HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	**Munsel Creek Coho Salmon STEP Program**
Species or Hatchery Stock:	**Coho Salmon Stock-38W**
Agency/Operator:	**Oregon Department of Fish and Wildlife**
Watershed and Region:	**North Coast Watershed District**
Date Submitted: **First Update Submitted:**	**March 20, 2006** **June 20, 2016**
Date Last Updated:	**June 20, 2016**

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Munsel Creek Coho Salmon program operated through the Salmon and Trout Enhancement Program (STEP).

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

Coho Salmon *Oncorhynchus kisutch* stock-38W. The Oregon Coast Coho Salmon Evolutionary Significant Unit (ESU) was listed as threatened under the federal ESA on August 10, 1998 (Federal Register Notice 1998). It was subsequently de-listed in 2005 and was relisted effective May 12, 2008 (Federal Register 73FR7816, Oregon Coastal Coho ESU, February 11, 2008).

1.3) Responsible organization and individuals.

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

The Florence Salmon and Trout Enhancement Program (STEP) group helps with collection of broodstock, spawning and rearing at the Munsel Creek STEP

facility. The city of Florence provides the electricity and the land for the hatchery and trap.

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

Funding source for the Munsel Creek Coho Salmon program is 10% State of Oregon General Fund, including program staffing of one Natural Resource Specialist 2 for part of their time. The other 90% is volunteer funds from the local community and City of Florence. Annual hatchery program cost is $12,333 including personnel services and volunteer services and supplies**.**

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

The Munsel Creek STEP hatchery facility is located on Munsel Creek, a tributary that enters the Siuslaw River at approximately river mile 5.0. This facility is located at the intersection of Munsel Creek and East 24th St. within the city limits of Florence, Oregon. The water body code for Munsel Creek is 1800500040.

1.6) Type of program.

Educational and Isolated Harvest.

1.7) Purpose (Goal) of program.

The primary goal of this program is the education of students and adult volunteers about Coho Salmon biology, critical life stages of Coho Salmon and their habitat requirements. As outlined in the Siuslaw River Basin Fish Management Plan, this project may also provide hatchery Coho Salmon for harvest while minimizing interactions with wild populations.

1.8) Justification for the program.

This program is designed primarily to educate people about salmon biology, Coho Salmon life stages and habitat needs, as well as, salmon conservation and habitat restoration. Secondarily, the program may provide harvest opportunities while minimizing adverse impacts to wild fish populations. The activities of trapping adults, spawning adults, and incubating eggs, and rearing and releasing fry are all hands on operations that bring volunteers into the Florence STEP Group. A nationally recognized “stream team” program at Siuslaw Middle School utilizes this facility as a tool to teach students and volunteers. The facility is also used to enhance student and public interest in habitat protection and watershed restoration efforts. Up to 30 field trips each year allow students to study specific and critical aspects of salmon biology and habitat requirements at various life stages. We emphasize during the field trips that restoring natural habitats for wild salmon is our best option for Coho Salmon management in the Siuslaw Basin and that large

scale hatchery fish production is a costly alternative. This STEP program involving Coho Salmon fry stocking in Munsel Lake was discontinued in 2001. Impacts to wild Coho Salmon are expected to be minimal because of the small size of the program, geographically isolated from natural production areas, and straying of hatchery fish would likely occur around Munsel Creek which is low in the system. Currently, there are strong public desires to restart this education program. All Coho Salmon fry will be adipose fin clipped (100% ± 5%) before stocking them into Munsel Lake.

1.9) List of program "Performance Standards" and 1.10) List of program "Performance Indicators" designated by "benefits" and "risk."

(1) <u>Sport Fishery Contribution</u>

Standard 1: Produce adult hatchery Coho Salmon to provide harvest opportunities in selective fisheries targeting hatchery fish.
Indicator (a): Implement angling regulations that will allow retention of fin clipped Coho Salmon in the Siuslaw Basin.
Indicator (b): All hatchery fry are marked with an adipose fin clip (100%), and mark quality checks prior to release indicate at least 95% mark retention.
Indicator (*c*): Annual harvest card estimate of Coho Salmon harvest in the Siuslaw basin.

(2) <u>Life History Characteristics</u>

Standard 2: Life history characteristics of the natural population do not change as a result of this fish propagation program.
Indicator (a): Adult run timing remains similar to Siuslaw wild Coho Salmon.
Indicator (b): Adult spawn timing remains similar to Siuslaw wild Coho Salmon.

(3) Stray Rates
Standard 3: Minimize genetic impacts to the Siuslaw wild Coho Salmon population through choice of broodstock, and controlling proportion of hatchery Coho in naturally spawning Coho population.
Indicator (a): Use wild Siuslaw basin Coho Salmon to found hatchery population.
Indicator (b): Limit hatchery fish to 10% or less of the fish spawning in natural habitats, except in the immediate area around the release sites.

(4) Stock Identification
Standard 4: All hatchery fish will have an external, visible mark to allow for identification of hatchery juveniles and adults in natural environments and in fisheries.
Indicator (a): All hatchery fry (100%) are marked with an adipose fin clip, and mark quality checks prior to release indicate at least 95% mark retention.

(5) Facility Operation and Maintenance

Standard 5: Adult broodstock collection does not significantly alter spatial and temporal distribution of the natural Coho Salmon population.
Indicator (a): Adults are collected throughout the entire run in proportion to the natural population found throughout the Siuslaw River.

Standard 6: Adult selection, mating, and spawning will be consistent with approved methods and procedures.
Indicator (a): Females and males are selected (and paired) randomly for spawning.
Indicator (b): Fish are spawned at a 1:1 male to female ratio and are spawned according to a 3 x 3 spawning matrix to maintain genetic diversity.

Standard 7: Use established techniques to maximize survival rates at varying life stages within the hatchery.
Indicator (a): Enumerate survival rates from egg-fry, fry-to fed fry to determine optimal rearing conditions and practices.

