HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	**Trask River Hatchery Spring Chinook Salmon Program**
Species or Hatchery Stock:	**Spring Chinook Salmon *Oncorhynchus shawytscha* (Stock 34)**
Agency/Operator:	**Oregon Department of Fish and Wildlife**
Watershed and Region:	**North Coast Watershed District**
Date Submitted: **First Update Submitted:** **Second Update Submitted:** **Third Update Submitted:**	**November 2, 2005** **October 6, 2008** **October 21, 2014** **August 1, 2016**
Date Last Updated:	**July 29, 2016**

SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Trask River Hatchery Spring Chinook Salmon Program.

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

Spring Chinook Salmon *Oncorhynchus tshawytscha* (stock 34) will be propagated under this program. Trask River spring Chinook Salmon are part of the Oregon Coast Chinook Evolutionary Significant Unit (ESU), which was listed as Not Warranted under the Federal Endangered Species Act (ESA) on March 9, 1998 (Federal Register Notice 1998).

1.3) Responsible organization and individuals.

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

- Trask Hatchery has a staff of 3.0 permanent full-time employees.
- Funding for this program is currently from several sources of the State of Oregon.

- The annual budget for the spring Chinook program is presented in Table 1-1.

Table 1-1. Trask Hatchery Stock-34 spring Chinook Salmon annual budget (2015 FY budget is estimated with additional production per CMP, 2014).

Year	Total Budget	Stock-34 Spring Chinook Budget	Percent of Total	Stock-34 Spring Chinook Smolts Produced[a]
2001	$210,778	$80,475	38.2%	246,847
2002	$230,085	$79,839	34.7%	255,551
2003	$268,689	$130,851	48.7%	224,769
2004[a]	$235,158	$114,592	48.7%	285,099
2005[a]	$255,245	$115,626	45.3%	261,365
2006[a]	$256,914	$112,271	47.7%	281,427
2007	$287,599	$105,549	36.7%	255,625
2015 (est.)	$328,226	$147,701	45.0%	400,000

Note: Information provided by ODFW Trask Hatchery

[a]FY 2015 budget and 400,000 smolts produced includes production at Trask Hatchery, Trask Pond, Tuffy Creek and Whiskey Creek for release into the Trask River.

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

Trask Hatchery is located 8 miles east of Tillamook, adjacent to the Trask River at about river mile (RM) 9.9. Elevation at the hatchery is 40 feet above sea level. Trask Hatchery has two satellite rearing ponds (East Fork Trask Pond [*i.e.* Trask Pond] and Tuffy Creek Pond). East Fork Trask Pond is located 17 miles east of Tillamook, adjacent to the East Fork of South Fork Trask River (ODFW waterbody code 0100130000) at RM 0.5.

(Note: in 2016 the intake dam for Trask Pond is being removed and the pond will no longer be utilized. Consequently, the Trask Pond's production component will shift Cedar Creek Hatchery. See Cedar Creek Hatchery Stock 47 Spring Chinook HGMP for facility details).

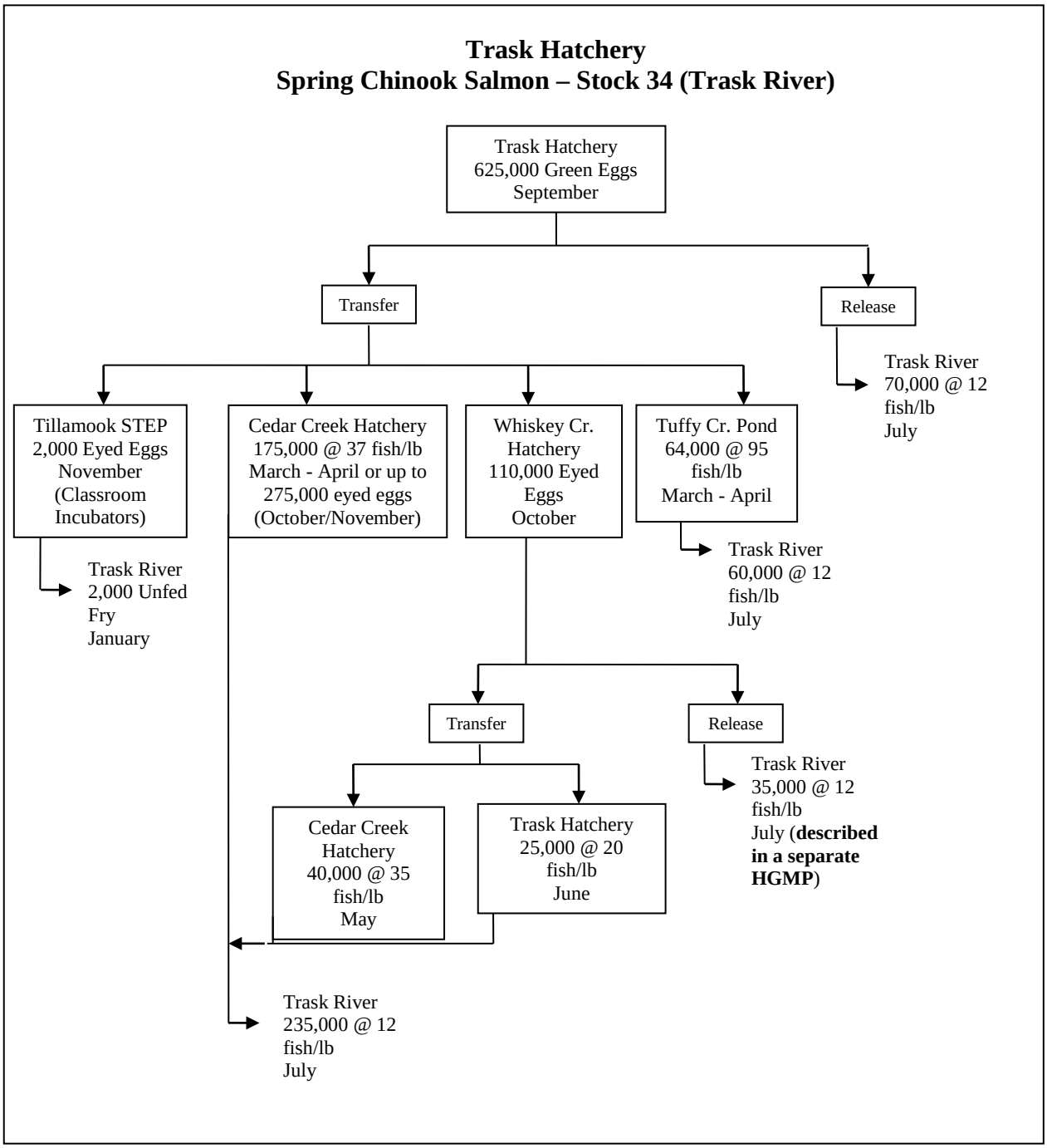
Tuffy Creek Pond is a cooperative project between ODFW, Oregon Department of Corrections, and Oregon Department of Forestry and is built on the site of a state prison camp. It is located 30 miles northeast of Tillamook, adjacent to the South Fork Wilson River at about RM 1.5. The South Fork Wilson River (ODFW waterbody code 0100125000) is a tributary of the mainstem Wilson River (ODFW waterbody code 0100120000) at approximately RM 33. Additional acclimation and adult recapture facilities may be developed elsewhere in the basin as needed in order to meet hatchery stray rate objectives identified in ODFW's Coastal Multi-Species Conservation and Management Plan (CMP).

***Adult collection facilities*:** Adult spring Chinook Salmon are collected primarily at the Trask Hatchery trap which is located at approximately RM 9.8 on the Trask River. Additional fish broodstock may be collected by seining resting pools, if necessary.

***Spawning, egg incubation, rearing and release facilities*:** Spawning, incubation and early rearing activities typically occur at Trask River Hatchery (eyed eggs may be transferred to Cedar Creek Hatchery in the future for incubation). Approximately 2,000 eyed-eggs may be transferred for use in STEP classroom incubators. Approximately 110,000 eyed eggs are transferred to the Whiskey Creek STEP facility on Netart's Bay for rearing to fingerling or smolt size. Details of the Whiskey Creek STEP spring Chinook Salmon program are covered in the Whiskey Creek Hatchery Stock-34 Spring Chinook HGMP.

Fish rearing and release details are shown below in flow diagram 1. Rearing to smolt size for this Trask River spring Chinook Salmon program occurs at Trask Hatchery, Trask Pond, Tuffy Creek Pond and Whiskey Creek Hatchery. From Trask Hatchery, approximately 64,000 fingerlings are transferred to the Tuffy Creek facility (for eventual ~60,000 smolt release) and ~175,000 are transferred to Cedar Creek Hatchery (or up to 275,000 eyed eggs may be transferred instead for incubation on site) Cedar Creek Hatchery receives approximately 40,0000 fingerlings from Whiskey Creek (see flow diagram 1). Trask Hatchery retains approximately 72,000 fingerlings and also receives approximately 25,000 fingerlings for eventual direct volitional release of ~95,000 into the Trask River. Therefore, subsequent releases from Cedar Creek Hatchery and Trask Hatchery into the Trask River include a mix of Trask Hatchery and Whiskey Creek Hatchery Stock-34 spring Chinook. Details regarding final rearing and release of Whiskey Creek Hatchery spring Chinook are covered within this HGMP. Other elements for the Whiskey Creek Stock-34 Spring Chinook Program are covered in the Whiskey Creek Hatchery Stock-34 Spring Chinook HGMP.

Flow Diagram 1. Shows Trask River spring Chinook Salmon program's production and release details.



1.6) Type of program.

Harvest Augmentation – To increase sport harvest opportunities for adult hatchery spring Chinook Salmon by releasing artificially propagated spring Chinook smolts.

Salmon Trout Enhancement Program (STEP) – The use of stream side, or classroom incubators and rearing facilities to provide educational/learning opportunities to students and the public. In addition, volunteer involvement in STEP increases natural resource awareness and provides a volunteer base of individuals, and organizations, desiring to assist ODFW with natural resource program implementation activities.

1.7) Purpose (Goal) of program.

The purpose of this program is to release spring Chinook Salmon smolts in the Trask River with the primary goal to provide hatchery spring Chinook Salmon adults for recreational harvest in Tillamook Bay and the Trask River, as well as commercial and recreational harvest in the ocean. Up through the 2013 brood year, spring Chinook Salmon smolts from this program were also released in the Wilson River. With the adoption of the Coastal Multi-Species Conservation and Management Plan, the Wilson River release component was moved to the Trask River and overall smolt releases were increased by 55,000.

An additional purpose of this program is to provide educational learning opportunities to students and to encourage volunteer involvement from the public with natural resources through STEP activities. A portion of those activities includes the incubation of spring Chinook Salmon eggs and release of unfed fry from classroom incubators. The primary purpose of the classroom incubator program, when used, is to teach students about salmonid life history and their habitat requirements. Fry from classroom incubator programs are not marked.

1.8) Justification for the program.

The program is designed to support consumptive recreational and commercial fisheries in the ocean and local freshwater areas. The program releases full-term ocean-type smolts into the Trask River which have been mass marked since the 1998 brood year. Adult returns were mass marked (100%) as of return year 2003. A portion of the smolts may also be coded-wire tagged (Ad+CWT). The local freshwater fishery takes place primarily in Tillamook Bay and Trask River. Stray fish may be taken in other Tillamook Bay tributaries, but catch in these areas make up a small percentage of the total annual reported recreational catch. As of 2002, only fin-clipped spring Chinook Salmon could be retained in the recreational fishery.

This program releases sub-yearling (ocean-type) smolts to encourage rapid migration to the ocean. This strategy is intended to minimize residualism and ecological interactions with wild juvenile spring Chinook Salmon and other juvenile wild fish. Standard fish health inspections are done for both adult and juvenile spring Chinook Salmon in this program to minimize potential disease concerns.

This program will have minimal indirect effect on Federal ESA-listed (*Threatened*) Coho Salmon. Expected adult return timing of this spring Chinook Salmon stock is late March through July. Returns of adult Coho Salmon typically do not begin until late September or after the first fall rains. Incidental impacts from angling pressure are expected to be

low during the Coho Salmon smolt outmigration as trout angling is closed, and spring Chinook angling gear typically precludes incidental catch of juvenile salmonids.

The STEP classroom incubator program, when used, is to teach students about salmonid life history and their habitat requirements. Fry from classroom incubator programs are not marked.

1.9 – 1.10) List of program "Performance Standards" and "Performance Indicators" designated by "benefits" and "risks".

