing, age and sex composition data upon adult return. Annually record growth rates, mark rate and size at release and release dates.
3.8.3 Non-monetary societal benefits for which the program is designed are achieved.	Contributes to the cultural benefit that fishing provides. Recreational fishery angler days, length of season, number of licenses purchased. Fish available for tribal ceremonial use.	Estimate annual harvest of hatchery fish based on CWT recovery analysis and creel surveys.

1.10.2) "<u>Performance Indicators" addressing risks.</u>

Table 1.10.2:"Performance Indicators" addressing risks.

Risks		
Performance Standard	**Performance Indicator**	**Monitoring & Evaluation**
3.1.3 Program addresses ESA responsibilities.	Program complies with Federal ESA-listed fish take authorizations for harvest and hatchery actions.	HGMP is updated to reflect any major changes in program and resubmitted to NOAA fisheries. Program risks have been addressed in this HGMP through best available science hatchery management actions. Monitor juvenile hatchery fish size, number, date of release and mass-mark quality; monitor contribution of hatchery adult fish to fisheries and hatchery escapement.
3.2.1 Fish produced for harvest are produced and released in a manner enabling effective harvest, as described in all applicable fisheries management plans, while avoiding overharvest of non-target species.	Number of marks released and estimated proportion of marks in out-migrant juveniles and returning adults on the spawning ground. Production fish are mass-marked (adipose fin-clip) to allow for their differentiation from naturally-produced fish.	Monitor juvenile hatchery fish size, number, date of release and mass-mark quality; monitor contribution of hatchery adult fish to fisheries and hatchery escapement. Harvest is regulated to meet appropriate biological

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		assessment criteria. Agencies monitor harvests and hatchery escapements to provide up-to-date information.
3.2.2 Release groups are sufficiently marked in a manner consistent with information needs and protocols to enable determination of impacts to natural- and hatchery-origin fish in fisheries.	Percentage of total hatchery releases are identifiable as hatchery-origin fish. Mass-mark (adipose-fin clip, CWT, otolith-mark, other, etc., depending on species) production fish to identify them from naturally produced fish for selective fisheries.	As of December 2005, the Co-managers agreed to mass-mark the remaining production with full implementation beginning with brood year 2007 production (Skokomish Mass-marking MOU 2005). Annually monitor and record size, number, date of release and mass-mark quality (adipose fin-clip rate) of all hatchery releases. Estimate annual harvest of mass-marked hatchery fish based on CWT analysis and creel surveys.
3.3.1 Hatchery program contributes to an increasing number of spawners returning to natural spawning areas.	Total number of spawners, categorized by origin, are monitored (pHOS, spawner-recruit ratios).	Hoodsport Hatchery/Finch Creek fall Chinook are not included in the listed Puget Sound Chinook ESU. Finch Creek, where the Hoodsport Hatchery program is located, historically and currently lacks an extant local natural Chinook salmon population (NMFS 2005).
3.3.2 Releases are sufficiently marked to allow statistically significant evaluation of program contribution to natural production and to evaluate effects of the program on the local natural population.	Mass-mark rates and mark type (adipose-fin clip, CWT, otolith-mark, other, etc., depending on species) production fish to identify hatchery releases from naturally-produced fish.	Annually monitor and record size, number, date of release and mass-mark quality (adipose fin-clip rate) of all hatchery releases. Annually sample returning fish in fisheries and at the hatchery for CWT recovery; record numbers of estimated hatchery (marked) and natural (unmarked).
3.4.1 Fish collected for broodstock are taken throughout the return or spawning period in proportions approximating the timing and age distribution of population from which broodstock is taken.	Temporal and age distribution of broodstock collected, compared to that of naturally-produced population at collection point.	Segregated program - only marked hatchery-origin fish are used for broodstock purposes. Collect annual run timing, age and sex composition and return timing data. Adhere to WDFW spawning guidelines. (Seidel 1983, HSRG 2004).
3.5.2 Collection of broodstock does not adversely impact the genetic diversity of the naturally-spawning population.	Timing of collection compared to overall run timing.	All hatchery production is identifiable in some manner (fin-marks, tags, etc.). Segregated program - only marked hatchery fish are used for broodstock purposes. Collect annual run timing,

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		origin, age and sex composition data. Examine returning fish for the fin-mark at the hatchery. Annually record numbers of estimated hatchery (marked) and natural (unmarked).
3.5.1 Patterns of genetic variation within and among natural populations do not change significantly as a result of artificial production.	Within and between populations, genetic structure is not affected by artificial production.	Unmarked natural-origin Chinook salmon are not incorporated into the segregated hatchery broodstock.
3.5.4 Juveniles are released on-station, or after sufficient acclimation to maximize homing ability to intended return locations.	Location of release (on-station, acclimation pond, direct plant). Release type (forced, volitional or direct stream release). Proportion of adult returns to program's intended return location, compared to fisheries and artificial or natural production areas.	Annually monitor size, age class, number, date of release, location and release type, and record in the WDFW Hatcheries Headquarters Database. Annually coded-wire tag a portion of the releases to enable evaluation of fisheries contribution, survival rates, possible straying to other watersheds, and identification to release site. Annually report CWT release data to RMIS.
3.5.5 Juveniles are released at fully-smolted stage.	Level of smoltification at release. Release type (forced, volitional or direct). Chinook sub-yearlings are released at least 50-80 fpp (sub-yearlings) and 5-8 fpp (yearlings) per WDFW rearing guidelines.	Fish condition monitored in the hatchery throughout rearing stages. Annually monitor size, age class, number, date of release, location and release type, and record in the WDFW Hatcheries Headquarters Database.
3.5.6 The number of adults returning to the hatchery that exceeds broodstock needs is declining.	Program is sized appropriately for harvest goals. Numbers of surplus hatchery returns are calculated annually.	Annually record numbers of adults returning to the hatchery, broodstock collected, and surplus returns
3.6.1 The hatchery program uses standard scientific procedures to evaluate various aspects of artificial propagation.	Apply minimal monitoring standards in the hatchery: food conversion rates, growth trajectories, mark/tag rate error, weight distribution (CV).	Collect annual run timing, origin, age and sex composition and return timing data. Annually record growth rates, mark rate and size at release and release dates. Adhere to HSRG (2004) and WDFW spawning guidelines (Seidel 1983).
3.7.1 Hatchery facilities are operated in compliance with all applicable fish health guidelines and facility operation standards and protocols (IHOT, PNFHPC, WDFW Fish Health Policy, INAD, MDFWP).	Annual reports indicating levels of compliance with applicable standards and criteria. Periodic audits indicating level of compliance with applicable standards and criteria.	Pathologists from WDFW's Fish Health Section monitor program monthly. Exams performed at each life stage may include tests for virus, bacteria, parasites and/or pathological changes, as needed. The program is operated

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		consistent with *the Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006).
3.7.2 Effluent from hatchery facility will not detrimentally affect natural populations.	Discharge water quality compared to applicable water quality standards by NPDES permit. WDOE water right permit compliance.	Flow and discharge reported in monthly NPDES reports.
3.7.3 Water withdrawals and in-stream water diversion structures for artificial production facility operation will not prevent access to natural spawning areas, affect spawning behavior of natural populations, or impact juvenile rearing environment.	Water withdrawals compared to NMFS, USFWS and WDFW applicable passage and screening criteria for juveniles and adults.	Barrier and intake structure compliance assessed and needed fixes are prioritized.
3.7.4 Releases do not introduce pathogens not already existing in the local populations, and do not significantly increase the levels of existing pathogens. Follow Co-managers Fish Health Disease Policy (WDFW and WWTIT 1998, revised 2006).	Necropsies of fish to assess health, nutritional status, and culture conditions.	WDFW Fish Health Section inspects adult broodstock yearly for pathogens and monitor juvenile fish on a monthly basis to assess health and detect potential disease problems. As necessary, WDFW's Fish Health Section recommends remedial or preventative measures to prevent or treat disease, with administration of therapeutic and prophylactic treatments as deemed necessary. A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings.
	Release and/or transfer exams for pathogens and parasites.	Examine fish 1 to 6 weeks prior to transfer or release, in accordance with the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006).
	Inspection of adult broodstock for pathogens and parasites.	At spawning, lots of 60 adult broodstock are examined for pathogens
	Inspection of off-station fish/eggs prior to transfer to hatchery for pathogens and parasites.	Controls of specific fish pathogens through eggs/fish movements are conducted in accordance to Co-managers Fish Health Disease Policy.
3.7.5 Any distribution of carcasses or other products for nutrient enhancement is	All applicable fish disease policies are followed. See HGMP sections 7.5 and 7.8	Controls of specific fish pathogens through eggs/fish movements are conducted in

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accomplished in compliance with appropriate disease control regulations and guidelines, including state, tribal and federal carcass distribution guidelines.		accordance with the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006). Record disposition of carcasses in the WDFW Hatcheries Headquarters Database.
3.7.6 Adult broodstock collection operation does not significantly alter spatial and temporal distribution of any naturally-produced population.	Spatial and temporal spawning distribution of natural populations above and below weir/trap currently compared to historic distribution.	Collect annual run timing, age, and sex composition data.
3.7.7 Weir/trap operations do not result in significant stress, injury or mortality in natural populations.	All observations of natural-origin fish at hatchery facilities are recorded and reported annually.	Trap checked daily. Annually record numbers of natural- and hatchery-origin fish.
3.7.8 Predation by artificially produced fish on naturally – produced fish does not significantly reduce numbers of natural fish.	Hatchery juveniles are raised to smolt-size and released from the hatchery at a time that fosters rapid migration downstream.	Not available.
3.8.1 Cost of program operation does not exceed the net economic value of fisheries in dollars per fish for all fisheries targeting this population.	Total cost of operation.	Compare annual operational cost of program to calculated fishery contribution value (Wegge 2009).
3.8.2 Juvenile production costs are comparable to or less than other regional programs designed for similar objectives.	Artificial production was chosen as the preferred alternative for attaining hatchery production objective.	Agencies and tribes to provide up-to-date information needed to monitor harvests.

1.11) Expected size of program.

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

Up to 2,500 adults collected annually.

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

Table 1.11.2.1: Proposed release levels for Hoodsport fall Chinook program.

Life Stage	Release Location	Annual Release Level
Sub-yearling	Finch Creek (WRIA 16.0222)	3,000,000[a]
Yearling	Finch Creek (WRIA 16.0222)	120,000[b]

Source: WDFW Future Brood Document 2013.

[a] Sub-yearling releases will increase from 3,000,000 to 2,800,000 beginning with 2015 release, 2014 brood in accordance with the Skokomish Fall Chinook Management Plan (Skokomish Indian Tribe and WDFW Draft 2014). Release levels were originally reduced in 2005 release (2004 brood) from 3,000,000 to 2,800,000.

[b] Yearling releases were reduced from 250,000 to 120,000 beginning with the 2006 release (2004 brood).

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

For brood years 2002 to 2007, the average smolt-to-adult survival rate was 0.30% for sub-yearling and 0.64% for yearling releases. Based on the average smolt-to-adult survival rates and

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the program release goal of 3,000,000 sub-yearlings and 120,000 yearlings, the estimated production (goal) level would be 9,768 (see HGMP section 3.3.1).

Table 1.12.1: Fall Chinook escapement to the Hoodsport Hatchery 2001-2013.

Year	Escapement
2001	4,578
2002	4,080
2003	4,634
2004	4,101
2005	3,949
2006	4,357
2007	4,019
2008	2,032
2009	3,351
2010	1,517
2011	3,333
2012	6,165
2013	2,753
Average	**3,759**

Source: WDFW Hatcheries Headquarters Database 2013.

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

Hood Canal fall Chinook sub-yearling releases at Hoodsport Hatchery began in 1953.

The current production level of Hood Canal yearling fall Chinook for on-site release at Hoodsport Hatchery began in 1995.

1.14) Expected duration of program.

Ongoing

1.15) Watersheds targeted by program.

Finch Creek (WRIA 16.0222) in Hood Canal.

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

Alternative 1: *Reduce or eliminate the program*. With prior agreement from the Co-managers, WDFW reduced fall Chinook release numbers at the Hoodsport Hatchery in brood year 2004 from 3,000,000 to 2,800,000 sub-yearlings, and from 250,000 to 120,000 yearlings. This was done to help minimize any potential ecological risks to recovering natural-origin Mid-Hood Canal fall Chinook, while continuing to meet fisheries enhancement objectives, treaty Indian fishing right entitlements, the *Puget Sound Salmon Management Plan* (PSSMP), the *Hood Canal Salmon Management Plan* (HCSMP), the *Magnuson/Stevens Act* for sustainable fisheries and the legislatively-mandated *Puget Sound Recreational Enhancement Program*. Further reductions were not pursued as these would not meet enhancement or harvest objectives for the program and would not meet the goals of either Co-Manager, which include providing recreational, cultural and subsistence, ceremonial, religious, commercial and non-commercial benefits, nor be compatible with Treaty fishing rights assured through *U.S. v Washington* (1974) or the Magnuson/Stevens Act for sustainable fisheries.

