HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	**Alsea Hatchery Winter Steelhead Program**
Species or Hatchery Stock:	**Winter Steelhead *Oncorhynchus mykiss* Stock 43/43W**
Agency/Operator:	**Oregon Department of Fish and Wildlife**
Watershed and Region:	**North Coast Watershed District**
Date Submitted:	**May 27, 2003**
First Update Submitted:	**August 26, 2014**
Second Update Submitted:	**June 17, 2016**
Date Last Updated:	**June 17, 2016**

SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Alsea Hatchery, Alsea Stock Winter Steelhead Program.

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

Winter Steelhead/*Oncorhynchus mykiss* (stock 43 was developed in1936 using Alsea wild steelhead, and later 43W was developed using wild Alsea steelhead beginning brood year 2000). The Oregon Coast steelhead Evolutionary Significant Unit (ESU) was designated as a candidate species under the Endangered Species Act (ESA) on March 19, 1998 (Federal Register Notice 1998). These fish are also a sensitive (vulnerable) species under Oregon's Sensitive Species Rule (OAR 635-100-0040).

1.3) Responsible organization and individuals.

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

- Funding for Alsea Hatchery is 50 percent General Fund and 50 percent other funds.
- The hatchery is staffed with four FTE positions.

- The annual Alsea Hatchery budget, which includes personnel, services, and supply costs for all rainbow and winter steelhead programs is $455,635.
- The Alsea winter steelhead program cost is approximately 18.4 percent $83,836 of the annual budget.

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

The hatchery is located at RM 5 on the North Fork of the Alsea River off Highway 34, near the town of Alsea, 15 miles west of Philomath (Attachment B). The hatchery site occupies about 25 acres at 380 feet above MSL (44º 25'22" N and 123º 33' 05" W). The North Fork Alsea watershed code is 1800430000.

1.6) Type of program.

Isolated harvest.

1.7) Purpose (Goal) of program.

The goal of the Alsea smolt release group, as outlined in the Coastal Multispecies Conservation Plan is to release up to 140,000 winter steelhead to provide harvest opportunities, while minimizing risk to wild fish.

1.8) Justification for the program.

This program provides steelhead for harvest while limiting adverse impacts to wild fish, including listed Coho Salmon, to very low levels. Currently, hatchery fish are necessary to meet public desires for consumptive harvest because angling regulations require the release of wild steelhead in the Alsea Basin.

Releases in the Alsea will be made from the North Fork Alsea Hatchery and at an off channel acclimation pond and will be timed with smoltification to minimize interactions with wild juveniles. This document outlines the hatchery program using both the existing (Stock 43) and new broodstocks. The wild winter steelhead used in the 43W broodstock will be collected in traps and by angling. Measures will be taken to ensure the survival of both target and non-target fish that are encountered during broodstock collection.

Low numbers (less than 5,000) of unfed fry releases, using hatchery winter steelhead, are made in the Big Creek (Newport), Siletz, Alsea, and Yaquina basins. These fry are produced from educational programs. Because of the small numbers released, and the use of release locations isolated from the main wild production areas these releases are assumed to pose a minimal risk to any native fish species in those basins.

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

The following are** key **performance standards and indicators identified to evaluate the success of this fish propagation program. Note: Not all measurable standards are listed. Additional within-hatchery standards will be evaluated using data gathered during adult collection, mating, incubation, rearing, and release of the winter steelhead. These additional standards will be used to monitor fish propagation procedures identified in Sections 7 to 10.

1—Sport Fishery Contribution

Standard 1: Release 140,000 winter steelhead smolts in the Alsea basin to provide opportunity to harvest hatchery winter steelhead.
Indicator (a): Annual fish liberation reports indicate the proposed number of smolts have been released.

Standard 2: New wild broodstock performance in fisheries should be equal to, or greater than the traditional stock performance.
Indicator (a): Compare fishery contribution rate (adults caught/smolts released) between the two Alsea River winter steelhead stocks (Stock 043 and Stock 043W) utilizing estimates of harvest from creel surveys of anglers, and from angler log books.

2—Impacts to Wild Fish

Standard 3: Adult migration timing of natural population does not change as a result of this fish propagation program.
Indicator (a): Wild fish return timing at monitoring sites is consistent with historical return timing.

Standard 4: Broodstock collection does not remove a significant portion of the wild winter steelhead population in the Alsea.
Indicator (a): Confirm through angler logs that no more than half of the wild winter steelhead caught by anglers are used for broodstock.

Standard 5: Limit hatchery fish to 10 percent or less of the fish spawning in natural habitats of the Alsea and neighboring basins, except in the immediate area (within 1 mile) around the release site.
Indicator (a): Enumerate the total number of adult returns and the number of marked hatchery adult returns (stock 043 & 043W plus other stocks) to three traps within the Alsea Basin; on Fall Creek, Cascade Creek, and Drift Creek. All of these sites are removed from the release site.
Indicator (b): Enumerate the total number of adult returns and the number of marked hatchery adult returns (stock 043 & 043W plus other stocks) at traps outside of the Alsea Basin at Siletz Falls (Siletz), Mill Creek (Siletz), Schooner Creek (Siletz), Mill Creek (Yaquina), and Whittaker Creek (Siuslaw).

Standard 6: Impacts to wild Coho trapped at Alsea Hatchery are minimized.
Indicator (a): Confirm that trap is checked on a regular basis and wild Coho are promptly removed and released upstream. Take levels for wild Coho are within limits identified in Tables 2-5 and 2-6.

3—Stock Identification

Standard 7: All hatchery smolt releases from both stocks for this program will be marked so as to distinguish them from each other, from wild fish, and from other hatchery programs throughout their life. This mark or combination of marks will include an adipose fin-clip.
Indicator (a): Confirm that all 043 stock smolts were marked with an adipose fin-clip and a left maxillary clip and all 043W stock smolts were marked with an adipose fin-clip and a right maxillary clip prior to release. Pre-release mark quality checks, based on a sample of 200 smolts per stock, indicate at least 99% of fish released have retained identifiable marks.

4—Program and Facility Operation

Standard 8: Timing of adult broodstock collection mimics the average wild steelhead migration.
Indicator (a): The proportion of broodstock collected each month is consistent with the proportion of the natural population, on average, that enters North Fork Alsea Ladder trap during that month. Refer to Section 7 for details.

Standard 9: Adult selection, mating, and spawning is consistent with approved methods and procedures.
Indicator (a): Females and males are selected (and paired) randomly as they ripen for spawning.
Indicator (b): Fish are spawned at a 1:1 male-to-female ratio and are spawned according to a 2-by-2 spawning matrix.
Indicator (c): All wild fish are live-spawned and returned to the Alsea River.

Standard 10: Develop operational plans that maximize survival rates at varying life stages within the hatchery (refer to Section 9.2) to ensure cost-effectiveness / optimize the public's resources in implementation of the program. This standard will be implemented in a manner consistent with the hatchery premise as defined in the Fish Hatchery Management Policy (OAR 635-007-0544).
Indicator (a): Annually enumerate survival rates from egg to fry, fry to fingerling, and fingerling to smolt to determine optimal rearing conditions and practices and if needed, modify operational plans accordingly.

Standard 11: Release 60,000 stock 043 and 60,000 stock 043W (plus or minus 2%) hatchery winter steelhead smolts annually from Alsea Hatchery, 20,000 stock 043W at a lower river acclimation site.

Indicator (a): Hatchery production will be inventoried prior to release to enumerate smolt release numbers. Juveniles that die in transport will be subtracted.

Standard 12: Hatchery juveniles are released at sizes that promote maximum potential for survival and adult return.
Indicator (a): Release smolts at size called for on annual production schedule.

Standard 13: Achieve a 2 percent return rate of hatchery fish to the fishery, from the smolt release.
Indicator (a): Compare hatchery releases with harvest estimated from harvest tags to derive estimated return rate to the fishery.
Indicator (b): Compare return rate to the fishery in the Alsea River with return rates of hatchery winter steelhead programs in other basins to determine if factors out of ODFW's control (such as ocean conditions, climatically influenced angling conditions, or societal influenced angling effort) may be having strong influences on survival.

Standard 14: Follow approved fish health and disinfection guidelines to minimize disease impacts to natural populations.
Indicator (a): Compliance with approved fish health standards and criteria.

1.11) Expected size of program.

Annual release of winter steelhead under this program 140,000 smolts. Due to variances in hatchery rearing survival, the expected size of annual releases may vary ±5% of the 140,000 smolt release goal.

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

With the existing traditional stock 43 broodstock, on-site hatchery protocols include utilizing a portion of the eggs from a minimum of 350 pair of returning hatchery-origin adults to ensure some diversity within this hatchery stock. This likely will be the maximum broodstock level used for the 60,000 smolts from the stock 43.

The proposed maximum number of wild winter steelhead that will be used for broodstock is currently 45 pair for the 80,000 smolt release of stock 43W. This is based on similar programs in other basins. The number of adults collected will be adjusted, as needed, as experience is gained with this stock. The maximum number of wild winter steelhead used for brood may increase if it is decided to eliminate the traditional stock 43. This decision could be made if evaluation of the two stocks shows that objectives could be met more efficiently with the stock 43W alone. If the stock 43 is eliminated, more than twice as many wild steelhead would be needed to produce the total 140,000 smolts, as are currently used to produce the 80,000 smolts.

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

Table 1-1. Proposed annual fish release levels (maximum number) by life stage and location.

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry (STEP/School program)	Big Creek (Newport)	270
	Siletz River	2,160
	Yaquina River	1,800
	Big Elk Creek (Yaquina)	90
	Olalla Creek (Yaquina)	270
	Eckman Creek (Alsea)	180
Fry		
Fingerling		
Yearling	North Fork Alsea Hatchery	60,000 (stock 43) 60,000 (stock 43W)
	Lower river direct release (acclimation pond)	20,000 (43W)

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

Estimates of adult winter steelhead production from the Alsea River winter steelhead program, for the 1989-98 period are presented in Table 1-2. Estimates reflect program performance in relation to the average annual smolt release of 140,000 winter steelhead smolts. The estimated number of adult hatchery winter steelhead produced was derived from a variety of data sources.