Standard 8: Follow approved fish health, disease, and disinfection monitoring guidelines to minimize disease impacts to natural populations.
Indicator (a): Number of broodstock sampled and pathogens detected.
Indicator (b): Results of monthly fish health examinations are reported in the fish health database, with recommendation to hatchery staff as needed.
Indicator (c): Evaluate fish health status prior to release, and release on certified fish.

(6) <u>Education Activities</u>

Standard 9: Provide educational and public outreach opportunities.
Indicator (a): Document the events and numbers of students, public and educational groups that participate in STEP hatchery activities.
Indicator (b): Produce detailed annual report of operations for STEP.
Indicator (c): Photographs and articles will be published in local paper(s) and will be recorded and saved.

1.11) Expected size of program.

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

Only 10 brood fish (5 pairs) will be collected annually for this small program. Until hatchery produced broods are available, 100% wild fish as broodstock. Once the hatchery-produced adults start returning to Munsel Creek, hatchery fish may be used as broodstock.

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

Life Stage	Release Location	Annual Release Level
Eyed Eggs	NA	NA
Unfed Fry	NA	NA
Fry	Munsel Lake	10,000
Fingerling	NA	NA
Yearling	NA	NA

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

There is no reliable data to estimate the performance of this small program which was designed to educate school students and volunteers. The program in the past initially utilized 100 percent wild fish of stock-38 and began with fry releases in 1994. However, no set numbers of unfed fry, fed fry or smolts have been released consistently in any year or within any water body to help make accurate estimates.

No estimates of smolts produced from this program have ever been attempted because of the small size of the project. Adult Coho Salmon returns also have not been enumerated each year at the Munsel Creek fish trap. When high stream flows occurred in Munsel Creek, the trap gates were opened to allow debris to flow downstream and fish to travel upstream. Smolts produced from propagated fish and additional stray wild Coho Salmon adults may account for the production of fish we have seen returning to Munsel Creek, to date. There also may be natural production occurring from Coho Salmon utilizing spawning gravel placed by volunteers in the channel upstream from Munsel Lake in the year 2000.

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

Hatchery Coho Salmon fry stocking in Munsel Lake began in 1994, but was discontinued in 2001. Due to strong public desire for this program, the program was started again during the fall of 2006.

1.14) Expected duration of program.

The program will continue in Munsel Lake indefinitely. If required, modifications to the program may be made to improve fishery or educational benefits.

1.15) Watersheds targeted by program.

The Munsel Lake watershed within the Siuslaw Basin is the target of this program. Munsel Lake was not used historically by a naturally-produced Coho Salmon population because of a lack of spawning gravel (Griffiths 1938).

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

Brief overview of key issues:
The primary reasons for this hatchery Coho Salmon program in Munsel Lake are the educational benefits for adults and students in the Florence area. This program will give volunteers and students a basic understanding of Coho Salmon life history requirements. Most of the alternatives would involve fish stocking in habitat with natural Coho Salmon runs. It is recognized that fry releases in natural wild fish habitats pose a risk to the wild fish population. The proposed program for releasing fry in a habitat having no natural Coho runs minimizes the potential for impacts to wild Coho Salmon. The Munsel Lake system lacks natural gravel in tributaries for salmonid spawning (Griffiths 1938).

The number of fry that will be released is also an issue as they may interact with naturally produced fry downstream in the Siuslaw River, or if naturally produced fry move upstream into Munsel Creek. Potential interactions between these hatchery fry and any wild fish has been minimized by setting the maximum release number at 10,000 fry. The size of the program could be decreased or increased. However, making it smaller than 10,000 fry may result in insufficient fish to maintain public involvement, outreach opportunities, and educational purposes. Making the program larger may increase the risk to wild Coho Salmon populations.

Another issue raised about the hatchery program is potentially having a harvest of fin marked Coho Salmon at or near the mouth of Munsel Creek in the Siuslaw River. The small size of the program limits the potential for a target fishery. Increasing the size of the program to provide for a fishery would be very difficult, expensive and could potentially create a risk for Siuslaw wild Coho Salmon. An alternative to address this issue is to continue to improve wild fish habitat to promote faster wild fish recovery so that an in-river fishery for both wild and hatchery Coho could be approved in the Siuslaw Basin.

Alternative 1: Maintain the current status, and do not restart a hatchery Coho Salmon program in the Siuslaw basin. This would leave un-implemented an option in the Siuslaw Basin plan and would fail to take advantage of local public support for a public out-reach and educational opportunity.

Alternative 2: Restart the hatchery program in Munsel Lake but reduce the number of fry released. This may result in insufficient fish to maintain public

involvement, outreach opportunities, and educational purposes. The 10,000 fry release level was selected to provide enough opportunity to maintain public involvement and educational opportunities and keep impacts to wild Coho Salmon at a minimum.

Alternative 3: Focus on habitat restoration within the Munsel Lake sub-basin only by placing spawning gravel at key locations. This could build a self-sustaining run of naturally produced Coho salmon that would utilize the juvenile rearing habitat that is available in Munsel Lake. This would require funding to implement and maintain and would also eliminate the "hands on" educational activities.

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 STEP Coho Salmon program was submitted to NMFS on 3/20/2006 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 ESA-listed salmonid population(s) affected by the program.

Oregon Coast Coho Salmon have been listed as a threatened population under the Federal ESA and the listing decision was effective May 12, 2008. It is assumed that direct or indirect impacts to the naturally-produced Coho Salmon from this small propagation program will be negligible.

Siuslaw Complex

The Siuslaw Complex consists of Coho Salmon inhabiting the Siuslaw Basin and small ocean tributaries north to Heceta Head (Nickelson 2001). There is an estimated 580 miles of spawning habitat available to the Coho Salmon of this complex.

Siuslaw Coho Population

Coho Salmon that return to the Siuslaw River and its tributaries have been identified as an Independent Population by the Oregon Coast Technical Recovery Team Workgroup (Lawson et al. 2005) and by the Oregon Coastal Coho Assessment (Chilcote et al. 2005). As one of twenty three independent populations that comprise the Oregon Coast Coho Salmon ESU, the abundance,

distribution, and productivity of the Siuslaw Coho are monitored to assess population viability and to guide recovery planning.

