

HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Whiskey Creek Hatchery Spring Chinook Salmon Program - STEP
Species or Hatchery Stock:	Spring Chinook Salmon <i>Oncorhynchus tshawytscha</i> , Stock-34
Agency/Operator:	Oregon Department of Fish and Wildlife
Watershed and Region:	North Coast Watershed District, West Region
Date Submitted:	March 22, 2006
First Update Submitted:	October 6, 2008
Second Update Submitted:	October 21, 2014
Third Update Submitted:	August 8, 2016
Date Last Updated:	August 8, 2016

SECTION 1

GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Whiskey Creek STEP/Volunteer operated Salmon Hatchery. Spring Chinook Salmon Rearing Program (stock-34).

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

Spring Chinook Salmon *Oncorhynchus tshawytscha* (stock-34)

This program uses Trask River spring Chinook Salmon (stock-34) which are part of the Oregon Coast Chinook Salmon Evolutionary Significant Unit (ESU), which was listed as Not Warranted under the Federal Endangered Species Act (ESA) on March 9, 1998 (Federal Register Notice 1998).

1.3) Responsible organization and individuals.

Lead Contact:

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

Onsite Lead Contacts:

Name (and title): Robert Bradley, District Fish Biologist
Agency or Tribe: Oregon Department of Fish and Wildlife
Address: 4907 Third Street, Tillamook, Oregon 97141
Telephone: 503/842-2741 ext. 253
FAX: 503/842-8385
Email: Robert.Bradley@state.or.us

Name (and title): Ron Rehn, STEP Biologist
Agency or Tribe: Oregon Department of Fish and Wildlife
Address: 4907 Third Street Tillamook, Oregon 97141
Telephone: 503/842-2741 ext. 244
FAX: 503/842-8385
Email: Ron.F.Rehn@state.or.us

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

Whiskey Creek Hatchery is an ODFW approved volunteer operated facility that operates under the ODFW Salmon and Trout Enhancement Program (STEP). The Whiskey Creek Hatchery stock-34 spring Chinook Salmon program began in 1988. There are no FTEs for this facility; all labor is provided by the hundreds of volunteers associated with this program. Two full-time volunteer caretakers live on site and respond to round the clock emergencies as needed. The Tillamook Anglers secure funding for all operational costs except fish food which has been purchased through the ODFW R&E grant program beginning in 1998. Table 1-1 provides that portion of their operating cost that is provided by ODFW. Table 1-2 provides operational costs and volunteer contributions associated with the program.

Table 1-1. Trask Hatchery Stock 34 Spring Chinook Salmon Program’s Annual Budget, 2001-2007, and 2015 (estimated) Brood Years, and Eyed-eggs produced for Whiskey Creek Hatchery Program.

Brood Year	Total Budget	Percent Cost of Producing Eyed-egg for Whiskey Creek	Eyed-Eggs Produced for Whiskey Creek
2001	\$210,778	< 0.05%	132,075
2002	\$230,085	< 0.05%	110,000
2003	\$268,689	< 0.05%	111,170
2004	\$235,158	< 0.05%	110,000
2005	\$222,911	< 0.05%	110,000
2006	\$256,915	< 0.05%	110,000
2007	\$287,599	< 0.05%	110,000
2015 (est.)	\$328,226	< 0.05%	110,000
Data Source: Trask Hatchery records			

Table 1-2. Whiskey Creek Hatchery (STEP Volunteer Facility) Annual Costs for Spring Chinook Salmon Program, 2001-2006 Brood Years. Values shown are pre-CMP levels.

Brood Year	Release Year	Operational Costs ^a	Volunteer Contribution ^b	Total STEP Cost and Volunteer Contribution	Spring Chinook Released ^c
2001	2002	\$42,703	\$37,631	\$80,334	113,802
2002	2003	\$40,904	\$65,992	\$106,896	79,304
2003	2004	\$58,692	\$43,524	\$102,216	53,085 ^d
2004	2005	\$75,099	\$55,985	\$131,084	102,019
2005	2006	\$60,453	\$41,332	\$101,785	118,001
2006	2007	\$30,992	\$46,804	\$77,796	79,682

Data Source: Tillamook Anglers, District files

^a Feed, equipment, maintenance, repair, etc.

^b Volunteer labor contribution (feeding, pond cleaning, marking, etc.) based on the average wage of non-management, non-agricultural workers. The value of volunteer time is based on the average hourly earnings of all production and nonsupervisory workers on private nonfarm payrolls (as determined by the Bureau of Labor Statistics). Independent Sector takes this figure and increases it by 12 percent to estimate for fringe benefits.

^c Includes fish transported to Hughey Creek Pond, East Fork Trask Pond, and net pens for final rearing.

^d Pump failure at Hughey Creek Pond resulted in substantial mortality.

Figures represent STEP volunteer costs and contribution from transfer into Whiskey Creek Hatchery through release.

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

Whiskey Creek Hatchery is a STEP volunteer-operated facility that is located at the mouth of Whiskey Creek, a tributary to Netarts Bay, approximately 10 miles west of Tillamook. The legal description is Range 10 West, Township 2 South, Section 17. Whiskey Creek Hatchery currently receives 110,000 eyed spring Chinook Salmon eggs from Trask Hatchery annually.

Trask Hatchery is located 8 miles east of Tillamook, adjacent to the Trask River at about river mile (RM) 9.9. Elevation at the hatchery is 40 feet above sea level. Trask Hatchery has two satellite rearing ponds (East Fork Trask Pond [*i.e.* Trask Pond] and Tuffy Creek Pond). East Fork Trask Pond is located 17 miles east of Tillamook, adjacent to the East Fork of South Fork Trask River (ODFW waterbody code 0100130000) at RM 0.5. The South Fork Trask River is a tributary of the mainstem Trask River at about RM 19. (Note: After the 2015 releases, the East Fork Trask Pond will no longer be utilized for rearing as the water intake dam is being removed. Future plans are to transfer fish to Cedar Creek Hatchery- see the Cedar Creek Hatchery Spring Chinook HGMP for a description of that facility). Additional acclimation and adult recapture facilities may be developed elsewhere in the basin as needed in order to meet hatchery stray rate objectives identified in ODFW's Coastal Multi-Species Conservation and Management Plan (CMP).

Adult spring Chinook Salmon are collected primarily at the Trask Hatchery trap which is located at approximately RM 9.8 on the Trask River. Additional broodstock may be collected by seining resting pools.

Spawning and early incubation activities all occur at Trask River Hatchery. Approximately 110,000 eyed-eggs are transferred to the Whiskey Creek STEP facility for rearing to smolt size. The production goal for Whiskey Creek stock-34 spring Chinook is approximately 100,000 smolts (includes approximately 40,000 presmolts transferred to Cedar Creek Hatchery and 25,000 presmolts transferred to Trask Hatchery for final rearing and release into the Trask River, which has been described in a separate HGMP). Whiskey Creek Hatchery retains approximately 40,000 fingerlings (depending upon water conditions) for rearing to smolt size and eventual direct release of 35,000 smolts (12 fish/lb) into the lower Trask River.

1.6) Type of program.

Harvest Augmentation – To increase sport harvest opportunities for adult hatchery spring Chinook by releasing artificially propagated spring Chinook Salmon smolts.

1.7) Purpose (Goal) of program.

The goal of this program is to provide volunteer involvement through the Salmon and Trout Enhancement Program (STEP) which also increases natural resource awareness and provides a volunteer base of individuals, and organizations, desiring to assist ODFW with natural resource program implementation activities. In doing so, this program also provides hatchery fish for sport and commercial harvest in ocean and freshwater recreational fisheries consistent with ODFW's management objectives.

1.8) Justification for the program.

The program is designed to help support consumptive recreational and commercial fisheries in the ocean and local freshwater areas. The program currently releases sub-yearling smolts into the Trask River which have been mass marked since the program began. All fish releases between 1989 and 1998 were given a left ventral fin-clip only. Since 1999, all fish have been given an adipose fin-clip. The local freshwater fishery takes place primarily in Tillamook Bay and the Trask River. Stray fish may be taken in the Wilson River or other Tillamook Bay tributaries, but catch in these areas make up a small percentage of the total annual reported recreational catch. As of 2002, only fin-clipped spring Chinook Salmon could be retained in the recreational fishery.

This program currently releases sub-yearling (ocean-type) smolts to promote rapid migration to the ocean. This strategy is intended to minimize residualism and ecological interactions with naturally-produced juvenile spring Chinook Salmon and other juvenile naturally-produced fish. Standard fish health inspections are done for both adult and juvenile spring Chinook in this program to minimize potential disease concerns.

This program is likely to have minimal direct or indirect effect on the ESA-listed Coho Salmon within the basin. Expected adult return timing of this stock is late March through July. Returns of naturally produced adult Coho Salmon typically do not begin until late

September or after the first fall rains. Incidental impacts from angling pressure are expected to be low during the coho smolt outmigration as trout angling is closed, and spring Chinook Salmon angling gear typically precludes incidental catch of juvenile salmonids.

1.9 & 1.10) List of program “Performance Standards” and “Performance Indicators” designated by “benefits” and “risks”.

Indicator 1 – Harvest

Standard 1.1: Provide adult hatchery spring Chinook Salmon for harvest in such a way as to minimize impacts to naturally produced salmonid populations during the spring Chinook sport fishery. **(Benefit)**

Indicator: Number of stock-34 spring Chinook Salmon caught (Trask and Whiskey Creek programs) and number of angler days generated associated with these programs. **(Benefit)**

Indicator: Estimated number or rate of naturally-produced Coho Salmon and naturally-produced spring Chinook Salmon caught and released. **(Risk)**

Standard 1.2: All Whiskey Creek Hatchery stock-34 juvenile spring Chinook will be externally marked. **(Benefit)**

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

Indicator: Pre-release quality checks indicate a minimum 95% retention of identifiable marks. **(Benefit)**

Indicator 2 – Life History Characteristics

Standard 2.1: Egg collection for the Whiskey Creek Hatchery stock-34 spring Chinook program (collected at Trask Hatchery concurrent with the Trask Hatchery stock-34 spring Chinook program) will be managed to maintain genetic diversity within the population. **(Benefit)**

Indicator: Number of hatchery fish spawned each year, by gender. **(Benefit)**

Standard 2.2: Spring Chinook Salmon eggs, provided by Trask Hatchery, will be collected in a manner that approximates the distribution in timing, age, and size of hatchery fish returning to Trask River Hatchery; however, jacks will generally make up no more than 5% of males spawned. **(Benefit)**

Indicator: Temporal distribution of Trask Hatchery adult spring Chinook Salmon returns and adults collected for broodstock. **(Benefit)**

Indicator: Age distribution of Trask Hatchery adult spring Chinook returns and broodstock spawned. **(Benefit)**

Indicator: Size distribution of Trask Hatchery adult spring Chinook returns and broodstock spawned. **(Benefit)**

Standard 2.3: All Whiskey Creek Hatchery Stock 34 juvenile spring Chinook will be released as sub-yearling smolts to encourage rapid out-migration.

Indicator: Beginning and ending dates of Whiskey Creek Hatchery spring Chinook smolt releases. **(Risk)**

Indicator: Size and length frequencies of Whiskey Creek Hatchery spring Chinook smolts at release. **(Risk-Unknown)**

Indicator 3 – Genetic Characteristics

Standard 3.1: The percent hatchery-origin spawners (pHOS) in the population area will be consistent with goals identified in ODFW's Coastal Multi-Species Conservation and Management Plan. **(Benefit)**

Indicator: Estimated relative abundance of naturally spawning spring Chinook Salmon in the Tillamook Bay basin. **(Benefit)**

Indicator: Estimated relative abundance of naturally spawning spring Chinook Salmon in the Tillamook Bay basin that are of hatchery origin based on marks or tags. **(Risk)**

Standard 3.2: Releases of Whiskey Creek Hatchery stock-34 spring Chinook smolts will be completed using time and location in a manner which reduces impacts to naturally rearing spring chinook and naturally-produced listed Coho Salmon. Any fry or fingerlings in excess of needs for smolt production may be released into standing water bodies without natural Coho Salmon production, or may be destroyed. **(Benefit)**

Indicator: Location and timing of Whiskey Creek Hatchery stock-34 spring Chinook smolt releases. **(Benefit)**

Standard 3.3: All Whiskey Creek Hatchery stock-34 spring Chinook smolts will be released as sub-yearlings (ocean-type smolts) to reduce impacts to naturally produced salmonid populations. Release timing of hatchery-produced smolts may be adjusted as more research based information of outmigration timing of naturally-produced smolts becomes available. **(Benefit)**

Indicator: Beginning and ending dates of Whiskey Creek stock-34 spring Chinook smolt releases. **(Benefit)**

Indicator: Size and length frequency of spring Chinook Salmon smolts released. **(Benefit)**

Indicator 4 – Operation of Artificial Production Program

Standard 4.1: The Whiskey Creek Hatchery stock-34 spring Chinook program will be operated in compliance with ODFW's Hatchery Management Policy, Fish Health Management Policy, and the IHOT fish health guidelines (IHOT 1995). See Attachment A. **(Benefit)**

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

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

Indicator: Health of juveniles will be checked immediately prior to release and only certified fish will be released. **(Benefit)**

Standard 4.2: Whiskey Creek Hatchery water discharges will comply with the DEQ-approved Pollution Prevention Plan. **(Benefit)**

Indicator: Any observations exceeding water quality standards. **(Risk)**

Standard 4.3: Whiskey Creek Hatchery water withdrawals will comply with the National Oceanic and Atmospheric Administration (NOAA) Fisheries juvenile screening criteria. **(Benefit)**

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

Standard 4.4: Carcass placements for stream enrichment comply with ODFW established guidelines or as regulated by DEQ. **(Benefit)**

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

Standard 4.5: Releases of stock-34 spring Chinook smolts will limit impacts to naturally produced juvenile salmonids through control of hatchery release numbers and by minimizing spatial and temporal overlap with naturally produced juvenile salmonids. Sub-yearling smolt releases will be in late summer. Any fry or fingerlings in excess of needs for smolt production may be released into standing bodies of water without natural coho production or may be destroyed. **(Benefit)**

Indicator: Location of juvenile spring Chinook Salmon smolts releases. **(Benefit)**

Indicator: Record of the beginning and ending dates of stock-34 hatchery spring Chinook releases. **(Risk)**

Indicator: Number of stock-34 hatchery spring Chinook smolts released. **(Benefit)**

Standard 4.6: Naturally-produced spring Chinook and Coho Salmon that enter the Trask Hatchery adult trap during broodstock collection, or are collected by other means (e.g. seining) are handled and released in a manner that minimizes stress, injury, mortality, and delay in migration.