The “Freshwater Sport” column (Table 1-2) is based on catch card estimates of catch in the Alsea Basin. Since January 1, 1992 winter steelhead fisheries in the Alsea Basin have been managed for retention of hatchery fish only. Annual harvest of hatchery winter steelhead in the Alsea Basin averaged 1,487 fish from the 1992-93 through 1998-99 run years (see Section 3.3.1). Catch card estimates of catch are currently available through the 2014 calendar year. The harvest tag data was assigned to brood year using the average age composition from 1983-84 to 1990-91 fishery scale data. Some percentage of the hatchery fish harvested were likely strays from other hatchery programs. Although hatchery steelhead stocks are differentially marked to some extent, the catch card data can not be segregated by stock. Creel survey results indicated stray hatchery steelhead from other basins made up 26% of the catch in 1991-1994 (Schroeder et al. 2001) and

were primarily from releases of stock 43 in the Siuslaw basin, to the south. The recent development of a Siuslaw stock and elimination of stock 043 releases into the Siuslaw River, Siletz, Salmon, Smith, and Coos rivers has likely reduced the contribution of strays to harvest but the exact amount is not known.

The "Hatchery Return" column depicts the actual count of adult winter steelhead returns at Alsea and Fall Creek hatcheries, with the adult age composition based on an average of the 1983-84 to 1990-91 fishery scale data. Estimates are not available of the total number of hatchery winter steelhead that strayed to all natural spawning areas in the Alsea Basin. However, two sites removed from the hatchery release sites (Cascade Creek and Bohannon Falls on Drift Creek) have been monitored since 1991-92. The percentages shown in the "Spawning Grounds" column (Table 1-2) reflect the average percent of hatchery fish captured between the two trap sites. Smolt to adult survival (Table 1-2) is calculated as the sum of the Freshwater Sport and Hatchery Return columns divided by the "Smolt Release" column. The "Goal" row at the bottom of the table represents the Basin Plan goals of an average annual catch of 2,400 hatchery winter steelhead and a hatchery stray rate of 10% or less.

Table 1-2. Estimated total adult hatchery winter steelhead produced per brood year from smolts released in the Alsea Basin. Derived from fish trap and harvest tag data, n.a. = not available or applicable. Data in *italics* are incomplete.

Brood Year	Stock 43	Stock 43W	2-Salt Return Year	Estimated Adult Hatchery STW (2-salt + 3-salt)			
				Freshwater Sport *	Hatchery Return **	Spawning grounds	% Survival
1989	125,812	0	1991-92	1,948	1,650	56%	2.86%
1990	122,853	0	1992-93	1,634	1,392	31.5%	2.46%
1991	127,976	0	1993-94	1,183	1,557	64.5%	2.14%
1992	131,396	0	1994-95	1,260	2,347	49.5%	2.75%
1993	120,680	0	1995-96	1,100	2,844	54.5%	3.27%
1994	128,546	0	1996-97	1,856	2,656	44.5%	3.51%
1995	121,326	0	1997-98	1,429	1,307	42%	2.26%
1996	125,958	0	1998-99	1,698	2,222	35%	3.11%
1997	130,525	0	1999-00	*752*	1,670	23.5%	*1.86%*
1998	125,358	0	2000-01	n.a.	*1,038*	32.5%	*0.83%*
Goal [a]	60,000	80,000	n.a.	2,400	n.a.	≤10%	n.a.

* = Alsea Basin catch, based on harvest tag returns. The 1992-93 to 2000-01 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1990-91 scale data.

** = Used average age composition from fishery scale samples to assign age to Alsea and Fall Creek hatchery returns.

a = Program goals are based on the Basin Plan goals of an annual 2,400 hatchery winter steelhead harvest and hatchery stray rates of 10% or less.

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

Alsea Hatchery winter steelhead stock 43 program was developed from wild steelhead in the Alsea in 1936 (ODFW 1995). The 43W broodstock was developed from wild steelhead in the Alsea basin, starting in December 2000.

1.14) Expected duration of program.

The program will continue in the Alsea indefinitely. Stock 43 may be phased out if evaluation shows the 43W broodstock can meet all goals more effectively.

1.15) Watersheds targeted by program.

Smolts are released in the Alsea watershed. Unfed fry under the STEP/school program are released in the Siletz, Big Creek, and Yaquina watersheds.

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

One alternative would be to remove the goals from the Coastal Multispecies Conservation Plan calling for hatchery steelhead harvest. This plan went through extensive public involvement before being adopted into Oregon Administrative Rules. Another option considered was to allow harvest of wild winter steelhead. This was not pursued because of insufficient information on the wild population's status. The population's abundance was thought to be too low relative to the harvest objectives. A third option considered was a non-consumptive catch-and-release fishery for wild steelhead, but this would not meet the public's objective of keeping fish they caught. Creating a new broodstock from wild steelhead was an alternative outlined in the Alsea Basin Plan that is being implemented and further supported in the Coastal Multispecies Conservation Plan.

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 May 27, 2003 for approval and ESA coverage. This is an updated version of the previously submitted HGMP, to make it consistent with the Coastal Multi-Species Conservation and Management Pan.

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.

Alsea Complex Coho

The Alsea Complex Coho consists of Coho Salmon inhabiting mid-coast streams located from Beaver Creek south to China Creek, just north of Heceta Head (Nickelson 2001). Populations include Beaver Creek, Drift Creek, Alsea River and Yachats River. There is an estimated 360 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 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. Recent research is finding that rearing of wild Coho juveniles in the upper ends of tidal reaches can be extensive (Solazzi et al. 2001). However, Coho Salmon released from the Salmon River hatchery remained in the estuary for only a short time and only rarely entered the marsh channels (Cornwell et al. 2001).

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.

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

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

The Alsea Complex consists of Coho Salmon inhabiting mid-coast streams located from Beaver Creek south to China Creek, just north of Heceta Head. Populations include Beaver Creek, Drift Creek, Alsea River and Yachats River. There is an estimated 360 miles of spawning habitat available to the Coho Salmon of this complex. The critical population level for the Alsea Complex is 1,400 adult spawners (Nickelson 2001). The habitat of this complex has the potential to support a viable population because high quality habitat is estimated to be present in 97 miles of stream, well above the 15-mile threshold (Nickelson 2001).

The abundance of Coho Salmon spawners of the Alsea Complex has ranged from about 1,000 to over 25,000 and has averaged about 8,767 during the years 1990 - 2014(see below Figure 2-1 and Table 2-2).

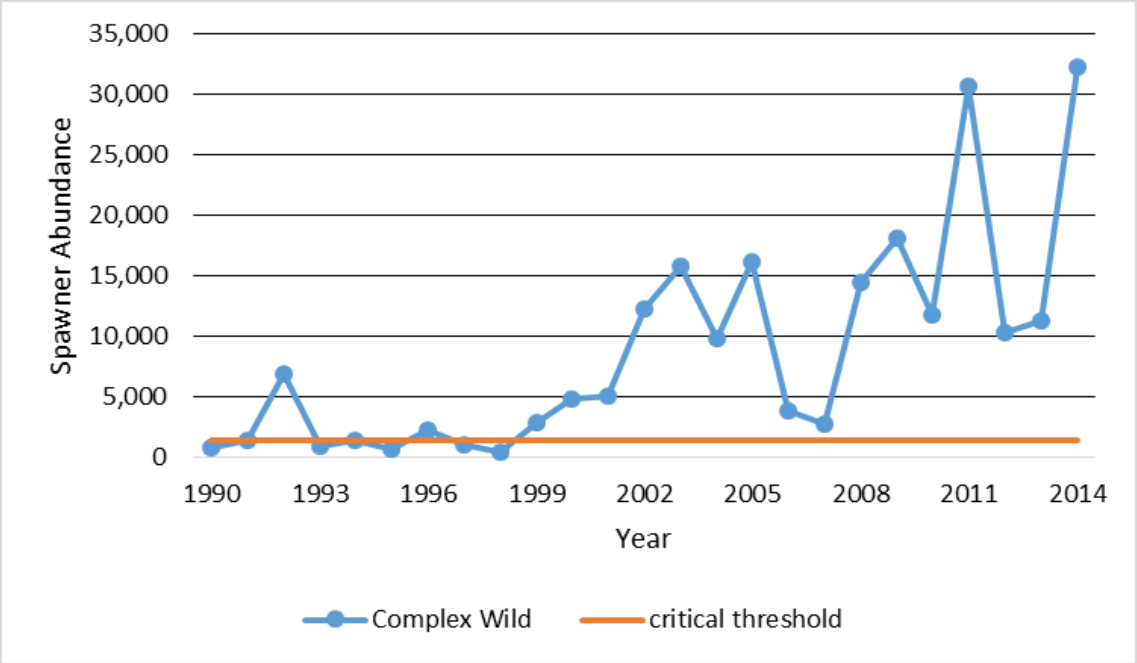

Figure 2-1. Trend in adult Coho Salmon abundance relative to the critical population level for the Alsea Complex. Error bars are 95 percent confidence limits.

Table 2-2. Population Parameters of Coho Salmon for the Alsea Complex, 1990-2014.

