

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Chetco River Winter Steelhead Program
Species or Hatchery Stock:	Winter Steelhead (Stock 96)
Agency/Operator:	Oregon Department of Fish and Wildlife
Watershed and Region:	Rogue Watershed, Southwest Region
Date Submitted:	March 13, 2006
First Update Submitted:	June 10, 2016
Date Last Updated:	June 10, 2016

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Elk River Fish Hatchery (Chetco River Winter Steelhead Program).

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

Chetco River Winter Steelhead *Oncorhynchus mykiss* Stock 96. ESA Status: Neither wild nor hatchery stock of Chetco River winter Steelhead are ESA-listed populations.

1.3) Responsible organization and individuals

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

State of Oregon's General Fund provides an approximate annual operational budget of \$330,000. Four permanent employees operate the facility full time. Annual Chetco River winter Steelhead program cost is approximately \$50,000.

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

Elk River Hatchery is located in Oregon on Elk River at RK 22.5 in Elk River Basin. Elk River Hatchery is at latitude 42° 44.322' N and longitude 124° 24.191' W. The hatchery area is 13.2 acres. Broodstock holding, spawning, rearing and release all take place at this location. Water body code is 1700130000. The regional mark processing code for Elk River hatchery is 5F22209 H9 21.

1.6) Type of program.

The Chetco River winter Steelhead program is an Isolated Harvest Program.

1.7) Purpose (Goal) of program.

The goal of the Chetco River winter Steelhead program is to provide fish for sport fishing harvest, while minimizing any potential adverse impacts to the wild populations, particularly the SONCC Coho which is a threatened population under the federal ESA.

1.8) Justification for the program.

This program provides adult winter Steelhead for the recreational fishery on the Chetco River. Maintaining these and other fisheries directed at unlisted species supports economic and cultural values associated with historic steelhead fisheries while reducing social pressures to increase fisheries directed at listed species. Another justification is that the program is also designed to educate students and increase public awareness about Steelhead biology, its critical life stages and special habitat requirements, through the STEP program. The program minimizes indirect impacts to listed species through brood collection techniques, rearing and release strategies.

Brood Collection

Migrating fish enter the Chetco River from December to April. ODFW staff and volunteers collect wild and hatchery Chetco River winter Steelhead by hook and line. Broodstock collection by tangle net was discontinued prior to the 2015 season. Adults are collected from December to March, and only Chetco River winter Steelhead are used for broodstock. Seasonally installed holding pens are utilized to hold broodstock for up to several days in the Chetco River prior to transport to Elk River Hatchery. Daily hook and line broodstock collection will cease if more than two Coho are captured in a day.

Rearing and Release Strategies

Strategies limit ecological interactions between hatchery and naturally produced fish. Fish are reared to a size sufficient to cause 98-100% of the entire population to smolt, reducing retention time during seaward migration. Smolts are released between mid March and mid April at river mile 4.0 (Social Security Bar) with the intent that hatchery produced smolts will migrate to sea prior to peak migration of naturally produced smolts, thus minimizing interactions (Past smolt trapping in south coast streams indicates that peak migration of naturally produced coho and winter steelhead smolts typically occurs

between mid-April and mid-May).

Any naturally produced juvenile Coho rearing in the lower mainstem and estuary of the Chetco mainstem at the time of smolt release may be subject to predation/competition by hatchery produced steelhead smolts.

Releasing smolts in the lower river reduces the straying of hatchery Steelhead to natural spawning grounds.

Fingerling Steelhead excess to the needs of the smolt program are released in various south coast lakes and ponds between May and the following April in order to supplement local trout fisheries. Most release sites are not accessible to anadromous fish and interactions with naturally produced fish are limited to Garrison Lake.

1.9) List of program “Performance Standards” and 1.10) Performance Indicators addressing benefits (1.10.1) and risks (1.10.2)

Benefits Performance Standards	Benefits Performance Indicators	Benefits Monitoring & Evaluation
<ul style="list-style-type: none"> • Provide hatchery Steelhead for an isolated harvest program. 	<ul style="list-style-type: none"> • Program fish contribute to freshwater fisheries. • One hundred percent of Steelhead smolts will be adipose clipped. 	<ul style="list-style-type: none"> • Annual abundance estimates and harvest rates of adult hatchery winter Steelhead.
<ul style="list-style-type: none"> • Healthy winter Steelhead are released. 	<p>Release timing and size of release will mimic naturally produced winter Steelhead, except Steelhead smolts will be released mid March to mid April, prior to the peak migration of naturally produced Steelhead and Coho smolts.</p> <ul style="list-style-type: none"> • Release groups will meet ODFW fish health standards. 	<ul style="list-style-type: none"> • Conduct appropriate health checks throughout incubation, rearing and release. • Document size and age of program fish prior to release
<ul style="list-style-type: none"> • The winter Steelhead hatchery program will meet criteria provided by the Native Fish Conservation Policy. 	<ul style="list-style-type: none"> • A Conservation Plan will be developed for Rogue Winter Steelhead (SMU). 	<ul style="list-style-type: none"> • Assess stock status and risks. • Monitor stray rates of hatchery Steelhead in the Chetco and non-Chetco River watersheds.

1.9) List of program “Performance Standards” and 1.10) Performance Indicators addressing benefits (1.10.1) and risks (1.10.2)

Risks Performance Standards	Risks Performance Indicators	Risks Monitoring & Evaluation
<ul style="list-style-type: none"> Life history characteristics of hatchery winter Steelhead will not diverge significantly from naturally produced winter Steelhead. 	<p>Release of program fish mimics the emigration of naturally produced winter Steelhead, except that smolts are released prior to the peak migration of naturally produced steelhead and coho smolts.</p> <ul style="list-style-type: none"> Behavioral and morphological characteristics of program fish are similar to naturally produced winter Steelhead. Broodstock collection reflects the run timing and age classes represented in the natural population. 	<ul style="list-style-type: none"> Downstream monitoring techniques will evaluate juvenile emigration and size. In-season broodstock collection records by District staff
<ul style="list-style-type: none"> Releases of hatchery winter Steelhead have minimal impact on Coho salmon. 	<ul style="list-style-type: none"> Program fish are released so that spatial and temporal differences in habitat utilization will minimize impacts on juvenile Coho rearing in the upper watershed and tributaries. 	<ul style="list-style-type: none"> Releases made when and where scheduled.

Risks Performance Standards	Risks Performance Indicators	Risks Monitoring & Evaluation
<ul style="list-style-type: none"> Hatchery operations comply with the Fish Hatchery Policy and other state and federal guidelines and permits. 	<ul style="list-style-type: none"> Hatchery operations conform to applicable fish health, sanitation, and operational guidelines. Hatchery operations conform to DEQ/NPDES guidelines for water quality. Facility intakes are screened appropriately. 	<ul style="list-style-type: none"> Fish health is certified prior to release. Appropriate protocols will be followed for monitoring water quality. Screens will be checked on a regular basis.
<ul style="list-style-type: none"> Broodstock collection will have minimal impact on Coho salmon. 	<ul style="list-style-type: none"> Remove wild Coho from hook and line immediately and return to the Chetco River. Hook and line broodstock collection will be suspended for the day if more than two wild Coho are captured. Steelhead collection will not begin until after the peak of the Coho Salmon run is over. 	<ul style="list-style-type: none"> Record the date and number of Coho captured. Record the number of winter Steelhead used for brood.

1.11) Expected size of program.

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

The highest number of annual collection recorded for the program is 120 adult fish. Maximum proposed broodstock collection: males 60 and females 60.

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

Life Stage	Release Location	Annual Release Level
Eyed Eggs		none
Unfed Fry	Chetco River (STEP)	800
Fry		none
Fingerling	Various lakes and ponds within the South Coast Fish District, including Babyfoot Lake, Laird Lake, Southard Lake, Foster Lake, Lake of the Woods, Mineral Hill Pond, Libby Pond, Garrison Lake	30,000
Yearling	Chetco River	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.

Table 1.12 Estimated return of adult hatchery origin winter Steelhead to the Chetco River. Contribution of hatchery Steelhead to the sport catch ranges from 22-56% (Table 3.2). Estimated sport catch is from ODFW punchcard estimates. Expanded red counts from Jacobsen et al. 2015.

Return Year	Smolt Release	Estimated Sport Catch	Estimated Hatchery Spawning Escapement (expanded redd counts)
1990	41,518	1,681	
1991	57,739	1,252	
1992	45,371	1,671	
1993	51,210	1,587	
1994	52,481	1,295	
1995	51,805	1,594	
1996	42,924	1,451	
1997	41,879	1,783	
1998	51,168	1,436	
1999	50,953	751	
2000	59,742	604	
2001	49,610	530	
2002	44,453	1,248	

2003	46,006	1,456	
2004	49,369	1,476	
2005	43,032	2,446	
2006	27,301	1,889	
2007	28,418	2,341	3,804
2008	38,012	2,077	115
2009	51,965	732	0
2010	52,627	929	0
2011	56,584	1,835	0
2012	45,801	2,479	0
2013	44,409	1,986	0
2014	43,888	1,871	0
2015	37,416		647

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

The first smolt release was in 1969.

