HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	**Trask Hatchery Winter Steelhead Program**
Species or Hatchery Stock:	**Winter Steelhead *Oncorhynchus mykiss* (Stock-121W)**
Agency/Operator:	**Oregon Department of Fish and Wildlife**
Watershed and Region:	**North Coast Watershed District, West Region**
Draft Submitted:	**April 2, 2001**
First Update Submitted:	**December 27, 2011**
Second Update Submitted:	**October 22, 2014**
Third Update Submitted:	**July 29, 2016**
Fourth Update Submitted:	**September 18, 2017**
Date Last Updated:	**September 18, 2017**

SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Trask Hatchery stock-121W Winter Steelhead Program. Note: ODFW designates wild adults collected for this program with the suffix "W". For purposes of record keeping, ODFW designates hatchery eggs/juveniles and returning hatchery adults with the suffix "F" (for F-1, first generation hatchery fish). In this document, the program will be referred to as 121W for consistency and ease of reading.

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

Winter steelhead *Oncorhynchus mykiss,* stock-121W.
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 15, 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 3.75 permanent full-time employees.
- Funding for this program is currently a mix of several sources.
- The total budget for Trask Hatchery for 2015 is $370,421.
- Estimated cost for STW (stock 121W) program is ~$91,494 (about 24.7% of the total budget).

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

Trask Hatchery is located 8 miles east of Tillamook, adjacent to Trask River, at approximately river mile (RM) 10. The hatchery site is at an elevation of approximately 100 feet above sea level, at latitude 45º 25' 53" N (45.43139) and longitude 123º 43' 58" W (123.7328). Tuffy Creek Pond is used as a satellite fish rearing pond under the Trask Hatchery. Tuffy Creek Pond is a cooperative project between the Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Corrections, and Oregon Department of Forestry. It is built on the site of a state correctional facility and is located 30 miles northeast of Tillamook, adjacent to the South Fork Wilson River, at approximately RM 1.5. The South Fork of the Wilson River is a tributary of the Wilson River at about RM 33.

***Adult collection*:** The majority of the winter steelhead adults collected for this program are caught with hook and line by volunteer anglers fishing the Wilson River. Adults are held in aerated live boxes and transported to the Hughey Creek Acclimation Pond (or sometimes directly to Trask Hatchery) by the anglers, where they are placed in a Canadian trough or other holding pen. Wild adult winter steelhead may also be collected in the South Fork Wilson River at the Tuffy Creek facility. Returning hatchery adults may also be collected at Tuffy Creek, if needed for broodstock. The Trask Hatchery trap is located at RM 0.2 on Gold Creek. The South Fork Wilson River trap is located at RM 1.5 on the South Fork Wilson River. Alternative methods of broodstock collection (such seining, tangle netting, or remote trapping/capture) may be considered if necessary.

***Spawning, egg incubation and rearing**:* These activities primarily occur at the Trask River Hatchery. The Tuffy Creek facility is equipped with an egg incubation building. Spawning, incubation, and early rearing could be accomplished on site if necessary.

***Acclimation and release**:* A portion of the stock 121W smolts are acclimated and volitionally released at the Hughey Creek acclimation facility on the Wilson River (RM 6.5). Smolts are also direct-released into the South Fork Wilson River, and the mainstem Wilson River at various points from river mile 5-33.

1.6) Type of program.

This is a harvest augmentation program aimed 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 121W) in the Wilson River basin with the goal to provide adult fish for freshwater harvest. The native stock of naturally-produced winter steelhead returning to the Wilson River shall be used as broodstock to minimize the adverse genetic and ecological impacts to natural population of winter steelhead within the basin.

1.8) Justification for program.

The hatchery program produces full-term smolts for release into the Wilson River. The ODFW's Oregon Coast Multi-Species Conservation and Management Plan 2014 authorized to release 150,000 yearling smolts annually into the Wilson River. Releases of winter steelhead into the Wilson River basin are currently a mix of stock 47 (Cedar Creek stock) and stock 121W Wilson River wild broodstock (*see* Trask River Hatchery Stock 47 Winter Steelhead HGMP for details of that program). Returns of adult Trask Hatchery stock 121W winter steelhead peak later in the season after the return of stock 47 winter steelhead. This separation in run timing between the two stocks expands the period of recreational angling harvest opportunity. However, beginning with brood year 2018, the plan is to produce and release a single stock of winter steelhead smolts (stock 121W), and consequently, release of stock 47 component may alter or discontinue, as appropriate that would be agreed upon by all parties involved. And, the total release number will not exceed 150,000 smolts annually as authorized in the Oregon Coast Multi-Species Conservation and Management Plan, 2014.

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%) to allow positive 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 require that all unmarked steelhead caught must be released unharmed. The Wilson River (above tidewater) is currently closed to retention of wild Coho Salmon and all unmarked Coho Salmon caught must be released unharmed.

1.9 & 1.10) List of program "Performance Standards and "Performance Indicators".

Indicator 1: Harvest

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

Indicator: Number of hatchery winter steelhead (stock 121W) 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-origin juvenile steelhead will be externally marked for easy identification. **(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 121W) will be collected in a manner that approximates the distribution in timing, age, & size of naturally produced and/or returning 121W hatchery fish returning to Wilson River basin. **(Benefit)**

Indicator: Temporal distribution of adult winter steelhead collected for broodstock **(Risk- unknown)**

Indicator: Age and size distribution of stock 121W adult winter steelhead returns and broodstock spawned. **(Benefit)**

Standard 2.2: Releases of stock 121W 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 121W winter steelhead released. **(Risk)**

Indicator: Dates of stock 121W winter steelhead releases. **(Risk)**

***Indicator*:** Location of stock 121W winter steelhead released. **(Risk)**

Standard 2.3: All Trask Hatchery stock 121W winter steelhead smolts will be released into the Wilson River basin as yearlings. **(Risk- unknown)**

Indicator: Beginning and ending dates of Trask Hatchery stock 121W winter steelhead smolt releases. **(Risk)**

Indicator: Size and length frequency of Trask Hatchery stock 121W winter steelhead smolts released. **(Risk- unknown)**

Standard 2.4: Trask Hatchery stock 121W winter steelhead in excess of production needs will be released during times and at locations that reduce impacts to naturally rearing steelhead and coho. Any stock 121W fry or fingerlings in excess of needs for smolt production may be released into suitable water bodies or destroyed as per ODFW's policy. **(Benefit)**

Indicator: Location, number, and timing of Trask Hatchery stock 121W winter steelhead fry and/or fingerling releases. **(Benefit)**

Indicator 3: Genetic Characteristics

Standard 3.1: The proportion of naturally spawning hatchery-origin 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 (pHOS may be estimated if necessary resources are available). **(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 121W winter steelhead, or adult returns from smolts released for this program, will be used for the Trask Hatchery stock 121W winter steelhead program component. **(Benefit)**

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

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

Standard 3.3: Stock 121W hatchery winter steelhead broodstock will be spawned following appropriate mating and spawning protocols. **(Benefit)**

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

Indicator: Mating 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)**

Indicator 4: Operation of Artificial Production Program

Standard 4.1: The Trask Hatchery stock 121W winter steelhead program will be operated in compliance with the ODFW Native Fish Conservation Policy, ODFW Fish Hatchery Management Policy, Fish Health Management Policy, and the IHOT fish health guidelines (IHOT 1995). See Attachment A. **(Benefit)**

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

Indicator: Rearing survival rates from egg to fry, and from fry to smolt. **(Benefit)**

Indicator: Number of juveniles sampled and pathogens observed immediately prior to release. **(Benefit)**

Indicator: Release of full term smolts at the target size. **(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 results reported. **(Benefit)**

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

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

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

Standard 4.4: Surplus Trask Hatchery stock 121W adult hatchery winter steelhead trapped at Trask Hatchery or satellite facility may be used for carcass placements in the stream nutrient enrichment program. This program will comply with ODFW approved guidelines (or as regulated by DEQ). **(Benefit)**

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

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

Standard 4.5: Naturally produced salmonids that enter the Trask Hatchery adult trap, or any off station trap facility, are handled and released (except wild salmonids retained for broodstock) in a manner that minimizes stress, injury, mortality, and delay in migration. **(Risk)**

Indicator: Number and disposition of unmarked adult salmonids collected and released alive in the Trask River, or at any satellite facility. **(Risk)**

Indicator: Number of unmarked adult salmonid mortalities at identified trapping facilities during operation of adult traps. **(Risk)**

Indicator: Dates of trap(s) operation and frequency of handling trapped adult salmonids. **(Benefit)**

Standard 4.6: Releases of Trask Hatchery stock 121W 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- unknown)**

Indicator: Location, dates, and sizes of Trask Hatchery stock 121W winter steelhead releases. **(Risk- unknown)**

Indicator 5: Socio-Economic Effectiveness

Standard 5.1: Estimated harvest benefits will equal or exceed hatchery production costs for Trask Hatchery stock 121W winter steelhead, based on the benefit-cost model in ODFW (1999), or an updated version of that model. **(Benefit)**

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

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

1.11) Expected size of program.