Return Year	Wild Spawners	Pre-harvest Wild Population	Recruits per Spawner
1990	865	3,204	
1991	1,495	4,153	
1992	9,891	18,624	
1993	969	1,615	1.87
1994	1,503	1,599	1.07
1995	749	842	0.12
1996	2,356	2,506	2.59
1997	1,098	1,207	0.80
1998	509	553	0.74
1999	2,852	3,067	1.30
2000	4,827	5,028	4.58
2001	5,060	5,271	10.36
2002	12,290	12,937	4.54
2003	15,833	17,210	3.57
2004	9,802	10,654	2.11
2005	16,171	16,845	1.37

2006	3,922	4,263	0.27
2007	2,757	3,133	0.32
2008	14,538	14,835	0.92
2009	18,213	19,584	4.99
2010	11,760	12,379	4.49
2011	30,726	32,687	2.25
2012	10,348	12,620	0.69
2013	11,298	13,137	1.12
2014	32,350	35,944	1.17
Annual mean	8,767	10,156	2.33

- Provide the most 12 years annual proportion of spawning abundance estimates and progeny-to-parent ratios, survival data by life stage, or other measures of productivity for the listed population. Indicate source of data.

Since 1999 the spawner abundance has not fallen below the critical threshold of 1,400 Coho Salmon. Recruits per wild spawner have been highly variable over the last 25 years (Table 2-2 above and Figure 2-2 below) and have been below one only seven times.

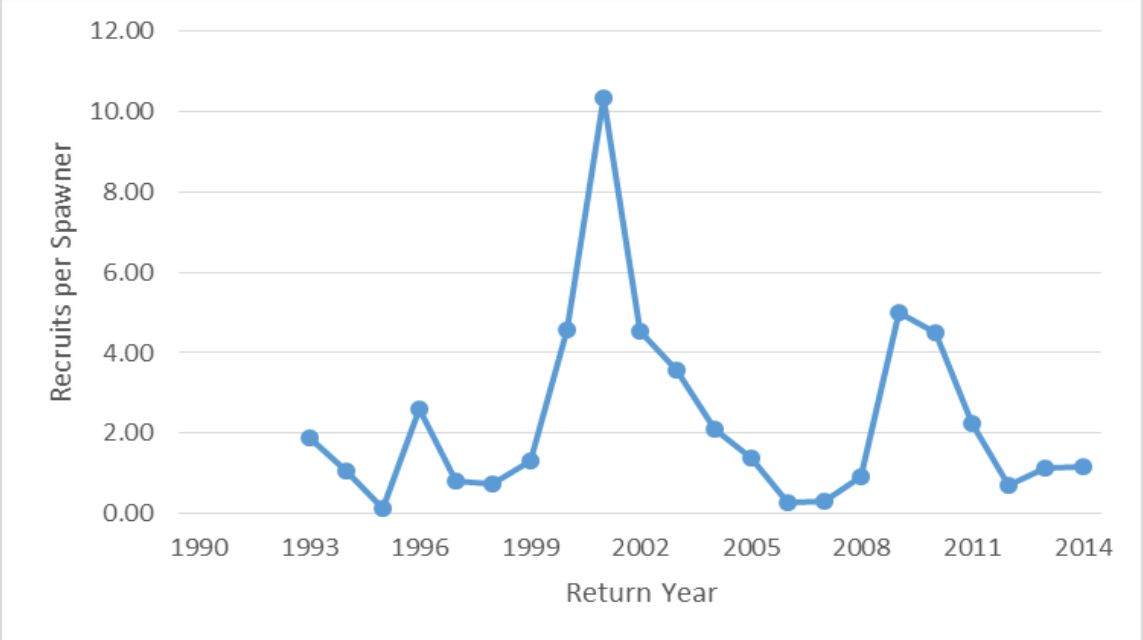

Figure 2-2. Trend in recruits per spawner for Alsea Complex wild Coho Salmon.

A Life-Cycle Monitoring Site (Solazzi et al. 2000) is located at Cascade Creek, (Table 2-3) and has averaged 50 percent males. Estimated smolt abundance for the entire Alsea Complex ranged from 89 thousand to over five million for the 1997-2014 brood years (Table 2-4).

Table 2-3. Summary of life-cycle monitoring for Cascade Creek (Alsea River).

Brood Year	Estimated Egg Deposition	Smolts Produced	Returning Adults			Freshwater Survival	Marine Survival
			Males	Females	Total		
1994			22	17	39		
1995			1	5	6		
1996		1,404	4	5	9		0.6%
1997	37,321	557				1.5%	
1998	10,104	13				0.1%	
1999	14,927						

Table 2-4. Estimated abundance of juvenile life stages based on spawner abundance, 1990-2014 (estimates are in millions).

Year	Eggs	Fry	Parr	Smolts
1990	1.081	0.703	0.436	0.148
1991	1.869	1.215	0.753	0.256
1992	9.614	5.599	3.471	1.180
1993	1.211	0.787	0.488	0.166
1994	1.879	1.221	0.757	0.257
1995	0.936	0.609	0.377	0.128
1996	2.945	1.914	1.187	0.404
1997	1.373	0.892	0.553	0.188
1998	0.636	0.414	0.256	0.087
1999	3.565	2.317	1.437	0.488
2000	6.034	3.922	2.432	0.827
2001	6.325	4.111	2.549	0.867
2002	15.363	9.986	6.191	2.105
2003	19.791	12.864	7.976	2.712
2004	12.253	7.964	4.938	1.679
2005	20.214	13.139	8.146	2.770
2006	4.903	3.187	1.976	0.672
2007	3.446	2.240	1.389	0.472
2008	18.173	11.812	7.324	2.490
2009	22.766	14.798	9.175	3.119
2010	14.700	9.555	5.924	2.014
2011	38.408	24.965	15.478	5.263
2012	12.935	8.408	5.213	1.772
2013	14.123	9.180	5.691	1.935
2014	40.438	26.284	16.296	5.541

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

Hatchery fish have been common in the spawning population in some years of the last decade, particularly in Beaver Creek and the Alsea River. Of 424 scale samples collected during 1990-99, 84 (19.8%) had hatchery scale patterns. However, the hatchery programs that contributed to the strays have now been eliminated.

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.

Broodstock Collection

Angling—Anglers trying to collect wild winter steelhead for broodstock may incidentally catch adult wild Coho Salmon. To minimize stress to Coho Salmon during broodstock collection, anglers participating in collection will have release techniques explained to them prior to angling for broodstock. Impacts will most likely occur in December and early January, when early returning wild winter steelhead enter areas and coexist with wild Coho Salmon.

Seining—Seining to capture wild winter steelhead for broodstock is likely to impact wild Coho Salmon through the capture and release of wild Coho adults. Incidental take is most likely to occur in December and January (when wild steelhead and Coho Salmon co-exist). However, because winter steelhead brood are collected throughout (and in proportion to) the run, seining impacts will not be frequent from December through early January. Likewise, methods other than seining will be used to collect brood during this time.

Trapping—There are two traps operated on the North Fork Alsea River to collect winter steelhead that are likely to impact wild Coho Salmon through the capture and release of adult wild Coho Salmon. Adult trapping is likely to incidentally take wild Coho by delaying upstream migrations and invoking stress as a result of capture, handling, and upstream release. These impacts will likely occur in December and January. Most fish will be captured at the trap in the fish ladder on the hatchery diversion dam. Wild Coho Salmon will be easily passed upstream with minimal handling or stress.

Monitoring and Evaluation

Wild Coho Salmon adults have been captured in the past in traps at winter steelhead monitoring stations (intended to track winter steelhead stray rates). Adult trapping is likely to incidentally take wild Coho by delaying upstream migrations and invoking stress as a result of capture, handling, and upstream release. These impacts will likely occur in December and January. Note: these incidental impacts have been identified under ODFWs 4(d) Research application.

Smolt Releases
Hatchery winter steelhead smolts may interact with wild Coho Salmon smolts after their release. This impact should be minimal; most hatchery smolts will be out of the Alsea Basin before the majority of wild Coho Salmon emigrate to the ocean. Hatchery steelhead smolts will be released in early April, while wild Coho smolts generally migrate down Oregon coastal rivers from late April through May (Solazzi et al. 2000).

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

Broodstock Collection
Trapping—In the past seven years (1993-2000), an annual total of from 5 to 12 Coho have been captured at Alsea Hatchery incidentally while collecting winter steelhead brood. Coho were (and will be) identified, sorted, and released unharmed. Note: (1) no visual scar or scale loss has been attributed to trapping; and (2) no mortality of Coho has been observed at the trap or at release site(s). A new trap has been built in the fish ladder on the hatchery's diversion dam. It is anticipated that more wild Coho, possibly up to 300, will be captured here than have entered the trap at the hatchery.

- 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).

1. Table 2-5 and Table 2-6 summarize projected take.
2. Incidental take associated with adult trapping (broodstock collection and stray monitoring) at Fall, Cascade, and Drift creeks has been identified under ODFW's 4(d) research application.
3. Incidental take resulting from angler impact while collecting wild winter steelhead brood was addressed under the Pacific Fisheries Management Council (PFMC) Section 7 consultation for fisheries.

- 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.

Methods used to collect wild winter steelhead for broodstock will be adjusted if the level of take of wild Coho Salmon is higher than expected. If one method of collecting broodstock (angling for example) encounters more wild Coho than anticipated, more emphasis will be put into other methods, such as trapping, that have encountered fewer wild Coho Salmon.

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

Listed Species Affected:	Coho Salmon	**ESU/Population:**	Oregon Coast Coho/ Alsea River	**Activity:**	Winter steelhead brood collection - trapping
Location of Hatchery Activity:	North Fork Alsea River	**Dates of Activity:**	Mid-December to March	**Hatchery Program Operator:**	Oregon Department of Fish and Wildlife

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			0 - 300	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)				
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.

Table 2-6. Estimated Listed Salmonid Take Levels by Hatchery Activity

Listed Species Affected:	Coho Salmon	**ESU/Population:**	Oregon Coast/ Alsea River	**Activity:**	Winter steelhead brood collection - seining & angling
Location of Hatchery Activity:	Alsea River	**Dates of Activity:**	Mid-December to March	**Hatchery Program Operator:**	Oregon Department of Fish and Wildlife

Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			0 - 40	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)				
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.