Indicator: Number of unmarked spring Chinook and coho collected and released alive at Trask Hatchery. **(Risk)**

Indicator: Number of unmarked spring Chinook and Coho Salmon mortalities at Trask Hatchery during operation of the hatchery adult trap. **(Risk)**

Indicator: Dates of trap operation and frequency of handling trapped unmarked spring Chinook and coho. **(Risk)**

Indicator 5 - Socio-Economic Effectiveness

Standard 5.1: Estimated harvest benefits will equal or exceed hatchery production costs for stock-34 spring Chinook, based on the benefit-cost model (ODFW 1999), or an updated version of that model. **(Benefit)**

Indicator: Annual budget expenditures and estimated harvest benefits. **(Benefit)**

1.11) Expected size of program.

The goal of this spring Chinook Salmon program at Whiskey Creek Hatchery is to produce approximately 100,000 sub-yearling ocean-type spring Chinook smolts. Only 35,000 of these smolts are released from Whiskey Creek Hatchery into the Trask River. The remaining smolts are transferred to Trask Hatchery or Cedar Creek Hatchery for further rearing and eventual release into the Trask River.

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

Broodstock for this program is collected concurrent with broodstock collection needs for the Trask Hatchery stock-34 spring Chinook program (see Trask Hatchery Stock 34 Spring Chinook HGMP). Proposed annual broodstock collection level for these two programs is a minimum of 127 males and 127 females.

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

Table 1-3. Proposed Annual Fish Release Levels – Whiskey Creek Hatchery Stock 34 Spring Chinook.

Life Stage	Release Location	Annual Release Level
Eyed Eggs	NA	NA
Unfed Fry	NA	NA
Fry	NA	NA
Fingerling	Standing waters	Varies, excess ¹
Sub-Yearling Smolt	Trask River	100,000 ²

Data source: ODFW HMS database

¹ This program does not produce fingerling for release as a program goal for stock-34 spring chinook. In any given year there may be surplus fingerling at the time of transfer to rearing facilities (typically resulting from above average fry and fingerling survival).

² Includes 65,000 presmolts transferred to Trask Hatchery and Cedar Creek Hatchery (described in a separate HGMP). Approximately 35,000 smolts are reared to full term and released directly from Whiskey Creek hatchery.

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

Direct estimates of smolt-to-adult survival rates, fishery contribution, escapement, and hatchery returns are not available for the Whiskey Creek Hatchery stock-34 spring Chinook program. However, because there are similarities between the Trask and Whiskey Creek Hatchery programs in broodstock collection, size at release, and release locations in most years, program performance may be inferred from Trask Hatchery

spring Chinook performance (see Trask Hatchery Stock-34 Spring Chinook HGMP). For the 1988 (when the Whiskey Creek program started) to 1999 brood years, the average smolt-to-adult survival rate for Trask Hatchery Stock-34 spring Chinook was 0.30%; adult spring Chinook harvested in ocean sport and commercial fisheries was 13.7 adults per 10,000 smolts released; and adult returns to Trask Hatchery was 16.5 adults per 10,000 smolts released. Survival estimates and fishery contributions for Whiskey Creek spring Chinook may be lower than those observed for the Trask Hatchery spring Chinook program as many of the Whiskey Creek releases up through 2003 were comprised of pre-smolts.

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

The Whiskey Creek stock-34 spring Chinook program began in the fall of 1988, with the first releases in 1989.

1.14) Expected duration of program.

The Whiskey Creek Hatchery spring Chinook program is ongoing and is expected to continue, but is subject to periodic reapplication and review as a rearing project under current STEP Administrative Rules (OAR, 1988).

1.15) Watersheds targeted by program.

The Trask River basin is the release site and desired return site for all spring Chinook released under this program.

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

1.16.1) Brief overview of key issues.

Status of naturally produced spring Chinook Salmon populations – Trask River Basin spring Chinook Salmon are considered to be a life history variant of a Chinook Salmon population that returns from the spring through early winter. The 2014 Coastal Multi-Species Conservation and Management Plan identifies this population as “*Strong-Guarded*” meaning that it is widely distributed, has little if any viability concerns across populations and a lower level of immediate threats that may affect viability in the future. However, either a lack of robust data relative to all VSP parameters or conflicting indications of viability warrant a cautious management approach when providing societal benefits and fisheries, especially with respect to potential threats and limiting factors. Monitoring efforts are being increased to develop a better understanding of this population.

Recycling adult spring Chinook - Recycling adult spring Chinook through the sport fishery provides for increased angling opportunity and some level of harvest on hatchery fish. Recycled hatchery spring Chinook may interact with naturally produced fish if they are not caught and/or do not return to the hatchery. The recycling program is very popular with anglers.

1.16.2) Potential alternatives to the current program.

Note: The alternatives listed are draft. They are presented here as forum for further discussion. This list is not exhaustive and the alternatives listed may not represent final decisions by ODFW.

Alternative 1 - Reduce program size

Description and Implications: This alternative would reduce the number of smolts released. The reduction in program size would reduce the budget at Trask Hatchery and allow savings to be used elsewhere for other programs. Lower release numbers would reduce potential impacts of hatchery spring Chinook on wild populations and could increase wild productivity. This alternative would decrease the consumptive angling opportunity for spring Chinook salmon in the Trask and Tillamook Bay basins, as the fishery is currently restricted to retention of hatchery-produced fish only. This could disenfranchise local and out of area volunteers and anglers. There would be unknown impacts to ocean sport and commercial fisheries. If the wild spring Chinook population is at extremely low levels, the population may be currently supported in part by hatchery supplementation.

Alternative 2 - Eliminate program

Description and Implications: This alternative would eliminate all spring Chinook Salmon production at Trask Hatchery and Whiskey Creek. Loss of the program would reduce the budget at Trask Hatchery and allow savings to be used elsewhere for other programs. This alternative would eliminate potential impacts of hatchery spring Chinook on wild populations and could increase population productivity. Eliminating hatchery releases would substantially decrease the consumptive angling opportunity for spring Chinook Salmon on the North Coast, as the fishery is currently restricted to retention of hatchery-produced fish only. This could disenfranchise local and out of area volunteers. Impacts to ocean sport and commercial fisheries are unknown. If the wild population is at extremely low levels, the population may be currently supported in part by hatchery supplementation.

Alternative 3 - Increase program size

Description and Implications: This alternative would increase the size of the hatchery spring Chinook Salmon program at Trask Hatchery and increase releases the Trask Rivers. Increasing the program size could increase the consumptive angling opportunity, as the fishery is currently restricted to retention of hatchery-produced fish only. This could enhance participation by some out of area volunteers and anglers. Increase in program size may increase the budget and workload at Trask Hatchery unless other program were reduced. This alternative could increase potential adverse impacts of hatchery spring Chinook Salmon on wild populations and could decrease productivity.

1.16.3) Potential reforms and investments.

Whiskey Creek Hatchery

Intake screens at Whiskey Creek Hatchery need to be modified to meet NOAA Fisheries screening standards. In addition, funds are currently being sought to purchase Canadian troughs to be used for early rearing of spring Chinook at Whiskey Creek Hatchery. Fry have previously been ponded directly into the concrete raceway which has led to difficulties with feeding and maintenance.

Trask Hatchery

Improvement of adult collection facilities at Trask Hatchery could provide the opportunity to capture and recycle hatchery spring Chinook Salmon to the downstream fishery. Facility improvements would require a hoist to transfer live finclipped spring Chinook from the T-3 holding pond into a liberation truck for transport downstream. Currently, the trap facility at Trask Hatchery does not have a crane or hoist as there is not a need to handle live fish for loading and transport (all hatchery fish that are removed from the pond are used for production needs or as part of the stream enrichment program). Improved flow through the trap facility would also be needed to improve attraction during periods of low flow. This would require a transfer of existing water rights or apportioning the existing water supply differently.

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 Whiskey Creek spring Chinook STEP program was submitted to NMFS on 03/22/2006 for approval and ESA coverage. This is an updated version of the previously submitted HGMP and is consistent with the ODFW's Coastal Multi-Species Conservation and Management Plan 2014.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

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

Oregon coastal Coho Salmon currently are listed under the federal ESA as *Threatened*. The listed Coho Salmon inhabit the Tillamook Bay basin and may be incidentally affected by the spring Chinook Salmon hatchery program through competitive interactions for food and space, during brood collection and recreational fishing for hatchery fish. The program has no intent to directly take any listed Coho Salmon.

Tillamook Bay Complex

The Tillamook Complex consists tributaries to Tillamook and Netarts bays and one small direct ocean tributary to the north of Tillamook Bay (Nickelson 2001), where listed natural Coho Salmon inhabit. There is an estimated 250 miles of spawning habitat available to the Coho Salmon of this complex.

Coho Salmon Life History

Adult Coho Salmon migrate into fresh water in the fall to spawn. Spawning of wild Coho Salmon usually occurs from mid-November through February. Adult spawning coho salmon are typically 3 years old and are often accompanied by 2-year-old jacks (precocious males) from the next brood. Spawning occurs primarily in small tributaries located throughout coastal basins. The parents normally exhibit strong homing to their natal stream. The female digs a nest (redd) in the gravel and lays her eggs, which are immediately fertilized by accompanying adult males or jacks. The eggs are covered by digging and displacing gravel from the upstream edge of the nest. Each female lays about 2,500 eggs. The adults die soon after spawning. Sex ratios of spawning adults tend to average around 50:50 at most locations (Table 2-1). However, Moring and Lantz (1975) observed 77 percent males in three small Alsea River tributaries over a period of 14 years. They concluded that males tend to move around a lot and visit multiple streams.

The eggs hatch in about 35 to 50 days, depending upon water temperature (warm temperature speeds hatching). The alevins remain in the gravel 2 or 3 weeks until the yolk is absorbed and emerge as fry to actively feed in the spring. Most juvenile Coho

Salmon spend 1 summer and 1 winter in fresh water. The following spring, approximately 1 year after emergence, they undergo physiological changes that allow them to survive in seawater. They then migrate to the ocean as silvery smolts about 10 to 12 centimeters (cm) in length.

Table 2-1. Observations of Coho Salmon Sex Ratio at Adult Traps.

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

The smolts undergo rapid growth in the ocean, reaching about 40 to 50 cm by fall. Little is known of the ocean migrations of Coho Salmon from Oregon coastal streams; however, based on what is known, it appears migrations are mostly limited to coastal waters. Initial ocean migration appears to be to the north of their natal stream (Fisher and Pearcy 1985; Hartt and Dell 1986). After the first summer in the ocean, a small portion 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 (53° 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). Complexity, primarily in the form of

large and small wood is an important element of productive coho salmon streams (Nickelson et al. 1992b; Rodgers et al. 1993). Little is known about residence time or habitat use of estuaries during seaward migration. It is usually assumed that coho salmon spend only a short time in the estuary before entering the ocean. However, recent research is finding that rearing in the upper ends of tidal reaches can be extensive.

The distribution of Coho Salmon within a basin is primarily determined by two factors: marine survival and the distribution of freshwater habitat of different levels of quality. When marine survival has been very poor as in recent years, coho will be found in only the highest quality habitats. Coast-wide, these habitats comprise about 22 percent of the habitat (Nickelson 1998). When marine survival increases, as could occur with a changing climate regime, coho will redistribute into freshwater habitats of lower quality. Thus, coho salmon population dynamics function with a classic “source-sink” relationship among stream reaches.

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

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

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

Indirect or incidental take of listed Coho Salmon may occur due to competitive interactions for food and space between hatchery-origin spring Chinook Salmon and listed natural-origin Coho Salmon. Minimal indirect impact to listed Coho Salmon may also occur due to water withdrawal for hatchery operations, and a few incidental take (catch and release) of listed coho may occur during Chinook Salmon brood collection. Oregon coast steelhead populations are considered a “species of concern”, and may also be indirectly affected by this program. There are no other ESA listed populations in the basin affected by this program.

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

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

The status of listed natural Coastal Coho has been documented by the Oregon Department of Fish and Wildlife in the Oregon Coastal Coho Conservation Plan, in addition to the previously developed Oregon Native Fish Stock Status Report. The following information about the status of the Tillamook Complex Coho Salmon population was taken from Nickelson (2001), which is consistent with the Coho Salmon population status described in the Oregon Coastal Coho Conservation Plan and the Oregon Native Fish Stock Status Report.

The critical population level of Coho Salmon for the Tillamook Complex is 1,000 adult spawners. However, this complex is not considered to be viable because high-quality

habitat is estimated to be present in only 12 miles of stream, below the 15-mile threshold needed to support a viable population.

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

The abundance of wild Coho Salmon spawners in the Tillamook Complex has ranged from about 1,300 to 20,000 and has averaged about 8,500 since 2003 (Figure 2-1 and Table 2-2).

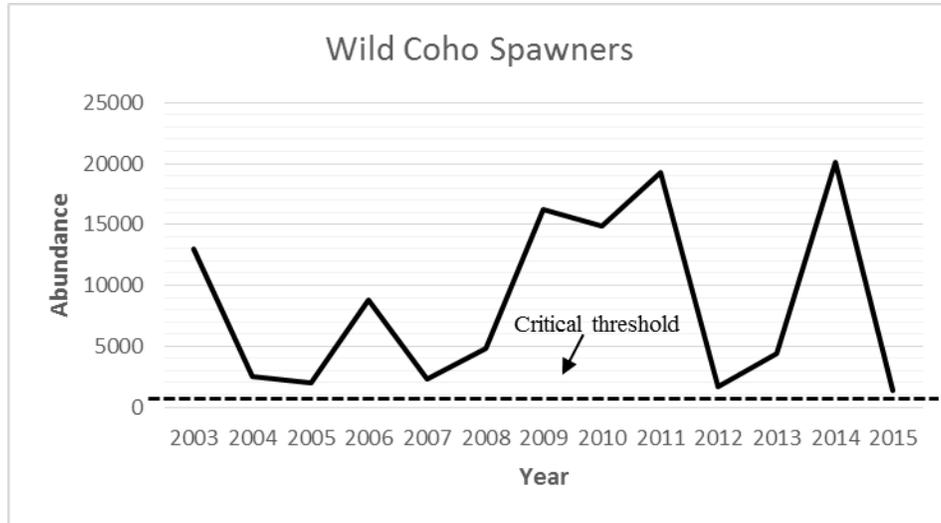


Figure 2-1. Trend in adult wild Coho Salmon spawner abundance relative to the critical population level for the Tillamook Complex, 2003-2015.