1.14) Expected duration of program.

The Chetco River winter Steelhead program is ongoing with no planned termination.

1.15) Watersheds targeted by program.

Targeted watershed is Chetco River drainage, ODFW waterbody code 1700150000.

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

1.16.1) Brief Overview of Key Issues

Chetco River winter Steelhead hatchery program and ESA listed Coho.

Issue 1: Straying

Straying of hatchery produced fish is a concern. The majority of the hatchery-origin Steelhead return to the Chetco River. Hatchery Steelhead typically return after Coho have entered the river and spawned. Generally, the proportion of hatchery-origin winter Steelhead on the natural spawning grounds (pHOS) averages 4% annually (Table 1.16).

Table 1.16 Summary of Chetco Winter Steelhead Spawning Ground Surveys, 2003 -2015 return years (ODFW OASIS Project at <http://odfw.forestry.oregonstate.edu/spawn/datasumm.htm>)

Return Year	# Surveys	Miles Surveyed	# StW Observed	# StW Marked	% Hatchery
2003	5	4.7	29	4	13.8
2004	10	8.9	131	1	0.8
2005	9	9.1	279	9	3.2
2006	11	9.2	41	3	7.3
2007	6	6.7	91	7	7.7
2008	3	3.9	27	0	0.0
2009	5	4.8	75	0	0.0
2010	4	3.7	54	0	0.0
2011	4	3.7	4	0	0.0
2012	3	2.9	1	0	0.0
2013	4	3.7	59	0	0.0
2014	2	1.6	0	0	--
2015	8	9.4	91	10	11.0

Issue 2: Release Strategies

Release of program fish affects only the lower 4 miles of the Chetco mainstem and occurs prior to peak migration of naturally produced Coho smolts. While juvenile coho may be present in the lower mainstem/estuary it is expected that most juvenile coho are rearing in tributary streams when hatchery produced steelhead smolts are released and likely would have no interaction. Any naturally produced juvenile coho rearing in the lower mainstem/estuary of the Chetco mainstem at the time of smolt release may be subject to predation/competition by hatchery produced steelhead smolts.

1.16.2) Potential alternatives to current program.

Alternative 1: Terminate Chetco River Winter Steelhead Hatchery Program

Pros: Eliminate the potential risk to listed Coho due to interactions with hatchery winter Steelhead in the Chetco River Watershed.

Cons: Eliminate hatchery contribution to valuable recreational fishery. Hatchery produced winter steelhead make up approximately one half of the total steelhead harvest in the Chetco River.

Alternative 2: Reduce the Number of Hatchery Winter Steelhead Smolts Released into the Chetco River.

Pros: Reduce potential risk to listed Coho due to interaction with hatchery winter Steelhead in the Chetco River Watershed.

Cons: Reduce the number of adult hatchery Steelhead available for selective recreational fisheries.

1.16.3) Potential Reforms and Investments.

Reform/Investment 1: Construct an adult Steelhead broodstock holding facility along the Chetco River. Currently, ODFW staff transport Steelhead collected on each day to Elk River Hatchery for holding, a 1.5 hour trip. With a broodstock holding facility, staff would transfer Steelhead broodstock once a week to Elk River Hatchery. A holding facility along the Chetco River would allow staff to spend more time collecting wild Steelhead, so fewer hatchery fish are incorporated into the broodstock. The inclusion of hatchery Steelhead into the broodstock increases the likelihood Steelhead will return earlier, at a time when Coho are present. Cost = \$5,000.

ODFW staff determined the construction of a broodstock holding facility is not currently feasible. As an alternative, four holding pens were constructed and beginning in 2013 were seasonally installed at strategic locations along the Chetco River for holding angler caught broodstock. Steelhead broodstock can be held in the pens for several days thus reducing the number of trips required for transporting steelhead broodstock to Elk River Hatchery. The holding pens also allow for better broodstock selection prior to transport to Elk River Hatchery.

Reform/Investment 2: Construct additional employee residence. Construction of a new residence on the hatchery grounds will add an additional employee able to respond to an emergency. Emergencies that may affect listed fish include: loss of water pressure which would result in the early release of fall Chinook smolts into the watershed. Cost = \$150,000.

Reform/Investment 3: Add additional spawning ground surveyors. Currently spawning surveys are limited to a few reaches of the Chetco River. Adding additional surveys will provide more detailed information on interactions between naturally spawning hatchery and wild steelhead, and Coho. Cost = \$20,000/annual basis. Steelhead spawning surveys south of Cape Blanco were discontinued after the 2014-15 season. Currently no steelhead surveys are conducted in the Chetco Watershed.

SECTION 2. PROGRAM EFFECTS ON NMFS ESA-LISTED SALMONID POPULATIONS. (USFWS ESA-Listed Salmonid Species and Non-Salmonid Species are addressed in Addendum A)

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

The HGMP for this Chetco River winter Steelhead program was submitted to NMFS on 3/13/2006 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 NMFS ESA-listed natural populations in the target area.

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

Southern Oregon/Northern California Coast (SONCC) Coho Salmon are listed as threatened and the Chetco population may be affected by this propagation program.

Coho Salmon Life History

Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (NOAA Fisheries, 2014) states:

- The Chetco River coho salmon population is not well studied and there is little trend data
- Coho salmon occur in many parts of the Chetco River population area and juvenile coho salmon have been found in the upper mainstem reaches in the Kalmiopsis Wilderness (ODFW 2005).
- The Expert Panel stated that the Chetco River coho population has a very low abundance and is verging on extirpation (ODFW 2008b).
- The Chetco River population is at high risk of extinction because the estimated average spawner abundance has been less than the depensation threshold in the three consecutive years of lowest abundance within the last twelve years (Williams et al. 2008).

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

No direct take of ESA listed SONCC Coho Salmon will occur due to this steelhead program.

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

ESA listed Chetco SONCC Coho Salmon may be incidentally affected by the program during steelhead brood collection. Also, there may be indirect effects of the program fish on listed natural Coho eggs, fry and adults through competitive interactions for food and space, and predations.

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 (see definitions in “Attachment 1”).

Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (NOAA Fisheries, 2014) identifies the Chetco Coho population as a Core, Functionally Independent Population with a High Extinction Risk and an ESU viability recovery goal of 4,500 for the Chetco population. Key limiting

stresses are identified as ‘Lack of Floodplain and Channel Structure’ and ‘Degraded Riparian Forest Conditions’.

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

These data or any other productivity measures for listed Coho in the Chetco River are not available.

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

Coho salmon are not monitored routinely in Chetco River Watershed. Adult and jack Coho Salmon are identified and enumerated during surveys to count spawning Chinook Salmon. Escapement estimates of wild adult Coho, based on Chinook surveys, has ranged from 0 to a high of 665 in 2001 (Table 2.1, ODFW unpublished data).

Very low densities of juvenile Coho have been found in the Chetco River watershed as indicated in Table 2.2, Table 2.3, and Table 2.4. Western Oregon Rearing Project Abundance Monitoring is the only currently funded project collecting information on presence of juvenile Coho in the Chetco River watershed. Due to the limited number of sites sampled no watershed estimate of juvenile Coho densities have been made.

Table 2.1. Estimated spawning escapement of Coho Salmon to the Chetco River Watershed. Estimates are based on Coho sampled during standard + supplemental Chinook surveys, 1995-2015.

Adult Coho Spawner Abundance						
Return Year	Number of surveys	Survey Km	Peak Count	Estimated escapement	Proportion of spawners w/o fin clips	Estimated escapement of unmarked adults
1995	6	10.36	4	207	1	207
1996	6	10.36	0	0	--	0
1997	6	10.36	0	0	--	0
1998	6	9.94	0	0	--	0
1999	6	9.94	0	0	--	0
2000	4	8.74	5	307	1	307
2001	6	10.36	20	1034	0.643	665
2002	4	8.74	0	0	--	0
2003	5	9.54	0	0	--	0
2004	7	10.76	6	299	1	299
2005	3	7.13	0	0	--	0
2006	3	7.13	1	75	1	75
2007	3	7.13	8	601	1	601
2008	3	7.13	1	75	1	75
2009	6	8.64	0	0	--	0
2010	5	8.32	1	64	1	64

2011	9	12.34	3	130	1	130
2012	7	10.89	0	0	1	0
2013	7	10.09	1	53	1	53
2014	6	9.95	5	269	1	269
2015	6	9.95	2	108	1	108

Table 2.2. Catch of Coho Salmon juveniles during juvenile trapping (ODFW unpublished data).