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.

- Alsea Basin Management Plan (approved by the Oregon Fish and Wildlife Commission—November 14, 1997).
- Alsea Basin management plan identify the existing and the proposed (new) winter steelhead broodstock programs. Projected smolt releases are within target levels identified in the plan.
- Oregon Steelhead Management Plan. This program attempts to manage hatchery program so it is compatible with wild populations and provides recreational opportunities.
- Oregon Policy is the guiding policy for state management of wild and hatchery fish for protection of genetic resources. Through various avenues including the development of a localized broodstock, acclimation and release strategies for smolts, and other management activities, ODFW has sought to bring the Alsea River winter steelhead program into compliance with the Wild Fish Management Policy.
- ODFW Native Fish Conservation Policy.
- ODFW Fish Hatchery Management Policy.
- ODFW Fish Health Management Policy.
- Oregon Coast Multi-Species Conservation and Management Plan – (approved by the Oregon Fish and Wildlife Commission, June, 2014). The plan identified the Alsea winter steelhead program.
- 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 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.

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 (Executive Order 99-01).

- Pacific Fisheries Management Council (Section 7, Consultation).

3.3) Relationship to harvest objectives.

The sole intent of this program is to provide sport fishing opportunities in the Alsea Basin while minimizing impacts on wild populations.

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

The Alsea River winter steelhead sport fishery benefit from this program. Since 1992, this program has been designed and managed as a hatchery winter steelhead targeted fishery. Thus, all non-finclipped steelhead are released. Estimated (not actual) harvest from 1989 to 2014 (run years) are presented in Table 3-1. Estimates are based upon returned harvest tags (from anglers); estimates have been adjusted to account for non-return bias in returned harvest tags associated with anglers who catch few, if any, fish.

Table 3-1. Harvest of Winter Steelhead in the Alsea River (based on returned harvest tags).

Location	**1991 - 1992**	**1992 - 1993**	**1993 - 1994**	**1994 - 1995**	**1995 - 1996**	**1996-1997**	**1997-1998**	**1998-1999**	***1999 - 2000***
Alsea River	2,011	1,785	1,139	1,382	858	2,023	1,310	1,914	*965*

Note:
1) Pre-1992 data includes hatchery and wild fish harvest
2) Estimates include strays harvested within Alsea Basin, but released from out-of-basin hatchery programs.
3) The 1999-2000 return year data is incomplete, only includes catch in 1999.

The harvest levels listed in Table 3-1 equate to 0.7 percent to 1.6 percent smolt-to-adult harvest rate. It is estimated that future harvest levels will average 2.0 percent of the smolt release. Impacts to listed wild Coho Salmon in the Alsea basin, from this fishery, will likely involve incidental catch-and-release of adults. Information from past creel surveys indicate that some coho are caught in December and January. Impacts resulting from this fishery are included in the PFMC Section 7 consultation for ocean fisheries.
The creation of the new winter steelhead hatchery broodstock will help shift the Alsea Basin sport fishery from an early winter steelhead fishery (in December/January) to a later winter fishery (in February/March). This will reduce angling pressures in December and January, thus reducing incidental (angler) impacts to wild Coho Salmon.

3.4) Relationship to habitat protection and recovery strategies.

Refer to Attachment A for ODFW habitat protection and enhancement policies identified in the *Alsea River Basin Fish Management Plan* (adopted November 14, 1997). Generally, habitat protection and recovery strategies are prioritized in areas with (potential) good-/high-quality habitat for Coho. Hatchery releases from this program are

localized away from these areas to minimize potential adverse impacts to wild Coho and steelhead populations.

Habitat protection and recovery strategies for Coho Salmon in the Alsea basin focus on riparian areas and winter and summer rearing habitat. Progress has been made to improve fish passage at road crossings. Most fish passage barriers blocking significant habitat reaches have been remediated. ODFW personnel work with both private and public landowners in the basin to protect and restore riparian areas along Coho streams. Numerous projects using large wood have been implemented to enhance natural processes in streams and create Coho summer and winter rearing habitat.

3.5) Ecological interactions.

We anticipate that releasing all winter steelhead smolts into the Alsea Basin (majority released from Alsea Hatchery) will minimize biological risks to wild fish. Monitoring studies are planned to determine stray rates of the returning hatchery fish (refer to Section 11). Modifications to the program can be made if stray levels are high.

Juvenile Interactions

Ecological interactions between hatchery steelhead smolts and listed Coho Salmon, as well as other native fish species, are likely to occur while hatchery smolts migrate to the ocean. Most of these interactions (competition, disease transmission, and predator attraction) are likely to have negative impacts on native fishes. There are also interactions with hatchery steelhead juveniles that residualize in the stream for one or more years. Measures to lessen the extent (and severity) of some of these interactions have been implemented:

Hatchery smolts are raised and released at optimal smolt size and condition factor to promote swift emigration. Observations in Alsea Bay over the last four years suggest that releases of large numbers of hatchery smolts may positively benefit marine mammals and other fish-eating wildlife. Concentrations of hatchery fish provide a readily accessible food source for these predators.

Hatchery smolts are released in April and emigrate before most wild Coho Salmon smolt emigration begins; however, hatchery smolt migration overlaps wild winter steelhead smolt migration.

Hatchery smolts volitionally released (over several weeks) from Alsea Hatchery are intended to reduce the number of fish entering the river before they are actually motivated to emigrate from the basin. Smolts released at lower Alsea River locations are transported by truck and released at optimal smolt size and condition factor to promote swift emigration.

The magnitude and impact that hatchery steelhead have on (or with) other marine dwelling organisms is not completely understood and cannot be comprehensively defined at present.

Adult Interactions

Adult hatchery winter steelhead are likely to interact with fish species present in the Alsea, including Coho Salmon, at the time of their migration up the river. The characteristics and impacts of these interactions are not completely understood and cannot be comprehensively defined at this time.

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.

- Alsea Hatchery utilizes the North Fork Alsea River as its sole surface water source.
- The intake source is screened with 1/8 inch screen, and conforms to past screening criteria. The intake diversion will be modified in the near future to ensure conformity with current National Marine Fisheries Service (NMFS) screening guidelines.
- Alsea maintains a water diversion permit for 21,103 gallons per minute (gpm).
- Alsea Hatchery operates under the NPDES 0300-J General Permit, to maintain Oregon Water Quality Standards.
- Total production at the Alsea facility is limited by low flows in late summer and early fall.

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.

- Intake diversion will be modified by ODFW to bring the screens into compliance with current NMFS screening guidelines.
- Downstream migration of fish over the intake screens is accomplished by a bypass channel which collects fish moving over the intake and diverts them back into the stream below the intake.
- A new passage and capture facility was recently completed at the diversion structure. Near normal migration upstream and downstream of the Alsea Hatchery by naturally produced fish can be attained.
- Hatchery effluents are sampled and tested according to NPDES discharge permit requirements. Facility effluent compliance falls well within permit allowances.

SECTION 5
FACILITIES

5.1) Broodstock collection facilities (or methods).

The 043W Alsea winter steelhead broodstock will be collected by a combination of hook-and-line angling with some additional collection at two trapping sites in the Alsea Basin: Fall Creek and North Fork Alsea (once a wild population of winter steelhead has been reestablished above the diversion dam). Broodstock will be transferred to Alsea Hatchery for holding to maturation and spawning. The Fall Creek trap facility consists of a ladder with a small holding area and trap located at the upstream end of the ladder. Fish entering the trap area will be sorted by sex and fin-clip (or lack of) and either placed upstream or in a portable tank for transport to Alsea hatchery. Fish that are caught by hook and line will be placed in PVC holding tubes and transported to Alsea hatchery in a portable tank.

The stock 43 Alsea Hatchery winter steelhead are collected at the hatchery trap. Hatchery trap consists of a ladder with a V-trap at the upper end. Fish swim through the V-trap into a 25 ft by 25 ft by holding area (12 feet deep). From this point, fish can either hold or swim up through a secondary V-trap and into the upper level pond that measures 20 ft by 36 ft (4 feet deep). This pond consists of four holding/sorting pens, on each side of a central alleyway channel. The channel is used for crowding fish into the spawning/sorting building located at the head of the pond. Adults are sorted by sex and fin clip (or lack of) and returned to designated holding pens via 10-inch return pipes. Wild stock adults of all species are removed, placed in a portable tank, and transferred above the hatchery intake diversion structure for release. A new passage and collection facility was recently completed at the diversion structure. The holding areas is 12 feet by 18 feet with 3 feet of water depth at most times. The majority of the trapping and sorting will occur at this facility. Hatchery fish will be transferred by tank to the hatchery facility for processing (spawning, hauling, etc). Wild adults will be passed above the trapping facility.

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

Broodstock caught by anglers will be placed in 36- by 5-inch PVC holding tubes or aerated, large, chest coolers. Broodstock that have been angler caught will be transported either by angler utilizing aerated cooler, by volunteer or ODFW staff using a portable tank. Fish will be transported to Alsea Hatchery and placed in a designated holding pen. Broodstock collected at the Fall Creek trap site will be loaded directly into a 300-gallon portable tank and transported to the Alsea hatchery adult holding area.

5.3) Broodstock holding and spawning facilities.

The 43W Alsea stock winter steelhead collected will be held isolated from the existing adult hatchery stock. Adults received will be placed in two 16 foot-by 30 inch-by 30 inch

fiberglass Canadian troughs. Fish will then be individually monitored for maturation, health, and needed treatments. Fish that are ready for spawning will be transferred to a covered spawning area.