Harvest

Standard 1.1: Provide hatchery-produced spring Chinook Salmon for harvest in such a way that impacts to naturally produced salmonid populations are minimized during the spring Chinook Salmon sport fishery. **(Benefit)**

Indicator: Number of Trask Hatchery stock-34 spring Chinook caught and number of angler days generated associated with this program. **(Benefit)**

Indicator: Estimated number or rate of wild coho and wild spring Chinook caught and released. **(Risk)**

Standard 1.2: All Trask Hatchery stock-34 juvenile spring Chinook will be externally marked. **(Benefit)**

Indicator: Mark rate by mark type for each release group. **(Benefit)**

Indicator: Pre-release quality checks indicate a minimum 95% retention of identifiable marks. **(Benefit)**

Life History Characteristics

Standard 2.1: Spring Chinook Salmon broodstock will be managed in a manner that approximates the distribution in timing, age, and size of stock-34 hatchery fish returning to Trask Hatchery. However, jacks will typically make up no more than 5 percent of males spawned. **(Benefit)**

Indicator: Temporal distribution of stock-34 adult spring Chinook Salmon returns and adults collected. **(Risk - unknown)**

Indicator: Age distribution of stock-34 adult spring Chinook Salmon returns and broodstock spawned. **(Benefit)**

Indicator: Size at age distribution of stock-34 adult spring Chinook Salmon returns and broodstock spawned. **(Risk - unknown)**

Standard 2.2: Releases of stock-34 spring Chinook will minimize impacts to naturally produced salmonids through control of hatchery release numbers and timing by minimizing spatial and temporal overlap with natural populations. **(Risk)**

Indicator: Number of stock-34 spring Chinook released. **(Risk)**

Indicator: Dates of stock-34 spring Chinook releases. **(Risk)**

Indicator: Location of stock-34 spring Chinook smolt releases. **(Risk)**

Standard 2.3: All stock-34 spring Chinook smolts will be released as sub-yearlings. **(Risk - unknown)**

Indicator: Beginning and ending dates of stock-34 spring Chinook smolt releases. **(Risk - unknown)**

Indicator: Size and length frequency of stock-34 spring Chinook smolts released. **(Risk - unknown)**

Standard 2.4: Stock-34 spring Chinook Salmon fry and/or fingerlings in excess of production needs will be released at times and locations that reduce impacts to naturally rearing salmonids. Any surplus stock-34 fry or fingerlings may be released into standing water bodies, or they may be destroyed. **(Benefit)**

Indicator: Location, number, and timing of stock-34 spring Chinook fry and fingerling releases. **(Benefit)**

Genetic and Ecological Characteristics

Standard 3.1: The percent of hatchery-origin spawners (pHOS) in the natural population spawning area will be consistent with goals identified in ODFW's Coastal Multi-Species Conservation and Management Plan. **(Benefit)**

Indicator: Estimated abundance of naturally produced spring Chinook Salmon spawning in the Tillamook Bay basin. **(Benefit)**

Indicator: Estimated abundance of naturally spawning spring Chinook in the Tillamook Bay basin that are of hatchery origin based on marks or tags. **(Benefit)**

Standard 3.2: Only stock-34 spring Chinook, or adult returns from smolts released for this program, will be used as broodstock. **(Risk - unknown)**

Indicator: Location of broodstock collection. **(Risk - unknown)**

Indicator: Fin clips on fish collected for brood. **(Benefit)**

Standard 3.3: Stock-34 spring Chinook Salmon broodstock will be spawned following appropriate mating and spawning protocols to maintain genetic diversity of the population. **(Benefit)**

Indicator: Number and ratio of males and females spawned. **(Benefit)**

Indicator: Matings will follow procedures as outlined and appropriate for the stock size, in the Fish Hatchery Management Policy, Fish Health Management Policy, Integrated Hatchery Operations Team (IHOT) fish health document, or as directed by the ODFW Fish Conservation and Recovery staff. **(Benefit)**

Operation of Artificial Production Facilities

Standard 4.1: The Trask Hatchery stock-34 spring Chinook Salmon program will be operated in compliance with ODFW's Hatchery Management Policy, and the IHOT fish health guidelines (IHOT 1995). See Attachment A. **(Benefit)**

Indicator: Number of broodstock sampled and pathogens detected. **(Benefit)**

Indicator: Rearing survival rates, egg to fry and fry to smolt. Results of fish health examinations. **(Benefit)**

Indicator: Determine fish health status of juveniles prior to release, and release only certified fish. **(Benefit)**

Indicator: Release of full term smolts at the target size of 12 fish per pound. **(Benefit)**

Standard 4.2: Trask Hatchery effluent will comply with prescribed 300J general NPDES permit as required by the Oregon Department of Environmental Quality (DEQ). **(Benefit)**

Indicator: Water samples collected and results reported. **(Benefit)**

Indicator: Results within permit requirements. **(Benefit)**

Standard 4.3: Trask Hatchery and satellite facility water withdrawals will comply with National Oceanic and Atmospheric Administration (NOAA) Fisheries juvenile screening criteria. **(Benefit)**

Indicator: Screens inspected and are in compliance, or are brought into compliance. **(Benefit)**

Standard 4.4: Trask Hatchery stock-34 spring Chinook Salmon carcass placements for stream nutrient enrichment comply with ODFW established guidelines for loading densities. **(Benefit)**

Indicator: Number and location of spring Chinook Salmon carcasses distributed. **(Benefit)**

Indicator: Examine carcass health and use only pathogen free carcasses. **(Benefit)**

Standard 4.5: Naturally produced steelhead, Chinook Salmon, Coho Salmon, Chum Salmon, and Cutthroat Trout that enter the Trask Hatchery adult traps are handled and released in a manner that minimizes stress, injury, mortality, and delay in migration. **(Risk)**

Indicator: Number of unmarked adult steelhead, Chinook Salmon, Coho Salmon, Chum Salmon, and Cutthroat Trout collected and released alive from the Trask Hatchery traps. **(Risk - unknown)**

Indicator: Number of unmarked adult steelhead, Chinook, coho, chum, and cutthroat mortalities at Trask Hatchery traps during operation of the hatchery adult trap. **(Risk)**

Indicator: Dates of trap operation and frequency of handling steelhead, Chinook, coho, chum, and cutthroat. **(Benefit)**

Standard 4.6: Releases of stock-34 spring Chinook smolts will limit predation impacts to naturally produced salmonids through control of hatchery release numbers and by minimizing spatial and temporal overlap of naturally produced salmonid juveniles. **(Risk - unknown)**

Indicator: Location of juvenile spring Chinook releases. **(Benefit)**

Indicator: Record of the beginning and ending dates of stock 34 hatchery spring Chinook releases. **(Risk - unknown)**

Indicator: Number of stock-34 hatchery spring Chinook released. **(Benefit)**

Standard 4.7: Releases of stock-34 spring Chinook Salmon will limit impacts to naturally produced juvenile salmonids through control of hatchery release numbers and by minimizing spatial and temporal overlap with naturally produced juvenile salmonids. Sub-yearling smolt releases will be in late summer. Any fry or fingerlings in excess of needs for smolt production may be released into standing bodies of water without natural coho production or may be destroyed. **(Benefit)**

Indicator: Location of juvenile spring Chinook releases. **(Benefit)**

Indicator: Record of the beginning and ending dates of stock-34 hatchery spring Chinook releases. **(Risk)**

Indicator: Number of stock 34 hatchery spring Chinook released. **(Benefit)**

Socio-Economic Effectiveness

Standard 5.1: Estimated harvest benefits will equal or exceed hatchery production costs for Trask Hatchery stock-34 spring Chinook Salmon, based on the benefit-cost model (ODFW 1999), or an updated version of that model. **(Benefit).** Note: Spring Chinook hatchery adults (all age classes) were not mass marked until the 2003 return-year, and it was not possible to quantify the contribution of program fish to recreational fisheries. The current marking system will help to determine socio-economic effectiveness of this program.

Indicator: Annual budget expenditures. **(Benefit)**

Indicator: Estimated harvest benefits. **(Benefit)**

1.11) Expected size of program.

The size of this spring Chinook Salmon program is to produce and release approximately 365,000 in smolts in the Trask River basin. Another group of 35,000 smolts (STEP component) from Whiskey Creek Hatchery are also released into the Trask River and that has been described in a separate HGMP. From these two release groups, a total of 400,000 smolts will be released in the Trask River per recommendation of the ODFW's Coastal Multi-Species Conservation and Management Plan 2014. Another ~2,000 unfed fry shall be released into the Trask River from the STEP's classroom incubators.

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

Proposed annual broodstock collection level is a minimum of 127 males and 127 females. Additional adults may be collected as necessary to cover shortages resulting from, but not limited to, fecundity variation, early egg mortality, positive disease test, etc.

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

Table 1-2. Proposed Annual Fish Release Levels – Trask Hatchery Stock-34 Spring Chinook Salmon and a component of Whiskey Creek Production reared at Trask Hatchery and Cedar Creek Hatchery.

Life Stage	Release Location	Annual Release Level
Eyed Eggs	NA	NA
Unfed Fry	Standing waters Trask River (STEP) Classroom Incubators	Hatchery production excess, varies 2,000
Fry	NA	NA
Fingerling	Standing waters	Varies, excess[1]
Sub-Yearling Smolt	Trask River Basin:	400,000[2]

Data source: ODFW HMS database

1. This program does not produce fingerling for release as a program goal for Stock-34 spring Chinook. In any given year there may be surplus fingerling at the time of transfer to rearing facilities (typically resulting from above average fry and fingerling survival).
2. Total production and release for Trask Hatchery spring Chinook program is set at 400,000 smolts. This includes the 35,000 smolts produced from Whiskey Creek Hatchery (described in a separate HGMP).

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

Estimates of minimum adult spring Chinook Salmon production from the Trask Hatchery stock-34 spring Chinook Salmon program for the period 1983-1999 are presented in Table 1-3. Estimates reflect program performance in relation to the harvest (ocean and freshwater) program goal. The estimated number of total adult hatchery spring Chinook Salmon produced was derived from a variety of data sources.

The "Ocean Commercial" and "Ocean Sport" columns were estimated by expansion of coded-wire tag (CWT) recoveries to reflect total production as follows: {(Estimated CWT recoveries / number of CWT smolts released) * total fish released}. This calculation was made for each group of CWT smolts released, and then summed across all CWT groups released for each brood year. This estimate represents landed catch only. For the period 1983 through 1999, punch card estimates of sport caught spring Chinook catch in Tillamook Bay and its tributaries, averaged 1,176 fish, and ranged from 446 to 2,893. However, punch card estimates of catch in the Tillamook system for that time period cannot be separated into hatchery and wild fish because fisheries were not

restricted to hatchery fish only until 2002 when most of the returning hatchery adults were mass marked. Therefore, the "Freshwater Sport" column includes both hatchery and wild fish and are not included in the survival estimate of Table 1-3. However, over the period 2002 through 2005 Tillamook Basin hatchery-origin spring Chinook Salmon catch based on angler harvest cards averaged 1,170 fish, and ranged from 819 to 1,565. The "Hatchery Return" column depicts the actual count of adult spring Chinook Salmon returns at Trask Hatchery. The adult spring Chinook returns for each run year were allocated to a brood year based on the age composition of hatchery recoveries of CWT spring Chinook. Spring Chinook spawning surveys did not begin in the Tillamook Basin until 2005, but data for population estimates have not yet been attained. Therefore, the "Spawning Areas" column is not available. Smolt to adult survival is calculated as the sum of the prior 5 columns divided by the "Smolt Release" column. This is a minimum survival estimate as we do not have estimates of the number of hatchery spring Chinook caught in freshwater fisheries or straying to spawning areas. Also because of the location and historical method of operation (broodstock collection needs only) of the hatchery trap, the "Hatchery Return" column underestimates returns of Trask Hatchery spring Chinook Salmon.

Table 1-3. Estimated (minimum) total adult Trask Hatchery Stock-34 spring Chinook produced per brood year. Derived from CWT expansions, and hatchery return data, 1983-1999.

Brood Year	Smolt Release	Estimated Total Adult Hatchery Spring Chinook Produced					
		Ocean Comm.	Ocean Sport	Freshwater Sport[a]	Hatchery Return	Spawning Areas	Smolt to Adult
1983	175,722	602	12	694	482	n.a.	0.62%
1984	170,828	786	35	953	609	n.a.	0.84%
1985	159,475	700	51	546	597	n.a.	0.85%
1986	190,783	406	63	529	295	n.a.	0.40%
1987	190,889	317	72	899	432	n.a.	0.43%
1988	270,057	283	11	2893	390	n.a.	0.25%
1989	360,274	211	63	1776	316	n.a.	0.16%
1990	298,255	279	72	1661	433	n.a.	0.26%
1991	337,628	82	8	2173	176	n.a.	0.08%
1992	299,543	249	115	1509	518	n.a.	0.29%
1993	310,824	297	116	1753	828	n.a.	0.40%
1994	252,263	129	41	792	303	n.a.	0.19%
1995	254,153	37	71	658	342	n.a.	0.18%
1996	248,779	6	91	715	278	n.a.	0.15%
1997	244,835	31	133	1383	245	n.a.	0.17%
1998	255,013	104	743	446	488	n.a.	0.52%
1999	246,583	99	1,158	608	1,126	n.a.	0.97%
Avg.	250,936	272	168	1176	462	n.a.	0.40%

Data source: ODFW's Hatchery Information Management System (HIMS) database and ODFW CWT recoveries

[a] Sport catch includes both hatchery and wild fish during the 1983-1999 period. They are not included in the survival estimate.

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

Available reports (Wallis, 1963) indicate that egg take of spring Chinook Salmon began in 1907, although the hatchery location at that time was approximately 3 miles upriver of its current location. The hatchery at the current location became operational in 1914 and since then it has operated continuously.

1.14) Expected duration of program.

The Trask Hatchery stock-34 spring Chinook Salmon program is ongoing and is expected to continue.

1.15) Watersheds targeted by program.

The Trask River basin within the Tillamook Bay basin is the release site and desired return site for all spring Chinook released under this program.

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

1.16.1) Brief overview of key issues.

Status of naturally produced spring Chinook Salmon populations – Trask River Basin spring Chinook are considered to be a life history variant of a Chinook Salmon population that returns from the spring through early winter. The 2014 Coastal Multi-Species Conservation and Management Plan identifies this population as "*Strong-Guarded"* meaning that it is widely distributed, has little if any viability concerns across populations and a lower level of immediate threats that may affect viability in the future. However, either a lack of robust data relative to all VSP parameters or conflicting indications of viability warrant a cautious management approach when providing societal benefits and fisheries, especially with respect to potential threats and limiting factors. Monitoring efforts are being increased to develop a better understanding of this population.

Recycling adult spring Chinook Salmon - Recycling adult spring Chinook Salmon through the sport fishery provides for increased angling opportunity and some level of harvest on hatchery fish. Recycled hatchery spring Chinook may interact with naturally produced fish if they are not caught and/or do not return to the hatchery. The recycling program is very popular with anglers.

1.16.2) Potential alternatives to the current program.

Note: The alternatives listed are draft. They are presented here as forum for further discussion. This list is not exhaustive, other ideas are welcome. The alternatives listed may not represent final decisions by ODFW.

Alternative 1 - Reduce program size

Description and Implications: This alternative would reduce the number of smolts released. The reduction in program size would reduce the budget at Trask Hatchery and allow savings to be used elsewhere for other programs. Lower release numbers would reduce potential impacts of hatchery spring Chinook Salmon on wild populations and could increase wild productivity. This alternative would decrease the consumptive angling opportunity for spring Chinook Salmon in the Trask and Tillamook Bay basins, as the fishery is currently restricted to retention of hatchery-produced fish only. This could disenfranchise local and out of area volunteers and anglers. There would be unknown impacts to ocean sport and commercial fisheries. If the wild spring Chinook Salmon population is at extremely low levels, the population may be currently supported in part by hatchery supplementation.

Alternative 2 - Eliminate program

Description and Implications: This alternative would eliminate all spring Chinook Salmon production at Trask Hatchery and Whiskey Creek. Loss of the program would reduce the budget at Trask Hatchery and allow savings to be used elsewhere for other programs. This alternative would eliminate potential impacts of hatchery spring Chinook on wild populations and could increase population productivity. Eliminating hatchery releases would substantially decrease the consumptive angling opportunity for spring Chinook Salmon on the North Coast, as the fishery is currently restricted to retention of hatchery-produced fish only. This could disenfranchise local and out of area volunteers. Impacts to ocean sport and commercial fisheries are unknown. If the wild population is at extremely low levels, the population may be currently supported in part by hatchery supplementation.

