HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	**Cedar Creek Hatchery Winter Steelhead Program**
Species or Hatchery Stock:	**Winter Steelhead *Oncorhynchus mykiss* Stocks 47 & 47W**
Agency/Operator:	**Oregon Department of Fish and Wildlife**
Watershed and Region:	**North Coast Watershed District, West Region**
Date Submitted: **First Update Submitted:** **Second Update Submitted:** **Third Update Submitted:**	**March 12, 2004** **March 31, 2008** **October 22, 2014** **July 20, 2016**
Date Last Updated:	**July 20, 2016**

SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Cedar Creek Hatchery, Nestucca River winter steelhead program (Stock 47 and 47W). Stock 47 is the long term stock originally of Alsea River origin. Stock 47W is wild Nestucca River stock. 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 47W for consistency and ease of reading.

An allotment of stock 47 is targeted for release in the Tillamook Bay Basin, however they are transferred to Trask Hatchery facilities as marked fingerlings. A portion of this HGMP will cover the broodstock activities, spawning and early rearing component for the program as a whole. The Tillamook Bay Basin component will then be addressed under the Trask Hatchery Stock 47 Winter Steelhead HGMP beginning with juvenile rearing at the time of transfer into that facility.

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

The Nestucca River winter steelhead *Oncorhynchus mykiss*, are part of the Oregon Coast Steelhead Evolutionary Significant Unit (ESU), which was designated as a candidate species under the Federal Endangered Species Act (ESA) on March 19, 1998 (Federal Register Notice 1998). These fish are also a sensitive species under Oregon's Sensitive Species Rule (OAR 635-100-0040).

1.3) Responsible organization and individuals.

Lead Contact:

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Onsite Lead Contacts:

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

- Funding for this program is currently a mix of several sources.
- Cedar Creek Hatchery has a staff of 3 permanent full-time employees.
- The annual budget for the winter steelhead program is as follows:

Table 1-1 Winter Steelhead Program Annual Budget

Year	Total Budget	Steelhead Budget	Percent of Total	Steelhead Smolts
2004	$250,170	$85,058	34%	118,647
2005	$266,250	$79,875	30%	95,910
2006	$266,250	$89,194	33.5%	119,479
2015 (est)	$372,442	$145,252	39%	140,000
Source: (ODFW)				

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

Adult Collection:

Cedar Creek Hatchery is located in the Nestucca River watershed 1.5 miles east of Hebo, (on Highway 22), at River Mile (RM) 2.25 on Three Rivers. The hatchery facility is located on the east side of the highway, the Three Rivers weir / trap complex is located across the highway (west) from Cedar Creek Hatchery. All trapping activity takes place at the Three Rivers weir / trap complex (referred to as the Three Rivers trap). The elevation is 43 feet above sea level, with a latitude of 45º 12’ 57” N and a longitude of 123º 50’ 43” W. The total land area of the hatchery is 35.33 acres.

Beginning in November, stock 47 adults return to the Three Rivers trap and are collected for broodstock and held until spawning in early January. Refer to Section 5 for further facility detail.

Wild broodstock (47W) adults are collected by angling, beginning in mid December and running through April. Low numbers of wild stock fish are trapped in the Three Rivers trap. Currently most fish are passed above the weir to spawn naturally. Wild adults collected at the trap may be used for broodstock.

An off station trapping facility was constructed on Bays Creek, a tributary to the mainstem Nestucca, at approximately RM 21.75 while research activities associated with these hatchery programs was being conducted. This site is no longer in use as research activities have ceased. Alternative brood collection methods such as an offsite trap facility, seining, or tangle netting may be used if necessary to meet production or fish management goals.

Spawning, egg incubation, rearing:

Stock 47 adults are typically spawned in January and eggs are incubated onsite (or may be incubated at alternative locations to be determined if necessary). All phases of hatchery operation, including adult broodstock collection (alternative collection sites may be utilized if necessary) and early rearing, occur at Cedar Creek Hatchery. Approximately 45,000 stock 47 juveniles are transferred to Tuffy Creek Rearing Pond (Trask Hatchery satellite facility), after marking at Cedar Creek. These transferred fish are production for the Wilson River and are addressed in the Trask Hatchery Stock 47 Winter Steelhead HGMP. Refer to Section 5 for further Cedar Creek Hatchery facility detail.

Stock 47W adults are spawned from throughout the collection period as they become ripe. All spawning, incubation and rearing take place at Cedar Creek Hatchery.

1.6) Type of program.

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

STEP Hatchbox – The use of stream side, or classroom, incubators to provide educational/learning opportunities to students.

1.7) Purpose (Goal) of program.

Hatchery winter steelhead smolts are released in the Nestucca, and Wilson River basins with a goal of providing adults for freshwater harvest.

1.8) Justification for the program.

The program is designed to support a consumptive, hatchery stock, sport fishery in the identified systems. The hatchery program produces full-term smolts for release into the identified systems, and the STEP classroom incubator program produces unfed fry. The rivers sections where releases take place are closed to angling for non adipose fin-clipped Coho Salmon.

Releases in the Nestucca basin currently are a mix of 47 and 47W stock winter steelhead. The new 47W stock was developed and evaluated as per Oregon Fish and Wildlife Commission action and direction under OAR 635-500-5400 with the intent of transitioning to a local broodstock after an interim period for evaluation of the two stocks performance. Both stocks are currently used to maintain the historic angling timeframe. Complete conversion to 47W stock would likely reduce catch rates in the early portion of the fishery. Stock 47 steelhead show a higher propensity to stray and appear to contribute to the creel at a much lower level. See Attachment E for an evaluation summary.

Currently, releases in the Wilson River will remain a mix of 47 stock and 121W stock, (Wilson wild broodstock).

This program releases yearling smolts to encourage rapid migration to the ocean, which should minimize residualism and ecological interactions with wild juvenile steelhead and other wild fish juveniles. Releases occur in locations that are mid to low in the watershed and seek to reduce impacts in wild steelhead juvenile rearing areas to further minimize these types of interactions. Standard fish health inspections and are done for both adult and juvenile steelhead in this program, to minimize potential disease concerns. The hatchery reared steelhead are mass marked to allow positive identification of hatchery fish throughout their life cycle. The basins where this program releases hatchery steelhead are managed for selective harvest of marked (hatchery) steelhead adults, and require that all unmarked steelhead caught must be released unharmed.

Low numbers of unfed fry are released from STEP classroom incubator education programs. When operational, these programs use stock 47 steelhead. Small numbers and release locations isolated from main wild production areas are assumed to minimize impacts to any native species in the respective basins.

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

Harvest

Standard 1.1: Provide adult hatchery steelhead for harvest in such a way that impacts to wild steelhead populations are minimized, and impacts on naturally produced coho will be minimized during the winter steelhead sport fishery. **(Benefit)**

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

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

Indicator: Comparison of stock performance, including but not limited to, catch, catch timing, and location. **(Benefit)**

Standard 1.2: Hatchery juvenile steelhead will be externally marked. **(Benefit)**

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

Indicator: Prerelease quality checks indicate a minimum 95 percent retention of identifiable marks. **(Benefit)**

Life History Characteristics

Standard 2.1: Winter steelhead broodstock (47 stock) will be collected in a manner that approximates the distribution in timing, age, & size of hatchery fish returning to Cedar Creek Hatchery during that stocks return period. Wild 47W stock will be collected in a manner that approximates the distribution in timing, age, & size throughout the wild run. One salt males (jacks) will be included in the broodstock when available. **(Benefit)**

Indicator: Temporal distribution of Cedar Creek Hatchery adult winter steelhead returns and adults collected for broodstock. Applies to both stocks. **(Risk – unknown)**

Indicator: Age distribution of Cedar Creek Hatchery adult winter steelhead returns and broodstock spawned. Applies to both stocks. **(Benefit)**

Indicator: Size at age distribution of Cedar Creek Hatchery adult winter steelhead returns and broodstock spawned. Applies to both stocks. **(Risk – unknown)**

Standard 2.2: Collection of stock 47W adult broodstock does not remove an excessive portion of the wild population of winter steelhead in the Nestucca basin. **(Benefit)**

Indicator: Monitor wild steelhead population to assure broodstock collection removes an acceptable proportion of the total basin population. **(Benefit)**

Standard 2.3: Releases of Cedar Creek Hatchery winter steelhead smolts will minimize impacts through control of hatchery release numbers and timing by minimizing spatial and temporal overlap with wild winter steelhead and wild coho. Applies to both stocks. **(Risk)**

***Indicator*:** Number of Cedar Creek Hatchery winter steelhead released. **(Risk)**

Indicator: Dates of Cedar Creek Hatchery winter steelhead releases. **(Risk)**

***Indicator*:** Location of Cedar Creek Hatchery winter steelhead released. **(Risk)**

Standard 2.4: All Cedar Creek Hatchery winter steelhead smolts will be released as yearlings. Applies to both stocks. **(Risk - unknown)**

Indicator: Beginning and ending dates of Cedar Creek Hatchery winter steelhead releases. **(Risk - unknown)**

Indicator: Size and length frequency of winter steelhead smolts released. **(Risk - unknown)**

Standard 2.5: Cedar Creek Hatchery winter steelhead in excess of production needs will be released during times and at locations that reduce impacts to naturally rearing wild steelhead and wild coho. Any stock 47 fry or fingerlings in excess of needs for smolt production may be released into standing water bodies that do not support natural winter steelhead or coho production; or they may be destroyed. Any stock 47W fry or fingerlings in excess of needs for smolt production may be released into Nestucca basin streams with underseeded steelhead habitat, standing water bodies, or they may be destroyed. **(Benefit – 47, Risk – unknown 47W if released instream)**

Indicator: Location, number, and timing of Cedar Creek Hatchery winter steelhead fry and fingerling releases. Applies to both stocks. **(Benefit – 47, Risk – unknown 47W if released in-stream).**

Genetic Characteristics

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

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

***Indicator*:** Estimated abundance of naturally spawning winter steelhead in Tillamook Bay and Nestucca basins that are of hatchery origin based on marks or tags. **(Benefit)**

Standard 3.2: Only wild Nestucca winter steelhead, or adult returns from smolts released for this program, will be used for Cedar Creek Hatchery 47W stock winter steelhead broodstock program component. **(Risk - unknown)**

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

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

Standard 3.3: Only 47 stock Nestucca winter steelhead, or adult returns from smolts released for this program, will be used for Cedar Creek Hatchery 47 stock winter steelhead broodstock program component. **(Risk - unknown)**

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

Indicator: Fin clips, or marks, on fish collected for broodstock. **(Risk)**

Standard 3.4: Cedar Creek Hatchery winter steelhead broodstocks will be spawned following appropriate mating and spawning protocols. **(Benefit)**

Indicator: Number of males and females spawned. Applies to both stocks. **(Benefit)**

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

Operation of Artificial Production Program

Standard 4.1: The Cedar Creek Hatchery steelhead program will be operated in compliance with ODFW's Hatchery Management Policy, and the IHOT fish health guidelines. See Attachment A. Applies to both stocks. **(Benefit)**

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

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

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

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

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

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

Indicator: Results within accepted criteria. **(Benefit)**

Standard 4.3: Cedar Creek Hatchery water withdrawals will comply with NOAA juvenile screening criteria. **(Benefit)**

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

Standard 4.4: Cedar Creek Hatchery stock 47 and 47W steelhead carcass placements for stream nutrient enrichment comply with the Memorandum of Agreement (MOA) between ODFW and Department of Environmental Quality (DEQ). **(Benefit)**

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

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

Standard 4.5: Wild steelhead and wild coho that enter the Cedar Creek Hatchery adult trap, or any off station trap facility, are handled and released in a manner that minimizes stress, injury, mortality, and delay in migration. A portion of the 47W stock winter steelhead may be retained for broodstock. **(Risk)**

Indicator: Number of unmarked adult steelhead and coho collected and released alive above Cedar Creek Hatchery weir on Three Rivers, or at any off station trap facilities. **(Risk - unknown)**

Indicator: Number of unmarked adult steelhead and coho mortalities at Cedar Creek Hatchery during operation of the hatchery adult trap, or at any off station trap facility. **(Risk)**

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

Standard 4.6: Releases of Cedar Creek Hatchery winter steelhead smolts will limit predation impacts to naturally produced salmonids through control of hatchery release numbers and by minimizing spatial and temporal overlap with wild salmonid juveniles. Applies to both stocks **(Risk – unknown)**

Indicator: Location, dates, and sizes of Cedar Creek Hatchery winter steelhead releases. **(Risk – unknown)**

Socio-Economic Effectiveness

Standard 5.1: Estimated harvest benefits will equal or exceed hatchery production costs for Cedar Creek Hatchery 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 goal for the stock 47 winter steelhead program at Cedar Creek hatchery is to produce 40,000 smolts for release into the Nestucca River basin and produce 45,000 fingerlings for transfer to Trask Hatchery. The goal of the stock 47W program at Cedar Creek Hatchery is to produce 100,000 smolts for release into the Nestucca River basin.
Note: The above goals shown are the intended production levels for these programs going forward. During the initial implementation of program changes dictated by the Coastal Multi Species Conservation and Management Plan, 2015 releases in the Nestucca River basin may include up to 70,000 stock 47 smolts and approximately 70,000 stock 47W

smolts as the programs are transitioned to the above release goals. Also, pending further evaluation and public input, future program releases may be transitioned to use of more or less stock 47W for the Nestucca River basin and stock 121W for the Wilson River.

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

The Cedar Creek Hatchery 47 stock winter steelhead program currently requires a minimum goal of 35 females and 35 males for spawning to meet the stock 47 program goals (includes Tillamook Bay Basin component). Any excess 47 stock adults are recycled to the river fishery, released in lakes, provided to food share programs, or killed for stream enrichment programs. The stock 47W winter steelhead program currently requires a minimum goal of 40 males and 40 females for spawning to meet the stock 47W program goals. Any excess, naturally produced, stock 47W adults are released into the Nestucca basin to spawn naturally.

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

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

Table 1-2 Proposed Annual Fish Release Levels

Life Stage	Release Location	Annual Release Level
Eyed Eggs	NA	NA
Unfed Fry [1]	Stock 47 - Standing waters; locations vary	Prior to 2000, annual fry releases averaged 30,000. Varies annually.
	Stock 47W – Nestucca Basin	Varies annually
STEP – unfed fry [2]	Wilson and Nestucca Rivers	<2,000 –STEP classroom incubators
Fry / Fingerling [3]	Stock 47 - Standing waters; locations vary	Excess, Varies
	Stock 47W – Nestucca Basin	Excess, varies
Yearling	Nestucca River Basin	40,000 [4] Stock 47
Yearling	Nestucca River Basin	100,000 [4] Stock 47W

Data source: District Files

1. This program does not produce unfed fry for release as a program goal for either stock (47 or 47W). 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); 47 stock will be released in standing water bodies; 47W stock may be released in under-seeded habitat or into standing water bodies. Numbers may vary.

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, however in the last 5 years the number is < 2,000 total, only stock 47 is used in STEP programs. Release sites are normally in systems close to schools where hatchery steelhead are already released in the system. In many areas, these sites are low in the system, often near the head of tidewater. Additional data is provided in Section 10.3, Table 10-3.

3. This program does not produce fry or fingerling for release as a program goal for either stock (47 or 47W). In any given year there may be surplus fry or fingerling at the time of marking (typically resulting from above average fry and fingerling survival); 47 stock will be released in standing water bodies; 47W stock may be released in under-seeded habitat or into standing water bodies.

4. The program is a mix of existing 47 stock and wild stock (47W) with a total smolt program of up to 140,000 smolts. During phase in of changes dictated by the Coastal Multi-Species Conservation and Management Plan, releases may include up to 70,000 stock 47 smolts and approximately 70,000 stock 47W

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 estimate of adult winter steelhead production from the Cedar Creek Hatchery winter steelhead program for smolts released in the Nestucca Basin, for a 12 year period. This reflects program performance in relation to the production of fish for harvest. The estimated number of adult hatchery winter steelhead produced was derived from a variety of sources. Available data shown is prior to implementation of the wild brood program (stock 47W). Creel data collected during initial years of returning adults for that program indicates a higher susceptibility to being caught by anglers.

The "Freshwater Sport" column is based on punch card estimates of catch in the Nestucca Basins. 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 1999-00 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 are only available through calendar year 2001. The "Hatchery Return" column is the actual count of adult winter steelhead returns at Cedar Creek Hatchery, with the adult age composition based on an average of the 1983-84 to 1991-92 fishery scale data. Estimates are not available of the number of hatchery winter steelhead that strayed to natural spawning areas in the Nestucca Basin. Smolt to adult survival is calculated as the sum of the prior 3 columns divided by the "Smolt Release" column.

Table 1-3 Estimated Adult Winter Steelhead Produced by the Cedar Creek Hatchery Winter Steelhead Smolts Released in the Nestucca Basin, 1986 to 1997 Brood Years.

Brood Year	Nestucca Smolt Release	2-Salt Return Year	Estimated Adult Hatchery STW (2-salt + 3-salt)			
			Freshwater Sport *	Hatchery Return **	Spawning grounds	Smolt to Adult Survival
1986	170,284	1988-89	1,946	280	NA	1.31%
1987	138,974	1989-90	3,457	483	NA	2.84%
1988	134,854	1990-91	2,050	471	NA	1.87%
1989	144,737	1991-92	3,428	635	NA	2.81%
1990	137,644	1992-93	2,437	473	NA	2.11%
1991	130,165	1993-94	1,783	356	NA	1.64%
1992	139,247	1994-95	2,007	330	NA	1.68%
1993	130,036	1995-96	1,771	433	NA	1.70%
1994	110,705	1996-97	1,798	558	NA	2.13%
1995	111,352	1997-98	1,290	992	NA	2.05%
1996	99,883	1998-99	1,318	2,013	NA	3.33%
1997	110,601	1999-00	1,447	1,230	NA	2.42%

* = Nestucca 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 1999-00 run years are hatchery fish only fisheries with age composition based on an average of the 1983-84 to 1991-92 scale data.
** = Used average age composition from fishery scales to assign age to hatchery returns.

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

Cedar Creek Hatchery began operation in 1914, but it is unclear what species and stocks were under propagation. District records indicate steelhead releases back to at least 1948, though stock use is also uncertain. Alsea Hatchery began production in 1936 and documents indicate it was the only hatchery winter steelhead stock produced for Oregon coastal streams for nearly 30 years, however there is no clear indication when outplanting actually began. Given this, it is probably safe to assume releases identified in 1948 were from Cedar Creek Hatchery using Alsea stock (stock 43).

The current stock 47 program began development in the late 1970's using stock 43 (Alsea) adults returning from releases to the Nestucca basin. During development and prior to 1984, eyed-eggs (Alsea Stock 43 StW) from Alsea Hatchery were used to fulfill the needs of the program if the new 47 stock egg take was insufficient. Since 1984 only stock 47 winter steelhead have been used with two exceptions (see section 6.2.1). The wild Nestucca stock, 47W, program began with broodstock collection in January 2002 with the resulting first smolt release in April 2003.

1.14) Expected duration of program.

The Cedar Creek Hatchery winter steelhead program is ongoing.

1.14) Watersheds targeted by program.

- Nestucca River, including tributaries, tributary to Nestucca Bay.
- 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.

Use of a long term, out of basin origin stock versus a new local "wild" broodstock for propagation: ODFW's Fish Hatchery Management Policy (FHMP) allows for use of either type stock based on the stock that best meets fishery objectives, is consistent with conservation objectives where risk to naturally-produced native fish and their watersheds is within acceptable limits.

Wild stock's health and its ability to support a consumptive fishery, and potential elimination of hatchery program(s): The issue revolves around the naturally produced stocks population and its apparent ability to support a consumptive fishery at some level; and the need, or desire, to provide hatchery fish to support a consumptive fishery.

Water quality issues at the rearing facility: Recent production changes have eliminated significant water quality issues, however monitoring will continue to assess the facilities ability to maintain production and meet water quality permit criteria.

Release strategies: Options range from an all direct release to an all tributary release (with, or without a recapture facility). The current direction is to implement a mixed release strategy which allows partial recapture at the hatchery facility while exposing returning adults to the majority of the available sport fishery locations and methods.

1.16.2) Potential alternatives to the current program.

Note: The alternatives listed are draft only. These 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, domesticated, out of basin stock (47 stock).

Historically the winter steelhead program at Cedar Creek operated in this manner for all winter steelhead production programmed for Nestucca and Tillamook Bay basins. If selected it would continue use of an out of basin stock with out-plantings of smolts in other basins (Tillamook Bay). This alternative would run counter to direction provided by the Commission action for the program.

Pros:

- Would provide for consumptive hatchery fish fishery.
- Broodstock is readily available.
- Return timing of adults is in a relatively narrow window allowing close grouping of egg takes with high assurance of a uniform end product (smolts).
- Degree of domestication makes juveniles easy to rear.

Cons:

- High level of domestication may make juveniles more susceptible to predation upon release as smolts.
- Adult returns are in a small window (Dec – Jan) relative to naturally produced fish (Dec – April). Concentrates anglers, which leads to social problems. Poor weather conditions in the return period can significantly reduce opportunity for harvest. Adults tend to move rapidly through the system limiting opportunity for harvest.
- Potential for genetic risk with the interbreeding of long term adult hatchery fish and wild fish in natural spawning areas. Run timing and spawn timing peaks appear to be temporally separated between stocks. However there is still overlap, particularly with hatchery males remaining in the spawning area.
- Surviving juveniles from early spawning stock may occupy rearing habitat earlier, may out compete wild juveniles for the habitat, resulting in reduced numbers of smolts and do not appear to produce many returning adults.

Alternative 2: Convert to 100% smolt release from a new broodstock originating from naturally produced local stock (Stock 47W).

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. Pending further evaluation and public input, this may be the preferred alternative in the future.