All 43 hatchery stock winter steelhead will be held in holding/sorting bins adjacent to the trapping facility until ready for spawning. Fish are manually crowded and netted into a 150-gallon anesthetic tank located in the spawning building. The spawning building is a 20 ft by 25 ft, three-sided, wooden building with a metal roof. The building has one large viewing window and contains a holding pool, anesthetic tank, spawning table, air spawning equipment, and all necessary sorting and spawning equipment.

5.4) Incubation facilities.

Incubation facilities consist of 24 stacks of vertical incubators (8-trays per stack). North Fork Alsea water, diverted at the intake, is delivered to the hatchery by a 42-inch mainline. An 18-inch line delivers water from the mainline to the hatchery building. Two 4-inch lines feed water in tandem to a screened headbox supported over the incubators to create a supply and flow reservoir. In addition, there are four 15-foot shallow trough incubators. Equipment includes a Jensorter egg picker, mechanical counter, egg picking trough, and other necessary equipment. Total egg capacity to hatch is 1.7 million. The incubation system is equipped with a low-water alarm system. The incubation facilities are housed in a 100 ft by 40 ft wooden building.

5.5) Rearing facilities.

Rearing facilities consist of twenty 16 ft by 30 inch concrete starter tanks housed inside the hatchery building. Outside there are twenty 100 ft by 20 ft concrete raceways: one 200 ft by 16 ft concrete pond, three 29 ft circular ponds, and two concrete raceway show ponds. Cleaning effluent is distributed to a 310 ft by 110 ft pollution abatement pond used to settle out solids. All rearing tanks and ponds utilized for production are individually alarmed.

5.6) Acclimation/release facilities.

The smolts produced for the Alsea River program are either volitionally released from Alsea hatchery or released at a lower Alsea River location. Release procedures include removing all dam boards and screens from raceway ponds to allow fish access to the outfall channel. Water in the outfall channel is directed toward a 24-inch volitional release line which empties into the North Fork Alsea River. Water level in raceways during volitional release is approximately 24 inches deep.

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

The program operates under the normal hatchery operations protocol. Hatchery operations are faced with seasonal environmental difficulties that could lead to fish mortality. These include high water events with muddy water inflows/siltation, extreme

low-flow situations, seasonal parasite infestation, and disease problems. Although there has not been any significant fish mortality due to these conditions in recent history, these conditions do exist and must be dealt with.

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.

The hatchery is staffed full time, 24 hours per day, and is equipped with a low-water alarm system to alert the hatchery personnel for immediate action on any emergency situations to help prevent stress, injury or mortality to rearing fish. Disinfecting procedures between stocks of fish are followed to prevent disease transmission. Regular exams are conducted by an ODFW fish pathologist to assess status of fish health. All equipment utilized to handle and move fish is regularly inspected and repaired or replaced, if necessary, to prevent damage to fish from handling. There is no backup water source available should primary water source be reduced due to some catastrophe.

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.

The 43 stock hatchery winter steelhead broodstock was founded using wild Alsea winter steelhead in 1936. The 43W stock hatchery winter steelhead broodstock was founded using wild (unmarked) Alsea winter steelhead beginning in December of 2000.

6.2) Supporting information.

6.2.1) History.

Stock 43W: The 43W stock was developed utilizing only naturally produced adults collected within the Alsea Basin. A decision on whether to use returning hatchery 043W stock in the brood will be made annually. The alternative would be to annually use only natural-origin winter steelhead to comprise the brood population.

Stock 43: The 43 Alsea stock winter steelhead hatchery broodstock originated in 1936 from native Alsea stock. Naturally produced adults were incorporated into the broodstock up through the early 1980s. Numbers of wild fish used in the 1970s and early 1980s are thought to have been small, but exact numbers were not documented. Since the early 1980s, the stock has been composed entirely of returning hatchery adults.

6.2.2) Annual size.

Stock 43W: The 43W Alsea winter steelhead program will utilize a minimum of 45 pair of wild fish.

Stock 43: The traditional 43 Alsea winter steelhead program has spawned a minimum of 350 pair per year since 1996. This program will continue to spawn a minimum of 350 pair per year in the future.

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

Stock 43W: The 43W broodstock was created with 100 percent wild Alsea basin winter steelhead. If hatchery fish are used in the 43W broodstock, at least 30 percent of the broodstock will be of wild fish origin. This is consistent with existing ODFW fish conservation policies (Wild Fish Management Policy).

Stock 43: No natural steelhead have been used in the 43 broodstock for nearly 20 years. There are no plans to use wild fish in this stock in the future.

6.2.4) Genetic or ecological differences.

Adult return timing
The 43 stock hatchery adults exhibit an earlier return timing than native Alsea Basin winter steelhead. Returns of hatchery adults peak in January and February. Based on historical data at ODFW's North Coast Watershed District Field Office in Newport, returns of wild steelhead to the North Fork fish ladder from 1954 through 1961 peaked in March and April. Consequences of this difference are not completely understood.

Age at smolt emigration
Hatchery smolts are one-year-old at the time of out-migration. Wild smolts emigrate when they are from one to three years old. The majority emigrate at age two (Wagner, et al. 1963). Consequences of this difference are not completely understood.

6.2.5) Reasons for choosing.

Stock 43W: The Alsea Basin origin winter steelhead were chosen as the only brood source for the endemic wild-type brood (stock 43W) because they are indigenous to the basin.

Stock 43: The 43 hatchery winter steelhead broodstock is a stock originating from the Alsea Basin and has been in continual use since 1936. This hatchery population exhibits an earlier return time than the wild population. To preserve this characteristic, only known Stock 043 hatchery adults will be incorporated into the brood.

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.

The only broodstock selection practice that may have an effect on wild Coho Slamon is the actual collection of broodstock. This practice and measures to minimize impacts to wild Coho are described in Section 7.

All broodstock selection practices followed for the Alsea Hatchery winter steelhead program were chosen to minimize the likelihood for adverse genetic and ecological affects to wild steelhead while maintaining a healthy hatchery stock. The number and timing of broodstock collected and spawned is intended to maintain the genetic diversity of the hatchery stock. As techniques are developed, efforts will be made to ensure the stock 43W maintains as many of the characteristics of the wild population as possible. Currently, broodstock collection timing is the only practice feasible that can maintain a characteristic of the wild population. There will be no attempts to mimic characteristics of the stock 43. A separation in return and spawn timing will be maintained between the stock 43 and wild steelhead. Efforts will also be made to limit the number of both stocks 43 and 43W hatchery fish spawning in the wild to avoid potential adverse genetic interaction to the wild winter steelhead population.

SECTION 7
BROODSTOCK COLLECTION

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

Production plan provides for collection of all returning adult stock 43 winter steelhead at the Alsea Hatchery collection facility. All live-spawned females be released into the North Fork Alsea. To maintain genetic diversity the hatchery spawning protocol is to keep a portion of the eggs from each of a large number of females. The goal is to keep a portion of the eggs from a minimum of 350 pairs. The goal for the stock 43W Alsea winter steelhead program is for angler and trap collection of a minimum of 35 pair, which will meet the minimum needs for this portion of the program.

7.2) Collection or sampling design.

Stock 43 Alsea winter steelhead are collected at the Alsea facility. Once steelhead reach the facility, nearly 100 percent of the adult fish are diverted into the collection area. Returns and collection begin mid-November and extend through April 1. Description of process and design is described in Section 5 (Item 5.1).

7.3) Identity.

All returning stock 43 winter steelhead will be identified by the absence of their adipose fin and their left maxillary bone. The stock 43W will be visually examined for the absence of their adipose fina and their right maxillary bone. Any unmarked winter steelhead are examined for level of fin erosion and/or a scale sample is taken to determine if they are of hatchery or natural origin. Hatchery stock-43 steelhead returns are made up of relatively early returning adults. The hatchery return peaks from mid- to late-January.

7.4) Proposed number to be collected:

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

All stock 43 winter steelhead returning to Alsea Hatchery are collected and processed. Although the program goal of 60,000 smolts can be achieved by 35 pairs, onsite hatchery protocols include utilizing portions of the eggs from a minimum of 350 pairs to ensure some diversity within this hatchery stock. Since 100 percent of all returning stock 43 hatchery adults must be processed in some way prior to release back in the Alsea Basin or removal, this large collection does not impose a problem for this stock. The initial design of the stock 43W component of the Alsea program is that a minimum of 45 pair of naturally-produced adults will be utilized on an annual basis. ODFW District staff believes there is less risk to the wild population from using a minimal number of wild fish for broodstock than taking larger numbers.

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

The data in Table 7-1 is taken from ODFW reports of anadromous adult fish returns for brood years 1991 through 1999.

Table 7-1. Winter steelhead stock 43 broodstock collection leevels, and egg takes at Alsea Hatchery.

Brood Year	Adults			Total	
	Females	Males	Jacks	Eggs	Juveniles
1991	555	546	0		
1992	657	872	0		
1993	316	793	0		
1994	398	396	0		
1995	232	220	0	787,123	
1996	245	245	0	803,470	
1997	407	407	0	1,234,084	
1998	336	334	0	1,056,101	
1999	534	506	0	1,633,896	
2000	332	346	0	1,152,000	

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

Disposition of hatchery origin Stock 043 Alsea winter steelhead is accomplished utilizing a variety of options as follows:

- All live-spawned females are transported for release into the North Fork Alsea.
- Males and females not utilized in spawning, and that are found to be in good condition may be redistributed down river to provide additional angling opportunities or may be stocked in standing waterbodies for trophy fisheries.
- Adults may be killed and utilized for in-stream nutrient supplementation programs.
- Adults in good condition may be killed and given to food share organizations when other options are exhausted.
- When all other options are exhausted, fish of poor quality are buried or rendered. Disposition of wild origin Alsea winter steelhead is accomplished utilizing a variety of options as follows:
- All males and females used in spawning for stock 43W will be released into the North Fork Alsea.
- Males and females not utilized in spawning for stock 43W will be released where they were collected.