The expected size of Trask Hatchery winter steelhead program is to release 110,000 winter steelhead smolts of stock 121W, and 40,000 smolts release of stock 47 into the Wilson River basin. It is expected that from brood year 2018, release of stock 121W smolts may increase to 150,000 smolts, and the component of stock 47 release may be altered or eliminated (as appropriate), if agreed upon by all parties involved. The ODFW is in the process of evaluating the plan in co-operation with the public for program shifting to a single stock release and/or altering or eliminating the stock 47 winter steelhead release component.

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

The existing program typically requires a minimum of 50 females and 50 males of stock 121W winter steelhead for broodstock.

Additional fish may be collected and held as necessary to cover shortages resulting from, but not limited to, adult holding mortality, fecundity variations, early egg mortality, positive disease tests, etc.

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

See Table 1-2 below.

Table 1-2. Proposed Annual Fish Release Levels for stock 121W Winter Steelhead

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry [1]	Suitable waterbody per ODFW's policy (OAR 635-007-0545)	Excess, varies [1]
STEP – unfed fry [2]	Wilson River or other Tillamook Bay tributaries; or standing waters	<2,000 –STEP classroom incubators
Fry[3]	Suitable waterbody per ODFW's policy (OAR 635-007-0545)	Excess, varies
Fingerling[3]	Suitable waterbody per ODFW's policy (OAR 635-007-0545)	Excess, varies
Yearling smolts[4]	Wilson River basin	Current release of stock 121W is 110,000 smolts. Release number of stock 121W may increase to 150,000 smolts, if release of stock-47 into Wilson River is eliminated.

Life Stage	Release Location	Annual Release Level

Data source: District Files

[1] This program does not produce unfed fry for release as a program goal for stock 121W. 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 121W will be released into suitable waterbodies, or they may be destroyed.

[2] 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. Typically stock 121W winter steelhead are not used in STEP programs, but could be in the case of a shortage of another stock. If used, 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.

[3] This program does not produce fry or fingerlings for release as a program goal for stock 121W. In any given year there may be surplus fingerling at the time of marking (typically resulting from above average fry and fingerling survival); surplus stock 121W will be released into suitable waterbodies or they may be destroyed.

[4] Current release number is 110,000 smolts of stock 121W. May increase up to 150,000 smolts if some or all of stock 47 program is converted to stock 121W

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 and smolt to adult survival rates 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 121W Stock 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).

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 smolts released and adult winter steelhead produced by winter steelhead stock 47 and stock 121W in the Tillamook Basin & tributaries (Combined), 1986 to 2009 brood years.[c]**

	Tillamook Basin Smolt Releases[c]		2-Salt	Estimated Adult Hatchery STW (2-salt + 3-salt)			
Brood Year	Nestucca Stock 47	Wilson R. Stock 121W	Return Year	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%
2001	117,216	46,989	2003-04	2,268	31	n.a.	1.40%
2002	82,588	29,033	2004-05	1,318	155	n.a.	1.32%
2003	78,755	45,904	2005-06	1,809	352	n.a.	1.73%
2004	34,473	67,990	2006-07	2,143	220	n.a.	2.31%
2005	80,473	79,554	2007-08	3,710	443	n.a.	2.60%
2006	70,236	76,844	2008-09	3,322	169	n.a.	2.31%
2007	98,765	46,226	2009-10	n.a.	353	n.a.	n.a
2008	67,084	73,846	2010-2011	n.a.	n.a.	n.a.	n.a.
2009	75,908	104,878	2011-2012	n.a.	n.a.	n.a.	n.a.
Avg.	139,696	55,218			230		1.51%

Source: ODFW catch cards and HMIS (n.a. = not available)

[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 Trask Hatchery and South Fork Wilson trap (Tuffy Creek). However, there are no winter steelhead smolts released at Trask Hatchery.

[c] The Trask Hatchery stock 121W did not begin until the 1997 brood, with first smolt releases in 1998. The first adult returns were in the winter of 1999-2000. Contribution of stock 121W is only included since that time.

Note: Smolt to adult survival rates are underestimated as the data of hatchery fish in the natural spawning grounds are not available.

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

The Trask Hatchery stock 121W hatchery winter steelhead program began in the winter of 1996-97. The 1996-97 return year was the first year that adults were collected; and 1998 marked the first year of smolt releases.

1.14) Expected duration of program.

The Trask Hatchery stock 121W winter steelhead program is an ongoing program.

1.15) Watersheds targeted by program.

Wilson River, tributary to Tillamook Bay.

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.

a) Broodstock collection: Currently, most broodstock for the stock 121W winter steelhead program is collected by anglers, and transported to the Hughey Creek acclimation pond where they are held in a live box prior to be transported to Trask Hatchery. On occasion, anglers transport adults directly to Trask Hatchery. Some broodstock collection also occurs at the Tuffy Creek trap on the South Fork Wilson or at the Trask Hatchery adult trap(s), if adults returning to hatchery. Anglers are generally very supportive of hook and line collection, and many are enthusiastic about assisting. Broodstock collection in this manner has worked very well, with generally few mortalities observed despite the handling of the adults that is required. The goal of the program is to use 100% wild adults each year, although returning hatchery adults will be utilized as necessary to meet production or fish management goals.

b) *Release strategies*: The Wilson River has many miles of publicly accessible water for angling; however only the lower 10 miles is available to drift boat anglers. The current release strategy is a blend of upper river releases (~25%) and lower river releases (~75%) in an attempt to provide hatchery fish for both bank and boat anglers, while also minimizing interactions with wild steelhead. Previous releases of more smolts higher in

the basin created complaints from lower river anglers that the fish moved through too quickly and were less available to the fishery, but also drew favorable comments from upper river anglers who found more hatchery fish available to catch.

c) *Wild steelhead population status*: The 2014 Coastal Multi-Species Conservation and Management Plan (ODFW 2014) identifies the coastal winter steelhead SMU as "*Strong-Guarded"* meaning that populations are viable (including the Wilson River component) based on spatial structure and diversity. However, either a lack of robust data relative to all VSP parameters or conflicting indications of viability warrant a cautious management approach when providing societal benefits and fisheries, especially with respect to potential threats and limiting factors.

1.16.2) Potential alternatives to the current program.

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

Alternative 1: 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 47 program are provided in the Trask River Hatchery Stock 47 Winter Steelhead HGMP). As a result, production numbers of stock 47 winter steelhead into the Wilson River declined from 120,000 annually to approximately 40,000 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 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.

Alternative 2: Convert to 100% smolt release from a broodstock originating from naturally produced local stock in the Wilson River (i.e. existing stock 121W program).

Descriptions and Implications- This alternative would eliminate the Wilson River component of the stock 47 program, 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 additional adults from the wild population may be necessary. The ODFW plans to

implement this alternative beginning with the 2018 brood year, if agreed upon by all parties concerned.

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. This requires removal of wild adults for the hatchery program. It 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 programs.

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 this system. 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.

1.16.3) Potential reforms and investments.

1. Modify Tuffy Creek trapping facilities- Modification to the adult trapping facilities at Tuffy Creek, where some adult stock 121W 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. No cost estimates are currently available.

2. Trask Hatchery modifications- 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. The hatchery abatement pond could be modified by enlarging the current pond or building a new one at a different location on the hatchery grounds. Modifying the abatement pond could require re-plumbing of hatchery outflows and/or installation of a pump system. No cost estimates are available for these improvements.

3. Modify pumping facilities at Hughey Creek acclimation pond- the Wilson River has been subject to regular flood events. In 2006, record high flood levels inundated the

pumps, necessitating their replacement. In 2007, the same situation nearly occurred again, with flood waters falling just short of the pumps. Further elevation of the pumps, or other alternatives such as submersible or removable pumps, could be explored. No cost estimates are currently available.

4. Alternative hatchery operations, facilities and techniques, in regard to conservation and restoration of natural fish populations, will be one of the areas of research questions at the Oregon Hatchery Research Center. In the future, the results of this and other research efforts may lead to additional reforms and investments at Trask Hatchery and/or its satellite facilities.