Alternative 3 - Increase program size

Description and Implications: This alternative would increase the size of the hatchery spring Chinook Salmon program at Trask Hatchery and increase releases in the Trask River. Increasing the program size could increase the consumptive angling opportunity, as the fishery is currently restricted to retention of hatchery-produced fish only. This could enhance participation by some out of area volunteers and anglers. Increase in program size may increase the budget and workload at Trask Hatchery unless other programs were reduced. This alternative could increase potential adverse impacts of hatchery spring Chinook on wild populations and could decrease productivity.

1.16.3) Potential reforms and investments.

Trask Hatchery
Improvement of adult collection facilities at Trask Hatchery could expand the opportunity to capture and recycle hatchery spring Chinook Salmon to the downstream fishery. Facility improvements would require a hoist to transfer live fin-clipped spring Chinook from the T-3 holding pond into a liberation truck for transport downstream. Improved flow through the trap facility would also be needed to improve attraction during periods of low flow. This would require a transfer of existing water rights or apportioning the existing water supply differently.

Additional assistance from volunteers or District staff would be needed to implement a consistent recycling program.

Tuffy Creek Pond
No potential reforms and investments are currently identified for the Stock 34 spring Chinook rearing phase at Tuffy Creek.

General
Alternative hatchery operations, facilities, and techniques in regard to conservation and restoration of wild fish populations, is one of the areas of research questions at the Oregon Hatchery Research Center. In the future, the results of this and other research efforts, may lead to additional reforms and investments at Trask Hatchery and its satellite facilities, and STEP rearing facilities.

Note: The reforms and investments listed are draft. They are presented here as a forum for further discussion. This list is not exhaustive, other ideas are welcome. The reforms and investments listed may not represent final decisions by ODFW.

SECTION 2

PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS

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

The HGMP for this program was submitted to NMFS on 11/02/2005 for approval and ESA coverage. This is an updated version of the previously submitted HGMP, and is consistent with the ODFW's Coastal Multi-Species Conservation and Management Plan 2014.

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

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

Oregon coastal Coho Salmon currently are listed under the federal ESA as *Threatened*. The listed Coho Salmon inhabit the Tillamook Bay basin and may be incidentally affected by the spring Chinook Salmon hatchery program through competitive interactions for food and space, during brood collection and recreational fishing for hatchery fish. The program has no intent to directly take any listed Coho Salmon.

Tillamook Bay Complex

The Tillamook Complex consists tributaries to Tillamook and Netarts bays and one small direct ocean tributary to the north of Tillamook Bay (Nickelson 2001), where listed natural Coho Salmon inhabit. There is an estimated 250 miles of spawning habitat available to the Coho Salmon of this complex.

Coho Salmon Life History

Adult Coho Salmon migrate into fresh water in the fall to spawn. Spawning of wild Coho Salmon usually occurs from mid-November through February. Adult spawning coho salmon are typically 3 years old and are often accompanied by 2-year-old jacks (precocious males) from the next brood. Spawning occurs primarily in small tributaries located throughout coastal basins. The parents normally exhibit strong homing to their natal stream. The female digs a nest (redd) in the gravel and lays her eggs, which are immediately fertilized by accompanying adult males or jacks. The eggs are covered by digging and displacing gravel from the upstream edge of the nest. Each female lays about 2,500 eggs. The adults die soon after spawning. Sex ratios of spawning adults tend to average around 50:50 at most locations (Table 2-1). However, Moring and Lantz (1975) observed 77 percent males in three small Alsea River tributaries over a period of 14 years. They concluded that males tend to move around a lot and visit multiple streams.

The eggs hatch in about 35 to 50 days, depending upon water temperature (warm temperature speeds hatching). The alevins remain in the gravel 2 or 3 weeks until the

yolk is absorbed and emerge as fry to actively feed in the spring. Most juvenile Coho Salmon spend 1 summer and 1 winter in fresh water. The following spring, approximately 1 year after emergence, they undergo physiological changes that allow them to survive in seawater. They then migrate to the ocean as silvery smolts about 10 to 12 centimeters (cm) in length.

Table 2-1. Observations of Coho Salmon Sex Ratio at Adult Traps.

Population Complex	Percent Males	Percent Females	Location	Run Years	Data Source
Nehalem	52%	48%	North Fork trap	1998-1999	Life Cycle Monitoring
Siletz	50%	50%	Mill Creek trap	1997-1999	Life Cycle Monitoring
Yaquina	51%	49%	Mill Creek trap	1997-1999	Life Cycle Monitoring
Alsea	77%	23%	Drift Creek tributaries	1959-1972	Moring & Lantz (1975)
	50%	50%	Cascade Creek trap	1997-1999	Life Cycle Monitoring
Umpqua	55%	45%	Smith River trap	1999	Life Cycle Monitoring
Coos	63%	37%	S. Coos River, Winchester Creek, and Fall Creek	1999	Oregon Plan Monitoring

The smolts undergo rapid growth in the ocean, reaching about 40 to 50 cm by fall. Little is known of the ocean migrations of Coho Salmon from Oregon coastal streams; however, based on what is known, it appears migrations are mostly limited to coastal waters. Initial ocean migration appears to be to the north of their natal stream (Fisher and Pearcy 1985; Hartt and Dell 1986). After the first summer in the ocean, a small portion of the males attain sexual maturity and return to spawn as jacks. Migration patterns during the fall and winter are unknown. Those fish remaining at sea grow little during winter but feed voraciously during the next spring and summer, growing to about 60 to 80 cm in length. During this second summer in the ocean, a substantial percentage of these maturing adults are caught in ocean troll and sport fisheries, usually to the south of their natal stream (Lewis 2000). The survivors return to their home streams or neighboring streams where they spawn and die to complete the life cycle.

Habitat Use and Freshwater Distribution

Spawning and rearing of juvenile Coho Salmon generally take place in small, low-gradient (generally less than 3 percent) tributary streams, although rearing may also take place in lakes where available. Coho Salmon require clean gravel for spawning and cool water temperatures (53º to 58°F preferred, 68°F maximum) for rearing (Reiser and Bjornn 1979). Fry emerge from February to early June (Moring and Lantz 1975) and occupy backwater pools and the stream margins (Mundie 1969; Lister and Genoe 1970; Nickelson et al. 1992a). During the summer, coho prefer pools in small streams, whereas during winter, they prefer off-channel alcoves, beaver ponds, and dam pools with

complex cover (Nickelson et al. 1992a, 1992b). Complexity, primarily in the form of large and small wood is an important element of productive coho salmon streams (Nickelson et al. 1992b; Rodgers et al. 1993). Little is known about residence time or habitat use of estuaries during seaward migration. It is usually assumed that coho salmon spend only a short time in the estuary before entering the ocean. However, recent research is finding that rearing in the upper ends of tidal reaches can be extensive.

The distribution of Coho Salmon within a basin is primarily determined by two factors: marine survival and the distribution of freshwater habitat of different levels of quality. When marine survival has been very poor as in recent years, coho will be found in only the highest quality habitats. Coast-wide, these habitats comprise about 22 percent of the habitat (Nickelson 1998). When marine survival increases, as could occur with a changing climate regime, coho will redistribute into freshwater habitats of lower quality. Thus, coho salmon population dynamics function with a classic "source-sink" relationship among stream reaches.

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

The program has no intent to directly take any listed natural Coho Salmon.

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

Indirect or incidental take of listed Coho Salmon may occur due to competitive interactions for food and space between hatchery-origin spring Chinook Salmon and listed natural-origin Coho Salmon. Minimal indirect impact to listed Coho Salmon may also occur due to water withdrawal for hatchery operations, and a few incidental take (catch and release) of listed coho may occur during Chinook Salmon brood collection. Oregon coast steelhead populations are considered a "species of concern", and may also be indirectly affected by this program. There are no other ESA listed populations in the basin affected by this program.

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

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

The status of listed natural Coastal Coho has been documented by the Oregon Department of Fish and Wildlife in the Oregon Coastal Coho Conservation Plan, in addition to the previously developed Oregon Native Fish Stock Status Report. The following information about the status of the Tillamook Complex Coho Salmon population was taken from Nickelson (2001), which is consistent with the Coho Salmon population status described in the Oregon Coastal Coho Conservation Plan and the Oregon Native Fish Stock Status Report.

The critical population level of Coho Salmon for the Tillamook Complex is 1,000 adult spawners. However, this complex is not considered to be viable because high-quality habitat is estimated to be present in only 12 miles of stream, below the 15-mile threshold needed to support a viable population.

- Provide the most recent 12 year annual spawning abundance estimates, or any other abundance information. Indicate the source of data.

The abundance of wild Coho Salmon spawners in the Tillamook Complex has ranged from about 1,300 to 20,000 and has averaged about 8,500 since 2003 (Figure 2-1 and Table 2-2).

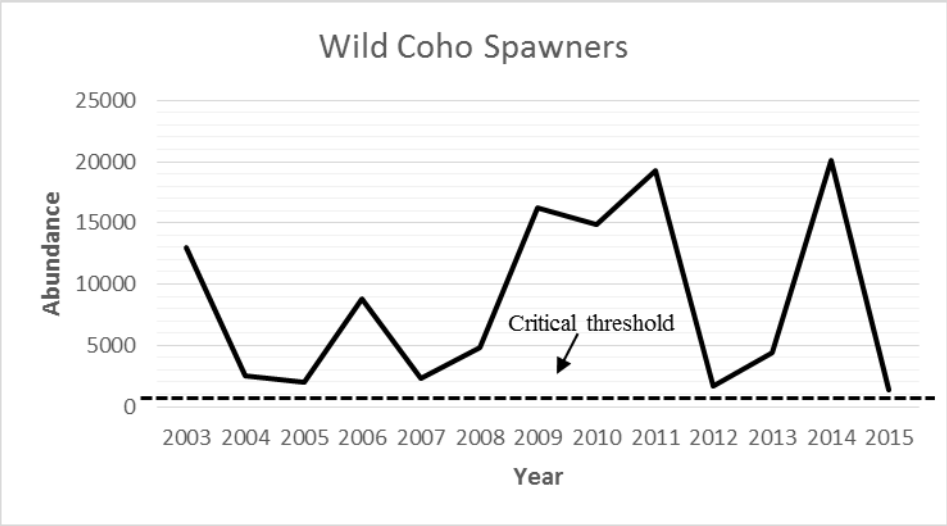


Figure 2-1. **Trend in adult wild Coho Salmon spawner abundance relative to the critical population level for the Tillamook Complex, 2003-2015.**

Table 2-2. **Population Parameters of Coho Salmon showing recruit per spawner for the Tillamook Complex, 2003-2015.**

Year	Wild Spawners	Hatchery Spawners	Percent Hatchery Spawners	Pre-harvest Wild Population	Recruits Per Spawner
2003	13,008	121	1%	14,139	6.5
2004	2,532	828	25%	2,743	1.4
2005	1,995	0	0%	2,087	0.2
2006	8,774	0	0%	9,496	0.7
2007	2,295	134	6%	2,602	1.0
2008	4,828	78	2%	4,922	2.5
2009	16,251	560	3%	17,418	2.0
2010	14,890	110	1%	15,592	6.8
2011	19,250	0	0%	20,457	4.2
2012	1,686	0	0%	2,064	0.1
2013	4,402	304	6%	5,137	0.3
2014	20,090	460	2%	23,470	1.2
2015	1,345	16	1%	1,679	1.0
Avg.	**8,565**	**201**	**3.6%**	**9,370**	**2.2**

Source: OASIS; District files

Estimated spawner abundance of Coho Salmon did not fall below the critical threshold of 1,000 fish in any year during this period. Nickelson (1998) estimated that 2,000 spawners were needed to seed productive freshwater rearing habitat during periods of poor marine survival and 5,700 were needed during periods of good marine survival.

Wild smolt production was estimated for the 1997 through 1999 broods. Estimated smolt abundance ranged from 34,000 to 85,000 for the Tillamook Complex (Table 2-3).

Table 2-3. **Estimates of Abundance of Juvenile Coho Life Stages Based on Spawner Abundance.**

Population Complex	1997 Brood (millions)				1998 Brood (millions)				1999 Brood (millions)			
	Eggs	Fry	Parr	Smolts	Eggs	Fry	Parr	Smolts	Eggs	Fry	Parr	Smolts
Tillamook	0.423	0.275	0.110	0.037	0.339	0.220	0.102	0.034	2.721	1.769	0.286	0.085
Data source: Nickelson (2001)												

- Provide the most 12 year progeny-to-parent ratios, survival data by life stge, or other measures of productivity for the listed population. Indicate the source of data.

Recruits per wild spawner have been highly variable, with six of the last 13 broods falling to one or below (Table 2-2 above and Figure 2-2).

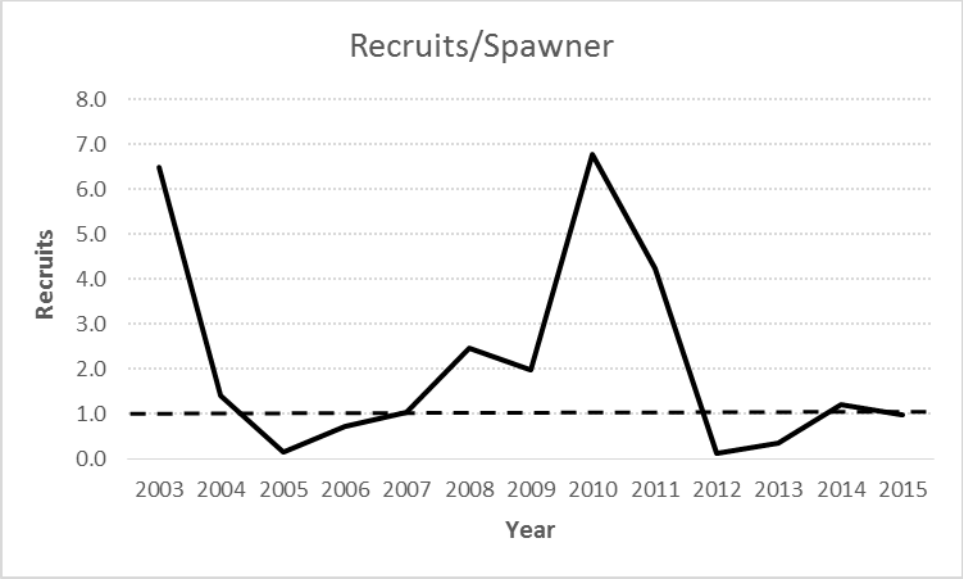


Figure 2-2. **Trends in Recruits per Spawner for Tillamook Complex Wild Coho, 2003-2015.**

- Provide the most recent 12 year estimates of annual proportions of direct hatchery-origin fish and listed natural-origin fish on natural spawning grounds, if available.