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

Year	Wild Spawners	Hatchery Spawners	Percent Hatchery Spawners	Pre-harvest Wild Population	Recruits Per Spawner
2003	13,008	121	1%	14,139	6.5
2004	2,532	828	25%	2,743	1.4
2005	1,995	0	0%	2,087	0.2
2006	8,774	0	0%	9,496	0.7
2007	2,295	134	6%	2,602	1.0
2008	4,828	78	2%	4,922	2.5
2009	16,251	560	3%	17,418	2.0
2010	14,890	110	1%	15,592	6.8
2011	19,250	0	0%	20,457	4.2
2012	1,686	0	0%	2,064	0.1
2013	4,402	304	6%	5,137	0.3
2014	20,090	460	2%	23,470	1.2
2015	1,345	16	1%	1,679	1.0
Avg.	8,565	201	3.6%	9,370	2.2

Source: OASIS; District files

Estimated spawner abundance of Coho Salmon did not fall below the critical threshold of 1,000 fish in any year during this period. Nickelson (1998) estimated that 2,000 spawners were needed to seed productive freshwater rearing habitat during periods of poor marine survival and 5,700 were needed during periods of good marine survival.

Wild smolt production was estimated for the 1997 through 1999 broods. Estimated smolt abundance ranged from 34,000 to 85,000 for the Tillamook Complex (Table 2-3).

Table 2-3. Estimates of Abundance of Juvenile Coho Life Stages Based on Spawner Abundance.

Population Complex	1997 Brood (millions)				1998 Brood (millions)				1999 Brood (millions)			
	Eggs	Fry	Parr	Smolts	Eggs	Fry	Parr	Smolts	Eggs	Fry	Parr	Smolts
Tillamook	0.423	0.275	0.110	0.037	0.339	0.220	0.102	0.034	2.721	1.769	0.286	0.085

Data source: Nickelson (2001)

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

Recruits per wild spawner have been highly variable, with six of the last 13 broods falling to one or below (Table 2-2 above and Figure 2-2).

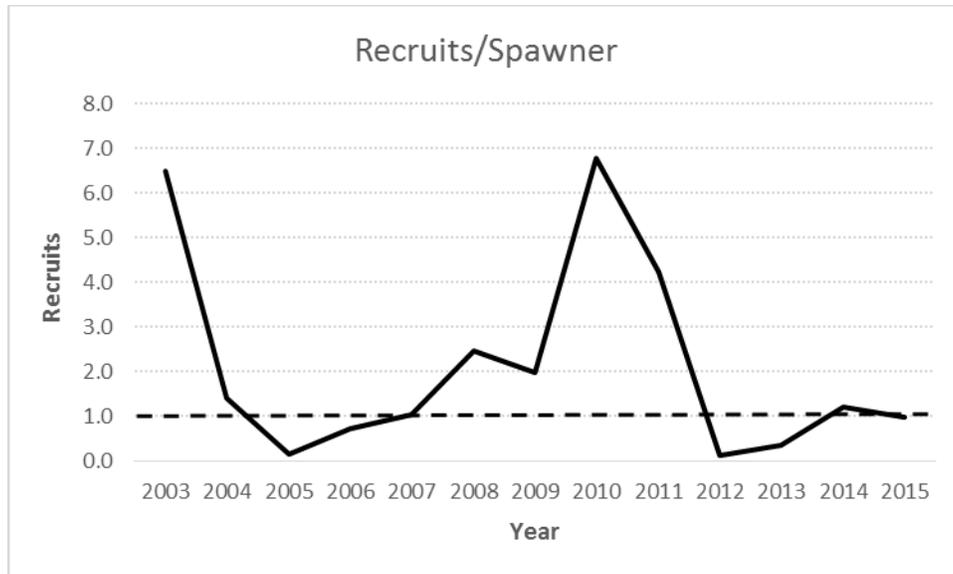


Figure 2-2. Trends in Recruits per Spawner for Tillamook Complex Wild Coho, 2003-2015.

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

Since 2003, hatchery strays have typically comprised a small portion of the Tillamook Complex Coho Salmon population observed on spawning grounds (Table 2-2). The decline is likely related to substantial decreases in hatchery coho production by the early 2000’s, and ceasing to utilize the East Fork Trask Pond for rearing. No data is available for progeny of naturally spawning hatchery coho rearing in the wild.

There was no planned spawning ground survey to estimate the proportion of hatchery-origin Chinook Salmon spawning naturally. However, limited data collected during 2013-2015 revealed that hatchery-origin Chinook Salmon carcasses were less than 5% in Tillamook Bay area.

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.

Past and future hatchery activities that may (have) impact(ed) risk to listed species include:

- Naturally-produced Coho Salmon are captured and handled by hatchery personnel at the T-3 trap on the Trask River (where broodstock for this program are collected) and occasionally at the Gold Creek trap at Trask Hatchery. Hatchery-origin Coho captured at these facilities may be used for hatchery broodstock (described in Trask Hatchery Stock 34 Coho HGMP), donated to food banks, or as part of the stream enrichment program. Naturally-produced Coho Salmon encountered in the traps are generally transported upstream on the Trask River (RM 14) and released (future plans

may include use of some fish for brood if approved). In the case of small numbers, release sites on the Trask River may vary and be located closer to the hatchery.

- No direct handling of adult or juvenile Coho Salmon occurs at Whiskey Creek Hatchery.

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

Naturally produced adult coho are occasionally present in low numbers during trapping periods for spring chinook at Trask Hatchery (where broodstock for this program are collected); therefore, impacts resulting from broodstock collection are expected to be minimal (see Table 2-4). Potential impacts have been listed above; however, there have been no observations or reports of any mortality or injury from those activities.

Table 2-4. Number of unmarked Coho Salmon captured at Trask Hatchery (Gold Creek) and South Fork Wilson River (Tuffy Creek) facilities.

Return Year	Unmarked Adult Coho		Unmarked Jack Coho	
	Gold Creek	Tuffy Creek	Gold Creek	Tuffy Creek
1999-00	0	50	0	0
2000-01	0	193	0	5
2001-02	10	32	0	26
2002-03	8	196	0	10
2003-04	118	26	15	0
2004-05	60	63	15	0
2005-06	96	102	13	13
2006-07	22	129	0	2
2007-08	38	179	5	2

Data source: HMIS

^a Number of coho captured at trapping facilities is the total number encountered for the entire adult trapping season for winter steelhead, coho, fall Chinook, and spring Chinook (August through April).

- Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

See Table 2-5.

- 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.

Trapping of adult stock-34 spring Chinook Salmon for broodstock occurs primarily at the adult trap at Trask Hatchery (T-3). If incidental handling of naturally-produced Coho Salmon at Trask Hatchery or in any of its facilities is expected to exceed projections, trap facility handling procedures will be modified immediately. This may include, but is not limited to, review of procedures and operation, trap modifications, cessation of trapping, modified operation by hatchery personnel, improved training, etc. No direct handling of adult or juvenile Coho Salmon occurs or is planned at Whiskey Creek Hatchery.

Table 2-5. Estimated Listed Salmonid Take Levels by Hatchery Activity at Trask Hatchery (Note: Coho adults or juveniles are not handled at Whiskey Creek Hatchery. All broodstock collection occurs at Trask Hatchery).

Listed Species Affected: OCN Coho		ESU/Population: Oregon Coast Coho		Activity: Spring Chinook broodstock trapping	
Location of Hatchery: Trask Hatchery and Tuffy Cr.		Dates of Activity: August 15 through Oct. 15		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)	0	0	0	NA	
Collect for transport b)	0	0	0	NA	
Capture, handle, and release c)	0	0-100*	0-750**	NA	
Capture, handle, tag/mark/tissue sample, and release d)	0	0	0	NA	
Removal (e.g. broodstock) e)	0	0	0-50	NA	
Intentional lethal take f)	0	0	0	NA	
Unintentional lethal take g)	0	<10*	<10***	NA	
Other Take (specify) h)					
<p>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.</p> <p>* Juvenile coho are typically not handled during hatchery operations, but are present and could occasionally be encountered. ** All unmarked, naturally produced coho adults trapped are passed upstream of the hatchery facility. *** No direct mortalities have been observed during trap and pass operations.</p> <p>Note: The take figures are not cumulative take at the facility but are total take for the indicated trapping period. Collection of spring chinook broodstock may overlap with trapping of fall chinook and coho. The number of unmarked coho handled represents a season total during spring chinook collection, and is not necessarily additive to numbers presented in other HGMP's.</p>					

SECTION 3

RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

- 3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the *NPPC Annual Production Review Report and Recommendations - NPPC document 99-15*). Explain any proposed deviations from the plan or policies.
- **Native Fish Conservation Policy** - The Oregon Fish and Wildlife Commission has approved the Native Fish Conservation Policy (NFCP). The NFCP required the development of a conservation plan which was completed in 2014 and is described below.
 - **Coastal Multi-Species Conservation and Management Plan (CMP)** – This plan addresses conservation and management of anadromous salmonids (salmon, steelhead and trout) on the Oregon coast from Cape Blanco to Seaside. The CMP is unique from other conservation plans in that it addresses both conservation and utilization of six distinct groups of fish species, none of which are listed under the ESA. In addition to meeting requirements of the Native Fish Conservation Policy, the CMP provides long-term management direction for species which are relatively healthy, with the intent to help ensure the continued existence of wild fish and the fisheries which wild and hatchery fish support. The program is consistent with ODFW’s CMP 2014.
 - **Fish Hatchery Management Policy (FHMP)** – This policy provides guidance for the responsible use of hatchery-produced fish. It outlines the best management practices for hatchery programs to ensure conservation and management of both naturally produced native fish and hatchery produced fish in Oregon. The FHMP calls for the development of Hatchery Program Management Plans (HPMPs) to outline the hatchery practices that will be followed for each hatchery program. A HPMP may be a Hatchery and Genetic Management Plan (HGMP) or an aspect of conservation plan developed under the Native NFCP. For the Oregon Coast Coho SMU, the conservation plan has been developed and adopted by the Commission, and this program is consistent with Coho Salmon conservation plan.
 - **Oregon Plan for Salmon and Watersheds:** The program is consistent with measures identified for hatchery programs in the *Oregon Plan for Salmon and Watersheds*.

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, Governors Executive Order EO 99-01:

The Oregon Plan for Salmon and Watersheds is a prescriptive set of measures for recovering threatened and endangered salmon and steelhead, and meeting federal water quality standards, established by Executive Order of the Governor. The Oregon Plan includes measures linked to the hatchery production of spring chinook in the Tillamook Bay watershed including nutrient enrichment, acclimation and other separations of hatchery and wild production, and monitoring of hatchery and naturally-produced runs.

NPDES Permit and Pollution Prevention Plan:

The Whiskey Creek Hatchery operates under a DEQ-approved Pollution Prevention Plan. The Trask Hatchery is operated under the NPDES 300-J general permit to maintain the environmental standards of hatchery effluent.

Salmon and Trout Enhancement Program:

The STEP component of the program operates under an ODFW approved STEP Fish Propagation Project Proposal consistent with OAR 635-09-090 through 635-09-140. Projects are permitted for a 5-year period and must be renewed for program continuance. This project will need to be re-approved for operation in October 2008. A copy of the proposal is on file at the North Coast Watershed District Office, 4907 Third Street, Tillamook, OR 97141. A copy of the most recent review of this program by ODFW's Fish Division Staff is included in Attachment B.

Facility Lease Agreement with the Oregon State University:

The Whiskey Creek Hatchery is located on property owned by Oregon State University. The Tillamook Anglers, who operate the facility, have a lease agreement with the University for the property.

3.3) Relationship to harvest objectives.

The artificial production component of this project is designed to minimize biological impacts to listed species. Likewise, fish culture practices are designed and carried out to rear smolts to size and condition that limit impacts to naturally rearing coho.

These hatchery spring Chinook Salmon are mass marked (100% marked) as a means of integration of hatchery and harvest management. Mass marking allows for selective harvest of hatchery fish while requiring release of all naturally-produced fish. Mass marking also allows for better monitoring and control of impacts of the hatchery program to naturally-produced spring Chinook Salmon populations. Incidental take of naturally-produced Tillamook Basin Coho Salmon in harvests is limited by the ESA Section 4(d) rule. The 4(d) rule requires development of Fishery Management and Evaluation Plans (FMEP). Such plans have been developed and will be guided by the Pacific Coast Salmon Plan, specifically Amendment 13 (Pacific Fisheries Management Council [PFMC] 1997). Under recent conditions of marine survival and abundance, the take is limited to less than 10-30% of the total, preharvest Oregon Coast ESU naturally-

produced Coho Salmon abundance. Take could increase to 35% if conditions improve (PFMC 1997). This standard is adopted as adequate for controlling incidental harvest impacts in this plan, pending completion of FMEPs. All further address of harvest impacts will occur under the FMEPs. Estimated harvest impacts (ocean and freshwater combined) on naturally-produced coho for the period 1994 through 1999 averaged 9.2% and ranged from 6.8% to 12.4%. Year 2000 harvest impacts were estimated to be about 8%.

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

The spring Chinook Salmon freshwater and ocean sport, and ocean commercial Chinook fisheries will benefit from this program. Angling regulation changes for spring Chinook, beginning in 2002, restricted the spring Chinook fishery in the Tillamook Bay Basin to fin-clipped fish only. Prior to this, enumeration of hatchery spring Chinook retained in the sport fishery was not possible. Section 1.12 provides additional information on fishery performance.

3.4) Relationship to habitat protection and recovery strategies.