SECTION 2

PROGRAM EFFECTS ON ESA-LISTED SALMONID

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

The HGMP for this program was submitted to NOAA Fisheries on April 2, 2001, for approval and take authorization for the ESA-listed fish. The HGMP revised and resubmitted multiple times. This is the latest version of the 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 currently are listed under the federal ESA as *Threatened*. The listed Coho Salmon inhabit the Tillamook Bay basin and may be incidentally affected by the winter steelhead (stock 121W) 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 Pearcy 1985; Hartt and Dell 1986). After the first summer in the ocean, a small portion of the males attain sexual maturity and return to spawn as jacks. Migration patterns during the fall and winter are unknown. Those fish remaining at sea grow little during winter but feed voraciously during the next spring and summer, growing to about 60 to 80 cm in length. During this second summer in the ocean, a substantial percentage of these maturing adults are caught in ocean troll and sport fisheries, usually to the south of their natal stream (Lewis 2000). The survivors return to their home streams or neighboring streams where they spawn and die to complete the life cycle.

Habitat Use and Freshwater Distribution

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

(Nickelson et al. 1992b; Rodgers et al. 1993). Little is known about residence time or habitat use of estuaries during seaward migration. It is usually assumed that Coho Salmon spend only a short time in the estuary before entering the ocean. However, recent research is finding that rearing in the upper ends of tidal reaches can be extensive.

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

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

The 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).

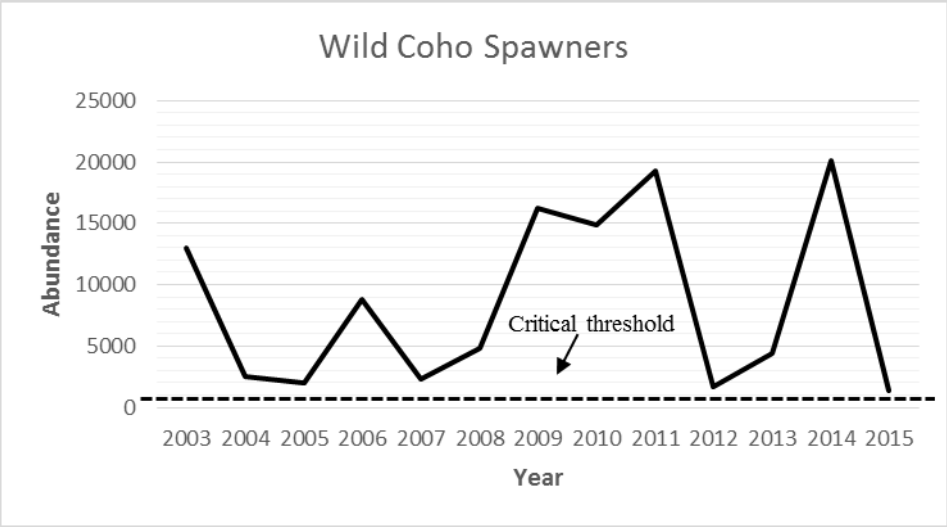

Figure 2-1. **Trend in adult wild Coho Salmon spawner abundance relative to the critical population level for the Tillamook Complex, 2003-2015.**

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: 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).

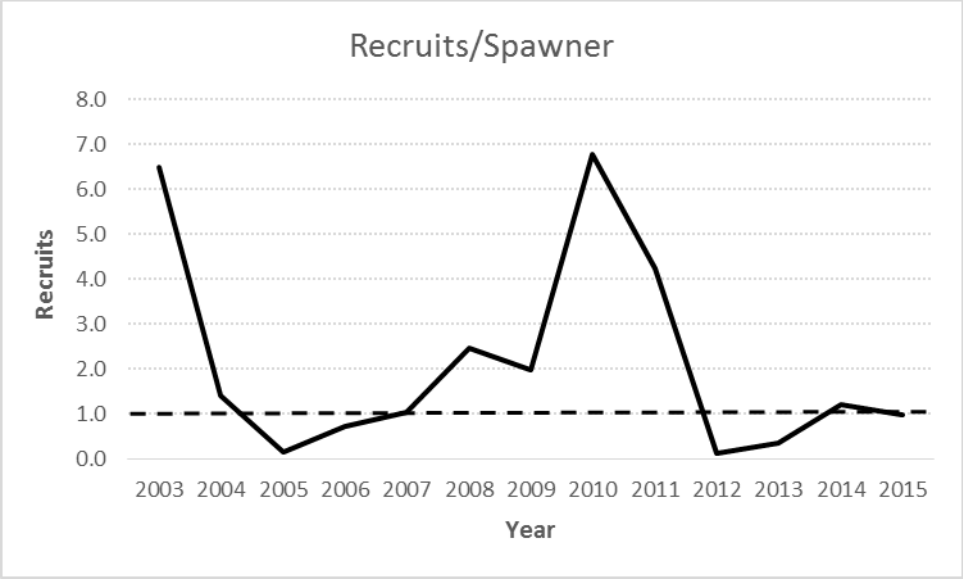

Figure 2-2. **Trends in Recruits per Spawner for Tillamook Complex Wild Coho Salmon, 2003-2015.**

- 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 impacted the 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 Salmon are also captured and handled by hatchery personnel at Trask Hatchery. Hatchery coho are used for broodstock (see Trask Hatchery stock 34 Coho HGMP for details of that program), as part of the stream enrichment program, or occasionally donated to food programs. Naturally produced coho encountered in the traps are transported upstream on the Trask River and released (see tables 2-4 and 2-5).

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

Naturally-produced Coho Salmon captured 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
2008-09	67	64	1	9
2009-10	66	175	2	18
2010-11	39	223	2	4

Data source: ODFW HMS database.

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

- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

See Table 2-5.

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

Trapping of adult stock 121W winter steelhead occurs primarily at the Tuffy Creek satellite facility; however, stray stock-121W winter steelhead are also encountered at the adult trap at Trask Hatchery. The purpose of trapping stock-121W hatchery winter steelhead is to recycle hatchery 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-121W hatchery 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:**	**Stock 121W StW trapping**
Location of Hatchery Activity:	**Trask Hatchery and Tuffy Creek**	**Dates of Activity:**	**Sept. 1 – May 15**	**Hatchery Program Operator:**	**ODFW**

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile /Smolt**	**Adult**	**Carcass**
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)		≤200*	< 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*	< 10***	
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.

b. Take associated with weir or trapping operations where listed fish are captured and transported for release.

c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.

d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.

e. Listed fish removed from the wild and collected for use as broodstock.

f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.

g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.

h. Other takes not identified above as a category.

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

**** All unmarked, naturally produced coho adults trapped are released upstream of the hatchery facility.**
***** No direct mortalities have been observed during trap and pass operations.**

Note: The take figures are not cumulative take but are total take for the trapping season. Collection occurs during trapping of spring chinook, fall chinook, summer steelhead and winter steelhead. The number of unmarked coho handled represents an annual total, and is not additive to numbers presented in other HGMP's.

SECTION 3

RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

Oregon Pan for Salmon and Watershed: 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 program is consistent with ODFW 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 MOA:
The Trask River Hatchery's Tuffy Creek satellite facility is operated under a Special Use Permit issued by the Oregon Department of Forestry. The permit is on file and can be reviewed at ODFW Headquarters at 4034 Fairview Industrial Drive 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.

Trask Hatchery stock-121W hatchery winter steelhead are mass marked (100%) as a means of integration of hatchery and harvest management. Mass marking will allow for selective harvest of hatchery fish while requiring release of all naturally produced steelhead. Mass marking will also allow for better monitoring and control of impacts of the hatchery program on naturally produced steelhead populations.

Incidental take of naturally produced Coho Salmon in harvests is limited by the ESA Section 4(d) rule. The 4(d) rule requires development of Fishery Management and Evaluation Plans (FMEP). Such plans 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 allowable has been in the range of 8-30% of the total pre-harvest Oregon Coast ESU natural coho abundance. Take varies based on marine survival and parental status(PFMC 1999). This standard is adopted as adequate for controlling incidental harvest impacts in this plan, and as addressed in FMEPs. All further address of harvest impacts will occur under the FMEPs. Estimated harvest impacts (ocean and freshwater combined) on naturally produced Coho Salmon for the period 1994 through 1999 averaged 9.2% and ranged from 6.8% to 12.4% (PFMC 1999). Adult Coho Salmon are likely encountered at a relatively low rate by anglers targeting hatchery winter steelhead. The Wilson River (above tidewater) is currently closed to angling for wild Coho Salmon.

The winter steelhead artificial production program is designed to have minimal biological impacts to naturally produced species. Likewise, fish culture practices are designed and carried out to rear full-term smolts to limit impacts to naturally rearing fish species.

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

The Wilson River basin winter steelhead recreational fishery will benefit from this program. This program began in 1997, when wild winter steelhead adults were first

collected for broodstock. Prior to 1997, only stock 47 winter steelhead were reared for release in the Wilson River. Winter steelhead releases are currently a combination of stock-47 and stock-121W. 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.