Coho Salmon Life History

Adult Coho Salmon migrate into fresh water in the fall to spawn. Spawning of wild Coho Salmon usually occurs from mid-November through February. Adult spawning coho salmon are typically 3 years old and are often accompanied by 2 year old jacks (precocious males) from the next brood. Spawning occurs primarily in small tributaries located throughout coastal basins. The parents normally exhibit strong homing to their natal stream. The female digs a nest (redd) in the gravel and lays her eggs, which are immediately fertilized by accompanying adult males or jacks. The eggs are covered by digging and displacing gravel from the upstream edge of the nest. Each female lays about 2,500 eggs. The adults die soon after spawning. Sex ratios of spawning adults tend to average around 50:50 at most locations (Table 2-1). However, Moring and Lantz (1975) observed 77 percent males in three small Alsea River tributaries over a period of 14 years. They concluded that males tend to move around a lot and visit multiple streams. The eggs hatch in about 35 to 50 days, depending upon water temperature (warm temperature speeds hatching). The alevins remain in the gravel 2 or 3 weeks until the yolk is absorbed and emerge as fry to actively feed in the spring. Most juvenile Coho Salmon spend 1 summer and 1 winter in fresh water. The following spring, approximately 1 year after emergence, they undergo physiological changes that allow them to survive in seawater. They then migrate to the ocean as silvery smolts about 10 to 12 centimeters (cm) in length.

Table 2-1. Observations of Coho Salmon sex ratio at adult traps.

Population Complex	Percent Males	Percent Females	Location	Run Years	Data Source
Nehalem	52%	48%	North Fork trap	1998-1999	Life Cycle Monitoring
Siletz	50%	50%	Mill Creek trap	1997-1999	Life Cycle Monitoring
Yaquina	51%	49%	Mill Creek trap	1997-1999	Life Cycle Monitoring
Alsea	77%	23%	Drift Creek tributaries	1959-1972	Moring & Lantz (1975)
	50%	50%	Cascade Creek trap	1997-1999	Life Cycle Monitoring
Umpqua	55%	45%	Smith River trap	1999	Life Cycle Monitoring
Coos	63%	37%	S. Coos River, Winchester Creek, and Fall Creek	1999	Oregon Plan Monitoring

The smolts undergo rapid growth in the ocean, reaching about 40 to 50 cm by fall. Little is known of the ocean migrations of Coho Salmon from Oregon coastal streams. However, based on what is known, it appears migrations are mostly limited to coastal waters. Initial ocean migration appears to be to the north of their natal stream (Fisher and Pearcy 1985; Hartt and Dell 1986). After the first summer in the ocean, a small proportion of the males attain sexual maturity and return to spawn as jacks. 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 the 1990's, 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 <u>directly</u> affected by the program.

The population in the Siuslaw Basin would be directly affected by this program during the period of using wild fish (5 pairs only) use as broodstock.

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

Coho Salmon runs to the north and south of the Siuslaw Basin might be indirectly affected by this program through competitive interactions between hatchery-origin and natural-origin Coho Salmon for food and space.

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

Oregon coastal Coho Salmon have been listed as a threatened species under the federal ESA. The possible impacts of this program on wild Coho populations are described below.

Updated information (2001-2003 return years) was utilized in conjunction with earlier data (1990-2001) to evaluate the current status for the Oregon Coast Coho Assessment. In that assessment, Siuslaw Population passed all biological criteria used to assess conservation status: Abundance, Productivity, Persistence, Distribution, and Diversity (Chilcote et al. 2005).

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

The Siuslaw Complex consists of Coho Salmon inhabiting the Siuslaw Basin and small ocean tributaries north to Heceta Head. There is an estimated 580 miles of spawning habitat available to the Coho Salmon of this complex. The critical population level for the Siuslaw Complex is 2,300 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 158 miles of stream, well above the 15-mile threshold (Nickelson 2001). It should be noted however, that the estimate of habitat quality is based on a sample size of only 15% of the available stream miles, much less than any other complex. In 2014 return year, there were about 39,289 wild Coho Salmon were observed and about 38,896 wild Coho were available for natural spawning within the Siuslaw Complex (see below Table 2-2) for further details.

- Provide the most recent 12 year progeny to parent rations, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of data.

The population status and recruit per spawner of Coho Salmon in the Siuslaw Basin are presented below in Table 2-2.

Table 2-2. Population parameters for the Siuslaw Complex Coho Salmon, 1990-2014.

Return Year	Wild Spawners	Pre-harvest wild population	Recruits per Spawner
1990	2,268	8,400	
1991	2,808	7,800	
1992	3,554	9,605	
1993	4,600	7,667	3.38
1994	3,159	3,361	1.20
1995	6,161	6,922	1.95
1996	7,234	7,696	1.67
1997	501	551	0.17
1998	1,020	1,109	0.18
1999	2,980	3,204	0.44
2000	6,532	6,804	13.58
2001	10,606	11,048	10.83
2002	55,445	58,363	19.58
2003	29,003	31,525	4.83
2004	8,729	9,488	0.89
2005	16,907	17,611	0.32
2006	5,869	6,379	0.22
2007	3,552	4,036	0.46
2008	17,491	17,848	1.06
2009	30,607	32,911	5.61
2010	25,983	27,351	7.70
2011	28,082	29,874	1.71
2012	11,946	14,568	0.48
2013	14,118	16,416	0.63
2014	38,896	39,289	1.40
Annual mean	13,522	15,193	3.56

- Provide the most recent 12 year (e.g. 1990-2014) annual spawning abundance estimates, or any other abundance information. Indicate source of data.

The abundance of Coho Salmon spawners of the Siuslaw Complex has ranged from less than 700 to more than 55,000 from 1990-2014 (Figure 2-1 and Table 2-2). Spawner abundance fell below the critical threshold of 2,300 fish three times since 1990 and in 5 other years the lower 95% confidence limit extended below the critical threshold. Recruits per wild spawner exhibited a downward trend from 1993 to 1999, which was dramatically reversed in 2000, when the 1997 brood produced about 7,100 recruits and 6,500 spawners from about 700 parent spawners (Table 2-2 and Figure 2-2).