Pros:

- Would provide for consumptive hatchery fish fishery.
- Use of a local stock may minimize impacts resulting from returning adults spawning in the wild.
- Adult returns over a larger window spread out the fishery and allow greater opportunity for harvest, and act to lessen social issues related to angler crowding.
- Juveniles may be less susceptible to predation.
- Broodstock is readily available, but currently requires alternative collection methods which in turn assure randomness in collection and use.
- Indications are that this stock contributes to the fishery at a higher rate than the 47 stock and the program is very popular with anglers.

Cons:

- Wider egg take period increases complexity of hatchery's early rearing process and may result in a less uniform end product (smolts).
- Live spawning of adults may require more females to meet egg take needs.
- Reduces the number of wild adults spawning in the wild (if this alternative was implemented we would need a minimum of 110 wild adults (55 male, 55 female),
- Use of a local stock may increase spatial and temporal overlap in spawning of hatchery and wild fish in the wild, i.e. increased interbreeding. A particular concern since the much higher freshwater survival of fish in a hatchery could mean that the relatively small number of wild fish used in the hatchery broodstock could produce a disproportionate number of the subsequent adult progeny on the natural spawning grounds.
- May experience somewhat higher residualism, or extended rearing, in juveniles if a lesser percentage is actually ready to smolt.
- Unknown reactions to captive rearing.

Alternative 3: Use a mixed program with releases consisting of 50% of each stock (47 and 47W) with equal numbers released at each release location.

This is the original makeup of the program when the 47W program was initiated. Evaluation indicated the 47W stock contributed to a higher rate in the fishery, and the

program was increased for this reason. The stock 47 program was retained at a lower level to maintain harvest opportunity in the early portion of the season.

Pros:

- Would provide for consumptive hatchery fish fishery.
- Angling opportunity window would remain increased, but a portion (Stock 47) would still remain short and subject to poor angling conditions.
- Provides opportunity for stock evaluation. Similar rearing and release for both stocks and both stocks subject to similar angling opportunities.

Cons:

- All the cons listed under Alternative 2.
- Continues increased work for hatchery staff to keep two stocks separate, requires additional rearing space to keep separate, different marking times.
- Retaining use of an out of basin stock does not resolve biological concerns associated with the stock.
- Requires differential marking to continue to keeps stock separate and removes option to go to a single mark that allows maximum survival of fish.

Alternative 4: Continue current program numbers with 100% release of both stocks into Three Rivers.

This is an alternative release strategy proposed by some members of the public.

Pros:

- Maintains a complete production program for the basin.
- Maintains consumptive angling opportunity in the basin.
- Angling opportunity window would remain increased, but a portion (Stock 47) would still remain short and subject to poor angling conditions.
- Potentially keep hatchery reared adult progeny (both stocks) away from the natural spawning areas in the upper basin.

Cons:

- Significantly increased work for hatchery staff to deal with increased adult returns to the trap and to keep two stocks separate.
- Retaining use of an out of basin stock does not resolve biological concerns associated with the stock.
- Requires differential marking to continue to keep stocks separate and removes option to go to a single mark that allows maximum survival of fish.
- Negatively impacts opportunity to harvest hatchery adults by confining the majority of the fishery to Three Rivers and the mainstem below Three Rivers

(approx. 2.75 miles), both with limited access. The open mainstem area above Three Rivers confluence (approx. 28.75 miles) would likely experience significantly reduced potential for harvest of hatchery fish (strays).

- Potential significant impacts on angler crowding and associated crowding issues.
- May bias contribution evaluation of the two stocks by not exposing returning adults to the majority of the open angling area.

Alternative 5: Eliminate hatchery steelhead propagation program and maintain the basin winter steelhead fishery as catch and release.

Pros:

- Eliminates virtually all biological impacts from local hatchery fish being present in the system.
- May significantly reduce angling pressure lessening social issues, crowding, etc. Loss of program would reduce budget at facility and allow savings to be used elsewhere for other programs.

Cons:

- May produce negative impact on local economy.
- Would reduce opportunity for consumptive steelhead fisheries in the local area.
- Angling pressure would be expected to shift to other areas and create additional issues in those areas.
- Create additional workload and funding needs with the need for real time monitoring of catch if fishery goes consumptive.

Alternative 6: Eliminate hatchery steelhead propagation program and allow wild steelhead harvest.

Pros:

- Provides for a consumptive fishery, primarily on the mainstem Nestucca.
- Eliminates virtually all biological impacts from local hatchery fish being present in the system.
- May reduce angling pressure lessening social issues, crowding, etc.
- Loss of program would reduce budget at facility and allow savings to be used elsewhere for other programs.
- Wild harvest could garner more support from anglers for habitat protection.

Cons:

- Harvest of wild steelhead at high levels could threaten the health of the wild population.

- Could reduce opportunity for consumptive steelhead fisheries in the local area, especially on Three Rivers.
- Angling pressure could shift to other areas and create additional issues in those areas.
- Create additional workload and funding needs with the need for real time monitoring of consumptive fishery.

Alternative 7: Modify current hatchery program numbers and release strategies. Total production numbers would stay at 140,000 smolts but individual numbers of each stock (47 & 47W) would be modified, as may release locations, based on evaluation and public input.

Pros:

- Maintains consumptive angling opportunity in the basin over an extended period.
- Potentially reduce straying of out of basin stock (47) fish, and potential to reduce overall straying.
- Allows adaptive management practices to adjust the program to meet fishery and management needs based on current data.
- May reduce angling pressure lessening social issues, crowding, etc. in some areas.
- Provides a production shift to the stock (47W) that contributes better to the fishery and appears to stray less.

Cons:

- Maintains an out of basin stock. Retaining use of an out of basin stock does not resolve biological concerns associated with the stock although reduce release numbers may reduce concerns.
- May affect angling pressure and locations from current patterns
- Requires differential marking to continue to keep stocks separate and removes option to go to a single mark that allows maximum survival of fish.
- Increased work for hatchery staff to deal with increased adult returns to the trap and to keep two stocks separate.

1.16.3) Potential reforms and investments.

(1) Cedar Creek Hatchery's ladder and trapping facility on Three Rivers has been identified for major modifications. The present configuration of the facility does not provide for Three Rivers water to flow through the ladder; it receives all its flow from Cedar Creek water. The ability to use either water source or to combine them, to operate the ladder would be expected to increase the ability to attract fish to the ladder and trap. It would also allow the option to open the ladder and allow fish to directly bypass the weir facility during periods when hatchery fish are present in low numbers and it is desirable to allow passage of wild fish above the facility without additional handling. The current trap and holding facility consist

of two small concrete ponds, one associated with the trap, the other across an alleyway as a holding pond. The holding pond is divisible, but small, so when multiple species are present some stocks must be handled and transported up to additional ponds on the hatchery proper. In September, 2006 ODFW teamed with U.S. Fish & Wildlife, NOAA and an independent engineering consultant; Tetra Tech/ KCM to develop the Three Rivers Trap & Passage study. This study outlines needs and options for a trapping, holding and passage facility to replace the existing trap. The design would incorporate Three Rivers attractant water as well as Cedar Creek water with options to separate or mix flows as needed. While several options were covered in this study, the main goals were to improve trapping efficiency while minimizing handling of wild stocks, improve upstream and downstream passage, and improved handling and holding of hatchery stocks. Cost estimates were approximately $1.9 million.

(2) Cedar Creek Hatchery has two large, asphalt lined, rearing lakes. The largest lake (approximately 360,000 cubic feet) is not currently in use for rearing because of effluent discharge issues related to discharge permit compliance and reductions in programs. This pond has recently been converted to a settling / abatement pond. A pump station was installed in the existing abatement pond with a pipeline running up to the large asphalt pond. Cleaning water from production ponds will be diverted to the old abatement pond and pumped to large pond. This modification will allow for more efficient pond cleaning to meet discharge requirements.

(3) Alternative hatchery operations, facilities and techniques, in regard to conservation and restoration of wild fish populations, will be one of the areas of research questions at ODFW's proposed Hatchery Research Center. In the future, the results of this and other research efforts may lead to additional reforms and investments at Cedar Creek hatchery and its satellite facilities.

SECTION 2

PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS

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

The HGMP for this program was submitted to NMFS on 3/12/2004, for approval and ESA coverage. This is an updated version of the previously submitted HGMP and consistent with ODFW's Coastal Multi-Species Conservation and Management Plan 2014. Prior to 2004, another HGMP covering the Nestucca winter steelhead program was submitted to NOAA in February 2002.

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 ESA as *Threatened*. The program has no intent to directly take any ESA-listed Coho Salmon, but incidental and/or indirect take occur due to this program. Oregon coastal Coho Salmon populations inhabiting the Nestucca Basin and the Tillamook Bay Basin may be indirectly affected by the stock 47 winter steelhead program due to competitive interactions for food and space.

Nestucca Complex

The Nestucca Complex consists of Coho Salmon inhabiting streams located between Cape Lookout on the north and Cascade Head on the south (Nickelson 2001). These include the Nestucca River, Sand Lake tributaries, and Neskowin Creek. There is an estimated 190 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 proportion of the males attain sexual maturity and return to spawn as jacks. Ocean, 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 Salmon 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). Habitat 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.

This steelhead hatchery program has no intent to directly take any ESA-listed Coho Salmon. Oregon coast steelhead populations are considered a "*Species of Concern*" and may also be affected by this program.

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

Incidental take of listed Coho Salmon may occur due to steelhead brood collection. Also, the listed Coho Salmon may be indirectly affected through competitive interactions for food and space between hatchery fish and listed coho within the program areas (Nestucca basins). Water withdrawal due to hatchery operations may have indirect impacts on natural Coho Salmon population in the Nestucca River.

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

The Oregon Native Fish Stock Status Report (ODFW 2005) includes the status of coastal coho. Some of the following information about the status of the Nestucca Complex's coho population was taken from Nickelson (2001), which is consistent with the coho population status described in the Oregon Native Fish Stock Status Report.

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

The Nestucca Complex consists of Coho Salmon inhabiting streams located between Cape Lookout on the north and Cascade Head on the south. These include the Nestucca River, Sand Lake tributaries, and Neskowin Creek. There is an estimated 190 miles of

spawning habitat available to the Coho Salmon of this complex. The critical population level for the Nestucca Complex is 800 adult spawners (Nickelson 2001).

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

The abundance of Coho Salmon spawners of the Nestucca Complex has ranged from less than 400 to about 10,100 and has averaged nearly 3,400 since 2003 (Figure 2-1 and Table 2-2). In two of those years, spawner abundance fell below the critical threshold of 800 fish.

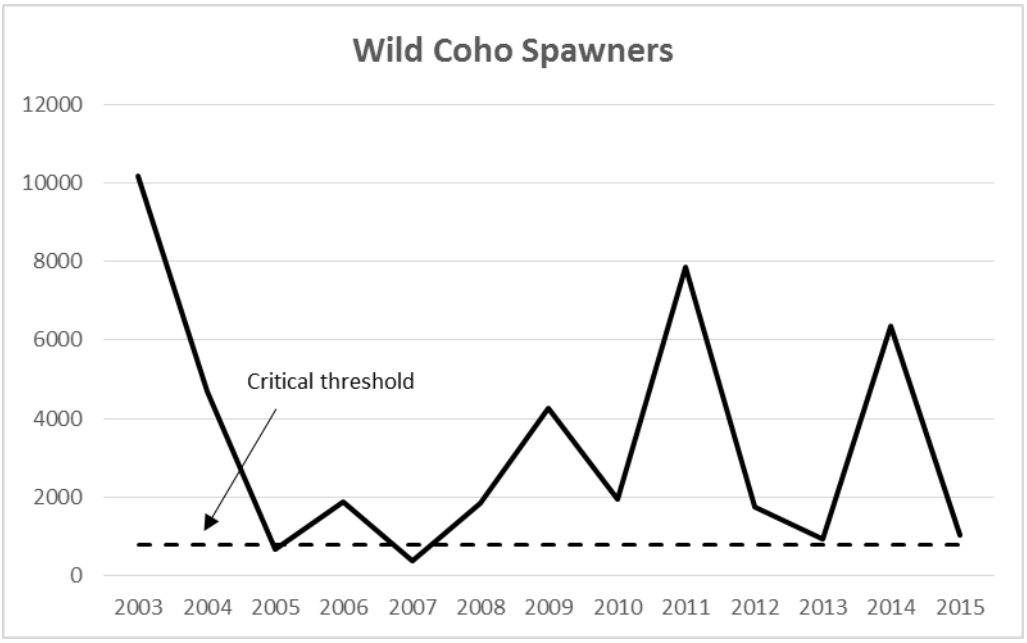

Figure 2-1. Trend in adult wild Coho Salmon spawner abundance relative to the critical population level for the Nestucca Complex, 2003-2015.

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

Year	Wild Spawners	Hatchery Spawners	Percent Hatchery Spawners	Pre-harvest Wild Population	Recruits Per Spawner
2003	10,194	109	1%	11,080	9.1
2004	4,695	73	2%	5,087	1.2
2005	686	9	1%	718	0.04
2006	1,876	19	1%	2,030	0.2
2007	394	5	1%	447	0.1
2008	1,844	0	0%	1,880	2.7
2009	4,252	0	0%	4,557	2.4
2010	1,947	93	5%	2,039	5.2
2011	7,857	0	0%	8,350	4.5
2012	1,751	0	0%	2,143	0.5
2013	946	37	4%	1,104	0.6
2014	6,369	0	0%	7,440	0.9
2015	1,029	0	0%	1,285	0.7
Avg.	**3,372**	**27**	**1.1%**	**3,704**	**2.2**

Smolt production was estimated for the 1997 through 1999 broods. Estimated smolt abundance ranged from 29,000 to 89,000 for the Nestucca Complex (Table 2-3).

Table 2-3. Estimates of the Abundance of Coho Salmon Juveniles of Different Life Stages Based on Spawner Abundance in Nestucca Complex.

Population	1997 Brood (millions)				1998 Brood (millions)				1999 Brood (millions)			
Complex	Eggs	Fry	Parr	Smolts	Eggs	Fry	Parr	Smolts	Eggs	Fry	Parr	Smolts
Nestucca	0.415	0.270	0.105	0.036	0.211	0.137	0.084	0.029	2.694	1.751	0.315	0.089
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 seven of the last thirteen broods falling to one or below (Table 2-2 above and Figure 2-2 below).

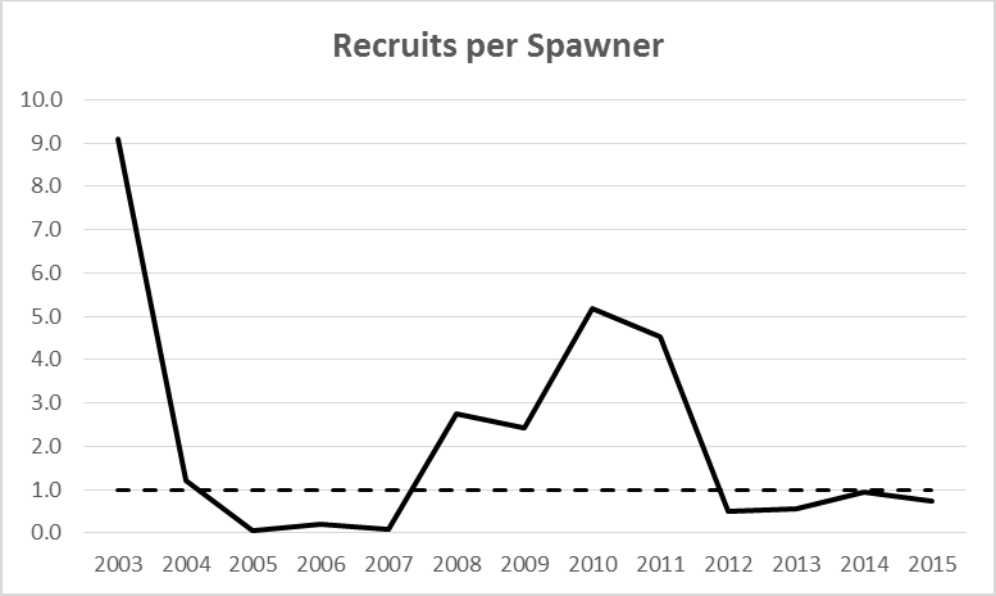

Figure 2-2. Trends in Recruits per Spawner for Nestucca Complex Wild Coho Salmon, 2003-2015.

- 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.

Hatchery Coho Salmon production in the Nestucca Basin was terminated in 1992. Hatchery fish are still observed at times on the spawning grounds. Surveys since 2003 have averaged about 1% hatchery coho observed on spawning grounds. In all years during that period, hatchery fish made up 5% or less of the fish sampled, with no hatchery fish observed in six of the thirteen years (Table 2-2). No data is available for the progeny of naturally spawning hatchery-origin Coho Salmon in natural rearing areas.

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 have potential impacts to a listed species include:

The trap facility on Three Rivers has captured some hatchery and wild Coho Salmon during prior and current trapping periods. Any hatchery coho (finclipped) are killed and disposed of by burial or sent to a landfill. Any wild coho encountered are immediately released alive above the dam/trap facility on Three Rivers, or transported in a portable tank a short distance upstream if flow conditions warrant. Potential for occurrence of listed coho is low to moderate. Potential take of coho is believed to be low, but may occur through migrational delay, capture, handling, and upstream release associated with trapping operation.

The proposed trap site on Bays Creek is expected to collect wild coho when operating. Spawning escapement figures for this system are limited, however peak counts on those surveys completed show low counts of coho. A Rapid Bio Assessment completed in the summer of 2002 concluded that at least two coho redds were present. The expanded summer rearing estimate for coho parr on Bays Creek was 395 fish, approximately 0.2% of total parr estimate for the Nestucca basin. Coho sized 0+ made up approximately 1.3% (1,765) of coho 0+ in the assessment areas (Trask 2002). The trapping and passing of unmarked coho at this site should have minimal impact on listed stocks within the Nestucca Basin. Potential take of coho is believed to be low, but may occur through migrational delay, capture, handling, and upstream release associated with trapping operation.

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

Prior to the 1998 return year, it was possible for fish to pass the Three Rivers weir/trap facility without entering the trap. Data on past take for 1998 to 2008 is provided in Table 2-4. The Bays Creek trap was only operated during the stock evaluation period, and is not currently in use.

Table 2-4. Number of unmarked Coho Salmon captured at Cedar Creek Hatchery and Bays Creek Trap.

Return Year	Cedar Creek Hatchery		Bays Creek Trap[1]	
	Unmarked Adult Coho	Unmarked Jack Coho	Unmarked Adult Coho	Unmarked Jack Coho
1998-99	0	0		
1999-00	4 males, 1 female – passed above weir	1 – passed above weir		
2000-01	3 males – passed above weir	0		
2001-02	1 male, 1 female – passed above weir	0		
2002-03	3 males - passed above weir	3 - passed above weir		
2003-04	13 males, 10 females – passed above weir	3 – passed above weir		
2004-05	4 males, 2 females - Passed above weir	2 – Passed above weir	1 male – passed above weir	0
2005-06	3 Passed above weir	0	5 male, 3 female – passed above weir	0
2006-07	1 male - Passed above weir	1 – Passed above weir	0	0
2007-08	2 males, 3 females passed above the weir	1 – passed above the weir	1 – male, passed above weir	0

Data source: HMIS & District files

1. First winter of operation was 2004-05, and trap was only operated part time. In subsequent years during extreme high flow conditions fish are able to pass over, or around the weir structure.

Under certain high flow conditions, the hydraulic weir assembly will drop as a safety feature. It is entirely possible that during these type events, additional fish passed the facility. All unmarked coho trapped are immediately passed above the weir facility. If flows are adequate fish are hand carried in a soft cotton net or a wet cloth bag approximately 100 feet above the weir from the trap and released. In low or poor water conditions, they are put in a portable tanker and transported approximately 2.5 miles upstream and release back into Three Rivers. No injuries or mortalities were noted on passed fish.

- **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 below.

- **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.**

The Three Rivers (Cedar Creek Hatchery), and any off station, trap facility handling procedures will be modified immediately if wild Coho Salmon mortality appears in, or near, the trap and appears to be related to operation of the facility. 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 Salmon ESU**	**Activity:**	**StW Broodstock Trapping**
Location of Hatchery Activity:	**Cedar Creek Hatchery, Bays Creek, or other off station trap sites**	**Dates of Activity:**	**Dec. 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	0 - 200	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)		<20	<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.

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

SECTION 3

RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

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

Native Fish Conservation Policy - The Oregon Fish and Wildlife Commission has approved the Native Fish Conservation Policy (NFCP). The NFCP requires the development of a conservation plan for each native stock within the species management unit (SMU), which was completed in 2014. The Nestucca River winter steelhead hatchery is program complies with the NPCP.

Fish Hatchery Management Policy – This policy provides guidance for the responsible use of hatchery fish. The Policy outlines the best management practices for hatchery programs. This HGMP will serve as the guiding document for the Nestucca winter steelhead program and shall serve as the hatchery program management plan (HPMP) for Nestucca River winter steelhead program, as described in the Hatchery Management Policy.

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

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 (OPSW) (Executive Order 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 salmon and steelhead, including; nutrient enrichment, exploration of the use of hatchery technology in the recovery of wild populations, acclimation and other separations of hatchery and wild production, terminal fisheries that reduce harvest impacts on wild fish, and monitoring of hatchery and wild runs.

NPDES 300-J General Permit. The hatchery program is operated under the NPDES 300-J general permit to maintain the environmental standards of hatchery effluents.

3.3) Relationship to harvest objectives.

These hatchery steelhead are mass marked (100%) as a means of integration of hatchery production and harvest management. Mass marking will allow for selective harvest of hatchery fish while requiring release of all wild fish. Mass marking will also allow for better monitoring and control of impacts of the hatchery program on wild steelhead populations. Incidental take of wild Nestucca Basin Coho Salmon in harvests is limited by the ESA Section 4(d) rule. The 4(d) rule requires development of Fishery Management and Evaluation Plans (FMEP), which will be guided by the Pacific Coast Salmon Plan, specifically Amendment 13 (Pacific Fisheries Management Council [PFMC] 1997).

