HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	**Siletz River Winter Steelhead Program**
Species or Hatchery Stock:	**Winter Steelhead (Stock 33W)**
Agency/Operator:	**Oregon Department of Fish and Wildlife**
Watershed and Region:	**North Coast Watershed District**
Date Submitted: **First Update Submitted:** **Second Update Submitted:**	**March 19, 2002** **June 27, 2008** **June 24, 2016**
Date Last Updated:	**June 24, 2016**

SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Siletz River Winter Steelhead Program (stock 33W)

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

Winter Steelhead *Oncorhynchus mykiss* (stock 33W). Oregon Coast Evolutionary Significant Unit (ESU) listed 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.

Lead Contact

Name and Title:	Scott Patterson, Fish Propagation Program Manager
Organization:	Oregon Department of Fish and Wildlife (ODFW)
Address:	4034 Fairview Industrial Drive SE, Salem, OR 97302
Telephone:	(503) 947-6218
FAX:	(503) 947-6202
Email:	Scott.D.Patterson@state.or.us

Onsite Lead Contacts

Name and Title:	John Spangler, District Fisheries Biologist
Organization:	Oregon Department of Fish and Wildlife (ODFW)
Address:	810 SW Alder, Unit C, Newport, OR 97365
Telephone:	(541) 265-8306
FAX:	NA
Email:	john.j.spangler@state.or.us

Name and Title:	Matt Frank, Hatchery Manager
Agency or Tribe:	Oregon Department of Fish and Wildlife (ODFW)
Address:	29050 Fish Hatchery Road; Alsea, Oregon 97324
Telephone:	541/487-7240
FAX:	541/487-7248
Email:	Alsea.Hatchery@state.or.us

Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

The U.S. Forest Service owns an adult fish trap on Schooner Creek (tributary to Siletz Bay). This trap is checked three days per week by ODFW staff and volunteers and the data is used to monitor stray rates of adult hatchery steelhead.

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

- Funding for Alsea Hatchery is 50 percent State or Oregon general fund and 50 percent other (license fees) 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 $278,511.
- The Siletz winter steelhead program cost is approximately 5.2 percent ($14,800) of the annual Alsea Hatchery budget.

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

This program collects wild winter steelhead adults from the Siletz Falls trap for broodstock (Attachment B). The adults are transported to Alsea Hatchery, where they are held, spawned and reared to smolts. The smolts are then transferred to a facility on Palmer Creek for acclimation and release.

The Siletz Falls trap is located at river mile (RM) 64.5 on the Siletz River at approximately 720 feet above MSL. The trap is associated with a fish ladder around a 41-foot high falls.

The Alsea 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. The hatchery site occupies about 25 acres at 380 feet above MSL (44º 25’22” N and 123º 33’ 05” W).

The Palmer Creek acclimation facility and trap is located approximately one-half mile up stream from the mouth of Palmer Creek at approximately 240 feet above MSL. Palmer Creek flows into the Siletz River across from Moonshine County Park at RM 52.5.

1.6) Type of program.

Isolated harvest program.

1.7) Purpose (Goal) of program.

The goal of this program, as outlined in the Coastal Multispecies Conservation and Management Plan, is to release 50,000 smolts from wild winter steelhead broodstock in the Siletz basin for harvest, while minimizing interactions with listed natural fish.

1.8) Justification for the program.

This program provides steelhead for harvest while limiting adverse impacts to listed natural fish. The main emphasis in limiting impacts will be on wild steelhead and any wild fish species listed under the Federal ESA, state ESA, and/or state sensitive specie list. Hatchery fish are necessary to meet public desires for consumptive harvest because angling regulations currently require the release of wild steelhead in the Siletz Basin.

All smolt releases in the Siletz will be made from an acclimation site(s) (currently Palmer Creek ponds) and will be volitional to minimize interactions with wild juveniles. A new broodstock (33W stock) has been developed on the Siletz using wild winter steelhead. The wild winter steelhead used to develop the new broodstock are collected in a trap at Siletz Falls. In an arrangement with the industrial timberland owner at Palmer Creek, no wild fish are removed from Palmer Creek for broodstock. Measures are taken to ensure the survival of both target and non-target fish that are encountered during adult trapping.

1.9 &10) List of program "Performance Standards" and applicable "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 and rearing, and release of the winter steelhead. Data will confirm fish propagation procedures identified in Sections 7 through 10.

Sport Fishery Contribution

Standard 1: Provide an annual release of 50,000 hatchery winter steelhead smolts in the Siletz Basin.
Indicator (a): Data from hatchery inventories indicate a release of 50,000 winter steelhead smolts.

Impacts to Wild Fish

Standard 2: Adult migration timing of natural population does not change as a result of this fish propagation program.
Indicator (a): Wild fish return timing is consistent with historical return timing prior to establishment of the 33W broodstock.

Standard 3: Broodstock collection does not remove a significant portion of the wild winter steelhead population in the Siletz.
Indicator (a): Confirm that no more than half of the wild winter steelhead captured at Siletz Trap are used for broodstock.

Standard 4: Limit hatchery fish to 10 percent or less of the fish spawning in natural habitats of the Siletz and neighboring basins, except in the immediate area (within 1 mile) around the release site(s).
Indicator (a): Enumerate the total number of adult returns and the number of marked hatchery adult returns (stock 33 plus other stocks) to three traps within the Siletz Basin; on Mill Creek, Siletz Falls, and Schooner 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 033 plus other stocks) at traps outside of the Siletz Basin at Bohannon Falls (Alsea), Cascade Creek (Alsea), Fall Creek (Alsea), Mill Creek (Yaquina), Whittaker Creek (Siuslaw).

Standard 5: Impacts to wild Coho trapped at Siletz Falls are minimized.
Indicator (a): Confirm that trap is checked on a regular basis and wild Coho are promptly removed and released in appropriate habitat downstream.

Stock Identification

Standard 6: All hatchery smolt releases for this program will be marked so as to distinguish them 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 smolts were marked with an adipose fin-clip and a left maxillary clip prior to release. Pre-release mark quality checks, based on a sample of 200 smolts, indicate at least 99% of fish released have retained identifiable marks.

Program and Facility Operation

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

Standard 8: 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 6-by-6 spawning matrix.
Indicator (c): All fish are live-spawned and those cleared by ODFW Fish Pathologists are returned to the Siletz River.

Standard 9: 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.
Indicator (a): Annually enumerate survival rates from egg-fry, fry-fingerling, and fingerling to smolt to determine optimal rearing conditions and practices and if needed, modify operational plans accordingly.

Standard 10: Release 50,000 (plus or minus 2%) hatchery winter steelhead smolts annually at site(s) in the Siletz Basin from existing Stock (033W).
Indicator (a): Hatchery production will be inventoried prior to release to enumerate smolt release numbers. Juveniles that die in transport and juveniles that die or are removed for other reasons at the acclimation facility will be subtracted.

Standard 11: 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 12: Achieve a 3 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 Siletz 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 meeting the 3 percent target for this program.

Standard 13: Follow approved fish health disease and disinfection monitoring guidelines to minimize disease impacts to natural populations.
Indicator (a): Compliance with approved fish health standards and criteria.

1.11) Expected size of program.

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

The intent of this program is to use only wild winter steelhead adults for the broodstock each year. A maximum of 40 pair of wild fish are needed to produce the 50,000 smolts. These fish will be collected at the Siletz Falls trap (a mainstem trap), and will represent a random collection of the wild population throughout the annual run.

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

Table 1-1. **Proposed Annual Fish Release Levels.**

Life Stage	Release Location	Annual Release Level
Eyed Eggs	NA	NA
Unfed Fry	NA	NA
Fry	NA	NA
Fingerling	NA	NA
Yearling	Palmer Creek (Siletz)	50,000

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

The existing program began with smolt releases in 1996. Before 1996, ODFW released 80,000 smolts from Alsea stock-43 annually. The first three-year-old fish from the new broodstock returned in the winter of 1997-98. Estimates of adult winter steelhead production from the Siletz River STW program are presented in Table 1-2. Estimates reflect program performance in relation to the average annual release of 50,000 hatchery winter steelhead smolts. The estimated number of adult hatchery winter steelhead produced was derived from a variety of data sources.

Flows in Palmer Creek, the site of the acclimation ponds, have not been conducive for attracting returning hatchery winter steelhead adults and are not a valid indication of

smolt survival. Therefore, the "Hatchery Return" (Table 1-2) column depicts the count of adult winter steelhead returns at Siletz Falls, with the adult age composition based on an average of the 1983-84 to 1991-92 fishery scale data.

Data from harvest tags and comments from anglers suggest returns from the Siletz broodstock have been better than what was seen with the most recent returns of the Alsea broodstock released in the Siletz (See Section 3.3.1). The "Freshwater Sport" column (Table 1-2) is based on punch card estimates of catch in the Siletz Basin. The 1997-98 to present run years are hatchery fish only fisheries, with age composition based on the average age composition from 1983-84 to 1991-92 fishery scale data. Although hatchery steelhead stocks are differentially marked, the punch card data can not be segregated by stock. The 1997-98 run year includes the last returns (3-salts, i.e. 4 year old fish) from Alsea stock winter steelhead released in the Siletz Basin. Punch card data reflects the most recent data available.