Year	Location	Time Period	Trap type	Juvenile Coho captured
1988	Jack Creek	April 1 to August 2	Adult trapping facility	0
1989	Jack Creek	April 18 to August 4	Adult trapping facility	0
1989	Chetco Mainstem	June 21 to August 4	Humphreys trap	0
1991	Chetco Mainstem	June 11 to July 23	Screw trap	0
1991	Jack Creek	April 8 to July 9	Adult trapping facility	0

Table 2.3. Estimated densities of juvenile Coho at various locations in the Chetco River Basin during 1999, 2000, and 2001 (Satterthwaite, 2002). At each location 4 pools and 4 riffles were sampled. Locations are described using Universal Transverse Mercator (UTM) grid lines spaced every kilometer or 1000 meters. The vertical grid lines (UTM-E) determine East-West position and the horizontal grid lines (UTM-N) determine North-South position.

Stream	Year	Location		Estimated densities 0+ Coho
		UTM-E	UTM-N	
Chetco River	1999	424736	4669300	0
South Fork Chetco River	1999	410143	4671148	0
South Fork Chetco River	1999	410646	4670582	0
Basin Creek	1999	410625	4670419	0
Henry Creek	1999	427359	4670818	0
Madstone Creek	1999	425689	4668026	0
Red Mountain Creek	1999	414734	4666907	0
South Fork Chetco River	1999	414549	4666496	0
Bravo Creek	1999	397487	4665269	0
North Fork Chetco River	1999	396481	4663393	0

Stream	Year	Location		Estimated densities 0+ Coho
		UTM-E	UTM-N	
North Fork Chetco River	1999	399321	4660684	0
Joe Hall Creek	1999	396103	4658796	0
Hamilton Creek	1999	399939	4656470	0
Jack Creek	1999	403215	4654938	0
Jack Creek	1999	400972	4654714	0
Chetco River	1999	425828	4673738	0
Chetco River	2000	426063	4667826	0
Henry Creek	2000	427334	4670922	0
Quail Prairie Creek	2000	412341	4673980	0
Mineral Hill Creek	2000	405357	4676402	0
Little Chetco River	2000	431611	4669102	0
Tincup Creek	2000	417277	4686469	0
Box Canyon Creek	2000	422982	4680740	0
Chetco River	2000	425734	4667940	0
West Coon Creek	2000	412636	4664426	0
Boulder Creek	2000	417008	4677699	0
Bravo Creek	2000	397520	4665296	0
Emily Creek	2000	402284	4663118	0
West Coon Creek	2000	413221	4664974	0
Quail Prairie Creek	2000	408943	4672913	0
Wilson Creek	2000	402658	4666222	0
Mislatnah Creek	2001	411045	4682422	0
North Fork Chetco River	2001	394357	4669340	0
Red Mountain Creek Tributary	2001	415231	4667169	0
South Fork Chetco River	2001	419185	4666028	0
Eagle Creek	2001	405822	4674190	0.006
Slide Creek	2001	429068	4679022	0
Emily Creek Tributary	2001	408095	4664900	0
Chetco River	2001	425491	4668437	0

Stream	Year	Location		Estimated densities 0+ Coho
		UTM-E	UTM-N	
South Fork Chetco River	2001	413335	4667470	0
Little Chetco River	2001	425876	4673637	0
Tincup Creek	2001	418455	4688579	0
Emily Creek	2001	404363	4663996	0
Nook Creek	2001	410371	4674811	0
Jack Creek	2001	403416	4655199	0
Mineral Hill Creek	2001	405563	4679436	0
North Fork Chetco River	2001	397372	4672144	0
Little Chetco River	2001	428653	4670683	0
Jack Creek	2001	399222	4657155	0
North Fork Chetco Creek	2001	395379	4665865	0
Jack Creek	2001	399873	4656369	0

Table 2.4. Western Oregon Rearing Project Abundance Monitoring of Juvenile Salmonids, Chetco River snorkel survey data, 2003-2004 (Jepsen 2005).

Year	Snorkel Survey Site #	Location	Distance (RM) upstream from Hatchery Release Site	Number of pools sampled for occurrence/density	% of pools containing juvenile Coho	Juvenile Coho density (fish/m ²)
2003	1601	Mainstem	51.6	23/23	0	0.00
2003	1603	Tincup Cr	36.3	31/31	0	0.00
2003	1610	Elk Cr	7.6	34/29	0	0.00
2003	1611	BoxCanyon Cr	41.0	28/28	0	0.00
2003	1615	Eagle Cr	18.7	34/34	0	0.00
2003	1617	Little Chetco	56.1	25/25	0	0.00
2003	1621	Emily Cr	12.5	37/37	0	0.00
2003	1623	S. F. Chetco	16.4	14/14	0	0.00
2003	1626	N. F. Chetco	3.2	6/6	0	0.00
2003	1627	Granite Cr	44.5	20/20	0	0.00
2003	1633	Brokencot Cr	58.8	28/27	0	0.00
2003	1635	Mainstem	34.5	12/12	0	0.00

Year	Snorkel Survey Site #	Location	Distance (RM) upstream from Hatchery Release Site	Number of pools sampled for occurrence/density	% of pools containing juvenile Coho	Juvenile Coho density (fish/m²)
2003	1641	N. F. Chetco	4.5	10/10	0	0.00
2003	1642	Mainstem	37.1	14/14	0	0.00
2003	1644	Little Chetco	57.0	29/28	0	0.00
2003	1646	Mislatnah Cr	29.0	23/23	0	0.00
2003	1648	Emily Cr	11.7	25/25	8	0.002
2003	1652	Mainstem	57.0	21/21	0	0.00
2003	2202	Mainstem	6.6	4/4	0	0.00
2003	2204	Mainstem	3.2	1/1	0	0.00
2003	2205	Mainstem	18.2	4/3	0	0.00
2003	2207	Mainstem	13.1	4/4	0	0.00
2004	1650	Quail Prairie Cr	21.3	33/33	0	0.00
2004	1652	Mainstem	57.0	23/23	17.4	0.005
2004	1654	Mainstem	37.0	16/16	6.3	<0.001
2004	1656	S. F. Chetco	28.9	29/29	0	0.00
2004	1657	Bravo Cr	8.0	31/31	0	0.00
2004	1658	S. F. Chetco	22.4	16/16	0	0.00
2004	1660	Hamilton Cr	2.8	16/15	0	0.00
2004	1665	N. F. Chetco	7.4	21/21	0	0.00
2004	1666	Panther Cr	16.6	20/20	0	0.00
2004	1668	Little Chetco	52.6	25/25	0	0.00
2004	1673	Emily Cr	7.8	19/19	0	0.00
2004	1674	Red Mtn Cr	30.0	21/21	0	0.00
2004	1676	Little Chetco	55.3	21/21	0	0.00
2004	1678	MineralHill Fk	24.4	31/31	0	0.00
2004	1680	Emily Cr	13.6	12/12	0	0.00
2004	1681	N. F. Chetco	11.1	15/15	0	0.00
2004	1682	S. F. Chetco	18.6	16/16	0	0.00
2004	1684	Mainstem	52.6	15/15	0	0.00
2004	1686	Mainstem	31.8	5/5	0	0.00
2004	2208	Mainstem	28.1	3/3	0	0.00
2004	2209	Mainstem	7.5	3/3	0	0.00
2004	2212	Mainstem	16.3	5/5	0	0.00

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

Table 2.1 provides the best estimates of the proportions of hatchery-origin and listed natural-origin Coho salmon on natural spawning grounds. On 12 of 13 years when coho were observed pHOS was 0%. Table 1.16 provides the best estimates of annual proportions of hatchery-origin and natural-origin winter Steelhead on the Chetco natural spawning grounds, Steelhead pHOS ranged between 0 and 14%, 2003 – 2015. Average annual pHOS is 4%.

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of NMFS 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.

Winter Steelhead Broodstock Collection

Adult hatchery and wild winter Steelhead return to the Chetco River later than Coho. Due to the relatively small size of the natural Coho population and earlier returning life history no recorded level of Coho adults have been captured during winter Steelhead broodstock collection. Consequently, incidental capture of adult Coho is likely to remain at a low percentage over time. Hook and line broodstock collection is conducted from December through March. Tangle netting for Steelhead broodstock was discontinued prior to the 2015 season. Any adult Coho captured will be released immediately back into the Chetco River with minimal handling. No adult Coho have ever been captured during tangle netting or hook and line Steelhead broodstock collection.

Smolt Release to Chetco River

Smolt releases likely have minimal impact on Coho juvenile rearing and migration due to the timing (late-March) and size (6 fish/lb) of Steelhead smolt at release, and due to the short distance of the Steelhead seaward migration (approximately 4 miles).