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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.

This HGMP was submitted to NOAA Fisheries for ESA consultation and determination regarding compliance of the plan with ESA Section 4(d) rule criteria for joint state/tribal hatchery resource management plans affecting listed Chinook salmon and steelhead originally in 2004. It is currently being re-submitted.

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.

- 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.

Puget Sound Chinook (*Oncorhynchus tshawytscha*): Listed as *Threatened* on March 24, 1999 (64FR14308); *Threatened* status reaffirmed on June 28, 2005 (70FR37160); reaffirmed *Threatened* by five-year status review, completed August 15, 2011 (76FR50448). The Puget Sound Chinook salmon ESU is composed of 31 historically quasi-independent populations, of which 22 are believed to be extant currently. The ESU includes all naturally-spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Strait of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington (Ford 2011), as well as twenty-six artificial propagation programs (Draft Proposed Language - NMFS 2013 78FR38270). In the Hood Canal region, the Technical Recovery Team (TRT) has identified two demographically independent populations (DIPs); the Skokomish and Mid-Hood Canal Rivers (Dosewalips, Duckabush and Hamma Hamma) (Ruckelshaus et al. 2006).

Hood Canal summer chum (*Oncorhynchus keta*): Listed as *Threatened* on Mar. 25, 1999 (64FR14507); *Threatened* status reaffirmed on June 28, 2005 (70FR37160); reaffirmed *Threatened* by five-year status review, completed August 15, 2011 (76FR50448). Final designation for Critical Habitat was published Sept. 2, 2005 (70FR52630), with effective date of Jan. 2, 2006. The ESU includes all naturally spawned populations of summer-run chum in Hood Canal and its tributaries, populations in Olympic Peninsula Rivers between Hood Canal and Dungeness Bay, Washington (Ford 2011). The ESU also includes summer chum from a wild stock supplementation and recovery program. Summer chum eggs are taken at Union river and shipped to George Adams Fish Hatchery where otolith marking is conducted, prior to transfer to the Tahuya River at 400-550 fpp. The Hamma Hamma Fish Hatchery/Lilliwaup Creek Fish Hatchery program now contributes to summer chum salmon recovery only in the Tahuya River. The Big Beef, and the Jimmycomelately Creek Fish Hatchery summer-run chum programs are also included (Ford 2011) (Draft Proposed Language - NMFS 2013 78FR38270).

Puget Sound steelhead *(Oncorhynchus mykiss*): Were listed as *Threatened* under the ESA on May 11, 2007 (72FR26722); reaffirmed *Threatened* by five-year status review, completed August 15, 2011 (76FR50448). The DPS includes all naturally spawned anadromous winter-run and summer-run *O. mykiss* (steelhead) populations, below natural migration barriers in the river basins of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, Washington (Ford 2011).

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This DPS is bounded to the west by the Elwha River (inclusive) and to the north by the Nooksack River and Dakota Creek (inclusive) (Ford 2011). The ESU also includes steelhead from six artificial propagation programs: the Green River Natural; White River Winter Steelhead Supplementation; Hood Canal Steelhead Supplementation Off-station Projects in the Dewatto, Skokomish, and Duckabush Rivers; and the Lower Elwha Fish Hatchery Wild Steelhead Recovery (Draft Proposed Language - NMFS 2013 78FR38270). In the Hood Canal region, the TRT has preliminarily delineated four demographically independent populations (DIPs) of winter steelhead; (East Hood Canal, South Hood Canal, Skokomish and Olympic West Hood Canal), no summer run populations were identified in the region (PSSTRT 2013a).

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.

Hoodsport Hatchery fall Chinook in the Puget Sound ESU. NMFS (2005) concluded that the Hoodsport Hatchery program is not part of the ESU, based on an evaluation of divergence of the Hoodsport hatchery program relative to the stock from which it was derived. Finch Creek, where the Hoodsport Hatchery program is located, historically and currently lacks an extant local natural Chinook salmon population. The stock was designated Category 2b or 3c. Broodstock sources are from within the ESU but because of the frequent exchange of George Adams Hatchery and Finch Creek (Green River origin) fall-run broodstocks, the George Adams or Hoodsport stock is unlikely to be representative of any of the native Hood Canal fall-run Chinook salmon populations. This categorization could be revised as more information on the genetic and demographic relationship between the hatchery and natural populations becomes available. (SSHAG 2003).

George Adams Hatchery fall Chinook in the Puget Sound ESU: NMFS (1999) considered this stock to be part of the ESU but not essential for recovery. The hatchery population was listed with natural-origin Chinook salmon that are part of the Skokomish population (70 FR 37160 June 28, 2005; NMFS SHIEER 2004, 78FR38270 Proposed January 26, 2013). This stock is a category 2b or 3c. Broodstock sources are from within the ESU, but because of the frequent exchange between George Adams Hatchery and Finch Creek (Green River origin) fall Chinook salmon broodstocks, the George Adams stock is unlikely to be closely related to any native Hood Canal fall Chinook salmon populations. This categorization could be revised as more information on the genetic and demographic relationship between the hatchery and natural populations becomes available (SSHAG 2003).

Skokomish fall Chinook in the Puget Sound Chinook ESU. Recent escapement levels (1990-2012) have averaged 1,309 for natural spawners in the Skokomish River and have shown an increasing population trend during this same period (NMFS 2014).

Hamma Hamma fall Chinook in the Puget Sound Chinook ESU. The hatchery population was listed with natural-origin Chinook salmon that are part of the Mid-Hood Canal population (70 FR 37160. June 28, 2005; NMFS SHIEER 2004). The stock was designated Category 2b or 3c. Broodstock sources are from within the ESU but because of the frequent exchange of George Adams Hatchery and Finch Creek (Green River origin) fall-run broodstocks, the George Adams stock is unlikely to be representative of any of the native Hood Canal fall-run Chinook salmon populations. This categorization could be revised as more information on the genetic and demographic relationship between the hatchery and natural populations becomes available (SSHAG 2003).

Mid-Hood Canal fall Chinook in the Puget Sound Chinook ESU: Recent escapement levels (1990-2012) have averaged 162 for spawners in the Mid-Hood Canal DIP and have shown declining population trend during this same period (NMFS 2014).

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Puget Sound Chinook salmon: Updated Risk Summary. All Puget Sound Chinook populations are well below the TRT planning range for recovery escapement levels. Most populations are also consistently below the spawner recruit levels identified by the TRT as consistent with recovery. Across the ESU, most populations have declined in abundance somewhat since the last status review in 2005, and trends since 1995 are mostly flat. Several of the risk factors identified by Good et al. (2005) are also still present, including high fractions of hatchery fish in many populations and widespread loss and degradation of habitat. Many of the habitat and hatchery actions identified in the Puget Sound Chinook recovery plan are expected to take years or decades to be implemented and to produce significant improvements in natural population attributes, and these trends are consistent with these expectations. Overall, the new information on abundance, productivity, spatial structure and diversity since the 2005 review does not indicate a change in the biological risk category since the time of the last BRT status review (Ford 2011).

Table 2.2.2.1: Hood Canal Chinook, minimum viability spawning abundance and abundance at equilibrium or replacement, and spawning A/P at MSY for a recovered state as determined by EDT analyses of properly functioning conditions and expressed as a Beverton-Holt function. The TRT minimum viability abundance was the equilibrium abundance or 17,000, whichever was less.

Region and population	TRT minimum viability abundance	Under properly functioning conditions (PFC)			NMFS Escapement Thresholds	
		Equilibrium abundance	Spawners at MSY	Productivity at MSY	Critical[a]	Rebuilding[b]
Mid Hood Canal[c]	11,000	11,000	2,500	3.2	200[d]	1,250
ESU	**261,300**	**307,500**	**70,948**	**3.2**	**3,875**	**2,785**

Source: Ford 2011.
[a]Critical natural-origin escapement thresholds under current habitat and environmental conditions (McElhaney et al. 2000; NMFS 2000a).
[b]Rebuilding natural-origin escapement thresholds under current habitat and environmental conditions (McElhaney et al. 2000; NMFS 2000a).
[c]The mid Hood Canal population consists of spawning aggregations from Dosewallips, Duckabush, and Hamma Hamma rivers. Only the Dosewallips was listed in the TRT viability report.
[d]Based on generic VSP guidance (McElhaney et al. 2000; NMFS 2000a).

Hood Canal summer chum in the Hood Canal summer chum ESU. A viable population of summer chum in the Hood Canal population has 24,700 spawners, assuming a 1:1 replacement rate and density-independent dynamics at low population sizes. Spawner escapement numbers for a viable Hood Canal population could be as low as 18,300 adults if we can assume that the population is driven by density-dependent dynamics and the corresponding intrinsic α and β parameters of the population's viable spawner-recruit curve can be estimated and achieved (i.e., for escapement = 18,300, then $\alpha = 5$ and $\beta = 13{,}500$) (Sands et al 2009).

Hood Canal summer chum salmon - Updated Risk Summary: The spawning abundance of this ESU has clearly increased since the time of listing, although the recent abundance is down from the previous five years. While spawning abundances have remained relatively high compared to the low levels in the early 1990s, productivity has decreased significantly for the last five brood years, being lower for brood years 2002-2006 than any previous 5-year average since 1971. This is a concern for future production. Since abundance is increasing and productivity is decreasing, this suggests that improvements in habitat and ecosystem function are needed. Diversity is increasing from the low values seen in the 1990s due both to the reintroduction of spawning aggregates and the more uniform relative abundance between populations; this is a good sign for viability in terms of spatial structure and diversity. Spawning survey data shows that the spawning distribution within most streams has been extended further upstream as abundance has increased (WDFW and PNPTC 2007). Overall, the new information considered does not indicate a change in the biological risk category since the time of the last BRT status review (Ford 2011).

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Skokomish winter-run steelhead in the Puget Sound steelhead DPS - Population trends for Skokomish River winter-run steelhead. The counts have been especially low since the late 1990s. The estimated probability that this steelhead population would decline to 10% of its current estimated abundance (i.e., to 35 fish) is high—about 80% within 80 years. With an estimated mean population growth rate of −0.037 (λ = 0.964) and process variance of 0.019, we can be highly confident ($P < 0.05$) that a 90% decline in this population will not occur within the next 20 years and that a 99% decline will not occur within the next 40 years. However, beyond the next 30−40 years we are uncertain about the precise level of risk (Ford 2011). Based on a preliminary intrinsic potential (IP) estimate by the PSSTRT (2011), the capacity for winter steelhead in this DIP is 8,275 adults.

East Hood Canal winter-run steelhead in the Puget Sound steelhead ESU - Population trends for east Hood Canal winter-run steelhead. Steelhead counts in east Hood Canal show no clear trend over the time series. The estimated probability that this steelhead population would decline to 10% of its current estimated abundance (i.e., to 22 fish) is relatively low—about 30% within 100 years. With an estimated mean population growth rate of −0.002 (λ = 0.998) and process variance of 0.052, we can be highly confident ($P < 0.05$) that a 90% decline in this population will not occur within the next 10 years, and that a 99% decline will not occur within 30 years. However, beyond about 30 years we are highly uncertain about the precise level of risk (Ford 2011). Based on a preliminary intrinsic potential (IP) estimate by the PSSTRT (2011), the capacity for winter steelhead in this DIP is 4,175 adults.

West Hood Canal winter-run steelhead in the Puget Sound steelhead ESU - Population trends for west Hood Canal winter-run steelhead. Steelhead counts in west Hood Canal have shown an increasing trend since the mid 1990s. The estimated probability that this steelhead population would decline to 10% of its current estimated abundance (i.e., to 31 fish) is low—near zero within 100 years. With an estimated mean population growth rate of 0.093 (λ = 1.097) and process variance of 0.017, we can be highly confident ($P < 0.05$) that a 50% or greater decline in this population will not occur within the next 100 years (Ford 2011). Based on a preliminary intrinsic potential (IP) estimate by the PSSTRT (2011), the capacity for winter steelhead in this DIP is 4,148 adults.

*Puget Sound steelhead: Updated Risk Summary***.** The status of the listed Puget Sound steelhead DPS has not changed substantially since the 2007 listing. Most populations within the DPS are showing continued downward trends in estimated abundance, a few sharply so (Ford 2011). For all but a few putative demographically independent populations of steelhead in Puget Sound, estimates of mean population growth rates obtained from observed spawner or redd counts are declining—typically 3 to 10% annually—and extinction risk within 100 years for most populations in the DPS is estimated to be moderate to high, especially for *draft* populations in the *putative* South Sound and Olympic MPGs. Collectively, these analyses indicate that steelhead in the Puget Sound DPS remain at risk of extinction throughout all or a significant portion of their range in the foreseeable future, but are not currently in danger of imminent extinction.

- 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.

Table 2.2.2.2: Number of natural-origin Chinook smolts in Hood Canal.

