

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Trask Hatchery Winter Steelhead Program
Species or Hatchery Stock:	Winter Steelhead <i>Oncorhynchus mykiss</i> Stock-47
Agency/Operator:	Oregon Department of Fish and Wildlife
Watershed and Region:	North Coast Watershed District, West Region
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SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Trask Hatchery Winter Steelhead Program (stock-47).

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

Winter steelhead *Oncorhynchus mykiss* (stock-47). Naturally-produced winter steelhead in the Wilson River are part of the Oregon Coast Steelhead Evolutionary Significant Unit (ESU), which was designated as a species of concern under the Federal Endangered Species Act (ESA) on April 15th, 2004 (Federal Register Notice 2004). These fish are also a sensitive species under Oregon's Sensitive Species Rule (OAR 635-100-0040).

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 full-time employees.
- Funding for this program is currently a mix of several sources.
- The annual budget for the stock 47 winter steelhead program is presented in Table 1-1.

Table 1-1. Trask Hatchery Stock-47 Winter Steelhead Program Annual Budget.

Year	Total Budget	Stock-47 Steelhead Budget	Percent of Total	Steelhead Smolts
2005	\$255,245	\$35,734	14.0%	34,473
2006	\$256,914	\$54,466	21.2%	80,378
2007	\$287,599	\$46,016	16.0%	70,237
2015 (est)	\$370,421	\$33,428	9.0%	40,000

Source: ODFW (2004)

Note: 2003 was the first year of stock 47 winter steelhead program at Tuffy Creek (Trask Hatchery satellite facility)

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

Trask Hatchery is located 8 miles east of Tillamook, adjacent to Trask River (ODFW waterbody code 0100130000) 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 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 at RM 0.5. The South Fork Trask River is a tributary of the mainstem Trask River at about RM 19. 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 correctional facility. It is located 30 miles northeast of Tillamook, adjacent to the South Fork Wilson River (ODFW waterbody code 0100125000) at about RM 1.5. The South Fork Wilson River is a tributary of the mainstem Wilson River (ODFW waterbody code 0100120000) at approximately RM 33. Rearing of stock-47 winter steelhead under this program currently occurs at the Tuffy Creek facility.

Adult collection facilities: Adult broodstock collection is covered under the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP. Returning adults of winter steelhead (stock-47) are also collected at the Tuffy Creek trap (South Fork Wilson River), and strays are collected in the Trask River at the Trask Hatchery trap. Adult winter steelhead (stock-47) collected at traps on the Wilson and Trask rivers are typically recycled into the Wilson River, transported to standing waters to provide fishing opportunities, are donated to food programs, or are used in the stream enrichment program. However, if necessary, stock-47 winter steelhead adults may be retained for broodstock.

Spawning, egg incubation, rearing facilities: Spawning, egg incubation, and rearing to fingerling size of winter steelhead (stock-47) occur at Cedar Creek Hatchery. These phases are addressed in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP. The Tuffy Creek facility is equipped with an egg incubation building. Spawning, incubation, and early rearing could be accomplished on site if necessary.

Fingerlings are transferred from Cedar Creek Hatchery to Trask River Hatchery facilities (Tuffy Creek) for final rearing and release at smolt size. Approximately 45,000 stock-47 juveniles are transferred to the rearing pond at the Tuffy Creek facility after being fin-

marked at Cedar Creek Hatchery for an eventual 40,000 smolts release in the Wilson River.

1.6) Type of program.

Harvest Augmentation – To provide sport harvest opportunities by releasing artificially propagated steelhead smolts (IMST 2001).

1.7) Purpose (Goal) of program.

The purpose of this program is to release winter steelhead smolts (stock-47) in the Wilson River basin with a goal to provide adult fish for freshwater harvest.

Note: This program previously produced smolts for release in the Kilchis River. Beginning with the 2014 brood year (2015 releases), those releases are being discontinued. In addition, pending further evaluation and public input, this program may be altered or discontinued and the equivalent number of smolt production may be transitioned to the Trask Hatchery stock-121W winter steelhead hatchery program.

1.8) Justification for the program.

The fishery in the Wilson river basin is managed conservatively to reduce impacts to the naturally-produced winter steelhead population. Retention of sport caught steelhead in the Wilson River is restricted to adipose fin-clipped hatchery fish. Therefore, this program is designed to support a recreational consumptive fishery in the Wilson River.

The hatchery program produces full-term smolts for release into the Wilson River. Releases of winter steelhead into the Wilson basin are currently a mix of stock-47 and stock-121W Wilson River wild broodstock (*see* Trask Hatchery Stock 121W HGMP for details of that program), although future release may be transitioned to use more 121W stock. Returns of adult Trask Hatchery stock-47 winter steelhead peak earlier in the season than the stock-121W (wild broodstock) winter steelhead. This separation in run timing between the two stocks expands the period of recreational opportunity.

This program releases yearling smolts to encourage rapid migration to the ocean. This strategy is intended to minimize residualism and ecological interactions with wild juvenile steelhead and other salmonids. Standard fish health inspections are done for both adult and juvenile steelhead in this program to minimize potential disease concerns. The hatchery-reared steelhead are mass marked (100% marked) for easy identification of hatchery fish throughout their life cycle. The basin where this program releases hatchery steelhead is managed for selective harvest of marked (hatchery) steelhead adults, and requires that all unmarked steelhead caught must be released unharmed. These rivers (above tidewater) are closed to Coho Salmon angling and all unmarked (wild) Coho Salmon caught must be released unharmed.

A small number of unfed fry (up to approximately 2,000) are also released from STEP classroom incubator education programs using stock-47 winter steelhead from Cedar Creek Hatchery, which has been described in the Cedar Creek Hatchery Stocks 47 and 47W HGMP. Small numbers and release locations isolated from primary wild production areas are assumed to minimize impacts to any native species in the respective basins.

1.9 and 1.10) List of program “Performance Standards” and “Performance Indicators designated by “benefits” and “risks”.

Indicator 1: Harvest

Standard 1.1: Provide adult hatchery steelhead for harvest. **(Benefit)**

Indicator: Number of hatchery winter steelhead (stock-47) caught, and number of angler days generated associated with this program. **(Benefit)**

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

Standard 1.2: All hatchery juvenile steelhead 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)**

Indicator 2: Life History Characteristics

Standard 2.1: Winter steelhead broodstock (stock-47) will be collected in a manner that approximates the distribution in timing, age, & size of hatchery fish returning to Cedar Creek Hatchery during the early portion of the run. **(Benefit)**

(This standard and performance indicators are addressed in the Cedar Creek Hatchery 47 and 47W Stock HGMP).

Standard 2.2: Releases of stock-47 winter steelhead smolts into the Wilson River will minimize impacts to naturally produced salmonids through control of hatchery releases to reduce spatial and temporal overlap with natural populations.. **(Risk)**

Indicator: Number of stock-47 winter steelhead released. **(Risk)**

Indicator: Dates of stock-47 winter steelhead releases. **(Risk)**

Indicator: Location of stock-47 winter steelhead released. **(Risk)**

Standard 2.3: All Trask Hatchery stock-47 winter steelhead smolts will be released into the Wilson River as yearlings. **(Risk)**

Indicator: Beginning and ending dates of Trask Hatchery stock-47 winter steelhead smolt releases. **(Risk)**

Indicator: Size and length frequency of Trask Hatchery stock-47 winter steelhead smolts released. **(Risk)**

Standard 2.4: Trask Hatchery stock-47 winter steelhead in excess of production needs will be released during times and at locations that reduce impacts to naturally rearing steelhead and Coho Salmon. Any stock-47 fingerlings in excess of needs for smolt production may be released into standing water bodies; or they may be destroyed. **(Benefit)**

Indicator: Location, number, and timing of Trask Hatchery stock-47 winter steelhead fingerling releases. **(Benefit)**

Indicator 3: Genetic Characteristics

Standard 3.1: The portion of naturally spawning hatchery winter steelhead (pHOS) in the Tillamook Bay basin will be consistent with the goals specified in ODFW's Coastal Multi-Species Conservation and Management Plan. **(Benefit)**

Indicator: Estimated abundance of naturally spawning winter steelhead in the Tillamook Bay basin. **(Benefit)**

Indicator: Estimated abundance of naturally spawning winter steelhead in the Wilson River that are of hatchery origin based on marks or tags. **(Benefit)**

Standard 3.2: Only stock-47 winter steelhead adults will be used for the Trask Hatchery stock 47 winter steelhead program component. **(Benefit)**

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

Indicator: Fin clips, if any, on fish collected for broodstock. **(Benefit)**

(This standard and performance indicators are further addressed in the Cedar Creek Hatchery 47 and 47W Stock HGMP).