Smolt production was estimated for the 1997 through 2014 broods. Estimated smolt abundance ranged from 100,000 to over nine million for the Siuslaw Complex (Table 2-3).

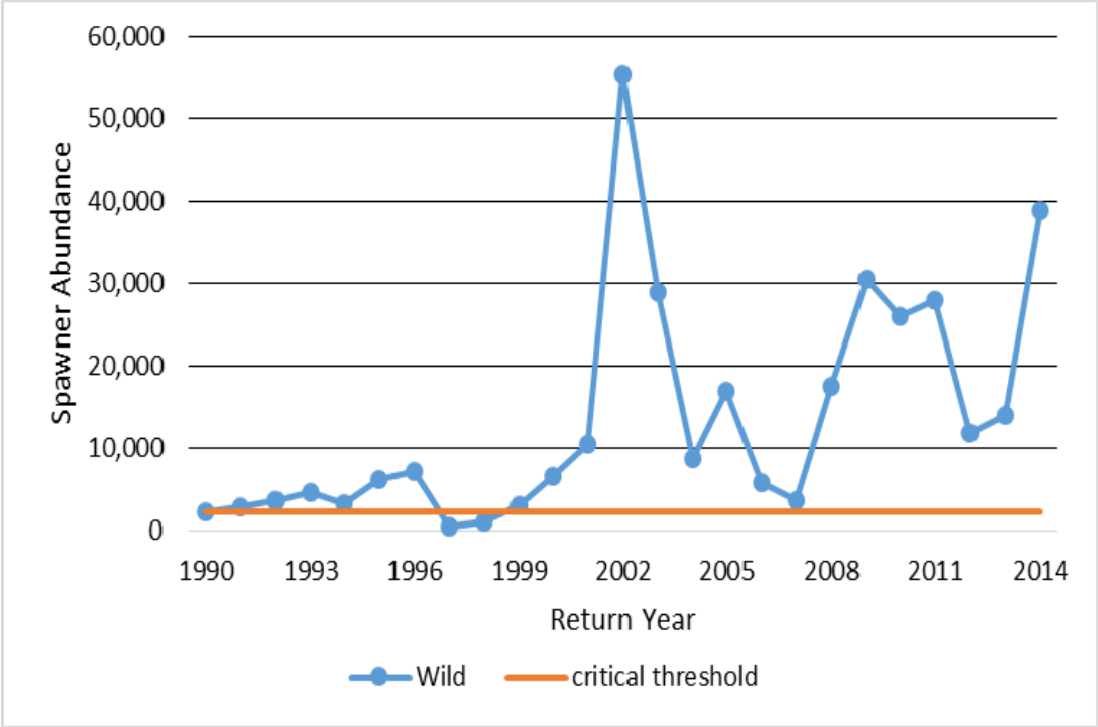

Figure 2-1. Trend in adult Coho Salmon abundance relative to the critical population level for the Siuslaw Complex. Error bars are 95% confidence limits.

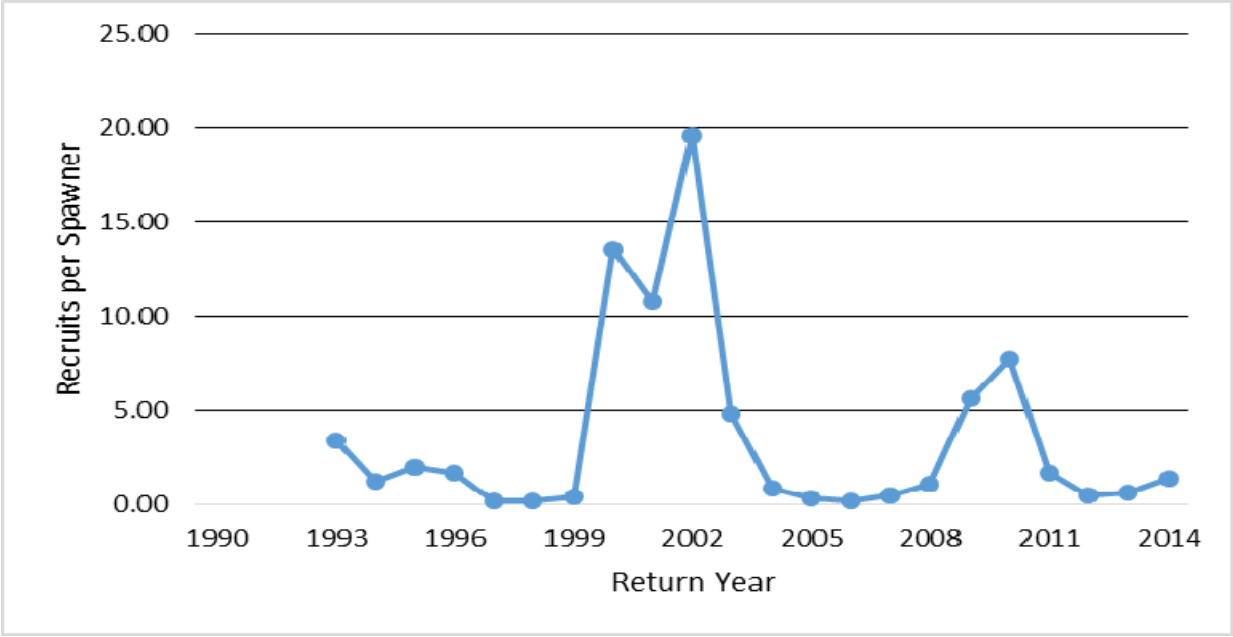

Figure 2-2. Trend in recruits per spawner for Siuslaw Complex wild Coho.