Major factors affecting natural production in the Wilson River are unknown; however, it is suspected that ocean survival may be among the largest contributing factors. In general, habitat condition is stable and possibly improving. A series of fires in the mid- to late-1930's and 1940's (Tillamook Burns) drastically impacted habitat with loss of shade, increased sedimentation, and loss of stream complexity in the Wilson River basin. Unfavorable natural events (flooding) are common in the basins and can have detrimental effects on egg depositions, incubating eggs, and juvenile rearing. However, these events also provide some long term benefits in the form of gravel and large woody debris recruitment.

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 may negatively impact program

Competition for food between stock 121W 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 may be negatively impacted by program

Competition for food between stock 121W 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 may 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 may be positively impacted by program

Adults of hatchery stock 121W 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-121W hatchery steelhead smolts and naturally produced Coho Salmon fry/juveniles are likely to be minimal. Hatchery-origin 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 naturally-produced 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 certified before release.

Target release size for stock-121W hatchery smolts is 6 fish 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-121W hatchery winter steelhead smolt releases typically take place in late March or April (occasionally into early May). The 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-121W 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-121W 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 Salmom broodstock, any steelhead that may return to the facility. 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. 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 Salmon 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 majority of Wilson River stock-121W wild winter steelhead adults are collected by anglers and held in the Hughey Creek acclimation pond. Water is supplied to the pond via electric pumps. Water is pumped directly from the Wilson River adjacent to the pond, with a typical flow of 250-300 gallons per minute. No water right is needed as this site is operated under the ODFW STEP program.

Winter steelhead adults held at the Trask River Hatchery are supplied with gravity flow water from Gold Creek. From the green-egg stage to the ponded fry (in incubator trays and starter tanks) stage the water source is Gold Creek and Mary's Creek. During the juvenile to full-term smolt stage, all fish are reared in water supplied from Gold Creek. Trask River Hatchery has a water right for a total of 10 cfs from Gold Creek and Mary's Creek. The facility is in compliance with the water rights, water withdrawals, and annual water uses reporting to Oregon Department of Water Resource.

Water temperatures typically range from 36° F to 50° F during the collection period. Water temperatures during incubation generally ranges from 41 to 55º F. Water temperatures during the rearing stage usually ranges from 41 to 65º F. Water temperatures may be manipulated if needed during rearing.

Trask River Hatchery currently operates and discharges effluents under a NPDES 300-J permit (Table 4-1). All conditions of the permit are administered within ODFW and regulated by the Oregon Department of Environmental Quality.

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

The risk of take at Trask Hatchery is minimal because listed fish are not intentionally passed above the hatchery trap facility and Gold Creek water intake structure. The Hughey Creek acclimation pond pump intakes are screened to NOAA criteria. Listed fish are present above the intake structure at the Tuffy Creek facility, ODFW is currently evaluating screen compliance at that facility and will work through the fish passage and screening program in order to comply with the NOAA Fisheries screening guidelines. All hatchery effluent from 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).

Wilson River stock 121W winter steelhead broodstock are captured by anglers (hook-and-line method) in the Wilson River then transported (by the angler/volunteer) to the Hughey Creek acclimation pond. Adults are held in a pen within the acclimation pond until transport to the Trask River Hatchery.

Additional stock-121W broodstock are captured at the Tuffy Creek facility fish ladder/trap located at RM 1.5 on South Fork Wilson River. Brood fish are held in fiberglass circular tanks until being transported to Trask Hatchery.

Wilson River stock-121W winter steelhead (hatchery) adults straying to the Trask River are collected in the hatchery trap on Gold Creek located at RM .2, at the Trask River Hatchery. These fish could be used for brood if needed to meet production goals. Alternative collection methods (such as seining, tangle netting, or remote traps) may be considered if necessary.

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

Wilson River stock-121W winter steelhead adults collected by anglers are placed in live boxes for transportation to the Hughey Creek acclimation pond (or in some cases directly to Trask River Hatchery). Live boxes utilized are usually specially made aluminum boxes or large coolers; however some anglers have custom made their own live boxes. Water volume varies by container, but typically is about 20-40 gallons. Live boxes are equipped with battery operated aeration systems, and anglers are instructed to change the water frequently. Transportation time varies depending on where fish are caught; fish may be held up to several hours in the live box.

Wilson River stock-121W winter steelhead broodstock are transported from the Hughey Creek acclimation pond and from South Fork Wilson River trap to Trask Hatchery in 200-430 gallon portable liberation tanks, typically equipped with oxygen diffusers and aerators. Transportation time is approximately 15 minutes to one hour depending on the location.

Live adults (spawned or unspawned surplus) returned to the Wilson River from Trask River Hatchery are also transported in portable liberation tanks as described above.

5.3) Broodstock holding and spawning facilities.

Wilson River stock-121W winter steelhead adults are held at the Hughey Creek acclimation pond prior to transport to Trask River Hatchery. Fish are placed in a 6’ by 4’ by 4’ aluminum pen within the acclimation pond.

After transport to Trask River Hatchery, Wilson River stock-121W winter steelhead broodstock are held for spawning in one of several Canadian style troughs housed within an outbuilding on the hatchery grounds. Adults could also be held in an outside concrete raceway (which has had an epoxy coating applied to reduce the roughness of the surfaces) if necessary.

5.4) Incubation facilities.

Incubation occurs in vertical stack incubator trays within the main hatchery building. Water is supplied with gravity flow at 4.5 gallons per minute from Gold Creek and Mary's Creek. A low-water alarm system is in place to detect interruption of water flow to the incubator trays. Up to approximately 5,000 eggs may be incubated in each tray. The facility is equipped with 24 stacks of incubation trays. Each stack contains 15 trays. The facility has a capacity to rear 1.8 million eggs. Immersion heaters or small chillers may be used to manipulate water temperature during the incubation stage.

5.5) Rearing facilities.

Newly hatched fry are transferred to Canadian troughs within the main hatchery building or within another outbuilding on the hatchery grounds. When the fish have outgrown the Canadian troughs, they are transferred to an outside raceway(s). The raceways measure 50'x 8'x 3.5', with a working depth of 2.6'. The volume is approximately 1,040 cubic feet or 7,800 gallons of water. Water flow to the raceway is supplied at a rate of 144 to 300 gpm. After the fish have been fin clipped in late summer they are transferred to two larger raceways for final rearing. These raceways measure 100'x30'x6' with a working depth of 3.5'. The volume is approximately 10,500 cubic feet or 78,500 gallons of water. Water flow is supplied to each raceway at 300 to 1,000 gpm.

5.6) Acclimation/release facilities.

The Hughey Creek acclimation pond is used to acclimate a portion of the stock-121W winter steelhead smolts, which are transferred from Trask Hatchery. Winter steelhead smolts are held in the acclimation pond for up to 14 days (average 5-7) prior to release. The above-ground raceway is vinyl-lined and measures 83 feet by 8 feet by 4.75 feet (approximately 17,600 gallons). Water for the pond is pumped from the Wilson River with three 5 horsepower (hp) pumps with a typical combined flow of 250-300 gpm (flow varies with river height). The site is equipped with an alarm system to alert staff or volunteers in the event of flow problems. In addition, a propane powered generator has been installed to provide electricity in the event of a loss of power.

The remaining stock-121W winter steelhead smolts are direct released into the Wilson River basin. Smolts are released in the mainstem Wilson River at various locations up to RM 33, or in the South Fork Wilson River at RM 1.5 (near the Tuffy Creek trap site).

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

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

The original start date of the program was delayed one year due to significant flood events in the winter of 1995-96 that precluded collection of broodstock.

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.

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

The Hughey Creek acclimation pond is equipped with an alarm system to alert staff or volunteers in the event of flow problems. In addition, a propane powered generator has been installed to provide electricity in the event of a loss of power. Staff or volunteers are typically present one or more times each day to check on the facility when fish are on-site.

SECTION 6

BROODSTOCK ORIGIN AND IDENTITY

6.1) Source.

Stock-121W winter steelhead broodstock are unmarked, wild winter steelhead adults returning to the Wilson River. Returning hatchery-origin adults may be used in the broodstock if necessary to meet production or fish management goals.

6.2) Supporting information.

6.2.1) History.

Wild winter steelhead are collected from the Wilson River. This stock is a naturally reproducing population in the basin. The program was scheduled to begin in the winter of 1995-96; however, no fish were collected that year due to severe weather conditions. The winter of 1996-97 was the first year of adult collection.

6.2.2) Annual size.

The existing stock-121W winter steelhead program typically requires a minimum of 50 females and 50 males for broodstock needs. Additional adults may be collected as necessary to cover shortages resulting from, but not limited to, fecundity variation, early egg mortality, positive disease test, etc.

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

The goal of the stock-121W winter steelhead program is to utilize 100% wild Wilson River winter steelhead for broodstock each year. Returning hatchery-origin adults of stock-121W winter steelhead may be collected if necessary to meet production or fish management goals. Past broodstock collections are presented in Table 7-1.