Standard 3.3: Stock-47 hatchery winter steelhead broodstock will be spawned following appropriate mating and spawning protocols. **(Benefit)**

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

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

(This standard and performance indicators are further addressed in the Cedar Creek Hatchery Stocks 47 and 47W HGMP).

Indicator 4: Operation of Artificial Production Program

Standard 4.1: The Trask Hatchery stock 47 winter steelhead 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: Rearing survival rates of smolts transferred from Cedar Creek Hatchery. **(Benefit)**

Indicator: Number of juveniles sampled and pathogens observed immediately prior to release and only certified fish will be released. **(Benefit)**

Indicator: Target size for hatchery produced smolts is 6 fish per pound to improve survival rates. **(Benefit)**

Standard 4.2: Trask Hatchery and satellite facility effluent will comply with the conditions and water quality limitations identified in the current NPDES permit. **(Benefit)**

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

Indicator: Any parameters exceeding permit limits. **(Risk)**

Standard 4.3: Trask Hatchery and satellite facility water withdrawals will gain compliance with NOAA juvenile screening criteria. **(Benefit)**

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

Standard 4.4: Trask Hatchery stock-47 adult winter steelhead trapped at Trask Hatchery or satellite facilities may be used for carcass placements in the stream nutrient enrichment program. This program is operated under ODFW approved guidelines (or as permitted by DEQ). **(Benefit)**

Indicator: Number and location of steelhead carcasses distributed. **(Benefit)**

Standard 4.5: Wild steelhead and coho that enter the Trask Hatchery adult trap, or any off station trap facility, are handled and released in a manner that minimizes stress, injury, mortality, and delay in migration. **(Risk)**

Indicator: Number of unmarked adult steelhead and Coho Salmon collected and released alive in the Trask River, or at any satellite facility and associated waterbody. **(Risk)**

Indicator: Number of unmarked adult steelhead and Coho Salmon mortalities at Trask Hatchery during operation of the hatchery adult trap, or at any satellite facility. **(Risk)**

Indicator: Recorded dates of trap(s) operation and frequency of handling trapped steelhead and Coho Salmon. **(Benefit)**

Standard 4.6: Releases of Trask Hatchery stock-47 winter steelhead smolts will limit predation impacts to naturally produced salmonids through control of hatchery release numbers and timing to reduce spatial and temporal overlap with wild salmonid juveniles. **(Risk)**

Indicator: Location, dates, and sizes of Trask Hatchery stock-47 winter steelhead releases. **(Risk)**

Indicator 5: Socio-Economic Effectiveness

Standard 5.1: Estimated harvest benefits will equal or exceed hatchery production costs for Trask Hatchery stock-47 winter steelhead, based on the benefit-cost model in ODFW (1999), or an updated version of that model. **(Benefit)**

Indicator: Annual budget expenditures and estimated harvest benefits. **(Benefit)**

1.11) Expected size of program.

The Trask Hatchery stock-47 winter steelhead program goal is to produce 40,000 smolts for release in the Wilson River.

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

Broodstock collection level for this program is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

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

Annual fish release levels for stock-47 winter steelhead are presented in Table 1-2. Although information is presented to describe the entire stock-47 winter steelhead

program, Trask Hatchery only releases yearling smolts. Other life stages presented are reared at, and released from, Cedar Creek Hatchery. Refer to the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP for details on that portion of the program.

Table 1-2. Proposed Annual Fish Release Levels for stock-47 Winter Steelhead¹

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry ²	Standing waters; locations vary	Surplus; Varies annually.
STEP – unfed fry ³	Wilson and Nestucca Rivers	≤2,000 –STEP classroom incubators
Fry	NA	NA
Fingerling ²	Standing waters; locations vary	Surplus; Varies annually
Yearling smolts	Wilson River	40,000 ⁴

Data source: District Files

¹ This table summarizes annual release levels for all stock-47 winter steelhead propagated at Cedar Creek Hatchery and Trask Hatchery facilities. Detailed information for activities undertaken at Cedar Creek Hatchery and releases in the Nestucca Basin can be found in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

² This program does not produce unfed fry or fingerlings for release as a program goal for stock-47. In any given year there may be surplus unfed fry at the time of ponding (typically resulting from below average egg and swim-up mortality); surplus stock-47 will be released in standing water bodies. Surplus fry/fingerlings would be from Cedar Creek Hatchery, prior to transfer to Trask Hatchery; refer to the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP for details.

³ Unfed fry from classroom incubators varies yearly depending on the number of schools and classrooms that may choose to become involved. As such, it is hard to predict a “proposed” release level, however in the last 5 years the number is < 2,000 total, only stock-47 is used in STEP programs. Release sites are normally in systems close to schools where hatchery steelhead are already released in the system. In many areas, these sites are low in the system, often near the head of tidewater. Stock-47 STEP fry would be from Cedar Creek Hatchery; refer to the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP for details.

⁴ These fish are incubated and initially reared at Cedar Creek. After marking they are transferred to Trask Hatchery (Tuffy Creek facility) for continued rearing and release at smolt size. Release details for these allotments are the focus of this 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.

Table 1-3 provides an estimate of adult winter steelhead production for the Tillamook Basin winter steelhead hatchery program. This reflects program performance in relation to production of fish for harvest. The estimated number of adult hatchery winter steelhead produced was derived from a variety of sources as described below. These data sources do not provide a means to estimate the performance of each stock (47 vs. 121W) separately. Therefore, results are for the two stocks combined across all the releases sites within the Tillamook Basin. These programs include the Wilson River stock-121W winter steelhead program, as well as the now modified Nestucca stock-47 winter steelhead program (replaced with the Trask Hatchery stock-47 program in 2003).

Because the Trask Hatchery stock-47 winter steelhead program did not begin until 2003 (2002 brood), punch card data are not yet available to estimate their contribution to combined smolt-to-adult survival rates. The Wilson River stock-121W winter steelhead HGMP covers all components of that program.

The “Freshwater Sport” column is based on punch card estimates of catch in the Tillamook Bay Basin. For the 1988-89 through 1991-92 run years total estimated catch was adjusted for hatchery/wild and age composition based on scale samples from the fishery. The 1992-93 to 2000-03 run years are hatchery fish only fisheries, with age composition based on an average of the 1983-84 to 1991-92 fishery scale data. Punch card data is only available through calendar year 2003. The “Hatchery Return” column is the actual count of adult winter steelhead returns at Trask Hatchery or its satellite facilities, with the adult age composition based on an average of the 1983-84 to 1991-92 fishery scale data. While steelhead spawning ground surveys have estimated the proportion of hatchery versus naturally-produced fish, estimates are not available of the total number of hatchery winter steelhead that strayed to natural spawning areas in the basin. Smolt to adult survival is calculated as the sum of the prior three columns divided by the “Smolt Release” column.

Table 1-3. Estimated minimum number of adult winter steelhead produced by winter steelhead stocks 47 and 121W smolt releases in the Tillamook Basin & tributaries (Combined), 1986 to 2000 brood years.

Brood Year	Tillamook Basin Smolt Releases ^c		2-Salt Return Year	Estimated Adult Hatchery STW (2-salt + 3-salt)			
	Nestucca Stock 047	Wilson R. Stock 121W		Freshwater Sport ^a	Hatchery Return ^b	Spawning grounds	Smolt to Adult Survival
1986	309,559	n.a.	1988-89	4,009	n.a.	n.a.	1.30%
1987	200,481	n.a.	1989-90	3,823	n.a.	n.a.	1.91%
1988	208,687	n.a.	1990-91	2,639	n.a.	n.a.	1.26%
1989	205,192	n.a.	1991-92	2,993	n.a.	n.a.	1.46%
1990	214,155	n.a.	1992-93	2,791	n.a.	n.a.	1.30%
1991	196,688	n.a.	1993-94	1,739	n.a.	n.a.	0.88%
1992	195,037	n.a.	1994-95	1,193	n.a.	n.a.	0.61%
1993	194,931	n.a.	1995-96	1,166	n.a.	n.a.	0.60%
1994	140,713	n.a.	1996-97	1,309	31	n.a.	0.95%
1995	146,556	n.a.	1997-98	919	182	n.a.	0.75%
1996	128,721	n.a.	1998-99	1,608	399	n.a.	1.56%
1997	111,114	41,739	1999-00	2,288	143	n.a.	1.59%
1998	106,778	20,505	2000-01	2,146	118	n.a.	1.78%
1999	110,148	50,254	2001-02	3,826	386	n.a.	2.63%
2000	137,519	34,070	2002-03	2,383	235	n.a.	1.53%
Avg.	173,752	36,642		2,322	214	n.a.	1.34%

Source: ODFW catch cards and HMS database

^a Tillamook Basin catch, based on punch card returns. The 1988-89 through 1991-92 run years hatchery/wild and age composition based on scale samples. The 1992-93 to 2002-03 run years are hatchery fish only fisheries with age composition based on an average of the 1983-84 to 1991-92 scale data.