Under recent conditions of marine survival and abundance, the allowed take has been in the range of 8-30% of the total pre-harvest Oregon Coast ESU wild Coho Salmon abundance. Take could increase if conditions improve (PFMC 1997). This standard is adopted as adequate for controlling incidental harvest impacts in this plan, pending completion of FMEPs. All further address of harvest impacts will occur under the FMEPs. Estimated harvest impacts (ocean and freshwater combined) on wild Coho Salmon for the period 1994 through 1999 averaged 9.2 percent and ranged from 6.8 percent to 12.4 percent.

The hatchery program evaluation (Table 1-3 in Section 1.12) was as part of an ODFW hatchery review (ODFW 1999). Stock 47W steelhead is a relatively new program and the first adult return was in the winter of 2004/05.

This winter steelhead artificial production program is designed to have minimal biological impacts to listed species and other resident species. Likewise, fish culture practices are designed and carried out to rear full-term smolts to limit impacts to naturally rearing coho and other 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 Nestucca basin winter steelhead sport fishery will benefit from both stocks (47 and 47W) produced by this program. This program also currently produces 47 stock smolts for the Wilson River. Until the 1994 brood year, it also produced 47 stock smolts for the Little Nestucca, Tillamook, and Miami rivers. The estimated number of Cedar Creek Hatchery adult steelhead (47 stock) harvested in the Nestucca Basin in run years 1988-89 to 1999-00 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 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.

In general, habitat condition is stable and improving. A series of fires in the mid- to late-1930's (Tillamook Burns) drastically impacted habitat with loss of shade, increased sedimentation, and loss of stream complexity in the Wilson River basin and in portions of the upper Nestucca Basin. The Nestucca Basin also suffered habitat degradation similar to that of the Tillamook Burn from a number of separate fires in that basin during the same timeframe. The basins are now recovering to a forest condition with shade and sedimentation impacts greatly reduced; however, there is still a lack of instream complexity throughout the system. Unfavorable natural events (flooding) are common in the basins and can have detrimental effects on egg depositions and juvenile rearing as well as modifying rearing habitats; sometimes improving, sometimes degrading their quality. However, these events also provide some long term benefits in the form of gravel and large woody debris recruitment.

Habitat restoration projects over the past 25 years (on state, federal, and private timberlands, which make up the majority of the basins ownership) have begun addressing instream complexity concerns. Recent or ongoing projects are working to improve habitat conditions and/or access to habitat in the Nestucca Bay estuary. Fish passage structures believed to impede migrations (primarily culverts) are being evaluated on most county, state and federally owned timberlands. Major highways and county road systems have been inventoried and priority ranked. Some sites have been addressed and others are in various planning stages; however, all are subject to biennial budgeting processes and / or outside fund availability.

3.5) Ecological interactions.

(1) Negatively impact program

Competition for food between stock 47 & 47W winter steelhead smolts and other salmonids (hatchery and wild) in the Nestucca estuary and near shore ocean environment may negatively impact this program. Avian and marine mammal predation may also negatively impact this program.

(2) Be negatively impacted by program

Competition for food between Stock 47 & 47W winter steelhead smolts and wild salmon and steelhead juveniles in the Nestucca 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) Positively impact program

Increased abundance of naturally produced adult salmonids, primarily Coho and Chinook Salmon, will increase stream nutrient levels and biomass productivity of the prey base used by hatchery and naturally produced fish in the basin.

(4) Be positively impacted by program

The reduction of stock 47 smolt releases and restructuring of release strategies will reduce the incidence of non-native stock spawning in the wild. Adult stock 47 winter steelhead carcasses are 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 Nestucca Basin and are permitted through the Oregon Department of Environmental Quality.

General Information

Interactions between out-migrating hatchery steelhead smolts and listed Oregon Coast coho are likely to be minimal. Steelhead are reared to smolt size and expected to migrate upon, or soon after, release. Most smolt releases are confined to lower sections of the Nestucca River, or selected tributaries. While these lower areas are known to rear wild juvenile salmon and steelhead the hatchery smolts being released are not anticipated to remain in these areas for extended periods. It is possible that some may residualize after release, but it is anticipated that interactions between remaining steelhead and rearing coho are minimal based upon their species-specific rearing and life history characteristics. All hatchery fish releases are sampled and disease tested by ODFW fish health staff and cleared before release.

Target release size for hatchery smolts is 6 per pound (average fork length [FL], 200 mm) which is larger than wild steelhead smolts (average FL, 111 mm and 102 mm; treatment and control streams respectively), and wild coho smolts (average FL, 104 mm and 101 mm; treatment and control stream respectively) trapped in East Creek (treatment) and Moon Creek (control) Research Study1988 – 1995 (Johnson, S.L. ODFW Newport,

personal communication). East and Moon Creeks are tributaries to the Nestucca. No outmigrant monitoring is currently being done in the Nestucca Basin.

Stock 47 hatchery winter steelhead smolt releases typically take place during late March or April; stock 47W smolts are typically released in April. East Creek and Moon Creek juvenile monitoring showed a wild outmigration timing for the 1988-1995 trapping seasons with a range of late April to mid May with peak movement the first week of May for steelhead, and a range of early April to early May with a peak movement the first week of May for coho (Johnson, S.L. ODFW Newport, personal communication).

Excess unfed fry from stock 47 hatchery production are released into habitat locations (standing water) that do not overlap spatially with rearing coho fry/fingerling. Excess unfed fry from 47W stock hatchery production may be released into river habitat locations which are underseeded, or handled similar to stock 47 excess fry.

This program currently utilizes a mid-river tributary (Bays Creek) as the uppermost release site. It is intended as a method to separate returning hatchery adults that are not caught from the primary wild steelhead spawning areas in the Nestucca basin. This strategy reflects results of research work done in the Siuslaw River basin (Lindsay et. al., 2001).

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.

STEP Program

The ODFW has had a Salmon and Trout Enhancement Program (STEP) in place and operational since 1981. A portion of the program (STEP hatchbox program) is the incubation of eggs and release of unfed fry by public participants (Note: The use of hatchboxes on the North Coast is being phased out over the next 10 years as part of actions adopted in the Coastal Multi-Species Conservation and Management Plan). Egg requests are handled as part of annual hatchery production operations. Early stage eyed eggs are given to volunteers for incubation in classroom incubators for educational purposes. Direct stream releases are made when fish are in the late “button-up” stage. Releases are directed into locations that are close to participating schools (in the basins in which this program operates), and generally low in the chosen river system. Winter steelhead are only used in classroom incubators.

Habitat Above Trapping Facilities

Trapping operations are typically used as a means to collect broodstock, or to remove excess hatchery fish from systems. They also provide the opportunity to collect and pass wild stocks into available habitat above the facility while limiting the competition from hatchery stocks. Following are assessments of the habitat available above trapping facilities or in release locations associated with this program.

Three Rivers

There is no ODFW aquatic habitat inventory completed on Three Rivers above the hatchery weir site. The USFS conducted small-scale surveys in headwater tributaries of the Three Rivers subbasin that are on federally owned land. These areas are small and not representative of the basin as a whole and therefore will not be used in this discussion.

In general, Three Rivers above the weir/trap facility, including Alder Creek, provides approximately 12 to14 miles of mainstem type habitat for salmonids. Overall gradient is low to moderate in most of the area. The area typically lacks deep holding pools but does appear to have a reasonable amount of shallower pools. Substrate is a mix of gravels and cobbles suitable for use by Cutthroat Trout, Coho Salmon, steelhead, and Chinook Salmon. The system lacks large wood in any significant amount. Most of the system is paralleled by State Route 22, a significant arterial highway from the Willamette Valley to the coast area. Much of the area has residential development along the system. Development and the highway placement have heavily impacted the riparian vegetation on the system.

Bays Creek

There is no ODFW aquatic habitat inventory completed on Bays Creek. The USFS contracted a habitat survey in 1995. The survey was done in several sections with the mainstem comprising one section and several tributaries comprising the remaining sections. Fish use was observed in only four of nine tributaries. This use was limited, with coho use found only in the mainstem section. In general the basin covers approximately 3,150 acres with predominant land use of timberland, but also supports a small amount of agriculture and residential use mostly in the lower reaches. Gradient ranges from 3 to 5 % with channel entrenchment ranging from moderate to deep. Mixed hardwoods and conifers with dense shrub / forb understory comprise the riparian areas. Road densities are low. Most timber harvest in the basin occurred in the early to mid 1980's (Lind, 1995).

Because most fish use observed was in the mainstem the discussion will review that section. Surveyed length was approximately 8,350 feet. Gradient in the section averaged 3%. Riffles make up 61% of the habitat type and pools make up 37%. Mainstem habitat was categorized having 83% in lesser quality status consisting of shallow low gradient riffles, rapids, and straight scour pools lacking depth and complexity and generally of low quality. Large Woody Debris (LWD) was poor. Cobble and gravel dominate the substrate, however spawning gravel quality was poor and very limited. Much of the

gravel was embedded with sand and fines; bedrock intrusions were common. Summer water temperatures ranged form 52º to 60ºF.

Steelhead, cutthroat Trout, and Coho Salmon juveniles were observed during the survey. Chinook Salmon juveniles were not observed but do use the system. This was likely a function of the survey being completed in early August after most chinook fry/juveniles left the system. ODFW has a supplemental Chinook Salmon spawning survey on Bays Creek and has documented use in Bays Creek.

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.

Cedar Creek Hatchery has two different surface water supplies: (1) Cedar Creek, which supplies year-round flow to the facility; and (2) 2,000 gallons per minute (gpm), approximately 4.4 cfs, can be pumped from Three Rivers beginning in July through early November each year as needed. The facility has existing water rights up to 110.9 cubic feet per second (cfs) from Cedar Creek and 5 cfs (pumped) from Three Rivers. Under current rearing strategies and rearing densities sufficient water is available from these sources. The facility is in compliance with the water right permits, water withdrawals, and annual water uses reporting to Oregon Department of Water Resource.

During the winter months, Cedar Creek's water source fluctuates in water quality and temperature. During major freshets, there is heavy silt accumulation in the rearing ponds and raceways. O perational procedures during pond cleaning include utilizing abatement pond and lawns for filtering sand and silt before returning water back to Cedar Creek. Water temperature fluctuates between 40º and 50ºF.

During the summer months, Cedar Creek's water source consists of Cedar Creek and 2,000 gpm supplementation pumped from Three Rivers. Water temperatures fluctuate between 50º and 67º F. Pond cleaning operations are similar to winter.

Three Rivers pumping facility and the Main Intake No. 1 on Cedar Creek are currently compliant with NOAA Fisheries fish screening criteria.

The portion of the stock 47 (Alsea) production that is transferred to Trask hatchery will have pertinent information addressed in that HGMP.

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

Risk of take at the Cedar Creek facility is minimized because listed fish and other salmonids are not present in the Cedar Creek drainage upstream from Intake No.1 which is screened to NOAA standards. During the summer months when pumping from Three Rivers, risk is minimized because pumps are protected with 3/32-inch mesh screens which meet the NOAA screening criteria.

All hatchery effluent is monitored and reported quarterly under a National Pollutant Discharge Elimination System (300J) permit. All conditions of the permit are administered within ODFW and regulated by the Oregon Department of Environmental Quality.

SECTION 5
FACILITIES

5.1) Broodstock collection facilities (or methods).

Broodstock for the winter steelhead program are collected at the Three Rivers trap or by angling. Alternative collection methods (offsite trapping, netting) may be utilized if necessary.

Three Rivers Trap

Three Rivers trap is located in the Nestucca River watershed 1.5 miles east of Hebo off Highway 22. It is at an elevation of 43 feet, at latitude 45º 12' 57" N and longitude 123º 50' 43" W. Three Rivers trap and ladder utilizes water from Cedar Creek. Fish enter the trap via an adjacent ladder (see 5.3 for more details). Fish are manually sorted and held in the same facility until spawning begins in early January. Stock 47W adults are also collected at the trap facility and may be retained for broodstock.

Angling

Wild Nestucca steelhead, 47W stock, are collected by volunteer anglers from the mainstem Nestucca River. Only authorized volunteers are allowed to collect and transport broodstock fish. Consideration may be given to collecting some 47 stock adults for broodstock by angling. Collection is done by sport angling methods and complies with all current angling gear, area, and season regulations. Retention of unmarked steelhead for personal use is not allowed under any circumstances.

Alternative Methods

Offsite trapping stations or netting may be utilized if necessary to meet production and/or fish management goals. To date this has not been needed but remains an option for future consideration.

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

Broodstock (stock 47) are held and spawned in the Three Rivers trap facility. Hatchery adults not needed for the program are recycled back into the Nestucca River or are recycled into local lakes providing additional fishery opportunities for the public. Fish may also be used for food programs or stream enrichment activities. The hatchery personnel utilize 200-430 gallon portable liberation tanks and /or a 1,000-2,000-gallon liberation truck for transporting fish. All tankers have recirculation pumps and an oxygen injection system, which utilizes carbon, or ceramic, defusing stones. The governing factors that determine the loading densities are: water temperature in the truck, water temperatures at the receiving water body, duration of transit, size, and species of fish to be hauled.

Stock 47W adults collected are typically held and transported in stainless steel boxes (with lids), or in large capacity plastic coolers. Boxes are approximately 20 gallon

capacity (estimated 15 gal useable); coolers are approximately 21 gallon capacity (estimated 17 useable). Both containers use battery powered recirculating pumps, and water is changed as necessary during transport.

5.3) Broodstock holding and spawning facilities.

Adult facilities consist of a trap located on Three Rivers across Highway 22 from the main hatchery facility and two ponds on the hatchery grounds. The trap consists of two concrete tanks (approximately 10 feet by 20 feet). One tank is used as the trapping facility and the other to hold fish. The trap and tank can be subdivided. The trapped fish are sorted into the adjacent holding tank. The tanks are supplied with gravity fed water from Cedar Creek. Water flow can be adjusted but is normally supplied at approximately 3.2 cfs. Water flows exit through the adjacent trap and fish ladder. Water flow measurements are taken weekly and the trap monitored at least once per day. The trap and tanks are located in an approximately 30-foot by 50-foot building. The building has a concrete floor and metal walls and roof. The building can be secured to protect fish and equipment. The building has electrical service for lighting. Auxiliary pumps can supply additional water during low-flow periods. All necessary supplies for spawning can be stored in this building. The trap has a capacity of several hundred fish. All stock 47 steelhead broodstock are sorted and spawned in this building. There are two additional adult holding ponds on the hatchery proper. These ponds can be divided in half. These ponds have the capacity to hold 2,000 adults.

Wild stock (47W), are delivered to the hatchery by volunteer anglers. Adults are typically placed in one of the adult holding ponds, although other containers have been used at times (i.e. Canadian troughs). Hatchery staff sort the fish by sex and maturation level. The broodstock are spawned on a portable spawning table. The fish are anesthetized in a small tank using MS 222, and then air spawned. Upon completion of spawning they are placed directly into a portable tank or unused holding container, allowed to recover, and transported for release into the Nestucca River.

The water supply to the adult holding pond is approximately 408 gpm.

5.4) Incubation facilities.

The incubation room is approximately 43 feet by 38.5 feet. It is a wooden structure on a concrete foundation with a composition roof. The building receives gravity fed water from Cedar Creek. The facility contains 6 shallow troughs and 6 stacks of vertical incubator trays. Each stack contains 14 trays. Flow through heaters and a small capacity chiller allow for limited temperature manipulation of selected groups of eggs. This allows for acceleration or deceleration of development in order to close the gaps between eggs taken on different dates. The heaters can raise the water temperature about 3ºF above ambient and is equipped with an automatic shut off if water flow is restricted. The chiller unit is a recirculation system of limited capacity, but can maintain water temperatures around 39ºF. Discharge water is returned to Cedar Creek. The same facility and equipment is used for both stocks.

Incubation of eggs for the STEP classroom projects is done in small aquariums with a natural substrate bottom. Systems usually have a standard aquarium pump and filter setup. Temperature control is accomplished by insulation around the tank and the addition of liter-sized bottles of frozen water as needed. Water is partially changed on a weekly basis to keep it "fresh".

5.5) Rearing facilities.

The incubation building also contains 4 concrete tanks and 3 fiberglass Canadian-style deep troughs. These facilities are used to start fish on feed. The concrete tanks each have a rearing capacity of 90 pounds of fish. Two of the Canadian troughs each have a capacity for approximately 50 lbs. of fish, and the third has a capacity of 100 lbs. of fish. The hatchery also has 7 concrete ponds and 2 asphalt lakes. Three of the concrete ponds have a capacity of 10,000 cubic feet; three have a capacity of 8,000 cubic feet, and one a capacity of 4,500 cubic feet. One of the lakes has a capacity of 360,000 cubic feet and the other 89,000 cubic feet. Winter steelhead were historically reared in the larger lake. Lake rearing was discontinued in 2002 as a result of the inability to meet effluent discharge criteria under the DEQ 300J permit.

The component of juvenile fish transferred to Trask Hatchery for rearing and release in the Wilson River will be addressed in the Trask Hatchery stock 47 winter steelhead HGMP.

5.6) Acclimation/release facilities.

There are no direct or volitional releases from the facility and no acclimation is currently utilized for this production, although acclimation may be used in the future to meet management objectives. All Nestucca production is by direct stream release from liberation trucks. All other Tillamook Basin production is reared by Trask Hatchery and is covered in the Trask Hatchery Winter Steelhead 47 Stock HGMP.

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

There has been no significant fish loss to disease in most years with the exception of the 47W stock 2003 BY which incurred an approximate 20 K loss due to cold water disease (CWD). Juveniles are treated as necessary for external parasites, typically during summer months, but high loss is not associated with these parasites. See Attachment A for disease history and protocols for stock 47. No long term disease history is available for the 47W stock; however at this time it appears to follow a similar history as the 47 stock with the exception of the CWD loss noted above. Current production uses all the shallow trough incubators and six stacks of vertical incubators. Egg and fry mortality continues to be high because of the high silt content in the water, particularly during large storm events. Extreme rainfall events, such as flood events in 1996, 1999, 2006, and 2007, create operational difficulties. Around-the-clock pumping of sand and silt from

intakes and sand traps was necessary to maintain flows to ponds and avert catastrophic losses.

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.

Because no listed fish are being reared at the facility any operational failures are anticipated to have minimal effects. The following risk aversion measures are in place to reduce the potential for adverse impacts to salmonids in the wild in the event of equipment failure or natural event affecting the hatchery. Procedures and equipment are used to address events and allow fish to remain on station and avoid emergency releases except in extreme situations.

The hatchery facility is staffed full-time, 24 hours per day. A computerized alarm system allows instantaneous notice of a system failure. Each rearing container has a float-activated switch tied into our central alarm system. Currently in use are Motorola hand-held alarm radios that have a range up to five miles. The radios also allow for two-way communication between employees, which has been tested and used effectively. The facility is equipped with a propane operated pump, utilized during high water events to supply settled water. Operating procedures include exercising the propane pump and topping the fuel tank as needed.

SECTION 6

BROODSTOCK ORIGIN AND IDENTITY

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

6.1) Source.

Prior to 1981, no broodstock were collected locally for use in the Cedar Creek winter steelhead program. Alsea stock (43) eggs were shipped in from Alsea Hatchery, reared at Cedar Creek Hatchery, and released in the Nestucca and Tillamook Bay basins. Beginning with the 1981-82 return year, broodstock were collected from fish returning to the Cedar Creek trap facility on Three Rivers. These adults may have been descendants of Alsea River winter steelhead or Nestucca River winter steelhead.

Nestucca wild stock (47W) were first collected in the winter of 2001-02. These adult fish are un-marked and are primarily collected by angling from the Nestucca River basin.

6.2) Supporting information.

6.2.1) History.

Prior to the 1981 brood year, Alsea River (stock 43) winter steelhead were used for this program. For a discussion of the Alsea River Hatchery winter steelhead stock see the Alsea Hatchery winter steelhead HGMP. Beginning with the 1981-82 run year, adult winter steelhead have been collected for broodstock at Three Rivers trap. This broodstock was designated stock 47. This is prior to mass marking and the broodstock consisted of returning Alsea Hatchery stock but might have included wild, naturally produced, Nestucca River winter steelhead, however it is unknown what the percentage may have been. Since the 1981 brood year, only smolts from broodstock collected at Cedar Creek Hatchery have been released for this program with 2 exceptions:

(a) For the 1989 brood year, the number of ponded fry equaled 278,793 Alsea River stock (stock 43 from Alsea Hatchery) and 124,707 Nestucca River 47 stock. A disease outbreak in the facility resulted in loss of stock 47 steelhead. Stock 43 fish were brought in to replace the loss.

(b) For the 1990 brood year, the number of ponded fry equaled 128,059 Alsea River stock (from Alsea Hatchery), 99,130 Nestucca river 47 stock from Trask River Hatchery, and 200,324 Nestucca River 47 stock. The Trask River stock identified here is actually stray Cedar Creek 47 stock that was captured at Trask Hatchery. It was used when Cedar Creek Hatchery lost adults to disease and was short on egg take that year.

6.2.2) Annual size.

Current production program for stock 47 winter steelhead requires a minimum broodstock of approximately 70 fish (35 male, 35 female) to meet genetic guidelines for a production goal of 80,000 stock 47 smolts.

Current production program for 47W stock winter steelhead requires a minimum broodstock of approximately 80 naturally produced winter steelhead adults (40 male, 40 female), to meet guidelines for a production goal of 100,000 stock 47W smolts.

Total combined production is 140,000 winter steelhead smolts. Pending further evaluation and public input, production may shift to utilize more or less stock 47W for this program.