Table 2-3. Estimates of abundance of juvenile life stages based on spawner abundance in the Siuslaw Complex. Estimates are in Millions

Brood year	Eggs	Fry	Parr	Smolts
1990	2.835	1.843	1.143	0.388
1991	3.510	2.282	1.415	0.481
1992	4.443	2.888	1.790	0.609
1993	5.750	3.738	2.317	0.788
1994	3.949	2.567	1.591	0.541
1995	7.701	5.006	3.104	1.055
1996	9.043	5.878	3.644	1.239
1997	0.626	0.407	0.252	0.086
1998	1.275	0.829	0.514	0.175
1999	3.725	2.421	1.501	0.510
2000	8.165	5.307	3.290	1.119
2001	13.258	8.617	5.343	1.817
2002	69.306	45.049	27.930	9.496
2003	36.254	23.565	14.610	4.967
2004	10.911	7.092	4.397	1.495
2005	21.134	13.737	8.517	2.896
2006	7.336	4.769	2.957	1.005
2007	4.440	2.886	1.789	0.608
2008	21.864	14.211	8.811	2.996
2009	38.259	24.868	15.418	5.242
2010	32.479	21.111	13.089	4.450
2011	35.103	22.817	14.146	4.810
2012	14.933	9.706	6.018	2.046
2013	17.648	11.471	7.112	2.418
2014	48.620	31.603	19.594	6.662

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

Hatchery fish have been common in the spawning population in some years of the last decade, although they have primarily been concentrated in one or two tributaries just below Lake Creek Falls. This was the result of a hatchery program to introduce Coho Salmon into the watershed above the falls, which was very successful and has now been discontinued. In other parts of the basin, of 302 scale samples collected in 1990-99, 84 (27.8%) had hatchery scale patterns. Since large hatchery Coho programs have been discontinued in the mid coast area, only a few Coho from hatchery stock have strayed into Siuslaw tributaries since 1999.

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

Since the Munsel Creek STEP program for Coho Salmon was discontinued in 2001, it is expected that all Coho adults returning to Munsel Creek are naturally produced fish. Therefore, all required brood fish (5 pairs) were collected from the naturally produced Coho run until fin-clipped hatchery produced adults become available. Broodstock will be captured at the Munsel Creek trap.

The trapping of these fish may result in incidental take of wild Coho that would migrate from the Siuslaw into Munsel Creek. These Coho could be affected by delaying upstream migrations, and invoking stress as a result of capture, handling and upstream release. These impacts will likely occur in November, December and January.

Fry Release

Coho fry released in Munsel Lake could compete with naturally produce Coho Salmon for food and rearing habitat. However, with limited spawning habitat and abundant rearing habitat it is not anticipated that a small release of artificially propagated Coho fry will have significant impacts to naturally produced Coho.

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

The may be 20-80 adult Coho Salmon had been captured and released during broodstock collection and a maximum of only 5 fairs of adult Coho Salmon had been taken for broodstock purpose (see Table 2-5 below).

- 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 of wild Coho from this program are identified below in Table 2-5.

Table 2-5

Estimated Listed Salmonid Take Levels by Hatchery Activity. NOTE: This take was previously identified in ODFW's 4(d) Research and Monitoring Application.

Listed Species Affected:	Coho Salmon	**ESU/Population:**	Oregon Coast/ Siuslaw River	**Activity:**	Coho Salmon Trapping
Location of Hatchery Activity:	Trap on Munsel Creek.	**Dates of Activity:**	Oct.- Feb.	**Hatchery Program Operator:**	Oregon Dept. of Fish and Wildlife

	Annual Take of Listed Fish By Life Stage *(Number of Fish)*			
Type of Take	**Egg/Fry**	**Juvenile/Smolt**	**Adult**	**Carcass**
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			20-80	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)			Maximum 10	
Intentional lethal take f)				
Unintentional lethal take g)				
Other Take (specify) h)				

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

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

- **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.**

Historically, Munsel Lake did not have a native run of Coho Salmon adults. It is unlikely that there will be significant take associated with this program. If there becomes a concern with take, methods of handling fish and operating the program will be reviewed and modified to address the problem.

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.

- **Siuslaw River Basin Fish Management Plan** (approved by the Oregon Fish and Wildlife Commission - 11/14/97). The basin management plan identifies an option for a hatchery coho program, such as the prior coho salmon broodstock program. The projected fry release is within the target level identified in the plan.
- **Native Fish Conservation Policy**. The Oregon Fish and Wildlife Commission approved the Native Fish Conservation Policy (NFCP) in 2002. This policy relies on conservation plans being developed for each species management unit.
- **Fish Hatchery Management Policy (FHMP).** This policy was approved by the Oregon Fish and Wildlife Commission in 2003, and provides guidance for hatchery programs. The policy requires the development of Hatchery Program Management Plans, but allows an HGMP to serve as the required plan. This HGMP will serve as the guiding document for the Munsel Lake Coho program under the Hatchery Management Policy.
- **Oregon Coast Coho Conservation Plan –** The Oregon coast Coho Conservation plan was completed in 2007 and directs management of Coho Salmon within the ESU.

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

- Oregon Plan for Salmon and Watersheds (Executive Order 99-01)
- Pacific Fisheries Management Council (Section 7 Consultation)

3.3) Relationship to harvest objectives.

The primary intent of this program is to provide educational opportunities for students and volunteers in the Munsel Lake sub-basin. Providing harvest opportunities is a secondary objective of this program. It is expected that the number of Coho Salmon harvested would be very small (maybe only a few adults) due to the small size of the program.

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.

During the prior period of releases in Munsel Lake, the Siuslaw fishery was closed for non-fin-clipped Coho Salmon. And then it planned that the fry released under this program would be fin clipped allowing harvest in ocean recreational fisheries or Siuslaw Basin fisheries which were opened to retention of fin-clipped Coho Salmon. It's not known how many program fish were harvested from the smaller number of fry releases (10,000 fry), as the program was designed mainly for educational purposes.

3.4) Relationship to habitat protection and recovery strategies.

Refer to Appendix 1 for ODFW habitat protection and enhancement policies identified in the Siuslaw River Basin Fish Management Plan. Munsel Creek has a sandy bottom throughout the entire basin which greatly limits its potentials as Coho habitat. Generally, habitat protection and recovery strategies prioritize areas that have, or have potential for good to high quality habitat and good water quality. These areas are generally located elsewhere in the Siuslaw Basin.

Education through this STEP program familiarizes volunteers with salmon biology and their special habitat requirements. This learning will eventually enhance student and public interest in active participation in fish habitat protection and watershed restoration efforts.