^b A limited number of hatchery STW adults are recovered at the Trask Hatchery, and South Fork Wilson (Tuffy Creek) traps. Since 2006, ODFW has operated a Life Cycle Monitoring project in the East Fork Trask River. A few hatchery stock 47 winter steelhead adults have been captured at that trap site. However, there are no winter steelhead smolts released in the Trask River.

^c The Trask Hatchery stock-47 did not begin until 2003 when smolts were first transferred from Cedar Creek Hatchery to the Trask Hatchery satellite facility at Tuffy Creek; therefore, this table does not present the contribution of the Trask Hatchery stock-47 winter steelhead program to survival estimates.

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

The Trask Hatchery stock-47 winter steelhead program began in 2003 (2002 brood), the first year that stock-47 winter steelhead fingerlings were transferred to the Trask Hatchery satellite facility at Tuffy Creek. For the previous 32 years, stock-47 winter steelhead were reared to smolt size at Cedar Creek Hatchery before being released into the Tillamook basin. Releases into the Kilchis River were discontinued after the 2013 brood year.

1.14) Expected duration of program.

The Trask Hatchery stock-47 winter steelhead program is ongoing.

1.15) Watersheds targeted by program.

- Wilson River, a tributary to Tillamook Bay
- South Fork Wilson River, a tributary to the Wilson River

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.

- *Use of a long-term out-of-basin origin stock (stock-47) versus a local wild broodstock (such as stock-121W for the Wilson River) for hatchery propagation use:* ODFW's Fish Hatchery Management Policy (FHMP) allows for use of either type of stock based on the stock that best meets fishery objectives, and is consistent with conservation objectives where risk to naturally-produced native fish and their watersheds is within acceptable and clearly defined limits.
- *Wild stock health and its ability to support a consumptive fishery, and potential elimination of hatchery program(s):* The issue is regarding the naturally produced stocks population level and its ability to support a consumptive fishery; and the need, or desire, to provide hatchery fish to supplement a consumptive fishery.

1.16.2) Release strategies: Options range from all direct stream release(s) to a single tributary release (with or without a recapture facility). Historically releases consisted of a portion of the total Wilson River releases being acclimated at a lower river location, and the remaining directly released in stream at multiple locations. Currently, a portion of the Wilson River releases are acclimated at a lower river site with the remaining direct released at multiple lower river sites and a single upriver tributary location with a recapture facility to reduce straying.

1.16.3) 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: Revert program back to 100% production with a long term, out-of-basin stock (stock-47) in the Wilson River.

Descriptions and Implications- Historically the winter steelhead program in Tillamook Bay streams operated in this manner. Beginning in 1998, stock-121W winter steelhead

smolts were released into the Wilson River (Note: Details of the stock-121W program are provided in the Trask Hatchery 121W Winter Steelhead HGMP). As a result, production numbers of stock-47 winter steelhead into the Wilson River declined from 120K annually to approximately 40K annually. This alternative would continue to provide a consumptive winter steelhead fishery, with a hatchery stock that is readily available and easily reared in the hatchery environment. The truncated run timing of this stock (primarily Dec.-Jan.) provides only a narrow window of angling opportunity during often marginal angling conditions, but does maintain some temporal separation from naturally spawning steelhead. Biological concerns over use of an out of basin hatchery stock are not addressed. This option eliminates the need for separate external marks for individual stock identification. Stock-121W winter steelhead are very popular; elimination of that program would likely upset a substantial number of anglers, particularly those that volunteer their time to assist with broodstock collection.

Alternative 2: Convert to 100% smolt release from a broodstock originating from naturally produced local stock in the Wilson (existing Stock-121W Program)

Descriptions and Implications- This alternative would eliminate the stock-47 program in the respective basins, and would replace the production with a locally adapted stock. This option would maintain a consumptive recreational fishery in these basins. There would likely be a shift in fishery timing from Dec-Jan to the Jan-Apr period. This could increase overlap of hatchery and natural steelhead in spawning area, although hatchery fish would be derived from a local (wild) origin. Harvest benefits may increase as fish are exposed to the fishery over a longer period. Broodstock is readily available, but may require alternative collection methods (angling, netting). Removal of some adults from the wild population would be necessary, and protracted spawn timing creates complexity in hatchery rearing.

Alternative 3: Maintain current program with releases consisting a mix of each stock (47 and 121W) in the Wilson River.

Descriptions and Implications- This alternative would retain the current program. Harvest opportunity is maximized by providing hatchery fish over a larger window (Dec-Apr) in the Wilson River. Existing hatchery operational and rearing procedures are retained. Biological concerns over the use of an out of basin hatchery stock are not addressed. Differential marking for stock identification is still required. Requires removal of wild adults for the hatchery program. Maintains temporal separation of stock-47 adults from naturally produced steelhead on the spawning grounds, while overlap of the locally adapted hatchery stock (121W) still occurs.

Alternative 4: Eliminate hatchery steelhead propagation program.

Descriptions and Implications- This alternative would eliminate the hatchery winter steelhead programs in the Wilson River. This would eliminate consumptive harvest opportunities for hatchery winter steelhead in these systems. Conservative management of natural steelhead populations requires release of unmarked fish. It is unknown if the natural populations could support a limited harvest. Angler pressure may shift to other locations. Biological concerns of hatchery steelhead are eliminated. Hatchery operation costs are reduced, and may be re-directed to other programs.

Alternative 5: Eliminate stock-47 releases in the Kilchis River and maintain a mix of stocks 47 and 121W in the Wilson River. Note: This option was implemented as part of the Coastal Multi Species Conservation and Management Plan adopted by ODFW in 2014. The last release of hatchery steelhead smolts was in the spring of 2014 (2013 BY)

Descriptions and Implications- This alternative would eliminate hatchery releases in the Kilchis River. Consumptive harvest opportunity would be reduced or eliminated. Hatchery production could be shifted to the Wilson River for increased harvest opportunity. Angling effort may be reduced in the Kilchis River, but may increase in the Wilson River, which could cause social problems such as angler crowding. Biological impacts of hatchery fish released in the Kilchis River are eliminated. Hatchery operating costs could be reduced if production is reduced and not shifted elsewhere. Biological impacts associated with hatchery fish would be reduced or eliminated in the Kilchis River, and would remain similar or increase in the Wilson River.

1.16.4) Potential reforms and investments.

Potential reforms and investments for stock-47 broodstock collection, egg takes, and initial rearing are identified in the Cedar Creek Hatchery Stocks 47 and 47W HGMP.

Trask Hatchery

Intake screens on Gold Creek currently do not meet NOAA criteria. Intake structures would need to be improved, modified, or rebuilt so that adequate water flows are met with the smaller screen size.

Tuffy Creek

Modification to the adult trapping facilities at Tuffy Creek, where some adult stock-47 winter steelhead are collected, has been identified as a potential need. The currently used 6' x 8' trap does not operate effectively during high water levels. A larger, more efficient trapping facility may be developed in the future to allow for trapping over a wider range of flows. Adult holding tanks at the Tuffy Creek facility are also small and do not allow for sorting stocks or holding more than a few dozen adult steelhead at one time. These may be modified or replaced in the future to accommodate more fish and sorting by sex or stock. Additional predation prevention measures (such as bird netting) have been identified as an investment for the rearing phase of stock-47 winter steelhead smolts at the Tuffy Creek facility. The Tuffy Creek rearing pond is in need of updated screens at the intake structure that meet NOAA standards. The intake structure would need to be improved, modified, or rebuilt so that adequate water flows are met with the smaller screen size. No cost estimates are available for these reforms and investments.

General

Alternative hatchery operations, facilities and techniques, in regard to conservation and restoration of wild fish populations, will be one of the areas of research questions at Oregon's 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.

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 11/4/2005 for approval and ESA authorization. This is an updated version of the previously submitted HGMP and 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 populations currently are listed under the federal ESA as *Threatened*. The listed Coho Salmon also inhabit the Tillamook Bay basin and may be incidentally affected by the winter steelhead (stock-47) hatchery program through predation, competitive interactions for food and space, 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 Percy 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 (53° 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 winter steelhead 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 winter steelhead 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 winter steelhead brood collection. Oregon coast natural 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).