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

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

Prior to the 1992-93 adult return, which were the first returns of mass marked stock 47 hatchery winter steelhead, it is unknown at what level, if any, naturally produced fish may have been included in the broodstock. With the return of mass marked fish back to the facility, no unmarked (naturally produced) adults have been used for broodstock purposes until the start of the Nestucca Wild winter steelhead broodstock (47W) program in December 2001. None of the wild stock 47W fish are mated with the long term Alsea origin 47 stock, both programs are held separate.

Unmarked winter steelhead trapped at Cedar Creek Hatchery are currently passed above the weir/trap facility to spawn naturally; except a portion of any returning unmarked fish may be collected and incorporated into the 47W program with the remainder being passed above to spawn naturally. The 47W program primarily uses naturally produced (unmarked) wild stock steelhead for broodstock annually at this time. Returning hatchery adult 47W stock may be used in the brood if needed to meet production or fish management goals.

6.2.4) Genetic or ecological differences.

The current stock 47 broodstock (locally adapted Alsea progeny) are likely to exhibit differences from the naturally produced Nestucca and Tillamook Bay basin winter steelhead. A significant percentage of returning hatchery adults appears to be 2-salt fish, and may represent a higher percentage than would be expected in a naturally producing population. Return timing of stock 47 appears to be in an earlier period (late November through February, peaking in late December to early January) compared to a wild steelhead (stock 47W) return period (January through May, usually peaking in late-March). Information on spawning locations show, in general, that stock 47 hatchery adults tend to spawn in smaller tributaries, and wild stock steelhead (47W) appear well dispersed within the Nestucca basin with more spawning activity observed in larger tributaries and upper mainstem areas (Jacobs and Susac 2003).

6.2.5) Reasons for choosing.

Prior to 1981, Alsea stock 43 eggs were used for winter steelhead production at Cedar Creek. In 1981, the decision was made to take eggs from hatchery fish returning to Cedar

Creek Hatchery and eliminate the continual releases of an out-of-basin stock. This "new" stock was designated stock 47. It was felt the use of a "locally adapted" stock was likely to reduce out-of-basin straying and provide broodstock better suited to the basins of release. The parent Alsea stock appears to be a good contributor to angling success. At the time, there was no mass marking of hatchery fish; however, it was assumed that, based on timing, fish being taken for broodstock were of hatchery origin.

The Nestucca wild winter steelhead stock (47W) was chosen as part of management direction to begin using local indigenous stocks for hatchery programs. It is felt these stocks are best suited to reduce out of basin straying, and minimize genetic concerns when these fish spawn in the wild. In addition it is felt they contribute to providing an increased window of opportunity for angler harvest.

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.

Risk aversion measures (to impacts to listed coho) associated with the Nestucca 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).

A minimum of approximately 70 stock 47 adult winter steelhead are needed (35 males and 35 females) to meet the program objective of 80,000 smolts and to meet genetic guidelines.

A minimum of approximately 80 stock 47W adult winter steelhead are needed (40 males, 40 female) to meet the program objective of 100,000 smolts. Additional fish may be collected to assure meeting program goals with all unspawned fish returned to the river to spawn naturally (along with live-spawned fish).

7.2) Collection or sampling design.

Beginning in late November, stock 47 adults begin returning to the Three Rivers trap. They are collected and held for broodstock during December and January, with spawning completed in January. Broodstock are collected randomly from throughout the early portion of the run to provide improved temporal run and spawn timing between hatchery and wild stocks. Future consideration may be given to collecting a portion of the 47 stock brood adults by angling.

Beginning in December and running through April, stock 47W adults, are collected from the Nestucca by volunteer anglers. Some fish may be collected for the Three Rivers trap or by alternative methods (described earlier) if needed. Collection is approximately apportioned to overall return timing by month throughout the collection period based on run timing data from creel and recent spawning survey data. Adults are checked regularly and spawned as fish ripen.

7.3) Identity.

The hatchery reared winter steelhead have distinctive external fin and/or maxillary bone clips that distinguish them from the unmarked naturally produced fish, additionally the two stocks (47 & 47W) are further differentially marked for evaluation and broodstock management needs. Currently, stock 47W are adipose fin-clipped and stock 47 is adipose/left maxillary clipped. Alternate marks may be considered as needed for management purposes.

7.4) Proposed number to be collected:

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

A minimum of approximately 70 stock 47 winter steelhead broodstock (35 males and 35 females) must be collected to achieve the current project's smolt production goal of 80,000 smolts and to meet genetic guidelines. The broodstock sex ratio at collection time

is assumed to be 1:1; however, difficulty verifying sex due to lack of distinct sex related external characteristics can affect the sex ratio. Adults are spawned at a one-to-one, male-to-female ratio.

A minimum of approximately 80 stock 47W naturally produced winter steelhead broodstock (40 males and 40 females) must be collected to achieve the current project's smolt production goal of 100,000 smolts and to meet genetic guidelines. The broodstock sex ratio at collection time is assumed to be 1:1; however, difficulty verifying sex due to lack of distinct sex related external characteristics can affect the sex ratio. Adults are spawned at a one-to-one, male-to-female ratio.

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

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

Table 7-1 Broodstock Collection Levels for Stock 47. Data represents the number of fish spawned and eggs collected from those spawned females. Figures represent previous production levels and are subject to change as production goals described in this HGMP are implemented.

Year	Adults			Total	
	Females	Males	Jacks	*Eggs	Juveniles
1988	386	365	2	1,076,076	408,368
1989	174	197	0	523,185	355,477
1990	163	121	0	563,086	351,799
1991	276	279	9	967,247	360,457
1992	169	331	6	572,672	455,200
1993	145	247	8	468,849	375,373
1994	125	125	0	436,661	271,762[1]
1995	96	63	3	364,017	274,873
1996	99	99	12	371,015	248,844
1997	97	97	4	344,749	249,668
1998	95	96	3	315,799	213,032
1999	100	100	42	420,920	219,191
2000	100	100	0	339,531	266,967
2001	85	85	0	392,856	274,573
2002	55	55	0	303,383	272,253
2003	55	55	0	200,228	136,037
2004	58	58	0	212,793	134,215
2005	86	86	0	254,089	104,341
2006	90	90	0	254,738	146,952
2007	93	93	0	272,364	127,758

Data source: ODFW Hatchery Management System (HMS) Database, Salem.

[1]Smolt reductions are primarily a result of budget reductions, and development of a Wilson River broodstock to replace a portion of the StW 47 stock released in the Wilson. These reductions, along with rearing improvements, in turn led to a reduction of necessary broodstock numbers.

Table 7-2 Broodstock Collection Levels for Stock 47W. Data represents the number of fish spawned and eggs collected from those spawned females.

Year	Adults			Total	
	Females	Males	Jacks	*Eggs	Juveniles
2002	22	22	0	68,689	49,547
2003	23	23	0	64,953	54,633
2004	25	25	0	78,591	57,266
2005	27	27	0	76,814	60,053
2006	37	37	0	125,872	38,321
2007	34	34	0	107,989	60,966
Data source: ODFW Hatchery Management System (HMS) Database, Salem.					

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

Winter steelhead (stock 47) are collected for hatchery broodstock at the Three Rivers trap facilities. Alternative collection methods may be employed if necessary, including offsite trapping (includes Tillamook basin sites), angling, or netting. Unripe surplus adults not needed for the program are recycled back into the Nestucca River. Later returning ripe males are recycled into local lakes allowing additional fishing opportunity for the public. Ripe females are stripped and returned to the river, or may be taken to local lakes. Stock 47 winter steelhead adults may also be used for food programs or stream enrichment activities. Naturally produced fish (unmarked) collected are passed upstream to spawn naturally, however on occasion some may be retained for the wild broodstock program if necessary.

Any stock 47W hatchery winter steelhead adults collected at the Three Rivers trap, off-station trap facility, or by alternative methods will be handled in a similar manner.

7.5) Fish transportation and holding methods.

Adult (stock 47) hatchery winter steelhead collected at the Three Rivers trap (or alternate sites) are held in the holding facility at the Three Rivers trap until ready to spawn. All on site spawning activities typically take place in the Three Rivers trap facility building.

Stock 47W adults collected are typically held and transported in stainless steel boxes (with lids), or in large capacity plastic coolers. Boxes are approximately 20 gallon capacity (estimated 15 gal useable); coolers are approximately 21 gallon capacity (estimated 17 useable). Both containers use battery powered recirculating pumps, and water is changed as necessary during transport to Cedar Creek Hatchery. At the hatchery fish are placed in an adult holding pond (other suitable containers may be used if necessary).

7.6) Describe fish health maintenance and sanitation procedures applied.

Broodstock and developing eggs receive regular treatments with formalin to prevent/control fungus (*Saprolegnia parasitica*) outbreaks. The spawning area and equipment are routinely disinfected with an iodine solution to prevent disease outbreaks. Green eggs are water-hardened in an iodine solution to prevent disease or viral contamination. Treatments apply to both stocks. See Attachment A. Stock 47W winter steelhead is a relatively new program, as such, it has not had time to develop an extensive health maintenance "history" of significance; however it does appear to mirroring stock 47 fish health at this time. For fish health maintenance, stock 47W fish will be handled and treated similar to stock 47 fish as necessary, and/or as directed by ODFW fish health personnel.

The 47W brood are treated up to three times per week with Hydrogen Peroxide at a rate of 1: 4,250 or with Formalin at a rate of 1:12000 – 1:6000 to control fungus as necessary. This is a one-hour treatment.

7.7) Disposition of carcasses.

Spawned 47 stock hatchery winter steelhead carcasses are used for stream enrichment activities in the Nestucca Basin. Stock 47W adults are live spawned and fish are returned to the river after spawning and a short recovery period. If necessary to kill spawn stock 47W adults (for example to collect pathology samples), carcasses may be used for stream enrichment. Specific criteria and guidelines for operation of the stream enrichment program are identified in an MOA between ODFW and DEQ. Pond and trap mortalities for either stock are buried or disposed of in a landfill.

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

There should be minimal likelihood for adverse genetic or ecological effects to listed fish as a result of broodstock collection. The following measures will be used to minimize adverse genetic or ecological effects to Nestucca Basin wild coho:

Wild coho that enter the Three Rivers (Cedar Creek Hatchery) trap will be immediately released alive above the trapping facility, or trucked a short distance above if flow conditions dictate. The hatchery trap will be visually checked at least daily, and fish sorted at least weekly (or as needed) to minimize delay and potential harm to wild Coho Salmon. Wild steelhead will be handled in a similar manner with the future option to retain a portion for broodstock if desired. The weir and trap facility is further being operated as indicated in the letter from Tom Stahl to Lance Kruzic. See Attachment B.

If used, operation of an off-station trapping facility (Bays Creek or other location) will be directed to minimize impacts to listed coho, wild steelhead, and chinook. Trap(s) will be checked and run at least once a day by a dedicated trapping crew. Any wild Coho Salmon and steelhead, and Chinook Salmon encountered will be documented and immediately passed above the trap and allowed to spawn naturally.

Collection of wild winter steelhead by angling should pose little or no impacts to listed coho. Angling is done only in those areas and times open to steelhead angling, and any coho caught must be immediately release unharmed. Similar collection programs indicate virtually no interception of Coho Salmon.

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 stock 47 winter steelhead is random throughout the December and January portion of the run. Individual fish are collected throughout the collection period. Typically spawning is completed once a week during the collection period (approximately 3 weeks) once the fish ripen. Ripe fish are randomly selected for spawning with the number of fish spawned dependent on the number of ripe fish available on each spawning day. Stock 47 adults collected in February typically are not used as broodstock to maintain separation between the earlier returning and spawning hatchery fish and later returning wild fish. This is done to reduce the likelihood that hatchery fish spawning in the wild will interbreed with naturally produced fish.

Collection of stock 47W winter steelhead takes place from December through April to represent wild run timing characteristics. Current broodstock fish are collected throughout the return period approximately proportional to their run timing. Fish are typically spawned randomly as they ripen during the collection period, and depends on the number of fish available at any given time.

8.2) Males.

Backup males may be used on occasion when spawning 47 and 47W stock if sufficient fresh ripe males are not available at the time of spawning (i.e. individual males could be spawned more than once). Jacks (1 salt fish) may be included in both broodstocks when available.

8.3) Fertilization.

Stock 47 winter steelhead are kill spawned using a 1:1 (male-to-female) ratio and are incorporated in a 5- by 5 modified matrix. The individual family groups could be kept separate if necessary. There is sampling on up to 60 females for infectious hermatopoietic necrosis (IHN) through ovarian fluid samples to facilitate culling if the virus is detected. Tissue samples taken on the first 60 fish of both sexes are used to test for IHN as well as other opportunistic viral pathogens.

Stock 47W winter steelhead are live spawned using a 1:1 (male-to-female) ratio and are incorporated in a modified matrix (up to 5x5) when possible. The individual family groups are kept separate. There is a sampling on up to 60 females for infectious hermatopoietic necrosis (IHN) to facilitate culling if the virus is detected.
Stock 47W adults are live spawned. Ovarian fluid samples are collected for viral analysis. Fertilized eggs are water-hardened in an iodine solution prior to placement in incubators, which applies to both stocks.

8.4) Cryopreserved gametes.

Cryopreservation of winter steelhead gametes is not used in the 47 or 47W stock programs.

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.

The winter steelhead mating schemes have no effect on listed Coho Salmon. Stock 47 broodstock are selected at random from the early component (December and January) of the hatchery winter steelhead run. Spawning is done randomly based on availability of ripe fish. Matings are done on a 1:1 sex ratio (i.e. one male and one female). Each fish is usually only used once in spawning and is incorporated in a 5- by 5-matrix and kept separate in individual family groups. On occasion males may be spawned more than once if fresh, or ripe, males are not available for a given spawning.

Stock 47W broodstock are collected from throughout the period (December through April) of the wild winter steelhead run. Spawning is done randomly based on availability of ripe fish. Matings are done on a 1:1 sex ratio (i.e. one male and one female). Each fish is usually only used once in spawning and is incorporated in a 5x5 modified matrix (when possible) and may be kept separate in individual family groups. On occasion males may be spawned more than once if fresh, or ripe, males are not available for a given spawning.

SECTION 9

INCUBATION AND REARING

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

9.1) Incubation.

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

Table 9-1. Eggs Taken and Survival Rates of Winter Steelhead at Cedar Creek Hatchery.

Year	47 Stock (Alsea)		47W Stock (Nestucca Wild)	
	Egg Take	Percent Survival to Eye-up	Egg Take	Percent Survival to Eye-up
1995	364,017	98%		
1996	371,015	92%		
1997	344,749	95%		
1998	315,799	97%		
1999	420,920	95%		
2000	339,531	95%		
2001	392,856	94%		
2002	303,383	91%	68,689	91%
2003	200,288	87%	64,953	87%
2004	212,793	88%	78,591	93%
2005	254,089	93%	76,814	76%
2006	254,738	91%	125,872	91%
2007	272,364	72% [1]	107,989	83%

Data source: ODFW Hatchery Information Management System (HMIS) Database, Salem.

1. Experimental disinfection procedure tried at time of spawning resulted in above average losses.

9.1.2) Cause for and disposition of surplus egg takes.

Extra stock 47 winter steelhead eggs are typically collected in order to compensate for egg to smolt mortality and genetic considerations, such as increased family size to promote genetic diversity, etc. Surplus eggs are culled on a percentage basis across all family groups to retain diversity among those adults spawned. Mortality and culled eggs are all disposed of by freezing and then buried.

Stock 47W egg take is managed to prevent surplus egg take to the extent possible. In the event of significant surplus, eggs would be incubated and fry excess to production needs would be released in suitable water bodies or destroyed. Mortality and culled eggs are all disposed of by freezing and then buried or taken to a landfill.

9.1.3) Loading densities applied during incubation.

Stock 47 winter steelhead egg average size (eggs per ounce) is 135 eggs per ounce. Average fecundity is approximately 3,400 eggs. The shallow trough type egg incubators have a water flow of 12 gpm. Each incubator basket typically receives 17,000 eggs.

Stock 47W winter steelhead egg average size (eggs per ounce) is 108 eggs per ounce. Average fecundity is approximately 2,950 eggs. The shallow trough type egg incubators have a water flow of 12 gpm. Each incubator basket typically receives up to 14,750 eggs.

Loading densities for STEP classroom incubators varies with the size and setup of equipment being used but typically runs from 200 to 1,000 eggs. A standard aquarium recirculating type pump supplies flow. No flow rates have been calculated but it is believed that flow is sufficient for the small number of eggs used in these programs. Only stock 47 eggs are used for STEP, at this time.

9.1.4) Incubation conditions.

The water supply to the egg incubators is monitored for flow and temperature daily. The incubating eggs are held in water that is 40º to 47ºF. The dissolved oxygen (DO) for the influent water ranges between 10 to11 parts per million (ppm). No data is available for the effluent water.

Students will sometimes monitor temperature in the STEP classroom incubators; however, it is likely to vary significantly between incubators, rooms, and schools. Typically, these systems run at ambient room temperatures. However, ice is often added daily to keep temperatures in the optimum range of 50º to 60º F., below the prolonged exposure lethal level of 63º F. A standard aquarium recirculating type pump supplies flow.

9.1.5) Ponding.

Fry are physically relocated from the incubator trays to starting ponds when the majority of fry are buttoned up.

Stock 47 fry ponding occurs with approximately 1,100 temperature units. At the time of ponding, stock 47 winter steelhead fry average 2,015 fish per pound.

Stock 47W fry ponding occurs with approximately 1,200 temperature units. At the time of ponding, stock 47W fry average 1,500 fish per pound.

9.1.6) Fish health maintenance and monitoring.

See Attachment A regarding state approved fish health management protocols.

Stock 47W winter steelhead is a relatively new program, as such, it has not had time to develop an extensive health maintenance “history” of significance; however it does appear to be mirroring stock 47 fish health at this time. For fish health maintenance

issues stock 47W fish will be handled and treated similar to stock 47 fish as necessary, and/or as directed by ODFW fish health personnel.

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.

The incubation protocols described above have no known effect on listed natural Coho Salmon.

9.2) Rearing:

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

Table 9-2. Stock 47 StW Survival Rates.

Brood Year	Percent Survival Green Egg to Ponded Fry	Percent Survival Ponded Fry to Smolt [1]
1991	92.9%	84.5%
1992	84.8%	79.5%
1993	92.5%	88.1%
1994	95.7%	84.3%
1995	93.7%	86.0%
1996	93.9%	74.0%
1997	93.7%	75.0%
1998	95.6%	71.0%
1999	94.0%	65.9%
2000	92.6%	78.6%
2001	92.0%	74.9%
2002 [2]	88.9%	96.0%
2003	84.0%	80.0%
2004	84.0%	82.0%
2005	70.0%	81.0%
2006	88.0%	68.0%
2007	70.0%	93.0%
Average	88.6%	80.1%

Data Source: ODFW Hatchery Management System (HMS) Database, Salem.

1. Prior to Brood Year 2002, fingerling were reared in lakes and subject to significant bird predation.

2. Figure represents survival of component held for Nestucca release after marking.

Table 9-3. Stock 47W StW Survival Rates.

Brood Year	Percent Survival Green Egg to Ponded Fry	Percent Survival Ponded Fry to Smolt
2002	90.5%	90.0%
2003	85%	98%
2004	91%	98%
2005	73%	82%
2006	88%	70%
2007	90%	96%
Data Source: ODFW Hatchery Management System (HMS) Database, Salem.		

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

The criteria for Cedar Creek Hatchery's raceway, fish densities, and loading differ considerably from season to season. Early rearing densities are below goals set within the Fish Hatchery Management publication (Piper 1982). Ponds used and timing may vary annually as necessary depending on the facilities production programming, water flows, or ponding densities.

Stock 47 winter steelhead are ponded in March. In July or August after fin-clipping, the Tillamook Bay basin portion of the program are transferred to Trask Hatchery. The remaining fingerlings are retained in one pond at Cedar Creek Hatchery. Loading density at the time of marking is approximately 0.25 pounds of fish per cubic foot of water. The density at time of release is approximately 0.75 pounds of fish per cubic foot of water.

Stock 47W winter steelhead are ponded into Canadian Troughs and reared until mid-July when density dictates they be moved to a larger rearing container. At that time they are moved into an outside pond. In October they are fin-clipped and split into two ponds. Loading density at the time of splitting is approximately 0.25 pounds of fish per cubic foot of water. The density at the time of release is approximately 0.75 pounds of fish per cubic foot of water.

9.2.3) Fish rearing conditions.

Winter steelhead reared at Cedar Creek Fish Hatchery, grow on Cedar Creek river water; hence, rearing water temperatures vary with seasons and with natural river fluctuations. Water temperatures range from 54º to 67ºF during spring and summer, and from 40º to 56ºF during the fall and winter. Dissolved oxygen (DO) levels coming into the facility are typically between 10.0 ppm and 10.5 ppm in the fall and winter.

With the reduced production and revised rearing scenarios now in place at the facility it is not anticipated that DO levels will be a concern. Cedar Creek Hatchery has the ability to run recirculation pumps or place surface aeration equipment in the ponds during extreme conditions.

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

Weight samples are collected for inclusion in monthly pond reports. Length frequency and condition factor measurements are made at the time of liberation; marked quality observations are also made at this time. Table 9-4 shows average monthly weights for the 47 stock program from ponding to release for the prior two years, and for the first year of the 47W stock program.

Table 9-4. Average Monthly Fish Size for Cedar Creek Winter Steelhead (2006-2007).

Week	47 Stock Size in fish/pound	47W Stock Size in fish/pound
Ponding	2,100	
Week 4	817	1,700[1]
Week 8	265	1,028
Week 12	114	335
Week 16	54	112
Week 20	29	50
Week 24	16.7	40
Week 28	13.7	27
Week 32	12.6	20.3
Week 36	11.2	13.2
Week 40	7.3	10.9
Week 44	76.6	7.6
Week 48 or release	5.8	7.4

Numbers represent end-of-month averages

Data source: ODFW Hatchery Management System (HMS) Database, Salem.