This isolated harvest program is not directly related to habitat protection or recovery. It is designed to provide hatchery spring Chinook Salmon for harvest in ocean sport and commercial fisheries and freshwater sport fisheries, while other actions are taken to protect and restore habitat. Management of the hatchery program will focus on attaining harvest objectives using methods that minimize impacts to naturally-produced fish and their habitats.

Major factors affecting natural production in the Trask River are largely unknown; however, it is assumed that ocean survival may be the largest contributing factor. In general, habitat condition in the Trask River is slowly improving. A series of fires in the mid- to late- 1930s (Tillamook Burns) drastically impacted habitat with loss of shade, increased sedimentation, and loss of stream complexity. The basin is now recovering to a forest condition with some shade and sedimentation impacts reduced; however, there is still a lack of instream complexity throughout the system. Flood events are common in the basin and can have detrimental effects on egg depositions and juvenile rearing.

Habitat restoration projects conducted over the past seventeen years or more (on state, federal, and private timberlands, which make up the majority of the basin ownership) have worked to address instream complexity concerns. Watershed council volunteers have been active in addressing and implementing riparian improvements on private lands within the basin. Fish passage structures believed to impede migrations (primarily culverts) are evaluated and being addressed on these lands as well as on major highways and county road systems. Current fish passage laws require the addressing of all impediments to migration when passage statute criteria are triggered, thus fish passage in these basins should continue to improve over time.

3.5) Ecological interactions.

(1) Species that could negatively impact program:

Competition for food between Whiskey Creek Hatchery spring Chinook Salmon smolts and other hatchery and naturally-produced smolts in the Tillamook Bay estuary and near shore ocean environment may negatively impact this program. Avian and marine mammal predation may also negatively impact this program.

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

Competition for food between Whiskey Creek Hatchery spring Chinook Salmon smolts and naturally-produced salmon and steelhead juveniles in the Tillamook Bay estuary and near shore ocean environment may negatively impact the naturally-produced juveniles. Straying of Whiskey Creek Hatchery spring Chinook to natural spawning areas can negatively impact populations through interbreeding that may reduce genetic fitness of the naturally-produced population. Large concentrations of hatchery fish may attract predators causing increased predation on hatchery and naturally-produced salmon and steelhead juveniles. Increased angling pressure on hatchery spring Chinook may increase incidental mortality on spring Chinook (primarily adult), and steelhead stocks (both adult and juvenile).

(3) Species that could positively impact program:

Increased abundance of naturally produced spring Chinook Salmon may positively impact this program by easing management concerns over stock viability and by providing naturally-produced fish for incorporation into the hatchery broodstock.

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

Stock-34 spring Chinook carcasses from this program and the Trask Hatchery spring Chinook program are used in stream enrichment programs. The nutrients provided by these carcasses should benefit salmonid and non-salmonid fishes in the streams where the carcasses are placed. Carcasses used in the stream enrichment program are placed according to ODFW established guidelines or as regulated by DEQ.

General Information

Interactions between migrating spring Chinook hatchery smolts and Oregon Coast coho are likely to be minimal. Spring Chinook are reared to smolt size and expected to migrate upon, or soon after, release. Whiskey Creek Hatchery production smolt releases are primarily in lower sections of the mainstem Trask River. These typically are areas with limited rearing of naturally-produced juvenile coho. Target release size is 12 fish per pound. Release timing is typically late July, which is well after the naturally-produced coho smolt migration timing of April and May (Solazzi et al. 2000). All release groups are sampled and disease tested by ODFW Fish Health staff and cleared before release. It is possible that some hatchery spring Chinook juveniles may residualize after release, but it is anticipated that interaction(s) between residual spring Chinook and rearing coho are minimal based upon their species-specific rearing and life history characteristics.

Monitoring of naturally spawning Spring Chinook is not routinely conducted, thus little information on the proportion of naturally spawning hatchery fish is available. Grant funded surveys were conducted from 2005-2008 in north coast basins (ODFW 2008; ODFW 2013). Additional surveys were conducted in the Wilson River in 2015 by the Tillamook District (ODFW unpublished data). Observed hatchery fish on spawning grounds generally exceeded 50% of the naturally spawning population. However, Spring Chinook hatchery releases were modified in 2015 with the implementation of the Coastal Multi-Species Management Plan. Thus, in the future the proportion of hatchery fish is likely to differ from the previous surveys. No data will be available for several years until returns include all year classes from these modified hatchery releases.

Habitat Above Trapping Facilities

Broodstock for this program are collected primarily at the T-3 trap at Trask Hatchery. The T-3 trap is supplied from water diverted from Gold Creek. The trap located directly on Gold Creek (T-9) at Trask Hatchery is operated to collect spring Chinook broodstock only when late summer flows allow spring Chinook to enter Gold Creek.

Gold Creek (Trask Hatchery facility)

Aquatic inventory of habitat above the trap weir on Gold Creek was completed in 1993; however, it should be noted that several major flood events have occurred in subsequent years and the data presented may have changed substantially.

Gold Creek is a third-order stream. The area surveyed above the weir was approximately 5,245 meters with an overall gradient of 9.8%. The large wood debris condition score is low at 1.4 on a scale of 1 - 5 with 1 being woody debris absent or in very low abundance; and 5 being woody debris providing excellent persistent and complex habitat (Moore et al. 1997). The habitat is dominated by cascades and rapids over boulders. Overall stream complexity is low, with a minor amount of secondary channels present (OFIC/ODFW, 1993).

The North Fork of Gold Creek is a second-order stream. The area surveyed was approximately 5,504 meters with an overall gradient of 10.0%. The large wood debris condition score is considered low to moderate at 1.8 (Moore et al., 1997). Pools were present in approximately 30% of the first 1,000+ meters; however, the habitat overall was dominated by cascades and rapids over boulders. Stream complexity is low with a minor amount of secondary channels present (OFIC/ODFW, 1993). This system was known to have a number of debris torrents associated with the 1996 flood event.

Resident cutthroat trout are present in both systems. No fish are intentionally passed above the trap weir at this time; however, Coho Salmon and winter steelhead may be passed in the future once screens have been upgraded to NOAA standards. Given the low summer flows in Gold Creek in most years, Gold Creek does not provide suitable spawning habitat for spring Chinook. Gold Creek provides Trask Hatchery's main source of rearing water.

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.

Whiskey Creek Hatchery: Approximately 110,000 eyed-eggs are transferred from Trask Hatchery to Whiskey Creek Hatchery for rearing. Whiskey Creek Hatchery receives its water from Whiskey Creek. A small diversion dam diverts water into a pipeline that supplies water to the hatchery. The water is screened at the point of diversion but does not meet NOAA screening requirements. Whiskey Creek is a small coastal basin that is subject to wide variations in flow and is dependent on regular rainfall. The hatchery uses approximately 6 gallons per minute (gpm) per incubation stack during egg incubation. During rearing, water use varies from 100 gpm to 700 gpm. Stream flow levels are the primary determining factor of water use during rearing. Low spring and summer flows contribute to the need to transfer some production as presmolts to other facilities to maintain safe loading levels in the pond and maintain overall fish health. The Oregon Legislature passed a bill (ORS 536.050) that exempts STEP rearing projects from the need for Water Rights. Water temperatures during incubation range from 34° to 49° F. Water temperatures during the rearing stage typically ranges from 34° to 62° F.

Trask Hatchery: Adult spring Chinook (Stock 34) are generally trapped and held at the Trask River Hatchery in a pond (T-3) supplied with gravity flow water from Gold Creek. These are the broodstock source for the Whiskey Creek Stock-34 Spring Chinook Program. Other operational details for Trask Hatchery can be found in the Trask Hatchery Stock-34 Spring Chinook HGMP.

A portion (~40,000) of the Whiskey Creek Hatchery presmolts are transferred to Cedar Creek Hatchery. See the Cedar Creek Hatchery Spring Chinook HGMP for a description of that facility.

Trask River Hatchery and Cedar Creek Hatchery currently operate with a 300J NPDES permit. Whiskey Creek Hatchery is not subject to 300J NPDES permitting requirements but does have DEQ approved Pollution Prevention Plans. Compliance with the NOAA Fisheries screening criteria will be based on rearing systems inspection results (at all three facilities) completed by the fish screen passage program leader and staff. Any necessary modifications will be made as funding allows.

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

The risk of take at Whiskey Creek Hatchery is low because existing intake screens typically preclude entrainment of juvenile fish, and densities of coho in the Whiskey Creek basin are relatively low as the basin lacks much suitable habitat. The risk of take

at Trask Hatchery is minimal because listed fish are not currently present above the trap facilities and Gold Creek water intake structures. Coho Salmon are not present upstream of the Cedar Creek Hatchery water intake on Cedar Creek, and the pumping station on Three Rivers is screened to NOAA criteria. Intake screens at Whiskey Creek Hatchery will be evaluated in the future.

Whiskey Creek Hatchery is not subject to 300J NPDES permitting requirements but does have a DEQ approved Pollution Prevention Plan and hatchery effluent is visually monitored. All hatchery effluent from Trask Hatchery and Cedar Creek Hatchery is monitored and reported quarterly under a National Pollutant Discharge Elimination System (300J) permit. All conditions of the permit are administered within ODFW and regulated by the Oregon Department of Environmental Quality.

SECTION 5

FACILITIES

Adult collection, spawning, and initial rearing to the eyed-egg stage of Whiskey Creek Hatchery stock-34 spring Chinook occurs at Trask Hatchery. Trask Hatchery transfers 110,000 eyed-eggs to Whiskey Creek Hatchery for rearing. All fish are fin-marked by volunteers at Whiskey Creek Hatchery prior to release or transfer to other rearing facilities. Once fin-marked, approximately 65,000 fingerlings are transferred to Cedar Creek Hatchery and/or Trask Hatchery. Whiskey Creek Hatchery retains approximately 40,000 for final rearing to smolt size and eventual direct release of 35,000 smolts into the Trask River.

5.1) Broodstock collection facilities (or methods).

Trask River hatchery-origin spring Chinook Salmon adults are collected primarily in the mainstem Trask River trap located at RM 9.8 at Trask Hatchery. During the summer, adult spring Chinook hold in a large pool in the Trask River that is below the trap entrance. Water flow diverted from Gold Creek attracts adult spring Chinook entering the T-3 trap via a fish ladder located at the upstream end of the holding pool. Once fish enter the trap, they are manually sorted and held in the collection facility until spawning in September. Unmarked spring Chinook Salmon that enter the trap are transported upstream (usually RM 14).

In some years, following heavy late-summer rains, some spring Chinook Salmon will enter Gold Creek and the Gold Creek trap will be operated. Fish enter the Gold Creek trap via a fish ladder with attraction flow provided by diverted Gold Creek water. Adult hatchery spring Chinook captured in the Gold Creek trap are usually loaded into a liberation tank and hauled to the T-3 trap for holding.

During some extreme low water years when adult spring Chinook fail to enter the trap, it has been necessary to use seines or tangle nets deployed from boats to collect adult spring Chinook for broodstock. This has only been necessary a couple of times in the past 30 years.

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

Eyed eggs are transferred from Trask Hatchery to Whiskey Creek Hatchery using personal vehicles provided by volunteers. Volunteers use the hatchbox trays and cover the eyed-eggs with wet burlap during transport. Transport time is usually less than 30 minutes. The North Coast Watershed District has one small stainless steel transport tank used for fry and a 200-gallon tank that can be loaded in a pickup truck used for transporting juveniles. In addition to these, Whiskey Creek Hatchery may utilize four other types of fish transportation equipment for the transportation of juveniles from the hatchery to acclimation, rearing, or release locations.

- a) A typical fish liberation unit of a cab-over flatbed truck with a 1,000-gallon fiberglass tank. The unit has a 12-inch outlet for releasing adults if needed. It also is equipped

with recirculation pumps and an oxygen injection system, which utilizes carbon stones. The governing factors that determine the loading densities are: water temperature in the tank, water temperatures at the receiving water body, duration of transit, and size and species of fish to be hauled.

- b) A portable fish liberation unit, which consist of a 300-gallon slip tank that fits onto the bed of a 1-ton pickup truck. The portable liberation unit is equipped with an electric aeration system and an oxygen injection system. The governing factors determining loading densities are the same as identified for the 1,000-gallon liberation unit.
- c) A 3,000-gallon tractor-trailer unit which consists of a truck and a stainless steel tank on a fifth-wheel trailer. The tank trailer is equipped with electric aerators for circulation. In addition, there is bottled oxygen with carbon defusing stones for oxygen replenishment.
- d) A 430-gallon trailer mounted stainless steel tank with recirculation pump and oxygenation system.

5.3) Broodstock holding and spawning facilities.

Trask Hatchery holds stock-34 spring Chinook Salmon broodstock in one 37-foot by 20-foot by 3-foot (working volume) holding pond (T-3). This holding pond receives water by gravity flow from Gold Creek via ponds 1 and 2. During the time of collecting and holding adult fish for spawning the pond has an average water flow of 1,200 gpm. Minimum water flow levels could be as low as 700 gpm. This trap facility has a spawning shed structure where spawning apparatus is stored and spawning activities are conducted.

5.4) Incubation facilities.

Incubation to the eyed egg stage occurs at Trask Hatchery in vertical incubator trays supplied with gravity flow water from Gold Creek and Mary's Creek. Flow rate for incubation is 4.5 – 5.0 gpm. A low-water alarm system (mercury float type) is in place to detect interruption of water flow to the incubator trays. Incubation of eyed eggs occurs at Whiskey Creek Hatchery in eight Heath-style incubator trays supplied with gravity flow water from Whiskey Creek. A low-water alarm system is in place to detect interruption of water flow to the incubator trays. Flow rates at Whiskey Creek Hatchery during incubation are 5-7 gpm. Discharge water is returned directly to Whiskey Creek immediately above its confluence with Netarts Bay.

5.5) Rearing facilities.

Three Canadian-style troughs are used for ponding and early rearing of Whiskey Creek Hatchery's spring Chinook Salmon fry. Once the fish reach maximum capacity in the Canadian troughs, they are transferred to a concrete raceway which has a capacity of 6,000 pounds of fish. Summer water availability requires that some fish are transferred to other facilities prior to reaching smolt size. Flow range during the rearing period is 100

to 700 gpm. The pond has a center wall allowing for the creation of two completely separate ponds if needed. Keyways for screens allow further subdivision of the pond.