Smolts are released between mid March and mid April at river mile 4.0 (Social Security Bar) with the intent that hatchery produced smolts will migrate to sea prior to peak migration of naturally produced smolts, thus minimizing interactions (Past smolt trapping in south coast streams indicates that peak migration of naturally produced coho and winter steelhead smolts typically occurs between mid-April and mid-May).

While juvenile coho may be present in the lower mainstem/estuary it is expected that most juvenile coho are rearing in tributary streams when hatchery produced steelhead smolts are released and likely would have no interaction. Any naturally produced juvenile coho rearing in the lower mainstem/estuary of the Chetco mainstem at the time of smolt release may be subject to predation by hatchery produced steelhead smolts.

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

Table 2.5. Adult Coho Salmon handled during Chetco winter steelhead broodstock collection, 2000-2015.

Brood Year	Males	Females	Jacks	Injured/Mortality
2000	0	0	0	0/0
2001	0	0	0	0/0
2002	0	0	0	0/0
2003	0	0	0	0/0
2004	0	0	0	0/0
2005	0	0	0	0/0
2006	0	0	0	0/0
2007	0	0	0	0/0
2008	0	0	0	0/0
2009	0	0	0	0/0
2010	0	0	0	0/0
2011	0	0	0	0/0
2012	0	0	0	0/0
2013	0	0	0	0/0
2014	0	0	0	0/0
2015	0	0	0	0/0

- 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).

Approximately 6 adult Coho may be handled during winter steelhead broodstock collection. Mortality of about 2 Coho is expected during brood collection.

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

Options include:

1. Request an increased take limit to observe/handle/release.
2. Discontinue collecting winter Steelhead as take limits are reached.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with ESU-wide hatchery plans or other regionally accepted policies. Explain proposed deviations from the plan or policies.

Oregon Plan for Salmon and Watersheds is a prescriptive set of measures for recovering Salmon and Steelhead populations and habitats, and meeting federal water quality standards, established by Executive Order of the Governor. The Oregon Plan includes measures linked to the hatchery production of Steelhead in the Chetco River Basin including: nutrient enrichment, and monitoring hatchery and wild runs. While many of the particular measures in the OPSW make reference to a particular species, the measures are broadly applicable to all salmonids.

ODFW Native Fish Conservation Policy: The Oregon Fish and Wildlife Commission adopted the policy in 2003 to ensure the conservation and recovery of native fish in Oregon, and manage hatchery based fisheries consistent with conservation of naturally produced native species. Conservation plans will provide guidance for hatchery programs for species within the associated Species Management Units.

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

- 1) ODFW South Coast Basin Plan, Draft 1995
- 2) ODFW Fish Hatchery Management Policy, adopted 2003
- 3) ODFW Fish Health Management Policy
- 4) National Pollutant Discharge Elimination System Permit
- 5) DEQ Memorandum of Agreement: fish carcass distribution in Oregon streams.
- 6) ODFW Native Fish Conservation Policy, adopted 2003.

3.3) Relationship to harvest objectives.

Steelhead smolts released at Social Security Bar, river mile 4.0. The hatchery program emphasizes release of smolts rather than pre smolts or fry. This emphasis is based on intent to minimize the potential for competition between hatchery and wild juvenile salmonids. Adult hatchery Steelhead that return to the Chetco River are intended to remain around the release site and provide anglers with an opportunity to harvest the fish.

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. Also provide estimated future harvest rates on fish propagated by the program, and on listed fish that may be taken while harvesting program fish.

Steelhead harvest on the Chetco River has been affected in recent years by various regulation changes. Anglers were allowed to keep two wild Steelhead per day until February 1998 when the Chetco River was closed to the retention of wild Steelhead. A

limited harvest of 1 wild Steelhead per day and 5 per year was re-instituted on January 1, 2002. Punch card harvest data is listed in Table 3.1. Table 3.2 is hatchery to wild ratio of angler caught Steelhead from creel surveys, 1988 to 2014. The 1993-94, 2011-12, and 2012-13 hatchery to wild ratio was determined based on the ratio of fin-clipped fish. The hatchery to wild ratio from the other creel surveys was determined from scales collected during the creel.

Table 3.1. Chetco River Steelhead Punch Card Data for 1987 to 2013.

Run Year	Estimated Sport Catch
1987-1988	1,701
1988-1989	2,360
1989-1990	1,681
1990-1991	1,252
1991-1992	1,671
1992-1993	1,587
1993-1994	1,295
1994-1995	1,594
1995-1996	1,451
1996-1997	1,783
1997-1998	1,436
1998-1999	751
1999-2000	604
2000-2001	530
2001-2002	1,248
2002-2003	1,456
2003-2004	1,476
2004-2005	2,446
2005-2006	1,889
2006-2007	2,341
2007-2008	2,077
2008-2009	732
2009-2010	929
2010-2011	1,835
2011-2012	2,479
2012-2013	1,986
2013-2014	1,871

Table 3.2. Hatchery to wild ratio of harvested winter Steelhead (from creel surveys).

Run Year	Hatchery		Total sampled
	Number	Percent	
1988-89	98	54 %	183
1990-91	63	33 %	191
1991-92	32	39%	83
1993-94	194	22%	865
2011-12 ¹	1,659	56%	2,951
2012-13 ¹	626	35%	1,810

¹Estimated harvest

3.4) Relationship to habitat protection and recovery strategies.

Major factors affecting natural production include spawning habitat, rearing habitat, ocean conditions, predation, water flows, water quality, and climatic conditions. The Oregon Plan for Salmon and Watersheds lays out measures to be followed by all state agencies including habitat protection, restoration, harvest, and hatchery refinement measures, by Oregon Department of Fish and Wildlife; forest practices revisions by Oregon Department of Forestry; water quality protection by Department of Environment Quality; diversion monitoring by Water Resources Division, and Senate Bill 1010 implementation by Department of Agriculture; all of which are designed to protect and improve salmonid habitat. The Chetco River Winter Steelhead Program is consistent with these habitat protection and recovery strategies.

3.5) Ecological interactions. [Please review Addendum A before completing this section. If it is necessary to complete Addendum A, then limit this section to NMFS jurisdictional species. Otherwise complete this section as is.]

(1) Species that could negatively impact program.

Predation by coastal Cutthroat trout, mink, otters, harbor seals, sea lions, raccoons, blue herons, king fishers, mergansers, cormorants, and gulls could negatively impact out migrating Steelhead smolts.

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

Competition and/or predation by hatchery steelhead smolts on listed (Coho) and candidate (Steelhead and Cutthroat) salmonids are expected to be minimal due to competitive exclusion, spatial and temporal differences in habitat utilization, and relative size of hatchery Steelhead smolts compared to juvenile listed/candidate species.

(3) Species that could positively impact program.

Any fish (Coho, Chinook, Steelhead) that dies (or is recycled for nutrient enrichment) in the basin may positively impact the program.

(4) Species that could be positively impacted by the 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. Hatchery production has potential for significant influence on predator-prey relationships and community ecology during periods of low natural productivity.

SECTION 4. WATER SOURCE

4.1) Provide quantitative and narrative descriptions of the water source, water quality profile, and natural limitations to production attributable to the water source.

Water source for Elk River Hatchery rearing ponds and adult collection is approximately 5-20 cfs of pumped surface water based on seasonal use from the mainstem Elk River. The hatchery intake is equipped with NMFS compliant perforated plate screens. Water quality is generally excellent with low turbidity, incoming dissolved oxygen at approximately 9 ppm and a seasonal temperature range of 42-72°F. At current levels of production no limitations are anticipated. Water rights for this source are listed with ODFW Certificate #54007. All pumped water used for fish production is discharged at the hatchery outlet to the mainstem Elk River. Effluent discharged to the mainstem is permitted, monitored and reported under the NPDES General Permit 300J issued by Oregon DEQ. Elk River Hatchery remains in compliance with DEQ's NPDES permit water quality standards for temperature and effluent discharge. Although low flows can occur in late summer of drought years, water supplies are more than sufficient. Program goals are met easily, and oxygen supplementation and pond recirculation are not required.

Water source for incubation of eggs and fry is approximately 300 gpm from a subsurface well, which provides filtered river water to the hatch house. Water quality is generally excellent with no turbidity, incoming dissolved oxygen at approximately 10-11 ppm and a seasonal (November – May) temperature range of 48-52°F. At current production levels no limitations are anticipated. Water rights for this source are listed with ODFW Certificate #60600.

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

Elk River Hatchery intake is equipped with NMFS specified perforated aluminum panels (3/32" slotted openings April – October and 1/8" slotted openings November – March). Screened area of the intake vault is sufficient to prevent excessive approach velocity on the river side of the screens. Screen openings are sufficiently small to exclude listed Coho juveniles. Discharged effluent limits are not exceeded, and quarterly discharge sampling results are monitored and reported to DEQ as per NPDES permit 300J.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Adult Chetco River winter Steelhead are collected by hook and line in the lower Chetco River.