Estimates of the total number of hatchery winter steelhead that strayed to all natural spawning areas in the Siletz Basin are not available. Therefore, data for the "Spawning Grounds" column (Table 1-2) is not available. Data on stray rates is available for three trap sites within the Siletz Basin that are removed from the smolt release site. These traps are on Schooner Creek, Mill Creek and Siletz Falls. The average hatchery stray rate (all stocks of hatchery fish) seen at these traps has ranged from 45 to 93 percent (1998-2007). The stray rate for just the stock 33W from 1998 through 2007 has ranged from 40 to 70 percent at Mill Creek, and from 34 to 65 percent at Siletz Falls. Both of these sites are removed from the release site, although the Siletz Falls site is on the mainstem and may not represent levels seen in tributaries. The stock 33W has been seen in five different years (1998-2007) ranging 1-5 fish in the Schooner Creek trap; the only other site in the Siletz Basin used as a monitoring site. Very few fish of this stock have been recorded in sites outside of the Siletz Basin, which includes several adult traps in neighboring basins.

Smolt to adult return (SAR) is calculated as (the "Freshwater Sport" column divided by the "Smolt Release" column) x 100 (Table 1-2). The "Goal" row at the bottom of the table represents the Basin Plan goal of an average annual catch of 1,500 hatchery winter steelhead. Since returning hatchery winter steelhead are not used for broodstock there is no hatchery return goal. However, the fishery cannot harvest every returning hatchery winter steelhead adult and there are fish collected at Siletz Falls and other trapping sites in the Siletz basin.

Table 1-2. Estimated total adult hatchery winter steelhead produced per brood year (and related adult return year). Data derived from fish trap and punch card data, n.a. = not available. Data in *italics* is incomplete.

Brood Year	Siletz Stock	2-Salt Return Year	Estimated Adult Hatchery STW (2-salt + 3-salt)			
			Freshwater Sport *	Siletz Falls Return **	Spawning grounds	SAR
1995	57,154	1997-98	1365	223	n.a.	2.39%
1996	55,133	1998-99	2326	153	n.a.	4.22%
1997	52,599	1999-00	1785	151	n.a.	3.39%
1998	50,124	2000-01	2028	216	n.a.	4.05%
1999	56,622	2001-02	3544	287	n.a.	6.26%
2000	56,259	2002-03	888	162	n.a.	1.58%
2001	53,280	2003-04	2927	154	n.a.	5.49%
2002	59,400	2004-05	1800	301	n.a.	3.03%
2003	28,554	2005-06	na	169	n.a.	na
2004	55,614	2006-07	na	203	n.a.	na
Goal [a]	50,000	n.a.	1,500	0	b	3.00%

* = Siletz Basin catch, based on punch card returns. The 1997-98 to 2000-01 run years are hatchery fish only fisheries with age comp based on an average of the 1983-84 to 1991-92 scale data.

** = Used average age composition from fishery scales to assign age to Siletz Falls returns.

a = Program goal is based on the Basin Plan goal of an annual 1,500 hatchery winter steelhead harvest.

b = 10% or less of Siletz Basin wild winter steelhead population.

Table 1-3 below summarizes spawning ground surveys as a pooled five year average. The sample size is small with a lot of variability. Trap catches from Siletz Falls, Mill Cr. LCM site (within 4 miles of smolt release) and Schooner Creek are shown below in Table 1-4. The mainstem trap may have a higher proportion of hatchery fish because it is a mainstem trapping site.

Table 1-3. Yearly and 5-year running average data of spawning ground survey showing pHOS levels of winter steelhead, 2003-2015.

Spawning Year	5-year avg pHOS	5-year observations (n)	Yearly pHOS	Yearly observations (n)
2003	NA	NA	8.5%	47
2004	NA	NA	4.3%	46
2005	NA	NA	9.1%	11
2006	NA	NA	15.0%	20
2007	11.8%	148	45.8%	24
2008	17.2%	110	33.3%	9
2009	26.1%	64	NA	0
2010	21.2%	57	0.0%	4
2011	22.7%	47	20.0%	10
2012	12.8%	44	9.5%	21
2013	12.2%	43	37.5%	8
2014	11.0%	54	0.0%	11
2015	13.1%	62	8.3%	12

Table 1-4. Percent of hatchery winter steelhead returns to Siletz basin trapping sites.

Year	Siletz Falls	Mill Creek	Schooner Creek
1998	51	74	48
1999	37	89	53
2000	48	74	51
2001	50	60	26
2002	54	74	30
2003	46	62	32
2004	43	89	37
2005	54	93	2
2006	30	78	0
2007	47	90	44
2008	36	72	15
2009	35	79	9
2010	57	76	8
2011	52	65	9
2012	56	72	20
2013	54	85	19
Average	**47**	**77**	**25**

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

Hatchery winter steelhead have been stocked in the Siletz since the 1960s. The stock used through release year 1995 (1994 brood year) was Alsea stock-43. Smolt releases with the new broodstock (Stock 33W) originating from wild Siletz winter steelhead began with the 1995 brood year smolts released in 1996.

1.14) Expected duration of program.

The program is intended to continue in the Siletz indefinitely. Modifications to the program may be necessary to control the level of straying. Smolt numbers or release sites may be changed to meet the goal of the program (Section 1.7) if monitoring or other studies throughout the region suggests changes are needed.

1.15) Watersheds targeted by program.

The Siletz watershed is the target of this program.

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

1.16.1) Brief Overview of Key Issue.

A key issue related to this hatchery program is the overall abundance of hatchery steelhead spawning in natural habitats occupied by wild winter steelhead in the Siletz

Basin. Observations in tributaries of the Siletz River indicate a substantial proportion of hatchery spawners in winter steelhead habitats. Some of these hatchery spawners are thought to be Siletz hatchery winter steelhead. These fish have an adipose and left maxillary fin clip. However, other hatchery programs in near by coastal basins also release winter steelhead with the same mark so it is uncertain to what extent hatchery Siletz winter steelhead stray. There is also concern that large numbers of hatchery steelhead smolts released in the Siletz Basin may create competition with wild fish or attract predators which could also affect wild fish.

A second issue related to this hatchery program is providing adequate smolt releases. The fishery for hatchery adult winter steelhead is very popular, and anglers would like to have more fish to harvest. The release objective of 50,000 hatchery winter steelhead smolts has been consistently met or exceeded in recent years with the exception of 2013-14. Alternatives that would address this issue are to release more hatchery steelhead smolts and/or allow some wild steelhead harvest.

1.16.2) Potential Alternatives to the Current Program.

These alternatives are ideas only and not necessarily endorsed by the agency.

Alternative 1 - *Discontinue the current hatchery winter steelhead program.*
This alternative would be the least impacting to wild winter steelhead. However, this plan went through extensive public involvement before being adopted. The "no hatchery fish" option was considered but not supported by most of the public. A reduction or elimination of the program would impact the consumptive harvest objective specified in the Siletz River Basin Fish Management Plan.

Alternative 2 - *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.

Alternative 3 - *A non-consumptive catch-and-release fishery.*
A third option considered was a non-consumptive catch-and-release fishery for wild steelhead, but this would not meet the public's desire of keeping fish they caught.

Alternative 4 - *Release more hatchery winter steelhead smolts.*
Releasing more smolts could increase the harvest of winter steelhead in the Siletz River. Any increase in smolts, and resulting adults, would increase the risk to wild fish in the Siletz River.

1.16.3) Potential Reforms and Investment.

Reform/Investment 1
Expand monitoring of wild and hatchery steelhead spawning in natural habitats in the Siletz Basin, and differentially fin clip the hatchery winter steelhead to help understand the magnitude and sources of hatchery steelhead straying in the Siletz. The cost of operating a third adult steelhead trap (on Cedar Creek) is estimated at $10,000 annually.

Reform/Investment 2

Develop a Conservation Plan under the Oregon Native Fish Conservation Policy for coastal steelhead, including those in the Siletz Basin. In this plan, develop strategies for addressing potential impacts of hatchery steelhead on wild steelhead, strategies for meeting fishery objectives, and monitoring and research needs. The cost of developing this plan for an area which would include the majority of the Oregon Coast is estimated at $100,000.

SECTION 2

PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS

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

The HGMP for this program was submitted to NMFS on 3/19/2002 for ESA permit or take authorization. This is an updated version of the previously submitted HGMP.

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 NMFS ESA-listed salmonid population(s) affected by the program.

Siletz Complex

The Siletz Complex consists of listed Coho Salmon inhabiting mid-coast streams located between Cascade Head on the north and Cape Foulweather on the south (Nickelson 2001). These include Salmon River, Devils Lake tributaries, and Siletz River. There is an estimated 170 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 Observed in 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. However, recent research is finding that rearing in the upper ends of tidal reaches can be extensive. The distribution of Coho Salmon within a basin is primarily determined by two factors: marine survival and the distribution of freshwater habitat of different levels of quality.