6.2.4) Genetic or ecological differences.

This program was founded using broodstock from locally adapted, naturally reproducing winter steelhead. There has been no intentional selection for any specific traits during broodstock collection. Although some inadvertent selection may have occurred, there are no known genetic differences between the hatchery and wild fish. Due to the relatively short term history of the program and lack of available data, it is currently unknown if there are any differences in adult age, size, and sex ratios between the hatchery and wild adults.

6.2.5) Reasons for choosing.

The stock-121W winter steelhead program produces smolts for release in the Wilson River basin. Wild winter steelhead were chosen as the broodstock source because they

are a locally adapted stock native to the Wilson River, and also to produce hatchery fish that are genetically similar to wild fish. Use of a locally adapted broodstock may reduce the negative impacts to natural populations due to hatchery program.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

Stock-121W winter steelhead broodstock selection should have minimal impact to listed naturally produced Coho Salmon. Naturally produced coho may be incidentally caught by anglers collecting broodstock; however, current angling regulations require the immediate release of all unmarked Coho Salmon in the Wilson River. The number of coho intercepted by anglers is not expected to increase due to anglers collecting broodstock since there are already fisheries taking place. Naturally produced Coho Salmon may also be trapped at trapping facilities associated with this program (Tuffy Creek or Trask River Hatchery). Any unmarked Coho Salmon trapped are passed upstream of the collection facility (Tuffy Creek) or transported further upstream on the Trask River (Trask Hatchery) and released to spawn naturally.

Additional risk aversion measures associated with the stock-121W winter steelhead broodstock collection (and selection) are discussed in Section 7.9.

SECTION 7

BROODSTOCK COLLECTION

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

The stock-121W winter steelhead program uses unmarked, wild adult winter steelhead collected from the Wilson River for broodstock. If necessary, returning stock-121W adult hatchery winter steelhead may also be utilized for broodstock.

7.2) Collection or sampling design.

Adult winter steelhead collected for broodstock are collected by angling (utilizing volunteer anglers) or are captured at a trapping facility. Broodstock collection occurs from December through April each winter/spring. Volunteer anglers randomly collect wild adult winter steelhead (or returning stock 121W adult hatchery winter steelhead) from throughout the run period and transport fish to the Hughey Creek acclimation pond, where they are held prior to transportation to Trask River Hatchery. Some anglers may transport fish directly to Trask Hatchery.

Wild adult winter steelhead and returning adult stock-121W hatchery winter steelhead adults are also trapped at the Tuffy Creek trap on the South Fork Wilson River (RM 1.5). Wild adult winter steelhead may be retained for broodstock, or may be passed upstream to spawn naturally. Stock 121W hatchery winter steelhead adults may be held for broodstock, recycled to the Wilson River or transported to standing waterbodies to provide additional angling opportunity, donated to food programs, or used in stream enrichment activities.

Some strays of hatchery winter steelhead returning to the Trask River Hatchery are collected in the Gold Creek trap, located at RM 0.2 throughout the return period. These fish may be held for broodstock, recycled to the Wilson River or transported to standing waterbodies to provide additional angling opportunity, donated to food programs, or used in stream enrichment activities.

Alternative broodstock collection techniques (such as seining, tangle netting, or remote traps) may be considered if necessary.

7.3) Identity.

Wild Wilson River winter steelhead adults collected for broodstock are unmarked. Returning adult stock-121W hatchery winter steelhead adults are externally marked with an adipose fin clip to differentiate them from wild steelhead, and from other stocks of hatchery steelhead (stock-47 winter and summer steelhead). Other fin marks may be considered if necessary for management purposes.

7.4) Proposed number to be collected:

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

Existing program typically utilizes a minimum of 50 females and 50 males for broodstock to meet production goals. Additional adults may be collected as necessary to cover shortages resulting from, but not limited to, fecundity variation, early egg mortality, positive disease test, etc.

Any wild adults not needed for the program are released back into the Wilson River to spawn naturally.

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

The goal of the stock-121W winter steelhead program is to utilize 100% wild Wilson River winter steelhead for broodstock each year. Returning stock-121W winter steelhead hatchery adults may be utilized for brood if needed to meet production or fish management goals. Broodstock collection levels are presented in Table 7-1.

Table 7-1. Trask River winter steelhead (stock 121W) brood collection levels, egg take and fry production for 1997-2010.

Brood Year[a]	Adults[b]			Eggs	Fry
	Females	Males	Jacks		
1997	30	25	0	67,560	56,599
1998	34	30	0	45,648	39,493
1999	46	57	0	108,850	69,772
2000	80	60	0	124,037	105,357
2001	56	59	0	104,520	76,444
2002	46	55	0	71,547	37,290
2003	58	50	0	99,232	74,931
2004	61	53	1	116,796	102,684
2005	96	79	1	179,439	161,485
2006	73	73	0	177,558	153,618
2007	99	74	0	188,649	168,140
2008	83	85	0	158,436	145,459
2009	181	171	1	162,626	149,641
2010	56	36	2	138,262	125,208

Data source: ODFW HMS database; Trask Hatchery files
[a] Adults were not collected prior to 1997.
[b] Includes total number of fish collected (both returning hatchery and wild fish). Wild fish not spawned were released back to the Wilson River

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

Surplus stock-121W hatchery adults not needed for broodstock may be recycled back into the Wilson River or transported to standing waterbodies to provide additional angling opportunities. Surplus adults may also be donated to food programs or utilized in stream enrichment activities. Mortalities may be disposed of in a landfill or by burial.

7.6) Fish transportation and holding methods.

Wilson River stock-121W winter steelhead adults collected by anglers are placed in live boxes for transportation to the Hughey Creek acclimation pond (or in some cases directly to Trask River Hatchery). Live boxes utilized are usually specially made aluminum boxes or large coolers; however some anglers have custom made their own live boxes. Water volume varies by container, but typically is about 20-40 gallons. Live boxes are equipped with battery operated aeration systems, and anglers are instructed to change the water frequently. Transportation time varies depending on where fish are caught; fish may be held up to several hours. Adults are held in a 6'x 4'x 4' aluminum pen within the Hughey Creek acclimation pond. Fish are removed and transported to Trask River Hatchery on a regular basis, typically 3 days per week.

Winter steelhead adults collected at Tuffy Creek on the South Fork Wilson 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 (approximately 5' diameter and 2.1' depth) adjacent to the trapping facility.

Wilson River stock-121W winter steelhead broodstock (and returning adult stock 121W hatchery winter steelhead) are transported from the Hughey Creek acclimation pond and from South Fork Wilson River trap to the Trask River Hatchery in 200-430 gallon portable liberation tanks, typically equipped with oxygen diffusers and aerators. Transportation time is approximately 15 minutes to one hour depending on the location. Adult stock 121W winter steelhead collected for broodstock and transported to Trask River Hatchery are held in fiberglass Canadian style troughs within an outbuilding on the hatchery grounds. Prior to being placed in the holding troughs, adult steelhead are anesthetized and sampled for sex, length, and weight. A scale sample, and in some years a DNA sample, is also collected. Fish are typically injected with an antibiotic, and temporarily placed in a recovery tank (which typically contains an artificial slime stimulant). Adults are typically also individually tagged (usually a Floy tag) for individual identification. Fish are held until spawning. Holding time varies depending on the ripeness of the fish, and may be from a few days up to 2-3 months. Relatively few adult mortalities have been observed utilizing this handling procedure.

Live spawned or surplus adult winter steelhead returned to the Wilson River from Trask Hatchery are also transported in portable liberation tanks as described above.
Trask Hatchery staff may trap some marked adults from this program in the Gold Creek trap which may be used for broodstock. Any fish collected in the trap are placed in an

adjacent holding pond and subject to the same procedures listed above for fish brought in from off-station collection activities.

7.7) Describe fish health maintenance and sanitation procedures applied.

Adult stock-121W winter steelhead adults collected for broodstock are usually given an antibiotic (such as oxytetracycline) injection when first collected, and are typically treated with an artificial slime stimulant prior to being placed in holding pens. Adults being held may be treated (typically with formalin or hydrogen peroxide) to control external fungus or parasites. Additional sanitation procedures are described in section 9.2.7. Also, see Attachment A for fish health management protocol.

7.8) Disposition of carcasses.

Adult stock-121W winter steelhead are live spawned and released (either by transportation back to the Wilson River or occasionally by releasing to the Trask River at the hatchery), to give them opportunity for multiple spawning in their life time. Any stock-121W wild winter steelhead adult mortalities will be disposed of in a landfill, or by burial.

Returning adult stock-121W hatchery winter steelhead carcasses may be donated to food programs, used in stream enrichment activities, or may be disposed of in a landfill, or by burial.