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

An insulated, chassis mounted, 250-gallon tank with agitation, oxygen supplementation and recirculation used to transport seined adults to the hatchery. An insulated, chassis mounted, 1,800-gallon tank with agitation, oxygen supplementation, recirculation and cab mounted dissolved oxygen sensors is used to transport smolts to the liberation site at Social Security Bar.

5.3) Broodstock holding and spawning facilities.

Adults are sorted by sex into one of two separate 16' x 4' x 3' holding ponds. Spawning facilities include a closed construction, roofed spawn deck with overhead lighting and domestic water supply, concrete and asphalt surfaces for sorting spawned adults, water level monitor and alarm system.

5.4) Incubation facilities.

Elk River Hatchery incubation facilities include a separate 16' x 35' hatch house. A sub-surface well pump provides 300 gpm of filtered well water to 35 stacks of Heath vertical incubators. Each stack consists of 15 usable trays (525 total trays) with combined capacity for 3,150,000 eggs or fry. Of this capacity, approximately 6-10 stacks are used for the Chetco River winter Steelhead project to incubate a maximum of 150,000 eggs or fry annually.

5.5) Rearing facilities.

Elk River Hatchery rearing facilities for this stock include four 17.5' x 75' x 3' modified Burrows concrete ponds for rearing fry to smolts.

5.6) Acclimation/release facilities.

Smolts produced from this stock are loaded onto liberation trucks by forced crowding to a fish pump, and then delivered to the liberation site on Chetco River. No acclimation facilities are used for this program.

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

No operational difficulties or disasters have led to significant fish mortality.

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

No adverse impacts to listed Coho are expected as a result of equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Four permanent, full time employees are trained to respond to emergency situations at all times in any weather conditions. Employees living on station are assigned to be on-call 24 hours/day. An emergency generator provides electricity to buildings and water pumps if commercial power fails. A back-up diesel engine provides power to the incubation well pump if the emergency generator fails. Gas powered water pumps are available for emergency recirculation. An alarm system, which conducts a daily self-check, monitors commercial power supply, intake water supply level, water pump status, and rearing and incubation water levels. Fish Health Services employees perform monthly pathology and pre-liberation examinations. Throughout the annual rearing cycle, trained employees apply disinfection and maintenance protocols to prevent the spread of disease.

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.

Chetco River winter Steelhead are not an ESA listed population. Broodstock source includes all mature winter Steelhead of both hatchery- and natural-origin adults.

6.2) Supporting information.

6.2.1) History.

The propagation program of Chetco River winter Steelhead began in 1969. Prior to 1973, hatchery Steelhead releases into the Chetco River were smolts of Alsea River Stock. All broods of both hatchery- and natural-origin are now collected from the Chetco River.

6.2.2) Annual size.

The goal is to use up to 120 winter Steelhead from wild and hatchery origin fish.

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

The program had been using approximately 68% natural fish in the broodstock (1997-2005). Due to the uncertainty regarding hatchery-wild interactions, a high proportion of natural fish will be incorporated into the broodstock. The program goal is to maintain a

level of at least 65% natural fish in the broodstock.

6.2.4) Genetic or ecological differences.

ODFW staff has detected no genetic, phenotypic, or ecological differences between hatchery and naturally produced Chetco River winter Steelhead.

6.2.5) Reasons for choosing.

Brood selection and spawning guidelines were chosen to best mimic naturally occurring characteristics of the Chetco River winter Steelhead.

6.3) Indicate risk aversion measures applied to minimize adverse genetic or ecological effects to listed natural fish as a result of broodstock selection practices.

No adverse genetic or ecological impacts to listed Coho are expected as a result of broodstock selection practices for Chetco River winter Steelhead.

SECTION 7. BROODSTOCK COLLECTION

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

All broodstock will be mature adult winter Steelhead.

7.2) Collection or sampling design.

Adults are collected by hook and line from December through March in the lower Chetco River.

7.3) Identity.

Adults returning from hatchery origins are identified by external examination for clipped fins (adipose, etc.). All (100%) of the hatchery released smolts are adipose fin-clipped. Naturally reared adults can be identified by the presence of all fins and are generally described as “unmarked”.

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 up to 60 pairs of adults to use for broodstock; however, all collected adults regardless of abundance will be spawned by full factorial matrix.

7.4.2) Broodstock collection levels for 1993-2016 (percentage of wild Steelhead was figured during broodstock collection).

Brood Year	Males	Females	% wild
1993	51	57	nr
1994	60	67	nr
1995	36	54	nr
1996	68	61	nr
1997	50	39	70.8%
1998	48	50	66.7%
1999	59	57	81.7%
2000	43	59	91.3%
2001	51	52	nr
2002	45	52	nr
2003	45	50	32.2%
2004	55	42	60.8%
2005	38	43	75.3%
2006	42	51	71.0
2007	56	63	77.3
2008	53	49	55.9
2009	53	51	66.3
2010	51	47	59.2
2011	49	53	59.8
2012	54	51	68.6
2013	50	50	90.0
2014	52	50	98.0
2015	43	53	80.2
2016	40	46	81.4

nr- not recorded.

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

None. Currently, all fish collected are included in the broodstock.

7.6) Fish transportation and holding methods.

Adults collected for broodstock are placed onto a fish transport truck and hauled for 1.5 hours north to Elk River Fish Hatchery where they are held until they are ripe to spawn. At the Hatchery, adults are supplied with at least 150 gpm of fresh water throughout the holding period. Adults held for broodstock are treated with 1:6,000 hydrogen peroxide to control fungus.

7.7) Describe fish health maintenance and sanitation procedures applied.

All outer clothing, equipment and facilities used during sorting/spawning are hosed down with fresh water and disinfected with dilute iodine prior to the next use. Adults are observed for mortality and stress on a daily basis. Infrequent mortalities are removed from the holding pens immediately. Adults are sorted and examined for ripeness weekly. Ripe adults are removed, euthanized and spawned. Visceral and ovarian fluid samples are collected from 60 fish annually and examined for presence of pathogens by ODFW Fish Health Services employees.

7.8) Disposition of carcasses.

Spawned carcasses and mortalities are given to USDA Wildlife Services for use as bear bait. Some spawned carcasses may be transferred to the Chetco River for distribution in streams to provide nutrient enrichment.

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

Chetco River winter Steelhead is not an ESA listed population. No adverse genetic effects on listed Coho are expected or anticipated as a result of Steelhead broodstock collection. During brood collection, hook and line collection will cease if more than two Coho are captured on any day. All Coho inadvertently captured during steelhead brood collection will be released unharmed with minimum handling stress.

SECTION 8. MATING

Describe fish mating procedures used to meet performance indicators identified previously.

8.1) Selection method.

Adults are sorted and examined for ripeness weekly. All ripe adults discovered during sorting are used to produce a single spawn group on that day.

8.2) Males.

All males are used one time only and no jacks are used.

8.3) Fertilization.

Adults collected from throughout the run are spawned using the full factorial matrix method. Green eggs are gathered from each female and the carcass is inspected internally for signs of obvious pathology. If no signs of pathology exist, a measured portion of eggs from each female is placed into a common vessel. Green eggs are mixed, and then measured into containers equal to the number of ripe males. Sperm from a single male is ejected into a single container of eggs. Sperm from each male used will fertilize some eggs from every female. Age composition of spawned males is variable, but no jacks are used. Fertilized eggs are then water hardened and disinfected in 100 ppm iodophor for one hour prior to fresh water incubation.

8.4) Cryopreserved gametes.

Not used.

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

Chetco River winter Steelhead is not an ESA listed population. No adverse genetic or ecological effects on listed Coho are expected or anticipated as a result of this mating scheme for winter Steelhead. The number of adults (hatchery and natural) used and the full factorial matrix method employed ensure robust diversity and preservation of historic age composition and run timing characteristics of the steelhead 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.

Brood Year	Eggs Taken	% Survival to Eyed	% Survival To Swim-Up
1992	152,634	92.65	95.61
1993	177,901	82.36	90.48
1994	206,164	90.92	95.87
1995	175,367	84.89	94.72
1996	226,818	93.79	97.00
1997	127,770	94.17	90.92
1998	108,091	78.15	83.87
1999	183,984	89.85	85.66
2000	159,718	93.14	79.23
2001	205,252	91.65	77.59
2002	174,795	87.44	71.28
2003	111,752	85.01	61.10

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

Surplus eggs are collected to maximize genetic diversity in every spawn group. Surplus eggs or fry are removed from incubation, frozen and transported to a local landfill.

9.1.3) Loading densities applied during incubation.

Egg size data collected at the hatchery indicates Chetco River stock Winter Steelhead eggs range from about 80-160 eggs/ounce. Initial incubation density is approximately 4,000 eggs/tray in Heath vertical incubators. Well water is supplied at 4 gpm throughout the incubation period. After shocking, eggs are counted and incubated at densities of 2,000-6,000 eggs/tray.