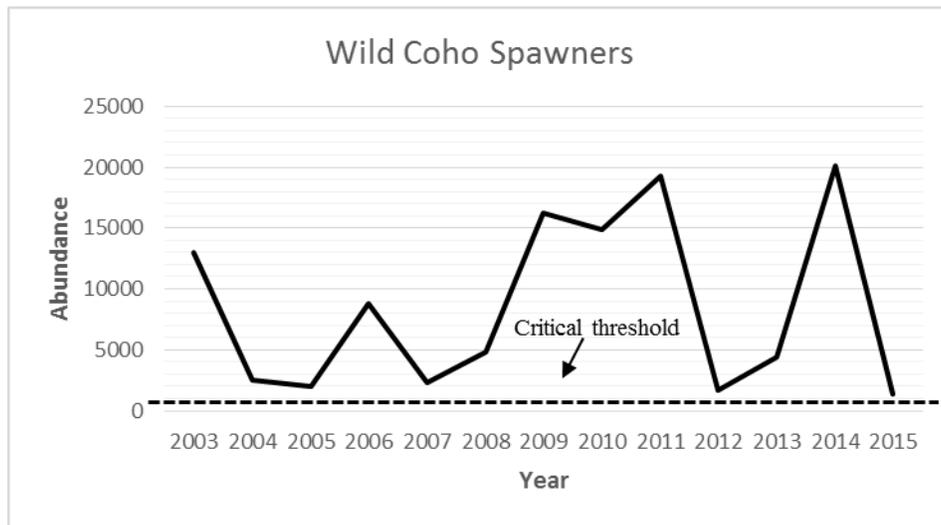


Figure 2-1. Trend in adult wild Coho Salmon spawner abundance relative to the critical population level for the Tillamook Complex, 2003-2015.

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: Oregon Adult Salmonid Inventory and Samplig (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 Salmon 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).

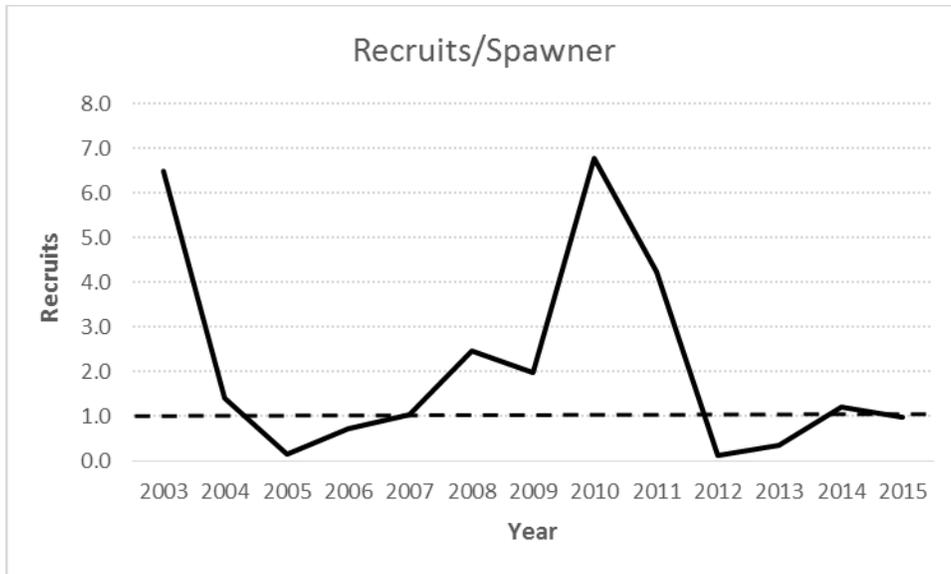


Figure 2-2. Trends in Recruits per Spawner for Tillamook Complex Wild Coho Salmon, 2003-2015.

- 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.

The ODFW conducts steelhead spawning surveys across north coast basins annually. Surveys are designed to sample across the north coast strata, and are not applicable to the population scale. Therefore, no population specific estimate of the proportion of hatchery steelhead spawning naturally is available. Observations of hatchery steelhead (based on adipose fin-clips observed on live fish and carcasses) during spawning surveys has averaged about 11% since 2003. However, steelhead 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 may differ from the previous surveys. No data will be available for several years until returns include all year classes from these modified hatchery releases. Origin (summer or winter) of live hatchery steelhead observed cannot be determined (and few carcasses are recovered), so no data is available specific to the composition of summer vs. winter hatchery steelhead that are spawning naturally.

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.

Past and future hatchery activities that may (have) impact (ed) to listed species include:

The trapping facility on the South Fork Wilson River captures some Coho Salmon during the trapping period. Trask Hatchery personnel, with on site assistance from correctional facility staff and inmates, operate and sort fish collected at the Tuffy Creek trap site. Any hatchery coho (fin-clipped) are dispatched and disposed of in a landfill or are buried, or they may be used in stream enrichment programs. Any naturally produced coho encountered are immediately released alive above the dam/trap facility on the South Fork. Naturally produced coho are also captured and handled by hatchery personnel at Trask Hatchery. Hatchery coho are used for broodstock, as part of the stream enrichment program, or occasionally donated to food programs. Naturally produced coho encountered in the traps are transported to the Trask River and released (either at the hatchery or at alternate release sites near or upstream of the hatchery).

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

Naturally produced Coho Salmon collected at trapping facilities are presented in Table 2-4.

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

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: HMIS

^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-47 winter steelhead occurs primarily at the Tuffy Creek satellite facility; however, stray stock-47 winter steelhead are also encountered at the adult trap at Trask Hatchery. The purpose of trapping stock-47 winter steelhead is to recycle fish to the river to provide fishing opportunity, transport them to enclosed waters, donate to food programs, or use them for stream enrichment. Adult stock-47 winter steelhead may also be collected for broodstock if necessary. If incidental handling of naturally produced coho at any of the Trask Hatchery 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:	Coho Salmon	ESU/Population:	Oregon Coast Coho	Activity:	Trapping and Recycling stock-47 Stw
Location of Hatchery Activity:	Trask Hatchery and Tuffy Creek	Dates of Activity:	Sept. 1 – May 15	Hatchery Program Operator:	ODFW
	Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>)				
Type of Take	Egg/Fry	Juvenile/Smolt	Adult	Carcass	
Observe or harass a)					
Collect for transport b)					
Capture, handle, and release c)			< 750		
Capture, handle, tag/mark/tissue sample, and release d)					
Removal (e.g. broodstock) e)			0-110		
Intentional lethal take f)					
Unintentional lethal take g)			< 10		
Other Take (specify) h)					
<p>a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.</p> <p>b. Take associated with weir or trapping operations where listed fish are captured and transported for release.</p> <p>c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.</p> <p>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.</p> <p>e. Listed fish removed from the wild and collected for use as broodstock.</p> <p>f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.</p> <p>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.</p> <p>h. Other takes not identified above as a category.</p>					

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.

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

Native Fish Conservation Policy - The Oregon Fish and Wildlife Commission has approved the Native Fish Conservation Policy (NFCP). The NFCP requires the development of a conservation plan for each native stock within the species management unit (SMU), 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. This winter steelhead hatchery program is consistent with the CMP 2014.

Fish Hatchery Management Policy – 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.

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 winter steelhead 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 MOASpecial Use Permit:

The Trask Hatchery Tuffy Creek satellite facility is operated under a special use permit from the Oregon Department of Forestry. The MOA is on file and can be reviewed at ODFW Headquarters at 4034 Fairview Industrial Dr. SE, Salem, Oregon 97302.

NPDES Permit and Stream Enrichment:

The Trask hatchery is operated under the NPDES 300-J general permit to maintain the environmental standards of hatchery effluents. Also, fish carcass distribution in Oregon streams for nutrient enrichment is conducted as per ODFW approved guidelines (or as regulated by DEQ).

3.3) Relationship to harvest objectives.

The hatchery-produced steelhead are mass marked (100% marked) 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 on wild steelhead populations.

Incidental take of naturally produced Tillamook Bay basin coho 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 are under development and will be guided by the Pacific Coast Salmon Plan, specifically Amendment 13 (Pacific Fisheries Management Council [PFMC] 1999). Under recent conditions of marine survival and abundance, the allowed take has been in the range from 8-30% of the total pre-harvest Oregon Coast ESU natural coho abundance. Take could increase if conditions improve (PFMC 1999). 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 naturally produced coho for the period 1994 through 1999 averaged 9.2% and ranged from 6.8% to 12.4% (PFMC 1999). Angling regulations in the Tillamook Bay basin currently require the release of all unmarked coho salmon.