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.

It is unlikely that stock-121W winter steelhead broodstock collection will have any genetic effects on naturally produced salmonids. To minimize genetic and ecological effects between hatchery-produced winter steelhead and naturally-produced coho (and other salmonids), the following measures will be taken:

- Naturally produced coho that enter hatchery trap facilities will be released alive. The hatchery trap(s) will be visually checked at least daily, and fish sorted at least weekly (or as needed) to minimize delay and potential harm to naturally produced Coho Salmon.
- Stock-121W winter steelhead will be managed as a hatchery broodstock isolated to the extent possible from naturally produced fish populations in the Wilson River basin. Only wild steelhead winter steelhead adults returning to the Wilson River, or their offspring, are currently used in the broodstock. See Section 1.16.2 for possible alternatives to the program.
- No transfers from other hatchery winter steelhead broodstocks for breeding purposes into stock-121W are permitted.
- A disease monitoring plan will be implemented (Attachment A).

- To safeguard against catastrophic loss of broodstock, excess adults may be retained.

SECTION 8

MATING

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

8.1) Selection method.

Collection of winter steelhead for use as broodstock occurs throughout most of the run (December through April). Spawning usually occurs from late January through April or early May. Spawning is done randomly based on availability of ripe fish at the time of spawning. It is assumed that the spawning population is representative of the entire run of winter steelhead, since adults are collected randomly from the returning population. Excess eggs may be collected to assure meeting the production goal.

Adults (males and females) are chosen randomly based on their maturity/ripeness. Stock 121W winter steelhead adults are examined on a regular basis (typically at least weekly) throughout the holding period to check for ripeness. Fish are spawned periodically throughout the winter as they become ripe.

8.2) Males.

Males are typically only used once during spawning. If necessary, in the case of a shortage of males or a shortage of ripe males on a given day, individual fish may be spawned more than once. One salt males (jacks) are included in the broodstock when available.

8.3) Fertilization.

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

Spawning may also be conducted using a modified matrix scheme, if necessary. Eggs from one or more females are spawned into a single plastic bucket and mixed (if more than one). The eggs are then divided into separate buckets. An equal number of males are spawned (if possible), one into each of the buckets of eggs. These groups are held separate and transferred to the incubation facility in the plastic buckets. Once in the incubation facility, the fertilized eggs are water hardened in a solution of iodophor and placed in the incubation baskets. Each family group is incubated in separate baskets. This matrix-spawning regime provides for the possibility of multiple family groups per each female spawned.

Ovarian fluid samples are taken from up to 60 females for viral testing. Fish health and sanitation procedures are described in Attachment A.

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.

No genetic or ecological effects to naturally produced fish species is expected from the mating scheme of the stock-121W winter steelhead program. However, to maintain the genetic diversity within the propagated winter steelhead population, broodstock is randomly selected from throughout the entire run. Spawning is done randomly based on availability of ripe fish and eggs are fertilized employing a modified matrix. Matings are done with a goal of a 1:1 sex ratio (i.e. one male and one female). Each fish is only used once in spawning, however if necessary, in the case of a shortage of males, individual fish may be spawned more than once.

SECTION 9

INCUBATION AND REARING

9.1) Incubation:

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

Current egg take goal is 180,000 green eggs. See table 9-1 for previous egg takes for this program.

Table 9-1. Eggs Taken and Survival Rates of Stock 121W Winter Steelhead at Trask River Hatchery for Brood Years 1997-2010.

Brood Year	Egg Take	Eyed Eggs	Percent Survival to Eye-up
1997	67,560	59,740	88.4%
1998	45,648	40,771	89.3%
1999	108,850	96,284	88.5%
2000	124,037	112,553	90.7%
2001	104,520	86,518	82.7%
2002	71,547	50,653	70.8%
2003	99,232	84,550	85.2%
2004	116,796	106,169	90.9%
2005	179,439	160,084	89.2%
2006	177,558	162,695	91.6%
2007	188,649	174,455	92.3%
2008	158,436	148,736	93.9%
2009	162,626	154,200	94.8%
2010	138,262	128,051	92.6%

Data source: HMS, Trask River Hatchery files.

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

Additional eggs from stock-121W winter steelhead may be collected in order to compensate for egg to smolt mortality in order to meet production goals.

Surplus eggs from wild STW are not culled. Any surplus is handled at the fry or fingerling stage. See section 10.8 for details. Eggs from returning 121W hatchery adults not needed for production may be culled at the egg stage.

9.1.3) Loading densities applied during incubation.

Winter steelhead green-egg size is approximately 200 eggs per ounce. Heath style incubator trays are loaded with approximately 4,000 eggs per tray. This would represent approximately 80% of the capacity of the tray.

9.1.4) Incubation conditions.

The water supply to the egg incubator is supplied by Mary's Creek and Gold Creek. The water is monitored for flow and temperature regularly. Flow through the incubation stacks averages approximately 4.5 gallons per minute. The incubating eggs are held in water that is generally 41º to 55ºF. Dissolved oxygen (DO) levels are typically not monitored during incubation, but natural DO levels of the in-flow are in the range of 10-11 ppm. Water temperature may be manipulated if necessary to bring all egg groups to the same developmental stage in order to reach a common ponding date. The incubation facility is subject to silting problems, as the incoming water will carry fine materials during heavy rain events. Incubating eggs are treated with formalin (or other approved treatments) to control fungus.

9.1.5) Ponding.

Fry are physically relocated from the incubator trays to starter troughs in the hatch house (or in another outbuilding on the hatchery grounds) when most of the fry are visually estimated to be fully buttoned up. This occurs with approximately 1,000 to 1,100 temperature units. Winter steelhead fry average approximately 2,000 fish per pound at the time of ponding.

9.1.6) Fish health maintenance and monitoring.

Green eggs are disinfected with an iodine solution (100 parts per million [ppm] for 15 minutes) just prior to water hardening. During green-egg through eyed-egg stage, eggs are treated regularly with formalin (or other approved chemical) to control fungus. At eyed-egg stage, egg mortalities are removed. Any additional egg mortalities are removed periodically as needed until to the ponding stage.

See Attachment A regarding ODFW-approved fish health management protocols.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

Incubation of stock-121W hatchery winter steelhead eggs should have no genetic effects on naturally produced fish species. To minimize ecological effects to the receiving stream and the inhabiting natural fish populations, hatchery personnel check incubating eggs regularly to remove dead eggs, treat eggs for disease/fungus, and keep the incubation facility clean to prevent transmission of diseases.

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.

Survival data for stock-121W winter steelhead at Trask River Hatchery from fry to the time of marking and release is presented Table 9-2. Survival rates to release have ranged from approximately 43-91%.

Table 9-2. **Survival Rates of Stock-121W Winter Steelhead at Trask River Hatchery, 1997-2010.**

Brood Year	Fry Ponded	Juveniles at Marking	Fish Released[1]	Percent Survival to Marking	Percent Survival to Release
1997	56,599	42,225	42,064	74.6%	74.3%
1998	39,493	24,728	20,530	62.6%	52.0%
1999	69,772	54,515	50,254	78.1%	72.0%
2000[2]	78,329	35,306	34,070	45.1%	43.4%
2001	76,444	54,571	47,106	71.4%	61.6%
2002	37,290	32,935	29,033	88.3%	77.9%
2003[2]	74,931	49,107	45,920	65.5%	61.3%
2004[2]	102,684	68,679	68,033	66.9%	66.2%
2005	161,485	146,370	141,802	90.6%	87.8%
2006[2]	153,618	124,199	110,051	80.8%	71.6%
2007	168,140	163,105	153,271	97.0%	91.2%
2008	145,459	140,390	124,666	96.5%	85.7%
2009	149,641	140,381	130,767	93.8%	87.4%
2010	125,208	110,215	107,218	88.0%	85.6%

Data Source: ODFW HMS database; Trask River Hatchery files

[1] Includes fry and/or fingerling releases

[2] Cold water disease caused substantial fry loss in these years.

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

The criteria for Trask River Hatchery fish density and loading varies considerably through the various life stages and by rearing container. Rearing densities are below goals set by Piper (1982).

Fry are typically ponded into starter troughs at about 2,000 fish/lb after they button up. Juveniles are transferred outside to concrete raceways after about one month. Juveniles are moved into two larger raceways at the time of fin-marking (usually late summer). Density targets from fry to smolt are not to exceed 1.0 pound of fish per cubic foot of water. Density in the raceway is typically less than 0.5 lbs/ft^3. Flow through the raceway is typically around 400 gpm when fish are first transferred to outside raceways. Flow increases to 500-1,000 gpm when fish are transferred to the larger raceways after marking.

Stock-121W winter steelhead are reared to smolt size in raceways. Maximum density in the raceways would be approximately 0.8 fish/lb at the time of release.