3.5) Ecological interactions.

(1) Species that could negatively impact program.
Predation by coastal Cutthroat trout, mink, otters, harbor seals, raccoons, blue herons, mergansers, cormorants, and gulls could negatively impact rearing Coho fry and out migrating smolts. Returning adults could be negatively impacted from predation by harbor seals and otters.

(2) Species that could be negatively impacted by program.
Competition and/or predation by artificially propagated Coho Salmon smolts on native fish species are expected to be minimal due to competitive exclusion,

spatial and temporal differences in habitat utilization, and relative size of Coho Salmon juveniles compared to other juvenile salmonids.

(3) Species that could positively impact program.
Any fish that dies (or is recycled for nutrient enrichment) in Munsel Lake may positively impact the program.

(4) Species that could be positively impacted by program.
Aquatic species (salmonids, other fish, mammals, birds, etc.) that depend directly or indirectly on salmonids for food and nutrient supply could be positively impacted by the program.

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.

This program will utilize a single facility at Munsel Creek to produce 10,000 Coho Salmon fry.

Water Source for Munsel Creek STEP Facility
The facility can obtain up to 60 gallons of water per minute pumped from Munsel Creek. Pumps are enclosed in a 1/16-inch mesh screen box. Munsel Creek originates from Munsel Lake and from seepage from 10 miles of dunal aquifer. The Munsel Creek Hatchery, as a STEP facility, is not required to have a water right permit. Water-temperature and -chemistry of the stream are not affected by the hatchery operations employed at the site. The water quality at the hatchery is at times low in pH and oxygen content because of upwelling of water from the dunal aquifer and heavy organic litter loading from natural processes. The stream carries very high iron content all year and produces an iron oxide flocculent when aerated. These natural water quality profiles may limit the production of Coho in the natural and the hatchery environment.

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

Munsel Creek STEP Facility
Hatchery intake screens are consistent with NMFS screening guidelines to minimize the risk of take/entrainment of wild juvenile fish during water withdrawal; and no juvenile fish or fish parts have ever been found in the header tanks where water is pumped.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Coho Salmon broodstock for this program will be collected at a trap facility on Munsel Creek. This is a "gorilla cage/raceway" design trap. Gorilla cage traps are made of steel pipes with a fyke at the entry point. Once fish have moved into the cage they are not able to escape. If required, broodstock may also be collected from the lower Siuslaw River using a seine net.

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

Volunteers with portable liberation tanks mounted in pick-ups will transport Coho Salmon fry from the hatchery upstream to Munsel Lake a distance of one mile. Several tanks may be used. Most of the tanks utilize 12-volt aerators to maintain oxygenated water. Maximum transport time would likely be less than twenty minutes. Transportation of brood fish is not required.

5.3) Broodstock holding and spawning facilities.

Munsel Creek Trap
Two 8' X 20' concrete raceways were built to hold broodstock. All brood fish are held in PVC tubes placed in quiet water areas.

5.4) Incubation facilities.

Munsel Creek STEP Facility
The facility has three double stacks (15 trays) Heath incubators. Each stack receives six gallons of water per minute.

5.5) Rearing facilities.

Munsel Creek STEP facility
The facility has two 500-gallon circular tanks for use as early rearing facilities. Each tank is equipped with an electric feeder, oxygen tanks and air diffusers with low-water-level alarms.

5.6) Acclimation/release facilities.

Coho Salmon fry are reared on site using water from Munsel Lake, and are released into Munsel Lake.

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

Munsel Creek STEP Facility
Power losses to pumps and volunteers inadvertently turning off power or water to tanks have caused significant losses in the past. Small losses occur annually due to low dissolved oxygen and fungus outbreaks. Records are not available to determine level of losses.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Munsel Creek STEP Facility
Back up systems consist of a low-water alarm and automatic reduced flows as system drains to extend outflow period. Three volunteers and an ODFW biologist familiar with the systems are on an emergency phone list to respond to the facility within 20 minutes of notification of any water flow reduction.

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 Siuslaw stock-38 Coho Salmon originated from wild Coho Salmon captured in Siltcoos and Tahkenitch Lakes during the falls of 1990-93. During 1994 to 2000, the broodstock was comprised of almost exclusively of returning hatchery adults from fry releases into Munsel Lake. The program was discontinued in 2001, and this hatchery broodstock was not maintained.

Since the program was discontinued in 2001, the returning naturally produced offspring from the previous releases would be used as broodstock or Siuslaw wild Coho (stock 38W) that stray into Munsel Creek shall be used as a source of broodstock to continue this program.

6.2) Supporting information.

6.2.1) History.

See Section 6.1.

6.2.2) Annual size.

Only 10 fish would be required annually for this program. This small number of fish will be collected from returning hatchery fish or, if necessary, from naturally produced offspring from the previous releases, Siuslaw wild Coho that stray into Munsel Creek.

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

The number of natural fish used as brood in the past are not known because the hatchery-produced fry were not fin-clipped in those days. It is proposed that, naturally produced Coho Salmon or stray wild Coho Salmon (10 fish) will be trapped in Munsel Creek.

6.2.4) Genetic or ecological differences.

Not known.

6.2.5) Reasons for choosing.

The Siuslaw Basin stock has been chosen to represent the genetic and life history characteristics of the local wild population, as it will exert the least possible genetic impacts to the wild stock due to smaller size of this artificial propagation.

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

Initially all brood (10 fish) will be selected from the wild Coho population. These fish will produce off springs which will be genetically close to the native population. Hatchery-produced adults may also be used as broodstock, if available.

SECTION 7. BROODSTOCK COLLECTION

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

Only adult Coho Salmon will be collected for broodstock purposes.

7.2) Collection or sampling design.

Collections will occur at Munsel Creek trap. If sufficient broods are not available in Munsel Creek, the remaining fish will be collected from the lower Siuslaw River using a seine net. Broodstock collections will occur from November through January to represent the entire run period with respect to run timing and age class distribution. Fish will be selected randomly and in proportion to the historic wild run in the Siuslaw basin.

7.3) Identity.