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

The Wilson River winter steelhead recreational fisheries will benefit from this program. This program began in 2003, when winter steelhead (stock-47) marked fingerlings were

first transferred from Cedar Creek Hatchery to the Trask Hatchery for final rearing to smolt size. Prior to 2003, stock-47 winter steelhead were reared to smolt size at Cedar Creek Hatchery. Smolts are then acclimated at a release point or directly released on the Wilson River. The estimated number of adult hatchery winter steelhead harvested in the Tillamook Basin streams in run years 1988-89 to 2002-03 is reported in Table 1-3 in Section 1.12.

3.4) Relationship to habitat protection and recovery strategies.

This harvest augmentation program is not directly related to habitat protection or recovery. It is designed to provide hatchery-produced winter steelhead for harvest in freshwater 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.

Habitat restoration projects conducted over the past 25 years or more on state, federal, and private lands (private and corporate timberlands, agricultural lands, etc.), have begun addressing instream habitat complexity concerns. Watershed councils and volunteers have been active in identifying and implementing riparian improvement on private lands within the basins. Recent or ongoing projects are working to improve habitat conditions and/or access to habitat in the Tillamook Bay estuary. Fish passage structures believed to impede migrations (primarily culverts) are being evaluated and addressed on these lands, as well as major highways and county road systems. Oregon fish passage laws require fish passage to be addressed at all impediments to migration when a passage “trigger” occurs. As such, fish passage in these basins is likely to continue to improve over time. The fish rearing and release strategies under this program are consistent with these habitat recovery and restoration strategies.

3.5) Ecological interactions.

(1) Species that could negatively impact program

Competition for food between stock-47 winter steelhead smolts and other salmonids (hatchery and wild) in the Wilson River, 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-47 winter steelhead smolts and wild salmon and steelhead juveniles in the Wilson River, Tillamook Bay estuary, and near shore ocean environment may negatively impact the wild juveniles. Large concentrations of hatchery reared fish may attract predators causing increased predation on hatchery and wild salmon and steelhead juveniles. Increased angling pressure on hatchery steelhead may increase incidental mortality on wild steelhead stocks.

(3) Species that could positively impact program

Increased abundance of naturally-produced adult salmonids, primarily Coho and Chinook Salmon and their eventual death after spawning may increase stream nutrient levels and biomass productivity, which may positively impact this program.

(4) Species that could be positively impacted by program

Adults of hatchery stock-47 winter steelhead may be used in stream enrichment programs. The nutrients provided by these carcasses should benefit salmonid and non-salmonid fishes in the streams where the carcasses are placed. Carcasses are used in the stream enrichment program in the Tillamook Bay watershed under ODFW approved guidelines (or as regulated by DEQ).

General Information

Interactions between out-migrating stock 47 hatchery steelhead smolts and naturally produced coho are likely to be minimal. Steelhead are reared to smolt size and are expected to migrate upon, or soon after release. Smolt releases in the Wilson River occur in the South Fork Wilson River at the Tuffy Creek facility or at locations further downstream. While these areas are known to rear wild juvenile salmon and steelhead, the hatchery smolts being released are not anticipated to remain in these areas for extended periods. It is possible that some may residualize after release, but it is anticipated that interactions between remaining steelhead and rearing coho are minimal based upon their species-specific rearing and life history characteristics. All hatchery fish releases are sampled and disease tested by ODFW fish health staff and cleared before release.

Target release size for hatchery smolts is 6 per pound (average fork length [FL], 200 mm) which is larger than wild steelhead smolts (average FL <160 mm), and wild coho smolts (average FL < 120 mm) trapped in the Little South Fork Kilchis and Little North Fork Wilson rivers as part of the Oregon Plan Life-Cycle Monitoring Project (Solazzi et al. 2003).

Stock-47 hatchery winter steelhead smolt releases typically take place in late March or April. Period of peak outmigration on the Little South Fork Kilchis and Little North Fork Wilson rivers is typically late April or early May for coho smolts, and late March for steelhead smolts (Solazzi et al. 2003).

ODFW conducts steelhead spawning surveys across north coast basins annually. Surveys are designed to sample across the north coast strata, and are not applicable to the population scale. Therefore, no population specific estimate of the proportion of hatchery steelhead spawning naturally is available. Observations of hatchery steelhead (based on adipose fin-clips observed on live fish and carcasses) during spawning surveys has averaged about 11% since 2003. However, steelhead 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 may differ from the previous surveys. No data will be available for several years until returns include all year classes from these modified hatchery releases. Origin (summer or winter) of live hatchery steelhead observed cannot be determined (and few carcasses are recovered), so no data is available specific to the composition of summer vs. winter hatchery steelhead that are spawning naturally.

Habitat Above Trapping Facilities

Adult trapping operations at the Tuffy Creek facility are typically used as a means to remove adult stock-47 winter steelhead from the system, transport them to enclosed waters for further recreational opportunity, recycle them to the downstream fishery on the

Wilson River, or use them in the stream enrichment program. Adults collected at Tuffy Creek may also be used for broodstock if necessary. The Tuffy Creek adult trap is generally operated from October 1 through May 15. The remainder of the year the system is open to passage. The trap on Gold Creek at Trask Hatchery is operated, in part, to collect and remove stray stock-47 winter steelhead that enter Gold Creek. These fish are typically either recycled to the recreational fishery on the Wilson River, transported to standing waters, used as part of the stream enrichment program, or may be used for broodstock if necessary. The Gold Creek trap is generally operated from late August through March or April primarily for collection of hatchery chinook and coho broodstock. Operation of the Tuffy Creek trap and Gold Creek trap also provide the opportunity to collect and pass wild stocks into available habitat above the facilities while limiting the competition from hatchery stocks. No adults are currently passed above the trap on Gold Creek. Passing adult fish will become more viable once intake screens are upgraded to NOAA standards. Following are assessments of the habitat available above trapping facilities associated with this program.

Tuffy Creek Facility (South Fork Wilson River):

Aquatic inventory of instream habitat above the Tuffy Creek facility of the South Fork Wilson River provides approximately 6,605 meters of good, low gradient stream (1.4 to 3.4% slope), and approximately 2,350 meters of stream averaging 7.1% slope. Residual pools, wood volume, and shade are all good to very good in the area. Pool percentage is low and rates poor; gravel falls between poor and good with an edge to the good (Moore et al. 1997). Wild coho trapped at the facility are identified and immediately passed above, as are a portion of the wild steelhead trapped. Any chinook trapped will also be passed. During high-water events, the trap is opened for passage and under higher flow conditions the dam structure itself is passable.

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, naturally produced coho and winter steelhead may be passed in the future once screens have been upgraded to NOAA standards. These systems provide 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.

The Tuffy Creek facility adult trap and rearing facilities are both supplied with water from the South Fork Wilson River. The water right for the Tuffy Creek facility is for 3 cfs. The facility complies with the water rights, water withdrawals, and annual water uses reporting to Oregon Department of Water Resource.

Rearing of stock-47 juveniles at the Tuffy Creek facility occurs from early August to late March/early April of the following year. Water temperature in the rearing pond at Tuffy Creek ranges from approximately 33° F to 60° F depending on time of the year.

The water supply for Trask Hatchery trap on Gold Creek is obtained from Gold Creek. The water right for the hatchery is a total of 10 cfs from Gold Creek and Mary's Creek. The facility complies with the water rights, water withdrawals, and annual water uses reporting to Oregon Department of Water Resource.

Water temperature at Trask Hatchery during the period of trapping ranges from approximately 35° F to 59° F.

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 of take at the Gold Creek facility is minimal because listed fish and other salmonids are not currently passed above the trap facility and intake structure. 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 meet NOAA Fisheries screening guidelines. Pump intakes for the Hughey Creek Acclimation Pond are screened to NOAA standards.

All hatchery effluent at Trask Hatchery is monitored and reported quarterly under a 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

5.1) Broodstock collection facilities (or methods).

Broodstock for the stock-47 winter steelhead program are typically collected at Cedar Creek Hatchery and are addressed in the Cedar Creek Hatchery Stocks 47 and 47W winter steelhead HGMP; however, it is possible that stock-47 winter steelhead broodstock captured in the Trask Hatchery or Tuffy Creek facility traps may be used in the future for use at Cedar Creek Hatchery to meet production goals. If necessary to meet program goals, stock-47 winter steelhead adults collected from the Tuffy Creek or Gold Creek traps will be transported to Cedar Creek Hatchery for use as broodstock. An ODFW Life Cycle Monitoring project on the East Fork Trask River collects some stray stock-47 adult winter steelhead; these fish could also be utilized for broodstock.