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

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

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

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

The NMFS ESA-listed Oregon Coast Coho Salmon may be indirectly affected through competitive interactions with hatchery fish for food and space, as well as during wild winter steelhead brood collection.

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

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

The Siletz Complex consists of ESA-listed Coho Salmon inhabiting mid-coast streams located between Cascade Head on the north and Cape Foulweather on the south. These include Salmon River, Devils Lake tributaries and Siletz River. There is an estimated 170 miles of spawning habitat available to the Coho Salmon of this complex. The critical population level for the Siletz Complex is 700 adult spawners. The habitat of this complex has the potential to support a viable population because high quality habitat is estimated to be present in 51 miles of stream, more than the 15-mile threshold (Nickelson 2001).

The abundance of Coho Salmon spawners of the Siletz Complex has ranged from about 400 to about 33,000 and has averaged about 7,300 since 1990 (Figure 2-1 and Table 2-2). In eight of those years, spawner abundance fell below the critical threshold of 700 fish. However, every year except 1992 and 2000 the lower 95% confidence limit extended below the critical threshold. Recruits per wild spawner have been highly variable (Table 2-2 and Figure 2-2). However, the 1997 brood was very productive: a parent stock of about 700 producing an estimated 3,300 adults and 3,000 spawners in the 2000-2001 run.

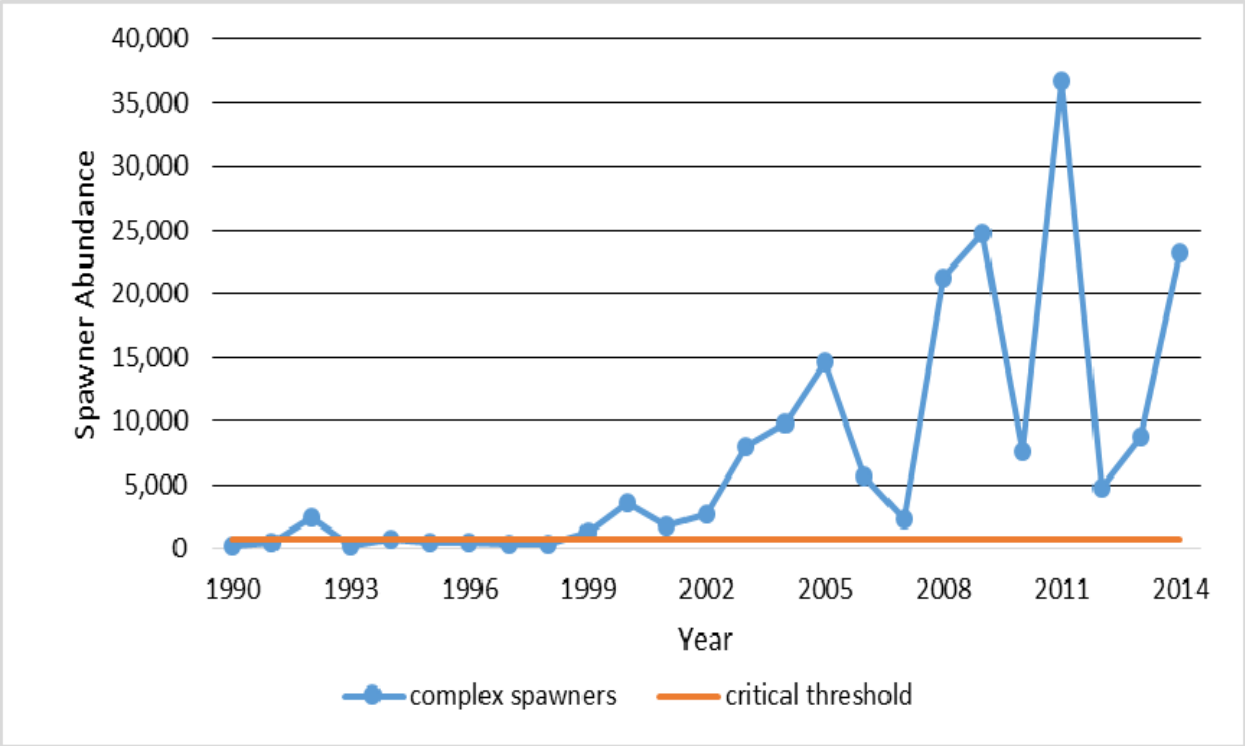

Figure 2-1. Trend in adult Coho Salmon abundance relative to the critical population level for the Siletz Complex. Error bars are 95% confidence limits.

Table 2-2. Population Parameters for the Siletz Complex Coho Salmon.

Return Year	Wild Spawners	Pre-harvest Wild Population	Recruits per Spawner
1990	247	915	
1991	415	1,153	
1992	2,397	6,478	
1993	220	367	1.48
1994	712	757	1.83
1995	419	471	0.20
1996	477	507	2.31
1997	314	345	0.48
1998	402	437	1.04
1999	1,223	1,315	2.76
2000	3,566	3,715	11.83
2001	1,820	1,896	4.72
2002	2,672	2,813	2.30
2003	8,080	8,783	2.46
2004	9,821	10,675	5.87
2005	14,646	15,256	5.71
2006	5,718	6,215	0.77
2007	2,256	2,564	0.26
2008	21,286	21,720	1.48
2009	24,823	26,691	4.67
2010	7,665	8,068	3.58
2011	36,730	39,074	1.84
2012	4,792	5,844	0.24
2013	8,825	10,262	1.34
2014	23,176	23,410	0.64
Annual mean	7,308	7,989	2.63

- **Provide the most recent 12 year (e.g. 1990-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.**

Recruits per wild spawner have been highly variable (Table 2-2 above and Figure 2-2 below). However, the 1997 brood was very productive: a parent stock of about 700 producing an estimated 3,300 adults and 3,000 spawners in the 2000-2001 run.

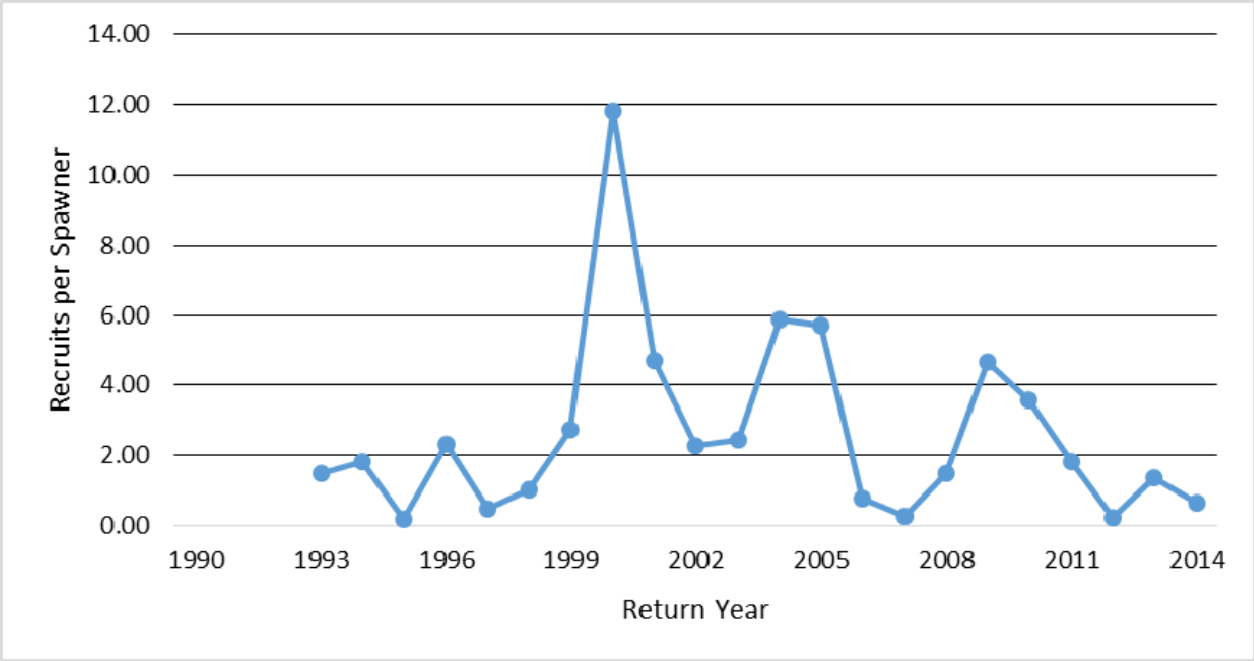

Figure 2-2. Trend in recruits per spawner for Siletz Complex wild Coho Salmon.

- **Provide the most recent 12 year (e.g. 1990-2002) annual spawning abundance estimates, or any other abundance information. Indicate source of these data.**

A Life-Cycle Monitoring Site (Solazzi et al. 2000) is located at Mill Creek, a Siletz River tributary. Adult abundance in Mill Creek since 1997 has ranged from 55 to 147 (Table 2-3) and has averaged 50 percent males. Smolt production has ranged from about 4,300 to about 9,500. Estimated smolt abundance for the Siletz Complex ranged from 39,000 to over six million for the 1997-2014 broods (Table 2-4).