Initially all broods will be from the wild population. Returning Munsel hatchery adults when they become available will be identified by adipose fin clip.

7.4) Proposed number to be collected:

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

The program goal is to collect only 10 fish (M:F = 1:1) annually. Once the hatchery-produced adults become available, only 10 hatchery fish will be collected annually.

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

Broodstock collection for the past program releasing all Munsel Creek stock began in 1995 and ended in 2001. The table below shows the numbers of males and females spawned since 1996, and the number of eggs taken.

Table 7.1. Munsel Creek hatchery Coho Salmon broodstock collection levels and egg takes, 1996-2004.

Brood Year	Adults Females	Males	Jacks	Eggs	Juveniles
1996	15	15	5	32,000	10,000
1997	40	40	10	125,000	44,000
1998	40	48	4	124,000	20,000
1999	10	12	4	20,000	4,200
2000	2	2	1	2,000	1,000
2001	15	9	2	22,000	4,750
2002-2004	0	0	0	0	0

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

In the past, adult fish captured in the trap were released upstream and no surplus brood fish were collected. If the program begins again, there will be fish retained only for broodstock needs. No surplus brood fish will be collected.

7.6) Fish transportation and holding methods.

Fish collected for broodstock are held in the trap in PVC tubes and are not transported.

7.7) Describe fish health maintenance and sanitation procedures applied.

Equipment used for handling and spawning Coho are disinfected between uses. No chemicals or drugs are used on the adults.

7.8) Disposition of carcasses.

All Coho Salmon for this program are kill spawned. Carcasses of spawning and trap mortalities are placed in headwater sections of Munsel Lake for nutrient enhancement.

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.

Only 5 pairs of natural-origin adult Coho Salmon will be taken for broodstock purpose, and any surplus Coho captured in trap will be removed immediately from holding area and released upstream of the trap with minimal handling stress. Matrix spawning (3x3), equal sex ratios (1:1 M to F), will be used to maintain genetic diversity in the hatchery-produced population.

SECTION 8. MATING

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

8.1) Selection method.

Brood for spawning will be selected randomly to represent the whole run. Fish will be paired and spawned randomly from fish ripe on the day of each spawning.

8.2) Males.

Males will be selected randomly without any bias for size or particular traits. There will be no backup of male broodstock and males will be used only once. Jacks will be included in the broodstock at a similar proportion that they return.

8.3) Fertilization.

Adults are kill-spawned in this STEP program. Coho Salmon are spawned using a 3x3 spawning matrix that will maintain a 1:1 (male to female) ratio. There may be a need to use a 2:2 or 4:4 matrix depending on fish availability. The individual family groups are kept separate.

8.4) Cryo-preserved gametes.

Cryopreserved Coho Salmon gametes are not used in this program.

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

Broodstock will be selected randomly from the entire run to mimic the natural genetic characteristics of the wild population. Matrix spawning and a 1:1 male to female ratio will be used to maintain genetic diversity within the population.

SECTION 9. INCUBATION AND REARING -

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

9.1) Incubation:

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

Munsel Creek Hatchery
Eggs were incubated to the eyed stage at this facility from 1995 to 2001. Numbers of eggs taken are shown in Table 7.1. Average survival to the eyed stage was 55 percent.

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

Any surplus eggs will be pulled equally from all family groups and destroyed, or allowed to hatch and fry will be placed in closed coastal lakes to supplement the trout fishery.

9.1.3) Loading densities applied during incubation.

Munsel Creek Hatchery
A maximum of 6,000 Coho Salmon eggs are placed in individual incubator trays. Flows are maintained at 6 gallons per minute.

9.1.4) Incubation conditions.

Munsel Creek Hatchery
Incubating water temperatures range from 40 to 54 degrees F. Flows are monitored daily and maintained at 6 gallons/min. Filters and egg trays are cleaned daily to remove silt and debris.

9.1.5) Ponding.

Munsel Creek Hatchery
Fry will be force ponded at 100 percent button-up, as determined by visual inspection.

- Fry are physically carried from tray to tank by baskets at the time of ponding.

9.1.6) Fish health maintenance and monitoring.

Munsel Creek Hatchery
Eggs are treated with formalin three-times a week to control fungus.

- Appropriate actions including drug or chemical treatments will be recommended as necessary. If a bacterial pathogen requires treatment with antibiotics a drug sensitivity profile will be generated when possible.
- Fish health maintenance and monitoring will be carried out under standard procedures. These will include:
  (1) Eggs disinfected upon receiving with iodophor solution.
  (2) Incubators are monitored daily for environmental conditions.
  (3) Mortality is removed at eye up (shocking) to ponding stage unless significant loss would dictate otherwise. Folded vexar is utilized in each incubator tray. With this method mortality is isolated in small locations of the tray and is easily removed at the time of ponding.
- Incubators are continually monitored by float alarm system and visually checked twice daily..

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.

Munsel Creek Hatchery
The program is small and geographically removed from wild Coho habitats. Risk aversion measures for this program are to follow established operation procedures including:
(1) Incubation system will be continuously monitored by an alarmed system to indicate low flows. Daily inspection will be made of incubation conditions such as flow, mortality, silting, and temperature.
(2) Monitoring of egg and embryo development.
(3) Incubate in substrate (vexar) and darkness.
(4) Incubate at low densities.
(5) Incubator screening in good order to prevent escapement.

9.2) Rearing:

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

Munsel Creek Hatchery
No survival data is available at the Munsel Creek Hatchery. Fry are not inventoried at ponding.

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

Munsel Creek Hatchery
There are no set loading goals for fry in the circular tanks. Separating different sizes of fish and the number of circulars available dictates the loading densities. Efforts are made within these constraints to keep densities low. Flows are kept high or as much as the tributary can provide.

9.2.3) Fish rearing conditions

Munsel Creek Hatchery
Circular tanks are monitored and cleaned daily. Fish are observed for feeding activity and signs of disease.

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.

Munsel Creek Hatchery
Obtaining accurate weight samples of the Coho once they are in rearing ponds will occur monthly. The STEP group has sought to minimize the handling of these fish.