Adults of stock-47 returning to the Tuffy Creek facility on the South Fork Wilson River are trapped in one step of the fish ladder built into the water diversion dam. An angled weir allows fish to jump into the step, with upstream passage blocked by a slotted grate. Steelhead are held in fiberglass circular tanks until they can be recycled to the fishery, transported to enclosed waters, used in the stream enrichment program, donated to food programs, or transported to Cedar Creek Hatchery for broodstock if necessary.

Adults of stock-47 winter steelhead straying to the Trask River Hatchery are collected in the Trask Hatchery trap located on Gold Creek. The trap and holding pond are located in the upper area of the hatchery grounds and are utilized primarily to trap hatchery Coho and fall Chinook Salmon adults swimming up Gold Creek from the Trask River. The holding pond measures 45 feet by 30 feet by 3.3 feet. Gravity fed water is supplied to the facility from Gold Creek. The trap runs generally from September through April. The trap is visually checked regularly, usually daily throughout the period.

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

Trapped hatchery stock-47 adult winter steelhead are usually transported from the Gold Creek and Tuffy Creek traps in 200-430 gallon portable liberation tanks equipped with oxygen diffusers and an aerator. If large numbers of fish needed to be transported at once, stock-47 winter steelhead could be transported in liberation trucks as described below.

Fingerlings transferred or smolts that are released into the Wilson River (other than volitional releases at the Tuffy Creek facility) are loaded onto liberation trucks for transport. Liberation trucks are typically 1000-2500 gallon capacity units, either mounted on a large flatbed truck, or a tanker style truck. The liberation trucks are equipped with oxygen diffusing systems, water re-circulation pumps, and typically have dissolved oxygen meters. The governing factors that determine the loading densities are: water temperature in the truck, water temperatures at the receiving water body, duration of transit, size, and species of fish to be hauled.

5.3) Broodstock holding and spawning facilities.

Broodstock for the winter steelhead program (stock-47) are normally collected in the Nestucca River basin by Cedar Creek Hatchery. Information on broodstock holding and spawning facilities are presented in the Cedar Creek Hatchery Stocks 47 and 47W HGMP. If necessary, broodstock may be collected at the Tuffy Creek or Gold Creek trap sites. Fish may be held for a short period in fiberglass tanks (Tuffy Cr.) or in holding pens within the trap (Gold Cr.) prior to transport to Cedar Creek Hatchery. All spawning currently occurs at Cedar Creek Hatchery.

5.4) Incubation facilities.

Incubation for stock-47 winter steelhead program currently occurs entirely at Cedar Creek Hatchery. Information on incubation facilities at Cedar Creek Hatchery are presented in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

5.5) Rearing facilities.

Fingerlings are transported from Cedar Creek Hatchery to Trask Hatchery facilities after fin-marking for final rearing to smolt size. Information on early rearing facilities at Cedar Creek Hatchery are presented in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

Trask Hatchery stock-47 winter steelhead fingerlings are held in a 31 foot (W) by 117 foot (L) by 5.5 foot (D) (approximately 134,500 gallons working volume) concrete rearing pond at the Tuffy Creek facility where they are reared to smolt size. Water flow in the rearing pond typically ranges from 600 gpm to 1300 gpm. The rearing pond has a maximum capacity of 134,500 lbs. of fish. At the time of transfer, there are approximately 750 lbs. of fish, approximately 0.6 % of capacity. At the time of release, there are about 6,667 lbs. of fish, approximately 5 % of capacity.

5.6) Acclimation/release facilities.

A portion of the stock-47 winter steelhead smolts released in the Wilson River basin are acclimated at the Hughey Creek Acclimation Pond. Hughey Creek Acclimation Pond is located at approximately RM 6.5 on Wilson River, near the mouth of Hughey Creek. Winter steelhead smolts transported to the Hughey Creek acclimation pond are typically held up to 14 days (average 5-7 days) prior to release directly into the Wilson River. The above-ground, galvanized steel-framed acclimation pond at Hughey Creek is vinyl-lined and measures 83 feet by 8 feet by 4.75 feet. Water for the pond is pumped from the Wilson River with three 5-horsepower (hp) pumps with a flow of approximately 80-120 gpm each. Working volume is approximately 17,600 gallons and is regulated by a standpipe. The facility is equipped with an automatic backup propane powered generator and an alarm system.

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

There has been no significant fish loss due to disease or other difficulties since the program began in 2003. However, juveniles are treated yearly for external parasites, typically during summer months, but high loss has not been associated with these

parasites. See Attachment A for disease history and protocols for fish health management.

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 being reared at the facility. However, the following risk aversion measures are in place to reduce the potential for adverse impacts to salmonids in the wild in the event of equipment failure or natural event affecting the hatchery activities. Procedures and equipment are used to address events and allow fish to remain on station and avoid emergency releases except in extreme situations.

Trask Hatchery staff, in coordination with Oregon Department of Corrections staff, oversee work crews that are responsible for daily adult trap operation, feeding of fish in the rearing pond, daily maintenance activities, etc. and are available 24 hours per day, 7 days per week to respond to operational failures. An audible alarm system allows instantaneous notice of a system failure. The rearing pond has a float-activated switch tied into a central alarm system. The water supply from the South Fork Wilson River is through gravity flow and no pumps are needed. Trask Hatchery personnel are present at the Tuffy Creek facility regularly during periods of trap operation or when stock-47 winter steelhead juveniles are being held in the rearing facility.

Smolts are transferred to the Hughey Creek acclimation pond up to 14 days (average 5-7 days) before release into the Wilson River. The Hughey Creek acclimation pond has three, 5-hp pumps. An alarm system wired to a cellular phone line notifies ODFW staff or volunteers in the event of operational failure. The facility is inspected at least once per day during periods when fish are being acclimated. An automatic propane powered generator has been installed to provide backup electricity in the event of a power failure.

SECTION 6

BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Broodstock collection for Trask Hatchery stock-47 winter steelhead typically occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery Stocks 47 and 47W winter steelhead HGMP. However, it is possible that stock-47 winter steelhead broodstock captured in the Trask Hatchery or Tuffy Creek facility traps may be needed in the future for use at Cedar Creek Hatchery to meet production goals. If necessary to meet program goals, stock-47 winter steelhead adults collected from the Tuffy Creek or Gold Creek traps will be transported to Cedar Creek Hatchery for use as broodstock.

6.2) Supporting information.

6.2.1) History.

The Trask Hatchery winter steelhead program (stock-47) began in 2003; Prior to 2003, Cedar Creek Hatchery stock-47 winter steelhead were released in the Wilson River.

6.2.2) Annual size.

Broodstock collection needs for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

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

Broodstock collection needs for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

6.2.4) Genetic or ecological differences.

Broodstock collection needs for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

6.2.5) Reasons for choosing.

This stock was chosen because hatchery broodstock were readily available from Cedar Creek Hatchery, and because prior to 2003, the Cedar Creek Hatchery stock-47 winter steelhead had been used successfully in the Wilson River. Additional information can be found in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

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.

Broodstock selection and risk aversion measures for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

SECTION 7
BROODSTOCK COLLECTION

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

Broodstock collection for Trask Hatchery stock-47 winter steelhead typically occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery Stocks 47 and 47W winter steelhead HGMP. However, occasionally stock-47 winter steelhead broodstock captured in the Trask Hatchery or Tuffy Creek facility traps may be needed for use at Cedar Creek Hatchery to meet production goals. If necessary to meet program goals, stock-47 winter steelhead adults collected from the Tuffy Creek, Gold Creek, or East Fork Trask (ODFW Life Cycle Monitoring site) traps will be transported to Cedar Creek Hatchery for use as broodstock. Only returning stock-47 hatchery winter steelhead adults are collected for this program. Past collections are shown in Table 7-1

Table 7-1. Trask Hatchery Adult Stock-47 Winter Steelhead Collections and Transfers to Cedar Creek Hatchery.

Brood Year	Adults Collected				Adults Transferred			
	Tuffy Creek Trap		Gold Creek Trap		Tuffy Creek Trap		Gold Creek Trap	
	Males ¹	Females						
2003	40	38	66	65	0	0	0	0
2004	14	10	167	163	0	0	0	0
2005	60	43	18	16	0	0	0	0
2006	307	223	28	27	0	0	0	0
2007	39	77	16	30	21	44	6	12
2008	38	60	0	1	0	0	0	0

Source: ODFW HMS database; Trask Hatchery files

¹ includes jacks

7.2) Collection or sampling design.

Broodstock collection needs for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

7.3) Identity.