Table 2-3. Summary of Life-Cycle Monitoring for Mill Creek (Siletz River).

Brood Year	Estimated Egg Deposition	Smolts Produced	Returning Adults			Freshwater survival	Marine survival
			Males	Females	Total		
1994			65	48	113		
1995		8,110	30	25	55		0.7%
1996		9,547	64	83	147		1.5%
1997	95,945	8,409				8.8%	
1998	52,716	4,311				8.2%	
1999	204,416						

Table 2-4. Estimated Abundance of Juvenile Life Stages Based on Spawner Abundance.

Year	Eggs	Fry	Parr	Smolts
1990	0.309	0.201	0.124	0.042
1991	0.519	0.337	0.209	0.071
1992	2.996	1.948	1.207	0.411
1993	0.275	0.179	0.111	0.038
1994	0.890	0.579	0.359	0.122
1995	0.524	0.340	0.211	0.072
1996	0.596	0.388	0.240	0.082
1997	0.393	0.255	0.158	0.054
1998	0.503	0.327	0.203	0.069
1999	1.529	0.994	0.616	0.209
2000	4.458	2.897	1.796	0.611
2001	2.275	1.479	0.917	0.312
2002	3.340	2.171	1.346	0.458
2003	10.100	6.565	4.070	1.384
2004	12.276	7.980	4.947	1.682
2005	18.308	11.900	7.378	2.508
2006	7.148	4.646	2.880	0.979
2007	2.820	1.833	1.136	0.386
2008	26.608	17.295	10.723	3.646
2009	31.029	20.169	12.505	4.252
2010	9.581	6.228	3.861	1.313
2011	45.913	29.843	18.503	6.291
2012	5.990	3.894	2.414	0.821
2013	11.031	7.170	4.446	1.512
2014	28.970	18.831	11.675	3.969

- **Provide the most recent 12 year (e.g. 1990-2002) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.**

See Table 1-3 for annual proportions hatchery-origin steelhead on natural spawning grounds. In 2014 and 2015 brood years the average proportion hatchery fish on natural spawning ground was <10%.

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, Monitoring and Evaluation
Wild Coho Salmon have been incidentally captured in the past at Siletz Falls trap while attempting to collect wild winter steelhead for broodstock for this program. The wild Coho Salmon are transported downstream and released in appropriate tributaries. Impacts are considered minimal. The area above Siletz Falls is managed as a sanctuary for wild summer steelhead and no Coho Salmon or winter steelhead are passed into this area.

Wild Coho Salmon have also been incidentally captured in traps at winter steelhead monitoring stations (intended to track winter steelhead stray rates). Adult trapping is likely to incidentally take wild Coho Salmon by delaying upstream migrations and invoking stress as a result of capture, handling, and release. These impacts will likely occur in December and January. Note: All incidental impacts from steelhead trapping have been identified under ODFW's 4(d) Research and Monitoring application and have been deemed to not be significant.

Smolt Releases
Hatchery winter steelhead smolts may interact with listed natural Coho Salmon smolts after their release. This impact should be minimal because most hatchery steelhead smolts will be out of the Siletz Basin before the majority of wild Coho Salmon emigrate to the ocean.

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

Trapping at Palmer Creek begins in mid December. Capture of listed natural Coho Salmon is variable from year to year. From three to 34 wild Coho have been captured since 2002. All wild Coho Salmon were passed upstream. Trapping at Siletz Falls also captures wild Coho. From 1994 through 2015 the number of listed natural Coho Salmon captured ranged from zero to 68 (in 2002). All wild Coho captured were taken to a lower river tributary with good spawning habitat. All were uninjured and appeared to be healthy when released.

- 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).

Projected take levels are outlined in Table 2-5. This take was also identified in ODFW's 4(d) Research and Monitoring application.

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

Listed Species Affected:	Coho Salmon	**ESU/Population:**	Oregon Coast/ Siletz River	**Activity:**	Winter Steelhead Trapping
Location of Hatchery Activity:	Siletz Falls and Palmer Creek traps	**Dates of Activity:**	January - May	**Hatchery Program Operator:**	Oregon Dept. 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 - 80	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)			5	
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.

- 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.

If the number of Coho Salmon captured in the traps is higher than expected, the trapping operations may be rescheduled to address the issue. Also, methods of handling will be reviewed and modified if there appears to be increases in injuries or mortality of wild Coho Salmon.

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.

- **Siletz River Basin Fish Management Plan** (approved by the Oregon Fish and Wildlife Commission—November 14, 1997). The basin management plan identifies the existing winter steelhead broodstock program. The projected smolt release is within the target level of 50,000 identified in the plan.

- **Native Fish Conservation Policy** - The Oregon Fish and Wildlife Commission has approved the Native Fish Conservation Policy (NFCP). The NFCP requires the development of a conservation plan for each native stock within the species management unit (SMU). The ODFW has completed an Oregon Native Fish Stock Status Report 2005. Information in the document will be used for the development of conservation plan as part of the NFCP. The conservation plan shall illustrate options for the responsible use of hatchery-produced fish within the SMU.

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

- **Coastal Multispecies Conservation and Management Plan (CMP)** (approved by the Oregon Fish and Wildlife Commission—June 2014). The conservation plan identifies the existing winter steelhead broodstock program. The projected smolt release is within the target level of 50,000 identified in the plan, and the program is in compliance with the CMP.

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

- Oregon Plan for Salmon and Watersheds (OPSW) (Executive Order 99-01). The Oregon Plan for Salmon and Watersheds is a prescriptive set of measures for recovering threatened and endangered salmon and steelhead, and meeting federal water quality standards, established by Executive Order of the Governor. The Oregon Plan includes measures linked to the hatchery production of salmon and steelhead,

including; nutrient enrichment, exploration 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.

- Pacific Fisheries Management Council (Section 7 Consultation).

3.3) Relationship to harvest objectives.

The sole intent of this program is to provide sport fish opportunities in the Siletz Basin.

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

The Siletz winter steelhead sport fishery benefits from this program. Since 1992, this program has been designed and managed as a hatchery winter steelhead targeted fishery; thus, all non-fin clipped steelhead are released.
Estimated (not actual) harvest from 1988 – 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 tags associated with anglers who catch few, if any, fish.

Table 3-1. Harvest of winter Steelhead in the Siletz River, 1992-2004 return years.

1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
1,705	1,190	1,377	1,167	883	1,365	2,326	1785	2085	3544	888	2927	1800

The harvest levels listed in Table 3-1 equate to 1.5 percent to 6.2 percent of the smolt release. It is estimated that future harvest levels will average 3.0 percent of the smolt release. Impacts to listed wild coho in the Siletz 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 Pacific Fisheries Management Council (PFMC) Section 7 consultation for ocean fisheries.

3.4) Relationship to habitat protection and recovery strategies.

Refer to Attachment A for ODFW habitat protection and enhancement policies identified in the Siletz River Basin Fish Management Plan (adopted November 14, 1997). Generally, habitat protection and recovery strategies for Coho are prioritized in areas with (potential) good- / high-quality habitat. Hatchery releases from this program are localized away from these areas to minimize potential adverse impacts to wild fish populations. Habitat protection and recovery strategies for Coho Salmon in the Siletz 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 remedied.

ODFW personnel work with both private and public landowners in the Siletz Basin to protect and restore riparian areas along coho streams. Numerous projects using large wood have been implemented to enhance or simulate 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 Siletz Basin at Palmer Creek will limit biological risks to wild fish to very low levels. Monitoring is in place to determine stray rates of the returning hatchery fish. 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 introduction, predator attraction) are likely to have negative impacts on native fishes. Measures to lessen the amount (and severity) of these interactions have been implemented:

- Hatchery smolts are raised and released at optimal smolt size and condition factor to promote swift emigration.
- Hatchery smolts are released in April and emigrate before most wild Coho Salmon smolt emigration begins; however, hatchery smolt emigration overlaps wild winter steelhead smolt emigration.
- Hatchery smolts are volitionally released (over several weeks) from the acclimation ponds at Palmer Creek to reduce the number of fish entering the river before they are actually motivated to emigrate from the basin.

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 Siletz Basin, 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.

In general:

(1) Species that could negatively impact program:

Competition for food between hatchery winter steelhead smolts and other hatchery and naturally produced salmon smolts in the Siletz Basin and near shore ocean environment may negatively impact this program. Avian and marine mammal predation may also negatively impact this program.

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

The competitive interactions with hatchery winter steelhead smolts may negatively impact the listed natural Coho Salmon and other natural salmonid juveniles in the Siletz Basin and near shore ocean environment. Straying of hatchery steelhead adults to natural spawning habitats may have adverse ecological impacts to listed Coho Salmon or other native populations. Increased angling pressure on adult hatchery steelhead may increase incidental mortality on naturally produced Coho Salmon in Siletz Basin.