Since 2003, hatchery strays have typically comprised a small portion of the Tillamook Complex Coho Salmon population observed on spawning grounds (Table 2-2). The decline is likely related to substantial decreases in hatchery coho production by the early 2000's, and ceasing to utilize the East Fork Trask Pond for rearing. No data is available for progeny of naturally spawning hatchery coho rearing in the wild.

There was no planned spawning ground survey to estimate the proportion of hatchery-origin Chinook Salmon spawning naturally. However, limited data collected during 2013-2015 revealed that hatchery-origin Chinook Salmon carcasses were less than 5% in Tillamook Bay area.

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

- 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.

Hatchery activities that may (have) impacts to listed species include:

- The trap on the South Fork Wilson River (Tuffy Creek facility) is not operated during the period of the adult spring Chinook Salmon returns, and adult Coho Salmon are generally not present during that time.
- Wild Coho Salmon are trapped and handled by hatchery personnel at the trap on the Trask River and at the Gold Creek trap at Trask Hatchery. Any wild Coho Salmon

encountered in the traps are immediately transported upstream (usually RM 14) on the Trask River and released. In 2004-05, 61 unmarked coho were handled at the Gold Creek trap; however, virtually all of these were handled as part of other hatchery programs (*i.e.* fall Chinook Salmon and Coho Salmon).

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

Adult Coho Salmon are occasionally present in very low numbers during trapping periods for spring Chinook Salmon; therefore, impacts resulting from broodstock collection are expected to be minimal. Potential take impacts from all Trask Hatchery programs are listed in Table 2-5; however, there have been no observations or reports of any mortality or injury of listed Coho Salmonfrom those activities.

Table 2-4. Number of unmarked Coho Salmon captured at Trask Hatchery (Gold Creek) and South Fork Wilson River (Tuffy Creek) facilities[a].

Return Year	Unmarked Adult Coho		Unmarked Jack Coho	
	Gold Creek	Tuffy Creek	Gold Creek	Tuffy Creek
1999-00	0	50	0	0
2000-01	0	193	0	5
2001-02	10	32	0	26
2002-03	8	196	0	10
2003-04	118	26	15	0
2004-05	60	63	15	0
2005-06	96	102	13	13
2006-07	22	129	0	2
2007-08	38	179	5	2

Data source: ODFW HMS database.

[a] Number of coho captured at trapping facilities is for the entire adult trapping season for winter steelhead and other returning hatchery stocks (*i.e.* coho, fall Chinook, spring Chinook, etc.).

- 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 Table 2-5.

- 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.

Trapping of adult stock-34 spring Chinook Salmon occurs primarily at the adult trap at Trask Hatchery (T-3). If incidental handling of wild Coho Salmon at Trask Hatchery or

in any of its facilities is expected to exceed projections, trap facility handling procedures will be modified immediately. This may include, but is not limited to, review of procedures and operation, trap modifications, cessation of trapping, modified operation by hatchery personnel, improved training, etc.

Table 2-5. Estimated Listed Salmonid Take Levels by Hatchery Activity.

Listed Species Affected:	OCN Coho	**ESU/Population:**	Oregon Coast Coho	**Activity:** Spring Chinook broodstock trapping
Location of Hatchery Activity:	Trask Hatchery & Tuffy Creek	**Dates of Activity:**	August 15 through Oct. 15	**Hatchery Program Operator:** ODFW

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile/ Smolt**	**Adult**	**Carcass**
Observe or harass a)	0	0	0	NA
Collect for transport b)	0	0	0	NA
Capture, handle, and release c)	0	0-100*	0-750**	NA
Capture, handle, tag/mark/tissue sample, and release d)	0	0	0	NA
Removal (e.g. broodstock) e)	0	0	0-110	NA
Intentional lethal take f)	0	0	0	**NA**
Unintentional lethal take g)	0	<10*	<10***	**NA**
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.

*** Juvenile coho are typically not handled during hatchery operations, but are present and could occasionally be encountered**

**** All unmarked, naturally produced coho adults trapped are released upstream of the hatchery facility (unless retained for brood).**

***** No direct mortalities have been observed during trap and pass operations.**

Note: The take figures are not cumulative take at the facility but are total take for the indicated trapping period. Collection of spring Chinook broodstock may overlap with trapping of fall Chinook and coho. The number of unmarked coho handled represents a season total during spring Chinook collection, and is not necessarily additive to numbers presented in other HGMP's.

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.

- **Native Fish Conservation Policy** - The Oregon Fish and Wildlife Commission has approved the Native Fish Conservation Policy (NFCP). The NFCP required the development of a conservation plan which was completed in 2014 and is described below.

- **Coastal Multi-Species Conservation and Management Plan (CMP)** – This plan addresses conservation and management of anadromous salmonids (salmon, steelhead and trout) on the Oregon coast from Cape Blanco to Seaside. The CMP is unique from other conservation plans in that it addresses both conservation and utilization of six distinct groups of fish species, none of which are listed under the ESA. In addition to meeting requirements of the Native Fish Conservation Policy, the CMP provides long-term management direction for species which are relatively healthy, with the intent to help ensure the continued existence of wild fish and the fisheries which wild and hatchery fish support. The program is consistent with ODFW's CMP 2014.

- **Fish Hatchery Management Policy (FHMP)** – This policy provides guidance for the responsible use of hatchery-produced fish. It outlines the best management practices for hatchery programs to ensure conservation and management of both naturally produced native fish and hatchery produced fish in Oregon. The FHMP calls for the development of Hatchery Program Management Plans (HPMPs) to outline the hatchery practices that will be followed for each hatchery program. A HPMP may be a Hatchery and Genetic Management Plan (HGMP) or an aspect of conservation plan developed under the Native NFCP. For the Oregon Coast Coho SMU, the conservation plan has been developed and adopted by the Commission, and this program is consistent with Coho Salmon conservation plan.

- **Oregon Plan for Salmon and Watersheds:** The program is consistent with measures identified for hatchery programs in the *Oregon Plan for Salmon and Watersheds*.

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

Oregon Plan for Salmon and Watersheds, Governors Executive Order EO 99-01:
The Oregon Plan for Salmon and Watersheds is a prescriptive set of measures for recovering threatened and endangered salmon and steelhead, and meeting federal water quality standards, established by Executive Order of the Governor. The Oregon Plan includes measures linked to the hatchery production of spring Chinook Salmon in the Tillamook Bay watershed including nutrient enrichment, acclimation and other separations of hatchery and wild production, and monitoring of hatchery and wild runs.

Tuffy Creek Operational MOA:
The Trask Hatchery Tuffy Creek satellite facility is operated under a Memorandum of Agreement (MOA) between ODFW and the Oregon Department of Forestry. The MOA is on file and can be reviewed at ODFW Headquarters at 4034 Fairview Industrial Drive SE, Salem, Oregon 97302.

NPDES Permit:
The Trask Hatchery is operated under the NPDES 300-J general permit to maintain the environmental standards of hatchery effluent.

Salmon Trout Enhancement Program:
The STEP component of the program operates under an ODFW approved STEP Fish Propagation Project Proposal. Projects are permitted for a 5-year period and must be renewed for program continuance. A copy of the proposal is on file at the North Coast Watershed District Office, 4907 Third Street, Tillamook, OR 97141.

3.3) Relationship to harvest objectives.

The artificial production component of this project is designed to minimize biological impacts to listed species. Likewise, fish culture practices are designed and carried out to rear smolts to size and condition that limit impacts to naturally rearing Coho Salmon.

These hatchery spring Chinook Salmon are mass marked (100%) as a means of integration of hatchery and harvest management. Mass marking will allow for selective harvest of hatchery fish while requiring release of all wild fish. Mass marking will also allow for better monitoring and control of impacts of the hatchery program to wild spring Chinook Salmon populations. Incidental take of wild Tillamook Basin Coho Salmon in harvests is limited by the ESA Section 4(d) rule. The 4(d) rule requires development of Fishery Management and Evaluation Plans (FMEP). Such plans have been developed and are guided by the Pacific Coast Salmon Plan, specifically Amendment 13 (Pacific Fisheries Management Council [PFMC] 1997). Under recent conditions of marine survival and abundance, the take is limited to less than 10% of the total, preharvest Oregon Coast ESU wild coho abundance. Take could increase to 35% if conditions improve (PFMC 1997). This standard is adopted as adequate for controlling incidental harvest impacts in this plan, pending completion of FMEPs. All further address of harvest impacts will occur under the FMEPs. Estimated harvest impacts (ocean and

freshwater combined) on wild Coho Salomon for the period 1994 through 1999 averaged 9.2% and ranged from 6.8% to 12.4%. Year 2000 harvest impacts were estimated to be about 8%. Adult coho are typically not encountered by anglers targeting hatchery spring Chinook because adult coho usually do not enter the Tillamook Bay basin until well after spring Chinook Salmon sport fisheries are closed.

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

The spring Chinook Salmon freshwater and ocean sport, and ocean commercial Chinook fisheries will benefit from this program. Angling regulation changes for spring Chinook, beginning in 2002, restricted the spring Chinook fishery in the Tillamook Bay Basin to fin-clipped fish only. Prior to this, enumeration of wild spring Chinook retained in the sport fishery was not possible. See Table 1-3 for past harvest level data.

3.4) Relationship to habitat protection and recovery strategies.

This isolated harvest program is not directly related to habitat protection or recovery. It is designed to provide hatchery spring Chinook Salmon for harvest in ocean sport and commercial fisheries and freshwater sport fisheries, while other actions are taken to protect and restore habitat. Management of the hatchery program will focus on attaining harvest objectives using methods that minimize impacts to wild fish and their habitats.

Major factors affecting natural production in the Trask River are largely unknown; however, it is assumed that ocean survival may be the largest contributing factor. In general, habitat condition in the Trask River is slowly improving. A series of fires in the mid- to late- 1930s (Tillamook Burns) drastically impacted habitat with loss of shade, increased sedimentation, and loss of stream complexity. The basin is now recovering to a forest condition with some shade and sedimentation impacts reduced; however, there is still a lack of instream complexity throughout the system. Flood events are common in the basin and can have detrimental effects on egg depositions and juvenile rearing.

Habitat restoration projects conducted since the early 1990's (on state, federal, and private timberlands, which make up the majority of the basin ownership) have worked to address instream complexity concerns. Watershed council volunteers have been active in addressing and implementing riparian improvements on private lands within the basin. Fish passage barriers (primarily culverts) are being evaluated and addressed on these lands as well as on major highways and county road systems. Oregon fish passage laws require fish passage to be addressed at all impediments to migration. As such, fish passage in these basins is likely to continue to improve over time.

3.5) Ecological interactions.

(1) Species that could negatively impact program:

Competition for food between Trask Hatchery spring Chinook Salmon smolts and other hatchery and wild smolts in the Tillamook Bay estuary and near shore ocean environment may negatively impact this program. Avian and marine mammal predation may also negatively impact this program.

(2) Species that could be negatively impacted by program:

Competition for food between stock-34 spring Chinook Salmon smolts and naturally produced salmonid juveniles in release streams, their estuaries, and near shore ocean environment may negatively impact naturally rearing salmonids. Large concentrations of hatchery reared fish may attract predators, which may cause increased predation on naturally produced salmonid juveniles. Increased angling pressure on hatchery spring Chinook Salmon may increase incidental mortality of naturally produced spring Chinook.

(3) Species that could positively impact program:

Increased abundance of naturally produced adult salmonids, primarily Chinook and Coho Salmon, and their eventual death after spawning, will increase stream nutrient levels and biomass productivity of the prey base used by hatchery and naturally produced fish. Use of hatchery salmon carcasses for stream enrichment activities will further enhance this nutrient base and positively influence the spring Chinook program.

(4) Species that could be positively impacted by program:

Adult stock 34 spring Chinook carcasses are used in stream enrichment activities. The nutrients provided by these carcasses will benefit salmonid and non-salmonid fishes in the streams where the carcasses are placed.

General Information

Interactions between migrating hatchery-produced spring Chinook Salmon smolts and ESA Threatened Oregon Coast Coho Salmon fry/juveniles/smolts are likely to be minimal. Spring Chinook are reared to smolt size and expected to migrate upon, or soon after release. Most Trask Hatchery production smolt releases are relatively low in the watershed. These typically are areas with minimal rearing of wild juvenile Coho Salmon during the summer. Target release size is 12 fish per pound. Release timing is late-July to mid August, which is well after the wild Coho Salmon smolt migration timing of April and May (Solazzi et al. 2000). All release groups are sampled and disease tested by ODFW Fish Health staff and cleared before release. It is possible that some hatchery spring Chinook juveniles may residualize after release, but it is anticipated that interaction(s) between residual spring Chinook and rearing coho are minimal based upon their species-specific rearing and life history characteristics.

Monitoring of naturally spawning Spring Chinook is not routinely conducted, thus little information on the proportion of naturally spawning hatchery fish is available. Grant funded surveys were conducted from 2005-2008 in north coast basins (ODFW 2008;

ODFW 2013). Additional surveys were conducted in the Wilson River in 2015 by the Tillamook District (ODFW unpublished data). Observed hatchery fish on spawning grounds generally exceeded 50% of the naturally spawning population. However, Spring Chinook hatchery releases were modified in 2015 with the implementation of the Coastal Multi-Species Management Plan. Thus, in the future the proportion of hatchery fish is likely to differ from the previous surveys. No data will be available for several years until returns include all year classes from these modified hatchery releases.

The ODFW has had a Salmon and Trout Enhancement Program (STEP) in place and operational since 1981. Spring Chinook are seldom used in the "classroom incubator" educational component of the STEP program due to their spawning timing being at the beginning of the school year when classes are not set up to incubate eggs.

Habitat Above Trapping Facilities

The trap on Gold Creek at Trask Hatchery is operated to collect spring Chinook Salmon broodstock only when late summer flows allow spring Chinook to enter Gold Creek.

Gold Creek (Trask Hatchery facility)

Aquatic inventory of habitat above the trap weir on Gold Creek was completed in 1993; however, it should be noted that several major flood events have occurred in subsequent years and the data presented may have changed substantially.

Gold Creek is a third-order stream. The area surveyed above the weir was approximately 5,245 meters with an overall gradient of 9.8%. The large wood debris condition score is low at 1.4 on a scale of 1 – 5 with 1 being woody debris absent or in very low abundance; and 5 being woody debris providing excellent persistent and complex habitat (Moore et. al. 1997). The habitat is dominated by cascades and rapids over boulders. Overall stream complexity is low, with a minor amount of secondary channels present (OFIC/ODFW, 1993).