Broodstock collection needs for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

7.4) Proposed number to be collected:

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

Broodstock collection needs for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

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

Broodstock collection for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

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

Broodstock collection for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

7.6) Fish transportation and holding methods.

Broodstock collection for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

7.7) Describe fish health maintenance and sanitation procedures applied.

Broodstock collection for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

7.8) Disposition of carcasses.

Broodstock collection for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

Broodstock collection for Trask Hatchery stock-47 winter steelhead is covered in the Cedar Creek Hatchery Stocks 47 and 47W winter steelhead HGMP.

SECTION 8

MATING

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

8.1) Selection method.

Broodstock mating for stock-47 winter steelhead occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

8.2) Males.

Broodstock mating for stock-47 winter steelhead occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

8.3) Fertilization.

Broodstock mating for stock-47 winter steelhead occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

8.4) Cryopreserved gametes.

No cryopreserved gametes are 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.

Broodstock mating for stock-47 winter steelhead occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

SECTION 9

INCUBATION AND REARING

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

9.1) Incubation.

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

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

9.1.2) Cause for and disposition of surplus egg takes.

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead currently occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

9.1.3) Loading densities applied during incubation.

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead currently occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

9.1.4) Incubation conditions.

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead currently occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

9.1.5) Ponding.

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead currently occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

9.1.6) Fish health maintenance and monitoring.

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead currently occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

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.

Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead currently occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.

9.2) Rearing:

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

Stock-47 survival rates are presented in Table 9-1.

Table 9-1. Stock-47 winter steelhead survival rates from fingerling to smolt at the Tuffy Creek facility.

Brood Year	Percent Survival Fingerling to Smolt ^a
2002 ^b	99.5%
2003	95.0%
2004	76.4%
2005	94.7%
2006	80.2%
2007	91.9%
Average	89.6%

Data source: ODFW HMS database

^a Represents survival of fingerlings from the time they arrive at the Tuffy Creek rearing facility after fin-marking to the time of release at smolt size.

^b The 2002 brood was the first group of stock-47 winter steelhead reared to smolt size at Tuffy Creek.

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

The criteria for the Tuffy Creek rearing pond, fish densities, and loading differ considerably from season to season. Early rearing densities are below goals set within the Fish Hatchery Management publication (Piper 1982).

Stock-47 winter steelhead fingerlings are transferred from Cedar Creek Hatchery to the Tuffy Creek facility in July or August of each year after fin-marking. Maximum rearing density is 1.0 lbs/ft³, or approximately 20,000 lbs of fish. The density at time of loading into the Tuffy Creek rearing pond in August is approximately 0.04 pounds per cubic foot (~4% of maximum capacity). The density at time of release is typically 0.33 pounds of fish per cubic foot of water (~33% of maximum).

9.2.3) Fish rearing conditions.

Winter steelhead reared at the Tuffy Creek facility grow on South Fork Wilson River water; hence, rearing water temperatures vary with seasons and with natural river fluctuations. Water temperatures range from 33° to 65°F depending upon the time of year. Dissolved oxygen (DO) levels coming into the facility are typically around 10-11 ppm in the fall and winter, and 8.0-10.0 ppm in the summer.

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

Weight samples are collected regularly for inclusion in pond reports. Length frequency measurements are made at the time of liberation; fin mark quality observations are also made at this time. At liberation, condition factors may also be calculated. Table 9-2 shows average monthly weights for the Trask Hatchery winter steelhead (stock-47) program from the time they arrive at the Tuffy Creek rearing facility to the time they are released at smolt size.

Table 9-2. Example of monthly fish size for Trask Hatchery winter steelhead (stock-47) reared at the Tuffy Creek satellite facility^a. Beginning size varies annually depending on growth, date of transfer, etc.

Week	Stock-47 Size in fish/pound
Ponding	
Week 4	
Week 8	
Week 12	
Week 16	
Week 20	
Week 24	34.5
Week 28	18.9
Week 32	12.5
Week 36	10.9
Week 40	9.2
Week 44	7.9
Week 48 or release	6.7
Source: ODFW- HMS database ^a Fingerlings are transferred from Cedar Creek Hatchery beginning in August (Week 24). Details of average monthly size prior to Week 24 can be found in the Cedar Creek Hatchery stocks 47 and 47W winter steelhead HGMP.	

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

Once fingerlings have been transferred from Cedar Creek Hatchery to the Tuffy Creek facility their feed rates are programmed to ensure that the fish do not exceed pond density limitations and to meet programmed release size (target of 6 fish/lb).

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).

Juveniles reared at the Tuffy Creek facility are fed a dry diet 1 to 4 times daily from the time they arrive to the time they are released. Fish are sampled regularly to determine fish size and growth rates. Feeding rates are adjusted as needed to ensure density limitations are not exceeded and to meet programmed release size.

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

Fish health of rearing juvenile winter steelhead is monitored regularly by ODFW fish health staff. The fish health staff diagnoses disease problems and prescribes the appropriate treatments to eliminate or control disease. An iodine antiseptic is routinely used to sanitize hatchery equipment and prevent the incidence or spread of diseases. For further description, see Attachment A.

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

Weight samples of the fish are taken regularly to ensure proper growth rate so that smolts meet the target release size at the proper time. Prior to release, length frequencies are taken. At this time, condition factors may also be calculated. Coloration and visual marks are also checked to determine the onset of smolting prior to release. No ATPase gill activity is measured. Table 9-5 shows average fork length of smolts at the time of release.

Table 9-5. Average Fork Length Frequency Percentages for smolts at the time of release (2002 and 2003 broods).

Fork Length Size Range	stock-47 Releases
< 18 cm.	34.7%
18 – 22 cm.	63.1%
> 22 cm.	2.2%

Source: HMS database; Trask Hatchery files

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

There are no “natural” rearing methods applied to Trask stock-47 winter steelhead.

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.

Stock-47 winter steelhead reared in this program are not listed under the Federal or State ESA. However, fish will be reared to full-term smolt size to encourage rapid migration and minimizing freshwater residence time after release. In addition, standard ODFW fish health monitoring and control procedures are followed to prevent the spread or amplification of pathogens in the basin.

SECTION 10
RELEASE

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

10.1) Proposed fish release levels for Trask Hatchery stock-47 winter steelhead.

Table 10-1. Proposed Fish Release Levels.

Age Class	Production Goal	Target Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
STEP – unfed fry				
Fry				
Fingerling				
Yearling	40,000 ¹	6.0	March/April	Wilson River

¹ The production goal for this program going forward is 40,000 smolts for the Wilson River. Spring 2015 releases may include up to 50,000 smolts as program changes (discontinuing Kilchis River releases and transferring production to Wilson River 121W and Nestucca River 47W programs) dictated by the adoption of the Coastal Multi-Species Conservation and Management Plan are phased in.
Data source: Production schedules and District files.

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

Stream, river, or watercourse:	Wilson River
Release point:	South Fork Wilson at RM 1.5 Wilson River (various locations RM 2-33)
Major watershed:	Wilson River
Basin or region:	Tillamook Bay Basin

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

Table 10-2. Trask Hatchery stock-47 Winter Steelhead Release Numbers and Size at Release, 2002-2014 Brood Years.

Brood Year	Eggs/ Unfed Fry	Avg Size (fish/lb.)	Fry	Avg Size (fish/lb.)	Fingerling	Avg Size (fish/lb.)	Smolt	Avg. Size (fish/lb.)
2002							82,548	7.3
2003							78,755	6.7
2004							34,473 ¹	6.2
2005							80,378	7.0
2006							70,237	6.5
2007							78,936	6.7
2008							67,084	8.5
2009							75,908	7.0
2010							80,780	8.1
2011							81,738	6.8
2012							60,718	5.8
2013							77,610	6.8
2014							58,039	6.71
<i>Average</i>								

Data source: ODFW – HMS database

¹ Only 45,156 juveniles were transferred to Tuffy Creek due to large shortage at Cedar Creek Hatchery

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

Stock-47 winter steelhead smolts are typically released in the Wilson River in late March or April. Actual dates of release are presented in Table 10-3.

Table 10-3. Annual Stock-47 Winter Steelhead Smolt Release Dates.

Release Year	Release Dates for Releases into Wilson River
2003	4/1; 4/9
2004	4/9; 4/14
2005	3/22; 3/28
2006	3/29; 4/3
2007	4/3; 4/9
2008	4/1; 4/6
2009	3/30; 4/8
2010	3/30; 4/30
2011	3/29; 4/1
2012	4/4; 4/6
2013	4/4
2014	3/26; 4/2
2015	3/31; 4/3

Source: ODFW HMS database

10.5) Fish transportation procedures, if applicable.