(3) Species that could be positively impact program:

Any hatchery- or wild-origin fish that dies naturally and recycled for nutrient enrichment in the basin may positively impact the program.

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

Spawned carcasses of steelhead if placed in Siletz Basin for nutrient enrichment will benefit other aquatic species or avian. The freshwater and marine species that depend directly or indirectly on salmonids for their food and nutrient supply could be positively impacted by the program. These include larger salmonids, other fish species, aquatic mammals, birds, etc. Thus, the hatchery production has the potential for playing a significant role in the predator-prey relationships and community ecology during periods of low natural productivity.

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 average water temperatures range from 37º to 68º F. Alsea maintains a water diversion permit for 21,103 gallons per minutes (gpm). Alsea Hatchery operates under a NPDES 0300-J discharge permit. Low stream flows during the late summer and fall can limit total hatchery production.

Water is provided for the Palmer Creek acclimation ponds through an unscreened diversion and channel from Palmer Creek. This intake is not screened so that the ponds can serve as over-wintering habitat for wild Coho in Palmer Creek. The ponds are flushed prior to the arrival of the hatchery steelhead smolts to reduce the number of wild Coho in the ponds that might be susceptible to predation by the hatchery smolts.

The facility is in compliance with the NPDES permit requirements, water rights permit, water withdrawals, and annual water uses reporting to Oregon Department of Water Resource.

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.

Hatchery intake is screened with 1/8-inch-square screening to avoid entrapment of juveniles. Downstream migration of fish over intake screens is accomplished through a bypass channel, which collects fish moving over the intake screen, and allows diversion back into the stream below the intake. The recent construction of a new trap and fish ladder facility at the water intake dam will allow for both downstream and upstream migration for fish.

Hatchery effluent is sampled and tested according to NPDES discharge permit requirements. Facility effluent compliance falls well within permit allowances. The date for inspection of the intake screens, to check compliance with NMFS standards, is to be determined in cooperation with the ODFW Engineering Division.

SECTION 5
FACILITIES

5.1) Broodstock collection facilities (or methods).

Wild winter steelhead adults are collected for broodstock at the Siletz Falls trap. The trap is located in the top step of the Siletz Falls fish ladder at RM 64.5 on the Siletz River. The area where fish are collected and held is made of rock and concrete and is approximately 8 feet by 20 feet and the water is maintained at a 2.5-foot depth. Hatchery winter steelhead are also collected here and removed from the basin. The adults are transported across the Siletz River to a portable tank by a hydraulic hoist system with a 100-gallon steel bucket.

Hatchery winter steelhead adults are also captured at the Palmer Creek acclimation site. The trap structure is made of concrete and is approximately 10 feet by 30 feet and the water depth is maintained at 2 feet. Hatchery fish are not used in the broodstock but are captured and removed from the basin to reduce straying of hatchery fish into natural spawning areas.

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

Wild winter steelhead adults are transported to Alsea Hatchery by ODFW in a portable tank mounted in a pickup. The tank holds 300 gallons of water and utilizes two 12-volt aerators to maintain oxygenated water. The tank is also equipped with bottled oxygen. Maximum transport time is approximately 4 hours.

Transportation of the Siletz winter steelhead smolts from Alsea Hatchery to Palmer Creek acclimation site is accomplished with the use of various size liberation truck units. The units range in size from 1,000- to 2,500-gallon tankers. Some units utilize re-circulatory refrigeration systems which are used to maintain or cool the temperature of water taken at the hatchery site. Oxygen is added at a rate of 1.5 liters per minute (Lpm). Some units utilize insulated tanks equipped with aerators. Oxygen is added at a rate of 1.5 Lpm. All units haul steelhead at an average density of 1.2 pounds per gallon. Total length of time in transit averages 3 hours for this haul.

5.2) Broodstock holding and spawning facilities.

Beginning in mid January, broodstock are collected at Siletz Trap and are transported to Alsea Hatchery for spawning starting in mid-February. Adults are collected through out the months of February, March, April and May in an effort to preserve run timing and spawn timing. Once at Alsea Hatchery fish are held in circular tanks where they are treated three days each week with formalin to prevent fungus. The circular tanks are approximately 9.5 feet in diameter by 4 feet high. Flows are set at approximately 40 gallons per minute.

5.4) Incubation facilities.

Alsea Hatchery
Incubation facilities consist of 24 stacks of 8-tray vertical incubators. 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 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. Incubation system is equipped with low-water alarm system. The incubation facilities are housed in a 100-foot by 40-foot, wood-constructed building.

5.5) Rearing facilities.

Rearing facilities consist of twenty 16-foot by 30-inch concrete starter tanks housed inside the hatchery building. Outside there are twenty 100-foot by 20-foot concrete raceways, one 200-foot by 16-foot concrete pond, three 29-foot circular ponds, and two concrete raceway show ponds. Cleaning effluent is distributed to a 310-foot by 110-foot 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 winter steelhead smolts produced in this program are acclimated at the Palmer Creek acclimation facility. The 50,000 smolts are divided equally into two earthen ponds. The ponds are approximately 140 feet by 60 feet and 160 feet by 90 feet respectively. The ponds are supplied with water diverted from Palmer Creek and are not screened.

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

Program operates under normal hatchery operations. Hatchery operations are faced with seasonal environmental difficulties that could lead to fish mortality. This includes high muddy water, extreme low flow situations, seasonal parasite infestation, and disease problems.

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 low-water alarm system to help prevent loss. Disinfecting procedures between stocks of fish are followed to prevent disease transmission. Regular exams are conducted by an ODFW fish pathologist to stay current on 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 Siletz winter steelhead broodstock (33W) was founded in 1995 from wild winter steelhead collected in the Siletz River. The wild winter steelhead population in the Siletz Basin is part of the Oregon Coast ESU and has been identified as a candidate species under the Endangered Species Act.

6.2) Supporting information.

6.2.1) History.

The Siletz winter steelhead stock 33W began in 1995 using Siletz wild winter steelhead for broodstock. For the first four years, only wild winter steelhead were used as broodstock. In 1999 and 2000, approximately 70 percent of the broodstock used were returning stock-33W hatchery fish with the other 30 percent being wild fish. The broodstock has been comprised of 100 percent wild fish since 2001 and will remain that way in future years.

6.2.2) Annual size.

The program goal for broodstock collection is 40 pair of wild winter steelhead adults, or 80 fish. Only wild fish will be used in the broodstock. The status of the wild winter steelhead population in the Siletz Basin is not known. The size of the population is depressed from historic levels but is estimated to be from one to two thousand fish. At the estimated population size, the number of fish removed for broodstock may be from 4 to 8 percent of the population. No analysis has been done to identify the critical or viable population threshold for this population. It is unlikely that the current population level, even with fish removed for broodstock, is anywhere close to the critical threshold.

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

Table 6-1 below shows the numbers of wild and hatchery winter steelhead that have been used as broodstock in the Siletz winter steelhead program. The goal for future years is to collect 80 wild Siletz winter steelhead for broodstock in this program.

Table 6-1. Numbers of Wild and Hatchery Winter Steelhead Collected for the Siletz Winter Steelhead Program.

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Wild	79	43	53	99	32	30	72	81	80	76	86	76
Hatchery	0	0	0	0	72	70	0	0	0	0	0	0

6.2.4) Genetic or ecological differences.

There are no known genotypic or phenotypic differences between the wild Siletz winter steelhead and the offspring of wild fish reared in a hatchery. There are likely to be behavioral differences due to the different environments the fish are raised in. The hatchery smolts are one-year olds, as compared to the wild smolts, which are usually two years old. The consequences of these differences are not completely understood.

6.2.5) Reasons for choosing.

Wild Siletz winter steelhead are being used in this isolated harvest program on the Siletz River as they are better adapted for this watershed.

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 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 Siletz hatchery winter steelhead program were chosen to minimize the likelihood for adverse genetic and ecological effects to wild steelhead while maintaining a healthy hatchery stock. The number and timing of broodstock collected and spawned is intended to maximize the genetic diversity of the hatchery stock. Efforts will be made to ensure the broodstock maintains as many of the characteristics of the wild population as possible to minimize the risk to wild fish from interbreeding. Efforts will also be made to limit the number of hatchery fish spawning in the wild in order 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).

Wild Siletz winter steelhead adults are collected for this program.

7.2) Collection or sampling design.

Wild adults are collected at Siletz Falls trap for broodstock. Fish are collected twice a month from January through May. The number of fish taken each month is based on the average percent of the wild run seen that month at Siletz Falls since 1994. For 2005, the percent of broodstock taken each month was 15 percent (13 fish) in January, 12 percent (10 fish) in February, 38 percent (33 fish) in March, 24 percent (21 fish) in April and 11 percent (9 fish) in May. Wild winter steelhead are not collected for broodstock at Palmer Creek due to low numbers of wild fish and an agreement with the industrial timberland owner.

Collecting fish at the Siletz Falls trap is believed to provide an adequate degree of randomness in broodstock collection. Because winter steelhead do not spawn above the falls, any fish seen at the trap are considered to be strays seeking to migrate to a new area. These strays are likely to have come from various areas lower in the basin and their removal should not adversely impact any one breeding population.