7.6) Fish transportation and holding methods.

Stock 43 Alsea winter steelhead are collected and held in the Alsea Hatchery collection facilities. Holding time of individual adults varies from one to six weeks. Collection begins in mid-November and continues to April 1. No injections of antibiotics or chemical treatments of holding pond is carried out during this period. The 43W Alsea winter steelhead are transported in a 300- or 1,000-gallon tank to the Alsea facility. Holding methods are described under Section 5.

7.7) Describe fish health maintenance and sanitation procedures applied.

- 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. The American Fisheries Society *Fish Health Blue Book* procedures will be followed.
- Eggs collected are water hardened in Iodaphor for 15 to 30 minutes to reduce horizontal transmission of bacterial or viral pathogens from adult.
- All equipment and facility areas used in sorting and spawning are disinfected between operations.

7.8) Disposition of carcasses.

Adult stock 43 Alsea winter steelhead are first used as a live product in some fisheries as described in Section 7 (item 7.5). Once all allocations or potential use as live fish have been exhausted fish are killed and utilized as described in Section 7 (item 7.5).

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.

- Fish health inspections and sanitation procedures as described under Integrated Hatchery Operations Team guidelines (IHOT 1995) are followed to minimize increase in disease resulting from collection and holding of adult winter steelhead.
- All adults of natural origin, that are found at the time of sorting and are not held as potential broodstock for stock 043W, are immediately released alive, upstream of the dam on the North Fork Alsea River.

SECTION 8
MATING

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

8.1) Selection method.

- Adults used for broodstock will be collected randomly and reflect the run timing of the entire run.
- Spawners will be selected randomly from ripe fish on days selected for spawning.
- The 43 Alsea stock program will utilize only adults of hatchery origin from stock 43.
- The 43W Alsea stock program will utilize only adults of natural origin for at least the first three years. A decision on whether to incorporate returning hatchery-origin fish into the brood population will be determined annually.

8.2) Males.

- Males are randomly selected from fish collected up to date of spawning.
- Males spawned represent random collection over the entire run period.
- Males are not utilized as repeat spawners.
- Jacks are spawned like any male.

8.3) Fertilization.

- Females will be live-spawned (air spawn technique). Eggs from two females will be mixed then divided equally into two groups. Each group will be fertilized by a separate male (2 by 2 matrix).
- All fish health monitoring will be conducted by a qualified fish health specialist, according to approved fish health standards.
- Brood stock will be examined annually 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. The American Fisheries Society's *Fish Health Blue Book* procedures will be followed. Wild fish will be sampled using non-lethal techniques.
- Findings and results of fish health monitoring will be recorded on a standard fish health reporting form and maintained in a fish health database.
- All eggs will be disinfected during egg water-hardening phase to reduce bacterial transfer from parent to progeny.
- Equipment and spawning areas will be disinfected following spawning operations.

8.4) Cryopreserved gametes.

Not applicable to this program.

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

- Program does not utilize listed stocks.
- Broodstock selection and spawning procedures are intended to minimize any adverse effects that offspring may have on any native fish species in the Alsea Basin.

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.

The number of eggs taken since 1995 are shown in Table 7-1 (see Section 7.4.2). Since only a portion of the eggs from each female spawned are retained for program smolt production, many of the remaining eggs are immediately destroyed as surplus to program. Survival from egg take to ponding ranged from 90 percent to 95 percent from 1995 to 2000 (Table 9-1, Alsea Hatchery records, Tim Schamber). Except for eggs initially destroyed at time of egg take, survival rates include the survival of eyed eggs and fry prior to being destroyed.

Table 9-1. Number of Eggs Taken and Survival Rate to Ponding

Year	Egg-Take	Fry Ponded	Percent Survival (Egg-Take) to Fry Ponded)
1995	787,123	334,331	94.9
1996	803,470	195,076	90.1
1997	1,234,084	215,640	92.7
1998	1,056,101	203,962	90.3
1999	1,633,896	235,649	90.6
2000	1,152,000	269,866	93.5
Note: Portions of each egg-take and subsequent fry are destroyed (as surplus to program needs) throughout various rearing stages.			

9.1.2) Cause for and disposition of surplus egg takes.

Circumstances where extra eggs may be taken are as follows:

1. More eggs than are needed for production goals may be taken to fully utilize genetic input from all females collected for brood stock. In this situation, a percentage of the eggs spawned from each female is used, while remaining eggs from each female are destroyed during egg-take or at time of ponding.
2. When surplus eggs and fry exist as a result of high survival rates in the hatchery, then surpluses are removed and buried. Surpluses are reduced in a manner that maintains equal representation of all family groups.

9.1.3) Loading densities applied during incubation.

Based on historical hatchery data, the program follows parameters for incubation as follows:

1. Expected egg size = 130 eggs per ounce (on average)
2. Standard Incubator Flow = 5 gpm / vertical incubator stack.
3. Density per tray = maximum of 8,000 eggs/tray from green to eyed stage
   = maximum of 6,000 eggs/tray from eyed-egg to ponding

9.1.4) Incubation conditions.

- Incubators are visually inspected twice daily for proper flow. Water supply to the incubator head box is monitored continuously by a low-water alarm.
- Silt loads in incubator trays are monitored. Roding techniques are used to remove silt loads when necessary.
- Water temperature is tracked continuously. Temperature units are reported and projected on a weekly basis. This information, along with visual inspections, is used to track egg development and to determine proper timing of eggshell removal during hatching, egg shocking, and fry ponding.
- Eggs are incubated on ambient river water; the hatchery does not thermally control incubator water supply.
- Dissolved oxygen (DO) is not monitored unless conditions indicate a need to do so. For example, influent water supplies are less than saturation, high-density loading, and/or warm temperatures.

9.1.5) Ponding.

Fry are ponded when 95 percent of those fish sampled are at complete button-up. This generally occurs from March to late April, when fry are at 2,050 fish per pound (2,175 to 1,850 fish per pound) and are at 1,050 to 1,200 cumulative temperature units (TU). Average fry length at time of ponding should be 2.8 cm. Fry are physically carried in baskets from incubator trays to ponding tanks.

9.1.6) Fish health maintenance and monitoring.

- A qualified ODFW fish health specialist will conduct all fish health monitoring. Appropriate actions including drug or chemical treatments will be recommended as necessary. If bacterial pathogens require treatment with antibiotics, a drug sensitivity profile will be generated (if feasible).
- Fish health maintenance and monitoring for the Alsea winter steelhead program are carried-out according to existing standardized procedures. These protocols include:

    1. Eggs are disinfected during water hardening phase; iodophore treatment at 1:150 ppm for 15 to 30 minutes.

2. To control fungus, eggs are treated with a flow-through formalin treatment (at 1:600 ppm) every other day until eye-up and shocking.
3. Incubators are monitored daily for environmental conditions (water temperature, water flow, and silting).
4. Egg mortality is removed at eye-up (during shocking) and ponding, unless significant losses dictate otherwise. Folded Vexar is used (in each incubator tray) to isolate mortalities to particular locations on the tray. This method also allows mortalities to be easily removed during ponding.

- Mortalities are removed 24 hours after shocking, initially via an automated egg picker, followed by thorough handpicking. Mortalities are also removed (by hand) at the time of ponding.
- Incubators are continuously monitored by a float alarm system and by a visual inspection, which occurs twice daily and again during evening check rounds.

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.

Risk aversion measures applied during incubation follow established hatchery operation procedures.

- Incubation system is hooked up to an alarm, such that hatchery staff is notified if low flows occur.
- Hatchery staff is available 24 hours per day.
- Daily inspection of incubator environmental conditions such as flow, mortality, silting, and temperature.
- Egg, fry, and smolt development is monitored regularly.
- Eggs are incubated in substrate (Vexar) and in the dark.
- Eggs are incubated at low densities.
- Incubator screening is in good condition and prevents escapement.

9.2) Rearing:

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

Since the Alsea winter steelhead program was drastically changed, beginning in 1994, the averages for rearing survival were taken from hatchery pond management records. The expected losses for all rearing stages at the Alsea facility are shown in Table 9-2.

Table 9-2. Average Losses at each Rearing Stage since 1994.

Average survival from egg-take to ponding	90%
Average survival from fry to fingerling	93%
Average survival from fingerling to smolt	98%
Overall survival from eyed-egg to release	82%
Source: Hatchery pond management records, Alsea Hatchery, Tim Schamber	

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

Alsea winter steelhead (Stock 043) are managed according to rearing density equivalency of (spatial and volume) guidelines recommended by IHOT protocols (IHOT 1995), and by protocols stated in the Northwest Power Planning Council's 1999 Artificial Production Review (NPPC 1999).

- Starter-tank rearing density (goal): Not to exceed 25,000 fish at ponding and a flow index factor of 1.5 at any time during rearing (Piper et al. 1982).
- Raceway pond density (goal): Maintain a flow index factor of less than 1.5. This is sometimes exceeded during late summer low flows or if fall rains have been delayed.
- Fish densities are monitored weekly by updating flow and growth data. Weekly reports are reviewed for compliance with on site operating guidelines with adjustments being made as needed. An example of weekly report is seen in Table 9-3.

9.2.3) Fish rearing conditions.

The following parameters and procedures have been established to maintain optimal pond rearing environments.

1. Pond density levels are monitored weekly (flow index and fish growth). This data is used to calculate individual pond density levels based upon pounds per gallons per minute, pounds per cubic feet, and flow index.
2. Dissolved oxygen is monitored weekly during summer flows and throughout the year when environmental factors indicate a need.
3. Hatchery effluent water quality parameters are measured and monitored quarterly: total suspended solids, settable solids, pH, and flow. Data is completed according to conditions identified in a 300-J NPEDS General State Permit. Data is reported on a standard Discharge Monitoring Report and is administered by the Oregon Department of Environmental Quality (DEQ).
4. Ponds are cleaned weekly.
5. During summer rearing, ponds are lowered to an average depth of 8 inches for 4 hours each day; usually from 7:30 a.m. to 11:30 a.m. This has greatly reduced the need to treat fish for external parasites.
6. Alsea Hatchery has no water temperature control system. Winter temperatures range from 36º to 49ºF. Summer temperatures range from 50º to 72ºF.
7. There is no monitoring program for carbon dioxide, nitrogen saturation, etc. There is no history of fish loss at Alsea Hatchery in recent years attributed to these factors.