As the fish at Whiskey Creek Hatchery begin to reach maximum density, a portion of them (approximately 65,000) are transferred to Cedar Creek Hatchery (40,000) and Trask Hatchery (25,000) for final rearing. These fish at Cedar Creek Hatchery are mixed with the Trask Hatchery program fish.

See Trask Hatchery stock-34 Spring Chinook Salmon HGMP for a description of rearing facilities at Trask Hatchery.

See the Cedar Creek Hatchery spring Chinook Salmon HGMP for a description of rearing facilities at Cedar Creek Hatchery.

Generally, ~40,000 spring Chinook Salmon fry are retained (determined by fish size and water flow) at Whiskey Creek Hatchery and complete rearing in the concrete raceway for an eventual release of 35,000 smolts into the Trask River.

5.6) Acclimation/release facilities.

Approximately 35,000 smolts are directly released from Whiskey Creek Hatchery to Trask River. An additional 65,000 smolts are released along with Trask Hatchery program fish reared at Trask Hatchery and Cedar Creek Hatchery (described in a separate HGMP).

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

Whiskey Creek Hatchery is a volunteer operated facility with minimal direct oversight from ODFW personnel. ODFW staff regularly visits the facility to conduct fish health checks, check feeding schedules and provide training to volunteers responsible for its operation. However, the day-to-day operation of the facility depends upon the volunteers. Experienced volunteers also assist ODFW in the training of new volunteers. The facility has one residence on the site that is occupied by a caretaker. Egg-to-fry and fry-to-release survival are shown in Tables 9-1 and 9-2, respectively. Interrupted water flows have been the cause for the most mortalities. The volunteers have been improving the alarm systems to help minimize future losses. Float switches have been placed in each stack in the incubator room to monitor water supplies and flow meters have been placed into the inlet lines or the pond. Aerators and a back-up generator have also been purchased. ODFW staff continues to work with the volunteers to improve all aspects of operation of the facility.

In 2007 (brood year 2006), a change in feed from moist to dry starter diet led to significant pin-heading and subsequent losses. Changes in starter feed have been made and appear to have corrected the problem.

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.

No listed fish are under propagation in this program. However, equipment failures at rearing facilities could potentially lead to juvenile releases which may impact rearing juvenile coho in the Trask and Wilson systems.

Whiskey Creek hatchery has a full-time caretaker on site and available 24-hours per day in the event of an emergency. The facility is also equipped with an alarm system and back-up generator.

The Trask River Hatchery and Cedar Creek Hatchery are staffed full time with at least one person onsite 24 hours per day, 7 days per week. The facilities are equipped with a low-water float alarm systems to help prevent catastrophic fish loss resulting from water system failure.

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.

Spring Chinook Salmon collected for broodstock are stock 34 spring Chinook returning to Trask Hatchery. Egg take from returning Trask River stock has occurred in every year since 1907 (missing or incomplete records for period 1913 to 1921). Records indicate that some out-of-basin spring Chinook eggs were propagated in the past at Trask Hatchery. These eggs were primarily from the Nestucca and Columbia River basins and were received between 1926 and 1933. It is unclear if all were returned and released to basins of origin, other basins, or released in Trask River. Eggs from Trask River Hatchery spring Chinook have been used for the Whiskey Creek Hatchery program since 1988.

6.2) Supporting information.

6.2.1) History.

This program currently uses one broodstock source, originally derived from Trask River wild spring Chinook Salmon beginning in 1907. While the lineage is unclear, the early 1900s broodstocks were collected by racking the Trask River. Beginning in 1959, broodstocks were collected by seining at the hatchery (Wallis, 1963). Wallis (1963) indicated a new adult holding pond was constructed in 1961, and fish (Coho and Chinook Salmon) were either trapped in the upper pond from Gold Creek trap (now T-9), or from the lower pond directly from the river. Stock-34 spring Chinook eggs from Trask Hatchery have been used for the Whiskey Creek Hatchery program since 1988.

6.2.2) Annual size.

A minimum of 127 female adults and 127 male adults will be needed to fulfill existing smolt production goals (365,000 smolts for Trask Hatchery program and 35,000 smolts for Whiskey Creek Hatchery program), and to meet STEP's classroom egg incubation requests. Adults are spawned at a one-to-one, male-to-female ratio.

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

Historic records indicate the original broodstock were likely from wild origin. Because fish were not routinely marked and origin cannot be determined from scale reading, it is not known to what extent wild, or hatchery broodstock have been incorporated over time. At the time of the Wallis (1963) report, it was assumed that spring Chinook Salmon holding in the lower river were primarily of hatchery origin based on spawning ground data and hatchery trapping data early in the hatchery's operation. The probability of including wild fish in the broodstock prior to mass marking is believed to have been approximately 10%. From 2003 (year of mass marked spring Chinook returns) to 2012,

no wild spring Chinook were used for broodstock. Beginning in 2013, unmarked adults have been used for broodstock in approximately the same proportion they have entered the hatchery trap

6.2.4) Genetic or ecological differences.

The broodstock used in this program is locally founded. However, the current hatchery spring Chinook stock may have diverged—to some unknown extent—from the Trask Basin naturally-produced spring Chinook population, based on past hatchery practices and probable lack of recent incorporation of naturally-produced fish into the broodstock. No genetic study has been conducted to determine any genetic differences between the naturally-produced and hatchery-origin adults. Future incorporation of naturally-produced fish in the hatchery broodstock could help to reduce differences between the hatchery and naturally-produced fish.

6.2.5) Reasons for choosing.

Trask River stock-34 spring Chinook Salmon was not chosen for any special traits or characteristics other than it being the stock indigenous to the Trask River Basin.

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

The broodstock selection practices for stock-34 spring Chinook Salmon program should have no genetic effects on Coho Salmon. Naturally-produced Coho Salmon, however, may be trapped during spring Chinook Salmon broodstock collection (particularly late in the season), although this has rarely occurred in the past. Any unmarked Coho Salmon that is trapped is passed upstream of the hatchery facility to spawn naturally. Juvenile Coho Salmon may be encountered during seining operations to collect broodstock. However, large mesh seines which easily pass juvenile fish are used, and few, if any Coho juveniles have been observed during this operation. Any juvenile fish captured would be immediately released.

SECTION 7

BROODSTOCK COLLECTION

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

All spring Chinook Salmon broodstock for the Whiskey Creek stock-34 program's eyed-egg needs are collected at Trask Hatchery. A minimum of 127 adult females and 127 adult males must be spawned to meet the egg requirements for Trask Hatchery and Whiskey Creek Hatchery programs, as well as for the STEP's class room incubators. Additional fish may be collected and held as necessary to cover shortages resulting from, but not limited to, fecundity variations, early egg mortality, positive disease tests, etc.

7.2) Collection or sampling design.

Spring Chinook Salmon broodstock adults are captured at Trask River Hatchery upon swimming into the mainstem (T-3) trap. The T-3 trap is operated such that the spring chinook run-timing, adult size, and age distribution are represented. Adult collection in T-3 fish ladder/trap for broodstock begins in mid August and continues throughout the remainder of the run (usually late September). During some years, late summer rains result in adult spring Chinook ascending Gold Creek. These fish can be captured in the Gold Creek trap (T-9) and used as broodstock. Both traps are not considered to be size or age selective. On occasion some adults may be collected via seines or tangle nets from the Trask River.

7.3) Identity.

All Whiskey Creek Hatchery and Trask Hatchery stock-34 spring Chinook Salmon are currently identifiable by a missing adipose fin. Other marks may be considered if needed/desired. Spring Chinook broodstock collected at Trask Hatchery is likely a mix of adults returning from both programs although the exact contribution of each is unknown.

7.4) Proposed number to be collected:

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

A minimum of 127 female adults and 127 male adults will be needed to fulfill existing production goals (365,000 smolts for Trask Hatchery program, 35,000 smolts for Whiskey Creek Hatchery program, and 2,000 eyed eggs for STEP's classroom egg incubation program). Jacks will be used in the broodstock.

7.4.2) Broodstock collection levels for the last twelve years, or for the most recent years available:

Broodstock collection numbers of the past are presented in Table 7-1.

Table 7-1. Trask Hatchery Spring Chinook Salmon Broodstock Collection, Spawning, Egg Take Levels and Eyed-Eggs transferred to Whiskey Creek Hatchery (NA = Data not available for some years). Adult collection and production numbers shown are pre-CMP levels.

Year	Adults ^a			Total Egg Take	Eyed eggs to Whiskey Cr.	STEP Hatchbox Eggs	Trask Production Eggs	Trask Fry Pondered
	Females	Males	Jacks					
1995	171	151	8	848,000	120,000	90,000	311,800	300,000
1996	185	184	0	864,000	120,000	95,000	305,000	300,000
1997	195	193	1	898,000	145,000	141,000	385,000	306,000
1998	153	152	0	742,000	120,000	106,600	314,750	298,000
1999	168	169	2	729,000	124,750	212,650	310,000	304,000
2000	171	135	32	751,000	120,000	90,550	492,900	294,000
2001	128	91	37	582,000	120,000	13,500	448,500	262,000
2002	147	145	2	671,000	110,000	31,500	460,000	297,000
2003	131	127	0	641,000	111,100	14,100	315,440	281,000
2004	184	184	0	759,083	110,000	46,400	335,000	297,314
2005	160	160	0	634,824	110,000	45,900	374,350	332,362
2006	135	135	0	550,844	110,000	31,000	409,000	363,104
Data source: ODFW HMS database, Trask Hatchery, and North Coast Fish District								
^a Values include adult collection needed to meet production goals for the Whiskey Creek Stock-34 Spring Chinook STEP Program (described in Whiskey Creek Stock-34 Spring Chinook HGMP).								

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

The T-3 trap located at Trask Hatchery is operated through the end of the run in late September or early October. While the trap has been closed prior to the end of the run in the past, the current operating procedure is to continue to operate the trap to remove fin-clipped adult spring Chinook Salmon from the system. Excess hatchery spring Chinook Salmon are generally dispatched and used in the stream enrichment program. Most naturally produced spring Chinook Salmon (unmarked) are released to the mainstem Trask River to spawn naturally although some may be used for broodstock. The amount of wild spring Chinook retained for broodstock will generally be proportional to the percentage encountered in the hatchery trap.

7.6) Fish transportation and holding methods.

Broodstock collected at the trap on Gold Creek (T-9) are transported to the holding pond at T-3 using the portable 300-gallon fish liberation unit described in Section 5.2. All broodstock collected at Trask Hatchery are held and spawned in the T-3 trap structure. See section 5.3 for trap details. Transportation of adults may also occur during June and July of high return years to recycle bright hatchery fish and provide additional angling opportunities.

7.7) Describe fish health maintenance and sanitation procedures applied.

At spawning, ovarian fluid and visceral samples (kidney, spleen, etc.) are collected and cultured by ODFW Fish Health Staff. See Attachment A regarding state approved fish health maintenance protocols.

7.8) Disposition of carcasses.

- Spawned fish carcasses, CWT recovery fish are used in the stream enrichment program. Hatchery origin surplus adults captured in traps that are good for human consumption may be used in food bank programs.
- Pre-spawn mortalities are disposed of in a local landfill.

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

There should be minimal likelihood for adverse genetic or ecological effects to listed fish as a result of broodstock collection. To ensure that impacts to Coho Salmon are minimized during broodstock collection, the trap is visually checked daily to determine if any have entered the trap. Naturally produced adult Coho Salmon collected in the traps are removed when fish are sorted and released into the Trask River (usually RM 14).

Coho Salmon may be present in the system, on occasion, when seining or tangle netting is necessary to collect spring Chinook Salmon broodstock. The seine is pursed only to the point that fish are contained and are removed individually by hand. Tangle nets are light mesh that is easily breakable. Any listed natural Coho Salmon collected are immediately released outside the seine. Any juvenile Coho Salmon that may be present can easily escape the large-mesh seine net used.

SECTION 8

MATING

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

8.1) Selection method.

Collection of spring Chinook Salmon for use as broodstock occurs from mid August-early October. Fish are collected from the population holding in the river over the summer, and are assumed to represent the entire run. Spawning usually occurs during September. Spawning is done randomly based on availability of ripe fish at the time of spawning. Adults are collected randomly from fish entering the hatchery trap. Excess eggs may be collected to assure meeting the production goal. Excess eggs may be culled randomly across egg take groups after spawning is completed if necessary (see section 9.1.2).

8.2) Males.

Males are generally only used once for spawning in the prescribed matrix, unless a shortage of broodstock occurs. Males will be used and selected randomly for any, and all, spawning days. Jacks will be included in the broodstock when available and at the proportional rate they are collected, but will typically not exceed 5% of the males spawned unless a shortage of males occurs.

8.3) Fertilization.

Spring Chinook Salmon are kill-spawned typically using a 1:1 male-to-female ratio. Fish are incorporated into spawning matrix using equivalent numbers of males and females. All females are bled prior to spawning. Ovarian fluid samples are taken from 60 females to diagnose the presence of any viral pathogens. Fish health and sanitation procedures are described in Attachment A.

8.4) Cryopreserved gametes.

Cryopreservation of spring Chinook Salmon gametes is not used for Whiskey Creek Hatchery stock-34 spring Chinook 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.

Not applicable. We anticipate no genetic or ecological risks to naturally-produced listed Coho Salmon from the mating techniques used in this spring Chinook Salmon program.

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.

Whiskey Creek Hatchery receives stock-34 spring Chinook eyed-eggs from Trask Hatchery. Egg survival to ponding is provided below.

9.1.1) Number of eggs taken and survival rates to ponding.

Table 9-1. Eyed Egg Survival – Whiskey Creek Hatchery Stock-34 Spring Chinook Program (Note: Does not include fry that were transferred to Whiskey Creek in some years to backfill significant catastrophic losses). Values are pre-CMP levels.