9.1.4) Incubation conditions.

Magnetic floats monitor incubation water level and activate the alarm system when flow is lost or disrupted. Incubation water flow is set, monitored and adjusted daily by trained employees. Ambient incubation temperature is 48-52°F. Incubation temperature is monitored by calibrated thermometer on a daily basis. Incubation temperature is adjusted using 240 V electric heaters to increase temperature by 3°F. Influent dissolved oxygen is 10.9 ppm. Effluent dissolved oxygen is approximately 10.3 ppm.

9.1.5) Ponding.

Fry (1,200 fish/lb) are ponded at approximately 1,100-1,150 temperature units from April through May. Visual inspection confirms that fry are 95-100% buttoned up prior to forced swim up and transfer into modified Burrows rearing ponds. No mean length and weight data are collected routinely.

9.1.6) Fish health maintenance and monitoring.

Fertilized eggs are water hardened and disinfected in 100 ppm buffered iodophor for one hour prior to incubation. Eggs are treated with 1:600 formalin for 3 days on, 3 days off to control fungus. Shocked at the eyed stage, all non-viable and diseased eggs are removed with hand tools or a mechanical picker. Dead and diseased fry are removed prior to ponding using hand tools. All equipment and tools used during incubation are cleaned and sterilized with concentrated iodophor between uses. No yolk-sac malformations have been recorded. All incubators are pressure washed and dried after each season.

9.1.7) Indicate risk aversion measures applied to minimize adverse genetic and ecological effects to listed fish during incubation.

Chetco River winter Steelhead is not an ESA-listed fish, and no adverse effects to listed Coho are anticipated during incubation of program fish.

9.2) Rearing:

9.2.1) Provide recent twelve years' survival rate data by hatchery life stage (fry to fingerling; fingerling to smolt) 1993-2004.

Brood Year	Fry Ponded	% Survival to Fingerling	% Survival to Smolt	Smolts Released
1993	73,820	95.93	99.0	51,210
1994	74,708	91.67	99.0	52,481
1995	73,546	95.59	91.33	51,805
1996	80,931	90.99	98.77	42,924
1997	78,964	82.48	92.95	42,633
1998	75,702	88.92	96.34	51,168
1999	94,543	81.60	88.69	50,953
2000	94,418	89.99	96.12	59,742
2001	102,010	87.77	83.43	49,610
2002	127,209	92.83	85.93	44,453
2003	71,834	92.21	96.93	46,006
2004	77,648	92.31	99.88	49,369

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

Target loading at ponding is approximately 40,000 fry at size 1,200 fish/lb (33.3 lbs of fish) in each of two 17' x 75' x 3' (3,825 cu ft) rearing ponds supplied with approximately 150 gpm of fresh water for the first month. This method equals an approximate 0.222 lb fish/gpm and 0.0087 lb fish/cu ft. As fish grow, water flow increases to approximately 250-500 gpm. Target size at liberation is 6 fish/lb in early April, when pond loads equal 4,167 lbs. This load equals 8.334 lbs fish/gpm and 1.09 lbs fish/cu ft.

9.2.3) Fish rearing conditions

Water sources and rearing facilities are described in sections 4.1, 5.3, and 5.5. Rearing water temperatures are recorded daily. Dissolved oxygen levels are monitored occasionally during high water temperature or low flow events. Pond screens prevent the escape of fish. Avian and mammalian predators are present through the rearing cycle but are not excluded or harassed. Debris and wastes are cleaned from rearing ponds as needed. Standard pond management includes ponding of this stock in the same rearing ponds each year, routine adjustment of water supplies, installation of screens to prevent fish loss, and adjustment of tilt tubes and dam boards to control water height.

9.2.4) Indicate monthly fish growth information including length, weight, and condition factor data collected during rearing.

Routine monthly lengths and condition factors are not collected. See Table below for monthly weights in fish per pound for the last six brood years.

Monthly Growth Information of Chetco River Winter Steelhead for Brood Years 1999-2004.

	1999	2000	2001	2002	2003	2004	Average
March	1054	-	-	-	-	957	1005
April	797	757	-	974	848	1087	893
May	600	687	976	672	593	626	692
June	275	338	277	364	205	202	277
July	98	102	172	100	77	107	109
Aug	36	48	78	56	37	66	54
Sept	21	19	37	39	24	37	30
Oct	16	14	17	20	14	19	17
Nov	14	11	13	14	11	14	13
Dec	12	8	11	11	9.5	11	10.4
Jan	9	7.6	8.8	8.7	8.4	9.2	8.6
Feb	7	6.4	7.3	7.3	7.4	7.5	7.2
March	6	5.4	6	5.8	6.4	-	-
April	5.7	5.1	5.2	5.2	-	-	-

9.2.4) Monthly fish growth rate (average program performance).

Average schedule for 80,000 fish (ponding to Oct) to 50,000 fish (graded to release).

Date	Temp F	Fish/Lb	Lbs Feed/Day	Feed Conversion
31 Mar	52	1050	.25	1.00
30 Apr	54	848	.5	1.00
31 May	57	593	1.5	1.00
30 June	61	205	7	1.02
31 July	67	77	18	1.02
31 Aug	65	37	31	1.10
30 Sept	62	24	32	1.10
31 Oct	56	14	36	1.00
30 Nov	49	11	30	1.10
31 Dec	50	9.5	24	1.20
31 Jan	48	8.4	25	1.20
28 Feb	50	7.4	35-50	1.30
31 Mar	52	6.4	50-60	1.00
30 Apr	54	6.0	55	1.00

9.2.6) Indicate food type, daily ration schedule, feeding rate range and estimates of food conversion efficiency during rearing (average program performance).

Bio-Oregon and Skretting feed products are hand fed to this stock throughout the rearing cycle. Starter diet for each pond is a total of 44 lbs of Skretting #0 Nutra-Plus fed on demand over a period of 20-30 days, followed by 44 lbs of Skretting #1 Nutra-Plus fed on demand over a period of 30-40 days, followed by 88 lbs of Skretting #2 Nutra-Plus fed on demand over a period of 20-30 days. Pellet diet for each pond begins with a total of 154 lbs of Skretting 1.2 mm Nutra-Fry fed on demand over a period of approximately 20-30 days, followed by 242 lbs of Skretting #2 Nutra-Plus fed on demand over a period of 20-30 days. Larger Nutra-Fry pellets, 2.0 mm and 2.5 mm, are introduced on demand as fish grow. After marking and grading in October, the 2.5 mm Bio-Moist Feed (BMF) diet is introduced. At that time, most fish have reached adequate size to be placed on a controlled growth program typified by a scheduled daily ration of BMF. Finishing diet includes 3.0 mm and 4.0 mm BMF fed at a rate of 0.75-1.0% body weight per day. Average feed conversion for this stock for the rearing cycle is 1.1 lbs feed/lb fish.

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

Fish health and behavior are monitored daily. Mortality is picked, discarded and recorded daily. Mortality and treatment records are reported to ODFW Fish Health

Services. Fish Health Services employees perform monthly site visits for routine sampling and pre-liberation examinations. Parasitic and bacterial problems are treated as prescribed by Fish Health Services, and may include antibiotic, flush or bath treatments. Empty rearing ponds are pressure washed and sun dried in preparation for incoming groups of fish. All equipment used in the rearing ponds is disinfected with iodophor or bleach solutions prior to the next use.

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

No gill ATPase analysis is performed. Smoltification is determined by fish behavior, age, size, time of year, scale loss and coloration.

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

Natural rearing strategies include minimal handling of the fish, allowing avian and mammalian predation and restricting human presence near the fish to ODFW staff only.

9.2.10) Indicate risk aversion measures applied to minimize adverse genetic and ecological effects to listed fish under propagation.

Listed stocks are not reared at Elk River Hatchery.

SECTION 10. RELEASE

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

10.1) Proposed fish release levels.

Age Class	Maximum Number	Size (# of fish/lb)	Release Date	Location
Unfed Fry	800	900	March-May	Jack Creek (RM 0.3)
Yearling	50,000	6	March-April	Chetco River (RM 4.0)
Fingerling	30,000	6 - 80	May-April	Babyfoot Lake, Laird Lake, Southard Lake, Foster Lake, Lake of the Woods, Mineral Hill Pond, Libby Pond, Garrison Lake

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

Stream, river, or watercourse:

Chetco River 1700150000, Jack Creek 1700150040, Babyfoot Lake 1505000000, Laird Lake 1708500000, Southard Lake 1509100000, Garrison Lake 1705200000, Foster Lake n/a, Lake of the Woods n/a, Mineral Hill Pond 1709900000, and Libby Pond 1508800000

Release Point:

Chetco River (Social Security Bar, RM 4.0; 42.03496 N, 124.1343 W);
Jack Creek (42.06222 N, 124.2188 W);

Babyfoot Lake(42.22127 N, 123.8039 W);
 Laird Lake (42.70004 N, 124.2020 W);
 Southard Lake(42.65184 N, 124.1203 W);
 Garrison Lake (42.75062 N, 124.5082 W);
 Foster Lake (42.64019 N, 124.1085 W);
 Lake of the Woods (42.60214 N, 124.1179 W);
 Mineral Hill Pond (42.31130 N, 124.1312 W);
 Libby Pond (42.48328 N, 124.3299 W)

Major watershed: Chetco River

Basin or Region: Rogue Watershed District

10.3) Actual number and average size of fish (# of fish/lb) released by age class through the program.