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.

Data listed below (Table 9-4) shows expected fish growth (measured as fish per pound) and size (measured as fork length [inches]) for the Alsea winter steelhead program from

the time of ponding to release. Data shown represents 200 to 400 fish sampled per sample period.

Table 9-3. Example fish rearing density weekly report for Alsea Hatchery.

Pond No.	Lot No.	No. Fish	Fish per lb.	Prev. F/lb.	Lbs. Fish	Flow in inches	Flow gpm	Lbs. Fish/gpm	Lbs. Fish/ cu.ft.	Fish Length	Flow Index
11					0.0		0	0	0.00		0.00
12	7297 Rb	28,675	2.76	2.76	10,389.5	3 ½	942	11.03	1.73	9.3	1.19
13					0.0		0	0	0.00		0.00
14	7297 Rb	30,363	2.8	2.8	10,843.9	3 ¼	843	12.86	1.81	9.25	1.39
15	7297 Rb	17,179	1.87	1.87	9,186.6	3 ½	942	9.75	1.53	10.6	0.92
16	7297 Rb	15,189	1.87	1.87	8,122.5	3 ½	942	8.62	1.35	10.6	0.81
17	7297 Rb	29,788	2.94	2.94	10,132.0	3 ½	942	10.76	1.69	9.11	1.18
18	7297 Rb	27,697	4.16	4.16	6,657.9	3 ¼	843	7.9	1.11	8.11	0.97
19	7297 Rb	7,098	1.62	1.62	4,381.5	3 3/8	892	4.91	0.73	11.1	0.44
20	7297 Rb	28,253	4.38	4.38	6,450.5	3	748	8.62	1.08	7.98	1.08
21	4398 StW	40,924	6.24	6.24	6,558.3	5 1/8	1254	5.23	1.09	7.57	0.69
22	4398 StW	38,529	6.17	6.17	6,244.6	4 1/8	904	6.91	1.04	7.59	0.91
23	4398 StW	33,378	5.98	5.98	5,581.6	5	1206	4.63	0.93	7.68	0.60
24	3798 StS	32,694	6.35	6.35	5,148.7	4 5/8	1073	4.8	0.86	7.52	0.64
25	3798 StW	32,741	6.65	6.65	4,923.5	4 ½	1030	4.78	0.82	7.41	0.65
26	3798 StW	31,125	6.52	6.52	4,773.8	5 1/8	1254	3.81	0.80	7.46	0.51
27	3798 StW	34,909	6.02	6.02	5,798.8	4 ¾	1117	5.19	0.97	7.66	0.68
28	3398 StW	21,716	6.9	6.9	3,147.2	4	863	3.65	0.52	7.32	0.50
29	3398 StW	29,518	7.02	7.02	4,204.8	4 ¾	1117	3.76	0.70	7.27	0.52
30	7297 Rb	24,621	2.98	2.98	8,262.1	5 ¼	1299	6.36	1.38	9.07	0.70
34	7296 Rb	978	0.5	0.5	1,956.0	2 1/8	334	5.86	0.24	16	0.37
T-1	7298 Rb	32,000	2203	2203	14.5	½	20	0.73	0.13	0.99	0.74
T-2	7298 Rb	32,000	2218	2218	14.4	½	20	0.72	0.13	0.99	0.73
T-3	7298 Rb	32,000	2218	2218	14.4	½	20	0.72	0.13	0.99	0.73
T-4	7298 Rb	32,000	2218	2218	14.4	½	20	0.72	0.13	0.99	0.73
T-5	7298 Rb	32,000	2117	2117	15.1	½	20	0.76	0.13	0.99	0.77
T-6	7298 Rb	32,000	2335	2335	13.7	½	20	0.69	0.12	0.99	0.70
T-7	7298 Rb	32,000	2126	2126	15.1	½	20	0.76	0.13	0.99	0.77
T-8	7298 Rb	32,000	2307	2307	13.9	½	20	0.7	0.12	0.99	0.71
T-9	7298 Rb	32,000	2220	2220	14.4	½	20	0.72	0.13	0.99	0.73
T-10	7298 Rb	32,000	2220	2220	14.4	½	20	0.72	0.13	0.99	0.73
T-11	7298 Rb	32,000	2228	2228	14.4	½	20	0.72	0.13	0.99	0.73
T-12	7298 Rb	32,000	2220	2220	14.4	½	20	0.72	0.13	0.99	0.73
T-13	7298 Rb	12,880	2140	2140	6.0	½	20	0.3	0.05	1	0.30
T-14	7298 Rb	43,400	1778	1778	24.4	½	20	1.22	0.21	1.07	1.14
Totals	945,655				122,967.3						

Table 9-4. Target and actual growth rate and size of winter steelhead sampled during rearing.

Week Sampled	Goal		2000 brood		1999 brood		1998 brood		Month Sampled
	Growth (fish/lb)	Size (inches)	Growth (fish/lb)	Size (inches)	Growth (fish/lb)	Size (inches)	Growth (fish/lb)	Size (inches)	
Ponding	2,056	1.16	2,034	1.16	1,870	1.19	1,965	1.17	March
Week2	1,072	1.36							
Week4	730	1.55	822.8	1.49	1,143	1.34	503	1.76	April
Week 6	350	1.98	327	2.03	320	2.03	252	2.21	May
Week 10	100	3.00	100	3.0	112	2.89	135	2.73	June
Week 14	46	3.88	54.2	3.68	55.4	3.65	65	3.45	July
Week 18	25	4.76	27.5	4.62	24.4	4.8	25	4.75	Aug
Week 22	16	5.52	15.3	5.59	15.5	5.56	14	5.76	Sept
Week 26	12	6.11	10.9	6.29	11	6.28	12	6.07	Oct
Week 30	9.5	6.60	na		8.6	6.78	9	6.7	Nov
Week 34	8.3	6.89	na		8.03	6.95	8	6.9	Dec
Week 38	7.6	7.08	na		7.6	7.09	7.5	7.09	Jan
Week 42	6.9	7.29	na		6.47	7.5	6.8	7.35	Feb
Release	6.0	7.70	na		5.71	7.79	5.9	7.68	April

Expected Results at Release:

Cumulative Conversion	**1.18**	
Percent of Pond Population	< 18cm	**8.9%**
Length	18-22cm	**86%**
	>22cm	**5.1%**

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

Expected growth rates and sizes are shown in Table 9-4, Section 9.2.4. Energy reserve data is not available for the Alsea winter steelhead program.

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

- Fry (from 2,000 fish per pound to 300 fish per pound) are fed with an automatic feeder 8 to12 times per day. Fry are started on a dry diet and are fed at varying rates depending on the need to control or increase growth rates. The minimum fry feeding rate is 75 percent of the average daily growth rate (AGR). Expected conversion rates average less than or equal to 1.0.
- From 300 per pound to release, fish are fed a dry diet, and are auto fed 8 to 12 times per day. Feed schedules are developed to reach 3 target periods: (1) July 1 at 100 per pound; (2) November 1 at 12 per pound; and (3) April 1 at 6.0 per pound. Auto feeding 8 to 12 times per day occurs from July to release. The AGR levels vary but average 75 to 100% AGR from July to December. AGR levels are then reduced to

less than 50% AGR during cold water periods of December through February. At six weeks prior to release, the AGR level is increased to 100% AGR.
- A fish feed scheduling computer program is used to calculate growth factor parameters such as temperature, length/weight ratios, conversion rates, and expected average growth rates.
- Overall average conversions for the Alsea winter steelhead program is 1.2.

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

Incubation trays, rearing tanks, and rearing ponds are disinfected prior to and after rearing. In addition, all equipment used during daily rearing activities is disinfected between uses. Disinfection procedures for onsite operations were developed from IHOT recommendations for hatchery disinfection (IHOT 1995). Fish health monitoring is accomplished from daily observation of fish behavior, pond environment monitoring, and daily recording of fish mortality. In addition to daily onsite monitoring, the following steps are carried out routinely by qualified ODFW fish pathologist.

- A qualified fish health specialist will conduct all fish health monitoring.
- 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.

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

Condition factor data and fork length data are measured three days prior to volitional release. Past research indicates that Alsea wild winter steelhead generally smolt at 18 cm average length (Wagner, et al. 1963).

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

There are no intentional “natural” rearing methods used for this program. However, insects regularly hatch on raceway ponds during warm summer months, and hatchery staff has observed winter steelhead feeding on these hatches.

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.

Alsea winter steelhead are not listed under the federal ESA. However, steelhead are released at sizes (18 to 22 cm) and condition factors (less than 1.0) which are assumed to promote swift emigration.

SECTION 10
RELEASE

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

10.1) Proposed fish levels.

Table 10-1. Proposed Fish Release Levels, number of fish (±5%)

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry	90	2,050		Big Creek (ocean trib.)
	90	2,050		Olalla Creek (Yaquina)
	90	2,050		Siletz River
	1,500	2,050	Feb. – March	Scott Creek (Siletz)
	90	2,050		Little Elk (Yaquina)
	90	2,050		Eckman Creek (Alsea)
Fry				
Fingerling				
Yearling (43)	60,000	6.0	April 1	North Fork Alsea, Rivers Edge boat ramp and Five Rivers boat ramp
Yearling (43W)	80,000	6.0	May 1	North Fork Alsea and direct release from acclimation pond.