Area	Wild Smolts[a]
Hood Canal Streams	132,000

[a] Wild smolt numbers were estimated by averaging the 1995-1998 wild escapements in Hood Canal, halving that number to estimate the number of female spawners, applying a fecundity of 4,000 eggs per female (Bill Tweit, WDFW, personal communication) to estimate the total number of eggs produced, then applying a freshwater survival rate of 5% (Bill Tweit, WDFW, personal communication) to the egg estimate to estimate the number of surviving smolts.

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Table 2.2.2.3: Puget Sound Chinook population average productivity for five-year intervals measured as recruits per spawner (R/S) and spawners per spawner (S/S). Trend over the intervals is also given.

Brood Years	1982-1986		1987-1991		1992-1996		1997-2001		2002-2006		Trend	
Populations	**R/S**	**S/S**	**R/S**	**S/S**	**R/S**	**S/S**	**R/S**	**S/S**	**R/S**	**S/S**	**R/S**	**S/S**
Mid Hood Canal	*1.9*	*0.18*	*13.57*	*2.4*	*7.02*	*3.39*	*1.88*	*0.62*	*2.0*	*0.68*	*-1.15*	*-0.08*
ESU	***9.57***	***2.19***	***5.05***	***0.96***	***3.01***	***1.24***	***2.70***	***1.19***	***1.67***	***0.67***	***-1.81***	***-0.28***

Source: Ford 2011.

Table 2.2.2.4: Trends in abundance and productivity for Puget Sound Chinook populations. Long-term, reliable data series for natural-origin contribution to escapement are limited in many areas.

Region	Population	Natural Escapement Trend[1] (1990-2011)			Growth Rate (1990-2009)[2]	
		NMFS		Co-manager	Recruitment (Recruits)	Escapement (Spawners)
Hood Canal	Mid Hood Canal Rivers (late)	1.00	stable	declining	0.93	0.98

[1] Escapement trend is calculated based on all spawners (i.e., including both natural-origin spawners and hatchery-origin fish spawning naturally) to assess the total number of spawners passed through the fishery to the spawning ground. Directions of trends defined by statistical tests. Source: NMFS 2014.

Table 2.2.2.5: Short and long term population trend and growth rate estimates for the Puget Sound Chinook ESU populations, Hood Canal Region.

Regions and Populations	Years	Trend Natural Spawners w/Cl	Hatchery Fish Success = 0 Lambda w/Cl	p>1	Hatchery Fish Success = 1 Lambda w/Cl	p>1
Mid-Hood Canal Fall Run	1995-2009	0.911 (0.818 - 1.016)	0.921 (0.224 - 3.787)	0.30	0.859 (0.209 - 3.532)	0.20
	1968-2009	0.952 (0.93 - 0.974)	0.934 (0.781 - 1.118)	0.20	0.871 (0.724 - 1.047)	**0.06**

Source: Ford 2011.

Table 2.2.2.6: Short and long term population trend and growth rate estimates for the Hood Canal Summer Chum ESU populations.

Population	Years	Trend Nat Sp w/CI	Hatchery Fish Success =0		Hatchery Fish Success =1	
			Lambda w/CI	p>1	Lambda w/CI	p>1
Hood Canal	1995-2009	1.075 (0.964 - 1.198)	1.041 (0.108 - 10.016)	0.57	0.958 (0.114 - 8.026)	0.42
	1968-2009	0.989 (0.956 - 1.022)	0.989 (0.786 - 1.244)	0.46	0.962 (0.775 - 1.195)	0.34

Source: Ford 2011.

Table 2.2.2.7: Status of the Skokomish winter steelhead DIP.

Population	Run timing	2000-2005 escapement	2006-2011 escapement	Percent change	Escapement Goal[a]	Status
Skokomish	Winter	214	388	81.6%	1,400	Depressed

Source: SaSI, WDFW 2012.

[a]Escapement Goal is for index areas and was derived WDFW methodology (Gibbons et al. 1985). However the state and Treaty Tribes have not agreed to the goal or the method used to derive it.

Table 2.2.2.8: Steelhead Population Exp. Trend ln(nat. spawners) (95% CI).

Population	1985-2009	1995-2009
East Hood Canal winter-run	1.022 (0.997 - 1.048)	1.033 (0.976 - 1.092)
Skokomish River winter-run	0.956 (0.932 - 0.979)	1.006 (0.958 - 1.057)
West Hood Canal winter-run	1.101 (1.046 - 1.160)	1.101 (1.046 - 1.160)

Source: Ford 2011.

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- 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.

Table 2.2.2.9: Spawner abundance data for Hood Canal fall Chinook 2000-2013.

Year	Fall Chinook
2000	1,792
2001	3,002
2002	1,725
2003	1,512
2004	3,663
2005	2,776
2006	1,549
2007	561
2008	1,574
2009	1,242
2010	1,338
2011	1,633
2012	1,988
2013	2,526
Average	**1,920**

Sources: Chinook data are from co-manager Chinook terminal run reconstruction. 2013.

Table 2.2.2.10: Hood Canal natural summer chum escapement from 1999 to 2013.

Year	Tahuya[a]	Union[b]	Liliwaup[c]	Hamma Hamma[d]	Duckabush[e]	Dosewallips[f]	Quilcene[g]
1999	1	159	13	255	92	351	3,237
2000	2	744	22	229	464	1,260	5,898
2001	0	1,491	92	1,227	942	990	6,373
2002	0	872	858	2,328	530	1,627	4,487
2003	0	11,916	353	854	1,869	7,066	12,733
2004	8	5,976	1,017	2,691	8,637	11,549	38,153
2005	4	1,987	1,049	1,408	821	2,658	6,672
2006	749	2,836	1,615	3,065	3,135	2,577	11,876
2007	623	1,967	529	1,489	1,294	1,468	2,526
2008	700	1,130	690	1,642	2,668	3,930	3,861
2009	380	611	255	663	2,659	1,127	1,492
2010	1,153	963	238	1,471	4,110	2,521	2,073
2011	325	276	111	773	1,538	1,130	2,597
2012	1,405	2,246	3,327	2,358	5,241	2,862	11,738
2013	862	1,949	2,631	2,185	3,939	1,815	7,950
Average	**414**	**2,342**	**853**	**1,509**	**2,569**	**2,862**	**8,111**

Source: SaSI 2014.

[a] Data are total escapement estimates based on live spawner counts from RM 0.0 to 2.6.

[b] Data are total escapement estimates based on rack counts and live spawner counts from RM 0.3 to 2.1.

[c] Data are total escapement estimates based on live spawner counts from RM 0.0 to 0.7 or counts of adult summer chum at a temporary trap.

[d] Data are total escapement estimates based on live spawner counts from RM 0.3 to 1.8 in the Hamma Hamma River and in John Creek, a tributary.

[e] Data are total escapement estimates based on live spawner counts from RM 0.0 to 2.3.

[f] Data are total escapement estimates based on live spawner counts from RM 0.0 to 2.3 on the Dosewallips.

g Data are total escapement estimates based on Quilcene National Fish Hatchery rack counts, live spawner counts from RM 0.0 to 2.8 on the Big Quilcene River, and on Little Quilcene River live spawner counts from RM 0.0 to 1.8.

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Table 2.2.2.11: Abundance Estimates for Mid Hood Canal Chinook 1998-2013.

Year	Hamma Hamma River	Duckabush River	Dosewallips River
1998	172	57	58
1999	557	151	54
2000	381	28	29
2001	248	29	45
2002	32	20	43
2003	95	12	87
2004	49	0	80
2005	33	2	10
2006	16	1	13
2007	60	4	9
2008	255	0	18
2009	98	9	23
2010	67	0	15
2011	273	5	11
2012	373	6	7
2013	661	7	4
Average	**211**	**21**	**32**

Source: SaSI 2014.

- 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.

Table 2.2.2.12: Puget Sound Chinook average natural (natural-origin and hatchery) and natural-origin only spawners and percent hatchery contributions for five year intervals. Spawning abundance averages are geometric means and hatchery contribution averages are arithmetic.

Return Years	1990-1994			1995-1999			2000-2004			2005-2009		
Populations	**Nat**	**%**	**NOR**	**Nat**	**%**	**NOR**	**Nat**	**%**	**NOR**	**Nat**	**%**	**NOR**
Mid Hood Canal	110	21%	86	176	16%	148	202	21%	158	81	39%	44
ESU	**23,938**	**75%**	**17,905**	**27,392**	**63%**	**17,245**	**43,192**	**72%**	**31,294**	**34,486**	**69%**	**23,938**

Source: Ford 2011.

Table 2.2.2.13: Spawner abundance for summer chum, Hood Canal region 2000-2013.

Year	Summer Chum[a,b]
2000	8,649
2001	12,044
2002	11,454
2003	35,696
2004	69,995
2005	16,378
2006	26,753
2007	10,781
2008	15,403
2009	7,423

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2010	12,741
2011	6,968
2012	30,058
2013	22,806
Average	**20,511**

Source: Summer chum data are from WDFW and PNPTT (2013) and co-manager run reconstruction.
[a] Includes wild broodstock used in supplementation program.
[b] Based on WDFW SaSI data 2013.

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

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

Broodstock collection: Hoodsport fall Chinook broodstock collection may result in take of listed Puget Sound fall Chinook if they enter the holding ponds at the facility. Mass-marking was initiated at Hoodsport Hatchery beginning with the 2007 brood production (Skokomish Mass-Marking MOU 2005); and all Hoodsport fall Chinook are coded-wire tagged and/or adipose-fin-clipped to allow identification and use of hatchery-origin fish in only the broodstock. See take table at the end of this document for estimated take of listed fall Chinook.

Summer chum are considered extirpated from Finch Creek (WDFW and PNPTT 2000). However, returns of chum from 2002 to present that swim into the adult holding ponds at Hoodsport Hatchery prior to October 15 have been returned to Finch Creek (**Table 2.2.3.1**.). As required per the Biological Opinion on Artificial Propagation in the Hood Canal and Eastern Strait of Juan de Fuca Regions of Washington State (NMFS 2002), every effort is made to release chum that return to the adult ponds at Hoodsport Hatchery during Chinook trapping operations from August through September 30th upstream. In 2013 genetic samples were obtained from 50 chum which returned to the Hoodsport Hatchery prior to October 15th. Genetic results indicated that 3 of the 32 fish sampled on October 3rd assigned to the known summer chum genetic baseline (Small et al. 2014).

Table 2.2.3.1: Number of Chum Handled at Hoodsport Hatchery Prior to October 15, from 2002 – 2013.

Return Year	Number of Chum Handled Prior to October 15	Final Disposition
2002	39	Passed Upstream
2003	17	Passed Upstream
2005	10	Passed Upstream
2008	33	Passed Upstream
2010	24	Passed Upstream
2013	50	32 surplussed/ 18 passed upstream[1]
Average	**29**	

Source: WDFW Hatcheries Headquarters Database 2014.
[1] 32 were sampled October 3, 2013. Of these 26 assigned to the fall chum known genetic baseline, 3 were ambiguous and 3 assigned to the known summer chum genetic baseline. The remaining 18 were sampled on October 15, 2013, results were unavailable for 98% of these due to the degraded condition. Results from Small et al. 2014.

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Operation of Hatchery Facilities: Potential facility operation impacts on listed fish include; water withdrawal, hatchery effluent, and intake compliance. Monitoring and maintenance are conducted along with staff observations. Effluent at outfall areas is rapidly diluted in Hood Canal, and operation is within permitted guidelines (see HGMP sections 4.1 and 4.2). All permit requirements are followed in order to minimize the potential indirect 'Take" associated with the operations of these facilities.

*Potential effects of Hoodsport Hatchery Chinook releases on Summer Chum***:** The *Summer Chum Salmon Conservation Initiative* (SCSCI) (WDFW and PNPTT 2000) provides an assessment of risks to summer chum juveniles and adults posed by the production of Hoodsport Hatchery chum, risk-averse measures to implement, and monitoring and evaluation measures to be applied to minimize any risks. Hatchery practices will follow the recommended actions of the SCSCI. Summer chum fry are expected to migrate to salt water from February through April and swim seaward quickly (Tynan 1997) thus they are expected to clear the area well before the Hoodsport Hatchery Chinook releases in late April/early May. The SCSCI requires that no hatchery fish releases are to occur prior to April 1 as a protection measure during out-migration of listed Hood Canal summer chum). Both juveniles and returning adults from the on-station program pose low risk for competition or predation to summer chum (Tynan 1999).

Disease Transmission: Interactions between hatchery-reared and naturally-produced populations may be a source of pathogen and disease transmission, although there is little evidence showing that diseases are transmitted from hatchery fish to natural-origin fish (Steward and Bjornn 1990, Tynan 1999). WDFW conducts fish disease examinations to ensure minimal disease transmission and to prevent the introduction and/or spread of any fish diseases. Fish health monitoring efforts include fish health examinations and virus sampling, abnormal fish loss investigations, virus sampling, and pre-transfer and pre-liberation inspections. All activities are done in accordance with guidelines developed under the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State (*WDFW and WWTIT 1998, updated 2006).