1. Stock 47W ponds about 1½ - 2 months after the stock 47 is ponded.

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

Once the fry have been ponded, their weight generally doubles each month until the time of marking when their feed is programmed to ensure that the fish do not exceed pond destiny limitations. This method of feeding applies to both stocks.

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

Winter steelhead juveniles reared at Cedar Creek Hatchery are fed a dry fish food diet at a rate and frequency that varies with fish size. For the first 90 days following ponding, the fish are fed 8 to 12 times per day. For the next 90 days, they are fed 4 to 6 times per day. For the remainder of rearing the fish are fed 2 or 3 times per day. The last six weeks of rearing, prior to release, the fish feed ration is reduced to a slow rate of growth and or maintenance diet depending on fish per pound and condition factor.

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

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

Stock 47W winter steelhead is a relatively new program as such it has not had time to develop an extensive health maintenance “history” of significance; however it does appear to mirror stock 47 fish health. For fish health maintenance issues stock 47W fish will be handled and treated similar to stock 47 fish as necessary, and/or as directed by ODFW fish health staff.

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. Prior to release, length frequencies are taken and condition factors are calculated. A visual mark quality check is completed on a representative sample of the fish targeted for release. Table 9-5 shows average fork length data for the two stocks.

Table 9-5. Average Fork Length Frequency Percentages (2002 -2006).

Fork Length Size Range	47 Stock Releases	47W Stock Releases
< 18 cm.	8 %	40%
18 – 22 cm.	82 %	57%
> 22 cm.	10 %	3%
Data Source: HMIS.		

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

There are no "intentional" natural rearing methods applied to either stock of winter steelhead in this program.

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

Winter steelhead reared in this program (stock 47 & 47W) are not listed under the Federal or State ESA. However, fish will be reared to full-term smolt size before release. Standard ODFW fish health monitoring and control procedures are followed to prevent the spread or amplification of pathogens in the basin.

SECTION 10
RELEASE

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

10.1) Proposed fish levels for Nestucca stock winter steelhead.

Table10-1 Proposed Fish Release Levels.

Age Class	Maximum Number	Approx. Size (fpp)	Release Date[4]	Location
Eggs	0			
Unfed Fry[1]	Excess fry, varies	2,000 est.	April	Various Lakes – stk 47
	Excess fry, varies	2,000 est.	April	Nestucca basin – stk 47W
STEP - unfed fry[2]	2,000 total	900 900 900	April April April	Wilson River Nestucca River Three Rivers
Fry	0			
Fingerling [3]	Excess, varies	110	July	Various Lakes – stk 47
	Excess, varies	70	Sept.	Nestucca basin – stk 47W
Yearling Stk 47[5]	40,000	6.0	March/April	Nestucca River
Yearling Stk 47W[5]	100,000	6.0	April	Nestucca River

Data source: Production schedules and District files.

1. This program does not produce unfed fry for release as a program goal for either stock (47 or 47W). 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); 47 stock will be released in standing water bodies; 47W stock may be released in under-seeded habitat or into standing water bodies.

2. Only stock 47 fish are used in STEP Program. Unfed fry from STEP 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. 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. Additional data is provided in Section 10.3, Table 10-3.

3. This program does not produce fingerling for release as a program goal for either stock (47 or 47W). In any given year there may be surplus fingerling at the time of marking (typically resulting from above average fry and fingerling survival); 47 stock will be released in standing water bodies; 47W stock may be released in under-seeded habitat or into standing water bodies.

4. Annual releases will typically take place during the months shown, however in some years releases may vary depending on circumstances.

5. During the transition to releases described in this document, up to 70,000 stock 47 and 70,000 stock 47W may be released (2014 BY). Pending further evaluation, stock 47W releases may increase up to 140,000 smolts. A corresponding decrease in stock 47 smolts would maintain a total release of 140,000 smolts.

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

Stream, river, or watercourse:	Nestucca River,
Release point:	Bays Creek, mainstem, and possibly other tributaries including, but not limited to, Three Rivers. See note below.
Major watershed:	Nestucca River
Basin or region:	Nestucca Bay Basin

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

Table10-2. Cedar Creek Hatchery Winter Steelhead Release Levels (including STEP Unfed Fry Release). Size of fish is number of fish/lb.

Brood Year	Stock	Eggs/ Unfed Fry	Avg Size (fish/lb.)	Fry	Avg Size (fish/lb.)	Fingerling[2]	Avg Size (fish/lb.)	Smolt	Avg. Size (fish/lb.)
1990	47	237,097	NA	0		0		351,799	5.5
1991	47	53,055	NA	0		33,604	10.7	326,853	5.2
1992	47	0		64,680	385	56,236	11.5	334,284	6.5
1993	47	39,653	NA	0		50,206	9.6	324,967	5.5
1994	47	109,260	NA	0		20,344	90.0	241,375	5.8
1995	47	40,778	NA	9,945	165	7,020	91.4	216,063	5.4
1996	47	32,984	NA	0		20,240	92.0	192,593	4.7
1997	47	11,000	NA	0		27,953	82.5	191,724	5.2
1998	47	17,972	NA	0		0		186,503	5.4
1999	47	83,173	NA	0		0		188,993	5.3
2000	47	1,329	NA	2,210	130	5,261	5.6	259,496	5.7
2001	47	766	NA	0		41,025	80.3	216,358	5.8
2002	47	0		82,490[1]	110	0		51,224	5.7
	47W	0		0		6,440	70.0	49,544	6.5
2003	47	0		0		0		49,612	5.7
	47W	0		0		177	59.0	45,254	6.4
2004	47	0		0		0		60,974	5.6
	47F	0		0		0		57,673	8.1
2005	47	0		0		82,008	72.0	57,690	5.2
	47F	0		0		0		38,216	7.0
2006	47	0		0		67,293	92.1	58,762	5.7
	47F	0		0		0		60,687	7.4
2007	47	0		0		36,120	70.0	41,582	5.7
	47F	0		0		0		71,985	9.1
2008	47	0		0		0		41,700	6.0
	47F	0		0		0		74,905	13.4

2009	47	0		0		14,059	53.9	42,102	6.6
	47F	0		0		0		67,077	7.8
2010	47	0		0		11,250	75.0	42,750	6.0
	47F	0		0		0		69,766	12.2
2011	47	0		0		12,540	57.0	42,835	5.9
	47F	0		0		10,068	36.3	73,780	7.3
2012	47	0		1,879	104	0		43,500	5.8
	47F	0		0		21,096	47.5	71,196	6.4
2013	47	0		0		0		41,938	5.5
	47F	0		0		7,056	63.0	72,314	7.7
2014	47	0		0		7,250	58.0	42,630	5.8
	47F	0		0		3,325	35.0	95,644	6.0
2015	47	0		0		0		30,662	5.5
	47F	0		0		0		95,537	6.7
Average	**47**	**24,118**	**NA**	**7,009**	**159**	**18,939**	**26.3**	**141,499**	**5.5**
	47W/F	**0**	**NA**	**0**	**NA**	**3,440**	**44.7**	**67,398**	**7.8**

Data source: ODFW HMS database. Notes: Drop in un-fed fry is a result of tightening hatchery operations to reduce surplus fry, and a reduction in the STEP hatchbox program. The drop in smolt production is budget related.

[1] Releases are all in closed water bodies.

[2] Excess wild fingerlings were released in Walker Creek (tributary to the upper Nestucca).

Table 10-3. STEP Fry Release Summary (Number of Un-fed Fry Released by Basin)

Brood Year	Miami	Kilchis	Wilson	Tillamook	Tillamook Bay	Nestucca	Little Nestucca	Neskowin	Sand Lake	Totals
1988	106,136	78,692	108,175	64,423	0	113,992	0	0	2,500	473,918
1989	73,731	41,157	68,249	45,657	0	53,551	0	0	0	282,345
1990	45,720	56,275	36,326	44,210	0	54,566	0	0	0	237,097
1991	7,941	0	19,920	7,918	0	17,276	0	0	0	53,055
1992	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	350	0	175	0	525
1996	0	0	0	0	0	185	0	174	0	359
1997	0	0	0	0	0	1,038	0	190	0	1,228
1998	0	0	0	0	0	397	0	0	0	397
1999	0	0	0	0	0	395	0	192	0	587
2000	0	0	0	0	800	377	0	152	0	1,329
2001	0	0	0	0	0	377	0	389	0	766

Notes: There were no STEP releases after 2001. Specific release numbers and locations for the period 1988 – 2000 are provided in Attachment C. The data provided in that attachment indicates many releases in tributaries to the major drainage basin. The exact location and number of release locations within the tributaries was not recorded. In most instances fish were released in small groups spread out over a number of sites which often varied with overall accessibility to the stream and the physical ability of the volunteers to access the stream.

Source: ODFW HMS database and district files.

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

Stock 47 & 47W winter steelhead smolts are typically released annually in the Nestucca basin in April; occasionally they are released in late March or early May. All fish are forced released. There are no volitional smolt releases from Cedar Creek Hatchery at this time due to pond outlet constraints.

STEP fry are usually released around April 15, dependent on incubation water temperatures in individual classrooms. Depending on the situation, temperature may be "controlled" (to the extent feasible) by teachers to allow fry release timing to avoid spring break periods when students are unavailable for release activities. Transportation is typically done in a set of buckets or garbage can (some with aeration) to the site and a direct release into the stream by students using a small aquarium dipnet. Transportation time is typically 10 to 15 minutes, but may be as high as 30 minutes in some instances.

10.5) Fish transportation procedures, if applicable.

Stock 47 & 47W steelhead are transported from Cedar Creek Hatchery to release sites in the Nestucca basin. Average hauling time is less than one hour.

Stock 47 winter steelhead programmed for the Wilson River are transported to Tuffy Creek Rearing Pond for continued rearing. Average hauling time is approximately one hour.

Liberation trucks are used to haul fish from the hatchery to the release point. Transport trucks are equipped with oxygen, DO meters, and water recirculation agitators.

10.6) Acclimation procedures.

No acclimation is used on stock 47 or 47W for release in the Nestucca basin.

Acclimation for Tillamook Basin releases of stock 47 steelhead are addressed in the Trask Hatchery Winter Steelhead 47 Stock HGMP.

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

Stock 47 winter steelhead smolts programmed for release in the Nestucca Basin are currently mass marked with an adipose / left maxillary mark. Stock 47W winter steelhead smolts programmed for the Nestucca Basin are currently mass marked with an adipose mark. Depending on stock evaluation needs in the future these marks may require change, however all mass marking has a goal of 100 percent finclips or other approved mark types.

Stock 47 winter steelhead smolts programmed for the Wilson River are currently mass marked while at Cedar Creek hatchery with an adipose / left maxillary mark. This may also be subject to change in the future. These stock 47 fish are mass marked at Cedar Creek before program allotment transfer to Trask Hatchery (Tuffy Creek Pond), however all mass marking has a goal of 100 percent finclips or other approved mark types.

STEP fry are unmarked.

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

Smolt releases have been within the programmed and approved levels.

These steelhead programs are designed for smolt production. Operation is designed to minimize potential for surplus fry and fingerling while still meeting smolt production targets. Due to the somewhat unpredictable nature of incubation, fry, and juvenile rearing mortality / survival in any given year may result in surplus fry and fingerlings being available. Information in Table 10.1 for fry and fingerling releases is “proposed” only in the respect of intention to utilize these surplus fry and fingerling if available. The programs do not purposely target fry and fingerling production for release.

10.9) Fish health certification procedures applied pre-release.

See Attachment A, for fish health management protocol.

Stock 47W winter steelhead is a relatively new program; as such it has not had time to develop an extensive health maintenance "history" of significance; however, it does appear to mirror Stock 47 fish health characteristics. For fish health maintenance issues stock 47W fish will be handled and treated similar to stock 47 fish as necessary, and/or as directed by ODFW fish health personnel.

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

The facility is equipped with a backup propane operated pump, utilized in case of power or equipment failure. Operating procedures include exercising the propane pump and topping the fuel tank as needed. The facility also has access to floating aerator devices (if not in use elsewhere), however in case of power failure these devices are inoperable unless a separate power generator is available.

In the event of a water system failure any emergency release of steelhead juveniles, will only occur after:

- The hatchery crew has exhausted all possibilities for retaining the fish.
- The hatchery crew has consulted with the ODFW District Biologist.
- The release will be into the Nestucca, Three Rivers, or into a closed water body and dependent on time of year and lifestage of fish.

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.

1. Both stocks of winter steelhead smolts are programmed as full-term smolts to assist migration and lessen contact time with fish naturally produced in the basin.
2. All smolts are released into mainstem areas, or tributaries, within the river basin. Tributary locations would be evaluated to provide suitable recapture features (if needed) and minimal impacts to wild stocks within the sub-basin.

These two release strategies minimize potential interactions and adverse ecological effects that may occur between hatchery winter steelhead and any juvenile coho, or other juvenile salmonids or trout rearing in the mainstems of the systems.

SECTION 11

MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

11.1.2) 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. Note, these activities will directly measure performance standards and indicators previously described in Sections 1.9 and 1.10. Specifically, information for Nestucca and Tillamook Bay basin wild and hatchery winter steelhead spawner abundance, proportion of hatchery strays, smolt size, and migration timing (adult and juvenile) will be obtained from *The Oregon Plan for Salmon and Watersheds (OPSW)* monitoring projects: Salmonid Life-Cycle Monitoring project (Solazzi et al. 2000) and Coastal Salmonid Inventory project (Jacobs et al. 2000). Information on the catch of hatchery winter steelhead is compiled from returned salmon/steelhead tags and is available from Fish Division in the Salem office of ODFW. Additional catch information was collected from 2004-2009 in the Nestucca basin from a creel program as part of the stock evaluation. 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. Monitoring of in-hatchery performance and adult returns to Cedar Creek Hatchery will be conducted by the hatchery staff. This information is stored on the ODFW mainframe computer in the Hatchery Management Information System (HMIS) database. This will include at least the following information:

Adults

- The number of stock 47 females, males, and jacks collected at Cedar Creek Hatchery, and number of stock 47W females, males, and jacks transported to Cedar Creek Hatchery (Standard 2.1).
- Number of wild winter steelhead and wild coho handled and released from Cedar Creek Hatchery, or off station trapping facilities (Standard 4.5).
- Any observed mortalities of wild winter steelhead and wild coho at Cedar Creek Hatchery, or any off station trapping facilities (Standard 4.5).
- Date of entry into the Cedar Creek Hatchery trap, specified by hatchery and wild fish, or any off station trapping facilities (Standard 2.1).

- Date of entry into the Cedar Creek Hatchery trap for 47 stock fish retained for broodstock, and date of transport (collection) of 47W stock received by the facility (Standard 2.1).
- Dates of spawning at Cedar Creek Hatchery, stock 47 & 47W (Standard 2.1).
- The number of males, jacks and females spawned of stock 47 & 47W (Standard 2.1, 3.4).
- Fecundity of females spawned of stock 47 & 47W (Standard 2.1).
- Disposition (spawned, sold, stream enrichment, etc.) of all stock 47 winter steelhead collected, and disposition (release, mortality, etc.) of all 47W stock wild winter steelhead collected (Standard 4.4).
- Comparison of stock performance of returning adults to the creel (Standard 1.1, 5.1)
- Collection of adult straying data (Standard 3.1)

Juvenile Rearing

- Monthly number of eggs/fish on hand, mortality, feeding rate, and growth for stock 47 & 47W (Standard 4.1).
- Results of fish health checks and any incidence of disease occurrence for stock 47 & 47W (Standard 4.1).
- Results of water quality sampling, (Standard 4.2).

Release

- Number of fish released, by mark type, for stock 47 & 47W (Standard 1.2, 2.3, 2.5).
- Fish size at release; average weight, and length frequency distribution, for stock 47 & 47W (Standard 2.4, 4.6).
- Location of releases, for stock 47 & 47W (Standard 2.3, 2.5, 4.6).
- Date releases started and ended, for stock 47 & 47W (Standard 2.3, 2.4, 2.5, 4.6).

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

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

However, as with all state programs, budgets are approved by the Legislature for a two-year period, and no commitment of funds can be made past the approved budget period. Funds for various projects associated with this HGMP come from a variety of sources

including license dollars, and state general funds. 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.

Risk aversion measures for the salmonid life-cycle monitoring project and the coastal salmonid inventory project are included under the NMFS 4(d) rule as part of the OPSW Research and Monitoring Program. The in-hatchery monitoring program is not expected to increase risks to listed coho 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

Note: This section describes monitoring associated with the initial years of the stock 47W program. I nformation from this research, along with staff and public input, was used to implement changes to the Nestucca hatchery winter steelhead program. The current program is described in this HGMP. While no directed research is occurring now, this information is retained in this section for reference.

Attachment D is a summary of the proposed monitoring and evaluation comparison of the two stocks. The final analysis is not completed at this time however, a preliminary analysis of the evaluation is provided in Attachment E.

12.1) Objective or purpose.

Winter steelhead releases in the Nestucca basin are currently a mix of 47 and 47W stock winter steelhead. The intent of the propagation program is for a transitioning to a local broodstock within an interim period as directed in ORS 635-500-5400. The research and evaluation project will compare performance in the areas of catch contribution, straying (adult and juvenile), and in-hatchery rearing performance during the interim period and provide management direction for program implementation. It is anticipated this evaluation will end after the 2008-09 return year.

12.2) Cooperating and funding agencies.

ODFW personnel will complete all evaluation work with volunteer assistance as necessary. Funding will come from several sources for evaluation components identified.

Catch Monitoring was done with a statistical creel program funded by an ODFW Restoration and Enhancement Program (R&E) grant for the 2004-05 through 2006-07 return years. Final analysis is pending.

Juvenile monitoring and spawning surveys was continued under a Sport Fish Restoration (SFR) grant funded by NOAA, Contract F-181. Juvenile monitoring ended in 20044; spawning surveys continue but at a reduced rate comparable to coastwide survey rates.

Stray monitoring and off station trapping was done by ODFW personnel funded by an ODFW Restoration and Enhancement Program (R&E) grant. Stray monitoring was completed with the 2006-07 return; off station trapping will continue through the 2008-09 return and is anticipated to terminate with restructured release strategies.

Hatchery monitoring will be done by Cedar Creek Hatchery personnel as part of their normal fish propagation activities and reporting, and funded as part of their base budget.

12.3) Principle investigator or project supervisor and staff.

Because several independent components are required the North Coast Watershed District will act as a clearinghouse for the components as well as supervising some components.

Statistical creel, stray monitoring, and off station trapping is supervised by district staff (Keith Braun, Robert Bradley). Creel program and details will be completed by Mary Buckman (ODFW Recreational Fisheries). Seasonal field personnel may change annually.

Juvenile monitoring was supervised by research personnel (Dave Jepsen). Seasonal field personnel may change annually.

Spawning surveys are supervised by research personnel (Mark Lewis). Seasonal field personnel may change annually.

Hatchery monitoring is supervised by the Cedar Creek hatchery manager, Joshua Rist. Hatchery staff includes Joe Hulbert, and Charles Baker.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

The stock affected by this program is naturally produced winter steelhead in the Nestucca basin. An assessment of the status of Nestucca winter steelhead was completed the period 2002 - 2005 (Jacobs and Susac 2003). These assessments estimated that the wild population ranged of from 4,190 to 10,400 during the years surveyed and has tracked with other long term steelhead data sets, and that as many as 10% could have originated for hatchery smolt releases. When compared to other basins the 2002 and 2003 returns (10,000 +) should be viewed as above average relative to long-term abundances.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

The statistical creel was to sample fish of both winter steelhead stocks taken in the consumptive sport fishery. Take of Coho Salmon was prohibited in the basin during the evaluation period.

Juvenile and spawning surveys are visual. No juvenile steelhead or coho were collected.

Trapping will occur at two locations, Cedar Creek Hatchery, and off-station at Bays Creek and are described previously in the document. At both locations any unmarked coho trapped will be recorded and passed above the trap structure to spawn naturally. Any unmarked winter steelhead will be handled in a similar manner with the option to retain a small percentage for broodstock if necessary. Marked hatchery steelhead were recycled and/or removed from the system, and whether they are recycled or removed varied during the evaluation period, and on occasion there were some retained for brood purposes.

Stray monitoring employed a remote site net sampling process. Surveyors used dipnets to capture steelhead when observed in sample areas (subsets of spawning survey locations). By using this method adult coho can be avoided. Collected fish were examined for marks, recorded, tagged, and released. Tagging was with numbered Floy tags inserted through the dorsal fin base. This allowed for identification of previously sampled fish without need for recapture, and would also allow identification and tracking if a fish were to later be caught or trapped.

12.6) Dates or time period in which research activity occurs.

Statistical creel was run annually from December through April, for the return years 2004-05, 2005-06, and 2006-07. Creel data for 2007-08 is being collected but it is not under a statistical creel program format. It is anticipated a similar creel will be undertaken in 2008-09 if funding is sufficient.

Juvenile monitoring typically took place annually in late summer. Specific timing varied according to the survey crews coastwide workloads. There was additional monitoring associated with smolt releases in the spring, typically in April.

Spawning surveys, stray monitoring, and trapping are annual and will typically occurred during the adult return timing period of December through May, but was adjusted as necessary late in the period based on staffing levels and workloads.

Hatchery monitoring continues on a monthly basis as part of standard propagation procedures for ODFW hatcheries.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

Winter steelhead and coho were subject to "holding" as part of the trapping with duration being the time between trap "runs". Typically traps are checked daily, more often if large numbers of fish are present or if flow situations dictate. Unmarked fish are released above traps as the traps are worked. If flow conditions dictate fish may be moved to a portable tank and taken a short distance upstream and released. Marked hatchery steelhead may be collected at either trap site and transported and held for broodstock needs as necessary for the propagation program. Transport equipment and methods are discussed in Sections 5.2 and 5.3.