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

Information is provided below for the 140,000 smolt program released into the North Fork Alsea from Alsea Hatchery and at release site from acclimation pond. All unfed fry releases are made up of small aquatic education school hatch box releases as listed in Item 10.1.

Release location for 120,000 smolts:
Stream, river, or watercourse: North Fork Alsea River
Release point: Waterbody Code:180043000 at the North Fork Alsea Fish Hatchery (Latitude 44º 25’22” N and Longitude 123º 33”05” W)
Major watershed: Alsea
Basin or Region: Alsea Basin

Release location for 20,000 smolts:
Stream, river, or watercourse: Alsea River, acclimation pond
Release point: Waterbody Code:18004000 (Latitude 42º 23’36” N and Longitude 123º 50’ 24” W)

Major watershed: Alsea
Basin or Region: Alsea Basin

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

Table 10-2 below shows fish release data of the past (2006 – 2015 release years). The unfed fry releases are made up of small school educational hatch box programs operated through STEP program.

Table 10-2. Fish released by age class.

Release Year	Eggs/ Unfed Fry	Avg Size	Fry	Avg Size	Fingerling	Avg Size	Yearling	Avg Size (fpp)	Release Date
2006							154,095	5.86	4/3 - 4/4
2007							150,550	5.64	3/26 - 4/2
2008							131,755	6.21	3/31 - 4/7
2009							144,928	5.98	3/31 - 4/6
2010							147,280	5.95	3/29 - 4/5
2011							146,727	6.15	4/4 - 4/8
2012							148,189	5.98	4/2 - 4/9
2013							149,271	5.78	4/1 - 4/2
2014							147,491	6.57	3/31 - 4/7
2015							146,706	6.38	3/31- 4/1
Average							**146,699**	**6.05**	
Data source: ODFW HMS database									

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

Table 10-3. Actual dates of release and description of release protocols.

Water-body	Release Date Ranges (past 10 year data)	Type of Release
Alsea Basin	March 31- April 4	Volitional release and direct release from liberation truck.

The program goal is to have most of pond population in the size range of 18 to 22 cm. At this size, most fish are smolting and are ready to migrate. Nonmigrants (usually less than 2 percent) are forced out. The disposition of these non-migrants is currently being reevaluated. Release times are within the natural migration period.

10.5) Fish transportation procedures, if applicable.

Transportation of the lower Alsea River allocation is accomplished with the use of various size liberation truck units. Units range in size from 1,000- to 2,500-gallon tankers. Some units utilize recirculatory refrigeration systems which are used to maintain the temperature of water taken at the hatchery site. Oxygen is added at a rate of 1.5 Lpm. Some units utilize insulated tanks equipped with agitators. All units haul fish at an average density of 0.75 pounds per gallon.

10.5) Acclimation procedures.

Volitionally released into North Fork Alsea at the hatchery site or direct release to the mainstem Alsea River from acclimation pond.

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

Program calls for marking 100 percent of the population with an adipose fin clip. The 43W stock Alsea winter steelhead will also receive a clipped, right maxillary and the 43 hatchery stock for release in the Alsea will also receive a clipped left maxillary. School class incubators, under the STEP program, release small numbers of unmarked unfed fry as shown in Section 10 (Table 10.1).

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

Numbers at release should be within the accepted level of plus or minus 2 percent of programmed release. Should that number be exceeded the release would still be made provided all fish were at smolt stage. Efforts are made to maintain program within acceptable release levels by reducing surplus at the egg/fry and/or fingerling stage.

10.9) Fish health certification procedures applied pre-release.

- All fish health monitoring will be conducted by a qualified fish health specialist.
- An ODFW fish health specialist will 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).

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

An emergency release due to water system failure may occur depending on stage of rearing. Due to seasonal conditions, a water system failure is most likely to occur in the later months of rearing when there exists a greater chance of successful migration. Under these conditions, the Alsea stock winter steelhead program would be released.
If a water system failure occurred during early rearing there would be no release of fish due to the length of time hatchery stock would rear within the Alsea system, and the associated risk of this rearing to natural production. Historical information from this site shows overall survival rate to adult of such an early release would be extremely low.

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.

- Program will target release of fish at an appropriate size to assist migration and lessen contact time with natural population in upper watershed.
- Program fish will be released at their own volition, and directly from rearing site. Fish moving out should be in smolt phase to assist in migration. Onsite release should reduce straying potential of returning adults within the Alsea Basin.

SECTION 11
MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

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

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

Sections 1.9 and 1.10 define the plans for monitoring the performance of this program. The indicators listed identify methods to be used to monitor the program. Most of the monitoring of Alsea Basin wild fish is conducted by OPSW monitoring projects: Adult abundance (Jacobs et al. 2000); Juvenile abundance (Rodgers 2000); and life cycle monitoring (Solazzi et al. 2000).

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

The majority of measures identified in Sections 1.9 and 1.10 are being performed with existing staff and facilities. Performing creel surveys and distributing angler logs are the only measures not currently being implemented. Members of the public are anxious to volunteer and help this program. There should be little difficulty in recruiting volunteers to creel anglers or to use the angler logs.

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.

Operating traps to monitor stray rates is the only monitoring that may have adverse ecological effects on Oregon Coast Coho Salmon. ODFW staff will oversee this monitoring project. Any adverse effects to wild coho that are above anticipated levels (including unanticipated impacts) will be reviewed. If necessary, modifications will be made to reduce or eliminate those effects.

None of the monitoring or evaluation activities are expected to impose adverse genetic effects.

SECTION 12
RESEARCH

Currently no research is being conducted in conjunction with this hatchery winter steelhead program on the Alsea River. Comparative evaluations of hatchery stock performance and hatchery and wild smolt emigration patterns will begin under this plan. Monitoring activities are occurring with this program. These activities are described in Sections 1.9 and 10.

SECTION 13
ATTACHMENTS AND 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, West Region, ODFW

Signature: _____ Date: _____

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

Signature: _____ Date: _____

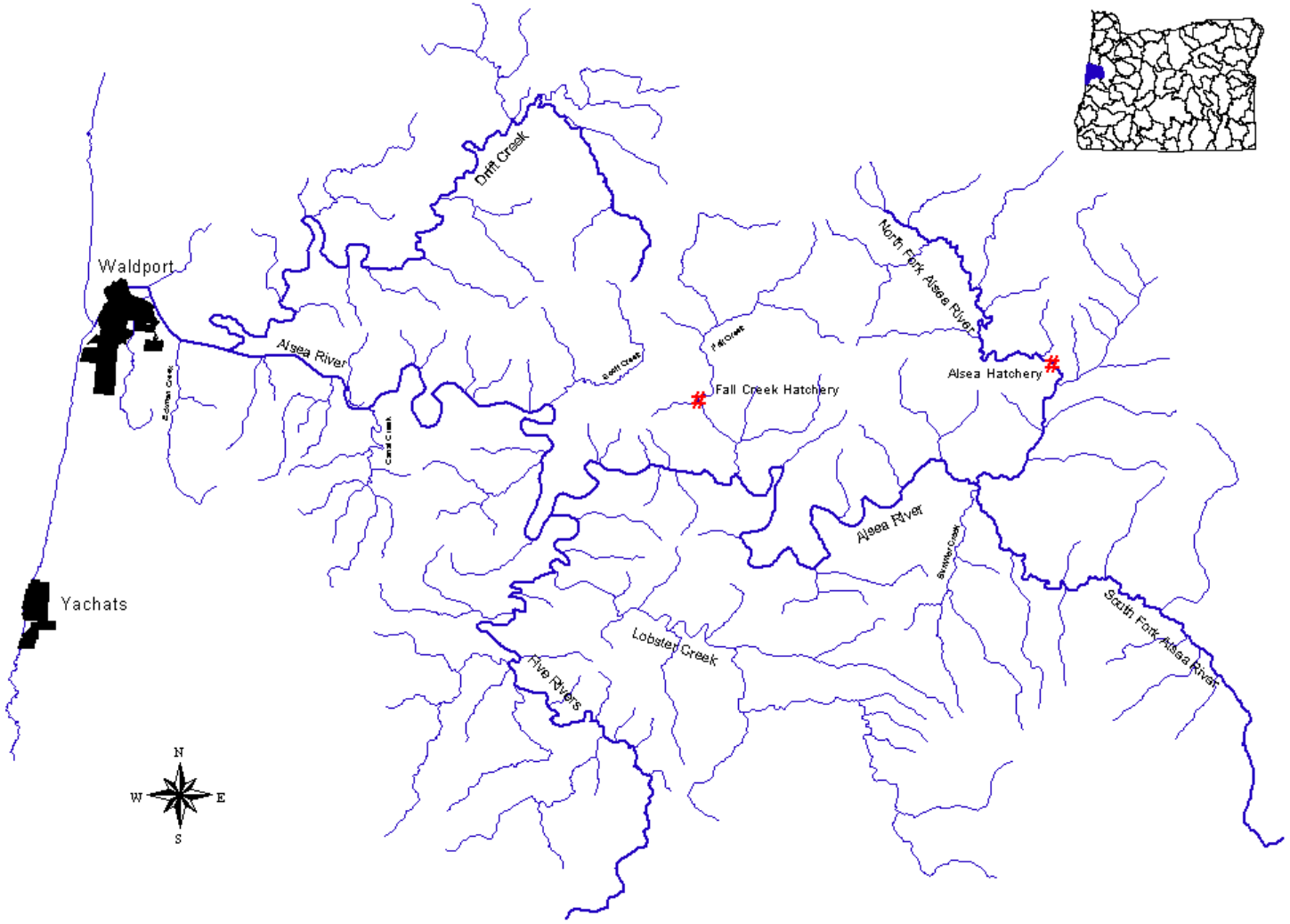

Figure 1. Map of the Alsea River Basin.