The North Fork of Gold Creek is a second-order stream. The area surveyed was approximately 5,504 meters with an overall gradient of 10.0%. The large wood debris condition score is considered low to moderate at 1.8 (Moore et al., 1997). Pools were present in approximately 30% of the first 1,000+ meters; however, the habitat overall was dominated by cascades and rapids over boulders. Stream complexity is low with a minor amount of secondary channels present (OFIC/ODFW, 1993). This system was known to have a number of debris torrents associated with the 1996 flood event.

Resident cutthroat trout are present in both systems. No fish are being passed above the trap weir at this time; however, coho and winter steelhead may be passed in the near future once screens have been upgraded to NOAA standards. Given the low summer flows in Gold Creek in most years, Gold Creek does not provide suitable spawning habitat for spring Chinook. Gold Creek provides Trask Hatchery's main source of rearing water.

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.

Trask Hatchery: Adult spring Chinook (Stock-34) are typically trapped and held at the Trask River Hatchery in a pond supplied with gravity flow water from Gold Creek. From the green-egg stage to ponding fry stage (in incubator trays and starter tanks) the water source is Gold Creek and Mary's Creek. Water temperature is only manipulated during the egg and fry incubation stages, by the use of immersion heaters placed into incubator trays. Water temperatures during incubation range from 41 to 55º F.

During the juvenile stage, all fish are reared in water supplied from Gold Creek or Mary's Creek. Water availability varies from 2,800 to 4,490 gallons per minute (gpm) with a total water right of 10 cubic feet per second (cfs) for the two streams. Water temperatures during the rearing stage range from 38 to 65º F.

At the eyed egg stage or after fin-marking, all but ~70,000 juvenile spring Chinook are transferred to Cedar Creek Hatchery , Tuffy Creek Pond (SF Wilson) or Whiskey Creek Hatchery. Trask River Hatchery and Cedar Creek Hatchery operate under the NPDES general permit 300-J.

Tuffy Creek Pond: The Tuffy Creek pond is used to rear stock 34 spring Chinook from the fingerling to smolt stage. All fish are reared in gravity fed water supplied from South Fork Wilson River. Water diverted for use at the rearing pond varies from 700 to 1,500 gpm. The water right is limited to 3.0 cubic feet per second measured at the point of diversion. The water right also requires that we continuously maintain at least 7.0 cfs in the natural channel of the river between the water diversion point, and the point at which the project return flows to the South Fork Wilson River at the mouth of Tuffy Creek. Water temperature in the rearing pond at Tuffy Creek ranges from approximately 45º F to 60º F during the spring Chinook rearing period (April – August). These fish are transferred to the Trask River for release. Spring Chinook are no longer released into the Wilson River. Tuffy Creek Pond is not subject to 300J NPDES permitting requirements because of low production level.

Cedar Creek Hatchery: See Cedar Creek Hatchery stock 47 Spring Chinook HGMP for a description of the rearing facilities at that location.

Trask River Hatchery currently operates under the 300J NPDES general permit. Compliance with the NOAA Fisheries screening criteria will be based on rearing systems inspection results completed by the fish screen passage program leader and staff. Any necessary modifications will be made.

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

The risk to listed Coho Salmon take due to water withdrawal for Trask Hatchery operation is minimal because listed coho Salmon are not currently present above the trap facilities and Gold Creek water intake structures. No coho are present upstream of the Cedar Creek water intake, and supplemental pumps on Three Rivers are screened to NOAA criteria. Because listed fish are passed above the intake structure at the Tuffy Creek facility, ODFW is currently evaluating screen compliance at that facility and will work through the fish passage and screening program in order to comply with the NOAA Fisheries screening guidelines.

All hatchery effluent from the Trask Hatchery and Cedar Creek Hatchery is monitored and data are reported to DEQ quarterly per requirements of the National Pollutant Discharge Elimination System (300J) permit. All conditions of the permit are administered within ODFW and regulated by the Oregon Department of Environmental Quality.

SECTION 5
FACILITIES

Adult collection and spawning of Trask Hatchery Stock-34 spring Chinook is located primarily at Trask Hatchery. Trask Hatchery rears juveniles on station until they reach marking size. Once fin-marked, most fingerlings will be transferred to Cedar Creek Hatchery and Tuffy Creek Pond where rearing is completed. Trask Hatchery also retains fingerlings on station for eventual direct release into the Trask River.

5.1) Broodstock collection facilities (or methods).

Trask River hatchery-origin spring Chinook Salmon adults are collected primarily in the mainstem Trask River trap located at RM 9.8 at Trask Hatchery. During the summer, adult spring Chinook hold in a large pool in the Trask River that is below the trap entrance. Water flow diverted from Gold Creek attracts adult spring Chinook Slamon entering the T-3 trap via a fish ladder located at the upstream end of the holding pool. Once fish enter the trap, they are manually sorted and held in the collection facility until spawning in September.

Unmarked spring Chinook Salmon that enter the trap are released upstream (except a portion may be retained for brood). The trap is generally not opened for broodstock collection until mid-August.

In some years, following heavy late-summer rains, some spring Chinook Salmon will enter Gold Creek and the Gold Creek trap will be operated. Fish enter the Gold Creek trap via a fish ladder with attraction flow provided by diverted Gold Creek water. Adult hatchery spring Chinook captured in the Gold Creek trap are usually loaded into a liberation tank and hauled to the trap for holding.

During some low water years when adult spring Chinook Salmon fail to enter the trap, it has been necessary to use seines or tangle nets deployed from boats to collect adult spring Chinook for broodstock. This has only been necessary a couple of times in the past 30 years.

If in the future Trask stock spring Chinook return to Cedar Creek Hatchery can be identified by unique external marks, adults may be collected for brood from that facility.

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

The ODFW North Coast Watershed District currently has one small stainless steel transport tank used for fry, a 200-gallontank that can be loaded in a pickup truck used for transporting juveniles, and a 430-gallon tank mounted on a flatbed trailer used for adults/juvenile transportation. Currently, Trask Hatchery utilizes 3 separate types of fish transportation equipment for the transportation of juveniles and adult fish. Fish transportation equipment will be replaced or upgraded as needed to meet transportation needs.

a) A typical fish liberation unit consists of a cab-over flatbed truck with a 1,000-gallon fiberglass tank. The unit has a 12-inch outlet for releasing adults if needed. It also is

equipped with recirculation pumps and an oxygen injection system. The governing factors that determine the loading densities are: water temperature in the truck, water temperatures at the receiving water body, duration of transit, and size and species of fish to be hauled.

b) A portable fish liberation unit, which consist of a 300-gallon slip tank that fits onto the bed of a 1-ton pickup truck. The portable liberation unit is equipped with an electric aeration system and an oxygen injection system. The governing factors determining loading densities are the same as identified for the 1,000-gallon liberation unit.

c) A tractor-trailer unit with a capacity of up to 3,000-gallons and a stainless steel tank on a fifth-wheel trailer. The tank trailer is equipped with electric aerators for circulation. In addition, there is bottled oxygen with carbon stones for oxygen replenishment.

Adult fish passed upstream of the hatchery are transported a short distance upstream (approximately 4 miles) in a portable liberation tank and returned to the river. Adult fish recycled downstream are transported less than 10 miles, with a haul time generally less than 15 minutes.

5.3) Broodstock holding and spawning facilities.

Trask Hatchery stock-34 spring Chinook Salmon broodstock are held for spawning at the Trask River Hatchery in one 37-foot by 20-foot by 3-foot (working volume) holding pond. This holding pond receives water by gravity flow from Gold Creek. During the time of collecting and holding adult fish for spawning the pond has an average water flow of 1,200 gpm. Minimum water flow levels could be as low as 700 gpm. This trap facility has a spawning shed structure where spawning apparatus is stored and spawning activities are conducted.

5.4) Incubation facilities.

Incubation occurs in vertical incubator trays supplied with gravity flow water from Gold Creek and Mary's Creek. Flow rate for incubation is 4.5 gpm. A low-water alarm system (mercury float type) is in place to detect interruption of water flow to the incubator trays; however a new alarm system is currently being installed. Immersion heaters are used to manipulate water temperature during the egg to fry incubation stage. Discharge water is returned directly to the Trask River; however, a system has been developed to divert incubation flow to the tailrace of Ponds 1 and 2, or to the pollution abatement pond for additional treatment, when necessary.

Eyed eggs may be transferred to Cedar Creek Hatchery for incubation. See the Cedar Creek Hatchery Stock 47 Spring Chinook HGMP for incubation facility details.

5.5) Rearing facilities.

Trask hatchery has recently constructed a 40'x 24' early rearing building. The early rearing building contains eight 16-foot long Canadian tanks that have the capacity to rear

100 pounds of fish each. In addition, there are two 16-foot deep Canadian troughs located in the main hatchery building. These troughs are used to start fish on feed. Prior to reaching a maximum density, fish are transferred to raceway ponds located at Trask Hatchery.

Up to eight single-pass raceway ponds—measuring 50-feet by 8-feet by 2.7-feet—are used for early rearing of the juveniles at Trask Hatchery. Approximately 175,000 fingerlings are transferred to Cedar Creek Hatchery (or alternatively up to 275,000 eyed eggs may be transferred to Cedar Creek Hatchery) and approximately 64,000 are transferred to the Tuffy Creek Facility. Trask Hatchery retains approximately 72,000 fingerlings for final rearing to smolt size, for eventual direct release of 70,000 smolts into the Trask River.

Tuffy Creek Pond is a 114-foot by 28-foot by 4.5-foot asphalt surfaced pond with sloping sides. Water for rearing is gravity flow from South Fork Wilson River and is adjusted throughout rearing time for desired flows. Water enters the pond through one aluminum header pipe containing 3" diameter aluminum tubes to distribute water flow evenly across the upper end of the pond. The water flow is regulated with one gate valve on the mainline at the head end of the pond. Flow range during the rearing period averages 1,056 gpm. Water temperature for the rearing period averages is 53.5º F.

See Cedar Creek Hatchery stock 47 Spring Chinook HGMP for a description of the rearing facilities at Cedar Creek Hatchery.

5.6) Acclimation/release facilities.

All Trask Hatchery stock-34 spring Chinook Salmon fry reared at the Tuffy Creek facility are transported back to Trask Hatchery for final acclimation and release or are released directly in the Trask River. Whiskey Creek component of spring Chinook Salmon releases are described in the Whiskey Creek Hatchery stock-34 Spring Chinook Salmon HGMP. The Trask Hatchery stock-34 spring Chinook held at Trask Hatchery ponds are volitionally released directly into the Trask River (see flow diagram 1). Stock 34 spring Chinook reared at Cedar Creek Hatchery will be transported back to, and released in the Trask River.

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

There have been no operational difficulties or disasters that have led to significant fish mortality.

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.

No listed fish are under propagation in this program. However, equipment failures at rearing facilities could potentially lead to juvenile releases which may impact naturally-produced juvenile Coho Salmon in the Trask River.

The Trask River Hatchery and Cedar Creek Hatchery are staffed full time with at least one person; personnel are available 24 hours per day, 7 days per week. The facility is equipped with a low-water alarm system to help prevent catastrophic fish loss resulting from water system failure. The adult traps are supplied with gravity flow.

The Tuffy Creek Pond rearing facility is within the confines of the Oregon Department of Corrections compound. Staffing available for the security of the fish reared in the pond is an appointed facility inmate. That person is available 24 hours per day, 7 days per week. Trask River Hatchery facility manager and staff provide the technical direction and advice in fish rearing activities. The facility is equipped with a low-water float alarm system to help prevent catastrophic fish loss resulting from water system failure.

See the Cedar Creek Hatchery stock-47 spring Chinook Salmon HGMP for additional description of risk aversion measures at that facility.

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.

Spring Chinook Salmon collected for program broodstock are stock-34 spring Chinook returning to the Trask River. Egg take from returning Trask River stock has occurred in every year since 1907 (missing or incomplete records for period 1913 to 1921). Records indicate that some out-of-basin spring Chinook Salmon eggs were propagated at Trask Hatchery in the early years. These eggs were primarily from the Nestucca and Columbia River basins and were received between 1926 and 1933. It is unclear if all were returned and released to basins of origin, other basins, or released in Trask River.

6.2) Supporting information.

6.2.1) History.

This program currently uses one broodstock, believed to have been originally derived from Trask River wild spring Chinook beginning in 1907. There have been some anecdotal reports that spring Chinook Salmon were not indigenous to the Tillamook Bay basin; however, these reports have not been substantiated. While the lineage is unclear, the early 1900's broodstock was collected by racking the Trask River. Beginning in 1959, broodstock was collected by seining at the hatchery (Wallis, 1963). Wallis (1963) indicated a new adult holding pond was constructed in 1961, and fish (Coho and fall Chinook Salmon) were either trapped in the upper pond from Gold Creek trap (now T-9), or from the lower pond directly from the river (assumed to be what is now the T-3 trap).

6.2.2) Annual size.

A minimum of 127 female adults and 127 male adults will be needed to fulfill the existing smolt production goals (~300,000 smolts for Trask Hatchery production, and egg take for 100,000 smolts reared at Whiskey Creek Hatchery), and STEP hatchbox egg requests. Adults are typically spawned at a one-to-one, male-to-female ratio. Additional adults may be collected as necessary to cover shortages resulting from, but not limited to, fecundity variation, early egg mortality, positive disease test, etc.

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

Historic records indicate the original broodstock were likely from wild origin. Because fish were not routinely marked and origin cannot be determined from scale reading, it is not known to what extent wild, or hatchery broodstock have been incorporated over time. At the time of the Wallis (1963) report, it was assumed that spring Chinook Salmon holding in the lower river were primarily of hatchery origin based on spawning ground data and hatchery trapping data early in the hatchery's operation. The probability of

including wild fish in the broodstock prior to mass marking is believed to have been approximately 10%. From 2003 (year of mass marked spring Chinook returns) to 2012, no wild spring Chinook were used for broodstock. Beginning in 2013, unmarked adults have been used for broodstock in approximately the same proportion they have entered the hatchery trap.

6.2.4) Genetic or ecological differences.

The broodstock used in this program is likely locally founded. However, the current hatchery spring Chinook stock may have diverged—to some unknown extent—from the Trask Basin wild spring Chinook population. No genetic study has been conducted to determine any genetic differences between the wild and hatchery-origin adults. Future incorporation of wild fish in the hatchery broodstock could help to reduce differences between the hatchery and wild fish.

6.2.5) Reasons for choosing.

Trask River stock-34 spring Chinook Salmon were not chosen for any special traits or characteristics other than it was the stock believed to be indigenous to the Trask River Basin.

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.