The ESA-listed Siletz River natural Coho Salmon may be captured incidental to winter steelhead trapping at Siletz Falls and Palmer Creek traps. The Siletz Falls trap is also run for wild summer steelhead management and may capture wild Coho Salmon from October through January. Palmer Creek trap is put in place at the start of January to collect returning hatchery winter steelhead, and may also capture wild Coho Salmon in January. These traps are checked 3 times a week and any wild Coho Salmon found are carefully handled and released. Wild Coho Salmon captured in Palmer Creek are passed upstream of the trap. Wild Coho at Siletz Falls are transported by portable tank to Bentilla Creek, a good Coho inhabating stream at RM 45 and released. Wild Coho are not passed above Siletz Falls because this area was not accessible to Coho Salmon prior to the building of the fish ladder in the 1950's, and is now being managed as a sanctuary for wild summer steelhead.

7.3) Identity.

Wild Siletz winter steelhead adults are identified by the presence of all of their fins and maxillary bones (the absence of “stubbed fins” and crooked fin rays that generally occur in hatchery smolt programs are also an indicator, though not a robust indicator). Progeny of hatchery-wild or hatchery-hatchery crosses that have spawned in the wild are indistinguishable from wild-wild crosses by these methods. All hatchery-raised steelhead in Oregon have had their adipose fin removed. On the Siletz, the hatchery winter steelhead have also had their left maxillary bone clipped.

7.4) Proposed number to be collected:

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

The current goal for the Siletz winter steelhead program is to collect 80 wild adults for broodstock. This would include jacks (1-salt males) in the proportion documented in the population each year. An overriding goal is to limit the take of broodstock to 10 percent of the wild population of winter steelhead each year.

The program goal has changed from previous years. After an initial use of only wild adults for the first four years, some returning hatchery adults were used along with wild adults in the broodstock in 1999 and 2000. ODFW District staff have decided that using all wild fish in the broodstock each year will minimize the impact stray hatchery fish will have if they interbreed with the wild winter steelhead population in the Siletz. This would occur because using all wild fish each year would limit the degree to which the relaxation of selective processes in the hatchery can alter the genetic make-up of these fish. For this reason, only wild winter steelhead will be used for broodstock in future years.

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

This program, utilizing a Siletz winter steelhead broodstock, began in 1995. As mentioned above and in Section 6, there have been years where hatchery and wild fish were used in the broodstock. Table 7-1 provides the actual numbers of fish collected for broodstock each year.

Table 7-1. Siletz Winter Steelhead (Stock 33) Broodstock Spawned and Egg Take Levels.

	Adults			Total	
Brood Year	Females	Males	Jacks	Eggs	Fry Ponded
1995	33	33	0	114,663	77,763 *
1996	21	15	0	88,091	80,983
1997	29	17	0	109,014	86,337
1998	47	47	0	152,505	135,677
1999	49	48	0	213,914	164,423 *
2000	53	41	0	167,942	119,047 *
2001	31	30	0	115,036	102,798
2002	41	38	1	101,000	86,000
2003	37	36	0	118,000	113,000
2004	35	35	0	107,000	83,000
2005	41	42	0	133,000	115,000
2006	36	36	0	111,000	86,000
2007	45	43	2	166,00	112,000

Data source: ODFW Hatchery Information Management System (HIMS) Database, Portland Oregon.
* = Some eggs and/or fry were destroyed as surplus to the program.

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

Hatchery adults that are collected at the Siletz Falls and Palmer Creek traps will not be used in the broodstock. To minimize stray rates, these fish will be removed from the basin and utilized in other ways. Hatchery winter steelhead adults will be planted in Olalla Reservoir (near Toledo) to be caught by trout anglers. Some of these fish will also be given to local foodshare organizations. Any fish that are of poor quality for human consumption will be killed and placed in the Siletz Basin for nutrient enrichment.

7.6) Fish transportation and holding methods.

Wild winter steelhead adults are transported to Alsea Hatchery by ODFW in a portable fiberglass tank mounted in a pickup. Siletz River water is loaded into the tank near the collection site just prior to loading the fish so the temperature change the fish experience at loading is negligible. The tank holds 300 gallons of water and utilizes two 12-volt aerators to maintain oxygenated water. The tank is also equipped with bottled oxygen. Maximum transport time is approximately 4 hours. Once the adults reach Alsea Hatchery, they are transferred to a circular tank (9.5 feet diameter by 4 feet high) until spawning begins in mid-February. All broodstock are handled and sorted in this pond, prior to spawning.

7.7) Describe fish health maintenance and sanitation procedures applied.

Broodstock and developing eggs receive regular treatments with formalin to prevent/control fungus (*Saprolegnia parasitica*) outbreaks. The spawning area and equipment are routinely disinfected with an iodine solution to prevent disease outbreaks. Green eggs are water-hardened in an iodine solution to prevent disease or viral contamination.

7.8) Disposition of carcasses.

All wild Siletz winter steelhead adults used for broodstock will be live-spawned and returned to the Siletz River (at Illahee Landing – RM 41) to potentially return the next year as a repeat spawner. This will only occur if ODFW pathologists have determined there is no risk from disease. Any mortalities while being held for spawning or fish found to have disease that prevents their release will be buried or rendered.

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.

- All hatchery adults collected at the Siletz Falls and Palmer Creek traps will be removed from the system as described in Section 7 (Item 7.5).
- Fish health inspections and sanitation procedures as described under Integrated Hatchery Operations Teams (IHOT 1995) guidelines will be followed to limit increase in disease in listed Coho in the Siletz and Alsea basins as much as possible

resulting from collection, holding, and return of adult winter steelhead to the Siletz River.

- All adult Coho Salmon of natural origin that are found in traps at time of sorting will be immediately removed from holding area and released upstream (or transported to Bentilla Creek if trapped at Siletz Falls).

SECTION 8

MATING

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

8.1) Selection method.

Wild winter steelhead adults are collected at Siletz Falls trap or from angler caught wild winter steelhead for broodstock. Angler caught wild steelhead are collected in December and January. Typically, only a small number of fish are collected in December. Fish are collected at the Siletz Falls trap twice a month from January through May. The number of fish taken each month is based on the average percent of the wild run seen that month at Siletz Falls since 1994. For 2014, the percent of broodstock taken each month was 15 percent (13 fish) in January, 12 percent (10 fish) in February, 38 percent (33 fish) in March, 24 percent (21 fish) in April and 11 percent (9 fish) in May. Wild winter steelhead are not collected for broodstock at Palmer Creek due to low numbers of wild fish and an agreement with the industrial timberland owner. Fish are spawned randomly as they ripen.

8.2) Males.

There will be no backup broodstock (such as another stock within or outside the Siletz Basin or from cryopreserved sperm from past years). Jacks will be included in the broodstock and used the same as any adult male in fertilizing the production egg takes.

8.3) Fertilization.

Winter steelhead are spawned using a 1:1 (male to female) ratio. The individual family groups are kept separate. There is a 100 percent sampling for viruses on all parents to facilitate culling if either or both parents have a high titer for virus.

8.4) Cryopreserved gametes.

Cryopreservation of winter steelhead gametes is not used in the 33W stock Siletz 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.

This program does not utilize listed fish. However, to limit risks to wild steelhead the broodstock are selected at random from throughout the winter steelhead run. Spawning is done randomly based on availability of ripe fish. Matings are done on a 1:1 sex ratio (one male and one female). Each fish is only used once in spawning and spawning is done in a 6-by-6 matrix. Eggs are kept separate in individual family groups.

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.

Survival from eyed-egg to ponding ranged from 97.5 percent to 98.8 percent, from 1995 to 1999 (Alsea Hatchery records). Refer to Table 9-1 for details.

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

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

Year	Egg-Take	Eyed Inventory	Fry Ponded	Percent Survival (Eyed-Egg to Fry Ponded)
1995	115,000	97,000	78,000 *	97.9%
1996	88,000	82,000	81,000	98.8%
1997	109,000	88,000	86,000	97.8%
1998	153,000	142,000	136,000	95.7%
1999	214,000	198,000	164,000 *	97.5%
2000	168,000	154,000	119,000 *	94.2%
2001	115,000	108,000	103,000	95.4%
2002	101,000	92,000	86,000	93.5%
2003	118,000	106,000	103,000	97.2%
2004	107,000	85,000	83,000	97.6%
2005	133,000	119,000	115,000	96.6%
2006	111,000	91,000	86,000	94.5%
2007	166,000	133,000	112,000	84.2%
* = Some eggs and/or fry were destroyed as surplus to the program.				

9.1.2) Cause for and disposition of surplus egg takes.

Circumstances when surplus eggs (and/or fry) may occur:

(1) Usually, more eggs are taken than needed to fully utilize genetic input from all females collected for brood stock. In such situation, a percentage of 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), the surpluses are removed and buried. Surpluses are removed randomly to maintain the appropriate representation of all family groups.