Predation/Competition: Hoodsport Chinook are expected to migrate quickly through Hood Canal and minimize the potential ecological interactions and any adverse affects to listed Chinook. Chinook sub-yearlings are released at around 80 fpp (88 mm fork length), per WDFW rearing guidelines in April/May when natural-origin Skokomish Chinook smolts are expected to be about 60 to 80 mm long (D. Seiler, WDFW, personal communication, February 2000; Weinheimer and Zimmerman 2012). The USFWS (1994) has suggested that juvenile salmonids can consume fish which are one-third or less their own body length; given this rule of thumb, there is little or no potential for predation by hatchery Chinook. Yearlings are released at around 6 fpp (210 mm fl) in May, at a size and time to encourage rapid migration through Hood Canal.

The Species Interaction Working Group (SIWG 1984) categorized various risks to wild salmon species and steelhead from hatchery-origin salmon species and steelhead (**Table 2.2.3.2**).

Table 2.2.3.2: Risks posed by hatchery-origin Chinook to wild Chinook (data from SIWG (1984).

Type of Risk	Level of Risk
Freshwater predation	Unknown
Freshwater competition	High potential
Early marine predation	Unknown
Early marine competition	High potential

There is currently no specific information available regarding hatchery/wild overlaps in the waters of Hood Canal. Clearly, the number of juvenile hatchery Chinook releases (reduced by 400,000 in 2004) greatly exceeds the estimated number of wild juveniles in the Skokomish Basin

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and throughout Hood Canal (Table 2.2.2.2) which may increase the risk of competition or attraction of piscivorous fish and avian predators.

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

As of December 15, 2005, the Co-managers agreed to mass-mark the remaining Chinook production with full implementation beginning with the 2007 brood year production (Skokomish Mass-Marking MOU 2005). The adipose-marked fish may also include fish with other marks, such as thermal otolith marks or coded-wire tags, as part of a program to conduct and evaluate alternative production strategies. The 100% marking of the Hoodsport Hatchery production allows monitoring and evaluation of the hatchery program production. The DIT group serves as an index group for wild sub-yearling fall Chinook, as well as providing data on catch contributions, run timing, total survival, migration patterns and straying into other watersheds. (See Take Tables at the end of this document).

- 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 at the end of this document.

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

Contingency plans to limit “take” to pre-determine numbers were to mass-mark (adipose-fin clip only) and/or coded-wire tag all the Chinook sub-yearlings at the facility. This would provide the means to differentiate hatchery (sub-yearling/yearling portions) and natural-origin fish returning to the hatchery (see HGMP section 10.7). Mass-marking at Hoodsport Hatchery took place in 2006.

In the unlikely event that identified listed Chinook salmon take levels exceed expected authorized levels, the Co-managers will consult with NOAA Fisheries in a timely manner.

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.

WDFW hatchery programs in Puget Sound operate under and adhere to: *U.S. v Washington* (1974) which provides the legal framework for coordinating these programs, defining artificial production; the *Summer Chum Salmon Conservation Initiative* (2000)*;* the *Comprehensive Chinook Salmon Management Plan* (2004); and the Hatchery Action Implementation Plan (HAIP) for the watershed (see HGMP section 3.4).

Summer Chum Salmon Conservation Initiative (*SCSCI*). Summer chum supplementation, habitat restoration and harvest management measures are integrated as presented in the *Summer Chum Salmon Conservation Initiative* (WDFW and PNPTT 2000). The SCSCI provides a standardized approach to determine freshwater and estuarine limiting factors in each summer chum watershed. The goal of the habitat protections and restoration strategy is to maintain and recover the full

array of watershed and estuarine-nearshore processes critical to the survival of summer chum across all life stages.

Draft Resource Management Plan: Puget Sound Chinook Salmon Hatcheries, a component within the *Comprehensive Chinook Salmon Management Plan*. This plan describes the operating procedures for Chinook salmon hatcheries in Puget Sound, their role in achieving the Co-managers' resource management goals, and their consistency with the protection given to Puget Sound Chinook salmon by the Endangered Species Act (ESA). The plan describes both Tribal and WDFW hatcheries, as are tightly linked: they often operate in the same watersheds, exchange eggs, and share rearing space to maximize the effectiveness of the programs (WDFW and PSTT 2004).

Washington Department of Fish and Wildlife Commission Policy C-3619. WDFW adopted the Hatchery and Fishery Reform Policy C-3619 in 2009. Its purpose is to advance the conservation and recovery of wild salmon and steelhead by promoting and guiding the implementation of hatchery reform. The intent of hatchery reform is to improve hatchery effectiveness, ensure compatibility between hatchery production and salmon recovery plans and rebuilding programs, and support sustainable fisheries. WDFW Policy C-3619 works to promote the conservation and recovery of wild salmon and steelhead and provide fishery-related benefits by establishing clear goals for each state hatchery, conducting scientifically defensible-operations, and using informed decision making to improve management. It is recognized that many state operated hatcheries are subject to provisions under U.S. v. Washington (1974) and U.S. v. Oregon and that hatchery reform actions must be done in close coordination with tribal co-managers (available at http://wdfw.wa.gov/commission/policies/c3619.html).

Hatchery Reform- Principles and Recommendations of the Hatchery Scientific Review Group: WDFW programs have incorporated suggestions this report provided, in a detailed description of the HSRG's scientific framework, tools and resources developed for evaluating hatchery programs, the processes used to apply these tools, and the resulting principles, system-wide recommendations, and program-specific recommendations to reform (HSRG 2004) (see also HGMP section 6.2.3).

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 hatchery program, and all other WDFW anadromous salmon hatchery programs within the Puget Sound Chinook ESU, operates under *U.S. v Washington* (1974) and the *Puget Sound Salmon Management Plan* (PSSMP 1985) and the *Hood Canal Salmon Management Plan* (HCSMP) (PNPTC et al. 1986), which provides the legal framework for coordinating these programs, defining artificial production objectives, and maintaining treaty-fishing.

The PSSMP and the 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 between WDFW and the Skokomish, Lower Elwha Kllalam tribes and the Point No Point Treaty Council (PNPTC) which includes the Port Gamble S'Klallam and Jamestown S'Klallam tribes. The co-management process requires that both the State of Washington and the relevant Puget Sound tribes agree on the function and purpose of each hatchery program and on production levels. Guidelines for production at Hood Canal facilities are set out in the *Hood Canal Salmon and Steelhead Production MOU* (1996) and the Future Brood Document. The *PSSMP* explicitly states that "no change may be made to the Equilibrium Brood Document (production goals) without prior agreement of the affected parties."

Hatchery salmon and steelhead production levels are detailed in the annual Future Brood Document. The Future Brood Document (FBD) is a pre-season planning document for fish hatchery production in Washington State for the upcoming brood stock collection and fish rearing

season (July 1 – June 30). The FBD is coordinated between WDFW, the Northwest Indian Fisheries Commission (NWIFC) representing Puget Sound and coastal treaty tribes, eastern Washington treaty tribes, and Federal fish hatcheries. Hatchery production by volunteers, schools, and Regional Fisheries Enhancement Groups are represented by WDFW.

See also HGMP section 3.1.

3.3) Relationship to harvest objectives.

Tribal and non-Tribal fisheries directed at salmon and steelhead produced through WDFW hatchery releases will be managed to minimize incidental effects to listed salmon and steelhead. Compliance with the fisheries management strategy defined in the *Puget Sound Chinook Harvest Management Plan* (WDFW and PSTT 2004, revised 2010) and *Summer Chum Salmon Conservation Initiative* (2000) will lead to fisheries on WDFW hatchery-origin stocks that are not likely to adversely affect listed Chinook or listed summer chum. There is no directed harvest on the Mid-Hood Chinook salmon population in the terminal area; however, there is a restricted sport fishery in mixed stock areas.

The *upper management threshold* (UMT) is set at 750, which is the best available estimate of MSH escapement for the Mid Hood Canal population. If escapement is projected to be less than 750 pre-terminal fisheries in southern U.S. (SUS) areas will be managed to not exceed an exploitation rate of 15%, as estimated by the FRAM model. The extreme terminal areas for this management unit, which include the Hamma Hamma, Dosewallips, and Duckabush rivers, will be closed if escapement is not projected to exceed 750. A low abundance threshold of 400 Chinook spawners has been established for the Mid-Hood Canal MU. This value is approximately 50% of the current MSY goal for the Mid-Hood Canal sub-populations. If escapement is projected to fall below this threshold, conservation measures will be implemented in pre-terminal SUS fisheries to further reduce mortality, such that that the projected pre-terminal Southern U.S. (PTSUS) exploitation rate does not exceed 12.0% (WDFW PSTT 2010).

WDFW general harvest goals are to provide fishing opportunities consistent with the mandate of the agency for restoration and recovery of wild indigenous salmonid runs, the Pacific Salmon Treaty, the Puget Sound Salmon Management Plan, *US v. Washington* (1974), and other state, federal, and international legal obligations.

The annual pre-season planning process for Northwest recreational and commercial salmon fisheries, known "North of Falcon", involves a series of public meetings between federal, state, tribal and industry representatives and other concerned citizens. NoF coincides with meetings of the Pacific Fishery Management Council, which sets the ocean salmon seasons at these meetings.

3.3.1) <u>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.</u>

Table 3.3.1.1: Hoodsport Hatchery Fall Chinook Fishery Contributions.

Brood Years: 2002-2007 Fishery Years:2006-2011			
	Average SAR%[a]	**0.30**	**0.64**
Agency	**Non-WA Fishery**	*% of total Survival*	
		Sub-yearlings	*Yearlings*
ADFG	All	*0.2*	---
CDFO	All	*19.0*	*5.6*
ODFW	All	*0.2*	*0.0*
NMFS	All	*0.6*	*0.0*

Agency	WA Fishery	*Sub-yearlings*	*Yearlings*
WDFW	10- Ocean Troll	*0.6*	*0.8*
WDFW	15- Treaty Troll	*2.4*	*1.6*
WDFW	23- PS Net	*46.2*	*36.8*
WDFW	41- Ocean Sport- Charter	*0.3*	*0.3*
WDFW	42- Ocean Sport- Private	*0.6*	*0.2*
WDFW	45- PS Sport	*8.3*	*22.4*
WDFW	45- PS Sport - Winter Blackmouth (Oct - April)	*3.3*	*9.9*
WDFW	46- Freshwater Sport[b]	---	*1.2*
WDFW	50- Hatchery Escapement	*17.9*	*18.9*
WDFW	50- Hatchery Escapement (Strays)[c]	*0.2*	*0.6*
WDFW	54- Spawning ground[d]	*0.1*	*1.6*
SUQ	54- Spawning ground[e]	*0.4*	---
WDFW	62- Test Fishery Seine	---	*0.1*
	Total	*100.0*	*100.0*

Source: RMIS 2013.

[a] Average SAR% = (tags recovered/tags released).

[b] A targted freshwater sport fishery does not occur for this program. All contribution is based off of tag recoveries from strays to the Skokomish River.

[c] Strays were recovered at Bernie Kai Kai Gobin, Garrison Springs, George Adams, Grovers Creek, Minter Creek, Tumwater Falls and Wells Hatcheries.

[d] Strays were recovered on the spawning grounds in WRIA 15 and 16.

[e] Strays were recovered on the spawning grounds in WRIA 15.

3.4) Relationship to habitat protection and recovery strategies.

Salmon and Steelhead Habitat Limiting Factor Analyses: Limiting factors analyses have been completed for streams and nearshore areas in WRIA 14 and 15 (Dewatto and Tahuya rivers), WRIA 16 (Skokomish, Dosewallips, Duckabush and Hamma Hamma rivers) and WRIA 17 (Quilcene river) by the Washington State Conservation Commission (Correa 2002 and 2003, Kuttel 2003); these reports will provide information useful for identifying factors limiting populations in Hood Canal. Gradients of west Hood Canal Rivers rapidly become steep with impassable waterfalls, so most of these rivers are not fully accessible to steelhead. All of these rivers have suffered damage from human activities (dam, roads, logging, diking, agriculture and development) that have exacerbated natural summer low flows, winter flooding and streambed scouring, and sediment deposition due to unstable soils and slopes. Large woody debris is lacking in most areas used as a result of forest practices. In the Skokomish, the Cushman hydropower project on the North Fork has reduced stream flows in the Skokomish by about 40% and has altered the normal pattern of sediment delivery to the estuary with the result that eelgrass has been lost (WDFW and WWTIT 1994). Gravel aggradation and removal have been problems in the lower Big Quilcene.

Hatchery Action Implementation Plans (HAIPs): Are watershed-level documents developed by the western Washington Treaty Tribes (Tribes) and WDFW, which consolidate descriptions of hatchery programs from each watershed into a single document. This document addresses co-manager priorities, legal requirements of the Puget Sound Salmon Management Plan (PSSMP 1985) and Endangered Species Act (ESA), and recommendations of the Hatchery Scientific Review Group (HSRG). It describes the adaptation of general principles for hatchery management to the unique genetic and ecological setting of each watershed. The HAIPs also describe how hatchery programs will operate in conjunction with harvest management, habitat restoration, and habitat protection to achieve near- and long-term goals for natural and hatchery production of salmon in each watershed, as well as listing funded and unfunded capital and

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operating/monitoring needs for all state and tribal hatchery programs and facilities. Each HAIP will also outline the monitoring and evaluation needs and describe the co-manager's adaptive management approach.