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

Munsel Creek Hatchery
In the past, no accurate weight sampling data were collected and growth rates were not determined. In the future, these data will be recorded.

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*).

Munsel Creek Hatchery
In the past, the following fish food from BioOregon was used:

- starter #2 (for fish 850-1999 per pound)
- starter #3 (for fish 501 – 849 per pound)
- 1.0 mm (400-500 per pound)
- 1.3 mm (for fish 250 – 399 per pound)

This food is not required to be frozen, but is kept frozen when the fish are in the rearing ponds. The food comes with a recommendation of which food to feed fish of a given size. However, this is used as a rough guide because there is often a range of fish sizes in a circular tank. Usually, at least two different sizes of feed are fed at the same time to make sure that the smallest fish don't end up starving. The commercial fish food is augmented with natural food (bugs, grubs, worms,

maggots, etc.) brought out to the fish by volunteers. It is hoped that exposure to "natural" food throughout their time in the hatchery will help the Coho Salmon transition to natural food after their release as fry. Because accurate weight samples were not taken, feed conversions ratios were not determined.

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

Munsel Creek Hatchery
Fish are observed for signs of disease while feeding. Any mortalities are removed. ODFW fish pathologists are consulted if high mortality or unusual fish behavior is observed and fish are treated as per pathologists' prescription.

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

Munsel Creek Hatchery
All fish will be released in Munsel Lake at fry stage before smoltification. No ATPase gill enzyme activities are measured.

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

Munsel Creek Hatchery
Fish are reared in plastic ponds supplemented with some natural live food. All fish are released in Munsel Lake at the fry stage. Once released, the fish will depend entirely on natural food until emigration to the sea.

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

Fry will be reared at low densities and optimum flow will be maintained. Rearing tanks will be screened to prevent escapement into the wild environment. Low-water alarm systems will be maintained to prevent any catastrophic fish loss. Also, please see Sections 5.8, 6.3, 7.9, 8.5 and 9.1.7 for risk aversion measures to minimize adverse genetic and ecological effects to the fish under this propagation program.

SECTION 10. RELEASE

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

10.1) Proposed fish release levels.

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry	10,000	250	May 1	Munsel Lake.
Fingerling				
Yearling				

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

Stream, river, or watercourse: Munsel Lake
Release point: 1800500040 water body code
Major watershed: Siuslaw
Basin or Region: Siuslaw

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

Releases of 100 percent Munsel stock-38 did not begin until 1996. Releases since 1996 are shown below.

Release Year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1996			10,000	500/lb				
1997			44,000	300/lb				
1998			20,000	800/lb				
1999			4,200	300/lb				
2000			1,000	800/lb				
2001			4,750	800/lb				
2002-09			0					
2010			12,838	160/lb				
2011			10,702	160/lb				
2012			9,052	160/lb				
2013			9,540	160/lb				
2014			0					
2015			0					

Source: ODFW HMS database

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

Munsel Creek Hatchery
Fry will be forced released directly from liberation truck into Munsel Lake around May 1.

10.5) Fish transportation procedures, if applicable.

Transportation is accomplished with the use of various size liberation truck units. Units range in size from 60 gallon to 300-gallon tankers. Some units utilize re-circulatory pumps, water taken at hatchery site. Oxygen is added at a rate of 1.5 Lpm. Some units utilize tanks equipped with agitators. All units haul fish at an average density of 0.75/lbs/gallon. Total length of time in transit averages 20 minutes for this haul.

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

Fish fry (250 fish/lb) are stocked directly into lake without acclimation.

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

All fish (100%) will be marked with adipose fin-clip.

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

Munsel Creek Hatchery
Efforts will be made at the egg stage to optimize numbers. If the fry number is substantially above target levels, excess fry will be released in a nearby lake that does not have native salmonids or an outlet to the ocean.

10.9) Fish health certification procedures applied pre-release.

Munsel Creek Hatchery
Fish health will be examined by ODFW's pathologists before release; and only certified fish will be released into the Lake.

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

Munsel Creek Hatchery
Coho Salmon being reared at Munsel Creek will be released on-site if there is a system failure that threatens the fish.

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

The release location is on a lake that does not have historic natural Coho Salmon production because of lack of spawning gravel. Spatial separation from Siuslaw Basin's wild Coho Salmon along with the small size of the program lessens risks. Coho Salmon fry released into Munsel Lake are naturally blocked by water temperature differences between the lake and Munsel Creek during the summer months. Warmer water temperatures and more available feed in Munsel Lake during summer months encourage Coho Salmon fry to stay in the lake, rather than migrate into Munsel Creek. This forms a natural thermal block for all hatchery-produced salmonids for 3-4 months each year and minimizes interactions with naturally-produced Coho Salmon fry in Munsel Creek.

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 will be performed with existing staff 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.

No genetic impact is expected from the monitoring activities. The only monitoring activity that could have ecological impact on wild Coho Salmon is the operation of the adult trap. Any wild Coho Salmon that are surplus of broodstock requirement trapped at the Munsel Creek trap facility will be released above the trap with minimum handling stress.

SECTION 12. RESEARCH

No research is being conducted or proposed in direct association with this Munsel Creek STEP program.

SECTION 13

ATTACHMENTS AND CITATIONS

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Rodgers, J. D., S. L. Johnson, T. E. Nickelson, and M. F. Solazzi. 1993. The seasonal use of natural and constructed habitat by juvenile coho salmon (*Oncorhynchus kisutch*) and preliminary results from two habitat improvement projects on smolt production in Oregon coastal streams. *In* Proceedings of the coho workshop, May 26-28, 1992 at Nanaimo, B.C.

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 Manager

Signature:_____Date_____

Certified by: Scott Patterson, Fish Propagation Program Manager

Signature: _____Date:_____

Siuslaw River Basin Fish Management Operating Policies and Objectives

635-500-6130

Habitat Management - Policies and objectives for habitat management in the Siuslaw 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 Siuslaw 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 Siuslaw River Basin;

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

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

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

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

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

(g) Increase habitat area available to fish in the Siuslaw 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

Stats. Implemented: ORS 506.109 & ORS 506.129

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