9.1.3) Loading densities applied during incubation.

(a) Expected egg size = 130 eggs per ounce (average)
(b) Standard Incubator Flow = 5.0 gpm per vertical incubator stack
(c) Density per tray = maximum of 6,000 eggs per tray (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 system.
- Silt loads in incubator trays are monitored. Standard techniques are used to remove silt loads without injuring eggs and fry.
- 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 (i.e., influent water supplies are less than saturation, high-density loading, and/or warm temperatures).

9.1.5) Ponding.

Fry are ponded at Alsea Hatchery when 95 percent of fish sampled are at complete button-up. This generally occurs from March to early July when fry are at 2,050 fish per pound and 1,050 to 1,200 temperature units. Refer to Table 9-1 for additional details. Fry are physically carried in baskets from incubator trays to ponding tanks.

9.1.5) 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 Siletz winter steelhead program are carried out according to existing standardized procedures. These protocols include:
  (a) Eggs are disinfected during the water-hardening phase (Iodophore treatment at 1:150 parts per million (ppm) for 15 to 30 minutes).
  (b) To control fungus, eggs are treated with a flow-through formalin treatment (at 1:600 ppm), every other day, until eye-up and shocking.
  (c) Incubators are monitored daily for environmental conditions (water temperature, flow, and siltation).
  (d) Fish 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.

- Fish 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 and buried or rendered.
- 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.

Siletz winter steelhead (stock 33) are not listed under the federal or state ESA. Potential disease transmission to wild Coho Salmon in Alsea basin is minimized by regular examinations at the hatcheries by ODFW pathologists.

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.

The Siletz winter steelhead program began in 1995. The average survival data from eyed eggs to smolt stage is 89% (Table 9-2).

Table 9-2. Average survival rates of Siletz winter steelhead at early life stages since 1995.

Average survival from eyed-eggs received to ponding	98%
Average survival from fry to fingerling	93%
Average survival from fingerling to smolt:	98%
Overall survival from eyed-egg received to release	**89%**
Source: Hatchery pond management records (Alsea Hatchery)	

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

Siletz winter steelhead are managed according to rearing density equivalency (spatial and volume) guidelines recommended by IHOT (1995) protocols and by protocols stated in the 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.
- 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.
- Density levels are monitored weekly by updating flow and growth data. Weekly reports are reviewed for compliance with onsite operating guidelines and adjustments are made as needed. Example of weekly report is seen in Table 9-3.

Table 9-3. Weekly Report of Fish Rearing Density at 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
T-15					0.0		0	0	0.00		0.00
T-16					0.0		0	0	0.00		0.00
T-17					0.0		0	0	0.00		0.00
T-18					0.0		0	0	0.00		0.00
T-19					0.0		0	0	0.00		0.00
T-20					0.0		0	0	0.00		0.00
Totals	945,655				122,967.3						

9.2.3) Fish rearing conditions.

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

(a) Pond density levels are monitored weekly (flow index and fish growth). These data are used to calculate individual pond density levels based upon pounds per gpm, pounds per cubic foot, and flow index.

(b) DO is monitored weekly during summer flows and throughout the year when environmental factors indicate a need.

(c) Hatchery effluent water quality parameters are measured and monitored quarterly: total suspended solids, settable solids, pH, and flow. Data are provided according to conditions identified in a 300-J NPEDS general state permit. Data are reported on a standard Discharge Monitoring Report and is administered by the Oregon Department of Environmental Quality (DEQ).

(d) Ponds are cleaned weekly.

(e) 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. T his has greatly reduced the need to treat fish for external parasites.

(f) Alsea Hatchery has no water temperature control system. Winter temperatures range from 36º to 49ºF. Summer temperatures range from 50º to 72ºF.

(g) 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.

Siletz winter steelhead are sampled every four weeks. Data listed below (Table 9-4) shows expected fish growth (measured as fish per pound) and size (measured as fork length [inches]) for the program from the time of ponding to release. Data shown represents 200 to 400 fish sampled per sample period.

Table 9-4. Target and Actual Growth Rate and Size of Winter Steelhead Sampled During Rearing.

	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)	Month Sampled
Ponding	1,725	1.16	Ponded at Cole River Hatchery		1,730	1.16	1,759	1.15	May/June
Week 2	1,432	1.22	Ponded at Cole River Hatchery				491.6	1.76	June
Week 6	253	2.18	Ponded at Cole River Hatchery		283	2.11	163.14	2.45	July
Week 10	96.8	3.04	Ponded at Cole River Hatchery		96.8	3.04	70.0	3.34	Aug
Week 14	32.9	4.35	83.6	3.12	32.9	4.38	36.4	4.21	Sept
Week 18	18.5	5.26	50.16	3.69	18.7	5.23	23.0	4.87	Oct
Week 22	13.1	5.90	Na		13.1	5.7	16.73	5.48	Nov
Week 26	9.5	6.57	Na		8.74	6.73	12.07	6.05	Dec
Week 30	8.7	6.76	Na		8.4	6.86	10.05	6.44	Jan
Week 34	6.8	7.32	Na		6.42	7.41	8.01	6.93	Feb
Release	6.0	7.70	Na		5.56	7.71	5.97	7.68	April

Expected Results at Release:

Cumulative Conversion	1.28	
Percent of Pond Population	< 18cm	18 percent
Length	18-22cm	71 percent
	>22cm	11 percent

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 above. Energy reserve data is not available for the Siletz winter steelhead program.

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

- 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 feed 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 fed with an automatic feeder 8 to 12 times per day. Feed schedules are developed to reach 3 target periods: (1) August 1 at 160 per pound; (2) November 1 at 23 per pound; and (3) April 1 at 6.0 per pound. The AGR levels vary but generally average 100 to 130 AGR from July to December. AGR levels are then reduced to less than 100 AGR when water temperatures drop from 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, the average food conversion ratio for the Siletz winter steelhead program is 1.3.

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:

- A qualified fish health specialist conducts all fish health monitoring.
- Conduct examinations of juvenile fish at least monthly and more often if necessary. A representative sample of healthy and moribund fish from each lot of fish will be examined. The number of fish examined will be as advised by 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 if 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 acclimation site transfer. Past research indicates that wild Alsea winter steelhead generally smolt at 18 cm average length, it is believed that wild steelhead in the Siletz perform the same (Kenaston and MacHugh 1983).

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.

Winter steelhead stock 33W 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 promote swift out migration. This, along with volitional release from the Palmer Creek acclimation site, should reduce impacts to listed stocks in the Siletz Basin by reducing time of migration through the system and exposure to naturally rearing listed stocks.

SECTION 10

RELEASE

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

10.1) Proposed fish levels.

Table10-1. Proposed Fish Release Levels.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling				
Yearling	50,000 ± 5%	6.0	April 1 - 21	Palmer Creek
Data source: ODFW 2001 hatchery production schedules.				

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

Stream, river, or watercourse: Palmer Creek (RM 52.5 of Siletz)
Release point: Palmer Creek acclimation site. (RM 0.5 of Palmer Creek)
Major watershed: Siletz River
Basin or region: Siletz Basin

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

Table10-2. Fish Released by Age Class (fpp = Fish per pound), 1996-2015.

Release Year	Eggs/ Unfed Fry	Avg Size	Fry	Avg Size	Fingerling	Avg Size	Yearling	Avg Size (fpp)	Release Date
1996							57,154	6.2	
1997					12,667	174	55,133	8.2	
1998							52,599	7.6	
1999							50,124	5.6	
2000							56,622	5.6	
2001							56,259	9.0	
2002							53,280	5.6	
2003							59,400	5.6	
2004							28,512	5.6	
2005							55,591	5.74	
2006							68,788	8.96	4/14
2007							54,387	7.41	3/27
2008							52,406	6.36	4/28
2009							54,387	7.41	4/13
2010							52,406	6.36	4/15
2011							52,191	6.13	4/20
2012							52,573	8.00	4/24
2013							37,094	6.70	4/15
2014							21,539	8.66	5/1

Release Year	Eggs/ Unfed Fry	Avg Size	Fry	Avg Size	Fingerling	Avg Size	Yearling	Avg Size (fpp)	Release Date
2015							49,032	6.66	4/20
Average							*50,974*	*6.87*	
Data source: ODFW Hatchery Management System (HMS) database..									

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

Smolt releases have begun as early as the beginning of April and as late as April 28. Actual release dates from release year 2006-2015 are shown above in Table 10-2. The time of release has been based on the fish being as close to six fish per pound as possible. Fish were allowed to grow in the hatchery longer if they were too small. In 1996, smolts were not acclimated but placed in Palmer Creek and the Siletz River. In 1997 and 1998, smolts were acclimated for approximately three weeks before they were allowed to swim out of the acclimation ponds. In 1999 and 2000, smolts were allowed to swim out of the ponds within a few days of being placed in the ponds. From 1997 through 2000, smolts were fed daily and allowed to volitionally swim out of the ponds for two to three weeks before the ponds were completely drained and the water reduced to force the remaining fish out. During this time, the ponds were gradually pulled down to encourage out-migration.