Brood Year	Eyed Eggs for Program ^a	Measure	Percent Survival to Ponding
1995	120,000	Survival to ponding	97
1996	120,000	Survival to ponding	98
1997	145,000	Survival to ponding	95
1998	120,000	Survival to ponding	72
1999	124,750	Survival to ponding	80
2000	120,000	Survival to ponding	79
2001	120,000	Survival to ponding	86
2002	110,000	Survival to ponding	94
2003	111,100	Survival to ponding	73
2004	110,000	Survival to ponding	98
2005	110,000	Survival to ponding	98
2006	110,000	Survival to ponding	73
2007	110,000	Survival to ponding	96

Source: ODFW HMS database, Trask Hatchery

^a Eyed-eggs provided for the Whiskey Creek Spring Chinook Program have been adjusted over time to account for improved survival in order to meet the program goal of 100,000 smolts (65,000 for Trask Hatchery program and 35,000 for Whiskey Creek STEP program).

9.1.2) Cause for and disposition of surplus egg takes.

Green eggs taken at Trask Hatchery are incubated to meet Trask Hatchery stock-34 spring Chinook smolt production goals, Whiskey Creek eyed-egg requests, and STEP requests. Trask Hatchery stock-34 spring Chinook Salmon egg take is managed to compensate for egg-to-smolt mortality and genetic considerations, such as increased family size to promote genetic diversity, etc. Surpluses are a result of egg take beyond eyed-egg needs to represent full run timing. Surplus eggs are currently identified at the eyed-egg stage and are destroyed. Mortality and culled eggs are all disposed of by freezing and then buried. Other elements regarding egg take are covered in the Trask Hatchery Stock-34 Spring Chinook Salmon HGMP.

9.1.3) Loading densities applied during incubation.

Spring Chinook Salmon green-egg size is approximately 57 eggs per ounce. Heath style incubator trays are loaded with approximately 105 ounces of eggs (or 6,000 eggs) per unit. Typically, eggs from different family groups are generally kept separate.

9.1.4) Incubation conditions.

The water supply to the egg incubators used at Whiskey Creek Hatchery is monitored for flow and temperature daily. The incubating eggs are held in water that ranges from 34° to 49° F with an average flow rate of 5.0-6.0 gpm per stack. The dissolved oxygen for the influent water ranges between 10 to 11 ppm.

9.1.5) Ponding.

Egg and fry mortalities are removed from the trays prior to ponding. Ponding generally occurs about 2 to 3 days before fish are 100% buttoned-up. The average fry size at ponding is approximately 780 fish per pound. Prior to the 2007 brood year, fry were removed from the incubator trays and placed directly into screened-off sections of the concrete raceway. Since 2007 fry have been ponded directly into Canadian troughs for early rearing. They remain in the troughs for about 5 weeks with an average flow of 20-25 gpm before transfer to the raceway.

9.1.6) Fish health maintenance and monitoring.

See Attachment A regarding state approved fish health maintenance protocols.

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.

Not Applicable. This program does not incubate listed fish species.

9.2) Rearing:

9.2.1) Provide survival rate data (average program performance) by hatchery life state (fry to fingerling; fingerling to smolt) for the most recent twelve years (1995-2006), or for years dependable data are available.

Table 9-2. Whiskey Creek Hatchery Stock-34 Spring Chinook Salmon Survival Rates (Fry to Release/Transfer). Values are pre-CMP levels.

Brood Year	Percent Survival of Fry to Release/Transfer ¹
1995	100
1996	88
1997	101 ²
1998	106 ²
1999	56
2000	82
2001	100
2002	77
2003	61
2004	95
2005	72
2006	64

Source: District Files

¹ Since the 2003 brood year, all Whiskey Creek Hatchery Stock-34 spring Chinook have been released as sub-yearling smolts or transferred to East Fork Trask Pond as presmolts. Prior to the 2003 brood, releases were a mix of smolts and pre-smolts that varied considerably from year to year with regard to date, location, and release strategy. When fish were held for further rearing or acclimation off station, survival estimates were often not available. As such, this table provides survival estimates from fry to date of transfer or release from Whiskey Creek Hatchery, all life stages combined.

² Whiskey Creek Hatchery has experienced several significant spring Chinook mortality events since operations began in 1988. Following mortality events, volunteers estimate the number of fish lost. Assessments made may be an over-estimate of actual losses. When available, additional eggs or fry were brought in to compensate for those losses. The presence of additional fish or eggs coupled with the overestimated losses, account for survival estimates exceeding 100%. Records did not provide sufficient detail to reconcile fry-to-smolt survival estimates in all cases.

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

Whiskey Creek Hatchery stock-34 juvenile spring Chinook Salmon remain on-station until they reach a size that is suitable for marking. Shortly after marking, ~65,000 are moved to Cedar Creek Hatchery and/or Trask Hatchery. The remaining ~35,000 juveniles are reared at Whiskey Creek Hatchery, and the rearing density (rearing space) targets from fry to smolt are not to exceed 1.0 pound of fish per cubic foot of water at any of the facilities. Actual density levels in raceway ponds at Whiskey Creek Hatchery reach a maximum of 0.37 pounds of fish per cubic foot of water for the fingerlings at time of transfer to Cedar Creek Hatchery and Trask Hatchery.

Loading level criteria for rearing is 10 pounds of fish per gpm. Maximum pond loading level is 11.0 pounds of fish per gpm at Whiskey Creek Hatchery (fingerling transfer) and 5.5 pounds of fish per gpm at East Fork Trask Pond (smolt release). Although maximum loading levels have been higher than recommended at Whiskey Creek, this is generally occurs for only short periods prior to release or transfer and no adverse affects on fish health have been observed.

See the Trask Hatchery stock-34 Spring Chinook Salmon HGMP and Cedar Creek Hatchery stock-47 Spring Chinook Salmon HGMP for a description of density and loading criteria at those facilities.

Table 9-3. Whiskey Creek Hatchery Stock-34 Spring Chinook Salmon Transferred to East Fork Trask Pond for Final Rearing. Values are pre-CMP levels. Future transfers will be to Cedar Creek Hatchery.

Brood Year	Number of Fish Transferred
2003	34,973
2004	25,007
2005	40,020
2006	23,010
Data Source: ODFW HMS database	

9.2.3) Fish rearing conditions.

Whiskey Creek Hatchery: Pond monitoring is done daily at feeding time. While feeding fish, volunteers observe for signs of stress, disease, water quality problems, and unusual fish behavior. Pond mortality is picked and recorded daily. During summer, ODFW Fish Health Staff monitor fish for external parasites once per month. Whiskey Creek supplies water to Whiskey Creek Hatchery. Incoming water temperature is monitored and varies from 34° to 62° F. The pond is fenced and roofed which eliminates predation.

See the Trask Hatchery stock-34 spring Chinook Salmon HGMP and Cedar Creek Hatchery Stock-47 spring Chinook Salmon HGMP for a description of rearing conditions at those facilities.

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.

Fish size (fish per pound) is sampled bimonthly; data is reported to District staff in the form of monthly ponded fish reports. Fish feed schedules are programmed based upon fish size data collected. Fork length (millimeters) frequency sampling is done just before smolt release. Feed schedules and data collection is conducted with the assistance and oversight of ODFW district staff. Table 9-3 shows monthly average weights for the

program from ponding to release for 2003 and 2004 broods. Average length frequency percentages at time of release for the 2003 and 2004 broods are presented in Table 9-4.

Table 9-3. Average Monthly Fish Growth Data on Stock-34 Spring Chinook Salmon reared at Whiskey Creek Hatchery, 2003 and 2004 brood years.

Month	Size (fish per pound)	Stage
December	425	Fry
January	190	Fry
February	100	Fry
March	65	Fingerling
April ^a	40	Fingerling
May	25	Fingerling
June	15	Fingerling
July	12	Smolt

Source: Whiskey Creek monthly pond reports. Numbers indicate end of month average weights.

Table 9-4. Whiskey Creek Hatchery Spring Chinook Salmon Smolts Average Fork Length Frequency at Release, 2003 and 2004 brood years^a.

Fork Length Size Range	Whiskey Creek Hatchery	Hughey Creek ^b
< 14 cm.	7.7%	8.4%
14 – 17 cm.	91.0%	90.5%
> 17 cm.	1.3%	1.1%

Source: HMIS database

^a Up to 40,000 Whiskey Creek Hatchery Stock-34 spring Chinook were also transferred to East Fork Trask Pond (Cedar Creek Hatchery beginning in 2017) and combined with approximately 145,000 spring Chinook from the Trask Hatchery spring Chinook program. Details regarding size at release for past East Fork Trask Pond (Cedar Creek Hatchery in the future) or Trask Hatchery smolts can be found in the Trask Hatchery Stock-34 Spring Chinook HGMP.

^b Hughey Creek Acclimation Pond is located on the Wilson River and was formerly used for final rearing of 25,000 smolts for release into the Wilson River. Those releases were discontinued with the implementation of the CMP, and those fish are now transferred to Trask Hatchery.

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

Monthly fish growth rate of fry ponded in December shows that spring Chinook Salmon will obtain a size of approximately 425 fish per pound by the end of that month. Then from January to June, spring Chinook fingerlings roughly double in weight each month. Growth rate slows and an average weight of 12 fish per pound is achieved by July. Release of full term smolts usually occurs in late July.

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).

Whiskey Creek Hatchery stock-34 spring Chinook Salmon juveniles reared at Whiskey Creek Hatchery, Cedar Creek Hatchery, and/or Trask Hatchery are fed appropriate feed as dictated by ODFW hatchery staff. At time of ponding, fry are hand-fed 8 to 10 times each day at a “by demand” rate. This rate continues for approximately one month then the frequency is reduced to 2-6 times per day. At that time, the fish are put on a feed schedule to control the rate of growth, to reach the goal size at smolt release time. Food conversion rates range from 0.5 to 1.0.

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

Fish health is monitored monthly by ODFW Fish Health staff. Fish Health staff diagnose diseases and prescribe the appropriate treatments to eliminate or control disease. See Attachment A, for fish health management protocol.

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

Weight samples are taken bi-monthly during rearing. Prior to release, length frequencies (see Section 9.2.4) are conducted. A visual examination of mark quality is also taken prior to release. No gill ATPase enzyme activity is measured.

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

No “natural” rearing method is practiced other than the use of natural stream water.

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

Not applicable; we anticipate no genetic or ecological risks to naturally-produced Coho Salmon from the in-hatchery rearing techniques used in this spring Chinook Salmon program. However, rearing ponds are cleaned regularly, fish health status is inspected each month, and mortalities are removed daily and not allowed to enter the water of the state. Fish are treated whenever necessary to minimize transfer of diseases agents to the watershed.

SECTION 10
RELEASE

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

10.1) Proposed fish levels.

Table 10-1. Whiskey Creek Hatchery Stock-34 Spring Chinook Salmon Program Proposed Annual Fish Release Levels.

Age Class	Release Number	Size (fpp)	Release Date	Location
Eggs	NA	NA	NA	NA
Unfed Fry ^a	NA	NA	NA	NA
Fry ^a	NA	NA	NA	NA
Fingerling ^a	NA	NA	NA	NA
Smolt	35,000 ^b	12/lb (target)	July Annually	Trask River

Data source: Hatchery Production Schedules

^aUnfed fry, fry, or fingerlings are not released as part of program goals. On occasion, it has been necessary to release unprogrammed excess to standing water bodies (once in the last 10 years).

^b Fish released directly from Whiskey Creek Hatchery. Approximately 65,000 smolts are transferred to Trask Hatchery or Cedar Creek Hatchery for eventual release in the Trask River.

The spring Chinook Salmon production goal for Whiskey Creek is 100,000 smolts. Typically ~65,000 smolts are transferred to the Cedar Creek Hatchery and/or Trask Hatchery and are mixed with Trask Hatchery production fish for eventual release into the Trask River basin. The production that remains at Whiskey Creek Hatchery (~35,000 smolts) is released into the lower Trask River. Numbers transferred and kept may vary annually depending on overall survival and annual rearing constraints at Whiskey Creek Hatchery.

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

Stream, river, or watercourse: Trask River
Release point: RM 6.0 or downstream
Major watershed: Trask River Watershed
Basin or region: Tillamook Bay Basin

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

Table10-2. Whiskey Creek Hatchery Stock-34 Spring Salmon Chinook Released by life stage. Release Years 1995 through 2007. Average size is in fish per pound. Values shown are mostly pre-CMP levels.

Release Year	Unfed Fry	Avg Size	Fry	Avg Size	Fingerling/ Presmolt	Avg Size	Smolt ^a	Avg Size
1995	NA	NA	NA	NA	NA	NA	117,501	16.4
1996	NA	NA	NA	NA	NA	NA	116,611	15.2
1997	NA	NA	NA	NA	NA	NA	103,425	15.3
1998	NA	800	NA	NA	NA	NA	115,795	14.3
1999	NA	800	NA	NA	NA	NA	111,083	16.5
2000	NA	800	NA	NA	NA	NA	48,824	12.7
2001	NA	NA	NA	NA	NA	NA	105,848	13.6
2002	NA	NA	NA	NA	NA	NA	109,738	13.8
2003	NA	NA	NA	NA	NA	NA	59,393	14.8
2004	NA	NA	NA	NA	NA	NA	15,112	8.3
2005	NA	NA	NA	NA	NA	NA	54,212	11.4
2006	NA	NA	NA	NA	NA	NA	0	NA
2007	NA	NA	39,315 ^b	375	NA	NA	56,663	18.4
2008			NA	NA	NA	NA	35,952	14.7
2009			NA	NA	NA	NA	40,618	15.0
2010			NA	NA	NA	NA	38,673	10.8
2011			NA	NA	NA	NA	36,888	12.7
2012			NA	NA	NA	NA	35,271	11.1
2013			NA	NA	NA	NA	35,658	11.5
2014			NA	NA	NA	NA	44,006	12.7
2015			NA	NA	NA	NA	35,798	17.3
Avg.	NA	NA	39,315	375	NA	NA	62,718	14.1

Data source: ODFW's Hatchery Management System (HMS) database.

^a These figures do not include presmolts which were transferred from Whiskey Creek Hatchery to East Fork Trask Pond for final rearing and subsequently released (less pond mortality) to the Wilson and Trask rivers. For more information on East Fork Trask Pond releases, see the Trask Hatchery Stock 34 Spring Chinook HGMP.

^b In 2007, Whiskey Creek experienced a large size discrepancy amongst fish due to change in feed. Excess fish were transferred from Trask Hatchery and fish were graded. This release represents smaller fish which were released into Cape Meares Lake. There are no longer programmed releases of fry associated with the Whiskey Creek Hatchery Stock 34 Spring Chinook program.