Brood year	Eggs/Unfed Fry ¹	Fry	Fingerling ²	Yearling	Yearling Avg size/lb
2000	310		22,837	48,919	5.2
2001	200		20,242	49,610	5.6
2002	0		28,667	44,453	5.6
2003	300		11,236	46,006	6.3
2004	300		16,546	49,364	5.8
2005	300		7,300	43,034	6.1
2006	400		6,979	27,331	6.4
2007	300		6,317	28,418	8.0
2008	300		0	38,012	6.4
2009	800		0	51,969	5.9
2010	700		1,000	52,637	8.4
2011	700		200	56,676	6.5
2012	800		0	45,801	6.2
2013	600		15,004	44,409	6.0
2014	600		25,508	43,888	6.3
2015	700		0	37,416	6.0

Source: ODFW HMS database.

¹STEP educational projects

²Stocked in standing waterbodies to supplement trout fisheries

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

Release Year	Life Stage	Release Date(s)	Release Type
2004	Yearling	3/25 - 3/26	Crowded/Pumped/Trucked
2005	Yearling	3/24	Crowded/Pumped/Trucked
2006	Yearling	3/22 - 4/11	Crowded/Pumped/Trucked
2007	Yearling	3/20 - 4/9	Crowded/Pumped/Trucked
2008	Yearling	3/27 - 3/28	Crowded/Pumped/Trucked
2009	Yearling	3/26 - 4/2	Crowded/Pumped/Trucked
2010	Yearling	3/25 - 4/9	Crowded/Pumped/Trucked
2011	Yearling	4/7 - 4/19	Crowded/Pumped/Trucked
2012	Yearling	4/17 - 4/19	Crowded/Pumped/Trucked
2013	Yearling	4/8 - 4/10	Crowded/Pumped/Trucked
2014	Yearling	4/21 - 4/22	Crowded/Pumped/Trucked
2015	Yearling	4/20 - 4/22	Crowded/Pumped/Trucked

Source: ODFW HMS database.

Yearling liberation timing is designed for post-emigration of natural Steelhead smolts in Chetco River.

10.5) Fish transportation procedures, if applicable.

Yearling releases are accomplished by lowering rearing pond water levels, crowding fish by hand to a fish pump which loads liberation trucks supplied with agitation/aeration and supplemental oxygen. Time in transit is approximately 1.5 hours. Oxygen is diffused through ceramic air stones at 3 liters/minute. Temperature control is not used or needed.

10.6) Acclimation procedures.

No acclimation devices or procedures are used in this program.

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

All (100%) of hatchery released smolts are adipose fin-clipped.

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

A portion of surplus grade out pre-smolts will be distributed to isolated water bodies to provide a trout fishery for anglers. All water bodies that receive grade out pre-smolts will be screened if an outlet exists. All other surplus program fish will be frozen and disposed of.

10.9) Fish health certification procedures applied pre-release.

ODFW Fish Health Services pathologists perform a pre-release examination within 30 days of the scheduled release of this stock. Identified pathology issues are treated as necessary and prescribed, fish are allowed to withdraw from therapy as recommended, and then the fish are rechecked and released if cleared. Fish deemed unfit for release are destroyed. To not stock fish as scheduled would be a joint decision between the hatchery manager, ODFW Fish Health Services, ODFW Fish Division, ODFW SW Region and Rogue Watershed staff, and consultation with appropriate NOAA Fisheries staff.

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

Emergency release of yearlings to scheduled water bodies may occur at the discretion of the hatchery manager within 60 days of scheduled liberation dates when fish are certified disease free, are within 20% of scheduled release goals and are marked and tagged properly. Emergency release of yearlings earlier than 60 days prior to scheduled release dates would be a joint management decision between ODFW Rogue Watershed staff, ODFW Southwest Region staff, ODFW Fish Division staff, the Elk River Hatchery manager and consultation with appropriate NOAA Fisheries staff.

10.11) Indicate risk aversion measures applied to minimize adverse genetic and ecological effects to listed fish resulting from fish releases.

Rearing and release strategies are designed to minimize ecological interactions that may occur between hatchery and naturally produced fish. Fish are reared to a size which is sufficient to cause 95-100% smoltification within the entire population, reducing retention time during seaward migration. Chetco River stock winter Steelhead are reared on Elk River water for eleven months prior to liberation in the lower Chetco, which is proven to reduce stray rates to natural populations. In addition, yearling releases of Chetco River winter Steelhead occur prior to peak seaward migration of the natural winter Steelhead population in the spring. Rapid emigration is expected and the likelihood of residuals is low, reducing interaction with listed Coho salmon in the watershed. While juvenile coho may be present in the lower mainstem/estuary it is expected that most juvenile coho are rearing in tributary streams when hatchery produced steelhead smolts are released and likely would have no interaction. Any naturally produced juvenile coho rearing in the lower mainstem/estuary of the Chetco mainstem at the time of smolt release may be subject to predation by hatchery produced steelhead smolts.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

This section describes how “Performance Indicators” listed in Section 1.10 will be monitored. Results of “Performance Indicator” monitoring will be evaluated annually and used to adaptively manage the hatchery program, as needed, to meet “Performance Standards”.

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.

Program fish contribute to the freshwater fishery.

Spawning ground surveys on an annual basis (currently funded for 2005-2006). Winter Steelhead smolts will be 100% adipose clipped (currently funded for 2005-2006). Statistical angler creel on an annual basis (not funded).

Release groups will meet ODFW fish health standard.

ODFW fish pathology will sample the hatchery cohorts prior to release (currently funded for 2004-2005).

Conservation plan will be developed for the appropriate Species Management Unit (SMU).

ODFW staff will complete a conservation plan for the Rogue Winter Steelhead SMU, which includes the Chetco River winter Steelhead population (currently funded for 2005-2006).

Hatchery winter Steelhead will not diverge significantly from naturally produced winter Steelhead.

Naturally produced adult Steelhead will comprise at least 65% of the broodstock used in the program. (Broodstock collection crew is currently funded through 2005/2006).

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

Funding level is noted in section 11.1.1

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.

Downstream monitoring techniques will be periodically used to monitor juvenile emigration and size.

All Coho juveniles captured during smolt trapping and estuary seining will be immediately returned to the river.

Conduct spawning ground surveys on an annual basis.

No effect.

Releases made when and where scheduled.

Hatchery maintenance will be up to date and properly funded so emergency releases are not necessary.

Fish health is certified prior to release.

No effect.

Appropriate protocols will be followed for monitoring water quality.

No effect.

Screens will be checked on a regular basis.

No effect.

Record the date and number of Coho captured tangle netting and hook and line.

No effect.

Record the number of Steelhead used for brood.

No effect.

SECTION 12. RESEARCH

No research program will be undertaken under this Chetco River Winter Steelhead program.