12.8) Expected type and effects of take and potential for injury or mortality.

The expected take of Coho Salmon will be associated with the trap facilities at Cedar Creek Hatchery and Bays Creek (discontinued after the evaluation period). The most common effect is anticipated to be a temporary delay in migration either by being trapped or delay before entering the trap. With any trapping operation there is potential for injury or mortality. Cedar Creek hatchery trap has been operational for many years and the potential for injury or mortality at that site is expected to be very low. The trap on Bays Creek was a new structure, though temporary at the time. Potential for injury or mortality was unknown, but similar type traps appear to have low mortalities. The Bays Creek system does support Coho Salmon production but indications are it is a small percentage (<1.5%) of the whole Nestucca basin coho production. While mortality to adult coho in the Bays Creek system would potentially reduce productivity within that basin it would not be expected to have a significant impact on the Nestucca basins overall productivity.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).

See Section 2, Table 2-5.

12.10) Alternative methods to achieve project objectives.

Alternative methods while available would likely subject listed coho to greater potential take than the methods listed.

No viable alternative exists for data collected by the creel program. Harvest tag data has no means to separate out differential marks on the two stocks and provides no other data.

Juvenile surveys are visual, the only alternatives would be trapping or electroshocking, both of which carry greater risk than visual methods, are more time consuming, and in some cases limit the area covered.

Spawning surveys are visual, and the only feasible alternative would be trapping which would increase risk and significantly reduce coverage within the basin. It would further eliminate the potential to develop watershed or basin population estimates.

Trapping at Cedar Creek is necessary for broodstock collection for propagation programs at that facility. Seining and angling are alternatives for collection. Seining is only viable during lower flow conditions and may subject fish to greater stress, however it is used in certain low flow situations but would not be efficient for evaluation purposes. Angling is used in some programs but is not feasible for production needs. Angling alone would not give sufficient data for evaluation of the stocks.

Trapping at Bays Creek was selected as a means for evaluation as well as for the management strategy of reducing straying within the basin, being able to remove known hatchery fish, and allowing fish to transit through the majority of the sport fishery. An alternative method would be to release all fish from the hatchery and significantly impact the basins sport fishery and limit the effectiveness of the evaluation as well as create social problems on the small system they return to. A second alternative is to make mainstem releases with virtually no opportunity to recapture fish except those that stray back to the hatchery. This would significantly impact evaluation needs and would provide no means to control straying within the basin.

Stray monitoring has an alternative but would require additional trapping sites. This alternative would increase risk to listed Coho Salmon, would be problematic finding suitable locations and would be a significant increase in workload, cost and maintenance. The evaluation component would be reduced because not as much of the basin could be covered and the number of sites would limit options incorporating the data with spawning survey data.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

Potential affected species other than listed coho are Chinook Salmon (fall), winter steelhead, and sea-run Cutthroat Trout. The greatest potential for mortality will be associated with trapping operations. Impacts from Cedar Creek hatchery trapping are expected to be minimal because the trap has been in operation for many years and operational procedures have been refined over time to minimize risks at that facility. The Bays Creek site is new and will be operational in the winter of 2004 / 05. Similar designs are used elsewhere and have been refined over time also. Impacts to fall Chinook Salmon are expected to be minor because the trapping period begins near the end of the run period. The intent of the trap and research project is to collect winter steelhead and it is likely there will be some low level of mortality associated with the trapping activities, however it is unknown what that level might be. Bays Creek does support steelhead and it is anticipated that any impacts to wild steelhead will be minimal and not have a significant impact on the overall basin population. Sea-run cutthroat may use the system and impacts are expected to be minor. Many of the Cutthroat Trout are expected to be able to exit the trap between the bars, and they also have a reputation for swimming in and out of adult salmonid traps.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

Because this is an evaluation of stocks under existing programs risk aversion is addressed in Sections 7.9, 8.5, 9.1.7, 9.2.10, 10.11, and 11.2 for most components of the research. Juvenile monitoring and spawning surveys are visual, which provides an extremely low level of potential impact to listed natural Coho Salmon. Most juvenile surveys are single pass observations by snorkelers, which also reduces impact. In general, spawning surveys are run throughout the return period but individual sites are surveyed approximately once a week. The stray monitoring method of netting and releasing was chosen over trapping to reduce potential impacts to listed natural Coho Salmon. If adult coho are observed, that particular location (pool, tailout, etc.) is skipped so the fish are left undisturbed, the same would be true for any fall Chinook Salmon encountered. It is expected that very few juvenile fish will be impacted with this method. Field crews will be in regular contact with supervisory staff and activities will be reviewed and modified if encounters with listed natural Coho Salmon become significant.

SECTION 13

ATTACHMENTS AND CITATIONS

Citations

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SECTION 14

CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

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

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

Signature: _____ Date: _____

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

Signature: _____ Date: _____

Attachment A

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 brood stock 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. With wild adult steelhead stocks generally all fish are sampled for viruses at spawning.
- Annually screen each salmon brood stock 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 Cedar Creek Hatchery include: green eggs are routinely water hardened in diluted buffered iodophor; flush treatments of 1:600 formalin for 15 minutes given three to five times per week for fungi prevention on eggs; and juvenile fish are treated with Hydrogen Peroxide. Depending on species of fish, parasite treating and water temperature, Hydrogen Peroxide is used at 1:8000 to 1:3500 for one hour plus turnover for three to five consecutive days. Treatments of winter or summer steelhead juveniles in the large rearing lakes require Hydrogen Peroxide flush treatments at 1:8000 to 1:3500 introduced into the water supply for 4 to 6 hours. Formalin may be prescribed to control certain parasites such as Ichthioptherious in juveniles at rates between 1:14000 and 1:6000 for 3 to 7 days. Any use of Formalin would be done within labeling requirements and DEQ (Permit 300J) effluent restrictions. 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). Each spring it is necessary to treat juvenile steelhead with oxytetracycline medicated food for cold-water disease and opportunistic aeromonad/pseudomonad bacteria. During the summer, on rare occasions the winter and summer steelhead juveniles may require an oxytetracycline or Romet medicated food treatment for furunculosis. The steelhead broodstocks are given Hydrogen Peroxide flush treatments at 1:4250 for one hour plus turnover three to five times per week. The spring chinook adults are given antibiotic injections of erythromycin and oxytetracycline under a veterinary prescription to prevent bacterial infections such as furunculosis and bacterial kidney disease. They are also treated with Hydrogen Peroxide flush treatments at 1:4250 for one hour three to five times per week, as needed for external fungi infections.

Table A-1
Five-year Disease History[a] (1996 to present) by Fish Stock at Cedar Creek Hatchery

Disease or Organism	47 CHS	47 STW	47W StW [d]	47 STS	33 STS[b]	33 StW[b]	72 Rb	47 CHF[c]
IHN Virus	No	No		No	No	No	No	No
EIBS Virus	No	No		No	No	No	No	No
Aeromonas salmonicida	No	Yes		Yes	No	No	No	No
Aeromonas/Pseudomonas	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Flavobacterium psychrophilum	Yes	Yes		Yes	No	No	Yes	No
Fl. columnare	No	No		No	No	No	No	No
Fl. branchiophilum	No	No		No	No	No	No	No
Renibacterium. salmoninarum	Yes	No		No	No	No	No	Yes
Yersinia ruckeri	No	No		No	No	No	No	No
Ichthyobodo	Yes	Yes		Yes	No	No	Yes	Yes
Gyrodactylus	No	Yes		Yes	No	No	Yes	No
Ichthyophthirius multifilis	No	Yes		Yes	No	No	Yes	No
Gill Ameba	No	No		No	No	No	No	No
Trichodinids	No	Yes		Yes	No	No	Yes	No
Loma sp	No	No		No	No	No	No	No
Nanophyetus salmincola	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Coagulated Yolk Disease	Yes	Yes		Yes	No	No	Yes	No
External Fungi.	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Internal Fungi	Yes	Yes		No	No	No	Yes	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] These stocks are held at Cedar Creek Hatchery as adults only.
[c] The 47 stock fall chinook fry are reared at Cedar Creek Hatchery and then transferred to Rhoades Pond for further rearing until release.
[d] Stock 47W winter steelhead is a new program with only one year of implementation, as such it has not had time to develop a health maintenance “history” of significance.

CHS = Spring Chinook Salmon
STW = Winter Steelhead
STS = Summer Steelhead
Rb = Rainbow Trout
Stock 47 = Nestucca River (Alsea origin)
Stock 47W = Nestucca River wild stock
Stock 33 = Siletz River
Stock 72 = Roaring River

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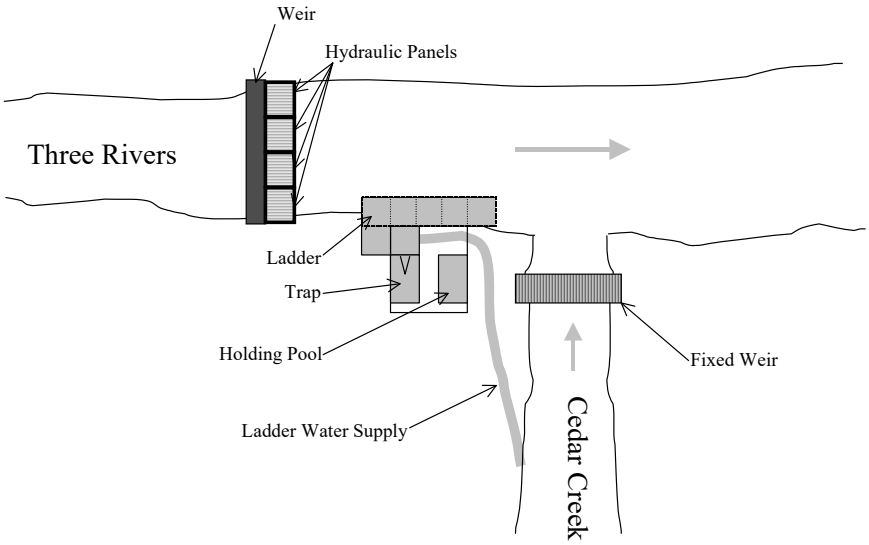
May 27, 2003

Lance Kruzic
NOAA Fisheries
lance.kruzic@noaa.gov

Dear Lance:

In your e-mail to Bill Otto dated 4/22/03, you asked if ODFW has done an operational assessment of the weir on Three Rivers associated with Cedar Creek Hatchery to determine whether it is being operated in the best manner possible for coho passage. At the local and Regional level, ODFW has thoroughly reviewed the operation of this weir and an internal, written operational plan was developed and distributed in late 2002 and early 2003. This operational plan put on paper the practices which have been in place for a number of years. After your correspondence with Bill, I was asked to review the operation of the weir from the perspective of the statewide fish passage program.

After reviewing the operational plan, talking with our local District Biologist and the Hatchery Manager, and visiting the site, I conclude that the weir is being operated in the best manner possible for passage of wild coho, as well as other wild native species, given the existing structures and hatchery fish management objectives. In fact, the weir is in place primarily for purposes of natural production (i.e., pass wild fish and prevent passage of hatchery fish) because it is our opinion that, without the weir, hatchery production needs could still be met with returns to the existing trap. A plan view (not to scale) of the structures involved follows:



With these structures, passage up Three Rivers is provided in several ways:

- At high flow levels, the weir automatically drops to prevent damage to it. Passage is possible and observed at these times, which last from one to several days.

- The hydraulic weir is lowered at certain times of the year and/or certain portions of days to allow wild fish passage. The weir's 4 panels can be operated independently to concentrate flows on one panel if needed.

- A portable denil fishway may be placed to span a lowered weir panel for very low flows. This concentrates flows and provides better water depth across the span.

- The ladder and trap operate year round with the exception of times where it is temporarily shut down for cleaning or repair. Any wild fish entering the trap are passed above the weir, or hauled up Three Rivers to a suitable release location, based on passage direction provided in the operational plan.

- If personal safety hazards are not too great, staff seine the pool directly below the weir to collect and pass fish if they are observed to be holding in the pool without passing.

Adult coho passage in Three Rivers starts in October with the initial fall rains and has been observed through later November, though passage continues in the rest of the Nestucca through late January. During parts or all of this period, fall chinook (hatchery and wild), winter steelhead (hatchery and wild), and hatchery summer steelhead (not indigenous) are or may be moving upstream as well. All of the methods described above are used to pass coho, with the exception of denil placement, which only occurs in early spring if low flow conditions necessitate. However, the weir is only lowered about twice a day (morning and evening) early in the migration when few hatchery steelhead are present. It is not lowered all of the time due to the possible presence of hatchery fish, which we do not want to move above the weir.

We feel that the lack of coho production in Three Rivers is not due to passage issues at the weir, but to a general lack of returns to Three Rivers. If steelhead and fall chinook can pass the weir when it is automatically or manually lowered, as is observed, then there is no reason to believe that coho could not pass the weir. In addition, very few coho have been observed or trapped in any part of Three Rivers. With recent improvement in wild coho returns, District personnel are considering options to supplement coho production in the Three Rivers sub-basin should adult returns remain low to this basin.

Although I believe our weir operation passes coho as effectively as possible given the circumstances, fish passage could definitely be improved at this site. In-stream passage over the weir is not ideal at all flows. The ladder "dead ends" into a trap (i.e., does not have the option of volitional in-ladder passage above the weir). The trap and holding pool are not user or fish friendly. The ladder does not have any attraction flow from Three Rivers. Given funding, we would clearly design trapping and passage at this site differently. Plans have even been made to address some of the concerns at this site, but given the lack of funds and all of the other hatchery upgrade/maintenance and fish passage needs across the state, they have not been implemented.

In summary, it is our intent to pass all wild fish above the Three Rivers weir and we are providing the best passage possible at this site given existing structures and management objectives. Operations have been worked out by our staff after years of experience. Only with very significant investment, which we are unable to make at this time, could passage be improved. Please let me know if you have any questions.

Sincerely,

Tom Stahl
Fish Passage Coordinator

cc: Wheaton, Otto, Klumph, Braun, Traynor, Krake, Thorpe, Hartlerode

Attachment C

STEP Hatchbox Fry Releases
Cedar Creek Hatchery – Stock 47 Winter Steelhead

Species	Brood Year	Hatch.	Lot #	Group	Ed.	# Eggs	Fry Released	Basin	Stream	River Mile	Location
StW	88	CC	47	CC401		8,800	8,000	Kilchis	Murphy Cr.	3.0	
StW	88	CC	47	CC401		6,000	6,000	Kilchis	Clear Cr.	5.0	
StW	88	CC	47	CC401		8,000	8,000	Kilchis	Tilden Cr.	6.0	
StW	88	CC	47	CC397		10,000	10,000	Kilchis	Coal Cr.	2.0	
StW	88	CC	47	CC397		10,150	10,000	Kilchis	Little S Fk Kilchis R	6.0	
StW	88	CC	47	CC394		21,960	21,692	Kilchis	Kilchis R	2.0	Landolts to Curl Bridge
StW	88	CC	47	CC398		16,500	15,000	Kilchis	Little S Fk Kilchis R	6.0	
					Sum	**81,410**	**78,692**				
StW	88	CC	47	CC401		8,000	8,000	Miami	Waldron Cr.	3.0	
StW	88	CC	47	CC401		8,504	8,000	Miami	Stewart Cr.	4.0	
StW	88	CC	47	CC401		8,000	8,000	Miami	Illingsworth Cr.	1.0	
StW	88	CC	47	CC397		31,522	31,426	Miami	N & S Fork Miami R	10.0	
StW	88	CC	47	CC397		10,146	10,000	Miami	Powderhouse Cr.	10.0	
StW	88	CC	47	CC397		10,000	10,000	Miami	Minich Cr.	2.0	
StW	88	CC	47	CC398		16,750	15,000	Miami	South Fk Miami R	10.0	
StW	88	CC	47	CC398		15,710	15,710	Miami	Illingsworth Cr.	0.5	
					Sum	**108,632**	**106,136**				
StW	88	CC	47	CC402		5,000	5,000	Nest	Squaw Cr.	5.0	
StW	88	CC	47	CC402		7,246	6,896	Nest	Nestucca R	4.0	Town Cr.
StW	88	CC	47	CC402		5,000	5,000	Nest	Sanders Cr.	8.0	
StW	88	CC	47	CC402		5,000	5,000	Nest	George Cr.	5.0	
StW	88	CC	47	CC395		5,000	5,000	Nest	W Fk Beaver Cr.	10.0	
StW	88	CC	47	CC395		16,890	7,500	Nest	E Fk Beaver Cr.	10.0	
StW	88	CC	47	CC400		14,426	14,345	Nest	Horn Cr.	3.0	

STEP Hatchbox Fry Releases
Cedar Creek Hatchery – Stock 47 Winter Steelhead

Species	Brood Year	Hatch.	Lot #	Group	Ed.	# Eggs	Fry Released	Basin	Stream	River Mile	Location
StW	88	CC	47	CC396		8,375	8,000	Nest.	W. Fk. Beaver Cr.	10.0	
StW	88	CC	47	CC396		8,000	8,000	Nest.	Hester Cr.	16.0	
StW	88	CC	47	CC396		8,477	8,477	Nest.	Bear Cr.	15.0	
StW	88	CC	47	CC396		10,000	10,000	Nest.	West Cr.	15.0	
StW	88	CC	47	CC395		9,996	9,957	Nest.	Boulder Cr.	6.0	
StW	88	CC	47	CC404	X	10,720	10,302	Nest.	Foland Cr.	12.0	
StW	88	CC	47	CC404		4,000	4,000	Nest.	Nestucca River	32.0	
StW	88	CC	47	CC404		3,700	3,700	Nest.	Slick Rock Creek	31.0	
StW	88	CC	47	CC404		3,020	2,815	Nest.	Mina Creek	32.0	
					Sum	**124,850**	**113,992**				
StW	88	CC	47	CC395		2,500	2,500	Sand Lk	Andy Cr.	1.0	
					Sum	**2,500**	**2,500**				
StW	88	CC	47	CC396		5,042	4,762	Till.	Tillamook R	10.0	Yellow Fir Rd
StW	88	CC	47	CC390		7,647	7,391	Till.	Mills Cr.	12.0	
StW	88	CC	47	CC390		7,451	7,392	Till.	Tillamook R	10.0	Yellow Fir Road
StW	88	CC	47	CC395		9,996	9,821	Till.	Simmons Cr.	10.0	
StW	88	CC	47	CC390		15,098	13,338	Till.	Tillamook R	8.0	Vermilyea property
StW	88	CC	47	CC390		7,000	7,000	Till.	Killam Cr.	10.0	
StW	88	CC	47	CC390		15,089	14,719	Till.	Fawcett Cr.	10.0	
					Sum	**67,323**	**64,423**				
StW	88	CC	47	CC399		20,678	20,000	Wilson	South Fk Wilson R	33.0	
StW	88	CC	47	CC399		10,000	10,000	Wilson	Elk Creek	33.0	
StW	88	CC	47	CC399		14,133	14,133	Wilson	Devils Lk Fk Wilson R	33.0	
StW	88	CC	47	CC402		2,000	2,000	Wilson	Wilson R	10.0	
StW	88	CC	47	CC402		5,053	5,000	Wilson	Fox Cr.	18.0	

STEP Hatchbox Fry Releases
Cedar Creek Hatchery – Stock 47 Winter Steelhead

Species	Brood Year	Hatch.	Lot #	Group	Ed.	# Eggs	Fry Released	Basin	Stream	River Mile	Location
StW	88	CC	47	CC402		15,192	15,000	Wilson	Wilson R	10.0	Jordan Cr. - Siskeyville
StW	88	CC	47	CC396		10,500	10,000	Wilson	Beaver Cr.	5.0	
StW	88	CC	47	CC396		4,542	4,042	Wilson	Wilson R	8.0	Jacobs Cr.
StW	88	CC	47	CC400		14,427	13,000	Wilson	Wilson R	10.0	Siskeyville to Donaldson's
StW	88	CC	47	CC398		16,000	15,000	Wilson	Little N Fk Wilson R	9.0	
					Sum	**112,525**	**108,175**				
StW	89	CC	47	CC418		20,000	20,000	Kilchis	Kilchis R	6.0	
StW	89	CC	47	CC394		21,960	21,157	Kilchis	Kilchis R	3.0	Landolts to Curl Bridge
					Sum	**41,960**	**41,157**				
StW	89	CC	47	CC416		9,275	9,169	Miami	Powderhouse Cr.	10.0	
StW	89	CC	47	CC418		22,731	22,625	Miami	Miami R	5.0	
StW	89	CC	47	CC419		13,293	13,187	Miami	Minich Cr.	2.0	
StW	89	CC	47	CC418		10,000	10,000	Miami	Miami R	5.0	
StW	89	CC	47	CC418		20,000	18,750	Miami	Miami R	5.0	
					Sum	**75,299**	**73,731**				
StW	89	CC	47	CC408		9,118	8,991	Nest	Nestucca R	4.0	Town Cr.
StW	89	CC	47	CC408		8,991	8,991	Nest	Squaw Cr.	5.0	
StW	89	CC	47	CC413		6,307	6,307	Nest	Sanders Cr.	8.0	
StW	89	CC	47	CC413		6,307	6,307	Nest	George Cr.	5.0	
StW	89	CC	47	CC415		8,493	8,000	Nest.	West Cr.	15.0	
StW	89	CC	47	CC408		15,000	14,955	Nest.	W Fk Beaver Cr.	15.0	
					Sum	**54,216**	**53,551**				
StW	89	CC	47	CC415		4,486	4,486	Till.	Tillamook R	10.0	Yellow Fir Rd
StW	89	CC	47	CC410		9,647	9,502	Till.	Simmons Cr.	10.0	