Summer Chum Salmon Conservation Initiative (SCSCI): Summer chum supplementation, habitat restoration and harvest management measures are integrated as presented in the Summer Chum Salmon Conservation Initiative (WDFW and PNPTT 2000). The SCSCI provides a standardized approach to determine freshwater and estuarine limiting factors in each summer chum watershed. The goal of the habitat protections and restoration strategy is to maintain and recover the full array of watershed and estuarine-nearshore processes critical to the survival of summer chum across all life stages.

Salmon Recovery Funding Board (SRFB): Created by the Legislature in 1999, the SRFB is composed of five citizens appointed by the Governor and five state agency directors, the Board provides grant funds to protect or restore salmon habitat and assist related activities. It works closely with local watershed groups known as lead entities (see below). The Board supports salmon recovery by funding habitat protection and restoration projects, and related programs and activities that produce sustainable and measurable benefits for fish and their habitat.

Lead Entities: The Lead Entity for the Hood Canal basin is the Hood Canal Coordinating Council. It oversees an area that is 62 miles long (Hood Canal) and covering about 358 miles of shoreline. Land ownership in the watershed is 48% federal and includes portions of Olympic National Park and Olympic National Forest, 39% private, 12% state and local, and 1% Tribal trust lands. Major projects are underway to restore critical estuarine habitat. These include removal of levees; ditches and tide gates to allow disconnected and degraded salt marshes to recover in the Skokomish, Union and Dosewallips estuaries. Natural functions and processes are being restored in the Chimacum Creek estuary through removal of fill and riprap.

RFEGs: Several citizen based groups in conjunction with local governments work on habitat actions to benefit both listed and non-listed stock in the system including the Hood Canal Salmon Enhancement Group (HCSEG).

Puget Sound Partnership Action Plan: An ESU-wide recovery planning effort is being undertaken by the Puget Sound Partnership, a collaborative group dedicated to restoring salmon and steelhead throughout Puget Sound (online at http://www.pugetsoundpartnership.org).

3.5) Ecological interactions.

(1) *Salmonid and non-salmonid fishes or other species that could negatively impact the program.* Negative impacts by fishes and other species on the Chinook program could occur directly through predation on program fish, or indirectly through food resource competition, genetic effects, or other ecological interactions. In particular, fishes and other species could negatively impact Chinook survival rates through predation on newly released, emigrating juvenile fish in nearshore and marine areas. Certain avian and mammalian species may also prey on juvenile Chinook while the fish are rearing at the hatchery site, if these species are not excluded from the rearing areas. Species that could potentially negatively impact juvenile Chinook through predation include the following:

- Avian predators, including mergansers, cormorants, belted kingfishers, great blue herons, and night herons
- Mammalian predators, including mink, river otters, harbor seals, and sea lions
- Cutthroat trout

Rearing and migrating juvenile and adult Chinook originating through the program may also serve as prey for large, mammalian predators in nearshore marine areas to the detriment of population abundance and the program's success in augmenting harvest. Species that may negatively impact program fish through predation may include:

- Southern Resident Killer Whales

- Sea lions
- Harbor seals
- River otters

(2) *Salmonid and non-salmonid fishes or other species that could be negatively impacted by the program).*

-Puget Sound Chinook
-Puget Sound steelhead
-Hood Canal summer chum

(3) *Salmonid and non-salmonid fishes or other species that could positively impact the program.* Not applicable

(4) *Salmonid and non-salmonid fishes or other species that could be positively impacted by the program.* The Chinook program could positively impact marine fish species that prey on juvenile and adult fish. These species include:
- Southern Resident Killer Whale
- Cutthroat trout
- Steelhead
- Coho salmon
- Pacific staghorn sculpin
- Numerous marine pelagic fish species

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.

Table 4.1.1: Water sources available at Hoodsport Hatchery.

Water Source	Available Water Flow (gpm)	Temp. (F)	Usage	Limitations
Shallow Well (2)	150 each	48	Emergency back-up for incubation	Low flows. Shallow.
Finch Creek (surface)	8,500	41-53	Broodstock holding, incubation, rearing, acclimation	No limitations.
Salt water	2 pumps x 800gpm each	50	Rearing, Acclimation.	No limitations.

Hoodsport Hatchery acquired two shallow wells on Finch Creek, previously owned and operated by the PUD to supply drinking water, in 2010. These supply water for incubation only in a back-up capacity during emergencies.

Water for rearing fall Chinook at Hoodsport Hatchery comes from Finch Creek. Finch Creek is mostly a spring-fed creek, with additional run-off during rainy periods. Flows may vary from 15 to 30cfs. Water quality has deteriorated in recent years. Finch creek meets water quality standards in the residential area along much of Finch Creek Rd., but water quality degrades in the last couple hundred feet as the creek enters the mixed use commercial/residential area (Kenny 2006).

Saltwater is used during rearing and for two weeks prior to release for salt water acclimation. This salt water is supplied to the hatchery via a pipeline connected to an intake located 80 feet deep in the Hood Canal. Two 20-HP vertical turbine pumps with pumping capacity of 1,600gpm are utilized to pump saltwater.

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Finch Creek surface and salt water rights are formalized through trust water right # S2-20588 and #S2-28855 respectively.

Table 4.1.1. Record of NPDES permit compliance at Hoodsport Hatchery.

Facility/ Permit #	Reports Submitted Y/N			Last Inspection Date	Violations Last 5 yrs (see Table 4.2.2)	Corrective Actions Y/N	Meets Compliance Y/N
	Monthly	Qtrly	Annual				
Hoodsport WAG13-1011	Y	Y	Y	3/24/2008	2	N	Y

Source: WDFW Hatcheries Headquarters Database 2013.

Table 4.1.2. List of NPDES violations at Hoodsport Hatchery, over the last five years (2008-2013).

Monitoring Month	Parameter	Sample Type	Result/ Violation	Permit Limit	Comment	Action
March 2008	TSS	Avg. Net Composite	10.0 mg/L	5.0 mg/L	Due to flooding.	NA
December 2011	TSS	PA Max Grab	117.1 mg/L	100.0 mg/L	Flooding at the hatchery brought in mud.	

Source: WDFW Hatcheries Headquarters Database 2013.
Note: These violations did not result in non-compliance with 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.

The hatchery water intake structure at Finch Creek is compliant with State and Federal withdrawal guidelines (NMFS 1995, 1996), but does not meet the current Anadromous Salmonid Passage Facility Design criteria (NMFS 2011).

This facility operates under the "Upland Fin-Fish Hatching and Rearing" National Pollution Discharge Elimination System (NPDES) general permit which conducts effluent monitoring and reporting and operates within the limitations established in its permit administered by the Washington Department of Ecology (DOE), WAG 13-1011. Monthly and annual reports on water quality sampling, use of chemicals at this facility, compliance records are available from DOE.

Discharges from the cleaning treatment system are monitored as follows:

- *Total Suspended Solids (TSS)* 1 to 2 times per month on composite effluent, maximum effluent and influent samples.
- *Settleable Solids (SS)* 1 to 2 times per week on effluent and influent samples.
- *In-hatchery Water Temperature* - daily maximum and minimum readings.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

A removable weir placed in Finch Creek directs fish into the ladder and three adult holding ponds. The weir is operated from July 1 through mid-December, until the conclusion of the fall chum run.

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

A 400-gallon tanker truck, equipped with aerators and oxygen tanks is available for transportation.

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5.3) Broodstock holding and spawning facilities.

Broodstock is held in three 13'x205'x5' adult concrete raceways. Spawning facilities are located at the end of the raceways.

5.4) Incubation facilities.

The incubation facility at Hoodsport Hatchery consists of 1,200 “Heath” style vertical incubators supplied with surface water.

5.5) Rearing facilities.

Table 5.5.1: Rearing ponds available at Hoodsport Hatchery.

Type	Number	Size
Concrete raceways	10	20'x80'x2.5'
Concrete ponds	1	40'x100'x3'
Adult concrete raceways	3	13'x205'x5'

5.6) Acclimation/release facilities.

All fish are reared at the facility in concrete raceways supplied with Finch Creek water. Two weeks before release salt water is added to creek water for seawater acclimation.

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

No operational difficulties have led to significant fish loss.

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 affected by this facility operation. Finch Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005). Operational protocols are in place to return any listed adults back to Finch Creek as quickly as possible when and where they occur. Any listed fish (Chinook, steelhead, summer chum etc.) found in holding pond will be immediately returned to Finch Creek.

An employee is on stand-by at the hatchery at all times to monitor hatchery operations and respond to any unexpected events. The facility is equipped with upgraded low water alarms and a back-up generator in case of power loss.

Fish rearing is conducted in compliance with the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006). Adherence to artificial propagation, sanitation and disease control practices defined in the policy should reduce the risk of fish disease pathogen transfers.

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.

Hatchery-origin adult fall Chinook returning to Finch Creek and George Adams Hatchery.

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6.2) Supporting information.

6.2.1) History.

The hatchery fall Chinook population propagated through this program was established in Finch Creek where no independent fall Chinook population previously existed (PSTRT 2003),(SHIEER, NOAA 2004). The Hoodsport program started in 1952 with the initial release of Dungeness Hatchery spring /summer Chinook. It was followed by transfers of Green River hatchery lineage Chinook populations from Soos Creek, Voights Creek, Minter Creek, Big Beef Creek, Tumwater Falls Hatcheries, and Trask River (Oregon). The releases continued until the hatchery became (largely) self sustaining. The actual contribution of these individual hatchery stocks to the Hoodsport stock is unclear (SSHAG, 2003).

Localized adult returns to the hatchery release site have been used to sustain the Hoodsport Hatchery fall Chinook programs since 1993 (SHIEER, NOAA 2004).

6.2.2) Annual size.

Up to 2,500 adults are collected annually, assuming a fecundity of 4,000 eggs/female, 60:40 male to female sex ratio, and a pre-spawning mortality of ≤10%.

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

Estimation of past levels of natural fish included in the broodstock is unknown prior to the release of 100% mass-marked fish in 2006. The current program is managed as segregated and excludes the use natural-origin fish in broodstock.

6.2.4) Genetic or ecological differences.

Monitoring and evaluation suggests that escaping hatchery-origin fish have been contributing to the abundance of the naturally spawning population in Hood Canal watersheds, including the Skokomish River (Vander Haegen and Doty 1995; WDFW 2003x), (SHEEIR, NMFS 2004) and Marshall et al., (1995) acknowledged that the Hood Canal hatcheries were the primary source of naturally spawning fall Chinook in the Hood Canal region rivers. Allozyme analysis results to date suggest that there is no significant genetic differentiation between Skokomish natural Chinook spawners and the George Adams and Hoodsport Hatchery populations (SaSI 2003). The hatchery populations propagated through these programs are considered to be substantially diverged from natural Chinook populations in Puget Sound (SSHAG 2004), and frequent exchange of George Adams and Hoodsport fall-run broodstocks, makes both stocks unlikely to be representative of any of the native Hood Canal fall-run Chinook salmon populations.

6.2.5) Reasons for choosing.

The program was designed to provide Chinook salmon for commercial and recreational fisheries harvest. To suit the purpose, a hatchery fall Chinook population propagated through the program was established in Finch Creek, where no independent fall Chinook population previously existed (PS TRT 2003), through transfers of hatchery lineage populations that were available at the time and reproduced well.

Currently, the program uses locally-adapted hatchery-origin adults established in and returning to Finch Creek and George Adams Hatchery.

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.

This program does not affect listed fish as a result of broodstock selection practices. Natural-origin fish are not selected for broodstock and Finch Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in the NOAA Fisheries Hatchery Listing Policy (June 28, 2005).

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SECTION 7. BROODSTOCK COLLECTION

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

Adults.

7.2) Collection or sampling design.

A removable weir is placed in Finch Creek from July through mid December. The weir blocks the stream and directs fish into the ladder and three adult holding ponds. Collected fish can be sorted and separated by species.

Chinook return to the trap from August through mid September and are collected throughout entire run. The trap can be temporarily closed when the maximum carrying capacity is reached. The trap is closed during tribal harvesting.

7.3) Identity.

WDFW began mass-marking 100% of the fall Chinook yearling production starting with the 2003 brood year and sub-yearling production with the 2005 brood year. Since 2002, a portion of the releases (100,000-200,000) were mass-marked and coded-wire tagged.

7.4) Proposed number to be collected:

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

Up to 2,500 adults collected annually.

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

Table 7.4.2.1: Sex composition of fall Chinook broodstock spawned at Hoodsport Hatchery 2002-2013.