A portion of the smolts released are acclimated at the Hughey Creek Acclimation Pond (RM 6.5). Winter steelhead smolts transported to the Hughey Creek acclimation pond are typically held up to 14 days (average 5-7 days) prior to release directly into the Wilson River. The remainder of the smolts are direct released into the South Fork Wilson River (RM 1.5) or the mainstem Wilson River (up to RM 33). Some fish (typically the last few remaining fish in the pond) may be volitionally released from the rearing pond into the South Fork Wilson River via Tuffy Creek. Hauling time varies but is generally less than one hour to the furthest destination (Hughey Creek). Liberation trucks are used to transport smolts to the Wilson River. See section 5.2 for a description of liberation equipment. Releases are usually completed in one day.

10.6) Acclimation procedures.

A portion of the fish programmed for release into the Wilson River may be acclimated prior to release at the Hughey Creek acclimation facility at Wilson River (RM 6.5). Smolts are acclimated for up to 14 days (average 5-7 days) prior to being directly released (forced) from the pond into the Wilson River mainstem.

Hughey Creek acclimation pond is located at the mouth of Hughey Creek, a tributary to the Wilson River at RM 6.5. The above ground pond is polypropylene-lined, steel framed, and measures 8 feet by 83 feet by 4.75 feet (3.5-foot water depth). Water for the

pond is pumped from the Wilson River with three 5-horsepower (hp) pumps with a flow of approximately 80-120 gpm each. Working volume is approximately 17,600 gallons and is regulated by a standpipe.

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

All smolts programmed for release in the Wilson River are currently mass marked with an adipose / left maxillary (ADLM) mark prior to being transferred from Cedar Creek Hatchery to the Tuffy Creek rearing facility. Depending on stock evaluation needs in the future these marks may require change, however all mass marking has a goal of 100% fin clips or other approved mark type.

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

Smolt releases have been within the approved levels for the program. Additional fingerlings (above production goals) may be transferred to Trask Hatchery from Cedar Creek Hatchery to account for average mortality from time of transfer to time of release. These fish are not considered surplus and would be within approved release levels if survival was above average in a given year.

This program does not produce fry or fingerlings. Egg collection, incubation, and rearing to fingerling size for Trask Hatchery stock-47 winter steelhead occurs at Cedar Creek Hatchery and is covered in the Cedar Creek Hatchery Stock s 47 and 47W winter steelhead HGMP.

10.9) Fish health certification procedures applied pre-release.

Per ODFW's Fish Health Management Policy, fish health status is always examined for prior to release or transfer. And only health certified fish are released. Also, see Attachment A, for fish health management protocol.

10.10) Emergency release procedures in response to flooding or water system failure. Contingency Plans are also applicable to "drought years".

Trask Hatchery personnel are present at the Tuffy Creek facility regularly during trap operation or when winter steelhead juveniles (stock-47) are being held in the rearing 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 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, the following procedure will be used:

- Department of Corrections staff will immediately notify Trask Hatchery and/or ODFW North Coast Watershed District personnel.
- The hatchery crew will exhaust all possibilities for retaining the fish.
- The hatchery crew will consult with the ODFW District Biologist.
- If emergency fish release is deemed necessary, the fish will be released directly into the South Fork Wilson River, into the mainstem Wilson River, or into a closed water

body dependent on time of year, lifestage of the fish, and availability of transport equipment.

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.

Stock 47 winter steelhead are reared to full-term, yearling smolts and released shortly before the majority of naturally produced coho and steelhead smolts typically emigrate. The peak outmigration of naturally produced coho and steelhead smolts typically occurs during mid-late April or early May (Solazzi et al, 2003). The hatchery winter steelhead smolts are expected to migrate upon or shortly after release, which should keep freshwater residence time to a minimum.

This release strategy should minimize potential interactions and adverse ecological effects that may occur between hatchery winter steelhead and juvenile salmonids rearing or migrating through these systems.

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 of Tillamook Bay basin wild and hatchery winter steelhead spawner abundance, proportion of hatchery strays, smolt size, and migration timing may be obtained from *The Oregon Plan for Salmon and Watersheds (OPSW)* monitoring projects: Salmonid Life-Cycle Monitoring project (Solazzi et al. 2000 and 2003) and Coastal Salmonid Inventory project (Jacobs et al. 2000). Information on the catch of hatchery winter steelhead is compiled from returned salmon/steelhead tags and is available from Fish Division in the Salem office of ODFW. Specific economic data for sport fisheries is not routinely developed for all stocks. Economic data that is compiled is available in ODFW’s Salem Headquarters. Salmon and steelhead population health goals are currently being addressed through *Oregon Plan for Salmon and Watersheds* activities and through the Coastal Multi-Species Conservation and Management Plan. New performance standards (and subsequent M&E) may be prescribed in the future as these population health goals are established. Monitoring of in-hatchery performance and adult returns to Trask Hatchery (and/or satellite facilities) will be conducted by the hatchery staff. This information is stored on the ODFW mainframe computer in the Hatchery Management Information System (HMIS) database. This will include at least the following information:

Adults

- The number of Trask Hatchery winter steelhead (stock-47) females, males, and jacks collected at Trask Hatchery facilities. (Standard 4.4 and 4.5).
- Number of wild winter steelhead and wild Coho Salmon handled and released from Trask Hatchery facilities (Standard 4.5).
- Any observed mortalities of wild winter steelhead and wild Coho Salmon at Trask Hatchery facilities (Standard 4.5).
- Dates of entry into the Trask Hatchery trap, specified by hatchery and wild fish, or any off station trapping facilities (Standard 2.1).
- Disposition (recycled, stream enrichment, etc.) of all winter steelhead (stock-47) collected (Standard 4.4).
- Collection of adult hatchery steelhead straying data in natural spawning areas (Standard 3.1).
- Harvest of adult Trask Hatchery stock-47 winter steelhead (Standard 1.1 and 5.1).

Juvenile Rearing

- Monthly data of number of fish on hand, mortality, feeding rate, and growth for Trask Hatchery Stock47 winter steelhead (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 and 2.3).
- Fish size at release; average weight, and length frequency distribution (Standard 2.3, 4.1, and 4.6).
- Location of releases (Standard 2.2 and 4.6).
- Dates of release started and ended for winter steelhead (Standard 2.3, 2.4, and 4.6).

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. Funding and staffing are currently in place for OPSW monitoring activities and are contingent on biennial budget reauthorization. Funding is being pursued for implementation of monitoring activities associated with the Coastal Multi-Species Conservation and Management Plan. At this time, there are no programs specific to Trask Hatchery stock-47 winter steelhead monitoring or evaluation. Volunteers will be used to assist with monitoring activities where feasible.

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 activities underway or planned for this program.

SECTION 13

ATTACHMENTS AND CITATIONS

Citations

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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, Acting North Coast Watershed District Manager, West Region, ODFW

Signature: _____ Date: _____

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

Signature: _____ Date: _____

ATTACHMENT A

Table A-1
Hatchery Programs Stock Code and Species Five-Year Disease History (1995 to 1999) 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
<i>Aeromonas salmonicida</i>	No	No	No	No	Yes	No	No	No	No
<i>Aeromonas/Pseudomonas</i>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
<i>Flavobacterium psychrophilum</i>	Yes	Yes	Yes	No	Yes	No	No	No	No
<i>Fl. columnare</i>	No	No	No	No	No	No	No	No	No
<i>Fl. branchiophilum</i>	No	No	No	No	No	Yes	No	No	No
<i>Fusiform gill disease bacterium</i>	No	No	No	No	No	No	No	No	No
<i>Renibacterium salmoninarum</i>	Yes	Yes	No	Yes	No	Yes	Yes	No	No
<i>Yersinia ruckeri</i>	No	No	No	No	No	No	No	No	No
<i>Carnobacterium sp.</i>	No	No	No	No	Yes	No	No	No	No
<i>Ichthyobodo</i>	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
<i>Gyrodactylus</i>	No	No	No	No	Yes	No	No	Yes	Yes
<i>Ichthyophthirius multifiliis</i>	No	Yes	No	Yes	No	Yes	Yes	No	No
Gill Ameba	Yes	No	No	No	No	Yes	No	No	No
<i>Trichodinids</i>	Yes	Yes	Yes	No	Yes	No	No	No	Yes
<i>Loma sp</i>	Yes	No	No	No	No	No	No	No	No
<i>Nanophyetus salmincola</i>	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 of ODFW.
- 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, 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 permanganate 1-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 1:3,500 flow for one hour to control *Costia* and *Trichodina*.