Stock-34 hatchery-origin spring Chinook Salmon broodstock selection should have minimal ecological or genetic impacts to listed naturally produced Coho Salmon. Naturally produced coho may be trapped during spring Chinook Salmon broodstock collection (particularly late in the season), although this has rarely occurred in the past. Any unmarked coho that is trapped is passed upstream of the hatchery facility to spawn naturally. Juvenile Coho Salmon may be encountered during seining operations to collect broodstock. However, large mesh seines which easily pass juvenile fish are used, and few, if any coho juveniles have been observed during this operation. Any juvenile fish captured would be immediately released.

SECTION 7

BROODSTOCK COLLECTION

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

Adult spring Chinook Salmon will be captured for broodstock. A minimum of 127 females and 127 males must be spawned to meet the proposed objective of 300,000 smolts, 110,000 eyed-eggs for Whiskey Creek STEP Hatchery, and to maintain genetic quality of the population. Additional fish may be collected and held as necessary to cover shortages resulting from, but not limited to, fecundity variations, early egg mortality, positive disease tests, etc.

7.2) Collection or sampling design.

Spring Chinook broodstock adults are captured at Trask River Hatchery upon swimming into the mainstem trap. The trap is operated such that the spring Chinook run-timing, adult size, and age distribution are represented. Adult collection in the fish ladder/trap begins in mid-August and continues throughout the remainder of the run (usually late September). During some years, late summer rains result in adult spring Chinook ascending Gold Creek. These fish can be captured in the Gold Creek trap and used as broodstock. The Gold Creek trap is not considered to be size or age selective.

7.3) Identity.

All Trask Hatchery stock-34 spring Chinook Salmon are currently identifiable by a clipped adipose fin. Since all Whiskey Creek Hatchery spring Chinook (described in Whiskey Creek Hatchery Stock-34 Spring Chinook HGMP) are also identified by a clipped adipose fin, some fish from that program may be collected and used for broodstock as well. Other fin or maxillary marks may be used as needed to meet program needs or for evaluation purposes.

7.4) Proposed number to be collected:

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

A minimum of 127 female adults and 127 male adults will be needed to fulfill existing production goals (300,000 smolts for Trask Hatchery production, 100,000 smolts at Whiskey Creek Hatchery, and 2,000 eyed-eggs for STEP classroom incubators). The broodstock sex ratio at collection time is assumed to be 1:1. Adults are spawned at a one-to-one, male-to-female ratio using a spawning matrix. Jacks will be used in the broodstock.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1990-99), or for the most recent years available:

Following are numbers of adults actually spawned. The number of spawned males for 1989 – 2006 are unknown. Males were not recorded as spawned or unspawned in those years.

Table 7-1. Trask Hatchery Spring Chinook Salmon Broodstock Collection, Spawning, and Egg Take Levels (NA = Data not available for some years). Adult collection and production numbers shown are pre-CMP levels.

Year	Adults[a]			Total Egg Take	Eyed eggs to Whiskey Creek.	STEP Hatchbox Eggs	Trask Production Eggs	Trask Fry Ponded
	Females	Males	Jacks					
1989	152	NA	0	779,000	100,000	130,000	392,000	383,000
1990	156	NA	3	792,000	135,000	95,200	419,000	382,000
1991	175	NA	2	859,000	125,000	70,250	411,000	402,000
1992	241	NA	12	1,201,000	120,000	75,000	428,000	412,000
1993	141	71	0	664,000	120,000	45,000	401,800	391,000
1994	169	167	13	796,000	120,000	90,000	375,250	291,000
1995	171	151	8	848,000	120,000	90,000	311,800	300,000
1996	185	184	0	864,000	120,000	95,000	305,000	300,000
1997	195	193	1	898,000	145,000	141,000	385,000	306,000
1998	153	152	0	742,000	120,000	106,600	314,750	298,000
1999	168	169	2	729,000	124,750	212,650	310,000	304,000
2000	171	135	32	751,000	120,000	90,550	492,900	294,000
2001	128	91	37	582,000	120,000	13,500	448,500	262,000
2002	147	145	2	671,000	110,000	31,500	460,000	297,000
2003	131	127	0	641,000	111,000	14,100	315,440	281,000
2004	184	184	0	759,083	110,000	46,400	335,000	297,314
2005	160	160	0	634,824	110,000	45,900	374,350	332,362
2006	135	135	0	550,844	110,000	31,000	409,000	363,104

Data source: ODFW HMS database, Trask Hatchery, and North Coast Fish District

[a]Values include adult collection needed to meet production goals for the Whiskey Creek stock-34 Spring Chinook STEP Program (described in Whiskey Creek Stock-34 Spring Chinook Salmon HGMP).

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

The trap at Trask Hatchery is operated through the end of the run, usually in late September or early October. While the trap has been closed prior to the end of the run in the past, the current operating procedure is to continue to operate the trap to remove fin-clipped adult spring Chinook from the system. Excess hatchery spring Chinook Salmon may be recycled down river, or dispatched and used in the stream enrichment or food

programs. Most naturally-produced spring Chinook Salmon (unmarked) are released to the mainstem Trask River to spawn naturally although some are used for broodstock. The number of wild spring Chinook retained for broodstock will generally be proportional to the percentage encountered in the hatchery trap.

7.6) Fish transportation and holding methods.

Broodstock collected at the trap on Gold Creek are transported to the holding pond using the portable 300-gallon fish liberation unit described in Section 5.2 or other available transportation equipment. Typically all broodstock collected at Trask Hatchery are held and spawned in the T-3 trap structure. See section 5.3 for trap details.

7.7) Describe fish health maintenance and sanitation procedures applied.

Developing eggs receive regular treatments with formalin or other approved treatments to prevent/control fungus (*Saprolegnia parasitica*) outbreaks. Green eggs are water-hardened in an iodine solution to prevent disease or viral contamination. Juveniles are treated (usually with medicated feed, hydrogen peroxide, or possibly formalin) as directed by ODFW fish health staff if necessary. Adult spring Chinook Salmon broodstock held at the hatchery may receive injections of antibiotics to control furunculosis. Adult spring Chinook broodstock are treated regularly (typically with hydrogen peroxide, or potentially formalin) in the holding pond. Additional sanitation procedures are described in section 9.2.7. See Attachment A.

7.8) Disposition of carcasses.

Hatchery-origin spring Chinook carcasses may be used for stream enrichment activities in the Tillamook Bay basin. Carcasses suitable for human consumption may be used for food programs, or carcasses may be sold for processing into fish food or other products. Carcasses not used for stream enrichment, food programs, or sold, are buried or disposed of in a landfill.

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.

There should be minimal likelihood for adverse genetic or ecological effects to listed fish as a result of broodstock collection. To ensure that impacts to wild Coho Salmon are minimized during broodstock collection, the trap is visually checked daily to determine if any have entered the trap. If wild coho are present, they are immediately transported upstream to (usually RM 14) and released.

Coho Salmon may be present in the system when seining or tangle netting is necessary to collect spring Chinook broodstock. The seine is pursed only to the point that fish are contained and are removed individually by hand. Tangle nets are light mesh that is easily breakable. Any coho collected are immediately released outside the seine. Any juvenile coho that may be present can easily escape the large-mesh seine net used.

SECTION 8
MATING

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

8.1) Selection method.

Collection of spring Chinook Salmon for use as broodstock occurs throughout the run. Spawning usually occurs during September. Spawning is done randomly based on availability of ripe fish at the time of spawning. Adults are collected randomly from fish entering the hatchery trap. Excess eggs may be collected to assure meeting the production goal. Excess eggs may be culled randomly across egg take groups after spawning is completed if necessary (see section 9.1.2).

8.2) Males.

Males are typically only used once for spawning in the prescribed matrix, but could be used to spawn with more than one female in the case of a shortage of males. Males will be used and selected randomly for any, and all, spawning days. Jacks will be included in the broodstock when available and at the proportional rate they are collected, but will generally not exceed 5% of the males spawned unless a shortage of males occur.

8.3) Fertilization.

Spring Chinook Salmon are kill-spawned with the goal of a 1:1 male-to-female ratio. Each fish is typically only used once in spawning, however if necessary, in the case of a shortage of males, individual fish may be spawned more than once.

Spawning is conducted using a modified matrix. Eggs from females are spawned into a single plastic bucket and mixed. The eggs are then divided into separate buckets. Males are spawned, one into each of the buckets of eggs. These groups are held separate and transferred to the incubation facility in the plastic buckets. Once in the incubation facility, the fertilized eggs are water hardened in a solution of iodophore and placed in the incubation baskets. Each family group is incubated in separate baskets or trays. This matrix-spawning regime provides for the possibility of multiple family groups per female spawned.

Ovarian samples are taken from all spawned females and visceral (kidney, spleen) samples are collected from up to 60 spawned fish for viral analysis. Eggs that test positive for disease may be kept or destroyed, at the direction of ODFW fish health staff.

8.4) Cryopreserved gametes.

Cryopreservation of spring Chinook gametes is not used in this program.

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.

No genetic or ecological effects to naturally produced listed fish species is expected from the mating scheme of the stock-34 hatchery spring Chinook Salmon program. However, to maintain the genetic diversity within the propagated spring Chinook population, broodstock are randomly selected from throughout the entire run. Spawning is done randomly based on availability of ripe fish. Matings are done with a goal of a 1:1 sex ratio (i.e. one male and one female) using a spawning matrix. Each fish is only used once in spawning, however if necessary, in the case of a shortage of males, individual fish may be spawned more than once.

SECTION 9

INCUBATION AND REARING

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

9.1) Incubation.

Trask Hatchery takes stock-34 spring Chinook Salmon eggs for several programs. Egg survival to ponding, provided below, is based on eyed-eggs retained for Trask Hatchery production (*i.e.* Trask Hatchery Stock-34 Spring Chinook Program). Green egg take to ponding survival would not provide an accurate representation of the Trask Hatchery spring Chinook Salmon program, primarily because of the large number of eggs collected for the STEP hatchbox program that was terminated in 2014.

9.1.1) Number of eggs taken and survival rates to ponding.

Table 9-1. Eyed Egg Survival – Trask Hatchery Stock-34 Spring Chinook Salmon Program. Values are pre-CMP levels.

Brood Year	Eyed Eggs for Program	Measure	Percent survival to Ponding
1988	436,400	Survival to ponding	97.4 (fry release included)
1989	392,000	Survival to ponding	97.8
1990	419,000	Survival to ponding	91.3 (fry shipped to Whiskey Cr.)
1991	411,000	Survival to ponding	97.8 (fry shipped to Whiskey Cr.)
1992	428,000	Survival to ponding	96.3
1993	401,800	Survival to ponding	97.3
1994	375,250	Survival to ponding	98.5 (fry release included)
1995	311,800	Survival to ponding	96.2
1996	305,000	Survival to ponding	98.2
1997	385,000	Survival to ponding	97.9
1998	314,750	Survival to ponding	94.8
1999	310,000	Survival to ponding	98.2
2000	492,900	Survival to ponding	97.9
2001[a]	448,700	Survival to ponding	58.3
2002[a]	529,500	Survival to ponding	56.0
2003[a]	327,074	Survival to ponding	71.4
2004	335,000	Survival to ponding	97.4
2005	634,824	Survival to ponding	97.7
2006	550,844	Survival to ponding	97.0

Source: ODFW HMS database, Trask Hatchery

[a]Represent years when Hydrogen Peroxide use substantially increased egg mortality.

9.1.2) Cause for and disposition of surplus egg takes.

Green eggs taken are incubated to meet Trask Hatchery stock-34 spring Chinook smolt production goals, Whiskey Creek eyed-egg requests, and STEP requests. Trask Hatchery stock-34 spring Chinook Salmon egg take is managed to compensate for egg-to-smolt mortality and genetic considerations, such as increased family size to promote genetic diversity, etc. Surpluses are a result of egg take beyond eyed-egg needs to represent full run timing. Surplus eggs are identified at the eyed-egg stage and are destroyed. Mortality and culled eggs are all disposed of by freezing and then buried.

9.1.3) Loading densities applied during incubation.

Spring Chinook green-egg size is approximately 71 eggs per ounce. Heath style incubator trays are loaded with approximately 64 ounces of eggs (or 4,544 eggs) per unit. Typically, eggs from different family groups are loaded into several trays and kept separate because of disease concern.

See Cedar Creek Hatchery stock-47 sprinh Chinook HGMP for description of loading densities during incubation at that facility.

Loading densities for STEP classroom incubators varies with the size and setup of equipment being used, but typically ranges from 200 to 1,000 eggs. A standard aquarium recirculating pump supplies water flow. Flow rates have not been calculated, but have been sufficient for the small number of eggs being used.

9.1.4) Incubation conditions.

The water supply to the egg incubators used at Trask Hatchery is monitored for flow and temperature daily. The incubating eggs are held in water that is maintained at 41º to 55º F with an average flow rate of 5.0 gpm per tray. Immersion heaters may be placed in selected incubator tray stacks as needed to maintain the desired temperature. The dissolved oxygen for the influent water ranges between 10 to 11 ppm.

9.1.5) Ponding.

Fry are removed from the incubator trays and placed into clean-up troughs where mortalities are removed and the remaining fish are counted. This generally occurs about 2 to 3 days before fish are 100% buttoned-up. Fish are then moved into Canadian-style deep troughs. Trask Hatchery has built a new 40'x24' early rearing building which houses 8 of the 10 Canadian tanks. Two additional tanks are located in the main hatchery building. Flow rate in the Canadian-style troughs is approximately 10 gpm. Within 2-5 days fish feeding occurs and within 2 to 3 weeks fish are transferred to raceway ponds. The average fry size at ponding is approximately 850 fish per pound.

See the Cedar Creek Hatchery Stock 47 Spring Chinook HGMP for a description of ponding techniques used at that facility.

9.1.6) Fish health maintenance and monitoring.

See Attachment A regarding state approved fish health maintenance protocols.

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.

Not Applicable. This program does not incubate listed fish species.

9.2) Rearing:

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

Table 9-2. Trask Hatchery Stock-34 Spring Chinook Salmon Survival Rates (Fry to Smolt). *Values are* pre-CMP levels.

Year	Percent Survival of Fry to Smolt
1988	56.8*
1989	91.3
1990	66.8
1991	98.9
1992	84.1
1993	72.8
1994	79.5
1995	76.4*
1996	74.3
1997	69.9*
1998	80.8*
1999	85.6
2000	81.0*
2001	97.7
2002	97.7
2003	98.3
2004	96.8
2005	96.8
2006	86.3

* Represents release year smolt survival was effected by fingerling (excess to smolt production needs) releases.