Brood Year	Male	Female	Jack
2002	744	720	6
2003	730	769	20
2004	748	670	49
2005	794	765	43
2006	645	665	39
2007	816	798	41
2008	299	284	13
2009	671	681	60
2010	291	323	31
2011	158	173	15
2012	674	680	24
2013	680	706	57
Average	**604**	**604**	**33**

Source: WDFW Hatcheries Headquarters Database 2014.

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

Fish collected in excess of broodstock needs are disposed and sold to the contracted fish buyer.

7.6) Fish transportation and holding methods.

Adults are not transported. Fish collected for broodstock are held in three 13'x205'x5' adult holding ponds filled with creek water.

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7.7) Describe fish health maintenance and sanitation procedures applied.

Standard fish health protocols, as defined in the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006) are adhered to.

To treat fungus infection present on juveniles they may be treated every other day with formalin as needed, at a rate not exceeding 25 parts per million (ppm) at the pond outfall. Occasionally during holding periods for adult broodstock salt water may be applied to reduce stress and minimize associated pre-spawn mortality.

To lower losses in yearling production, approximately 80 females are separated exclusively for yearling production and inoculated with erythromycin for BKD control. These fish are also screened for ELISA (Enzyme-Linked Immunosorbant Assay). Only eggs from below-low titer females are used for the yearling production.

7.8) Disposition of carcasses.

Carcasses of fish treated with medication or chemicals are buried on station. Untreated carcasses are disposed of by the contracted fish buyer.

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.

This program does not affect listed fish as a result of broodstock collection practices. Natural-origin fish are not collected for the hatchery broodstock and Finch Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005).

SECTION 8. MATING

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

8.1) Selection method.

Broodstock is selected randomly from ripe fish across the entire maturation time frame.

8.2) Males.

All males collected, including jacks, are considered for spawning and chosen when ripe.

8.3) Fertilization.

Eggs from one female are mixed with milt from one male (pairwise spawning) and allowed time for fertilization. Fertilized eggs are pooled into 5 gallon buckets and transported to the incubation room.

8.4) Cryopreserved gametes.

Cryopreserved gametes are not 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.

This program does not affect listed fish as a result of mating scheme. Natural-origin fish are not included in the broodstock and Finch Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005).

Only hatchery-origin brood will be selected at George Adams Hatchery for transfer and release at Hoodsport Hatchery.

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SECTION 9. INCUBATION AND REARING

9.1) Incubation:

Current egg-take goal for Hoodsport Hatchery fall Chinook program is 3,100,000 eggs (FBD, 2013). Beginning with the 2014 brood year, 2015 release year approximately 230K eggs will also be collected at George Adams Hatchery, incubated and reared and released at the Hoodsport Hatchery (Skokomish Indian Tribe and WDFW Draft 2014).

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

Table 9.1.1.1: Survival rates from egg-take to ponding, Hoodsport Hatchery fall Chinook, 2000-2013.

Brood Year	Eggs Collected	Survival Rates (%)	
		Green-to-Eyed Up	Eyed-Up-to-Ponding
2000	3,990,000	91.5	98.4
2001	2,303,150	88.6	96.2
2002	3,637,403	93.5	98.8
2003	3,487,913	94.4	97.6
2004	3,276,709	93.3	97.7
2005	3,142,619	94.8	96.8
2006	3,186,433	93.4	98.3
2007	3,201,082	93.2	96.3
2008	1,325,577	98.0	97.3
2009	3,097,352	95.8	95.9
2010	1,584,102	99.5	99.4
2011	772,627	92.9	94.7
2012	3,260,064	93.0	98.0
2013	3,317,351	91.8	93.5
Average	**2,820,583**	**93.8**	**97.1**

Source: WDFW Hatcheries Headquarters Database 2014.

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

No excess eggs are collected for this program. Current management approach do not allow for the taking of eggs in surplus of program goal. If hatchery losses exceed the expected levels, then program goals for release are supplemented with hatchery-origin only eggs from George Adams Hatchery, or are not met.

9.1.3) Loading densities applied during incubation.

Fertilized eggs are placed into vertical incubators at 8,000 per tray. Once eyed, eggs are reloaded at 6,000 per tray.

9.1.4) Incubation conditions.

All eggs are incubated in trays supplied with creek water and the rate of 4 gpm. Water temperature is monitored daily. Dissolved oxygen is checked when needed. Vexar® layers are placed in trays as a substrate substitute.

Use of surface water causes silt problems. Excess amount of silt is removed by “rodding” trays.

9.1.5) Ponding.

When 95%+ buttoned up, (January/February), the fish are moved from trays into seven 20'x80'x2.5' raceways supplied with surface creek water.

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9.1.6) Fish health maintenance and monitoring.

All fertilized eggs are water hardened in an iodophor solution. Fungus in incubators is controlled by daily formalin drip, (15-minute injection at a target dose of 1,667-ppm formalin), throughout incubation to just prior to hatching. Once eyed, eggs are shocked and dead eggs removed. Fry loss is picked at the time of ponding and then daily.

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 listed fish are incubated through this program. Finch Creek Chinook are not considered a viable population segment in the Puget Sound ESU nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005). Only hatchery-origin brood is selected for transfer, rearing and release at Hoodsport Hatchery.

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.

Table 9.2.1.1: Survival rates from fry-to sub-yearling/yearling survival, Hoodsport fall Chinook 2000-2013.

Brood Year	Survival Rates (%)	
	Fry-to-Sub-yearling	Sub-yearling-to-Smolt
2000	89.8	98.1
2001	87.0	96.3
2002	91.0	99.1
2003	94.0	99.0
2004	95.3	97.9
2005	91.6	98.9
2006	95.4	97.1
2007	94.8	98.9
2008	90.1	94.5
2009	91.1	96.7
2010	90.5	99.8
2011	99.9	99.4
2012	98.0	95.2
2013	Not Yet Available	Not Yet Available
Average	**92.9**	**97.7**

Source: WDFW Hatchery Records 2013.

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

Loading and density levels at WDFW hatcheries conform to standards and guidelines set forth in *Fish Hatchery Management* (Piper et. al. 1982) and the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006). Fish rearing densities are maintained at maximum less than 3 lbs of fish /gpm at release and under 0.35 lbs /ft^3.

9.2.3) Fish rearing conditions.

Chinook are initially reared in seven 20'x80'x2.5' raceways supplied with surface creek water. Mass-marking begins in April, when fish are 150 fpp. Marked fish are moved to rear in adult

raceways until release. Adult raceways used for rearing and acclimation of juveniles are supplied with surface creek water. Two weeks prior to release salt water is used for acclimation.

Table 9.2.3.1: Monthly average surface water temperature (°F) at Finch Creek.

Month	Average Water Temperature (ºF)
January	45
February	45
March	46
April	47
May	49
June	50
July	51
August	51
September	50
October	49
November	47
December	46

Source: WDFW Hatchery Records 2012.

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.

Table 9.2.4.1: Average size (fpp), by month, of juvenile fall Chinook reared at Hoodsport Hatchery.

Month	Average Size (fpp)	
	Sub-yearling	Yearlings
January	1,000	1,000
February	800	800
March	400	400
April	200	200
May	100	100
June	-----	90
July	-----	70
August	-----	50
September	-----	30
October	-----	18
November	-----	15
December	-----	11
January	-----	10
February	-----	9
March	-----	8
April	-----	7
May	-----	6

Source: WDFW Hatchery Records 2012.

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

Not available.

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

Fish are fed a variety of diet formulations including starter; feed brand used may vary, depending on cost and vendor contacts. Feeding frequencies varies depending on the fish size and water temperature and usually begin at 5 feedings/7 days a week and end at 1feeding/5 days a week. Feed rates varies from 1.70% to 2.5% B.W./day. An overall season food conversion rate is approximately 0.8-1.1:1.

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

Fish health is monitored on a daily basis by hatchery staff and at least monthly by a WDFW Fish Health Specialist. Hatchery personnel carry out treatments prescribed by the Fish Health Specialist. Procedures are consistent with the *Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State* (WDFW and WWTIT 1998, updated 2006). See also HGMP section 10.9 for WDFW Standard Fish Health Procedures.

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

The migratory state of the release population is determined by fish behavior. Aggressive screen and intake crowding, leaner condition factors, a more silvery physical appearance and loose scales during feeding events are signs of smolt development. ATPase activity is not measured.

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

No "NATURES" rearing is used for these programs.

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 listed fish are under propagation through this program. Finch Creek Chinook are not considered a viable population segment in the Puget Sound ESU, nor is the hatchery population included in NOAA Fisheries Hatchery Listing Policy (June 28, 2005). However, all reasonable and prudent measures are employed to minimize rearing and incubation losses. These include the use of high quality spring or well water for incubation, high quality feeds for rearing, rearing densities and loadings that conform to best management practices, frequent fish health inspections and presence of professionally trained personnel to operate the facilities. Hatcheries are designed to provide safe and secure rearing environment through the use of alarm systems, backup generators, and water re-use pumping systems to prevent catastrophic fish losses.

SECTION 10. RELEASE

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

10.1) Proposed fish release levels.

Table 10.1.1: Proposed number and size at release.

Age Class	Max Number	Size (fpp)	Release Date	Location
Sub-yearling	3,000,000	80	May-June	Hood Canal
Yearling	120,000	5-8	April-May	

Source: WDFW, Future Brood Document 2013.
Note: 60-80 fpp ~ 97-88 mm fork length (fl); 5-8 fpp ~220-190 mm fl.

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Beginning with brood year 2014, release year 2015 sub-yearling releases will increase to 3,000,000 (Skokomish Indian Tribe and WDFW – Draft 2014).

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

Stream, river, or watercourse: Finch Creek (WRIA 16.0222)

Release point: Finch Creek (mouth/confluence with Hood Canal)

Major watershed: Hood Canal

Basin or Region: Puget Sound/ Hood Canal

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

Table 10.3.1: Actual number and size at release, 2002-2013.

Release Year	Sub-yearling	Avg. size (fpp)	CV	Dates	Yearling	Avg. size (fpp)	CV	Dates
2002	2,930,377	80.0	n/a	5/17	295,788	8.0	n/a	4/23, 4/29
2003	3,047,111	92.0	5.7	6/1	227,008	7.0	9.7	5/1
2004	3,107,640	88.8	6..0	6/1, 6/25	166,405	6.0	9.0	5/1
2005	2,786,201	69.0	6.0	5/26	144,401	5.0	7.9	4/27
2006	2,810,573	79.8	n/a	6/1	123,543	5.0	5.3	4/19
2007	2,886,563	63.0	7.1	5/16, 5/26, 7/16, 12/2	128,435	5.0	7.2	4/28
2008	2,778,040	84.0	4.9	6/2	116,213	6.0	8.4	5/7
2009	2,762,918	75.5	5.3	5/18, 5/30	128,255	4.5	6.6	4/29
2010	2,830,162	83.0	5.0	5/29	118,085	5.3	7.5	4/14
2011	2,707.417	83.0	4.8	5/18, 5/28	120,891	6.1	6.6	5/1
2012	2,613,912	86.9	6.5	5/28	124,189	6.5	9.3	4/29
2013	2,251,126	81.6	5.9	5/29, 6/3	124,431	6.9	7.6	4/25
Average	**2,567,278**	**80.6**	**5.7**		**151,470**	**5.9**	**7.7**	

Source: WDFW Hatcheries Headquarters Database 2013.
Note: 60 fpp ~97 mm fork length (fl); 75 fpp ~90 mm fl; 90.fpp ~84 mm fl.
4 fpp ~239 mm fl; 6 fpp ~210 mm fl; 8 fpp ~188 mm fl.

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

Hoodsport Hatchery Chinook are force-released directly into the salt water, sub-yearlings are released in late May/June and yearlings are released in late April/May. As yearlings are released at a larger size, fish are released after dark to minimize predation. Releases also preferably occur during an incoming tide to avoid beach stranding.

See **Table 10.3.1** for release dates.

10.5) Fish transportation procedures, if applicable.

Not applicable. Fish are released on station.

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

There is no buffering estuary present near Hoodsport Hatchery and Chinook are released directly into salt water. To reduce transition shock, minimize stress and help to disperse more quickly, fish reared on fresh water are introduced to fresh water/salt water mix two weeks prior to release.

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

Table 10.7.1: Juvenile fall Chinook releases from Hoodsport Hatchery.

Brood Year	Release		Marking
	Sub-yearlings	Yearlings	
2012	2,800,000	20,000	AD only
	200,000	100,000*	AD+CWT

Source: WDFW, Future Brood Document 2013.
* Depending on available funding.

WDFW began mass-marking 100% of the fall Chinook yearling production starting with 2003 brood year and sub-yearling production with 2005 brood year. Since 2002, a portion of the releases (100,000-200,000) were mass-marked (adipose fin-clipped) and coded-wire tagged (CWT) to allow for evaluation of fishery contribution, survival rates and stray levels to other Puget Sound watersheds.

Each year, a group of 200,000 sub-yearlings and (depending on available funding) 100,000 yearlings, are released Ad+CWT. In recent years, yearling releases from brood years 2009 and 2011 were released Ad only. An additional group of 90,000 yearlings (from brood year 2009) were also released Ad+CWT.