The maximum loading level criteria for rearing in the raceway is 10 lbs of fish per gpm. Actual pond loading level in the raceways is approximately 8 lbs of fish per gpm at time of release (when fish are at their maximum size).

9.2.3) Fish rearing conditions.

Winter steelhead reared at Trask River Hatchery grow on incoming river water (from Gold Creek and/or Mary's Creek); hence, rearing water temperatures vary with seasons and with natural fluctuations. Water temperatures range approximately from 45º to 65ºF during spring and summer and from 36º to 45º F during the fall and winter. Dissolved oxygen (DO) levels coming into the facility are typically between 10.0 ppm and 11.0 ppm in the fall and winter. However, in the summer, DO levels can be as low as 7.0 ppm. Re-circulation of effluent water through the ponds is possible. Portable aerators may also be used to supplement oxygen levels if necessary and available.
Monitoring of the pond conditions is done daily at feeding time. While feeding fish, personnel are observing for signs of stress, disease, water clarity, and general fish behavior. Pond mortality is picked and recorded daily. During late summer and early fall, the fish are closely monitored by hatchery or ODFW Fish Health staff for external parasites. Water quality is monitored under the NPDES permit 300-J to meet the water quality limits and standards, and monitoring data are reported quarterly to DEQ.

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

Fish growth samples (weight) are collected regularly and data are reported on the ODFW Hatchery Management System (HMS) database. 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 9-3 shows typical monthly average weights of program fish from ponding to release.

Table 9-3. **Typical Monthly Fish Size for Trask River Hatchery Stock 121W Winter Steelhead.**

Month	Number of fish/pound*
February	--
March	--
April	--
May	2000.0
June	878.6
July	257.3
August	82.1
September	47.4
October	37.0
November	24.9
December	18.5
January	14.5
February	10.8
March	7.1
April	7.0

Data Source: ODFW HMS database; Trask River Hatchery files
* Numbers represent end-of-month averages

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

Once the fry have been ponded, their weight increases substantially (approximately doubles) each month (see Table 9-3) until the time of marking. After marking, feeding is programmed to ensure that the fish do not exceed pond density limitations and are on target to meet production size goals. Fish growth rate slows as they reach the pre-smolt and smolt stages.

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

Trask River Hatchery-origin stock-121W winter steelhead juveniles are fed a fish food diet at a rate and frequency that varies with fish size. Feeding rates may vary due to water temperature, water clarity, or other factors influencing food consumption. For the first 90 days following ponding, the fish are typically fed 8 to 12 times per day. For the next 90 days, they are fed 4 to 6 times per day. During the final stages of rearing, the fish are fed a programmed amount at a rate that will control their growth in order to meet the

desired size and condition factor at release. Food conversion rates generally range from 0.5 to 1.0.

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

Fish health of rearing juvenile winter steelhead is monitored regularly by Trask River Hatchery staff and ODFW fish health staff. ODFW fish health staff diagnoses disease problems and prescribes the appropriate treatments to eliminate or control disease.

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

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

Weight samples of the fish are taken monthly to ensure proper growth rate (Table 9-3). Prior to release, length frequencies are taken (Table 9-4) and condition factors may be calculated. A visual mark quality check is conducted on a representative sample of the fish targeted for release to determine fin-clip retention rates.

Table 9-4. **Average Fork Length Frequency Percentages at Release.**

Fork Length Size Range	Average Percentages at Release
< 18 cm.	30.5%
18-22 cm.	66.3%
> 22 cm.	3.2%
Data Source: HMIS; Trask River Hatchery files	

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

No “natural” rearing methods are used in this program.

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

Stock-121W winter steelhead reared in this program are not listed under either the Federal or State ESA. However, winter steelhead smolts will be released to the Wilson River basin as yearlings to encourage rapid migration and minimize interactions with naturally produced salmonids.

Winter steelhead smolts released in the Wilson River basin are either hauled and directly released in the S.F. Wilson River or the mainstem Wilson River, or are acclimated and released from an acclimation pond on the lower Wilson River. The majority of smolts should quickly migrate downstream, minimizing the amount of time spent in the freshwater portions of these basins.

SECTION 10

RELEASE

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

10.1) Proposed fish release levels.

Table 10-1. **Proposed fish release levels of stock 121W winter steelhead.**

Age Class	Maximum Number	Target Size (fish/lb)	Release Date	Location
Eggs				
Unfed Fry (STEP)	2,000	1,000-2,000	March	Wilson River basin, or standing water bodies[1]
Fry[2]	Surplus	1,000-2,000	March-April	Suitable waterbodies per ODFW policy (OAR 635-007-0545)
Fingerling[2]	Surplus	15-30	Sept.-Oct.	Suitable waterbodies per ODFW policy (OAR 635-007-0545)
Yearling	Current release # of stock 121W is 110,000 smolts annually. Release # may increase to 150,000 smolts, if release of stock-47 into Wilson River is eliminated or altered or as appropriate.	6.0	Late Mar.-early May	Wilson River basin

Data Source: ODFW hatchery production schedules; District files; Trask River Hatchery files

[1] This program does not currently supply eggs to STEP programs, but could be utilized if desired or needed in the case of a shortage of other stocks. The specified release level is a maximum number, based on the number of eggs that would be provided to the program.

[2] This program does not produce fry and/or fingerlings for release as a program goal for stock 121W winter steelhead. In any given year there may be surplus fingerlings (typically from above average fry and fingerling survival). These will be released into suitable waterbodies or destroyed per ODFW policy (OAR 635-007-0545).

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

Smolt Releases – Target Release:

Stream, river, or watercourse: Wilson River

Release point: Hughey Creek Acclimation Pond**,** RM 6.5
South Fork Wilson River, RM 1.5
Wilson River- various access sites 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.

Past examples of stock 121W winter steelhead releases are presented in Table 10-2.

Table 10-2. **Wilson River Basin Stock 121W Winter Steelhead Releases (1997-2015 brood years).**

Brood Year	Eggs/ Unfed Fry[1]	Avg Size	Fry	Avg Size	Fingerling[2]	Avg Size	Smolt	Avg Size
1997							41,739	13.8
1998							20,505	12.6
1999							50,254	8.9
2000			27,028	n.a.			34,070	6.8
2001							46,989	5.3
2002							29,033	6.1
2003							45,904	6.3
2004							67,990	6.6
2005			62,277	158			79,554	6.1
2006			33,195	181			76,844	7.5
2007			32,598	140	20,023	91.9	103,839	6.7
2008			29,605	199			95,039	8.0
2009			25,720	169			104,878	6.4
2010			5,184	110			102,026	7.8
2011			15,603	127	14,194	93.5	101,672	8.9
2012			17,846	130			103,635	7.4
2013	244	n.a.	23,922	111	22,304	76.3	107,733	7.2
2014	488		18,396	109	14,434	86.7	106,724	6.4
2015	287				4,072	70.0	104,104	7.1
Average[3]	**340**	**n.a.**	**26,489**	**147**	**15,005**	**84.6**	**74,870**	**7.2**

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

[1]STEP Releases

[2] Fingerling releases were to suitable riverine habitats

[3] Average is calculated based on years when releases occurred.

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

Stock 121W winter steelhead release dates are presented in Table 10-3. See Section 10.5 for fish release protocols.

Table 10-3. **Actual Release Dates for the Wilson River Stock 121W Winter Steelhead Smolts, 1998-2015.**

Release Year	Release Dates
1998	4/3; 4/8; 4/9
1999	4/5; 4/6
2000	4/23; 5/1
2001	30-Apr
2002	4/29; 5/2
2003	4/30; 5/1
2004	4/22; 4/26
2005	4/4; 4/5; 4/11; 4/27
2006	4/5; 4/12; 4/24; 5/1
2007	3/27; 4/3; 4/30; 5/7
2008	3/24; 3/31; 4/21; 4/28
2009	4/13; 4/22; 4/27; 5/5
2010	4/5; 4/10; 4/26; 4/29
2011	4/12; 4/15; 4/25; 4/28
2012	4/16; 4/17; 5/1
2013	4/16; 4/22; 4/30; 5/3
2014	4/14; 4/15; 4/22; 4/28; 5/14
2015	4/15; 4/21; 4/29; 5/4
2016	4/12; 4/18; 4/26; 4/29

Data source: ODFW's Hatchery Management System (HMS) database. Note: Unless directed otherwise by fish health or Department staff, date(s) of release is determined annually based on the ODFW production schedule and the size and condition of the fish.

10.5) Fish transportation procedures, if applicable.