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

Trask Hatchery stock-34 juvenile spring Chinook remain on-station until they reach a size that is suitable for marking (except when eyed eggs are transferred to Cedar Creek Hatchery). All but approximately ~70,000 are moved to Cedar Creek Hatchery (eyed eggs or fingerlings) or Tuffy Creek Pond (fingerlings). Density (rearing space) targets from fry to smolt are not to exceed 1.0 pound of fish per cubic foot of water at any of the facilities. Actual density levels in raceway ponds at Trask Hatchery reach maximum levels 0.61 pounds of fish per cubic foot of water for the fingerlings (April) at transfer time to Trask Pond and Tuffy Creek Pond.

At Tuffy Creek Pond, the maximum density level is at 0.58 pounds of fish per cubic feet water at smolt release time, which is well below the threshold 1.0 pounds per cubic foot of water. Loading level criteria for rearing is 10 pounds of fish per gpm. Maximum pond loading level in Tuffy Creek Pond (smolt release) is 7.5 lbs of fish per gpm.

At Trask Hatchery ponds 1 and 2, the maximum density level is at 0.48 pounds of fish per cubic foot of water at smolt release time, which is well below the 1.0 pounds per cubic foot of water threshold. Maximum pond loading level in Ponds 1 and 2 is 7.4 lbs of fish per gpm.

See Cedar Creek Hatchery stock-47 Spring Chinook HGMP for a description of density and loading criteria.

9.2.3) Fish rearing conditions.

Pond monitoring is done daily at feeding time. While feeding fish, personnel observe for signs of stress, disease, water quality problems, and unusual fish behavior. Pond mortality is picked and recorded daily. During summer, ODFW Fish Health staff monitor fish for external parasites once per month. Water quality at Trask Hatchery is monitored under the prescribed 300J general NPDES permit as required by DEQ (see Section 4).

Trask Hatchery: winter and spring (October through March) water temperatures are usually in the mid-30º to mid-40º range. Summer water temperature typically averages 59º Fahrenheit.

Tuffy Creek Pond: water temperatures during rearing (April to August) range from mid-30º to mid-60º Fahrenheit.

See Cedar Creek Hatchery stock 47 Spring Chinook HGMP for a description of rearing conditions at that site.

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.

Fish size (fish per pound) is sampled regularly; data is reported on HMS Monthly Ponded Fish Reports. Fish feed schedules are programmed based upon fish size data collected. Fork length (millimeters) frequency sampling is done just before smolt release. Table 9-3 shows monthly average weights for the program from ponding to release for 2005 and

2006 broods. Average length frequency percentages at time of release for the 2005 and 2006 broods are presented in Table 9-4.

Table 9-3. Average Monthly Fish Growth Data on Stock-34 Spring Chinook reared at Trask Hatchery facilities, 2005 and 2006 brood years.

Month	Size (fish per pound)	Stage
December	690	Fry
January	330	Fry
February	190	Fry
March	100	Fingerling
April[a]	60	Fingerling
May[a]	30	Fingerling
June[a]	20	Fingerling
July[a]	12	Smolt

Source: HMIS database

[a] Trask Hatchery Stock-34 were reared primarily at Trask Pond and Tuffy Creek facilities in 2005 and 2006. Values represent average for the two facilities. Trask Pond includes fish transferred from Whiskey Creek.

Table 9-4. Trask Hatchery (includes Trask Pond) and Tuffy Creek Spring Chinook Smolts Average Fork Length Frequency at Release, 2005 and 2006 brood years. Trask Pond includes fish transferred from Whiskey Creek.

Fork Length Size Range	Trask River	Tuffy Creek Pond
< 14 cm.	3.1 %	4.7 %
14 – 17 cm.	95.2 %	93.5 %
> 17 cm.	1.7 %	1.8 %

Source: HMIS database

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

Monthly fish growth rate of fry ponded in December shows that spring Chinook will obtain a size of approximately 690 fish per pound by the end of that month. Then from January to June, spring Chinook fingerlings roughly double in weight each month. Growth rate slows and an average weight of 12 fish per pound is achieved by July. Release of full term smolts occurs in early August.

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).

Trask Hatchery stock-34 spring Chinook Salmon juveniles are fed a fish food diet at a rate and frequency that varies with fish size. The fish are typically fed a dry feed, and

most feeding is done by hand. Fry are fed 8-10 times per day. As the fish grow, frequency of feeding is reduced gradually until the fish are being fed only two to three times per day as the time of release approaches. The fish are fed at a programmed rate to control their growth in order to meet the desired size and condition factor at release.

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

Fish health is monitored monthly by Trask Hatchery and ODFW Fish Health staff. Fish Health staff diagnose diseases and prescribe the appropriate treatments to eliminate or control disease. Also, see Attachment A for fish health management protocol.

Tools and equipment used for spring Chinook Salmon spawning are disinfected between family groups using an iodine antiseptic (100ppm). Nets and sampling equipment used for spring Chinook is also disinfected in this manner. Some tools and equipment used for rearing are not routinely disinfected (other than allowing to air dry) because they are kept separate from other fish at the hatchery. For further description, see Attachment A.

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

Weight samples are taken often during early rearing, and regularly during the fingerling stage. Prior to release, length frequencies (see Section 9.2.4) are conducted. A visual examination of mark quality is also taken prior to release.

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

No "natural" rearing methods are used.

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

Not applicable as propagated spring Chinook Salmon is not an ESA listed population; and we anticipate negligible ecological risks to listed natural Coho Salmon from the in-hatchery rearing techniques used in this spring Chinook Salmon program.

SECTION 10

RELEASE

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

10.1) Proposed fish levels.

Table10-1. Proposed Fish Release Levels through Trask Hatchery Stock-34 Spring Chinook Salmon Program. Total release of 400,000 smolts includes a component of 35,000 smolts reared at Whiskey Creek Hatchery (see flow diagram 1).

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs	NA	NA	NA	NA
Unfed Fry[1]	Varies (excess, un-programmed) STEP 2,000 (est.)	900/lb 900/lb (est.)	December December	Standing water bodies Trask River
Fry	Varies (excess, un-programmed)	330-100/lb	Jan.-Mar.	Standing water bodies
Fingerling[2]	Varies (excess, un-programmed)	60-20/lb	April-June	Standing water bodies
Yearling	400,000[3]	12/lb (target)	July/Aug	Trask River

Data source: Hatchery Production Schedules

[1] Releases of unfed fry from classroom incubators vary depending on the annual egg survival. The specified release level is a maximum number, based on the number of eggs provided to the program

[2] This program does not produce fingerlings for release as a program goal for stock 34 spring Chinook. In any given year there may be surplus fingerlings (typically from above average fry and fingerling survival). These will be released to standing water bodies, or destroyed.

[3] Includes 35,000 smolts reared at Whiskey Creek Hatchery (described in a separate HGMP).

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

Stream, river, or watercourse:	Trask River
Release point:	Trask Hatchery; various access points (through 2016 included EF Trask at Trask Pond)
Major watershed:	Trask River Watershed
Basin or region:	Tillamook Bay Basin

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

Table10-2. Trask Hatchery Stock-34 Spring Chinook Salmon Released by life stage from Trask Hatchery and associated rearing sites combined. Release Years 1995 through 2015, most Values shown are pre-CMP levels.

Brood Year	Eggs/ Unfed Fry	Avg Size	Fry[b]	Avg Size	Fingerling[b]	Avg Size	Smolt	Avg Size
1995	58,925	n.a.	0		0		224,004	10.6
1996	91,210	n.a.	13,261	152	0		208,413	11.1
1997	228,116	n.a.	1,968	123	6,965	96.6	244,835	10.6
1998	117,085	n.a.	0		0		214,704	12.8
1999	176,756	n.a.	30,000	160	0		246,583	9.3
2000	217,772	n.a.	12,800	160	0		255,415	10.2
2001	1,296	n.a.	0		0		224,602	9.8
2002	21,198	n.a.	27,218	126	0		257,692	9.8
2003	3,100	n.a.	0		0		263,050	11.6
2004[a]	74,247	n.a.	0		0		231,624	11.7
2005[a]	43,192	n.a.	37,092	191	0		281,237	10.7
2006[a]	19,360	n.a.	0		0		255,498	11.0
2007[a]	110,322	n.a.	0		0		210,794	13.8
2008[a]	14,493	n.a.	21,788	140	0		273,054	13.4
2009[a]	65,943	n.a.	11,052	145	0		271,465	11.6
2010[a]	40,088	n.a.	18,998	100	0		292,462	13.0
2011[a]	40,304	n.a.	78,847	202	0		243,928	12.8
2012[a]	22,245	n.a.	0		0		285,522	13.3
2013[a]	17,382	n.a.	35,073	121	0		293,362	12.0
2014[a]	1,073	n.a.	0		19,553	71.1	377,153	13.0
2015[a]	n.a.	n.a.	0		0		369,584	17.1
Average	**263,094**	**n.a.**	**26,191**	**150**	**13,259**	**76.4**	**263,094**	**12.0**

Data source: ODFW's Hatchery Management System (HMS) database.

[a]Average size calculations and release numbers from 2004-2015 include a component of Whiskey Creek Hatchery Stock-34 spring Chinook that are present in Trask Pond. Details are described in the Whiskey Creek Hatchery Stock-34 Spring Chinook HGMP.

[b]Since 1995, all excess unfed fry, fry, and fingerling releases have been made into standing water bodies.

Table 10-3. Trask Hatchery Stock-34 Spring Chinook STEP Fry Release Summary (Number of Fry Released by Basin). ***Most Values shown are pre-CMP locations and levels. Hatchbox fry are no longer produced as part of this program.***

Brood Year	Kilchis	Wilson	Trask	Tillamook Bay	Nestucca	Totals
1988	24,054	18,475	34,000	0	0	76,529
1989	24,140	20,742	876	0	19,035	64,793
1990	0	15,938	0	0	13,500	29,438
1991	0	0	14,852	0	0	14,852
1992	0	41,617	14,548	0	0	56,165
1993	0	27,349	13,907	0	0	41,256
1994	0	44,274	0	0	0	44,274
1995	0	58,925	0	0	0	58,925
1996	0	76,318	14,892	0	0	91,210
1997	0	128,763	61,476	0	0	190,239
1998	0	43,790	72,910	385	0	117,085
1999	0	115,958	59,998	800	0	176,756
2000	0	28,803	30,009	0	0	58,812
2001	0	0	1,296	0	0	1,296
2002	0	12,928	16,270	0	0	29,198
2003	0	0	3,100	0	0	3,100
2004	0	15,052	30,057	0	0	45,109
2005	0	13,652	29,540	0	0	43,192
2006	0	0	19,360	0	0	19,360
2007	0	0	29,969	0	0	29,969
2008	0	353	14,140	0	0	14,493
2009	0	940	19,442	0	0	20,382
2010	0	432	39,661	0	0	40,093
2011	0	0	39,871	0	0	39,871
2012	0	469	21,344	0	0	21,813
2013	0	483	16,417	0	0	16,900
2014	0	393	451	0	0	844

Data source: ODFW's Hatchery Management System (HMS) database.

Unfed Fry releases generally occur November thru December of the brood year. Occasionally releases may occur into January of the following year.

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

Table 10-4. Hatchery Stock-34 Spring Chinook Salmon Smolt Release Dates, from Trask Hatchery, East Fork Trask Pond and Tuffy Creek Pond. Release Years 1995 through 2015. ***Values shown are mostly pre-CMP locations and levels.***

Release Year	Date Ranges	Trask River Release Totals	Wilson River Rekease Totals
1995	Aug. 9 - 17	143,180	78,892
1996	Aug. 5 - 15	153,792	70,032
1997	Aug. 11 - 20	148,037	60,376
1998	Jul. 30 - Aug. 18	141,588	103,247
1999	Jul. 9 - Aug. 17	150,875	63,829
2000	Aug. 7 - 15	144,799	101,784
2001	Aug. 6 - 13	147,855	107,560
2002	Jul. 30 - Aug. 10	128,858	95,744
2003	Aug. 22 - 31	161,215	96,477
2004	Jul. 26 - Aug. 10	166,346	96,704
2005	Jul. 25 - Aug. 3	162,356	69,268
2006	Jul. 25 - Aug. 7	187,809	93,428
2007	Jul. 17 - 30	153,211	102,287
2008	Jul. 23 - 29	161,622	49,172
2009	Jul. 21 - 28	173,680	99,374
2010	Jul. 21 - 27	190,599	80,866
2011	Jul. 28 - Aug. 1	195,985	96,477
2012	Jul. 23 - 26	173,278	70,650
2013	Jul. 22 - 30	186,195	99,327
2014	Jul. 20 - 30	192,311	101,051
2015	Jun. 18 - Jul.1	377,153	0

Data source: ODFW's Hatchery Management System (HMS) database.

Table 10-5. Trask Hatchery Stock-34 Spring Chinook Unfed Fry & Fry Release Dates and Protocols, 2001-2014. *Values shown are mostly pre-CMP locations and levels.*

Release Year	Date Ranges	Release Totals	Release Location
2001	Mid January	14,696	S Fk Wilson River
	Mid March	2,080	Loren's Pond
	Mid March	10,720	Cape Meares Lake
	Mid December	1,296	Trask River
2002	Early December	16,270	Trask River
	n.a.	12,298	Wilson River
2003	Mid March	27,218	Cape Meares Lake
	Early November	2,000	Gold Creek
	Mid December	1,100	Trask River
2004	Late November	14,686	Wilson River
	Late November	14,334	Gold Creek
	Early December	366	Wilson River
	Early December	15,703	Trask River
	Late December	29,138	Loren's Pond
2005	Mid November	13,272	Wilson River
	Late November	14,785	Trask River
	Late November	14,479	Gold Creek
	Late December	380	Wilson River
2006	Early January	276	Trask River
	Late March	37,092	Cape Meares Lake
	Mid November	40	Trask River
	Early December	19,320	Trask River
2007	Late November	28,947	Trask River
	Late December	362	Trask River
2008	Early January	80,353	Cape Meares lake
	Mid November	353	Wilson River
	Mid November	14,140	Trask River
2009	Early April	21,788	Cape Meares lake
	Early December	19,442	Trask River
	Early December	475	Wilson River
2010	Early January	45,561	Loren's Pond
	Early January	465	Wilson River
	Late March	11,069	Loren's Pond
	Early December	22,535	Gold Creek
	Early December	16,694	Samson Creek

	Mid December	427	Nedonna Pond
2011	Early February	432	Wilson River
	Early April	18,998	Loren's Pond
	Late November	433	Nedonna Pond
	Early December	16,458	Samson Creek
	Early December	23,413	Gold Creek
2012	Late February	57,480	Loren's Pond
	Mid April	21,373	Cape Meares lake
	Late November	469	Wilson River
	Late November	714	Holden Creek
	Late November	16,432	Samson Creek
	Late November	432	Nedonna Pond
	Early December	4,198	Gold Creek
	Mid November	483	Wilson River
	Mid November	482	Nedonna Pond
	Late November	16,417	Samson Creek
2014	Late March	35,073	Loren's Pond
	Mid November	393	Wilson River
	Late November	229	Nedonna Pond
	Mid December	451	Trask River

Data source: ODFW's Hatchery Management System (HMS) database.