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

No excess fish are released through this program.

Egg-take is carefully managed to minimize the likelihood of collecting surplus eggs or raising surplus fry. Annual fluctuation in survival rates may however result in production level above release goal and release of fish up to 10% above release goal is acceptable. If fish are available for release in excess of 10% acceptable level, regional staff and NOAA Fisheries will be informed and consulted for proper action to be taken.

10.9) Fish health certification procedures applied pre-release.

Standard Fish Health Procedures performed at the facility:

- *All fish health monitoring is conducted by a qualified WDFW Fish Health Specialist.*
- *Juvenile fish examinations are conducted at least monthly and more often if necessary*. A representative sample (at the discretion of the fish health specialist) of healthy and moribund fish from each lot is examined.
- *Abnormal levels of fish loss are investigated if they occur*.
- *Fish health status is determined prior to release or transfer to another facility*. The exam may occur during the regular monthly monitoring visit, i.e. within one month of release or transfer.
- *Appropriate actions, including drug or chemical treatments are recommended as necessary*. If a bacterial pathogen requires treatment with antibiotics a drug sensitivity profile is be generated when possible.
- *Findings and results of fish health monitoring are recorded on a standard fish health reporting form and maintained in a fish health database.*
- *Fish culture practices are reviewed as necessary with facility personnel*. Where pertinent; nutrition, water flow and chemistry, loading and density indices, handling, disinfecting procedures and treatments are discussed.

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

In the event of a water system failure, screens would be pulled to allow fish to exit the pond. In some cases they can be transferred into other rearing vessels to prevent an emergency release.

In cases of severe flooding the screens are not pulled at this facility because floodwaters rise to the point where they breach the ponds. Past experience has shown that the fish tend to lie on the bottom of the pond during flooding events and only those that are inadvertently swept out are able to leave.

During severe drought conditions, fish may be released early directly into the mouth of Finch Creek to prevent fish loss.

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.

Fish from Hoodsport Hatchery are released directly into Hood Canal, thus eliminating the risk to listed fish in the freshwater phase.

Little is known about saltwater interactions between hatchery Chinook and listed wild Chinook and summer chum, however hatchery practices regarding fish releases are designed to minimize interactions. Acclimation of Hoodsport Hatchery Chinook to sea water prior to release helps hatchery fish quickly disperse and not congregate in the near-shore post release, which may help reduce near-shore interactions with listed Chinook and summer chum. Hatchery fish release timing is designed to accommodate wild migration in the manner that hatchery fish are released either before or after peak migration of wild fish and the expectation is that wild summer chum would have cleared lower Hood Canal before hatchery Chinook are released in May and June. Those from Lilliwaup Creek are expected to migrate to salt water in February and March and then to swim seaward quickly (Tynan, 1992). WDFW considers that both juveniles and returning adults from the on-station program pose low risk for competition or predation to summer chum (Tynan, 1999).

As a risk aversion measure hatchery Chinook releases are 100% marked allowing for assessments of hatchery fish contribution and stray rates into natural spawning areas in west side Hood Canal tributaries and the Skokomish River (SHEEIR, NMFS 2004). Chinook monitoring and evaluation suggests that escaping hatchery-origin fish have been sustaining the abundance of the extant naturally spawning Skokomish population (SaSI 2003 and Marshall et al., (1995) acknowledged that the Hood Canal hatcheries were the primary source of naturally spawning fall Chinook in the Hood Canal region rivers, (SHEEIR, NMFS 2004). Coded wire tag recoveries (**Table 3.3.1**) suggest that less than 2% of Hoodsport Hatchery releases have been recovered on spawning grounds in WRIAs 15 and 16 over Brood Years 2002-2007, which represent the most current reported recoveries in RMIS.

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.

Elements of the annual Monitoring and Evaluation plan for this program are identified in HGMP section 1.10. The purpose of a monitoring program is to identify and evaluate the benefits and risks that may derive from the hatchery program. The monitoring program is designed to answer questions of whether the hatchery is providing the benefits intended, while also minimizing or eliminating the risks inherent in the program. A key tool in any monitoring program is having a mechanism to identify each hatchery production group.

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The co-managers conduct numerous ongoing monitor programs, including catch, escapement, marking, tagging, genetic and fish health testing. The focus of enhanced monitoring and evaluation programs will be on the risks posed by ecological interactions with listed species.

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

See HGMP section 11.1.1.

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, evaluation and research follow scientific protocols with adaptive management process if needed. WDFW will take risk aversion measures to eliminate or reduce ecological effects, injury, or mortality as a result of monitoring activities. Most trap mortalities are the result of extreme environmental conditions that flood traps or equipment failure. WDFW will take precautions to make sure the equipment is properly functioning during the season. If environmental conditions are forecast that will cause high mortality then traps will be removed or opened up to allow unobstructed passage without mortality. Any take associated with monitoring activities is unknown but all follow scientific protocols designed to minimize impact.

SECTION 12. RESEARCH

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

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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

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SECTION 13. ATTACHMENTS AND CITATIONS

Bilby R.E., B.R. Fransen, and P.A. Bisson. 1996. Incorporation of nitrogen and carbon from spawning coho salmon into the trophic system of small streams: evidence from stable isotopes. Canadian Journal of Fisheries and Aquatic Sciences 53:164–173.

Ford, M.J. (ed.). 2011. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-113, 281 p.

Gregory, S.V., G.A. Lamberti, D.C. Erman, K.V. Koski, M.L. Murphy, and J.R. Sedell. 1987. Influence of forest practices on aquatic production. *In* Salo, EO and Cundy TW. (editors), Streamside management: forestry and fishery interactions. Institute of Forest Resources, University of Washington. Seattle, Washington.

HSRG (Hatchery Scientific Review Group). 2004. Hatchery reform; principles and recommendations of the Hatchery Scientific Review Group. Long Live the Kings. Seattle, Washington. Available from: http://hatcheryreform.us/hrp_downloads/reports/hsrg_princ_recs_report_full_apr04.pdf.

Kenny, S. 2006. Fecal coliform monitoring in the Hoodsport area, 2003-2006. Mason County Health Services, Shelton, Wash. 6 pp.

Kline, T.C. Jr., J.J. Goring, Q.A. Mathisen, and P.H. Poe. 1997. Recycling of elements transported upstream by runs of Pacific salmon: I _^{15}N and _^{13}C evidence in Sashin Creek, southeastern Alaska. Canadian Journal of Fisheries and Aquatic Sciences 47(1): 136-144.

Mathisen, O.A., P.L. Parker, J.J. Goering, T.C. Kline, P.H. Poe and R.S. Scalan. 1988. Recycling of marine elements transported into freshwater systems by anadromous salmon. International Association of Theoretical and Applied Limnology 23: 2249-2258.

NMFS (National Marine Fisheries Service). 1995. Juvenile fish screen criteria for pump intakes. Available from: http://www.nwr.noaa.gov/1hydrop/nmfscrit1.htm.

NMFS (National Marine Fisheries Service). 1996. Juvenile fish screen criteria for pump intakes. Available from: *http://www.nwr.noaa.gov/1hydrop/pumpcrit1.htm*.

NMFS (National Marine Fisheries Service). 1999. Endangered and threatened species: Threatened status for three Chinook salmon Evolutionarily Significant Units in Washington and Oregon, and Endangered status for one Chinook salmon ESU in Washington; final rule. Partial 6-month extension on final listing determinations for four Evolutionarily Significant Units of West Coast Chinook salmon; proposed rule. Federal Register 64:14308-14328.

NMFS (National Marine Fisheries Service). 2000a. A risk assessment procedure for evaluating harvest mortality of Pacific salmonids. National Marine Fisheries Service, Sustainable Fisheries Division, Northwest Region. May 30. 33pp.

NMFS (National Marine Fisheries Service). 2002. Record of Consultation on Endangered Species Act (ESA) Section 7 and Magnuson-Stevens Act Essential Fish Habitat (EFH) Consultation on Operation by the U.S. Fish and Wildlife Service (USFWS) and Funding by the Bureau of Indian Affairs (BIA) of Hood Canal Summer Chum Salmon Artificial Propagation Programs Affecting Listed Hood Canal Summer Chum Salmon. F/NWR/1999/01863. Sustainable Fisheries Division, Northwest Region. March 4. 289 pp.

DRAFT

NMFS (National Marine Fisheries Service). 2005. Policy on the consideration of hatchery-origin fish in endangered species act listing determinations for Pacific salmon and steelhead. U.S. Department of Commerce, NOAA. Docket No. 040511148–5151–02; I.D. 050304B.

NMFS (National Marine Fisheries Service). 2007. Endangered and threatened species: final listing determination for Puget Sound steelhead. Federal Register 72FR26722.

National Marine Fisheries Service (NMFS). 2010. Proposed evaluation of and pending determination on a Resource Management Plan (RMP) pursuant to the salmon and steelhead 4(d) rule. Comprehensive Management Plan for Puget Sound Chinook: Harvest Management Component. F/NWR/2010/06051. 235pp.

NMFS (National Marine Fisheries Service). 2011a. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon.

NMFS (National Marine Fisheries Service). 2011b. Evaluation of and recommended determination on a Resource Management Plan (RMP), pursuant to the salmon and steelhead 4(d) rule: Comprehensive management plan for Puget Sound Chinook: harvest management component. U.S. Department of Commerce, NOAA. FINWRl2010/06051. 244 pp.

NMFS (National Marine Fisheries Service). Draft 2013. Endangered and Threatened wildlife; proposed rule to revise the code of Federal Regulations for species under the jurisdiction of the National Marine Fisheries Service. Federal Register 78FR38270.

NMFS (National Marine Fisheries Service). 2014. Endangered Species Act Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Consultation. Impacts of Programs Administered by the Bureau of Indian Affairs that Support Puget Sound Tribal Salmon Fisheries, Salmon Fishing Activities Authorized by the U.S. Fish and Wildlife Service, and Fisheries Authorized by the U.S. Fraser Panel in 2014. F/WCR-2014-578. 156pp.

NPPC (Northwest Power Planning Council). 2001. Performance standards and indicators for the use of artificial production for anadromous and resident fish populations in the Pacific Northwest. Portland, Oregon. 19 pp.

Piper, R., I.B. McElwain, L.E. Orme, J.P. McCraren, L.G. Fowler, J.R. Leonard, A.J. Trandahl, and V. Adriance. 1982. Fish Hatchery Management. United States Dept of Interior, Fish and Wildlife Service. Washington, D.C.

PNPTC (Point No Point Treaty Council), USFWS (U.S. Fish and Wildlife Service) and WDFW (Washington Department of Fish and Wildlife). 1986. Hood Canal salmon management plan.

PNPTC (Point No Point Treaty Council), USFWS (U.S. Fish and Wildlife Service) and WDFW (Washington Department of Fish and Wildlife). 1996. Hood Canal salmon and steelhead production. 1996 MOU. Olympia, Washington.

PSSMP (Puget Sound Salmon Management Plan). 1985. United States vs. Washington (1606 F.Supp. 1405).

PSTRT (Puget Sound Technical Recovery Team). 2003. (Draft) Independent populations of Chinook salmon in Puget Sound - Puget Sound TRT public review draft (May 18, 2004 version). Northwest Fisheries Science Center. National Marine Fisheries Service. 92p.

PSSTRT (Puget Sound Steelhead Technical Recovery Team). 2011. (Review Draft) Identifying historical populations of steelhead within the Puget Sound distinct population segment. U.S

DRAFT

Department of Commerce National Oceanic and Atmospheric Administration, Northwest Fisheries Science Center. Seattle, Washington. 112 pp.

RMIS (Regional Mark Information System). 2013. Available from: http://www.rmpc.org/.

Ruckelshaus, M.H., K.P. Currens, W.H. Graeber, R.R. Fuerstenberg, K. Rawson, N.J. Sands, and J.B. Scott. 2006. Independent populations of Chinook salmon in Puget Sound. United States Department of Commerce, NOAA. Technical Memo. NMFS-NWFSC-78, Seattle, Washington. 125 pp.

Seidel, P. 1983. Spawning guidelines for Washington Department of Fish and Wildlife hatcheries. Washington Department of Fish and Wildlife. Olympia, Washington.

Slaney, P.A. and B.R. Ward. 1993. Experimental fertilization of nutrient deficient streams in British Columbia. *In* Schooner, G. and S. Asselin, (editors). Le developpmente du saumon Atlantique au Quebec: connaitre les regles du jeu pour reussir. Colloque international e la Federation quebecoise pour le saumon atlantique, p. 128-141. Quebec, decembre 1992. Collection *Salmo salar* n°1.

Slaney, P.A., B.R. Ward and J.C. Wightman. 2003. Experimental nutrient addition to the Keogh River and application to the Salmon River in coastal British Columbia. *In* Stockner J.G. (editor). Nutrients in salmonid ecosystems: sustaining production and biodiversity. American Fisheries Society, Symposium 34(1): 111-126.