12.1) Objective or purpose. N/A

12.2) Cooperating and funding agencies. N/A

12.3) Principle investigator or project supervisor and staff. N/A

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

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

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

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

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

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

12.10) Alternative methods to achieve project objectives. N/A

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

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

SECTION 13. ATTACHMENTS AND CITATIONS

References

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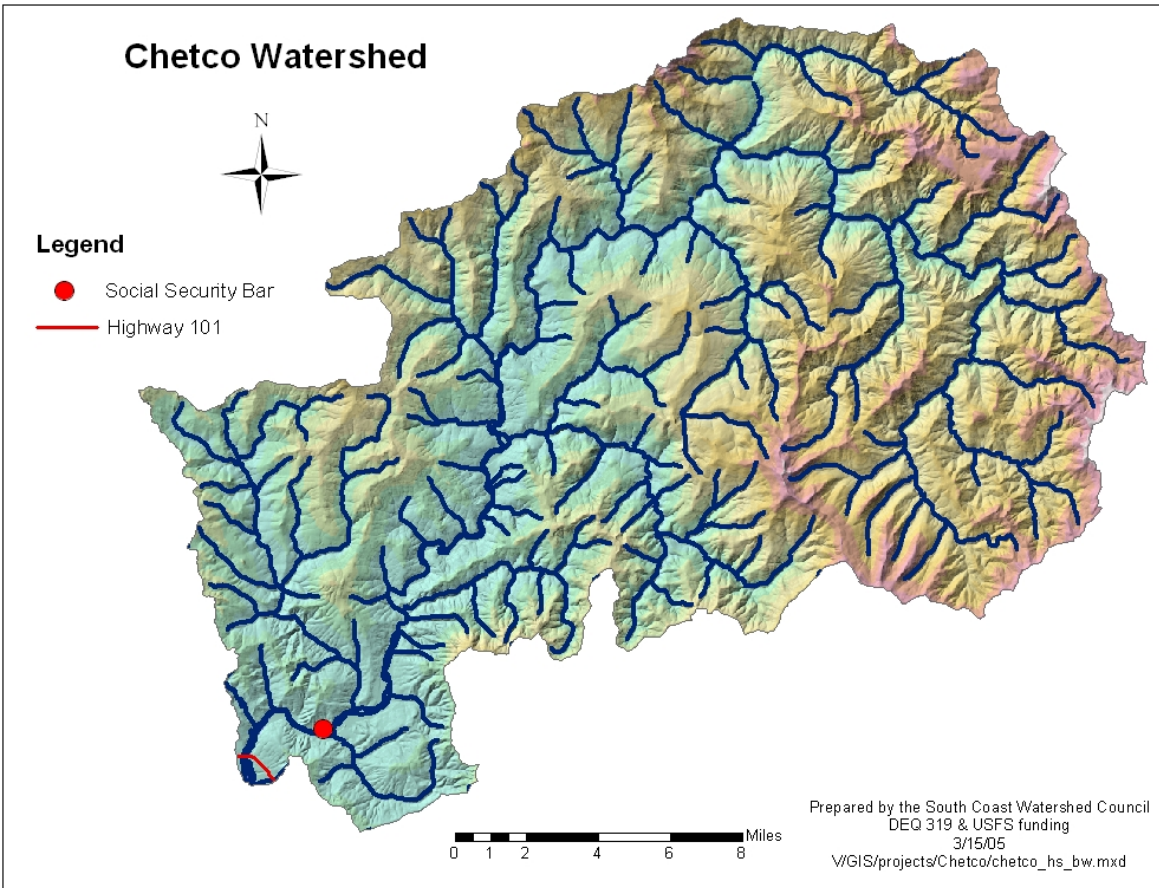
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Williams, T.H., B. Spence, W. Duffy, D. Hillemeier, G. Kautsky, T. Lisle, M. McCain, T. Nickelson, E. Mora, and T. Pearson. 2008. Framework for assessing viability of threatened coho salmon in the Southern Oregon / Northern California Coasts Evolutionarily Significant Unit. NOAA Technical Memorandum NMFS-SWFSC-432.

Map of Chetco Watershed



SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

“I hereby certify that the information provided 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: Russell Stauff, Rogue Watershed District Manager

Signature: _____ Date: _____

Certified by: Scott Patterson, Fish Propagation Program Manager

Signature: _____ Date: _____

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: Coho Salmon ESU/Population: Southern Oregon/Northern California Coast Activity: Broodstock Collection				
Location of hatchery activity: Chetco River (RM 3.0 to RM 16.0) Dates of activity: December 1 – March 31 Hatchery program operator: ODFW				
Type of Take	Annual Take of Listed Fish By Life Stage <i>(Number of Fish)</i>			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			6	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)			2	
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.

Attachment 1. Definition of terms referenced in the HGMP template.

Augmentation - The use of artificial production to increase harvestable numbers of fish in areas where the natural freshwater production capacity is limited, but the capacity of other salmonid habitat areas will support increased production. Also referred to as “fishery enhancement”.

Critical population threshold - An abundance level for an independent Pacific salmonid population below which: compensatory processes are likely to reduce it below replacement; short-term effects of inbreeding depression or loss of rare alleles cannot be avoided; and productivity variation due to demographic stochasticity becomes a substantial source of risk.

Direct take - The intentional take of a listed species. Direct takes may be authorized under the ESA for the purpose of propagation to enhance the species or research.

Evolutionarily Significant Unit (ESU) - NMFS definition of a distinct population segment (the smallest biological unit that will be considered to be a species under the Endangered Species Act). A population will be/is considered to be an ESU if 1) it is substantially reproductively isolated from other conspecific population units, and 2) it represents an important component in the evolutionary legacy of the species.

Harvest project - Projects designed for the production of fish that are primarily intended to be caught in fisheries.

Hatchery fish - A fish that has spent some part of its life-cycle in an artificial environment and whose parents were spawned in an artificial environment.

Hatchery population - A population that depends on spawning, incubation, hatching or rearing in a hatchery or other artificial propagation facility.

Hazard - Hazards are undesirable events that a hatchery program is attempting to avoid.

Incidental take - The unintentional take of a listed species as a result of the conduct of an otherwise lawful activity.

Integrated harvest program - Project in which artificially propagated fish produced primarily for harvest are intended to spawn in the wild and are fully reproductively integrated with a particular natural population.

Integrated recovery program - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), and fish produced are intended to spawn in the wild or be genetically integrated with the targeted natural population(s). Sometimes referred to as “supplementation”.

Isolated harvest program - Project in which artificially propagated fish produced primarily for harvest are not intended to spawn in the wild or be genetically integrated with any specific natural population.

Isolated recovery program - An artificial propagation project primarily designed to aid in the recovery, conservation or reintroduction of particular natural population(s), but the fish produced are not intended to spawn in the wild or be genetically integrated with any specific natural population.

Mitigation - The use of artificial propagation to produce fish to replace or compensate for loss of fish or fish production capacity resulting from the permanent blockage or alteration of habitat by human activities.

Natural fish - A fish that has spent essentially all of its life-cycle in the wild and whose parents spawned in the wild. Synonymous with *natural origin recruit (NOR)*.

Natural origin recruit (NOR) - See *natural fish* .

Natural population - A population that is sustained by natural spawning and rearing in the natural habitat.

Population - A group of historically interbreeding salmonids of the same species of hatchery, natural, or unknown parentage that have developed a unique gene pool, that breed in approximately the same place and time, and whose progeny tend to return and breed in approximately the same place and time. They often, but not always, can be separated from another population by genotypic or demographic characteristics. This term is synonymous with stock.

Preservation (Conservation) - The use of artificial propagation to conserve genetic resources of a fish population at extremely low population abundance, and potential for extinction, using methods such as captive propagation and cryopreservation.

Research - The study of critical uncertainties regarding the application and effectiveness of artificial propagation for augmentation, mitigation, conservation, and restoration purposes, and identification of how to effectively use artificial propagation to address those purposes.

Restoration - The use of artificial propagation to hasten rebuilding or reintroduction of a fish population to harvestable levels in areas where there is low, or no natural production, but potential for increase or reintroduction exists because sufficient habitat for sustainable natural production exists or is being restored.

Stock - (see "Population").

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Viable population threshold - An abundance level above which an independent Pacific salmonid population has a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over a 100-year time frame.

Attachment 2. Age class designations by fish size and species for salmonids released from hatchery facilities.

(generally from Washington Department of Fish and Wildlife, November, 1999).

	SPECIES/AGE CLASS	Number of fish/pound	SIZE CRITERIA
			Grams/fish
X	Chinook Yearling	<=20	>=23
X	Chinook (Zero) Fingerling	>20 to 150	3 to <23
X	Chinook Fry	>150 to 900	0.5 to <3
X	Chinook Unfed Fry	>900	<0.5
X	Coho Yearling 1/	<20	>=23
X	Coho Fingerling	>20 to 200	2.3 to <23
X	Coho Fry	>200 to 900	0.5 to <2.3
X	Coho Unfed Fry	>900	<0.5
X	Chum Fed Fry	<=1000	>=0.45
X	Chum Unfed Fry	>1000	<0.45
X	Sockeye Yearling 2/	<=20	>=23
X	Sockeye Fingerling	>20 to 800	0.6 to <23
X	Sockeye Fall Releases	<150	>2.9
X	Sockeye Fry	> 800 to 1500	0.3 to <0.6
X	Sockeye Unfed Fry	>1500	<0.3
X	Pink Fed Fry	<=1000	>=0.45
X	Pink Unfed Fry	>1000	<0.45
X	Steelhead Smolt	<=10	>=45
X	Steelhead Yearling	<=20	>=23
X	Steelhead Fingerling	>20 to 150	3 to <23
X	Steelhead Fry	>150	<3
X	Cutthroat Trout Yearling	<=20	>=23
X	Cutthroat Trout Fingerling	>20 to 150	3 to <23
X	Cutthroat Trout Fry	>150	<3
X	Trout Legals	<=10	>=45
X	Trout Fry	>10	<45

1/ Coho yearlings defined as meeting size criteria and 1 year old at release, and released prior to June 1st.

2/ Sockeye yearlings defined as meeting size criteria and 1 year old.