Stock-121W winter steelhead smolts released in the Wilson River basin are hauled in liberation trucks to the selected release (or acclimation) site(s). Liberation trucks are typically 1,000-2,500 gallon capacity units, either mounted on a large flatbed truck, or a tanker style truck. The liberation trucks are typically equipped with oxygen diffusing systems, water re-circulation pumps, and may have dissolved oxygen meters. Portable liberation tanks may also be used if necessary. Hauling time varies depending on the release site, with a maximum of approximately one hour.

Winter steelhead smolts released from the Hughey Creek acclimation pond on the Wilson River are released directly from the pond into the river. A standpipe at the downstream end of the pond is removed, and fish exit the pond through an outflow pipe. Smolts are crowded from the upstream end of the pond towards the exit pipe. Generally, once the pond has mostly drained, the last few remaining smolts must be hand netted and placed into the outflow at the pipe.

Juvenile winter steelhead in excess of production needs may be released to suitable water bodies at or prior to the time of marking, as per ODFW policy OAR 635-007-0545. Juveniles may be hauled in liberation trucks (as above) or portable liberation tanks to the selected release location.

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

Hughey Creek acclimation site is located on the Wilson River (RM 6.5). The facility is an above ground raceway with a vinyl liner supported by a galvanized steel frame. The dimensions are 83' x 8' x 4'9". The approximate working volume is 2,324 cubic feet or 17,600 gallons. Water is supplied from the Wilson River by three 5-hp pumps. Flow rates vary depending on river level, but the typical total flow rate is approximately 250-300 gpm. Pump intakes are screened to meet ODFW/NOAA screening requirements. Fish are hand fed a maintenance ration during the acclimation period. When in operation, smolts are transferred to acclimation site and held for up to 14 days (average 5-7 days). Release is by draining the pond directly to the river. Fish may leave volitionally via an unscreened standpipe.

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

Stock-121W winter steelhead smolts are mass marked (100%) with an adipose fin clip (although alternate clips may be used if necessary). If used, stock-121W fry released from STEP programs are unmarked.

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

Any juvenile fish surplus to production goal may be released as per ODFW policy (OAR 635-007-0545) into suitable water bodies as fry or fingerlings. This occurs prior to or at the time of marking, not at the time of smolt release. Smolt releases have generally been within programmed and approved levels.

10.9) Fish health certification procedures applied pre-release.

See Attachment A.

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

In the event a flood or water system failure causes an emergency release of winter steelhead juveniles, the release will only occur after:

- The hatchery crew has exhausted all possibilities for retaining the fish.
- The hatchery crew has consulted with the ODFW District Fish Biologist.
- The release will be into the Wilson River, Trask River at the hatchery, or into a closed water body, as directed by the District Fish Biologist.

Emergency releases at Hughey Creek acclimation pond would be accomplished by removing the standpipe and directly releasing the smolts into the Wilson River. This facility is equipped with an alarm system to alert staff and volunteers in the event of a loss of water flow. A propane generator as a backup power supply has been installed at the site.

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-121W winter steelhead are reared to full-term, yearling smolts and released before or at approximately the same time 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 strategy of releasing fish as full-term smolts should minimize potential interactions and adverse ecological effects that may occur between hatchery winter steelhead and naturally produced juvenile salmonids rearing or migrating through these systems.

SECTION 11

MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

This section describes how "Performance Indicators" listed in Section 1.10 will be monitored.

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.

Existing staff, funds and resources are available to conduct the following monitoring and evaluation activities. These activities will directly measure performance standards and indicators previously described in Sections 1.9 and 1.10. Information on the catch of 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 caught fish is not routinely developed for all stocks. Economic data that is compiled is available in the Salem Headquarters.

Salmon and steelhead population health goals are currently being addressed through *Oregon Plan for Salmon and Watersheds* activities and through the 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. Additional information regarding the number of naturally spawning winter steelhead of hatchery origin may become available in the future.

Monitoring of in-hatchery performance and adult returns at Trask River Hatchery and at the Tuffy Creek (S.F. Wilson River) facility will be conducted by the hatchery personnel. This information is stored on the ODFW mainframe computer in the HMS database. This will include at least the following information:

Adults

- The number of females, males, and jacks (one-salt adults) collected at, or transferred to, Trask River Hatchery and Tuffy Creek, (Standard 2.1; 3.3).

- Number of unmarked winter steelhead, unmarked coho, fall Chinook, chum, and cutthroat handled and released from Trask River Hatchery and Tuffy Creek, (Standard 4.5).

- Any observed mortalities of unmarked winter steelhead, unmarked coho, fall Chinook, chum, and cutthroat handled at Trask River Hatchery and Tuffy Creek (Standard 4.5).

- Date of entry into the Trask River Hatchery (or collected by anglers), or Tuffy Creek trap, specified by hatchery and naturally produced fish, (Standard 2.1).

- Date of entry into the Trask River Hatchery trap (or collected by angling), or Tuffy Creek, for fish retained for broodstock, (Standard 2.1).

- Dates of spawning at Trask River Hatchery, (Standard 2.1).

- The number of males, jacks and females spawned, (Standard 3.3).

- Fecundity of females spawned, (Standard 2.1).

- Disposition (spawned, sold, stream enrichment, etc.) of all winter steelhead collected, (Standard 4.4).

Juvenile Rearing

- Monthly number of eggs/fish on hand, mortality, feeding rate, and growth, (Standard 4.1).

- Results of fish health checks and any incidence of disease occurrence, (Standard 4.1).

- Results of water quality sampling, (Standard 4.2).

Release

- Number of fish released, by mark type, (Standard 1.2, 2.2).

- Fish age and size at release; average weight, and length frequency distribution, (Standard 2.3).

- Location of releases, (Standard 2.2; 2.3).

- Date releases started and ended, (Standard 2.2).

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

Funding and staffing are available as part of normal hatchery operation for those activities associated with hatchery operations. Funding and staffing are also currently in place for OPSW monitoring activities. Funding is being pursued to implement monitoring described in the Coastal Multi-Species Conservation and Management Plan.

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

notice. This could result in elimination or reduction in the hatchery program and associated monitoring and evaluation activities.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

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

SECTION 12
RESEARCH

There are no research programs conducted in direct association with the Wilson River winter steelhead program described in this HGMP. ODFW conducts a life cycle monitoring project on the East Fork Trask River. In addition, ODFW conducts limited steelhead spawning surveys annually to assess trends in escapement.

SECTION 13
CITATIONS

Citations:

Federal Register Notice. 1998. Endangered and Threatened Species; Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California. Vol. 63, No 53, pp 13347-13371.

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Solazzi, M.F., S.L. Johnson, B. Miller, T. Dalton, K.A. Leader 2003. Salmonid Life-Cycle Monitoring Project 2002 Monitoring Program Report Number OPSW-ODFW-2003-2, Oregon Department of Fish and Wildlife, Salem, Oregon.

SECTION 14

CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

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

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

Signature: _____ Date: _____

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

Signature: _____ Date: _____

ATTACHMENT A

Table A-1
Hatchery Programs Stock Code and Species Disease History (1995 to Present) by Fish Stock at Trask Hatchery, East Fork Trask Pond, and Tuffy Creek Pond.

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

[a] "Yes" indicates detection of the pathogen but in many cases no disease or fish loss was associated with presence of the pathogen. "No" indicates the pathogen has not been detected in that stock.
[b] Stocks held at Trask Hatchery.
[c] Stocks held at East Fork Trask Pond.
[d] Stocks held at Tuffy Creek Pond.
CHF = Fall Chinook Salmon
CHW= Winter Chinook Salmon
CHS= Spring Chinook Salmon
STW = Winter Steelhead
Co=Coho Salmon Trout
Stock 34 =Trask River
Stock 121W = Wilson River
Stock 047= Nestucca River

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

- All fish health monitoring will be conducted by a qualified fish health specialist.
- Annually examine broodstock for the presence of viral reportable pathogens. Number of individuals examined, usually 60 fish, will be great enough to assure a 95 percent chance of detection of a pathogen present in the population at the 5 percent 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 5 times per week for fungi prevention on eggs; and juvenile fish are treated with formalin. 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). Cold water disease is treated with florefenicol (such as Nuflor) at 15mg per Kg of fish for 10 days. Each spring a 28-day feeding of Aquamycin (erythromycin) medicated feed is administered to the coho juveniles under an INAD to prevent bacterial kidney disease. Adult Wilson River steelhead are given oxytetracycline injections under a veterinary prescription to prevent furunculosis and 1:6,000 formalin treatments for 3 to 7 days per week to prevent external fungi infections. At East Fork Trask Pond, the spring Chinook juveniles are given potassium permanganate1-hour baths at 1.0 ppm treatment on the first day and 1.25 ppm treatment on days 2 and 3 to control bacterial gill disease. Chemical treatments for pathogens have been necessary at Tuffy Creek Pond.

When necessary, hydrogen peroxide is used to treat trichodinids and gyrodactylids according to label requirements.