SIWG (Species Interaction Work Group). 1984. Evaluation of potential species interaction effects in the planning and selection of salmonid enhancement projects. J. Rensel, chairman and K. Fresh, editor. Report prepared for the Enhancement Planning Team for implementation of the Salmon and Steelhead Conservation and Enhancement Act of 1980. Washington Department of Fisheries. Olympia, Washington.

Skokomish Indian Tribe and WDFW (Washington Department of Fish and Wildlife). 2010. Recovery Plan for Skokomish River Chinook Salmon. 286 pp.

Skokomish Indian Tribe and WDFW (Washington Department of Fish and Wildlife). 2014. Draft Update for the Recovery Plan for Skokomish River Chinook Salmon. 20 pp.

Small, M.P., A. Whitcomb, C. Iverson. 2014. Draft Hoodsport Hatchery Chum salmon memo.

Tynan, T. 1992. Life history characterization of summer chum salmon populations in the Hood Canal and Eastern Strait of Juan de Fuca regions. Hatcheries Program, Assessment and Development Division. Olympia, WA.

Tynan, T. 1999. Draft risk assessment of anadromous salmonid artificial production programs within the Hood Canal summer chum ESU geographical boundary. Present practices and production, potential effects on summer chum and proposed risk aversion and monitoring and evaluation measures. Washington Department of Fish and Wildlife, Fish Program, Salmon and Steelhead Division. Olympia, Washington.

U.S. District Court of Western Washington. 1974. United States v. Washington, 384 F, Supp. 312.

United States v. Washington, No. 9213 Phase 1 (sub no. 85-2) Order Adopting Puget Sound Management Plan, 1985.

USFWS (U.S. Fish and Wildlife Service). 1994. Biological assessment for operation of U.S. Fish and Wildlife Service operated or funded hatcheries in the Columbia River Basin in 1995-1998. Submitted to National Marine Fisheries Service (NMFS) under cover letter, dated August 2, 1994, from William F. Shake, Acting USFWS Regional Director, to Brian Brown, NMFS.

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Ward, B.R., D.J.F. McCubbing and P.A. Slaney. 2003. Evaluation of the addition of inorganic nutrients and stream habitat structures in the Keogh River watershed for steelhead trout and coho salmon. *In* Stockner J.G. (editor). Nutrients in salmonid ecosystems: sustaining production and biodiversity. American Fisheries Society, Symposium 34(1): 127-147.

WDFW (Washington Department of Fish and Wildlife) and PNPTT (Point No Point Treaty Tribes). 2000. Summer Chum Salmon Conservation Initiative - An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region. Wash. Dept. Fish and Wildlife. Olympia, WA. 800 p. Available from: http://wdfw.wa.gov/conservation/fisheries/chum/

WDFW (Washington Department of Fish and Wildlife) and WWTIT (Western Washington Treaty Indian Tribes). 1998 (Updated 2006). Salmonid disease control policy of the fisheries Co-Managers of Washington State. Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes, Olympia Washington.

WDFW (Washington Department of Fish and Wildlife) and PSTT (Puget Sound Treaty Tribes). 2002. Puget Sound Chinook salmon hatcheries, resource management plan: a component of Comprehensive Chinook salmon management plan, Olympia, Washington. 103 pp.

WDFW (Washington Department of Fish and Wildlife). 2014. Hatcheries Headquarters Database. Hatcheries Data Unit, Washington Department of Fish and Wildlife. Olympia, Washington.

WDFW (Washington Department of Fish and Wildlife). 2013. 2013 Future brood document. Washington Department of Fish and Wildlife. Olympia, Washington. Available from: http://wdfw.wa.gov/publications/01356/.

WDFW (Washington Department of Fish and Wildlife). 2014. Salmonid stock inventory (SaSI). Fish Program, Science Division. Washington Department of Fish and Wildlife. Olympia, Washington. Available from: http://wdfw.wa.gov/conservation/fisheries/sasi/.

Weinheimer, J and M. Zimmerman. 2012. Mid-Hood Canal Juvenile Salmonid Evaluation: Duckabush and Hamma Hamma 2011. Washington Department of Fish and Wildlife. Olympia, Washington. 71 pp.

Wipfli, M.S., J. Hudson, and J. Caouette. 1998. Influence of salmon carcasses on stream productivity: Response of biofilm and benthic macroinvertebrates in southeastern Alaska, U.S.A. Canadian Journal of Fisheries and Aquatic Sciences. 55(6): 1503-1511.

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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:_____

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ADDENDUM A. PROGRAM EFFECTS ON OTHER (AQUATIC OR TERRESTRIAL) ESA-LISTED POPULATIONS. (Anadromous salmonid effects are addressed in Section 2)

15.1) List all ESA permits or authorizations for USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species associated with the hatchery program.

The WDFW and the USFWS have a Cooperative Agreement pursuant to section 6(c) of the Endangered Species Act that covers the majority of the WDFW actions, including hatchery operations.

> *"The department is authorized by the USFWS for certain activities that may result in the take of bull trout, including salmon/steelhead hatchery broodstocking, hatchery monitoring and evaluation activities and conservation activities such as adult traps, juvenile monitoring, spawning ground surveys..."*

15.2) Describe USFWS ESA-listed, proposed, and candidate salmonid and non-salmonid species and habitat that may be affected by hatchery program.

Skokomish Bull Trout *(Salvelinus confluentus):* Bull trout were listed as a threatened species in the Coastal-Puget Sound Distinct Population Segment on November 1, 1999 (64 FR 58910). Two local populations have been identified in the Skokomish Core Area, based the distribution of suitable spawning and rearing habitat: North Fork Skokomish and South Fork Skokomish Rivers; Brown Creek has also been identified as a potential local population. The Skokomish Core Area is thought to support adfluvial, fluvial, anadromous and resident life history forms but conclusive data is lacking (USFWS 2004). Emigrating smolts have been detected in the South Fork Skokomish population (WDFW Bull Trout SaSI, 2004). The USFWS (2004) considers this Core population to be depressed and at risk of extinction due to low numbers and habitat fragmentation. Bull trout are known to spawn in the South Fork Skokomish from R.M. 19 to an anadromous barrier at R.M. 23.5 and in Church Creek from R.M.0 to R.M.0.5. Spawning also occurs in the North Fork Skokomish, Elk and Slate Creeks above Lake Cushman Dam. The recovered abundance level for bull trout in the Skokomish Core Area has been set at 700 adult spawners, based on current habitat capacity (USFWS 2004).

Table 15.2.1: Summary table of core area rankings for population abundance, distribution, trend, threat, and final rank.

Core Area Population	Abundance Category (individuals)	Distribution Range Rank (stream length miles)	Short-term Trend Rank	Threat Rank	Final Rank
Skokomish River	50-250	125-620	Rapidly declining	Substantial, imminent	High Risk

Source Data: USFWS 2008.

Table 15.2.2: Adult bull trout counts in the North Fork Skokomish River above Lake Cushman and bull trout redd counts in the South Fork Skokomish River.

Year	North Fork Skokomish Bull Trout	South Fork Skokomish Bull Trout Redds
1999	90	NA
2000	93	20
2001	87	22
2002	93	13
2003	89	8
2004	109	16

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2005	150	18
2006	71	8
2007	243	14
2008	202	26
2009	74	3
2010	NA	3
Average	**118**	**14**

Source: SaSI (WDFW 2012).

Habitat— The Skokomish Core Area population has been impacted due to hydropower, timber production and agriculture. Rural development has accompanied or followed conversion of agricultural lands and has also impacted aquatic habitat. Alterations to aquatic habitat in the mainstem and South Fork Skokomish River from forestry, roads, agriculture, and rural development include increased sediment, channel aggradation, altered flows, loss of woody debris, and elevated stream temperatures. The South Fork Skokomish River watershed has some of the highest road densities found west of the Cascade Mountains in Washington (USFWS 2004).

Cushman Dams 1 and 2 on the North Fork Skokomish River were constructed without fish passage and have eliminated connectivity of fish upstream from the dams with habitat and fish in the lower North Fork Skokomish River, the mainstem Skokomish River, the South Fork Skokomish River, and Hood Canal. Lack of, or greatly reduced, flows in the North Fork Skokomish River resulting from diversion of water to a power canal have reduced sediment transport capabilities, resulting in further aggradation of the river. Channelizing and diking for agriculture and residential development have further contributed to sediment accumulation. Incidental mortality to migrating bull trout from Tribal gill-net fisheries has been documented in the DPS (Brenkman 2005) and incidental mortality from other targeted fisheries (both recreational and Tribal) likely also pose a threat to bull trout in the Skokomish River due to the low numbers of adult fish observed over the past several years (USFWS 2004).

Several listed and candidate species are found in Mason County; however the hatchery operations and facilities for this program do not fall within the critical habitat for any of these species. As such there are no effects anticipated for these species.

Listed or candidate species:
"No effect" for the following species:

Marbled murrelet (*Brachyramphus marmoratus*) –Threatened [critical habitat designated]
Northern Spotted owl (*Strix occidentalis caurina*) –Threatened [critical habitat designated]

Candidate Species
Fisher *(Martes pennanti)* – West Coast DPS
(Shelton) Mazama pocket gopher (*Thomomys mazama* ssp. *couchi*)
Streaked horned lark (*Eremophila alpestris strigata*)

15.3) Analyze effects.

There are no activities associated with this hatchery program that would directly impact bull trout other than encountering them in other hatchery programs during broodstock collection activities. There may be some mortality from hook and release of bull trout in fisheries targeting other species. Any unintended take, observed or unobserved encounters of bull trout are reported by WDFW to USFWS.

15.4) Actions taken to minimize potential effects.

There are no activities associated with this hatchery program other than encountering them in other hatchery programs during broodstock collection activities (steelhead or coho) that would

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directly impact or create potential effects on bull trout in this system based on the current understanding of the status of these fish.

15.5) References

Brenkman,S.J. and S.C. Corbett. 2005. Extent of anadromy in bull trout and implications for conservation of a threatened species. North American Journal of Fisheries Management 25:1073–1081.

USFWS (U.S. Fish and Wildlife Service). 2004. Draft recovery plan for the Coastal-Puget Sound distinct population segment of bull trout (*Salvelinus confluentus*). Volume II (of II): Coastal management unit. Portland, Oregon. 389 + xvii pp.

USFWS (U.S. Fish and Wildlife Service). 2008. Bull trout (*Salvelinus confluentus*) 5-year review: Summary and evaluation. Portland, Oregon. U.S. Fish and Wildlife Service. 55 pp.

WDFW (Washington State Department of Fish and Wildlife). 2004. Washington State salmonid stock inventory bull trout/ Dolly Varden. Washington State Department of Fish and Wildlife. Olympia, Washington.

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

Listed species affected: Chinook *(Oncorhynchus tshawytscha)*	**ESU/Population:** Puget Sound Chinook – Mid Hood Canal	**Activity:** Hoodsport Fall Chinook Program
Location of hatchery activity: Mouth of Finch Creek (WRIA 16.0222), Hood Canal	**Dates of activity:** Sub-yearlings: August- May Yearlings: May- May	**Hatchery program operator:** WDFW

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass a)	-	-	-	-
Collect for transport b)	-	-	-	-
Capture, handle, and release c)	-	-	-	
Capture, handle, tag/mark/tissue sample, and release d)	-	-	-	-
Removal (e.g. broodstock) e)	-	-	-	-
Intentional lethal take f)	-	-	-	-
Unintentional lethal take g)	-	-	14[1]	-
Other Take (specify) h)	-	-	-	-

[1] RMIS recoveries from brood years 2004-2008 show Hamma Hamma Fall Chinook Supplementation Group sub-yearling releases recruiting to Hoodsport Hatchery as adults. The number reported here represents an average of these adult recruits from brood years 2004-2008. Marking of the Hamma Hamma Supplementation release group has varied. In brood years 2004 to 2007 releases received an ad-clip and CWT. Beginning in brood year 2008 the release group received a CWT and an OT mark.

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.

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

Listed species affected: Steelhead *(Oncorhynchus tshawytscha)*	**ESU/Population:** Puget Sound Steelhead	**Activity:** Hoodsport Fall Chinook Program
Location of hatchery activity: Mouth of Finch Creek (WRIA 16.0222), Hood Canal	**Dates of activity:** Sub-yearlings: August- May Yearlings: May- May	**Hatchery program operator:** WDFW

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass a)	-	-	-	-
Collect for transport b)	-	-	-	-
Capture, handle, and release c)	-	-	0	-
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.

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

Listed species affected: Chum *(Oncorhynchus keta)*	**ESU/Population:** Hood Canal Summer Chum	**Activity:** Hoodsport Fall Chinook Program
Location of hatchery activity: Mouth of Finch Creek (WRIA 16.0222), Hood Canal	**Dates of activity:** Sub-yearlings: August- May Yearlings: May- May	**Hatchery program operator:** WDFW

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass a)	-	-	-	-
Collect for transport b)	-	-	-	-
Capture, handle, and release c)	-	-	Up to 33	-
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.

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