STEP Hatchbox Fry Releases
Cedar Creek Hatchery – Stock 47 Winter Steelhead

Species	Brood Year	Hatch.	Lot #	Group	Ed.	# Eggs	Fry Released	Basin	Stream	River Mile	Location
StW	89	CC	47	CC409		3,900	3,900	Till.	Mills Cr.	12.0	
StW	89	CC	47	CC409		4,311	3,900	Till.	Tillamook R	10.0	Yellow Fir Road
StW	89	CC	47	CC410		10,000	9,100	Till.	Tillamook R	8.0	Vermilyea property
StW	89	CC	47	CC413		7,500	7,385	Till.	Fawcett Cr.	10.0	
StW	89	CC	47	CC413		7,500	7,384	Till.	Killam Cr.	10.0	
					Sum	**47,344**	**45,657**				
StW	89	CC	47	CC410		9,851	9,851	Wilson	Wilson R	10.0	Mills Bridge
StW	89	CC	47	CC409		20,000	19,828	Wilson	South Fk Wilson R	33.0	
StW	89	CC	47	CC417		15,000	14,500	Wilson	Wilson R	10.0	
StW	89	CC	47	CC414		10,280	10,000	Wilson	Beaver Cr.	5.0	
StW	89	CC	47	CC414		4,170	4,170	Wilson	Wilson R	8.0	Jacobs Cr.
StW	89	CC	47	CC410		10,000	9,900	Wilson	Wilson R	10.0	Mills Bridge
					Sum	**69,301**	**68,249**				
StW	90	CC	47	CC427		15,649	15,649	Kilchis	Little S Fk Kilchis	8.0	
StW	90	CC	47	CC429		16,000	16,000	Kilchis	North Fk Kilchis	8.0	
StW	90	CC	47	CC429		16,000	16,000	Kilchis	S Fk Kilchis	7.0	
StW	90	CC	47	CC429		8,626	8,626	Kilchis	Little S Fk Kilchis	8.0	Sam Downs Cr.
					Sum	**56,275**	**56,275**				
StW	90	CC	47	CC428		10,000	10,000	Miami	Miami R	8.0	Trib N - Trib H
StW	90	CC	47	CC428		20,263	20,263	Miami	Miami R	10.0	Powderhouse Cr.
StW	90	CC	47	CC432		15,939	15,457	Miami	Miami R	2.0	Waldron property
					Sum	**46,202**	**45,720**				
StW	90	CC	47	CC426		10,000	9,000	Nest.	West Cr.	15.0	
StW	90	CC	47	CC431		12,168	11,879	Nest.	W Fk Beaver Cr.	15.0	
StW	90	CC	47	CC421		9,000	8,896	Nest.	Farmer Cr.	13.0	

STEP Hatchbox Fry Releases
Cedar Creek Hatchery – Stock 47 Winter Steelhead

Species	Brood Year	Hatch.	Lot #	Group	Ed.	# Eggs	Fry Released	Basin	Stream	River Mile	Location
StW	90	CC	47	CC421		5,335	5,000	Nest.	Saling Cr.	14.0	
StW	90	CC	47	CC426		20,096	19,791	Nest.	Beaver Cr.	10.0	
					Sum	**56,599**	**54,566**				
StW	90	CC	47	CC426		10,000	10,000	Till.	Tillamook R	10.0	Yellow Fir Rd
StW	90	CC	47	CC427		10,260	10,101	Till.	Simmons Cr.	10.0	
StW	90	CC	47	CC426		14,130	13,960	Till.	Tillamook R	8.0	Vermilyea property
StW	90	CC	47	CC427		5,100	5,100	Till.	Mills Cr.	12.0	
StW	90	CC	47	CC427		5,211	5,049	Till.	Tillamook R	10.0	Yellow Fir Road
					Sum	**44,701**	**44,210**				
StW	90	CC	47	CC427		15,490	13,598	Wilson	Wilson R	10.0	Mills Bridge
StW	90	CC	47	CC427		10,260	10,163	Wilson	Wilson R	10.0	Mills Bridge
StW	90	CC	47	CC430		6,283	6,283	Wilson	Slide Cr.	16.0	
StW	90	CC	47	CC430		6,592	6,282	Wilson	Jordan Cr.	24.0	
					Sum	**38,629**	**36,326**				
StW	91	CC	47	CC435		8,052	7,941	Miami	Miami R	5.0	
					Sum	**8,052**	**7,941**				
StW	91	CC	47	CC442		17,376	17,276	Nest.	Beaver Cr.	10.0	
					Sum	**17,376**	**17,276**				
StW	91	CC	47	CC435		8,052	7,918	Till.	Tillamook R	10.0	Yellow Fir Road
					Sum	**8,052**	**7,918**				
StW	91	CC	47	CC442		15,204	13,000	Wilson	Wilson R	10.0	Mills Bridge
StW	91	CC	47	CC441		7,000	6,000	Wilson	Slide Cr.	16.0	
StW	91	CC	47	CC442		13,032	920	Wilson	Jordan Cr.	24.0	
					Sum	**35,236**	**19,920**				

STEP Hatchbox Fry Releases
Cedar Creek Hatchery – Stock 47 Winter Steelhead

Species	Brood Year	Hatch.	Lot #	Group	Ed.	# Eggs	Fry Released	Basin	Stream	River Mile	Location
StW	95	CC	47	CC308	X	200	175	Nesk.	Neskowin Cr.	2.0	
StW	95	CC	47	CC308	X	200	175	Nest	Three Rivers	12.0	
StW	95	CC	47	CC308	X	200	175	Nest	Nestucca R	10.0	
					Sum	**600**	**525**				
StW	96	CC	47	CC311	X	200	174	Nesk.	Neskowin Cr.	2.0	
StW	96	CC	47	CC311	X	200	185	Nest	Foland Cr.	12.0	
					Sum	**400**	**359**				
StW	97	CC	47	CC314	X	200	190	Nesk.	Neskowin Cr.	2.0	
StW	97	CC	47	CC314	X	200	188	Nest	Foland Cr.	12.0	
StW	97	CC	47	CC314	X	400	350	Nest	Nestucca R	10.0	
StW	97	CC	47	CC314	X	500	500	Nest	Nestucca R	10.0	
					Sum	**1,300**	**1,228**				
StW	98	CC	47	CC318	X	400	397	Nest	Foland Cr.	12.0	
					Sum	**400**	**397**				
StW	99	CC	47	CC320	X	200	192	Nesk.	Neskowin Cr.	2.0	
StW	99	CC	47	CC320	X	400	395	Nest	Foland Cr.	12.0	
					Sum	**600**	**587**				
StW	00	CC	47	CC878	X	200	152	Nesk.	Three Rivers	10.0	
StW	00	CC	47		X	400	377	Nest	Foland Creek	12.0	
StW	00	CC	47		X	1000	800	T Bay	Patterson Creek	1.0	
					Sum	**1,600**	**1,329**				

Attachment D

Nestucca Wild Winter Steelhead Broodstock Monitoring and Evaluation Summary

In October 2001 the Oregon Fish and Wildlife Commission provided direction to begin implementing plans to establish a wild winter steelhead broodstock for the Nestucca Basin (OAR 635-500-5400). As part of the rule making, staff was directed to begin transition to a local broodstock. The transition will include an interim period when both local and Alsea stocks will be used and evaluated. The interim period will last for two generations (8 years). Unless evaluation results indicate, and the Commission directs a different approach, the program will fully transition to the local broodstock at the end of the interim period.

Monitoring and evaluation will include a number of performance measures relative to both stocks. Standard hatchery operational reporting will cover some of this, the remainder will be monitoring specific to this program and location. Following is a brief overview of the performance measures covered.

Catch Monitoring

While several options are available the preferred option is a statistical creel conducted by two ODFW employees. This option allows for estimation of total effort and total catch by stock. Data collected will be date, location of catch, number caught, mark(s), method (boat or bank), released fish (species, marked, unmarked), angler hours, and comments. Timeframe would be December through April.

Grant funding has been applied for. Until funding is secured specifics of the creel program will not be developed. Other creel options include standard creel with one ODFW employee, and volunteer creel. Either of these options may be used in the event only partial funding, or no funding, is secured. Under these options total effort and total catch would not be estimated.

Juvenile Monitoring

This component is already in place and has been operational since the summer of 2001 with funding from Sport Fish Restoration grants. We had a target of surveying juvenile steelhead rearing in 30 to 35, one-kilometer long stream reaches in the Nestucca River Basin. Sites were randomly selected using a stream reach database maintained by ODFW's Coastal Salmonid Inventory Project. On the Little Nestucca River, candidate stream reaches included all areas accessible to steelhead above tidewater. On the main Nestucca River, candidate stream reaches included all areas accessible to steelhead above the confluence of the Nestucca River and Beaver Creek. In total, 373 km of stream channel fell within our snorkeling sample universe.

To conduct the surveys, a two-to-four person snorkel crew counted the number of 1+ juvenile steelhead, 1+ cutthroat trout, and all coho salmon in each of the sample reaches. 0+ juvenile cutthroat and steelhead (< 90 mm fork length) were not counted. Age 1+ trout that could not be identified to species were counted as unknown trout. To reduce problems associated with snorkeling in shallow or fast water habitat, only pools ≥

6 m^2 in surface area and $\geq$ 40 cm deep were snorkeled. In smaller streams, crewmembers either alternated the pools that they snorkeled or one crewmember snorkeled the entire reach. In larger streams where one snorkeler could not effectively enumerate fish, surveys were conducted with snorkelers swimming side-by-side. Counts of the number of juvenile coho, cutthroat, steelhead, unknown trout, chinook, blackside dace, and redside shiner were recorded for each pool. This protocol is suitable for monitoring trends in the abundance and distribution of juvenile steelhead in the basin, but is not suitable for population estimates.

Juvenile monitoring will also include snorkeling for observation of residual juveniles after smolt releases in the spring. This will be conducted in the sub-basin of release and adjacent sub-basins shortly after release, and will be incorporated into the juvenile sampling described above. Details have not been finalized at this time.

Stray Monitoring

The preferred option for adult stray monitoring is remote site net sampling conducted by two ODFW employees (these will split duties with trap operation). This methodology has been used in other locations successfully. Netting was selected over remote trap sites for several reasons. A larger area can be sampled, netting can be implemented in conjunction with a subset of spawning survey sites, it is more flexible than fixed site traps, requires fewer staff to complete, and doesn't rely on ability to find a suitable trap location. Surveyors will walk pre-selected survey areas and net any steelhead observed, note date, location, and any marks and release the fish unharmed. Because species can be identified by observation any coho encountered will be left undisturbed.

Naturally Spawning Population Abundance Monitoring

This component is already in place and has been operational since the winter of 2001 / 02, with funding from the Oregon Plan for Salmon and Watersheds. A stratified random sampling design was used to estimate the spatial distribution and abundance of winter steelhead redds in the Nestucca Basin. Sampling strata consisted of mainstem reaches (47 stream miles) and tributary reaches (163 stream miles). The tributary stratum consisted of the extent of coho spawning in the basin as developed through the methods described in Jacobs and Nickelson (1999). The mainstem stratum consisted of the remainder of the Nestucca Watershed downstream of coho spawning habitat but upstream from the head of tidal influence. The resulting stream network coverage was used for selecting survey sites, based on 1:100,000 digital maps that were enhanced to include known spawning streams not included in the 1:100,000 stream layer. Survey site selection followed the procedure described in Jacobs et al. (2002), with the sampling rate set to achieve a target precision of the overall population estimate within approximately $\pm$ 30%. Cumulative redd counts are used as the metric of spawner abundance. Survey sites were repeatedly walked or floated throughout the spawning season to count redds. Individual redds were marked to avoid being recounted during subsequent surveys.

Hatchery Monitoring

Hatchery monitoring consists mainly of standard data collection as part of normal hatchery operations including, but not limited to, return timing, broodstock collection timing, spawning timing, fecundity, growth rates, mortality at various lifestages, disease and pathology history, and pre-release smolt size and condition.

Off Station Trapping

Current plans call for 100% of both stocks to be released in Bays Creek, a tributary to the Nestucca. Bays Creek will have a trap located a short distance above the mouth to capture returning adults. Number of each stock collected, and date collected will be recorded. Releases into Bays Creek will provide an opportunity to evaluate how many fish return to Three Rivers, where the hatchery of rearing is located, approximately 12 miles downstream of the release site. It has been speculated that many fish released off station in mainstem releases actually return to Three Rivers. This off station tributary release and recapture component will allow for evaluation of the "straying" back to the hatchery facility on Three Rivers.

Adult hatchery steelhead trapped may be handled by removal from the population, used as broodstock if necessary, a number of recycling options, or a mix of these options. No final plan has been selected at this time and may be determined by the number of fish trapped, or possible additional evaluations of options available to determine which provide the best blend of angling opportunity and wild stock protection.

Unmarked coho, and any chinook or cutthroat trout trapped will be passed above the trap to spawn naturally.

References

Jacobs, S.E. and T.E. Nickelson. 1998. Use of Stratified Random Sampling to Estimate the Abundance of Oregon Coastal Coho Salmon. Oregon Department of Fish and Wildlife, Final Reports (Fish) Project # F-145-R-09, Salem.

Jacobs S., J. Firman, G. Susac, D. Stewart and J. Weybright 2002. Status of Oregon coastal stocks of anadromous salmonids, 2000-2001 and 2001-2002; Monitoring Program Report Number OPSW-ODFW-2002-3, Oregon Department of Fish and Wildlife, Salem, Oregon.

DRAFT Nestucca Broodstock Evaluation Costs 4-24-2002

Activity by year
2002 - first wild brood take
2003 - first wild brood smolts released
2004 - build adult recapture facility, build tributary traps
2005 - first 2-salt return of experimental groups, creel, trap fish, tangle net
2006 - fourth year wild brood smolts released, creel, trap fish, tangle net
2007 - third year of 2-salt return, creel, trap fish, tangle net
2008 - fourth and last year of experimental group 2-salt returns, creel, trap fish, tangle net
2009 - fourth and last year of experimental group 3-salt returns, creel, trap fish, tangle net, final analysis available by November 2009

Year	Snorkel Surveys	Spawning Surveys	Juvenile Marking	Adult Recapture	Total	Comments
2002	$15K	$38.5	$12K		$65.5K	first wild brood take
2003	$15K	$38.5	$12K		$65.5K	first wild brood smolts released
2004	$15K	$38.5	$12K	Recapture site $20K + land, 5 adult sites @ $2K	$95.5K + land acquisition	build adult recapture facility, build tributary traps
2005	$15K	$38.5	$12K	$8K snouts, $20K creel, $20K trapping, $30K netting	$143.5K	first 2-salt return of experimental groups, creel, trap fish, tangle net
2006	$15K	$38.5		$8K snouts, $20K creel, $20K trapping, $30K netting	$131.5K	fourth year wild brood smolts released, creel, trap fish, tangle net
2007	$15K	$38.5		$8K snouts, $20K creel, $20K trapping, $30K netting	$131.5K	third year of 2-salt return, creel, trap fish, tangle net
2008	$15K	$38.5		$8K snouts, $20K creel, $20K trapping, $30K netting	$131.5K	fourth and last year of experimental group 2-salt returns, creel, trap fish, tangle net
2009	$15K	$38.5		$8K snouts, $20K creel, $20K trapping, $30K netting	$131.5K	fourth and last year of experimental group 3-salt returns, creel, trap fish, tangle net, final performance analysis available by November 2009
2010	$15K	$38.5			$53.5K	First all wild brood take (assuming commission approves)
2011	$15K	$38.5			$53.5K	1st all wild smolts
2012	$15K	$38.5			$53.5K	
2013	$15K	$38.5			$53.5K	1st all wild 2-salts
2014	$15K	$38.5			$53.5K	1st all wild 3-salts
2015	$15K	$38.5				1st summer of all wild juvenile 1+ f-1
2016	$15K	$38.5				1st all wild smolts f-1
2018	$15K	$38.5				1st all wild 2-salts f-1

This is a preliminary draft of options and costs for program evaluation and does not contain all components for evaluation, nor will all listed components be used.

DRAFT 9-2-2003
Nestucca Wild Steelhead Broodstock Evaluation

Component	Options	Estimated Costs	Comments
Creel Survey	**Statistical Creel (2 people; Dec-April)**	**$5,234/person/month = $52,340**	**Preferred option, give estimate of total catch by stock**
	Statistical Creel (1 person; Dec-Apr)	$5,234/person/month =$26,170	Estimate of total catch by stock with less confidence
	Volunteer Creel (supplement with District staff, Nov-May)	Minor; printing costs for log books	No estimate of total catch, gives comparison of contribution by stock
Stray Monitoring	**Remote site netting (2 people; Dec-May)**	**$4,751/person/month =$57,012+nets**	**Preferred option, allows repeated sampling of random sites**
	District/Volunteers (Dec-May)	Cost of nets, misc. supplies	Less intense, subject to personnel availability; less confidence in data
Juvenile Sampling	**ODFW surveys**	**No additional; already funded**	**Est. cost $15 K**
	Rapid Bio Assessment	Funded by NNWC	If continued, could use ODFW seasonal time on other projects
Spawning Surveys	**ODFW surveys**	**No additional; continue with present funding**	**Est. cost $38.5 K**

Component	Options	Estimated Costs	Comments
Hatchery Monitoring	**Cedar Creek Hatchery**	**No additional**	**Sampling is part of normal operations**
Bays Creek Trap	Daily trap operation (2 people; Dec-May)	$5,000 trap cost + $4,751/person/month =$60,012	Dedicated crew
	Daily trap operation (1 person with district/hatchery/volunteers; Dec-May)	**$5,000 trap cost + $5,234/month/person = $34,404**	**Preferred option. More coordination required, but workable and less expensive. Supplement with netting/creel crews**
	District/hatchery/volunteers)	$5,000 trap cost	Coordination/logistics difficult. Could also supplement with other crews

First year of adult returns (winter 2004 – 05) does not require trapping at Bays Creek because releases were in Three Rivers and mainstem Nestucca. No smolts were released in Bays Creek from the first production year.

Stray monitoring crew can provide additional assistance, if necessary, to run Bays Creek trap when operational in addition to volunteer help.

Funding for trap materials and construction is secured. Funding for first year of creel program is secured.

Attachment E

Nestucca Basin Hatchery Winter Steelhead Evaluation 2005-2007 Project Accomplishments

The Nestucca Hatchery Winter Steelhead Broodstock Evaluation was conducted from December through May each winter from 2004/05 through 2006/07. The purpose of the study was to compare the performance of two hatchery winter steelhead stocks released in the Nestucca River basin (the traditional hatchery stock of Alsea River origin and the new wild brood stock of Nestucca River origin). The evaluation included a statistical creel survey of the winter steelhead fishery in the Nestucca River basin, conducting surveys to assess straying of hatchery steelhead to natural spawning areas, and collecting returning adult winter steelhead at two trap sites. Additional monitoring, conducted by other projects, included steelhead spawning surveys, juvenile surveys, monitoring for residual hatchery steelhead smolts, and collection of hatchery spawning, rearing, and release data. A brief summary of accomplishments is presented below; more detailed information is available upon request. Some of the data presented is still considered preliminary.

Creel Survey

The statistical creel survey was conducted from December 1-April 30 each winter to encompass the majority of the winter steelhead fishery. The survey included the mainstem Nestucca River from Cloverdale to the angling deadline at Elk Creek, and Three Rivers (see Appendix A). Samplers conducted pressure counts throughout the fishery on a daily basis to estimate fishery effort, and interviewed anglers to document catch. Steelhead kept by anglers were sampled for length, sex, and fin clip, and a scale sample was collected. Location (within pre-determined river sections) of catch was also recorded.

Sampled catch data indicated that during 2004/05 the Nestucca and Alsea stocks contributed roughly equally to catch (this only includes 2 salt fish or younger as this was the first winter of returns of adult fish from the wild brood program). However, Nestucca stock contributed to the catch at a rate of 2-3 times that of the Alsea stock during the 2005-06 and 2006-07 fisheries (which included both 2 salt and 3 salt returns- see Table 1). Nestucca stock winter steelhead also contribute to the fishery over a longer period (Jan-Apr), than the Alsea stock (Dec-mid Feb) See Figures 1-3. Alsea stock hatchery steelhead were sampled at a higher rate in Three Rivers, with the Nestucca stock tending to stay in mainstem areas. Expanded catch estimates have not been finalized.

Table 1
Nestucca River Winter Steelhead Creel Summary
(Raw data, 2004/05 through 2006/07)

Brood Year	Alsea ADLM	Nestucca ADRM	AD	Summer ADRV	Released	
					H	W
2005	116	104	62	11	243	430
2006	125	344	65	21	245	855
2007	84	170	57	33	163	466

Note: AD mark is unknown stock, except 3 salt Alsea in 2005 were AD only marked. ADRV are 47 stock hatchery summer steelhead.