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

Table 10-3. Whiskey Creek Hatchery Stock-34 Spring Chinook Pre-smolt and Smolt Release Dates and Protocols, from Whiskey Creek Hatchery and Hughey Creek Pond^b. Release Years 1995 through 2007. Values shown are mostly pre-CMP levels.

Release Year	Date Ranges	Trask River Release Totals	Wilson River Release Totals
1995	5/30 to 8/5	53,299 Direct release 21,887 Acclimated	16,100 Direct release 26,365 Acclimated
1996 ^a	5/23 to 7/30	63,479 Direct release 30,896 Acclimated	18,600 Acclimated
1997	6/1 to 7/29	26,196 Direct release 53,656 Acclimated	23,673 Acclimated
1998	5/13 to 7/22	91,203 Direct release	17,497 Direct release 7,095 Acclimated
1999	6/6 to 8/3	58,988 Direct release 20,022 Acclimated	23,815 Direct release 8,258 Acclimated
2000	7/13 to 7/14	48,824 Direct release	25,725 Acclimated
2001	6/28 to 7/30	52,099 Direct release 40,544 Acclimated	9,141 Direct release 13,874 Acclimated
2002	6/9 to 7/22	91,395 Direct release	18,343 Direct release 4,064 Acclimated
2003	6/12 to 7/26	59,393 Direct release	19,911 Acclimated
2004	6/2 to 7/15	12,448 Direct release	2,664 Direct release 3,000 Acclimated ^c
2005	7/22 to 7/25	54,212 Direct release	22,800 Acclimated ^c
2007	7/6	56,672 Direct release	25,000 Acclimated ^c
2008	7/17 to 7/18	35,952 Direct release	24,940 Acclimated ^c
2009	6/29	40,620 Direct release	
2010	7/17 to 7/22	38,673 Direct release	25,100 Acclimated ^c
2011	7/21 to 7/27	36,888 Direct release	25,000 Acclimated ^c
2012	7/16	35,271 Direct release	24,985 Acclimated ^c
2013	7/26	35,720 Direct release	
2014	7/3 to 7/9	44,006 Direct release	26,055 Acclimated ^c

2015	6/12	35,789 Direct release	
<p>Data source: ODFW's Hatchery Management System (HMS) database.</p> <p>^a A direct release of 3,696 presmolts was made into the Tillamook River in 1996. No other releases into the Tillamook River have been made since.</p> <p>^b ODFW fish division staff mandated that beginning in 2004, all Whiskey Creek Stock 34 spring Chinook be released as smolts. As a result, presmolt releases were terminated and a portion of fish transferred to East Fork Trask Pond to complete rearing. Release numbers do not take into account those fish from East Fork Trask Pond that are eventually released into the Trask and Wilson Rivers. The Trask Hatchery Stock 34 Spring Chinook HGMP provides additional detail regarding these releases.</p> <p>^c These numbers represent those fish that are transferred from Whiskey Creek hatchery to Hughey Creek Pond where they complete their rearing and are direct released into the Wilson River. Those numbers previously noted as acclimations involved the use of net pens.</p>			

10.5) Fish transportation procedures, if applicable.

Transportation equipment used for this program is detailed in Section 5.2. Spring Chinook Salmon smolts are typically transferred from Whiskey Creek Hatchery to Cedar Creek Hatchery in May or June. Cedar Creek Hatchery reared fish, which include a mix of Whiskey Creek and Trask Hatchery spring Chinook, are transported to release sites on the mainstem Trask River, typically in late July. Fish held at Whiskey Creek Hatchery to smolt size are transported to the lower Trask River for direct release, typically in late July. The water used to transport fish comes from the facility where fish are being reared; water temperature is not regulated during transportation. The transportation time from Cedar Creek Hatchery to the release sites on the Trask River is approximately 30 to 60 minutes. Transportation time from Whiskey Creek Hatchery to the release site on the Trask River is usually about 20 minutes.

10.6) Acclimation procedures.

Off-site acclimation other than facilities already listed are not currently used in this program but may be implemented as needed to enhance fishery performance and to meet pHOS targets identified in the Coastal Multi-Species Conservation and Management Plan.

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

Spring Chinook Salmon smolts from Whiskey Creek Hatchery are mass marked (100% marked) with an adipose (AD) fin clip prior to release. Mark quality is randomly checked on at least 200 fish, at the time of marking. A final check of finclip quality is done as close to the release date (prior) as possible.

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

Releases have been within programmed and approved levels.

10.9) Fish health certification procedures applied pre-release.

All smolts are inspected by ODFW Fish Health staff prior to release or transfer from the Trask River Hatchery or satellite facilities, and only certified fish are released. Also, see Attachment A for fish health management protocols.

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

Whiskey Creek Hatchery volunteers and the facility caretaker are generally present at Whiskey Creek Hatchery 24 hours per day during periods when fish are present. Cedar Creek Hatchery personnel are present at Cedar Creek Hatchery 24-hours per day when fish are present. Water supply for these facilities is connected to a central alarm system

that notifies staff and volunteers in the event of operational failure. In the event of water supply failure or other emergency situation at any of the facilities, the following procedure will be used:

- The hatchery crew or Whiskey Creek Hatchery volunteers will exhaust all possibilities for retaining the fish.
- The hatchery crew or Whiskey Creek Hatchery volunteers will consult with the ODFW District Biologist.
- If emergency fish release is deemed necessary, fish being reared at Whiskey Creek Hatchery will be immediately trucked and released into the Trask River or into a closed water body dependent on time of year, life stage of the fish. If transportation equipment is not available fish will either be destroyed or released directly into Netarts Bay. Fish held at Cedar Creek Hatchery will be transported and released into the Trask River if possible. Fish held at Trask Hatchery would be released directly to the Trask River.

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.

- Spring Chinook Salmon smolts are released in late summer. Given the life history characteristics, smolt migration rates, and preference for estuary rearing of spring Chinook smolts, any adverse genetic or ecological impacts to Coho Salmon are anticipated to be minimal.
- All smolts are released into the mainstem or the East Fork Trask River to avoid competition of Coho Salmon rearing in cool-water tributaries.

These two release strategies minimize potential interactions and adverse ecological effects that may occur between hatchery spring Chinook and any juvenile Coho Salmon rearing in the mainstem.

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.

Information for Tillamook Bay Basin naturally-produced and hatchery (Trask and Whiskey Creek) spring Chinook Salmon spawner abundance, proportion of hatchery strays, smolt size, and timing, will be obtained from the District’s monitoring program, as well as *The Oregon Plan for Salmon and Watersheds (OPSW)* monitoring projects: Salmonid Life-Cycle Monitoring project (Solazzi et al. 2000 and 2003); and Coastal Salmonid Inventory project (Jacobs et al. 2000). Information will also be collected through monitoring programs associated with the Coastal Multi-Species Conservation and Management Plan. Information on the ocean catch of spring Chinook Salmon is obtained from the coastwide CWT marking and mark recovery program, and is available through PSMFCs on-line database. Information on the freshwater catch of spring Chinook is compiled from returned salmon / steelhead tags and is available from ODFW Fish Division at Salem Headquarters. Volunteer anglers also maintain log books and collect scale samples from the sport catch. Specific economic data for sport caught fish is not routinely developed for all stocks. Economic data that is compiled is available at Salem Headquarters.

Monitoring of in-hatchery performance at Trask Hatchery and Whiskey Creek Hatchery and adult returns to Trask Hatchery (where broodstock for this program are collected) will be conducted by the hatchery crew. This information is stored on the ODFW Hatchery Management Information System (HMIS) database. This will include at least the following information:

Adults

- The number of females, males, and jack spring Chinook Salmon collected at Trask Hatchery (Standard 2.1).
- Number of adult spring Chinook Salmon and naturally-produced Coho Salmon handled and released from Trask Hatchery (Standard 4.6).
- Any observed mortalities of adult spring Chinook Salmon and naturally-produced Coho Salmon at Trask Hatchery (Standard 4.6).
- Date of entry of hatchery and naturally-produced fish into the Trask Hatchery trap (or collected by other means) (Standard 4.6).
- Date of entry into the Trask Hatchery trap for spring Chinook retained for broodstock (Standard 4.6).
- Dates of spring Chinook spawning at Trask Hatchery (Standards 2.1 and 2.2).

- The number of males, jacks, and female spring Chinook Salmon spawned (Standards 2.1, 2.2 and 4.1).
- Fecundity of females spawned (Standard 4.1).
- Disposition (spawned, sold, stream enrichment, etc.) of all spring Chinook collected (Standard 4.4).
- Collection of adult spring Chinook straying data (Standard 3.1).
- Harvest of adult spring Chinook (Standards 1.1 and 5.1).

Juvenile Rearing

- Monthly number of spring Chinook eggs/fish on hand, mortality, feeding rate, and growth (Standard 4.1).
- Results of fish health checks and any incidence of disease occurrence (Standard 4.1).

Release

- Number of spring Chinook smolts released, by mark type (Standard 3.2).
- Fish size at release, average weight, and length frequency distribution (Standard 3.3 and 4.5).
- Location of releases (Standard 3.2 and 4.5).
- Date releases started and ended (Standard 3.3 and 4.5).

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 and staffing are available as part of normal operations at Trask Hatchery for those activities associated with broodstock collection and early rearing activities. However, as with all state and federal programs, budgets are approved by the Legislature, and no commitment of funds can be made past the approved budget period. Funds for various projects associated with this HGMP come from (or could come from) a variety of sources, possibly including license dollars, state general funds, and federal funding sources. Funds are committed for certain activities; but can change with relatively short notice. This could result in elimination or reduction in the hatchery program and associated monitoring and evaluation activities.

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

Risk aversion measures for the salmonid life-cycle monitoring project and coastal salmonid inventory project are included under the NOAA 4(d) rule as part of the OPSW Research and Monitoring Program. The District's spring Chinook Salmon resting hole monitoring and in-hatchery monitoring programs are not expected to increase risks to listed natural Coho Salmon above those imposed by operation of the program. Thus, risk

aversion measures for the monitoring program are the same as those discussed under prior sections of this document.

SECTION 12
RESEARCH

There are no research programs conducted in direct association with the Whiskey Creek Hatchery spring Chinook Salmon program described in this HGMP. Therefore, the answer to all questions in Section 12 is not applicable.

SECTION 13

ATTACHMENTS AND CITATIONS

Citations:

- Federal Register Notice. 1998. Endangered and Threatened Species: Proposed endangered status for two chinook salmon ESUs and proposed threatened status for five chinook salmon ESUs; Proposed redefinition, threatened status, and revision of critical habitat for one chinook salmon ESU; Proposed designation of chinook salmon critical habitat in California, Oregon, Washington, Idaho. Vol. 63, No 45, pp 11482-11520.
- Fisher, J. P., and W. G. Pearcy. 1985. Studies of juvenile salmonids off the Oregon and Washington coast, 1985. Oregon State University Sea Grant College Program, ORESU-T-85-004, Corvallis.
- IHOT (Integrated Hatchery Operations Team). 1995. Policies and Procedures from Columbia Basin Anadromous Salmonid Hatcheries. Annual Report 1994. Portland, OR. Project Number 92-043, Contract Number DE-B179-92BP60629.
- Hartt, A. C., and M. B. Dell. 1986. Early oceanic migrations and growth of juvenile Pacific salmon and steelhead trout. International North Pacific Fisheries Commission Bulletin 46:1-105.
- Jacobs S., J. Firman, G. Susac, E. Brown, B. Riggers and K. Tempel 2000. Status of Oregon coastal stocks of anadromous salmonids. Monitoring Program Report Number OPSW-ODFW-2000-3, Oregon Department of Fish and Wildlife, Portland.
- Lewis, M.A. 2000. Stock assessment of anadromous salmonids, 1999. Oregon Department of Fish and Wildlife, Oregon Plan for Salmon and Watersheds, Annual Progress Report number OPSW-ODFW-2000-4, Portland.
- Lister, D. B., and H. S. Genoe. 1970. Stream habitat utilization by cohabiting underyearlings of chinook (*Oncorhynchus tshawytscha*) and coho (*O. kisutch*) salmon in the Big Qualicum River, British Columbia. Journal of the Fisheries Research Board of Canada 27:1215-1224.
- Moore, K., K.K. Jones, and J.M. Dambacher. 1997. Methods for stream habitat surveys. Oregon Department of Fish and Wildlife, Information Report 97-4, Portland, Oregon
- Moring, J. R., and R. L. Lantz. 1975. The Alsea watershed study: Effects of logging on the aquatic resources of three headwater streams of the Alsea River, Oregon. Part I - Biological studies. Oregon Department of Fish and Wildlife, Fishery Research Report Number 9, Corvallis.
- Mundie, J. H. 1969. Ecological implications of the diet of juvenile coho in streams. Pages 135-152. In T. G. Northcote [ed.] Symposium on salmon and trout in streams. H. R. MacMillan Lectures in Fisheries. University. of British Columbia, Vancouver, B.C.
- Nickelson, T. E., J. D. Rodgers, S. L. Johnson, and M. F. Solazzi. 1992a. Seasonal changes in habitat use by juvenile coho salmon (*Oncorhynchus kisutch*) in Oregon coastal streams. Canadian Journal of Fisheries and Aquatic Sciences 49:783-789.