The current goal is to transport the fish to Palmer Creek acclimation ponds in early April at approximately six fish per pound. Once the smolts are in the ponds, they will almost immediately be allowed to swim out of the ponds. The pond levels will be kept up for one week and remaining fish will be fed daily. After the second week, remaining fish will no longer be fed and the pond levels will gradually be drawn down to encourage the smolts to leave the ponds. After three weeks, the ponds will be completely drained and the last fish forced out into Palmer Creek (Because of pond configuration and warming water temperatures, it is not possible to collect or continue rearing non-migrants). The intent of this release strategy is to have the majority of the hatchery steelhead smolts out of the Siletz Basin before the majority of the wild Coho Salmon smolts begin migrating in May.

10.5) Fish transportation procedures, if applicable.

Transportation of Siletz winter steelhead program smolts from Alsea Hatchery to Palmer Creek acclimation site is accomplished with the use of various sized liberation truck units. The units range in size from 1,000- to 2,500-gallon tankers. Some units utilize re-circulatory refrigeration systems used to maintain or cool 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 aerators. Oxygen is added at a rate of 1.5 Lpm. All units haul steelhead at an average density of 1.2 pounds per gallon. Total length of time in transit averages 3 hours for this haul and water temperature increases are minimal or nil.

10.6) Acclimation procedures.

Acclimation procedures are described in Section 10.4.

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

Program calls for marking 100 percent of the hatchery juveniles prior to release. All fish in the Siletz stock winter steelhead program have the adipose fin and left maxillary removed. Fish are sampled prior to release to assess mark regeneration or missed clips. Records for this program show that adipose fin regeneration or missed clips occur in only 0.05 percent of the population at time of release. Missed maxillary clips occur at a rate of 0.5 percent at time of release.

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

Effort is made to maintain the program within acceptable levels by reducing surplus at the egg/fry and fingerling stage. Numbers at release should be within the accepted level of plus or minus 5 percent of programmed release. Should that number be exceeded, all fish will be released, provided they are at smolt stage.

10.9) Fish health certification procedures applied pre-release.

- All fish health monitoring will be conducted by a qualified ODFW 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.
- Only health certified fish are released.

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

The stock 33W Siletz winter steelhead program is reared at Alsea Hatchery which is in the Alsea Basin, not the Siletz Basin. For this reason there would be no onsite release of this stock in case of water system failure. If fish were immature at time of failure, effort would be made to transfer fish to an alternative holding site. If fish were close to release date and size effort could be made to transport them to Palmer Creek in the Siletz Basin for release or acclimation.

Smolts would be immediately released from Palmer Creek ponds if there were a water system failure.

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 and time of year to assist migration and lessen contact time with natural populations of listed natural Coho Salmon and other fish in the upper watershed.
- Program fish will be released at their own volition and directly from the acclimation site. This should assist in a rapid migration.
- Onsite acclimation release should reduce straying potential for returning adults within the 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.

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

All of the measures identified in Sections 1.9 and 1.10 are being performed with existing regular staff, funding, and facilities.

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.

The only adult collection activity that may impact the ESA-listed Coho Salmon during the operation of the adult traps. However, winter steelhead adult collection usually occur from December – May when a negligible number of wild Coho Salmon may encounter. Measures to minimize the effects of operating the traps are identified in Section 2.2.3.

SECTION 12

RESEARCH

No true research is being conducted in conjunction with this hatchery winter steelhead program on the Siletz River. Monitoring activities are occurring with the hatchery winter steelhead program. These activities are described in Sections 1.9 and 1.10.

SECTION 13

ATTACHMENTS AND CITATIONS

References

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SECTION 14

CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

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

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

Signature: _____Date:_____

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

Signature: _____ Date:_____

Attachment A

Siletz River Basin Fish Management Operating Policies and Objectives

635-500-4530

Habitat Management - Policies and objectives for habitat management in the Siletz River Basin.

(1) Policies:

(a) The Department shall actively pursue and promote habitat protection and improvement necessary to achieve the objectives for management of the basin's aquatic resources;

(b) The Department shall coordinate with and advise landowners and management agencies of the Siletz River Basin;

(c) Habitat protection shall be emphasized over habitat restoration and enhancement;

(d) Potential losses of fish production from habitat alteration shall be prevented or reduced to the extent possible.

(2) Objectives:

(a) Maintain or increase in-stream flows during summer low flow periods in the Siletz River Basin;

(b) Reduce summer water temperatures where artificial warming occurs that is detrimental to fish;

(c) Increase in-stream channel complexity in the Siletz River Basin;

(d) Reduce artificially accelerated erosion rates and inputs of sediments into waterways in the Siletz River Basin;

(e) Prevent chemical contaminants from degrading fish habitat in the Siletz River Basin;

(f) Restore natural fish passage conditions in the Siletz River Basin;

(g) Increase habitat area available to fish in the Siletz River Basin;

(h) Coordinate with other agencies and landowners to implement habitat protection and restoration activities.

Stat. Auth.: ORS 496.138, ORS 496.146 & ORS 506.119

Stat. Implemented: ORS 506.109 & ORS 506.129

Hist.: DFW 5-1998, f. & cert. ef. 1-12-98

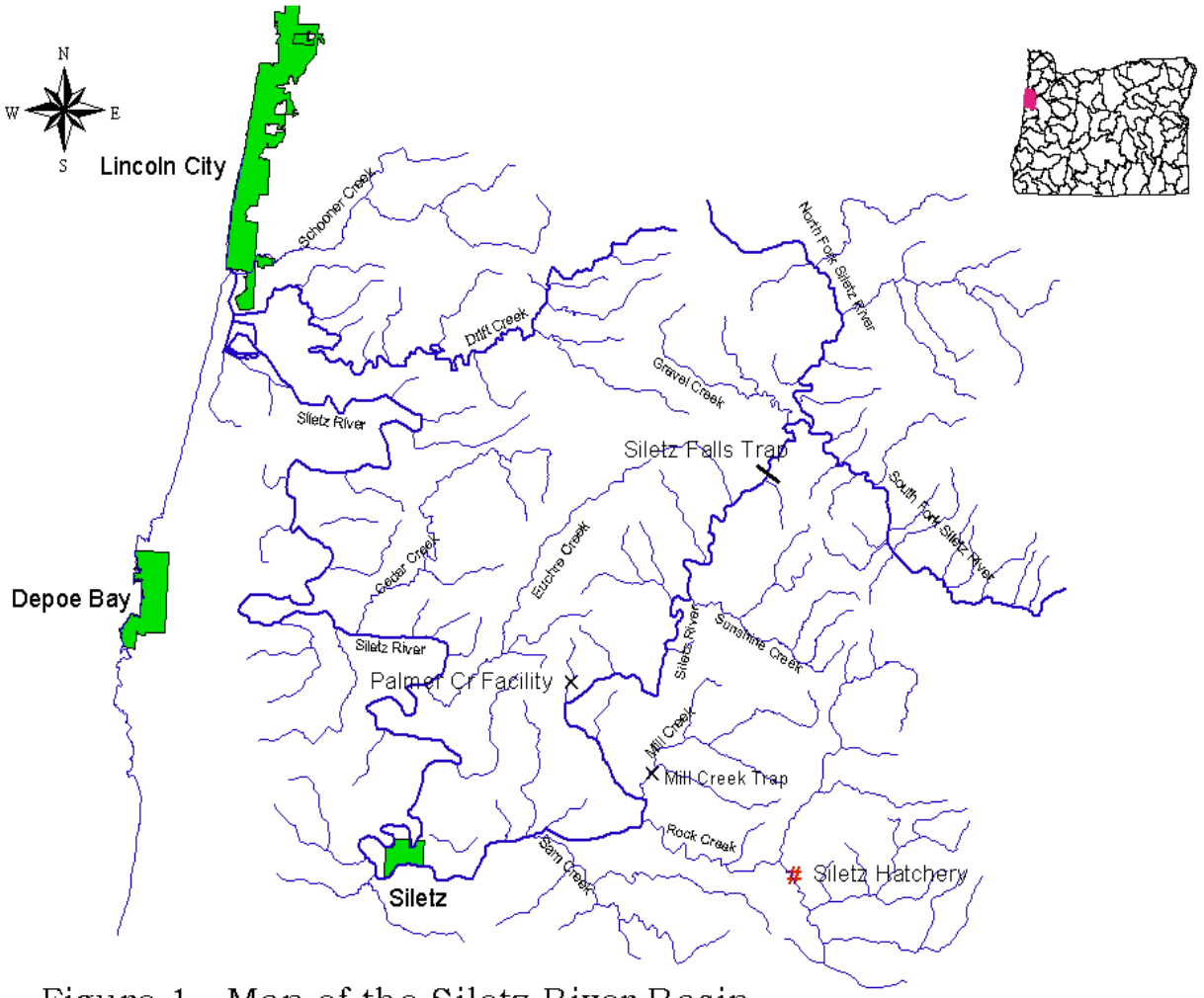

Figure 1. Map of the Siletz River Basin.