Figure 1
Hatchery Winter Steelhead Samples in the Nestucca River Basin Creel, 2004-2005

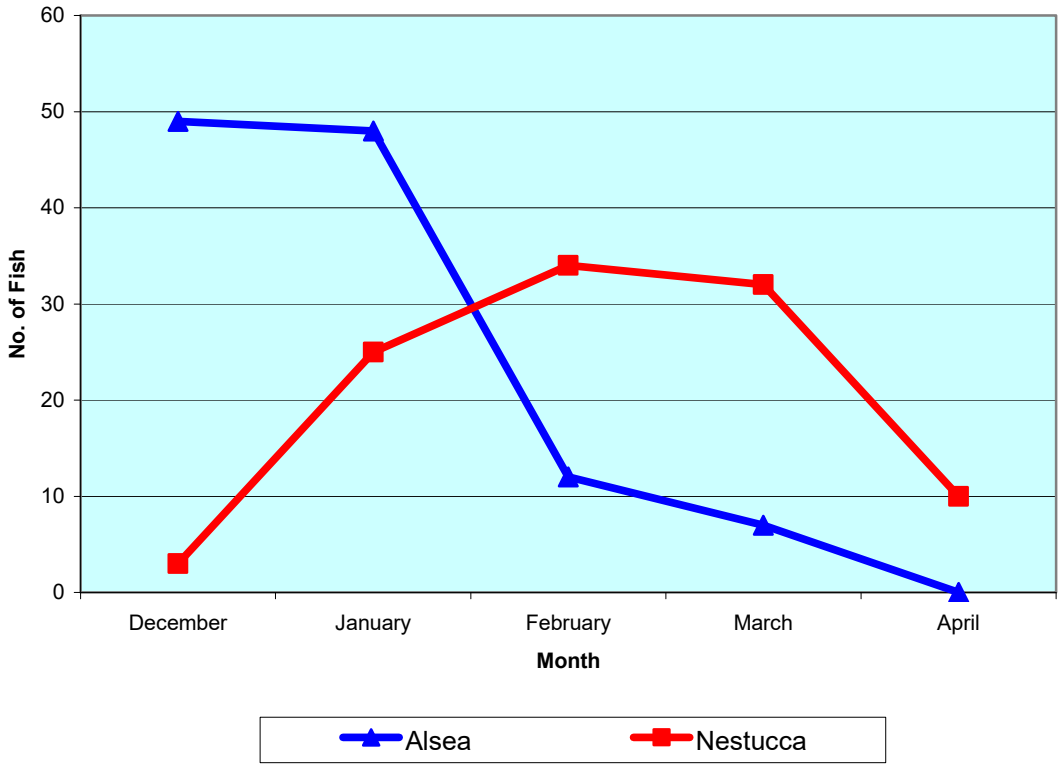


Figure 2.
Hatchery Winter Steelhead Samples in the Nestucca River Basin Creel, 2005-2006

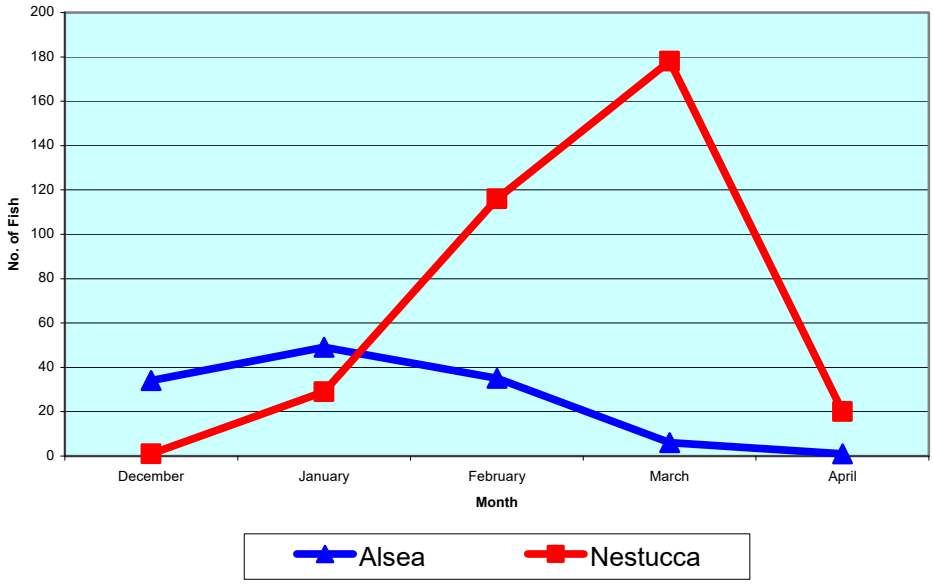
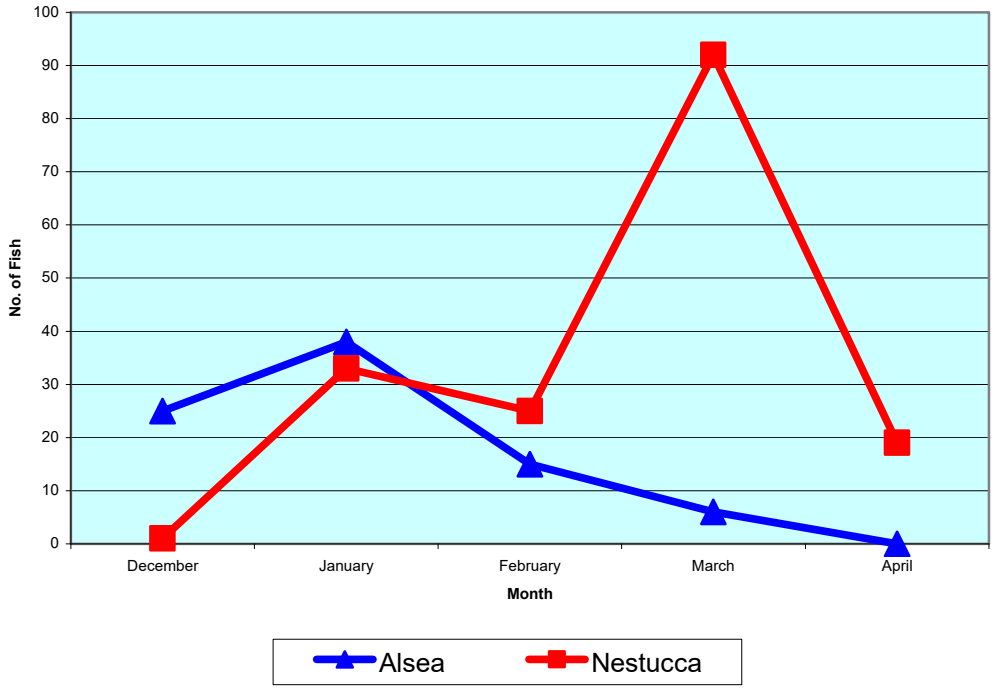


Figure 3
Hatchery Winter Steelhead Samples in the Nestucca River Basin Creel, 2006-2007



Stray Monitoring

Surveys were conducted in the mainstem Nestucca River and tributaries for the presence of hatchery steelhead in natural spawning areas. The goal of this portion of the project was to describe the distribution within the basin of each hatchery stock, and to estimate hatchery/wild ratios of naturally spawning steelhead. Steelhead were physically captured using dip nets or tangle nets and examined for fin clip, sex, and length. Fish were individually tagged with numbered Floy tags for identification if captured again. A scale sample was also collected. Surveyors also collected data from carcasses of any dead steelhead when encountered.

Surveys were relatively equally distributed between the upper and lower portions of the basin (the upper basin included the basin above Beaver Creek; the lower basin included Beaver Creek and downstream- see Appendix A). Nestucca stock distribution and relative proportion of capture was similar between years. The relative proportion of Alsea stock was similar between years (1.5-3 times that of Nestucca stock), but the distribution of spawners in 2006 and 2007 shifted to the upper basin (Table 2). This appears related to a change in the release site for the hatchery smolts.

Table 2
Nestucca River Basin StW Stray Survey Distribution Data, 2005 - 2007

Brood Year	Location	Wild	Alsea ADLM	Nestucca ADRM	AD	Summer ADRV
2005	Upper basin	33	0	2	3	5
	Lower basin	16	6	2	0	1
	Total	49	6	4	3	6
	%	72.1	8.8	5.9	4.4	8.8
2006	Upper basin	51	5	1	4	6
	Lower basin	35	1	1	6	1
	Total	86	6	2	10	7
	%	77.5	5.4	1.8	9.0	6.3
2007	Upper basin	47	9	2	8	37
	Lower basin	51	3	2	4	5
	Total	98	12	4	12	42
	%	58.3	7.1	2.4	7.1	25.0
	Grand total	233	24	10	25	55
	%	67.1	6.9	2.9	7.2	15.9

Note: AD mark is unknown stock, except 3 salt Alsea stock in 2005 were AD marked. ADRV are 47 stock hatchery summer steelhead.

Trapping

Returning adult winter steelhead are collected at two trap sites within the basin. One trap is located at Cedar Creek Hatchery on Three Rivers, and the other is located at a remote site on Bays Creek (see Appendix A). Bays Creek was utilized as a tributary release site for all hatchery winter steelhead smolts beginning in 2004 (with adults beginning to return there in 2005-06) to facilitate the evaluation of the program.

Alsea stock hatchery steelhead are consistently trapped in higher numbers at both trap sites than are Nestucca stock. Alsea stock hatchery steelhead also show a greater affinity to return to the hatchery, despite off-station releases, than do Nestucca stock (Table 3).

Table 3
Nestucca Basin Hatchery Winter Steelhead Trap Captures 2005-2007

Brood Year	Cedar Creek Hatchery		Bays Creek Trap	
	Alsea	Nestucca	Alsea	Nestucca
2005	730	31	--	--
2006	602	50	88	65
2007	241	3	316	147

Note: Adults did not begin returning to Bays Creek until the 2006 brood year, thus none were captured in 2005.

Other Monitoring Components

Steelhead Spawning Surveys

Steelhead spawning surveys are conducted annually by ODFW Research (Coastal Salmonid Inventory Project). From 2001-2005, intensive spawning surveys were conducted to estimate the naturally spawning population of winter steelhead in the Nestucca basin. Estimates of wild spawners ranged from approximately 4000-11,000 steelhead. Since 2005, spawning survey effort has been reduced and incorporated within the overall steelhead monitoring program for the north coast area. Reports from this project are available on the ODFW website at http://oregonstate.edu/dept/ODFW/spawn/reports.htm

Population estimates were made to assess what proportion of the population would be removed for the hatchery program. Annual removal averaged about 1 % of the population (Table 4).

Table 4
Nestucca River Basin Wild Winter Steelhead Estimated Populations 2001- 2005

Brood Year	Estimated wild adults	No. adults spawned at hatchery	% of population [1]
2001	8060	--	--
2002	10723	44	0.41%
2003	6510	46	0.71%
2004	8738	50	0.57%
2005	4190	47	1.12%
1. Percentage of population used for broodstock			

Juvenile Surveys

Juvenile surveys were conducted by ODFW Research (Western Oregon Rearing Project) during the summer from 2001-2006. Juvenile steelhead were found to be relatively abundant and well distributed within the basin. No impact from removal of adults for the hatchery program could be detected. Reports form this project are available on the ODFW website at http://nrimp.dfw.state.or.us/crl/default.aspx?p=391

Residual Monitoring

ODFW Tillamook District staff have monitored for the presence of juvenile hatchery steelhead following hatchery releases annually since 2003. Monitoring has been conducted by snorkeling, electroshocking, and/or angling. In addition, visual estimates of smolts remaining near the release site in Bays Creek have been made each spring in the days following releases.

Residualism of both stocks of winter steelhead appears to be low, and appears to be localized near the release site. The vast majority (visually estimated at 90-95%) of smolts leave the release site within a week of release, and most of those within the first 3 days. Relatively few juveniles remain in the release stream after the spring migration period. Some juveniles do remain in the mainstem Nestucca River, and have been documented both upstream (approximately 1 mile) and downstream of Bays Creek. It appears that the Nestucca stock residualizes at a somewhat higher rate than the Alsea stock, although surveys have been at insufficient levels to quantify the difference. It also appears that Nestucca stock residuals tend to be smaller individuals that may not have reached sufficient size or condition, (may migrate at a later date), whereas Alsea stock residuals tended to be larger individuals that may be precocial and possibly will never migrate.

Hatchery Monitoring

ODFW Cedar Creek hatchery staff monitors numerous aspects of the rearing of the two hatchery stocks, such as spawning activities, growth, health, and numbers of fish reared. The primary difference in the rearing of the two stocks is the difference in spawn timing. The Alsea stock adults are spawned in January, while the Nestucca stock adults are spawned from February to April. The juvenile Nestucca stock steelhead consist of multiple spawning groups from that period, and growth must be manipulated (such as controlling temperature or by different feeding schedules) to some degree in order to reach the desired size by release time. The Nestucca stock tends to be slightly smaller (and less uniform) than the Alsea stock juveniles at release, but are at or near the desired size of 6 fish / pound. The hatchery is successfully able to rear both stocks of fish and meet production goals.

Some examples of the type of data recorded are given in Tables 5 and 6, and Figure 4.

Table 5
Cedar Creek Hatchery Winter Steelhead Releases 2002 - 2006

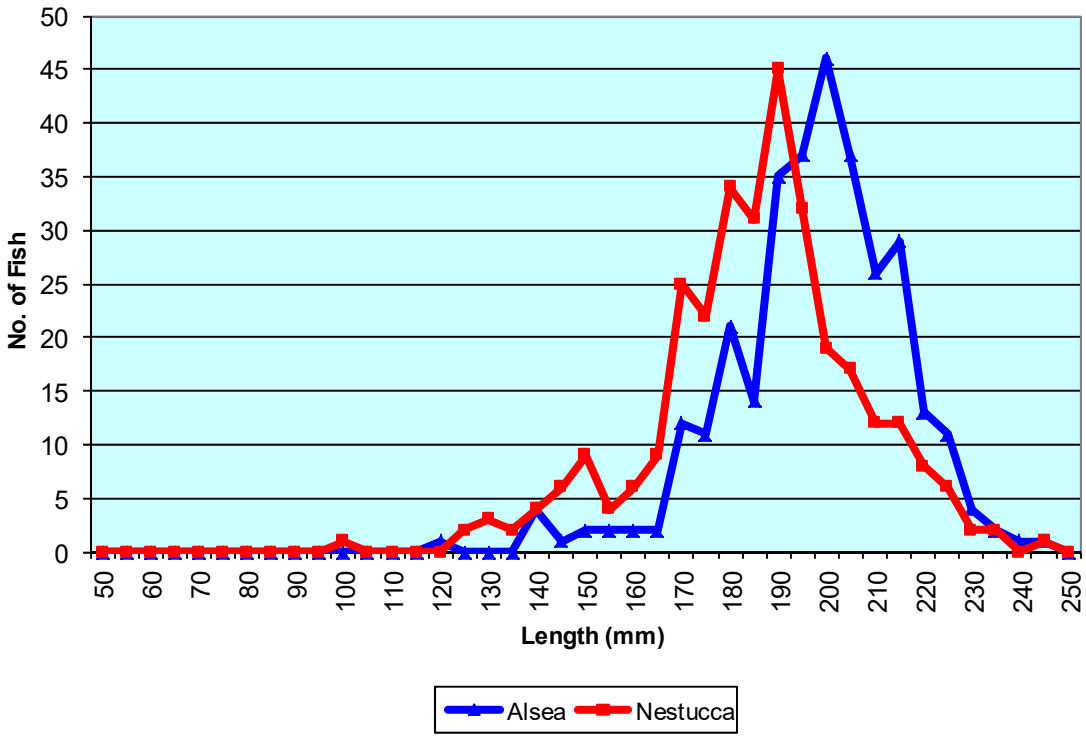
Brood Year	Release Year	Production Goal [1]	Alsea Stock	Nestucca Stock
2002	2003	50,000	51,224	49,544
2003	2004	50,000	49,612	45,254
2004	2005	55,000	60,974	57,673
2005	2006	55,000	57,690	38,216 [2]
2006	2007	55,000	58,762	60,717

1. **Production goal applies to each stock**
2. **Shortage due to late season outbreak of Cold Water Disease (CWD)**

Table 6
Cedar Creek Hatchery StW Growth Chart, 2003

Month	Average Weight (fish/lb)	
	Alsea	Nestucca
April	670	x
May	264	1168
June	140	1200
July	80	220
August	40	104
September	18.6	58
October	13.4	34.0
November	13.4	28.0
December	9.4	16.6
January	8.6	12.0
February	6.3	8.4
March	5.6	7.1
April	5.7	6.3
Condition Factor (Release)	1.01	1.01

Figure 4
Cedar Creek Hatchery StW Length at Release 2003



Summary

ODFW has decided, based on the information collected through this evaluation (and considering public comments), to modify the winter steelhead hatchery program within the Nestucca River basin. Previously, the hatchery program reared 110,000 smolts, of which the target was 55,000 smolts of each stock. The fish were all released in Bays Creek to facilitate the evaluation. Beginning with the 2007 brood (smolts released in spring, 2008), ODFW will modify the program to include releases of 70,000 Nestucca stock and 40,000 Alsea stock. In addition, release sites will be altered to include multiple release locations as follows:

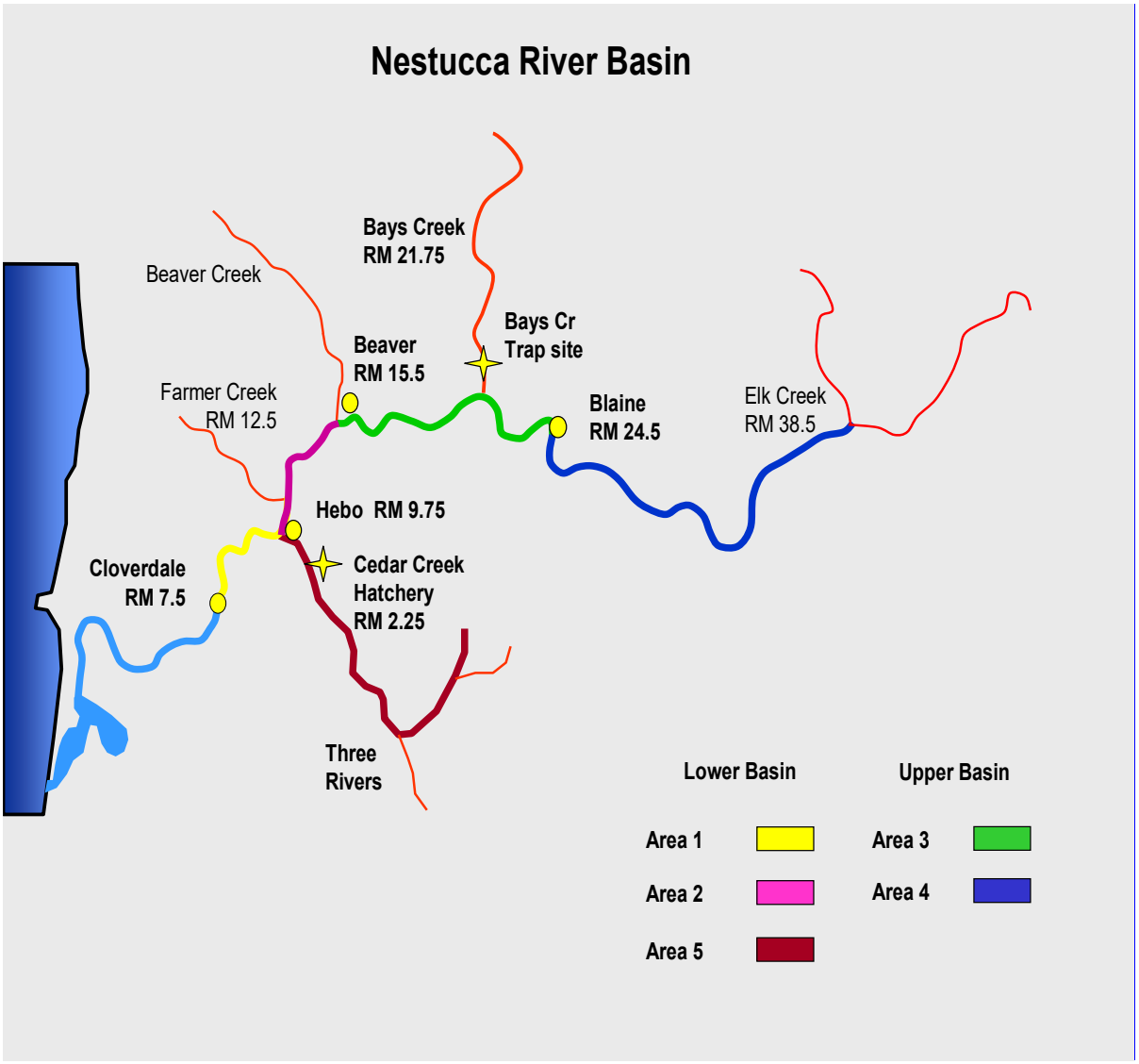
Alsea stock-	30,000 in Three Rivers, 10,000 @ Farmer Cr.
Nestucca stock-	20,000 in Bays Cr. 20,000 @ First Bridge 15,000 @ Farmer Cr. 15,000 in Three Rivers

The reduction in the number of Alsea stock smolts, combined with moving the majority of the releases into Three Rivers, should serve to reduce the escapement of this stock to natural spawning areas. Also, moving the release locations lower in the basin should confine escapement of this stock to the lower basin, away from the majority of wild spawners. Increasing production of the Nestucca stock may increase the escapement of this stock to natural spawning areas. However, the higher contribution to the fishery combined with a much lower observed stray rate, should serve to reduce the overall escapement of hatchery winter steelhead within the basin. Funding for future evaluation is unceartain. Monitoring options will be considered and evaluated at the time of adult returns from the reprogrammed release strategy.

The fishery benefits from this hatchery program are expected to increase under this strategy. Moving most of the Alsea stock releases back to Three Rivers should ensure that most fish return to Three Rivers, where they are more susceptible to being caught (and water conditions are generally more favorable during the period these fish return). Increasing production of the Nestucca stock should result in more fish to the creel, as fish contribute to the fishery at a higher rate and over a longer period. Spreading the releases through the lower mainstem should also improve the quality of the fishery by decreasing angler crowding.

ODFW believes this strategy provides the best combination of conservation benefits to wild salmonids and providing hatchery harvest opportunities.

Appendix A


Nestucca River Basin
Bays Creek
RM 21.75
Beaver Creek
Bays Cr
Trap site
Beaver
RM 15.5
Farmer Creek
RM 12.5
Blaine
RM 24.5
Elk Creek
RM 38.5
Hebo RM 9.75
Cloverdale
RM 7.5
Cedar Creek
Hatchery
RM 2.25
Three
Rivers
Lower Basin
Upper Basin
Area 1
Area 2
Area 3
Area 4
Area 5