- Nickelson, T. E., M. F. Solazzi, S. L. Johnson, and J. D. Rodgers. 1992b. Effectiveness of selected stream improvement techniques to create suitable summer and winter rearing habitat for juvenile coho salmon (*Oncorhynchus kisutch*) in Oregon coastal streams. *Canadian Journal of Fisheries and Aquatic Sciences* 49:790-794.
- Nickelson, T.E. 1998. A habitat-based assessment of coho salmon production potential and spawner escapement needs for Oregon coastal streams. Oregon Department of Fish and Wildlife, Fish Information Report 98-4. Portland.
- Nickelson, T.E. 2001. Population assessment: Oregon coast coho salmon ESU. Oregon Department of Fish and Wildlife, Fish Information Report 2001-2. Portland.
- ODFW. 1999. Coastal salmonid and Willamette trout hatchery program review. Draft Final Report (March 19, 1999), Oregon Department of Fish and Wildlife, Portland, Oregon.
- Oregon Department of Fish and Wildlife. 2008. Oregon North Coast Spring Chinook Stock Assessment- 2005-06. Information Report 2008-01. Oregon Department of Fish and Wildlife. Salem, OR.
<http://odfw.forestry.oregonstate.edu/spawn/pdf%20files/reports/ODFW%20Information%20Report%202008-01.pdf>
- Oregon Department of Fish and Wildlife. 2013. Oregon North Coast Spring Chinook Stock Assessment- 2007-08. Information Report 2013-01. Oregon Department of Fish and Wildlife. Salem, OR.
<http://odfw.forestry.oregonstate.edu/spawn/pdf%20files/reports/Spring%20Chinook%20ODFW%20Info%20Report%202013-01.pdf>
- Oregon Forest Industries Council (OFIC) and Oregon Department of Fish and Wildlife (ODFW). 1993. Stream Survey Pilot Project, Tillamook District, Oregon.
- Pacific Fishery Management Council (PFMC). 1997. Draft Amendment 13 to the Pacific coast salmon plan. Fishery management regime to ensure protection and rebuilding of Oregon coastal natural coho. Pacific Fishery Management Council. Portland, Oregon.
- Reiser, D. W., and T. C. Bjornn. 1979. Habitat requirements of anadromous salmonids. Ch. 1. *In* W. R. Meehan [tech. ed.] Influence of forest and rangeland management on anadromous fish habitat in the western United States and Canada. Pacific Northwest Forest and Range Experiment Station, USDA. Forest Service, Portland.
- 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.
- Solazzi, M.F., S.L. Johnson, B. Miller and T. Dalton. 2000. Salmonid life-cycle monitoring project, 1998 and 1999. Monitoring Program Report Number OPSW-ODFW-2000-2, Oregon Department of Fish and Wildlife, Portland, Oregon.
- Solazzi, M.F., S.L. Johnson, B. Miller, T. Dalton, K.A. Leader 2003. Salmonid Life-Cycle Monitoring Project 2002 Monitoring Program Report Number OPSW-ODFW-2003-2, Oregon Department of Fish and Wildlife, Portland, Oregon.

Wallis, J. 1963. An Evaluation of the Trask River Salmon Hatchery. Oregon Fish Commission Research Laboratory. Clackamas, Oregon.

SECTION 14

CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

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

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

Signature: _____ Date: _____

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

Signature: _____ Date: _____

ATTACHMENT A

Table A-1. Hatchery Programs Stock Code and Species Five-Year Disease History (1999 to Present) by Fish Stock at Trask Hatchery, East Fork Trask Pond, and Tuffy Creek Pond.

Disease or Organism	34 Coho ^b	34 CHF ^b	34 CHW ^b	34 CHS ^b	121 StW ^b	34 CHS ^c	34 CHS ^d	121 StW ^d	47 StW ^d
IHN Virus	No	No	No	No	No	No	No	No	No
EIBS Virus	Yes	No	No	No	No	No	No	No	No
Coho Anemia Disease	Yes	No	No	No	No	No	No	No	No
<i>Aeromonas salmonicida</i>	No	No	No	No	Yes	No	No	No	No
<i>Aeromonas/Pseudomonas</i>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
<i>Flavobacterium psychrophilum</i>	Yes	Yes	Yes	No	Yes	No	No	No	No
<i>Fl. columnare</i>	No	No	No	No	No	No	No	No	No
<i>Fl. branchiophilum</i>	No	No	No	No	No	Yes	No	No	No
<i>Fusiform gill disease bacterium</i>	No	No	No	No	No	No	No	No	No
<i>Renibacterium. salmoninarum</i>	Yes	Yes	No	Yes	No	Yes	Yes	No	No
<i>Yersinia ruckeri</i>	No	No	No	No	No	No	No	No	No
<i>Carnobacterium sp.</i>	No	No	No	No	Yes	No	No	No	No
<i>Ichthyobodo</i>	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No
<i>Gyrodactylus</i>	No	No	No	No	Yes	No	No	Yes	Yes
<i>Ichthyophthirius multifiliis</i>	No	Yes	No	Yes	No	Yes	Yes	No	No
Gill Ameba	Yes	No	No	No	No	Yes	No	No	No
<i>Trichodinids</i>	Yes	Yes	Yes	No	Yes	No	No	No	Yes
<i>Loma sp</i>	Yes	No	No	No	No	No	No	No	No
<i>Nanophyetus salmincola</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coagulated Yolk Disease	Yes	Yes	Yes	Yes	Yes	No	No	No	No
External Fungi.	Yes	Yes	No	Yes	Yes	Yes	No	No	No
Internal Fungi	Yes	No	No	Yes	No	No	No	No	No
Unidentified Trematode Cysts	No	No	No	Yes	No	No	No	No	No

^a "Yes" indicates detection of the pathogen but in many cases no disease or fish loss was associated with presence of the pathogen. "No" indicates the pathogen has not been detected in that stock.

^b Stocks held at Trask Hatchery.

^c Stocks held at East Fork Trask Pond.

^d Stocks held at Tuffy Creek Pond:

CHF = Fall Chinook Salmon

CHW= Winter Chinook Salmon

CHS= Spring Chinook Salmon

STW = Winter Steelhead

Co=Coho Salmon Trout

Stock 34 =Trask River

Stock 121W = Wilson River

Stock 047= Nestucca River

The fish health monitoring plan is identical to that developed by the Integrated Hatchery Operations Team for the Columbia Basin anadromous salmonid hatcheries. (See Policies and Procedures for the Columbia Basin Anadromous Salmonid Hatcheries, Annual Report 1994. Bonneville Power Administration.)

- All fish health monitoring will be conducted by a qualified fish health specialist.
- Annually examine broodstock for the presence of viral reportable pathogens. Number of individuals examined, usually 60 fish, will be great enough to assure a 95% chance of detection of a pathogen present in the population at the 5% level. American Fisheries Society “Fish Health Blue Book” procedures will be followed.
- Annually screen each salmon broodstock for the presence of *R. salmoninarum* (*R.s*). Methodology and effort will be at the discretion of the fish health specialist.
- Conduct examinations of juvenile fish at least monthly and more often as necessary. A representative sample of healthy and moribund fish from each lot of fish will be examined. The number of fish examined will be at the discretion of the fish health specialist.
- Investigate abnormal levels of fish loss when they occur.
- Determine fish health status prior to release or transfer to another facility. The exam may occur during the regular monthly monitoring visit; i.e., within 1 month of release.
- Appropriate actions including drug or chemical treatments will be recommended as necessary. If a bacterial pathogen requires treatment with antibiotics a drug sensitivity profile will be generated when possible.
- Findings and results of fish health monitoring will be recorded on a standard fish health reporting form and maintained in a fish health database.
- Fish culture practices will be reviewed as necessary with facility personnel. Where and when pertinent, nutrition, water flow and chemistry, loading and density indices, handling, disinfecting procedures, and treatments will be discussed.

Disease Treatment

Treatments for disease at Trask Hatchery include: green eggs are routinely water hardened in diluted buffered iodophor; formalin flush treatments of 1:600 formalin for 15 minutes given 3 to 7 times per week for fungi prevention on eggs. Juvenile fish are treated with formalin or hydrogen peroxide. Depending on species of fish, parasite treating and water temperature, hydrogen peroxide is used at 1:3500 for 1 hour, or formalin is used at 1:15,000 to 1:6,000 for 1 hour for 3 to 5 consecutive days. Winter steelhead fry may be given salt and acetic acid dip treatments to control *ichthyobodo* infestations. Juvenile fish are treated for bacterial infections with oxytetracycline or Romet medicated feed according to label or under an Investigational New Animal Drug Permit (INAD). Adult Wilson River steelhead are given oxytetracycline injections under a veterinary prescription to prevent furunculosis and 1:6,000 formalin treatments for 3 to 7 days per week to prevent external fungi infections. At East Fork Trask Pond, the spring chinook juveniles are given potassium permanganate 1-hour baths at 1.0 ppm treatment on the first day and 1.25 ppm treatment on days 2 and 3 to control bacterial gill disease. Fingerlings held at the Tuffy Creek facility are treated with hydrogen peroxide at 1:3500 flow for one hour to control costia and trichodina.

ATTACHMENT B



MEMORANDUM

OREGON DEPARTMENT OF FISH AND WILDLIFE

INTRADEPARTMENTAL

DATE: March 25, 2004

TO: Ed Bowles and Gary Galovich

FROM: Charlie Corrarino, Conservation and Recovery Program

SUBJECT: Whiskey Creek STEP Proposal Review

At your request, the Conservation and Recovery Program has reviewed the Whiskey Creek STEP proposal for a renewal period of five years. The attached flow diagram shows that the STEP program is an integral part of the Trask Hatchery spring Chinook program and as such, both programs must be evaluated as a whole. This review is consistent with the implementation of HB2606 and will make recommendations to ensure consistency with the recovery or sustainability of native stocks. Recommendations will include the continuation of some existing measures and implementation of some new measures.

The Trask Hatchery spring Chinook program currently produces 345,000 smolts and presmolts plus 65,000 unfed fry in the Wilson and Trask rivers. Of that total, the Whiskey Creek STEP program rears and releases 100,000 spring Chinook smolts and presmolts (see attached flow chart).

Brood Stock The brood stock for the Trask spring Chinook program is indigenous Trask River stock. The returning adults gather throughout the summer in the "Hatchery Hole", immediately adjacent to Trask Hatchery. When the fall rains begin, the adult spring Chinook from the "Hatchery Hole" swim into Trask Hatchery where 635,000 eggs are taken each September. This technique should adequately represent the run timing as adult fish have been congregating throughout the summer. **The Conservation and Recovery Program recommendation is to continue using the same collection method to represent the entire run timing.** This is critically important to the health of the stock, especially if very many hatchery fish are present on the spawning grounds.

Size at Time of Release The only juveniles (except unfed fry released into the Wilson River) released smaller than smolts are from Whiskey Creek. Presmolts released in May (25K) and June (20K) are likely to spend more time competing with naturally produced smolts. **The**

Conservation and Recovery Program recommendation is to develop a strategy to hold the Whiskey Creek presmolts released in May and June until they have reached the smolt stage. All smolt releases should occur in late July or early August. The Conservation and Recovery proposes three options for the District STEP Program to select from to accomplish this goal: reduce production, utilize existing facilities in a different manner or build an additional holding area to raise all Whiskey Creek spring Chinook to smolts. This will help minimize interactions between the hatchery juveniles and the naturally produced juveniles. A note of caution: if an additional facility is constructed and water is pumped from the Trask River to supply the facility (and that is what is being proposed), disease, specifically ICH and furunculosis may be problematic. Fish Health Program Manager Tony Amandi should be consulted prior to final approval if that option is selected. And just in case disease is not manageable, it may be prudent to use a temporary structure that is less expensive than concrete. **The Conservation and Recovery Program also recommends the continuation of the 100% adipose fin mark and CWT groups in the Wilson and Trask rivers.** This will provide a tool to monitor the percent of hatchery fish on the spawning grounds and allow a selective fishery.

Monitoring and Evaluation Currently there is no well-defined, systematic monitoring program that can estimate adult spring Chinook abundance. One of the interim criteria in the Native Fish Conservation Policy (NFCP) states that “at least 90% of the spawners within a population must be naturally produced and not hatchery produced fish”. **The Conservation and Recovery Program recommendation is that beginning in 2004, the North Coast Watershed District conduct random spawning ground surveys in the Wilson and Trask rivers to determine the relative abundance of hatchery and naturally produced spring Chinook adults.** The spawning ground surveys should be designed by and coordinated with Steve Jacobs, Leader of the Coastal Salmonid Inventory Project.

Recommendation **If the proposed changes are implemented as stated, the Conservation and Recovery Program recommends approval of the permit application for a period not to exceed five years.**

Contingency Approval is contingent upon the findings presented in the Stock Status Report, due for completion in fall 2004. If the Coastal Spring Chinook Species Management Unit (Coquille, Umpqua, Siuslaw, Alsea, Siletz, Nestucca and Tillamook) is determined to be “at risk”, appropriate agency action would be necessary. Consistent with the Native Fish Conservation Policy, “at risk” Species Management Units require the Department to implement fish management changes likely to improve the conservation status of the management unit, based upon a documented evaluation of the primary factors impacting fish within the species management unit. The Department shall respond as soon as possible to an improvement in the conservation status of the species management unit. If the SMU is found to be “at risk”, **the Conservation and Recovery Program may recommend that stocking hatchery spring Chinook in the Wilson River be discontinued in an attempt to minimize ecological and/or genetic impacts to the naturally produced spring Chinook. Spawning surveys and other monitoring and evaluation would continue in this portion of the species management unit. This proposed action would be considered an interim measure until a conservation plan was developed and be subject to public review.** Removal of hatchery spring Chinook from the Wilson River basin would create a Chinook sanctuary and, done in conjunction with a well-

designed spawning survey, would provide meaningful analysis for a potential recovery strategy. Fishery impacts would be minimal as the reported catch of spring Chinook from harvest cards is 48 fish per year in the Wilson River from 1995-2002. By comparison, the average spring Chinook catch in the Trask River was 245 fish per year for the same time sequence. The spring Chinook hatchery program may also have a negative impact on the naturally reproducing population of fall Chinook in the Tillamook/Nestucca complex.

Additional information is necessary to determine the relationship between spring and fall Chinook hatchery programs and naturally producing fall Chinook in the Tillamook-Nestucca Complex. Steve Jacobs (ODFW) states in a draft 2004 report that the Tillamook-Nestucca Complex is the only basin aggregate north of the Umpqua to display a downward trend in fall Chinook spawner abundance for the years 1984-2003. This decline is disturbing in view of other robust fall Chinook populations in the remainder of the coast. Further evaluation should be conducted to determine impacts related to angler harvest and hatchery programs.

Cc with attachment:

Rick Klumph
Keith Braun
Tracey Holton
Robert Bradley
Bill Otto
Joe Watkins
Chris Wheaton
Rhine Messmer
Bruce McIntosh
Mark Chilcote
George Nandor
Tony Amandi
Steve Jacobs
Mark Lewis
Steve Williams