10.5) Fish transportation procedures, if applicable.

Spring Chinook Salmon smolts reared at Cedar Creek Hatchery are transported to release sites on the mainstem Trask River. Smolts from Tuffy Creek Pond are transported to Trask Hatchery for acclimation and release or to other release sites on the Trask River. Transportation equipment used for this program is detailed in Section 5.2. The water used to transport fish comes from the facility where fish are being reared; water temperature is not regulated during transportation. The transportation time from Cedar Creek Hatchery to the release sites are approximately 30 minutes, and from Tuffy Creek Pond to release sites are approximately 45-60 minutes (times include loading time).

STEP fry from classroom programs usually released from early December to early January, dependent on incubation water temperatures.

10.6) Acclimation procedures.

Off-site acclimation other than facilities already listed are not currently used in this program but may be implemented as needed to enhance fishery performance and to meet pHOS targets identified in the Coastal Multi-Species Conservation and Management Plan.

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

Spring Chinook Salmon smolts are mass marked (100%) with an adipose (AD) fin-clip prior to release. Approximately 30,000 fish are currently marked with a Coded Wire Tag (CWT) in addition to the adipose fin-clip (AD+CWT). Additional CWT groups or alternative fin-clips may be used if needed to evaluate rearing of stock-34 spring Chinook at Cedar Creek Hatchery.

Fin-clip quality is checked on all groups immediately after fin-clipping. A final check of fin-clip quality is done as close to the release date (prior) as possible. STEP fry from classroom incubators are unmarked.

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

Releases have been within programmed and approved levels.

10.9) Fish health certification procedures applied pre-release.

All smolts are inspected by ODFW Fish Health staff prior to release or transfer from the Trask River Hatchery or satellite facilities. Also, see Attachment A.

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

Hatchery personnel are generally present at Trask Hatchery and Cedar Creek Hatchery twenty-four hours per day during periods when fish are present. Water supplies for these facilities are connected to a central alarm system that notifies staff in the event of operational failure. At the Tuffy Creek facility, Oregon Department of Corrections staff (and inmate workers) are available 24 hours per day, 7 days per week to respond to operational failures. The rearing pond at Tuffy Creek has a float-activated switch tied into the central alarm system. An audible alarm system allows instantaneous notice of a system failure. The water supply from the South Fork Wilson River is gravity flow, so pumps are not needed. In the event of water supply failure or other emergency situation at any of the facilities, the following procedure will be used:

- The hatchery crew(s) or Department of Corrections staff (Tuffy Creek facility) will exhaust all possibilities for retaining the fish or transporting them to another facility.
- The hatchery crew(s) or Department of Corrections staff (Tuffy Creek facility) will consult with the ODFW District Biologist.
- If emergency fish release is deemed necessary, the fish will be released directly into the East Fork Trask River (Trask Pond facility), South Fork Wilson River (Tuffy Creek facility), or mainstem Trask River (Trask Hatchery) or into a closed water body dependent on time of year, lifestage of the fish, and availability of transport equipment. Release of Tuffy Creek fish into the South Fork Wilson River or of Cedar Creek Hatchery reared fish into Three Rivers (Nestucca basin) will occur only as a last resort and as a means of avoiding catastrophic mortality.

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.

- Spring Chinook Salmon smolts are normally released in late summer. Given the life history characteristics, smolt migration rates, and preference for estuary rearing of spring Chinook, any adverse genetic or ecological impacts to coho are anticipated to be minimal.
- All smolts are released at sites that should minimize competition with Coho Salmon rearing in cool-water tributaries.

These two release strategies minimize potential interactions and adverse ecological effects that may occur between hatchery spring Chinook and juvenile Coho Salmon.

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.

Information on Tillamook Bay basins wild and hatchery spring Chinook Salmon spawner abundance, spawn timing, and proportion of hatchery strays will be obtained from the District's monitoring program, as well as *The Oregon Plan for Salmon and Watersheds (OPSW)* monitoring project: Coastal Salmonid Inventory project (Jacobs, et. al. 2000). Information will also be collected through monitoring programs associated with the Coastal Multi-Species Conservation and Management Plan. These activities will directly measure performance standards and indicators previously described in Sections 1.9 and 1.10. Information on the catch of spring Chinook Salmon is compiled from returned salmon/steelhead tags and is available from Fish Division in the Salem office of ODFW. Specific economic data for sport caught fish is not routinely developed for all stocks. Economic data that is compiled is available in the Salem Headquarters. Salmon and steelhead population health goals are currently being addressed through *Oregon Plan for Salmon and Watersheds* activities and through the development of conservation plans under the ODFW Native Fish Conservation Policy. New performance standards (and subsequent M&E) may be prescribed in the future as these population health goals are established. Monitoring of naturally spawning salmon and steelhead has increased coast-wide in recent years. Additional information regarding the number of naturally spawning spring Chinook of hatchery origin may become available in the future.

Monitoring of in-hatchery performance and adult returns at Trask Hatchery will be conducted by the hatchery crew. This information is stored on the ODFW mainframe computer in the Hatchery Management System (HMS) database. This will include at least the following information:

Adults

- The number of females, males, and jacks collected at Trask Hatchery, (Standard 2.1; 3.3).
- Number of unmarked winter steelhead, unmarked Coho Salmon, fall Chinook Salmon, Chum Salmon, and Cutthroat Trout handled and released from Trask Hatchery, (Standard 4.5).
- Any observed mortalities of unmarked winter steelhead, unmarked Coho Salmon, fall Chinook Salmon, Chum Salmon, and Cutthroat Trout handled and released from Trask Hatchery, (Standard 4.5).
- Date of entry into the Trask Hatchery traps (or collected by seining), specified by hatchery and naturally produced fish, (Standard 2.1; 4.5).

- Date of entry into the Trask Hatchery traps (or collected by seining) for fish retained for broodstock, (Standard 2.1).
- Dates of spawning at Trask Hatchery, (Standard 2.1).
- The number of males, jacks and females spawned, (Standard 3.3).
- Fecundity of females spawned, (Standard 2.1).
- Disposition (spawned, sold, stream enrichment, etc.) of all spring Chinook collected, (Standard 4.4).
- Proportion of hatchery spring Chinook on spawning grounds (Standard 3.1)
- Relative abundance of hatchery and wild spring Chinook on the spawning grounds (Standard 3.1)

Juvenile Rearing

- Monthly number of eggs/fish on hand, mortality, feeding rate, and growth, (Standard 4.1).
- Results of fish health checks and any incidence of disease occurrence, (Standard 4.1).
- Results of water quality sampling, (Standard 4.2).

Release

- Number of fish released, by mark type, (Standard 1.2, 2.2).
- Fish age and size at release; average weight, and length frequency distribution, (Standard 2.3).
- Location of releases, (Standard 2.2; 2.3).
- Date releases started and ended, (Standard 2.2).

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

Funding and staffing are available as part of normal hatchery operation for those activities associated with hatchery operations.

However, as with all state and federal programs, budgets are approved by the Legislature, and no commitment of funds can be made past the approved budget period. Funds for various projects associated with this HGMP come from (or could come from) a variety of sources, possibly including license dollars, state general funds, and federal funding sources. Funds are committed for certain activities; but can change with relatively short notice. This could result in elimination or reduction in the hatchery program and associated monitoring and evaluation activities.

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.

Neither the in-hatchery monitoring program nor other monitoring activities (i.e. life cycle monitoring, coastal salmonid inventories) is expected to increase risks to naturally produced fish above those imposed by operation of the program. Thus, risk aversion measures for the monitoring program are the same as those discussed under prior sections of this document.

SECTION 12
RESEARCH

There are no research programs conducted in direct association with the Trask Hatchery Spring Chinook Salmon program described in this HGMP. Therefore, the answer to all questions in Section 12 is not applicable.

SECTION 13
ATTACHMENTS AND CITATIONS

Citations:

Federal Register Notice. 1998. Endangered and Threatened Species: Proposed endangered status for two Chinook salmon ESUs and proposed threatened status for five Chinook salmon ESUs; Proposed redefinition, threatened status, and revision of critical habitat for one Chinook salmon ESU; Proposed designation of Chinook salmon critical habitat in California, Oregon, Washington, Idaho. Vol. 63, No 45, pp 11482-11520.

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Lewis, M.A. 2000. Stock assessment of anadromous salmonids, 1999. Oregon Department of Fish and Wildlife, Oregon Plan for Salmon and Watersheds, Annual Progress Report number OPSW-ODFW-2000-4, Portland.

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SECTION 14

CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

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

Name and Title of Applicant: Chris Knutsen, North Coast Watershed District Manager, ODFW

Signature: _____Date:_____

Certified by: Scott Patterson, Fish Propagation Program Manager, ODFW, HQs, Salem

Signature: _____Date:_____

ATTACHMENT A

Table A-1. Hatchery Programs Stock Code and Species Five-Year Disease History (1999 to Present) by Fish Stock at Trask Hatchery, East Fork Trask Pond, and Tuffy Creek Pond.

Disease or Organism	34 Coho[b]	34 CHF[b]	34 CHW[b]	34 CHS[b]	121 StW[b]	34 CHS[c]	34 CHS[d]	121 StW[d]	47 StW[d]
IHN Virus	No	No	No	No	No	No	No	No	No
EIBS Virus	Yes	No	No	No	No	No	No	No	No
Coho Anemia Disease	Yes	No	No	No	No	No	No	No	No
Aeromonas salmonicida	No	No	No	No	Yes	No	No	No	No
Aeromonas/Pseudomonas	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Flavobacterium psychrophilum	Yes	Yes	Yes	No	Yes	No	No	No	No
Fl. columnare	No	No	No	No	No	No	No	No	No
Fl. branchiophilum	No	No	No	No	No	Yes	No	No	No
Fusiform gill disease bacterium	No	No	No	No	No	No	No	No	No
Renibacterium. salmoninarum	Yes	Yes	No	Yes	No	Yes	Yes	No	No
Yersinia ruckeri	No	No	No	No	No	No	No	No	No
Carnobacterium sp.	No	No	No	No	Yes	No	No	No	No
Ichthyobodo	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
Gyrodactylus	No	No	No	No	Yes	No	No	Yes	Yes
Ichthyophthirius multifilis	No	Yes	No	Yes	No	Yes	Yes	No	No
Gill Ameba	Yes	No	No	No	No	Yes	No	No	No
Trichodinids	Yes	Yes	Yes	No	Yes	No	No	No	Yes
Loma sp	Yes	No	No	No	No	No	No	No	No
Nanophyetus salmincola	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coagulated Yolk Disease	Yes	Yes	Yes	Yes	Yes	No	No	No	No
External Fungi.	Yes	Yes	No	Yes	Yes	Yes	No	No	No
Internal Fungi	Yes	No	No	Yes	No	No	No	No	No
Unidentified Trematode Cysts	No	No	No	Yes	No	No	No	No	No

[a] "Yes" indicates detection of the pathogen but in many cases no disease or fish loss was associated with presence of the pathogen. "No" indicates the pathogen has not been detected in that stock.

[b] Stocks held at Trask Hatchery.

[c] Stocks held at East Fork Trask Pond.

[d] Stocks held at Tuffy Creek Pond:

CHF = Fall Chinook Salmon

CHW= Winter Chinook Salmon

CHS= Spring Chinook Salmon

STW = Winter Steelhead

Co=Coho Salmon Trout

Stock 34 =Trask River

Stock 121W = Wilson River

Stock 047= Nestucca River

The fish health monitoring plan is identical to that developed by the Integrated Hatchery Operations Team for the Columbia Basin anadromous salmonid hatcheries. (See Policies and Procedures for the Columbia Basin Anadromous Salmonid Hatcheries, Annual Report 1994. Bonneville Power Administration.)

- All fish health monitoring will be conducted by a qualified fish health specialist.
- Annually examine broodstock for the presence of viral reportable pathogens. Number of individuals examined, usually 60 fish, will be great enough to assure a 95% chance of detection of a pathogen present in the population at the 5% level. American Fisheries Society "Fish Health Blue Book" procedures will be followed.
- Annually screen each salmon broodstock for the presence of *R. salmoninarum* (*R.s*). Methodology and effort will be at the discretion of the fish health specialist.
- Conduct examinations of juvenile fish at least monthly and more often as necessary. A representative sample of healthy and moribund fish from each lot of fish will be examined. The number of fish examined will be at the discretion of the fish health specialist.
- Investigate abnormal levels of fish loss when they occur.
- Determine fish health status prior to release or transfer to another facility. The exam may occur during the regular monthly monitoring visit; i.e., within 1 month of release.
- Appropriate actions including drug or chemical treatments will be recommended as necessary. If a bacterial pathogen requires treatment with antibiotics a drug sensitivity profile will be generated when possible.
- Findings and results of fish health monitoring will be recorded on a standard fish health reporting form and maintained in a fish health database.
- Fish culture practices will be reviewed as necessary with facility personnel. Where and when pertinent, nutrition, water flow and chemistry, loading and density indices, handling, disinfecting procedures, and treatments will be discussed.

Disease Treatment

Treatments for disease at Trask Hatchery include: green eggs are routinely water hardened in diluted buffered iodophor; formalin flush treatments of 1:600 formalin for 15 minutes given 3 to 7 times per week for fungi prevention on eggs. Juvenile fish are treated with formalin or hydrogen peroxide. Depending on species of fish, parasite treating and water temperature, hydrogen peroxide is used at 1:3500 for 1 hour, or formalin is used at 1:15,000 to 1:6,000 for 1 hour for 3 to 5 consecutive days. Winter steelhead fry may be given salt and acetic acid dip treatments to control *ichthyobodo* infestations. Juvenile fish are treated for bacterial infections with oxytetracycline or Romet medicated feed according to label or under an Investigational New Animal Drug Permit (INAD). Adult Wilson River steelhead are given oxytetracycline injections under a veterinary prescription to prevent furunculosis and 1:6,000 formalin treatments for 3 to 7 days per week to prevent external fungi infections. At East Fork Trask Pond, the spring Chinook juveniles are given potassium permanganate1-hour baths at 1.0 ppm treatment on the first day and 1.25 ppm treatment on days 2 and 3 to control bacterial gill disease. Fingerlings held at the Tuffy Creek facility are treated with hydrogen peroxide at 1:3500 flow for one hour to control costia and trichodina.